

# THE NORDIC POPULATION IN 2040

– Analysis of past and future  
demographic trends

**Nora Sánchez Gassen**  
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**NORDREGIO REPORT 2019:6**





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*Prepared on behalf of the 2017 to 2020 Nordic Thematic Group for Sustainable Rural Development, under the Nordic Council of Ministers' Committee of Senior Officials for Regional Policy.*

## **The Nordic Population in 2040 – Analysis of past and future demographic trends**

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is a forum for co-operation between the Nordic parliaments and governments. The Council consists of 87 parliamentarians from the Nordic countries. The Nordic Council takes policy initiatives and monitors Nordic co-operation. Founded in 1952.

Stockholm, Sweden, 2019

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# 1. Introduction

## Research and policy questions

This paper is one output of the 2017 to 2020 Nordic Thematic Group for Sustainable Rural Development. The purpose of this project is to provide policy makers at the national, regional, and municipal levels an idea of what the size, composition, and geographic distribution of the rural populations in the Nordic countries might look like in 2040. It does this by compiling the population projections done by the national statistical offices of the Nordic countries to examine the size, regional concentration, age distribution, and other characteristics of the rural populations in the Nordic countries in the future. The future size of the both the urban and rural populations are examined to provide context for the expected population trends in rural areas. A separate policy brief is available which summarizes the key findings.

## Population policy

Population policy is a strategy for achieving a pattern of population change. The policy might involve trying to target a population size, growth rate, composition, or distribution. These policies can be targeted at the national, regional, urban or municipal levels. For instance, for much of the twentieth century, the Nordic countries had quite restrictive immigration policies in attempting to keep their populations relatively homogenous. In more recent decades, there have been more open immigration

policies in order to counter population decline and aging and also to have more diverse populations.

There can be both *direct population policies* aimed at altering specific demographic behaviors, such as the immigration restrictions and border controls which were instituted in the Nordic countries during the surge of refugees and asylum seekers in the 2015–2016 period. *Indirect population policies* are those which are designed to influence some other aspect of life not necessarily population change but which have an influence on demographic behavior. The long parental leaves in the Nordic countries, inexpensive daycare and health costs for children could have pronatalist influences.

A key input to population policy and the development of rural policy are projections of the future size, composition, and distribution of the population in the Nordic countries. If the expected future size or composition of the population differ from what is desired, policy interventions can be designed and implemented to attempt to achieve the desired population outcome. One policy option is no intervention but to simply adapt to the expected demographic trends of the future.

## How population projections are done

The national statistical offices of all the Nordic countries and autonomous areas regularly produce projections of their populations. These differ in detail, assumptions, and length of the projection period. The population projections are used for a variety of planning purposes. There are several methods for projecting the future size of a population. The easiest is to simply extrapolate past population change trends into the future. While simple, this method has limitations, mainly that it does not take into consideration the age structure of the population nor the recent trends in number of births and deaths and net migration. The standard practice for doing population projections is the cohort-component method. The components of population change – fertility, mortality, and migration – are applied to the cohorts or the age-sex structure of the population. This is an extension of the population balancing equation where the

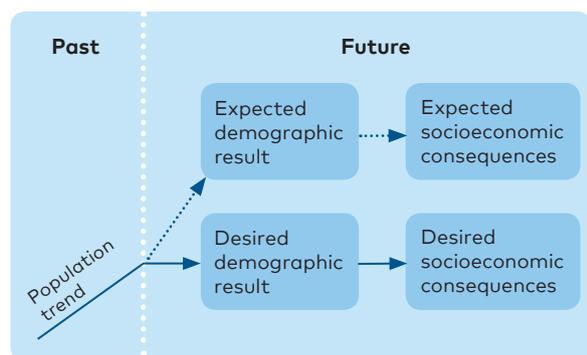
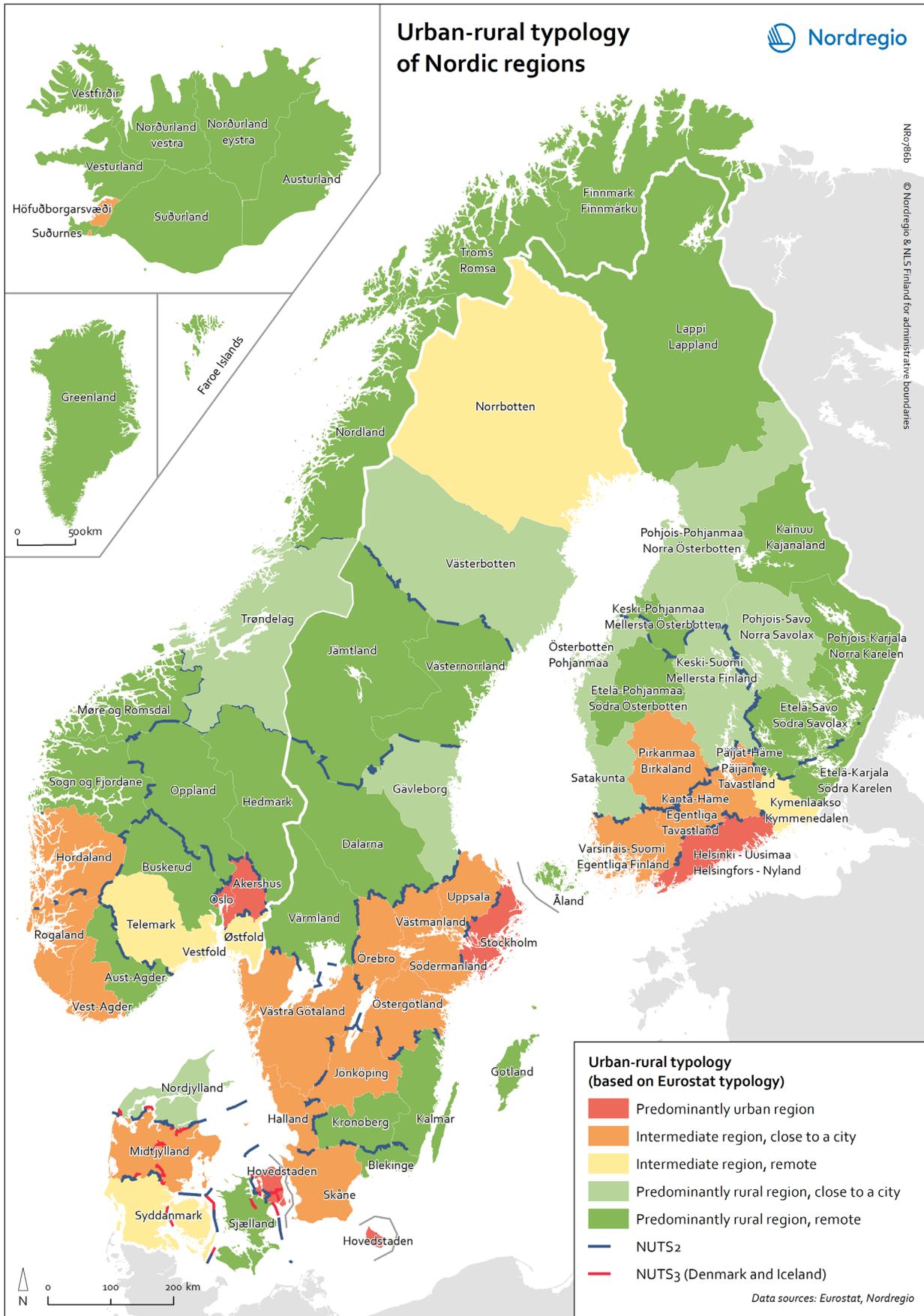


Figure 1.1: Formulating a population policy. Source: Weeks, John. R. (2008), *Population: An Introduction to Concepts and Issues, Tenth Edition*, Thomson-Wadsworth.

# Urban-rural typology of Nordic regions



NRO/966 © Nordregio & NILS Finland for administrative boundaries

population at the beginning of a period (usually a year) plus the number of births minus the number of deaths plus the number of in-migrants minus the number of out-migrants equals the population at the end of the period or year. The difference between the number of births and deaths is called natural increase. The difference between the number of in-migrants and out-migrants is called net migration. It is important to distinguish between these two components of population change because they are influenced by and influence populations differently.

Several factors influence population change. One is the age-structure. A population with a relatively younger population, meaning more people in the child-bearing ages, will tend to grow faster than a population with more people in old ages where mortality rates are higher. With some exceptions, most of the Nordic regions have relatively old populations. Another factor is the fertility rate, the number of children per woman. A rate of 2.1 children per woman over the course of her reproductive years is considered replacement-level fertility, the level at which a population would just replace itself. Deviations either above or below replacement-level have a significant impact on population growth. Again, with some exceptions, most Nordic populations have fertility rates below replacement level and are thus declining slightly because of this. Mortality or levels of life expectancy also influence population change but less so than other factors. Most of the Nordic regions are part of countries with rather high levels of life expectancy, some among the highest in the world.

For any country or region, the most difficult component of population change to project is migration because of its volatility due to exogenous factors outside the projection model. Migration – in-migration or out-migration – are subject to a variety of unforeseen factors such as wars, structural economic change altering the demand for labor migrants, the discovery of new economic resources or the depletion of current resources, technological breakthroughs, border changes, changes in government policy towards either internal or international migration, or environmental factors. The age structures of these migration flows can vary depending on the push and pull factors and how they impact different cohorts.

## Regional typology

The Nordic states and autonomous regions each have their own typologies of regions and municipalities which they use for planning and operational purposes. In this analysis of past and future population trends across the across the Nordic regions, a common typology of urban and rural regions is used with five different types of regions 1) predominantly urban regions (red), 2) intermediate regions, close to a city (orange) 3) intermediate regions, remote (yellow) 4) predominantly rural regions, close to a city (light green) and 5) predominantly rural regions, remote (dark green) (figure 1.2). This pattern of colours will be used throughout the report in tables and figures to be able to quickly distinguish demographic patterns according to the regional typology.

The urban-rural typology classifies the Nordic regions based on the Eurostat methodology.<sup>1</sup> The classification is completed in three steps: identify rural area population, classify regions, and adjust classification based on the presence of cities.<sup>2</sup>

## Population in rural areas

This typology uses a simple two-step approach to identify population in rural areas: rural areas are all areas outside urban clusters; urban clusters are clusters of contiguous grid cells of 1 km<sup>2</sup> with a density of at least 300 inhabitants per km<sup>2</sup> and a minimum population of 5,000.

## Regional classification

The region are classified on the basis of the share of population in rural areas:

- predominantly rural if the share of population living in rural areas is higher than 50%;
- intermediate, if the share of population living in rural areas is between 20% and 50%;
- predominantly urban, if the share of population living in rural areas is below 20%.

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1 Eurostat, Regional typologies overview, ([https://ec.europa.eu/eurostat/statistics-explained/index.php/Regional\\_typologies\\_overview#Urban-rural\\_typology\\_including\\_remoteness](https://ec.europa.eu/eurostat/statistics-explained/index.php/Regional_typologies_overview#Urban-rural_typology_including_remoteness) accessed 25 March 2019), last modified on 13 July 2018.

2 In a previous version of the map showing the typology, two regions in Norway, North Trøndelag and South Trøndelag, were shown separately. North Trøndelag was classified as a predominantly rural region, remote. South Trøndelag was classified as an intermediate region, close to a city. These two regions have since been merged into a new region called Trøndelag, which is classified as a predominantly rural region, close to a city.

### Presence of cities

In a third step, the size of the urban centres in the region is considered:

- a predominantly rural region which contains an urban centre of more than 200 000 inhabitants representing at least 25 % of the regional population it becomes intermediate;
- an intermediate region which contains an urban centre of more than 500 000 inhabitants representing at least 25 % of the regional population becomes predominantly urban.

### Remoteness dimension

All predominantly urban regions are considered close to a city.

A predominantly rural or intermediate regions is considered remote if less than half of its residents can drive to the centre of a city of at least 50 000 inhabitants within 45 minutes. If more than half of the region's population can reach a city of at least 50 000, it is considered close to a city.

It is based on this latter criteria that which a seeming anomaly occurs. Norrbotten in north-

ern Sweden is classified as an intermediate region, remote while Västerbotten is classified as a predominantly rural region, close to a city. In Norrbotten, more than half the region's population is within a 45 drive of the Luleå while in Västerbotten, the population is more dispersed away from Umeå.

### Outline of paper

Following this introduction, the main portion of the paper is divided into three chapters which each examines a different aspect of the population of the Nordic countries in the future. Chapter 2, titled 'Urbanisation and rural exodus in the Nordics: past and future trends' examines which Nordic regions and municipalities are growing and which are shrinking in the past and which are expected to grow and decline in the future. The period under examination is 1990 to 2040. Chapter 3 is titled 'Population ageing in the Nordics: past and future trends' which looks at aging trends at the national, regional, and municipal levels. Chapter 4 is titled 'The working age population in the Nordics: past and future trends', and looks at the size and share of the working-age population.

## 2. Urbanisation and rural exodus in the Nordics: past and future trends

As other parts of Europe, the Nordic Region is undergoing a process of urbanisation. More people are moving from the countryside to cities than in the opposite direction, leading to population growth in urban areas and population decline in many rural and remote municipalities. These ongoing trends are well-documented in the academic and grey literature and a general expectation is that they will continue unabated in the coming years.

This chapter will investigate this expectation on the basis of the most recently available data at a regional and local level. We will answer two sets of research questions:

- 1) Areas of population decline: Which Nordic regions and municipalities are shrinking? Is population decline restricted to rural and growth to urban areas, or do we find outliers?
- 2) Future and past trends: Will ongoing trends of population shrinkage or growth indeed persist across Nordic regions and municipalities in the future or are trend changes expected?

We will address these questions by first taking stock of how populations sizes have changed in Nordic regions and municipalities during the last decades. In the second part of the chapter, we will present the results of the most recently published sub-national projections from the Nordic countries and investigate which population trends are expected until 2040. In a final discussion section, we will bring both perspectives together and analyse municipal demographic trends over a fifty-year period, comparing past and future trends in each municipality.

### Past population change in rural and urban regions: 1990–2017

The population in the Nordic countries has grown substantially during the past decades. In 1990, 23.3 million people lived in the Nordic Region, with the largest numbers living in Sweden (8.6 million),

Denmark (5.1 million), Finland (5.0 million), and Norway (4.2 million). Until 2017, the population had increased by 16% to 27.1 million people. Sweden (10.1 million), Denmark (5.7 million), Finland (5.5 million), and Norway (5.3 million) still have the largest population sizes.

Table 1 and Figure 1 show the geographic distribution of the Nordic population in 1990 and 2017. We distinguish between the five different types of regions introduced earlier, each identifiable with a distinct colour: 1) predominantly urban regions (red), 2) intermediate regions, close to a city (orange), 3) intermediate regions, remote (yellow), 4) predominantly rural regions, close to a city (light green) and 5) predominantly rural regions, remote (dark green). We sum the population living in each type of region. Table 1 shows the absolute number of people living in the different regions in 1990 and 2017 by country, while Figure 1 shows the distribution in percent for the Nordic Region as a whole.

In 1990, more than 20% of the Nordic population – 5.3 million persons – lived in urban areas (Table 1 and Figure 1). This category includes the Nordic capital regions Stockholm, Oslo, Helsinki and region Hovedstaden in Denmark, but also the region (*fylke*) of Akershus in Norway. Another 5.1 million people lived in remote rural regions (in dark green) such as Finnmark (NO), Lappi (FI) or Austurland (IS). Hence in 1990, the most urban and the most rural Nordic regions were home to almost the same number of people and therefore arguably equally attractive living environments. Intermediate regions which are close to a city (orange regions) were the most popular living environments and home to almost eight million people. The remainder of the population lived in roughly similar numbers in intermediate remote regions (in yellow) such as Norrbotten (SE) and in rural areas in close distance to a city (in light green) such as Satakunta (FI).

Between 1990 and 2017, the population increased in all five types of regions. Nonetheless,

**Table 1: Nordic population by region of residence, 1990 and 2017 (rounded numbers)**

Urban-rural typology	1990	2017	Change in %
<b>Predominantly urban regions ("red")</b>	<b>5,266,000</b>	<b>7,025,000</b>	<b>33</b>
in Denmark	1,531,000	1,807,000	18
in Finland	1,220,000	1,638,000	34
in Norway	873,000	1,271,000	46
in Sweden	1,642,000	2,308,000	41
<b>Intermediate regions, close to a city ("orange")</b>	<b>7,917,000</b>	<b>9,463,000</b>	<b>20</b>
in Denmark	1,128,000	1,304,000	16
in Finland	1,206,000	1,360,000	13
in Iceland	146,000	217,000	49
in Norway	888,900	1,176,000	32
in Sweden	4,548,000	5,405,000	19
<b>Intermediate regions, remote ("yellow")</b>	<b>2,197,000</b>	<b>2,359,000</b>	<b>7</b>
in Denmark	1,140,000	1,217,000	7
in Finland	194,000	178,000	-9
in Norway	598,000	713,000	19
in Sweden	264,000	251,000	-5
<b>Predominantly rural regions, close to a city ("light green")</b>	<b>2,765,000</b>	<b>2,934,000</b>	<b>6</b>
in Denmark	571,000	587,000	3
in Finland	1,276,000	1,338,000	5
in Norway	377,000	455,000	21
in Sweden	541,000	554,000	2
<b>Predominantly rural regions, remote ("dark green")</b>	<b>5,140,000</b>	<b>5,293,000</b>	<b>3</b>
in Denmark	758,000	833,000	10
Faroe Islands	48,000	50,000	4
in Finland	1,054,000	959,000	-9
Åland	24,000	29,000	21
Greenland	56,000	56,000	1
in Iceland	110,000	121,000	11
in Norway	1,496,000	1,643,000	10
in Sweden	1,596,000	1,601,000	0
<b>Norden – all countries and regions</b>	<b>23,285,000</b>	<b>27,075,000</b>	<b>16</b>

Source: Own Table, based on NSIs.

population growth was stronger in the urban than in the rural regions. Of the total population increase of 3.8 million over this period, 46 percent was in predominantly urban regions (in red). These regions had 1.8 million more inhabitants in 2017

than they had in 1990 (an increase of 33%). The population in the intermediate urban (orange) regions also grew substantially, by around 1.5 million, or 20%. In the three more remote and rural Nordic regions, the population increased less strongly. The

dark green regions, for instance, only had around 153.000 inhabitants more in 2017 than in 1990 (an increase of 3%).

Population decline occurred only in a few regions between 1990 and 2017 (see Table 1): Intermediate remote regions (yellow) in Finland and Sweden (i.e. Kymenlaakso and Norrbotten) and remote rural (dark green) regions in Finland (seven regions including Kainuu) had fewer inhabitants in 2017 than in 1990. In all other Nordic regions, even in rural and remote areas, the population increased.

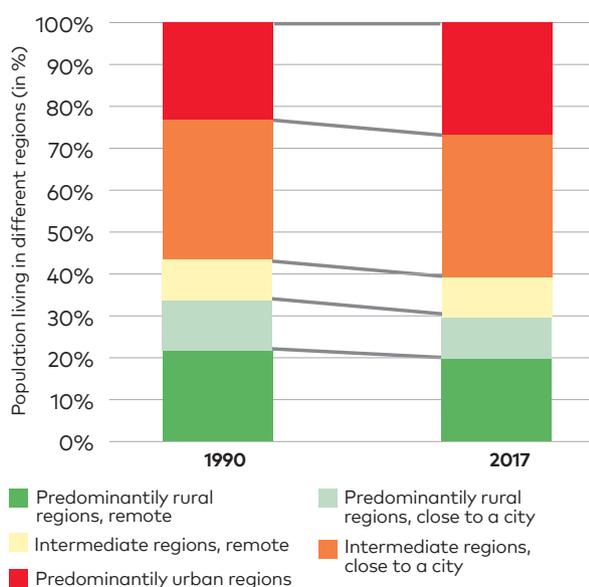
The differences in population growth have influenced the distribution of the Nordic population across the five types of regions, as can be seen in Figure 1. Whereas 23% of all people lived in predominantly urban, 'red' regions in 1990, it was 26%

in 2017. The population share living in orange regions also increased slightly, from 34% to 35%. The three more rural and/or remote types of regions were all home to a comparatively smaller share of the total population in 2017 than in 1990, and the decline has been particularly pronounced in the dark green regions. They were home to 20% of all Nordic inhabitants in 2017, down from 22% in 1990.

The trends shown in Figure 1 for the Nordic level also hold when comparing the five Nordic countries separately (not shown in the figure): In all countries, the share of people living in red and orange regions has increased since 1990, while the share of people in rural and remote regions has declined.

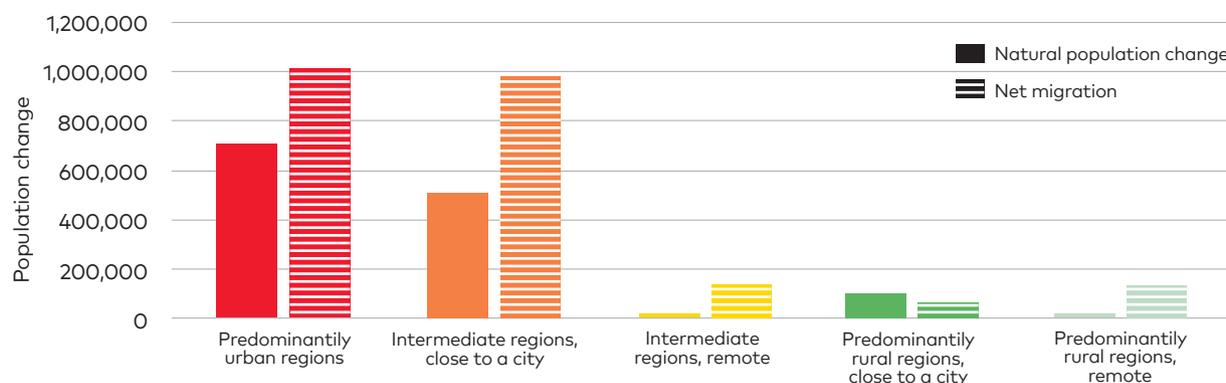
These statistics confirm that the Nordic Region is going through a process of urbanisation. Nonetheless, this trend has not been of a drastic scale: The changes in the proportions of the population living in each type of region have been around or below 3 percentage points, spread out over a period of 27 years. In absolute numbers, populations have even increased almost everywhere.

The differences in population growth between more urban and more rural areas can be attributed to the two sources of population change: natural population growth and migration. Natural population growth is defined as the difference between births and deaths in a region during a specific period of time. Net migration numbers show the difference between the number of people who move into a region and the number of people who move away. Figure 2 and Table 2 show that the population in predominantly urban regions ("red" regions) and intermediate regions in proximity to a city ("orange" regions) increased strongly between 1990 and 2017 both because of natural population growth and positive net migration numbers.



**Figure 1: Distribution of Nordic population by region of residence (in %), 1990 and 2017.**

Source: Own Figure, based on NSIs.



**Figure 2: Sources of population growth in the Nordic regions, 1990-2017.**

Source: Own Figure, based on NSIs

**Table 2: Sources of population growth in the Nordic regions, 1990–2017**

Urban-rural typology	Natural population change	Net migration	Total
Predominantly urban regions	709,000	1,014,000	1,723,000
Intermediate regions, close to a city	515,000	995,000	1,510,000
Intermediate regions, remote	24,000	141,000	165,000
Predominantly rural regions, close to a city	105,000	62,000	167,000
Predominantly rural regions, remote	9,000	139,000	148,000

Source: Own Table, based on NSIs.

In other words, the number of births strongly surpassed the number of deaths in these regions, and more people moved there than moved away. In the three more rural and/or remote regions (“yellow”, “light green” and “dark green” regions), the population also increased thanks to positive natural population change and migration, but growth from both sources remained much more modest.

### Past population change in rural and urban municipalities: 1990–2017

Moving from the urban-rural typology to a municipal perspective, we find strong differences in trends within each region. Figure 3 (next page) shows the level of population change between 1990 and 2017 for all municipalities in the Nordic Region. The smaller map in the bottom corner shows the urban-rural typology to facilitate comparisons between municipalities in regions classified as rural, intermediate or urban.

As described in the previous chapter, remote rural areas (in dark green on the small map), at least if considered together, did not experience population decline between 1990 and 2017, but in fact slightly increased their combined population size. Figure 3 (next page) however shows that this growth has in many cases been concentrated in urban centres and their surrounding areas. For instance, in Lappland (FI), the commercial and administrative centre Rovaniemi experienced strong

population growth of more than 30%. In all other municipalities – with the exception of neighbouring Kittilä – the number of inhabitants declined. Similarly, population growth occurred especially in and around regional centres in Sweden, such as Fallun in Dalarna and Karlstad in Värmland, as well as on the Faroe Islands and in Greenland (where the entire countries are classified as remote rural).

Nonetheless, there are exceptions to this pattern: In some regions, all municipalities, including regional centres, experienced population decline (e.g. Kainuu in Finland and Vestfirðir and Norðurland vestra in Iceland). In other regions such as Sjælland (DK) and Blekinge (SE) that are classified as remote and rural (“dark green” regions), but are in closer proximity to metropolitan centres, all or almost all municipalities profited from population growth. In many remote and rural regions in Norway and Iceland not only regional centres, but also some smaller municipalities in remote rural areas such as Vadsø in Finnmark, Hemsedal in Buskerud (both NO) or Svalbarðsstrandarhreppur and Fljótsdalshérað (both IS) increased their number of inhabitants. While population growth was hence restricted to the towns and urban centres in many remote rural (“dark green”) regions, exceptions do exist.

The same holds true when considering population growth in the most urban (red) regions in the Nordic countries. Here, population numbers grew in almost all municipalities, but a few municipalities in Denmark and Finland – for instance Albertslund, Bornholm (both region Hovedstaden, DK), Loviisa, Lapinjärvi and Myrskylä (all in region Helsinki/Uusimaa, FI) - had smaller populations in 2017 than they did in 1990. While these municipalities are situated in regions that are classified as predominantly urban, they are more remote and/or sparsely populated and hence in some respects comparable to small municipalities in the dark green regions.

### Future population change in rural and urban regions until 2040

The population in the Nordic Region is expected to grow further in size during the coming decades. Until 2040, the combined population size of the Nordic countries and regions is projected to increase from currently 27.1 million to 29.5 million people. Figure 4 (page 15) shows that all types of regions are expected to share in this trend: The largest increases in population numbers are ex-

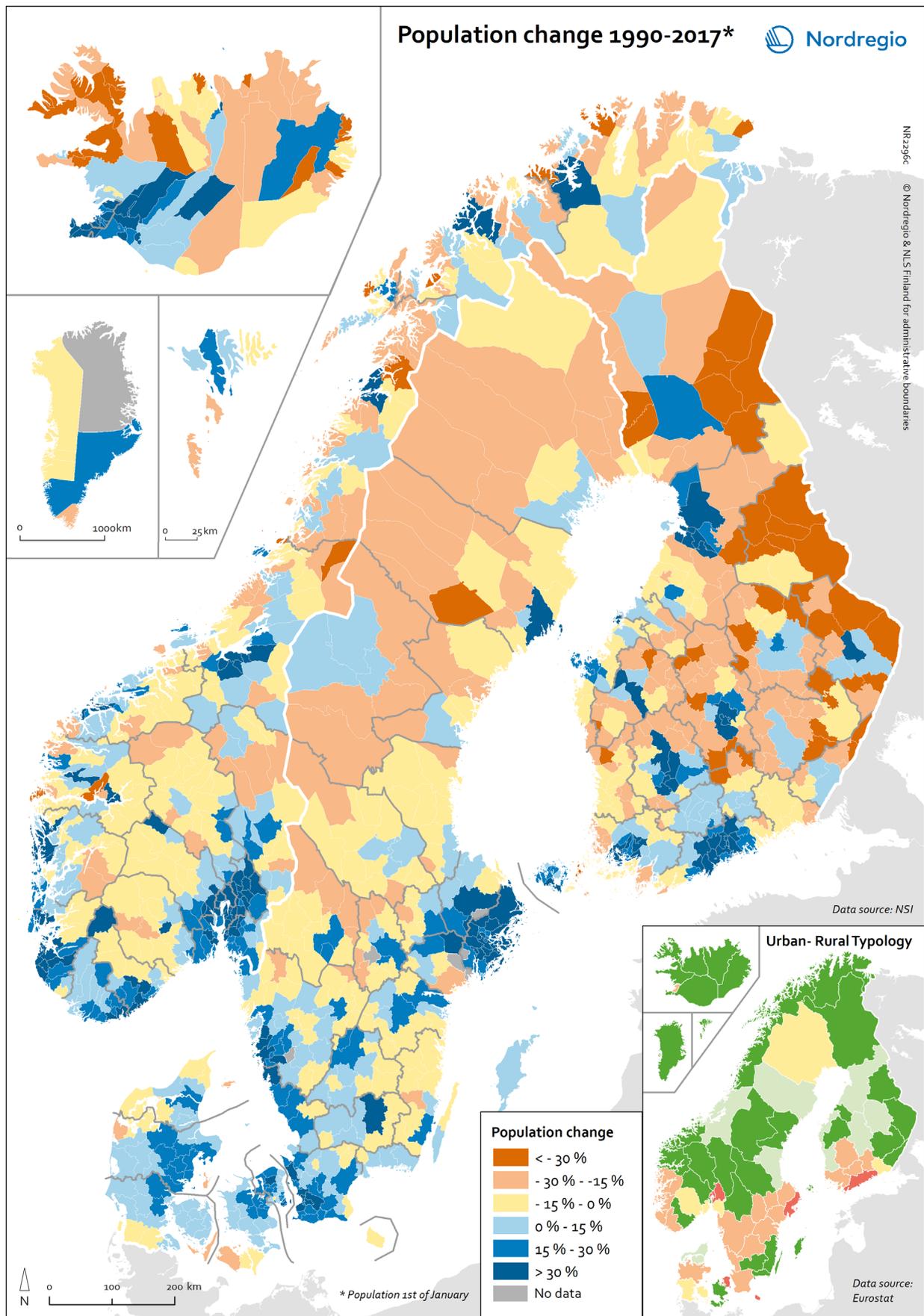


Figure 3: Population change in Nordic municipalities: 1990 and 2017 in comparison

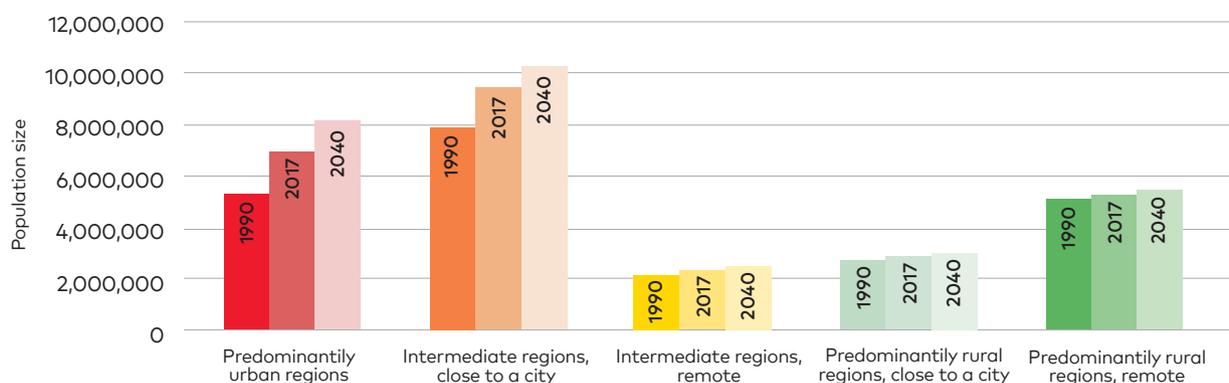


Figure 4: Population size in Nordic rural and urban regions, 1990, 2017 and projections for 2040.

Source: Own Figure, based on NSIs, Tillväxtverket (SE) and Byggdastofnun (IS).

pected in the predominantly urban (“red”) and intermediate regions that are close to a city (“orange”). The population living in these two types of region will be more than three million people larger in 2040 than it is today. This constitutes a 12% increase. The population in the three more rural and/or remote regions is also expected to be larger in 2040 than it is today. Nonetheless, the increase is expected to be more modest. In the dark green regions, for instance, the population is projected to increase from 5.3 million to 5.5 million persons – an increase of 3%.

Table 3 shows that regions in almost all Nordic countries are expected to share in the trend of population growth. When comparing the population numbers of 2017 and the expected numbers for 2040, only yellow regions in Finland and Sweden (Kymenlaakso and Norrbotten) and dark green regions in Greenland (entire region), Finland (seven regions, including Lappi) and Sweden (eight regions including Gotland) are expected to have smaller numbers of inhabitants in 2040 than today. The rest of Norden will, at least when considering trends at the regional typology level, experience further population increase.

Table 3: Nordic population by region of residence, 1990 and 2017 (rounded numbers)

Urban-rural typology	2017	2040	Change in %
<b>Predominantly urban regions</b>	<b>7,025,000</b>	<b>8,202,000</b>	<b>17</b>
in Denmark	1,807,000	2,082,000	15
in Finland	1,638,000	1,914,000	17
in Norway	1,271,000	1,564,000	23
in Sweden	2,308,000	2,643,000	15
<b>Intermediate regions, close to a city</b>	<b>9,463,000</b>	<b>10,284,000</b>	<b>9</b>
in Denmark	1,304,000	1,441,000	10
in Finland	1,360,000	1,444,000	6
in Iceland	217,000	297,000	37
in Norway	1,176,000	1,355,000	15
in Sweden	5,405,000	5,748,000	6
<b>Intermediate regions, remote</b>	<b>2,359,000</b>	<b>2,507,000</b>	<b>6</b>
in Denmark	1,217,000	1,273,000	5
in Finland	178,000	167,000	-6
in Norway	713,000	821,000	15
in Sweden	251,000	246,000	-2

<b>Predominantly rural regions, close to a city ("light green")</b>	<b>2,934,000</b>	<b>3,063,000</b>	<b>4</b>
in Denmark	587,000	609,000	4
in Finland	1,338,000	1,376,000	3
in Norway	455,000	520,000	14
in Sweden	554,000	558,000	1
<b>Predominantly rural regions, remote ("dark green")</b>	<b>5,293,000</b>	<b>5,450,000</b>	<b>3</b>
in Denmark	833,000	893,000	7
Faroe Islands	50,000	52,000	5
in Finland	959,000	926,000	-4
Åland	29,000	34,000	18
Grenland	56,000	52,000	-7
in Iceland	121,000	125,000	3
in Norway	1,643,000	1,797,000	9
in Sweden	1,601,000	1,572,000	-2
<b>Norden – all countries and regions</b>	<b>27,075,000</b>	<b>29,506,000</b>	<b>9</b>

Source: Own Table, based on NSIs, Tillväxtverket (SE) and Byggdastofnun (IS).

The differences in population increase in urban and rural areas will lead to further, slow urbanisation until 2040, as shown in Figure 5. This figure shows the share of the Nordic population that will live in each of the five types of regions in 1990, 2017 and 2040. Note that this figure shows the same content as Figure 1, except that population data for 2040 has been added.

Core trends already identified for the period 1990 to 2017 will continue in the coming years. Most importantly, the proportion of people living in urban ("red") regions will further increase from currently 26% to 28% in 2040. Second, the rural regions will be home to slightly smaller shares of the population than today. Ten percent of the population will live in rural regions close to a city ("light green" regions), and a further 19 percent in remote rural areas ("dark green" regions), down from 11% and 20% in 2017, respectively. The share of persons living in remote intermediate ("yellow") regions such as Norrbotten in Sweden or Syddanmark in Denmark and intermediate regions close to a city such as Pirkanmaa in Finland and Rogaland in Norway will remain almost the same in 2040 as it is now. Overall, the gradual process of gradual urbanisation which has characterized Nordic population change in the past decades, is expected to persist in the near future. In absolute numbers, however, the population in remote rural regions in Norden is not expected to decline.

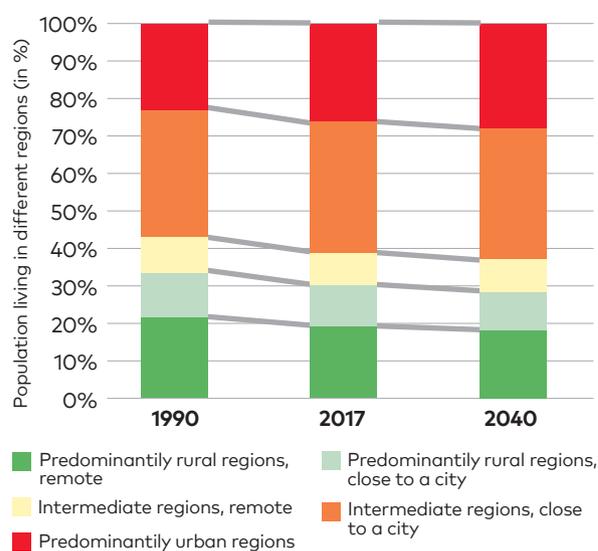


Figure 5: Distribution of Nordic population by region of residence (in %), 1990, 2017 and 2040.

Source: Own Figure, based on NSIs, Tillväxtverket (SE) and Byggdastofnun (IS).

## Future population change in rural and urban municipalities until 2040

Just as in the past, projected population trends until 2040 on a municipal level are highly diverse. On the aggregate level, all five types of urban and rural regions that we distinguish here are expected to have larger populations in 2040 than they have today, but municipalities within these regions do not necessarily follow this trend. This is illustrated

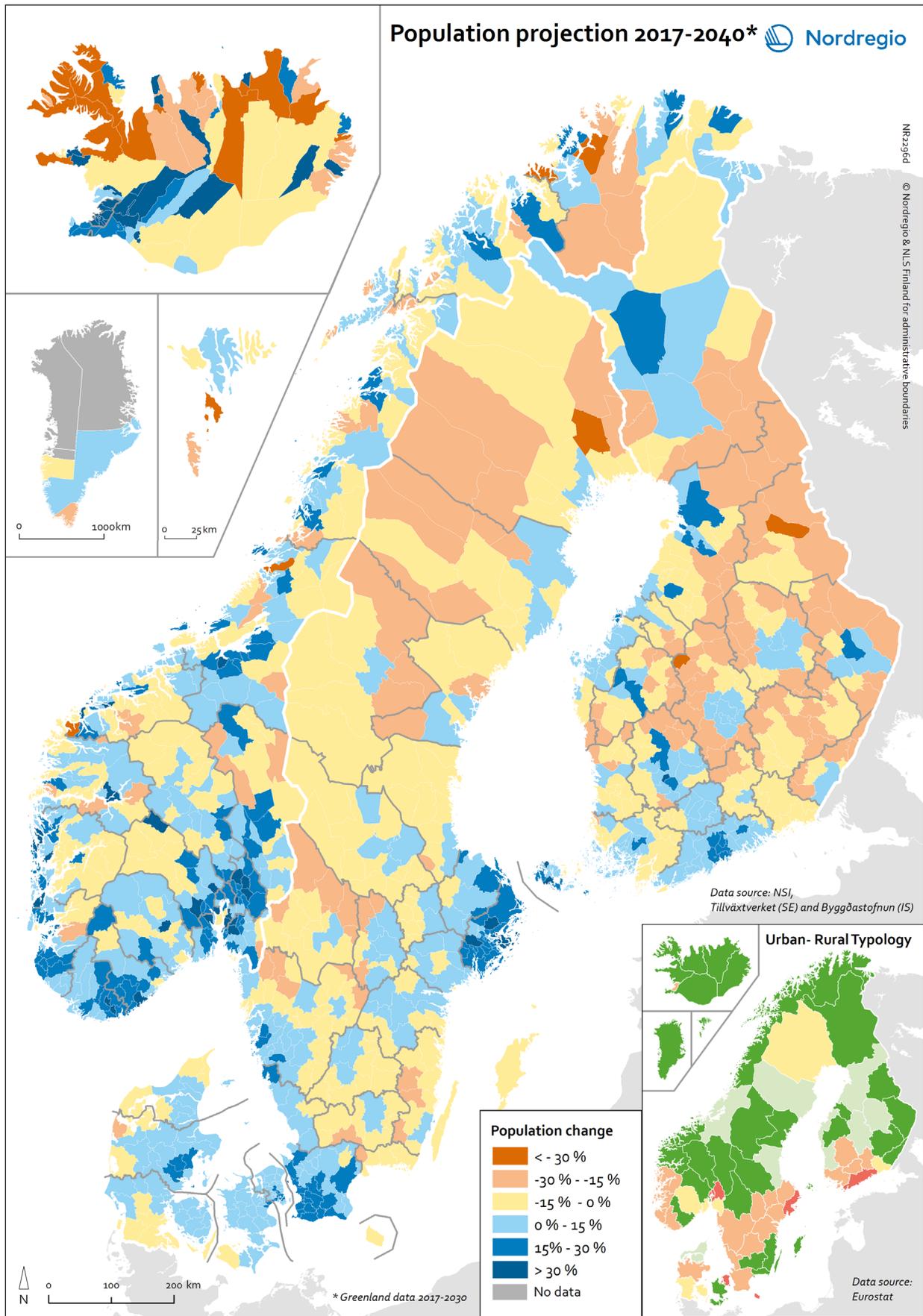


Figure 6: Expected population change in Nordic municipalities: 2017 and 2040 in comparison.

in Figure 6 (previous page) which shows the expected level of population increase or decline in all Nordic municipalities between 2017 and 2040.<sup>3</sup>

In the two types of regions classified as predominantly rural ("light green" and „dark green" regions), population growth largely remains concentrated in larger towns and their suburbs (Figure 6). This is particularly the case in Sweden and Finland. For instance, the regional capitals Östersund in Jämtland (SE) and Seinäjoki in South Ostrobothnia (FI) are expected to have larger populations in 2040 than today, while most other municipalities in these regions will decline. Lappi is an exception in Finland, since here population growth is also expected in several less populated municipalities outside of the city and municipality of Rovaniemi. In Norway and Iceland a somewhat more nuanced pattern applies, just as in the past. Here population growth is not only expected in regional capitals and other larger towns, but also in some smaller and more remote municipalities. These include Gamvik in Finnmark (NO) or Árneshreppur in Vestfirðir (IS). In Denmark, finally, population growth is expected for large parts of the country until 2040, in more rural and urban ar-

reas alike. Population loss is only expected in some of the most remote municipalities at the Northern, Eastern and Southern borders of the country. While the population loss in rural regions is hence expected to continue across the Nordic region, it appears to be more pronounced in some countries than in others. In the predominantly urban ("red") regions, the opposite pattern applies: With very few exceptions, municipalities in these regions are expected to experience a growth in population numbers until 2040.

The trends that are shown in Figure 6 are summarized in Table 4. It shows the percentage of municipalities each in of the five types of regions which are expected to experience strong population increase (defined here as increase by above 15%), strong population decline (defined as decreases by more than 15%) or smaller changes.

Around half of all Nordic municipalities in predominantly urban ("red") regions are expected to have larger populations in 2040 than today (52%) and none will experience strong population decline. In Sweden and Norway, the share of municipalities with strong expected population increases is especially large (81% and 74%).

**Table 4: Proportion of municipalities expected to experience growing, declining or stable population numbers between 2017 and 2040, by type of region and country**

Proportion of municipalities with expected trends:	Expected population change between 2017 and 2040		
	Strong decline (<-15%)	Smaller changes (-15% and +15%)	Strong increase (>+15%)
<b>Predominantly urban regions</b>	<b>0%</b>	<b>48%</b>	<b>52%</b>
in Denmark	0%	72%	28%
in Finland	0%	69%	31%
in Norway	0%	26%	74%
in Sweden	0%	19%	81%
<b>Intermediate regions, close to a city</b>	<b>6%</b>	<b>72%</b>	<b>22%</b>
in Denmark	5%	79%	16%
in Finland	12%	83%	6%
in Iceland	0%	0%	100%
in Norway	3%	55%	42%
in Sweden	5%	78%	17%

<sup>3</sup> For Greenland, the map compares population numbers in 2017 with projected numbers for 2030 only, since regional population projections provided by the NSI do not exceed beyond this year.

<b>Intermediate regions, remote</b>	<b>8%</b>	<b>74%</b>	<b>18%</b>
in Denmark	0%	100%	0%
in Finland	0%	100%	0%
in Norway	2%	62%	36%
in Sweden	43%	57%	0%
<b>Predominantly rural regions, close to a city</b>	<b>25%</b>	<b>66%</b>	<b>9%</b>
in Denmark	0%	100%	0%
in Finland	33%	63%	4%
in Norway	11%	62%	28%
in Sweden	28%	72%	0%
<b>Predominantly rural regions, remote</b>	<b>23%</b>	<b>62%</b>	<b>16%</b>
in Denmark	0%	88%	12%
Faroe Islands	33%	67%	0%
in Finland	49%	48%	3%
Åland	0%	56%	44%
Greenland*	50%	50%	0%
in Iceland	37%	30%	33%
in Norway	11%	70%	19%
in Sweden	22%	78%	0%
<b>Norden – all countries and regions</b>	<b>20%</b>	<b>65%</b>	<b>16%</b>

Source: Own Table, based on NSIs, Tillväxtverket (SE) and Byggdastofnun (IS).

\*Figure includes projected population data for Greenland for the year 2030.

At the other end of the spectrum, around 25% and 23% of municipalities in predominantly rural (“light green” and “dark green”) regions are expected to experience strong population decline. The proportion of municipalities with expected population loss is particularly large in Finland (49%) and Greenland (50%). Only a minority of 9% and 16% of all Nordic municipalities in the predominantly rural regions, respectively, are expected to see strong population increases. The proportion of strongly growing municipalities is particularly high on Åland (44%) and also in Iceland (33%), which have already experienced quite substantial population increase during the past decades (see section 2.1). The remaining two types of regions (in orange and yellow) lie in the middle of the spectrum with 72%-74% of municipalities expected to experience smaller population changes and around a fifth of municipalities expected to see populations increase.

Moving beyond the regional typology level to a country perspective, the distribution of municipalities varies substantially. Among the orange

regions, for instance, only 6% of municipalities in Finland, but all municipalities in Iceland (the capital area Höfuðborgarsvæði) are expected to have more inhabitants in 2040 than today. Similarly, in the yellow regions in Finland and Denmark (regions Kymenlaakso and Syddanmark) none of the municipalities are expected to experience strong population decline, while this will be the case in 43% of all municipalities in Sweden (Norrbotten).

Across the Nordic Region as a whole (last row in Table 3), population numbers are expected to strongly increase in 16% of all municipalities until 2040, 20% are expected to strongly decline while the rest will likely experience smaller population changes.

### Discussion: Persistence of the past? A comparison of past and future population trends

In the previous sections, we have mapped the Nordic regions and municipalities that have experienced population decline or growth in the past 27 years; and we have identified regions and muni-

palties where such trends are expected during the coming years. In this last section, we bring both perspectives together and ask: Are the municipalities that have experienced population decline in the past coincident with those where population loss is expected in the future? In other words, will past trends persist in the future or do we find trend changes?<sup>4</sup>

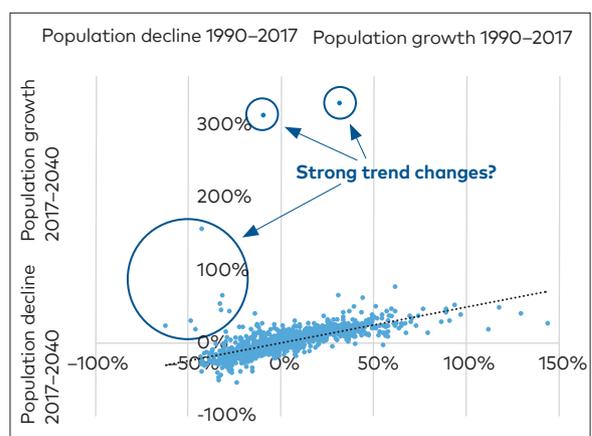
Figure 7 suggest that expected future trends indeed resemble past trends for many municipalities. The Figure shows the relative population change between 1990 and 2017 on the x-axis and the expected relative population change between 2017 and 2040 on the y-axis. Each dot on the figure represents one Nordic municipality.

The municipalities cluster in a remarkably consistent manner along a diagonal. Overall, municipalities that experienced population growth in the past are expected to do so in the future. Similarly, population projections suggest that municipalities where population numbers declined between 1990 and 2017 will experience similar loss until 2040. Nonetheless, there are municipalities which somewhat break this pattern – in the upper left and lower right quadrants of the figure, we see municipalities with population losses in the past that are expected to have population gains in the future and vice versa. The first group contains municipalities especially from Finland and Norway, such as Enontekiö and Marttila, Torsken and Gamvik. The second group – municipalities where populations have grown in the past but which are expected to decline in the future – includes municipalities especially from Norway (such as Marker and Hurum) and Sweden (such as Älmhult and Åre). When considering these cases, it should be noted that not all of them entail strong demographic changes. Some municipalities in these groups experienced minor population loss in the past and will experience minor gains in the future and vice versa. In Figure 7, these municipalities are located closer to the point of origin.

For a few municipalities, a strong trend change appears to be expected, highlighted in the orange

circles in the Figure 7. These municipalities are located in Iceland and have very small population sizes. The population developments are therefore extremely challenging to project, and already small changes in population numbers can make a large difference for the overall population size. Therefore, the projection results for these small municipalities have to be considered with due caution.

Overall, Figure 7 suggests that population trends are rather persistent. Municipalities are by and large expected to follow similar trends in the coming years as in the past 27 years, but the Statistical Offices who produced the projections shown in the Figure do expect trend changes in some cases.



**Figure 7: A comparison of past and future population changes in 1.200 Nordic municipalities<sup>5</sup>. Source: Own Figure based on NSIs, Tillväxtverket (SE) and Bygghäastofnun (IS).**

Figure 8 (next page) synthesises the demographic past and prospects of each municipality. It shows the decade with the lowest average number of inhabitants.<sup>6</sup> The reference time frame is the 1990s to 2030s, hence the decade with the lowest population numbers may lie in the past, present or future.

The majority of Nordic municipalities falls into one of two groups: Many municipalities had their lowest population numbers – within the fifty-year time period displayed here – in the 1990s.

4 It should be noted that the map shows the municipal boundaries as they currently exist. Many municipalities have merged during the last decades, particularly in Norway, Iceland and Denmark, but also in other Nordic countries and regions. In these cases, population numbers of available statistics were summed and harmonized to simulate what the population size in each decade would have been, had the current municipal boundaries existed in the past. For more information on this calculation, please contact the authors.

5 Note that the projection results for municipalities in Greenland only reach until 2030. For some Nordic municipalities – such as Nykvarn or Knivsta in Sweden - that had separated from other municipalities between 1990 and 2017, data on population change between 1990 and 2017 were not available. These have not been included in the Figure.

6 For the figure, population numbers for each decade were added and divided by ten to obtain the average for each decade. The projection for Greenland ends in 2030.

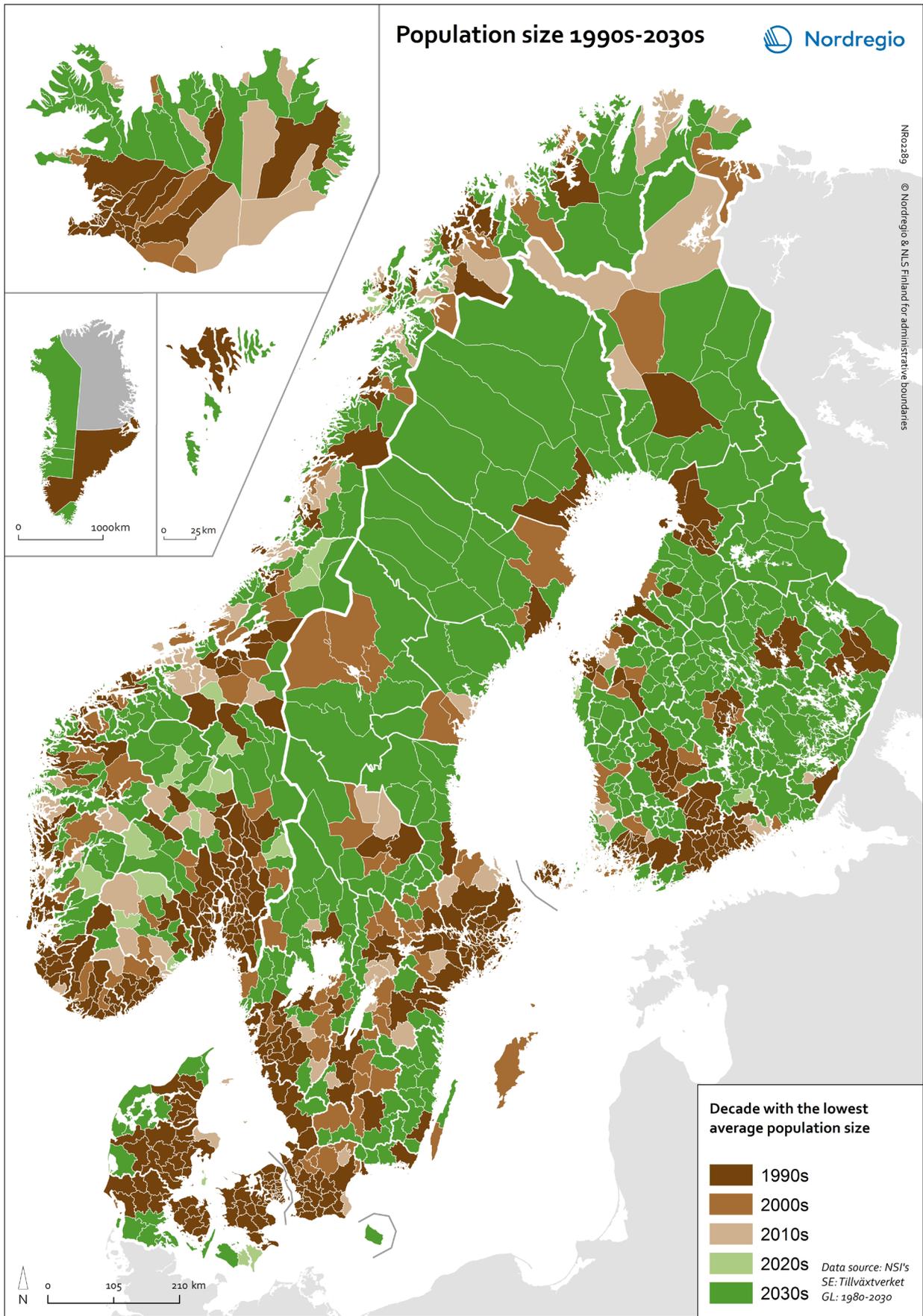


Figure 8: Municipalities by decade of lowest population size, 1990s–2030s

This group includes urban municipalities and their suburbs and hinterlands. In these municipalities, population numbers have been growing since the 1990s. Where declines in population numbers occurred, they never pushed the average population size below that experienced in the 1990s. These municipalities have remained and are expected to remain attractive living environments for an increasing number of persons. A second large group of municipalities falls in the opposite category. In these municipalities population numbers are expected to reach the lowest level in the 2030s. They are generally located in more rural and remote regions and at longer distance from larger towns and cities. Only few municipalities fall in between these two groups and have their largest population sizes in present times.

While these patterns emerge across the Nordic Region, nuances between the countries exist: In Sweden and Finland, the difference between urban and rural regions is particularly strong, and only few municipalities fall outside the pattern described above. These include most notably municipalities in northern Lappi (such as Inari and Enotekiö) and in Western Jämtland (Åre and Krokom). In Denmark, by contrast, larger parts of the country belong to the group of growing municipalities. Only in a few municipalities at the Western coast and the Southern borders of the country are the lowest population numbers yet to come. In Denmark, the relatively small size of the country coupled with the geographic distribution of major cities throughout the country may help to keep population numbers high in most areas. In Norway, there is a larger number of municipalities that are facing future population decline. Nonetheless, similar to Denmark, population growth is less strongly restricted to city regions. Throughout the country, even in the Northern remote regions, we find municipalities that reached their lowest population numbers in the 1990s and have had larger numbers of inhabitants ever since. This may be a reflection of Norway's long-standing regional and rural policy that has emphasized growth and investments in more remote regions. In Iceland, municipalities fall into two geographically rather distinct groups: Municipalities in the South and East of the country have seen their lowest population numbers in the past or present and can hence expect population increases in the future. Most

municipalities in the North-Western part of the country had the largest numbers of inhabitants in the 1990s, and population sizes are not expected to reach back to old levels in the foreseeable future.

Overall, Figure 8 confirms that many rural and remote municipalities – particularly in Sweden, Finland and Northern Norway – are facing continued population decline in the coming years. Trend changes may appear in some of them, but in most cases this will not be enough to push population numbers back to the levels from the 1990s – at least not during the time period considered here. Many rural municipalities hence have to continue or start planning for population decline. The goal should be to uphold the quality of life of its residents and exploit opportunities that come with declining population numbers to the largest extent possible. This may include for instance improving residential environments, promoting healthy lifestyles close to nature and open space with less pollution and stress and supporting initiatives in new economic sectors.

The tables and figures in this chapter also show that demographic decline is not a label that can characterise rural and remote regions in their entirety. As shown above, population numbers are in fact expected to increase in most rural regions in our urban-rural typology, even if this growth will often be concentrated in towns and urban centres. The questions then becomes how growth in these municipalities could be exploited to the benefit of the surrounding countryside, even across regional or country borders. Collaboration and joint planning of municipalities may help to make public services in rural towns more accessible to dwellers in surrounding municipalities, where such services may disappear due to population decline. The opportunities and conditions for such a collaboration may be different in a smaller country such as Denmark, where population growth is expected in many parts of the country, than in Finland. Collaborations between municipalities may also require different conditions in island contexts such as the Faroe Islands or sparsely populated territories such as Greenland than on the Nordic mainland. Regionally differentiated solutions may have to be found. In all cases, however, the development of individual municipalities cannot be considered in isolation but must be placed into the regional context.

# 3. Population ageing in the Nordics: past and future trends

A second trend that has characterized the demographic development of the Nordic Region during the past decades – apart from urbanisation – is population ageing. Population ageing is defined as “a process in which the proportions of adults and elderly increase in a population, while the proportions of children and adolescents decrease” (Population Reference Bureau 2018). One of the most commonly used indicators to measure trends in population ageing is the so-called old-age dependency ratio (OADR). The OADR typically measures the number of people aged 65 years and older (the “old” or retired population) as a share of the number of people aged 15 to 64 (defined as the “working age” population):

$$\text{OADR}_x = \frac{\text{(Number of people aged 65 years or older in year } x\text{)}}{\text{(Number of people aged 15 to 64 years in year } x\text{)}} * 100$$

In other words, the OADR compares the size of the older, presumably retired population with the size of the working-age population who sustains the retirees. The ages of 15 years and 65 years somewhat arbitrarily demarcate the boundaries of these groups.<sup>7</sup>

In this section, we will use the OADR to analyse and compare past and expected future trends of population ageing in the Nordic Region. In the first part, we compare past trends in population ageing in rural and urban regions and municipalities. In a second part, we present projected trends until 2040, again comparing rural regions and municipalities to their more urban counterparts. In a final section, we will reflect on the use of the OADR as an indicator to measure population ageing. Using the example of five Nordic municipalities, we show

<sup>7</sup> Other ages such as 16, years 20 years and 70 years are also sometimes, but less commonly, used to define the boundaries of the working-age and retired populations.

that alternative indicators may provide interesting new perspectives on the magnitude and challenges related to population ageing in rural areas of the Nordic Region.

## Past trends in population ageing in rural and urban regions: 1990–2017

In the Nordic Region, the OADR has increased from around 24% in 1990 to 30% in 2017. In other words, 100 persons in the working-age population supported 25 persons of retirement ages in 1990. In 2017, the ratio was 100 working-age persons to 30 retirement-age persons. As Figure 9 shows, most of the increase in the OADR has happened during the past ten years when the large cohorts born between the mid-1940s and 1960s started to reach retirement ages (van Bavel and Reher 2013). Between 1990 and 2007, the ratio had remained relatively stable at around 24%.

Figure 9 (next page) also shows differences in OADR levels between the Nordic countries and autonomous regions. Sweden had the highest OADR of all Nordic countries for most of the period but has recently been overtaken by Åland and Finland. The latter country has seen a particularly large increase in the OADR from 20% in 1990 to 33% in 2017. The populations in Iceland and especially Greenland still have comparatively young age structures, even though population ageing has also occurred there. In Greenland the OADR has increased from a very low level of 5% (1990) to 11% (2017). In Iceland it currently lies at around 21%. In other words, the population currently still boasts of 100 persons in working age population for 21 persons in retirement ages. This level is lower than the average OADR measured for the entire Nordic region in 1990. The other Nordic countries and regions lie in the middle of the spectrum, closer to the Nordic average.

Developments in the OADR do not only differ between the Nordic countries, but also by type of

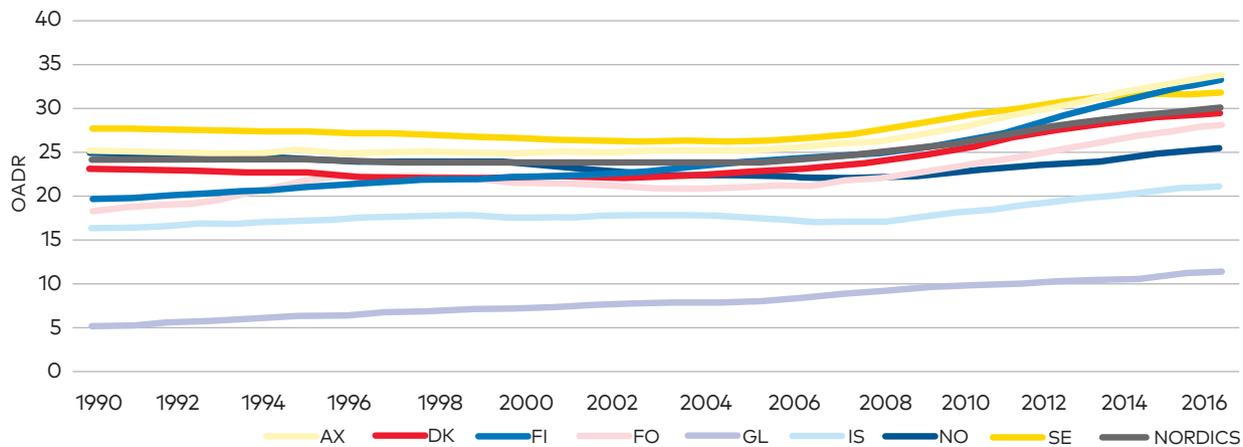


Figure 9: Development of the old-age dependency ratio in the Nordic Region, 1990–2017. Source: Own Figure, based on NSIs.

region. Figure 10 shows OADRs in the five types of regions from the previously introduced rural-urban typology in 2007 and 2017. We focus on these two years, since this is the period of time when the OADR in the Nordic Region as a whole started to increase.

Remote rural regions (dark green) – including for instance Finnmark (NO), Blekinge (SE) and Austurland (IS) – had the highest OADRs of all regions both in 2007 and 2017. In 2007, the ratio stood at 27%, ten years later it had reached 35%. In these regions now hence live 35 people in pension ages for 100 person in working ages. In the predominantly urban areas (red) – including the capital regions of Stockholm, Oslo, Copenhagen and Helsinki – the OADR was more than 10 percentage points lower in 2017 (24%). The three other types of regions have ranked in the middle both in 2007 and 2017, with OADR that currently lie between 31% and 33%.

The more remote and rural regions not only have substantially older population structures than the predominantly urban regions, the pace of population ageing has also been faster there. Between 2007 and 2017, the OADR in the intermediate remote and rural regions (in yellow, light green and dark green) increased by around seven to eight percentage points (from 26% to 33% in the yellow and light green regions, from 27% to 35% in the dark green regions). The urban areas (red) experienced a more moderate increase of four percentage points (from 20% to 24%) during the same period. While all regions in the Nordic countries are hence ageing, the challenges are somewhat larger outside the main metropolitan areas.

The averages shown in Figure 10 hide differences between Nordic countries, as shown in Table 5 (next page). The table includes OADRs for the different types of regions in each country. Differences in age structures are particularly wide among the remote

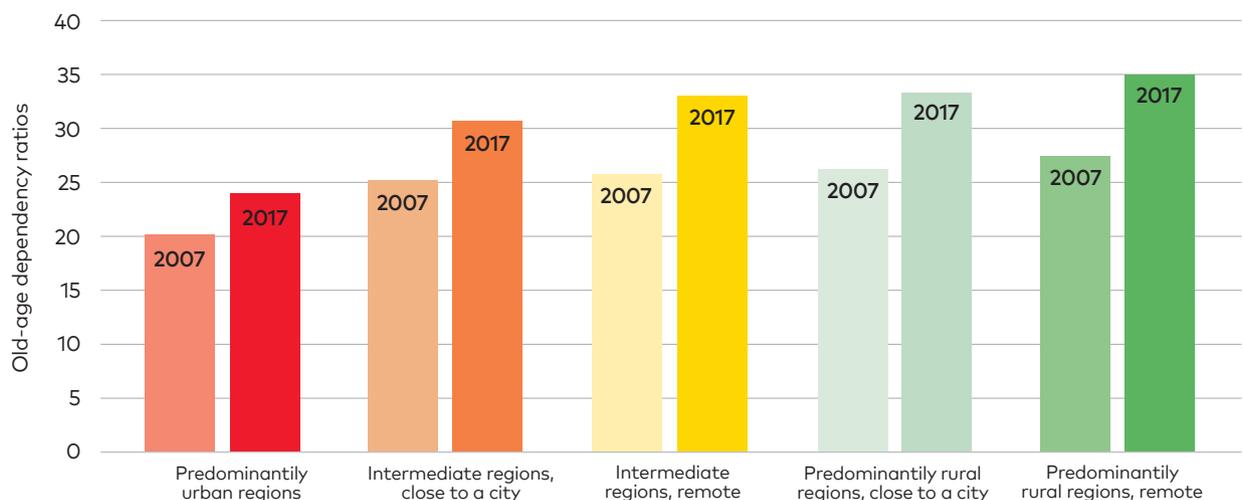


Figure 10: The old-age dependency ratio in urban and rural regions in 2007 and 2017. Source: Own Figure, based on NSIs.

**Table 5: Old-age dependency ratios by type of region and country, 2007 and 2017**

Urban-rural typology	2007	2017
<b>Predominantly urban regions</b>	<b>20</b>	<b>24</b>
in Denmark	22	25
in Finland	18	25
in Norway	19	20
in Sweden	21	24
<b>Intermediate regions, close to a city</b>	<b>25</b>	<b>31</b>
in Denmark	22	29
in Finland	26	35
in Iceland	17	20
in Norway	21	23
in Sweden	27	32
<b>Intermediate regions, remote</b>	<b>26</b>	<b>33</b>
in Denmark	25	33
in Finland	30	43
in Norway	25	29
in Sweden	30	39
<b>Predominantly rural regions, close to a city</b>	<b>26</b>	<b>33</b>
in Denmark	25	33
in Finland	26	35
in Norway	22	26
in Sweden	29	37
<b>Predominantly rural regions, remote</b>	<b>27</b>	<b>35</b>
in Denmark	25	35
Faroe Islands	21	28
in Finland	30	41
Åland	26	34
Greenland	9	11
in Iceland	18	22
in Norway	25	29
in Sweden	32	39
<b>Norden – all countries and regions</b>	<b>24</b>	<b>30</b>

Source: Own Table, based on NSIs.

rural regions (in dark green). This group includes both Greenland, which had the lowest OADR in the Nordic Region both in 2007 and 2017, and regions

in Sweden, such as Jämtland and Dalarna, with combined OADRs of 32% in 2007 and 39% in 2017. Interestingly, the highest OADR in 2017 (43%) was not measured in a remote rural region but in the intermediate remote (yellow) region of Finland – Kymenlaakso, a region that is within driving distance from Helsinki. There are now 43 people of pension ages for 100 persons aged 15 to 64 in this region. Structural economic change, the loss of industrial jobs and high unemployment are likely to be the driving factors behind the rapid population ageing in this region, since these processes may have led especially young people to leave. While the OADRs are not as high in other regions in the Nordic countries, they all have one characteristic in common: Populations are ageing everywhere and without exception populations had an older age structure in 2017 than ten years ago.

### Past trends in population ageing in rural and urban municipalities: 1990–2017

Moving from an urban-rural typology to a municipal perspective, we also find a variety of trends. Figure 11 visualizes the pace at which the OADR has increased across Nordic municipalities during the last ten years. As described above, this was the period of time during which population ageing in the Nordic Region as a whole has accelerated (see Figure 9). Nonetheless, the increase in OADR levels has been uneven across the Nordic Region. In Finland, particularly strong increases in the OADR (by more than 4%) were noted in many municipalities in all types of regions, both in those classified as urban (Uusimaa), remote rural (e.g. Lappi), and in intermediate kinds of regions (Kymenlaakso). The situation is similar in Norway, where municipalities with the fastest pace of population ageing can be found both in remote rural municipalities in the high north, but also in the outskirts of Oslo. In Denmark and Iceland high annual average increases in the OADR have also occurred both in more rural municipalities in Nordjylland, Sjælland (DK) and the Eastern parts of Iceland, but also in the region Hovedstaden, the suburbs of Aarhus (DK) and in municipalities in the Reykjavík area. In Sweden, indeed, all municipalities with the highest increases in population ageing are located in the more populous Southern part of the country, including both more rural areas such as Gotland and parts of Dalarna, but also municipalities in the region of Stockholm.

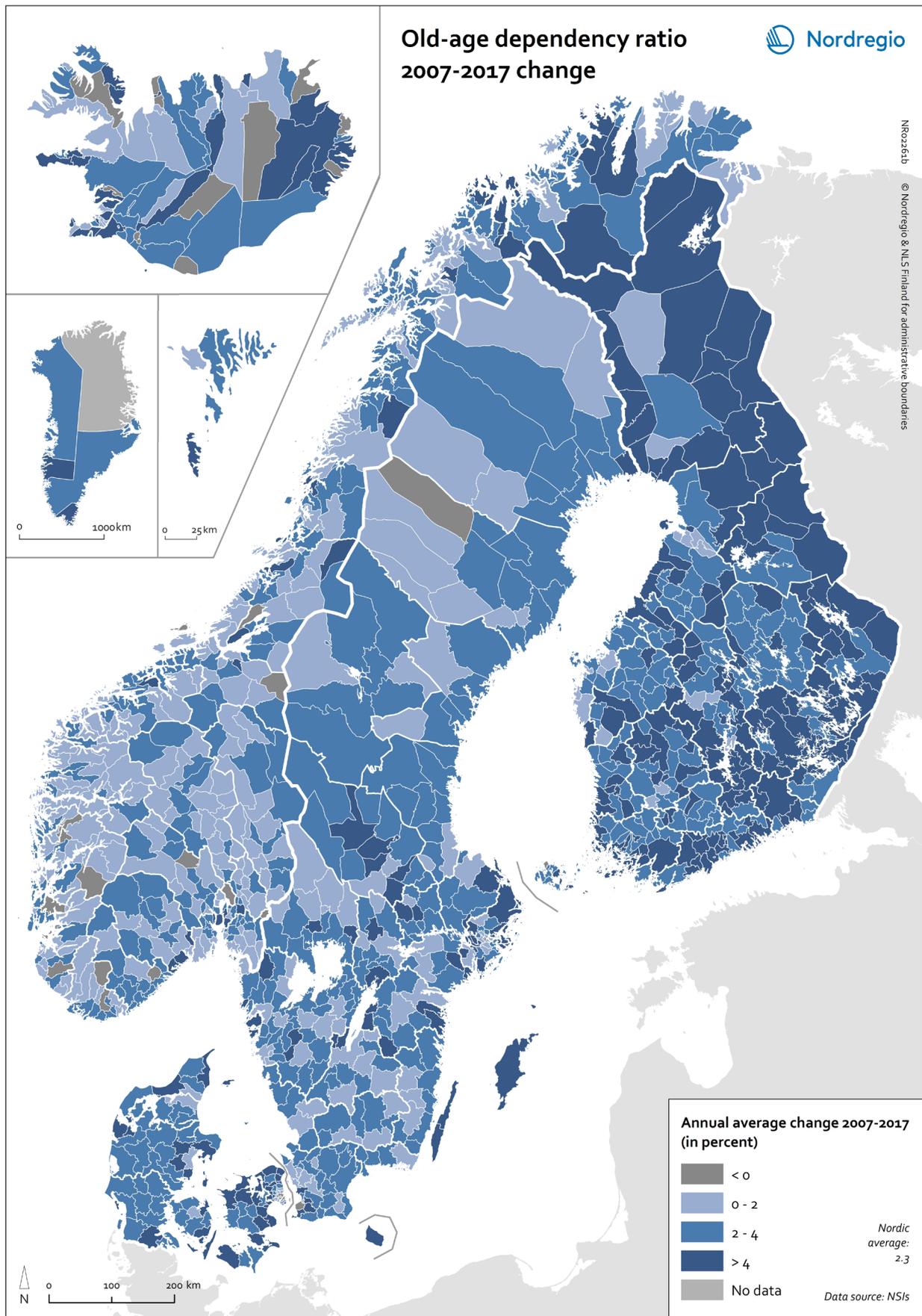


Figure 11: Changes in old-age dependency ratios in Nordic municipalities, 2007–2017.  
Source: Grunfelder, Rispling and Norlén (2018).

Very few municipalities in the Nordic countries had younger population structures in 2017 than they had in 2007. Most of these municipalities are located in Iceland and Norway. Many of them, particularly in Iceland, have very small populations with often just a few hundred inhabitants where even small changes in population numbers, for instance due to immigration or the birth of more babies, can have a strong impact on population age structures.

The overall picture that emerges is that while rural regions in the Nordic countries currently tend to have older age structures than city regions (see Figure 10), population ageing is not a challenge that is limited to them. Urban municipalities may have to adapt to ageing populations just as much as their rural counterparts.

### Future trends in population ageing in rural and urban regions: 2017–2040

The trend of population ageing will continue in the coming years. National Statistical Institutes in all Nordic countries and autonomous regions expect that the national OADRs in 2040 will be higher than they are today. Figure 12 visualizes the expected trends. Note that the left-hand side of the figure shows the increase in OADRs in the recent past. These trends were already displayed in Figure 9.

Figure 12 suggests that the increase in the Nordic OADR that started around the year 2007

will continue at a similar pace during the coming years. In 2017, the Nordic OADR was around 30%, i.e. for every person in pension ages there were around three people between ages 15 and 64 years living in the Nordic Region. In 2040, this ratio is projected to be 40%, the equal of 2.5 persons in working-ages for each person above age 65. The increase in the OADR shows no signs of slowing down, so that further increases after 2040 appear likely.

The differences in OADRs between Nordic countries and regions will largely persist during the next decades. Finland and the Åland islands, which already have the highest OADRs today will maintain their position as the countries with the oldest age structures in the Nordic Region. Only the Faroe Islands will have a similarly high OADR in 2040. Iceland and Greenland continue to have comparatively young population structures, although both will have substantially higher OADRs in 2040 than today. In the case of Greenland, population ageing is however expected to slow down after 2035. In Sweden, population ageing will progress slower than elsewhere. While it had the oldest age structure in the Nordic Region in 1990, the OADR in 2040 will be the third-lowest, at 38%. In Denmark and Norway, the OADRs in 2040 will be close to the Nordic average. While all Nordic countries and regions will hence have older population structures in 2040 than they have today, population ageing is expected to progress at different speeds.

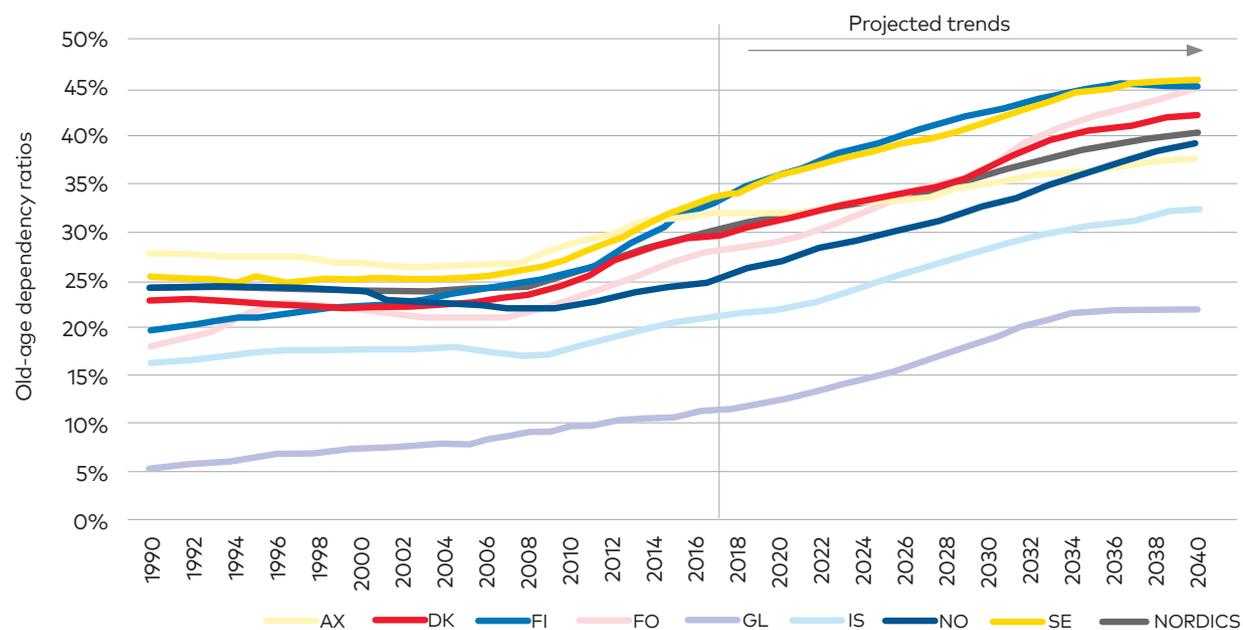
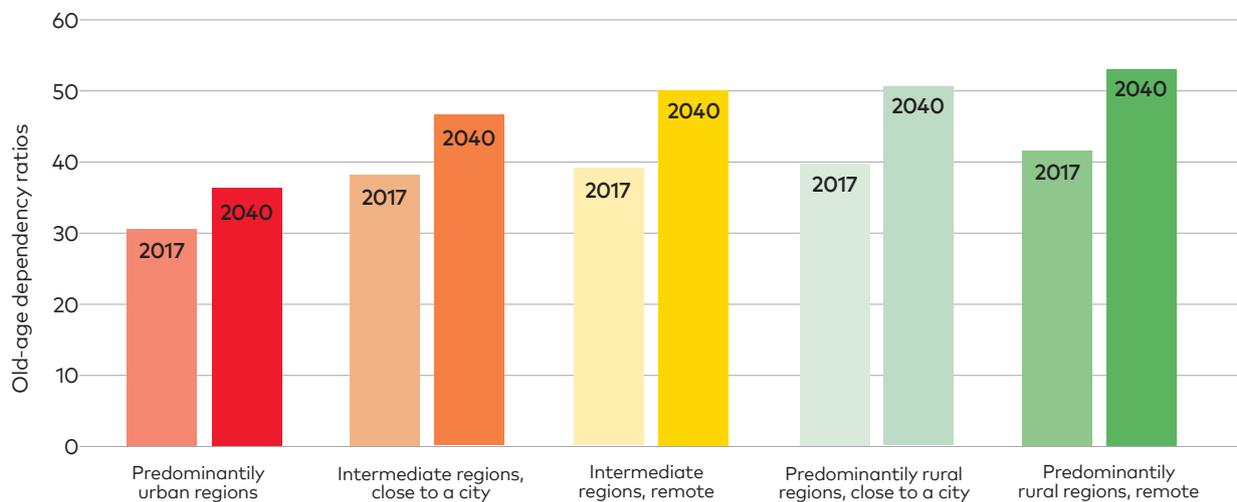


Figure 12: Past and projected development of the old-age dependency ratio. Source: Own Figure, based on NSIs, Tillväxtverket (SE) and Byggdastofnun (IS).



**Figure 13: The old-age dependency ratio in urban and rural regions in 2017 and 2040.**  
 Source: Own Figure, based on NSIs, Tillväxtverket (SE) and Bygghäastofnun (IS).

In a rural-urban comparison, the patterns observed in the past also largely persist (Figure 13): The predominantly urban regions (in red) such as Stockholm, Oslo and Helsinki will continue to have the youngest age structures in 2040. The OADR will increase, but the level reached in 2040 (33%) will still be lower than the OADR level that remote rural regions (in dark green) have today (35%). The intermediate regions which are close to a city (in orange) will have the second lowest OADR in 2040 with just above 40%.

The three more remote and rural types of regions will all have OADR between 45% and 49% in 2040. There will hence be four to five people in pension ages for every ten people in the working-ages. The increase in the OADR will be particularly steep in the intermediate remote regions (in yellow), which includes Norrbotten in Sweden, Syddanmark in Denmark and Kymenlaakso in Finland. Here the OADR will increase by 15 percentage points from 33% (in 2017) to 48% (in 2040). The predominantly rural regions that are close to a city (in light green) will also have older age structures in 2040, but here the increase of the OADR will not be as strong. It may be the proximity to cities that helps these regions to remain more attractive living environments for young people than the remote regions (in yellow and dark green).

The rural-urban OADRs shown in Figure 13 again hide a substantial variety of trends across the Nordic countries and autonomous regions. As shown in Table 6, the variety of OADR levels in 2040 is again particularly large in the most remote rural regions (in dark green). This group includes

Greenland with a very low OADR of 22% in 2040. At the other end of the spectrum, Finnish regions (including Lapland, South Ostrobothnia and North Karelia) have a projected OADR of 55% in 2040. The number of people in pension ages (65+ years) will be more than half as big as the population in working ages (15–64 years). Iceland is one of the cases in the middle, with an expected OADR of 41% in 2040. This OADR level is lower than in many intermediate regions (in yellow and light green) in the same year.

As in 2017, the region with the oldest age structure in 2040 is likely to be Kymenlaakso – a region classified as intermediate and remote (in yellow). The projection results from Statistics Finland suggest that this region will reach an OADR level 59% in 2040. Statistics Finland seems to expect that current challenges which drive young people away will persist in the future.

Some remote rural regions hence do face the prospect of substantially older populations in 2040 and will have to find solutions to uphold services and economic activities with a population where large parts are of retirement ages. Nonetheless, not all remote rural regions share the same prospect. Indeed, some rural regions will have similar or even younger age structures than regions in the intermediate categories. The challenges and opportunities that remote rural regions face are hence diverse. Generalizing pictures of a “demographic time bomb” across remote rural regions in the Nordics are too simplistic and do not do justice to the projected variety in demographic patterns and trends. All Nordic regions will have popula-

**Table 6: Old-age dependency ratios by type of region and country, 2017 and 2040**

Urban-rural typology	2017	2040
<b>Predominantly urban</b>	<b>24</b>	<b>33</b>
in Denmark	25	34
in Finland	25	36
in Norway	20	32
in Sweden	24	32
<b>Intermediate regions, close to a city</b>	<b>31</b>	<b>40</b>
in Denmark	29	42
in Finland	35	48
in Iceland	20	29
in Norway	23	37
in Sweden	32	40
<b>Intermediate regions, remote</b>	<b>33</b>	<b>48</b>
in Denmark	33	49
in Finland	43	59
in Norway	29	46
in Sweden	39	47
<b>Predominantly rural regions, close to a city</b>	<b>33</b>	<b>45</b>
in Denmark	33	47
in Finland	35	46
in Norway	26	40
in Sweden	37	45
<b>Predominantly rural regions, remote</b>	<b>35</b>	<b>49</b>
in Denmark	35	52
Faroe Islands	28	45
in Finland	41	55
Åland	34	47
Greenland	11	22
in Iceland	22	41
in Norway	29	46
in Sweden	39	49
<b>Norden – all countries and regions</b>	<b>30</b>	<b>41</b>

Source: Own Table, based on NSIs, Tillväxtverket (SE) and Byggdastofnun (IS).

tions with older age structures and a higher share of seniors in 2040 than today, but differences in the current level and future pace of population ageing require localized policy responses.

## Future trends in population ageing in rural and urban municipalities: 2017–2040

The diversity of population age structures in the Nordic Region also gets visible when comparing projected OADR levels in 2040 at a municipal level (Figure 14). Municipalities with the highest OADR levels lie especially in Eastern Finland, but also in Northern Iceland. The lowest OADRs are projected for municipalities in Greenland, South-Eastern Iceland, Southern Sweden and mostly urban municipalities in Finland, Denmark and Norway.

If we rank all Nordic municipalities by their predicted OADR in 2040, from highest to lowest, we can find rural remote municipalities across the entire spectrum. Among the ten municipalities with the highest projected OADRs in the Nordic Region, four are part of regions classified as rural and remote. These municipalities are Røst (NO), Kökar (FI), Puumala (FI) and Seyðisfjörður (IS). Five of the other six municipalities in the group of oldest-old municipalities lie in Danish and Finnish regions classified as rural and close to a city (in light green). The last municipality, Kustavi (FI), is part of the region of Southwest Finland, classified as intermediate and close to a city. Among the ten municipalities with the lowest OADRs in the Nordic Region, seven are located in remote and rural regions, all of them in Iceland and Greenland.<sup>8</sup> In between these two extremes, we can find municipalities from rural areas across the entire spectrum of OADR levels. Municipalities in remote and rural regions hence do not cluster together in a group of oldest-old cases. Instead, they represent the full spectrum of trends that are projected for the Nordic region. When it comes to planning for an older population, municipalities in the rural remote region cannot be treated as a separate and particularly challenging category. Instead, each case should be considered on its own within the regional and national context.

<sup>8</sup> It should be noted that the National Statistical Institute of Greenland has published subnational population projections only until 2030. The projected OADR shown here therefore also pertain to the year 2030. If projection results would be available for 2040, the OADRs for that year would likely be higher than the levels in 2030. Nonetheless, as shown in Figure 12, population ageing will slow down in Greenland in the mid-2030s. Therefore, the OADR for 2040 should not be substantially higher than the values shown in Figure 14.

It should also be noted that sub-national population projections for the Faroe Islands do not exist. Faroese municipalities are therefore not included on the map. Since the autonomous region as a whole has a relatively old age structure (as shown in Figure 12), it can be assumed that many of its municipalities would also rank among the oldest in the Nordic Region.

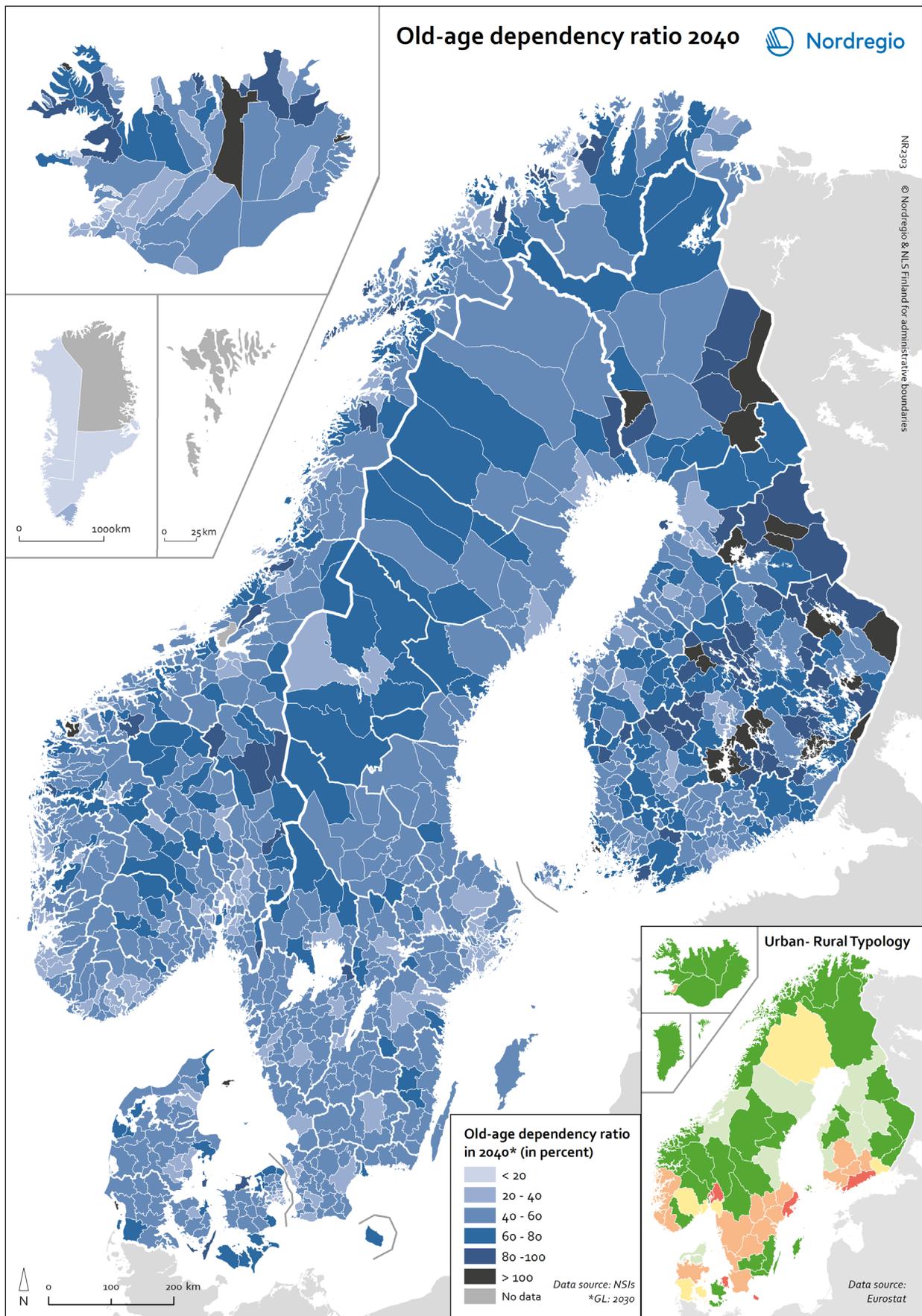


Figure 14: Projected old-age dependency ratios in Nordic municipalities, 2040.

## Discussion: How to measure population ageing? A comparison of indicators

Statistical Offices, international organisations and researchers routinely analyse and compare population age structures and trends in population ageing on the basis of OADRs, just as we have done in the preceding sections. One advantage of the OADR is that it is easy to calculate and input data on the number of people in different age groups is readily available for most countries, regions and municipalities. Nonetheless, the way that the OADR is used and interpreted has become subject to increasing criticism during recent years (e.g. Sanderson and Scherbov 2010). Demographers in particular point out that the OADR may not be the most adequate tool to grasp the multiple economic and societal challenges that are associated with population ageing.

The OADR compares the size of two large age groups – those aged 15 to 64 years and those aged 65 and older, where the former is considered to constitute the working-age population and the latter the economically dependent, or retired population. By relating the size of these two population groups, the OADR is frequently interpreted as indicating the pressures of population ageing on social security systems. This interpretation may be flawed for two reasons: First, not everyone between ages 15 and 64 is working and therefore paying into social security systems. Sickness, disability, unemployment, care for others or participation in educational programmes are some of the many reasons why people in this age group may not be in employment. Secondly, not everyone above age 65 is retired, economically dependent and/or in need of care. People who reach age 65 today are on average more active, healthier, and have more years of life left to live than previous generations did. Some people still work beyond traditional retirement ages or contribute as volunteers or by taking care of grandchildren. Casting those between ages 15 and 64 as sustaining the social security systems, and those aged 65 and older as depending on contributions and care does not account for economic trends, societal changes and improvements in health and life expectancy and can therefore be misleading (Spijker and MacInnes 2013). Hence, while the OADR compares the size of two large age groups, it does not necessarily indicate the relation between working and dependent population groups and the pressure on social security systems.

In order to account for these shortcomings, demographers have proposed a range of alternative indicators that may give a clearer impression of the scope and impact of population ageing.

■ Sanderson and Scherbov (2007) propose the so-called **Prospective Old-Age Dependency Ratio (POADR)**. This indicator starts from the observation that the need for acute care and associated costs for health and care systems usually rise steeply only towards the end of a person's life (Miller 2001, Seshamani and Gray 2004, Zweifel, Felder and Werblow 2004). Since life expectancies and disability-free life expectancies have increased considerably during the last decades and are expected to rise further in the future (Sanderson and Scherbov 2010, Mathers et al. 2015, Oeppen and Vaupel 2002), the onset of ill health, disability and dependency is, on average, also pushed to higher ages. Instead of using a chronological age such as age 65 to cast people as 'dependent', Sanderson and Scherbov therefore define old-age and dependency in relation to remaining life expectancy (Sanderson and Scherbov 2007). They use a remaining life expectancy of 15 years as a boundary to define dependency. The POADR divides the number of people who have less than 15 years of life left to live by the number of people who have more than 15 years of life left to live (and are at least 15 years old).<sup>9</sup>

■ In order to account for the impact of population ageing on care systems, Sanderson and Scherbov (2010) also introduce the so-called **Adult Disability Dependency Ratio (ADDR)**. This indicator is defined as the number of adults aged 20 years or older with disabilities divided by the number of adults aged 20 years and older without disabilities. This indicator requires a definition of disability, harmonized across countries. Sanderson and Scherbov (2010) recommend using the European Union Statistics on Income and Living Conditions survey (EU-SILC), available at the Eurostat database. This survey provides harmonized data on disability across different European countries, where disability is defined as experiencing severe self-perceived long-standing limitations in usual activities

<sup>9</sup> Information on remaining life expectancy at different ages and in different calendar years is available from national statistical institutes and the European Statistical Office Eurostat. This can be used to calculate the number of people living in the Nordic countries or municipalities who are above or below the threshold.

due to a health problem. This could include both physical and mental health issues. Limitations are only included if they persist for six months or more. The EU-SILC survey is directed at people aged 16 years or older. On the basis of the EU-SILC survey, the ADDR does not define dependency in terms of age, but in terms of health status.<sup>10</sup>

■ A third alternative to provide a more nuanced picture of population ageing and its consequences is proposed by Spijker and MacInnes (2013). They agree with Sanderson and Scherbov that dependency should not be defined by referring to a chronological age limit such as 65 years, but by using a remaining life expectancy of 15 years or less. In order to grasp how many people support these presumably dependent persons with their social security contributions, Spijker and MacInnes suggest to use the number of people who are employed,

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10 Information on remaining life expectancy at different ages and in different calendar years is available from national statistical institutes and the European Statistical Office Eurostat. This can be used to calculate the number of people living in the Nordic countries or municipalities who are above or below the threshold.

Here, we have used the EU-SILC dataset entitled "Self-perceived long-standing limitations in usual activities due to health problem by sex, age and labour status [hlth\_silc\_06]", available at Eurostat. For each Nordic country, the dataset shows the percent of people in different age groups who suffer from severe activity limitations. Data are available for the years 2008 to 2017. Due to the noisiness of the data, we have calculated average disability rates for each country by summing the age-specific percentages of people with disability for all available years and dividing by ten. We multiplied these disability rates with the age-specific population data in different Nordic municipalities to arrive at an estimate of the number of people who suffer from disabilities. Several assumptions underlie this approach: The EU-SILC survey provides only national-level data. Here we assume that disability levels in all municipalities are similar to the country average. By calculating average disability rates for a ten-year period, we also assume that no trend changes have occurred during this period. This may be a conservative assumption. To the extent that the health status of Nordic populations has improved during the last decade, e.g. due to new treatments or medications, or that disability is increasingly pushed to higher ages, the number of people with disability may be slightly lower than estimated here. Also, we do not use sex-specific disability data, even though these are available. Distinguishing the available disability data by sex in addition to age would further increase the noisiness of the data. Our use of uni-sex rates could over- or underestimate the number of disabled people in different localities if women or men are overrepresented and if disability rates in the given country deviate from the unisex rates used here. Finally, the EU-SILC survey could be biased if it systematically omits older disabled people. Indeed, the survey does not capture people in nursing homes, but according to Sanderson and Scherbov (2010), this seems to have little effect. In the following we also use 15 years as a lower age boundary for the ADDR – not 20 years as suggested by Sanderson and Scherbov (2010) – to make this indicator more comparable to the others. The EU-SILC survey only provides disability estimations for those 16 years or older. To fill this data gap, we assumed here that 15-year olds have the same disability rates as 16-year olds.

regardless of their age. Their so-called **Real Elderly Dependency Ratio (REDR)** hence divides the number of people with a remaining life expectancy of 15 years or less by the number of people in employment.<sup>11</sup>

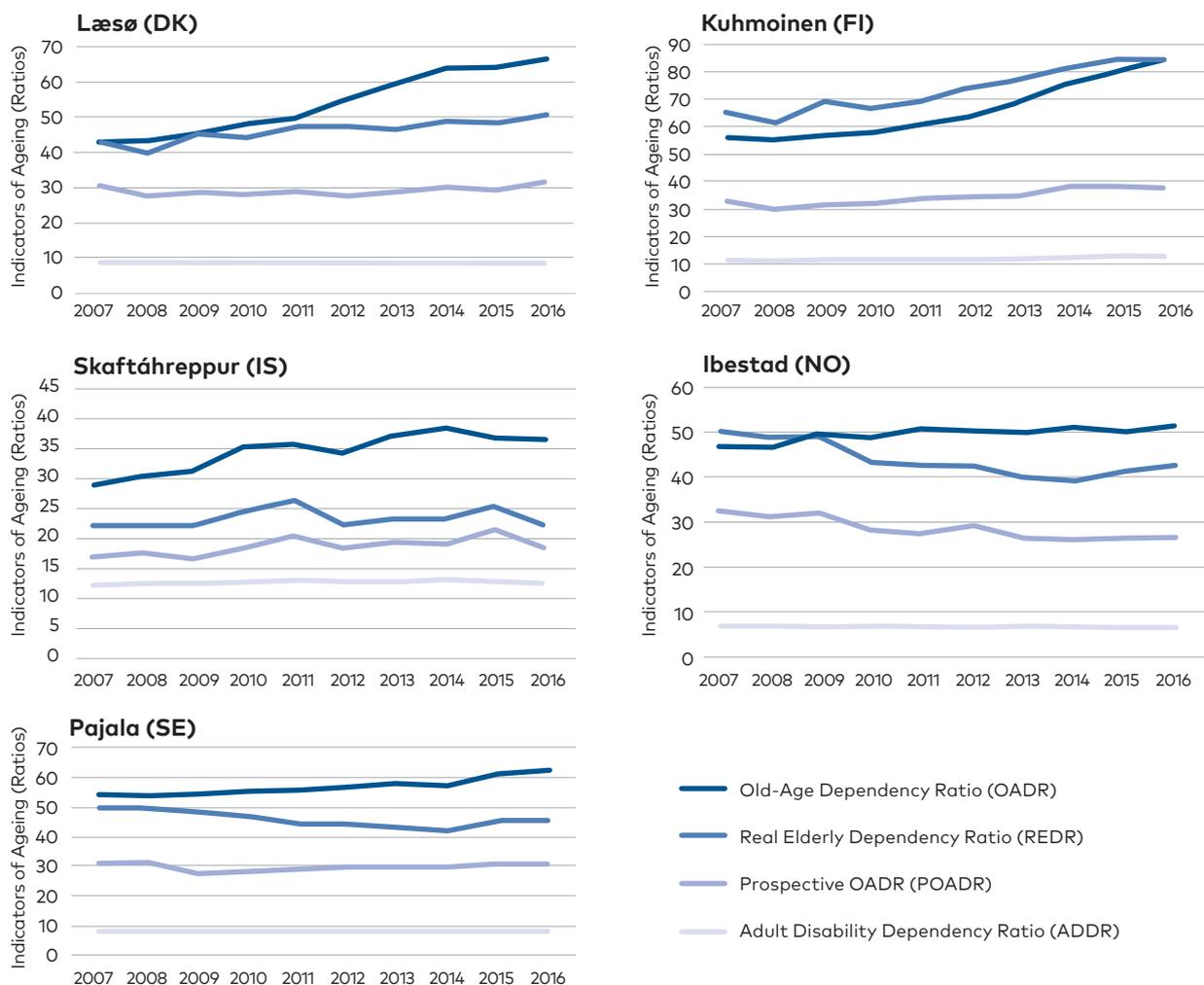
To illustrate the different perspectives on population ageing that can be gained from these alternative indicators, we have calculated the POADR, the ADDR and the REDR in addition to the conventional OADR for five Nordic municipalities, one from each of the five Nordic countries. The municipalities selected here currently have oldest age structure in each Nordic country, as measured by the OADR. As before, we focus on the time period 2007 to 2016, i.e. the years during which the Nordic OADR has seen a particularly strong increase (see Figure 9). Note that for better visibility, the y-axes of the five plots do not have the same scale and are therefore not directly comparable.<sup>12</sup>

The OADRs have increased in all five municipalities during the time period considered here, even though his increase was steeper in some cases (e.g. Laesø) than in others (e.g. lbestad). In comparison, the other indicators have increased much slower, have stayed constant, or even declined. The estimated ratio of people with and without disabilities (ADDR), for instance, remains at a level of around 10% in all five Nordic municipalities throughout the ten-year period. This could partly be attributed to the fact that we have assumed constant disability rates during this time period (see footnote 4). Population ageing could however also push the indicator upwards. This does not seem to happen. Population ageing by itself hence does not seem to lead to a substantial shift in the

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11 For the calculations shown in Figure 15, we have used employment statistics provided by the National Statistical Institutes (NSI) of each Nordic country. The following statistics were obtained: Norway - Employed persons per 4th quarter, by region of residence, age, contents and year; Finland - Employed labour force by Area, Commuting, Level of education, Age and Year; Iceland - Register based employment of persons with legal residence in Iceland by years, sex, age, origin and region 2005-2018; Sweden - Förvärvsarbetande 16+ år med bostad i regionen (nattbefolkning) (RAMS) efter region och år; Denmark - Employed (end November) by region, age and time. It must be noted that the NSIs use partly differing definitions of employment. The levels and trends of REDRs shown in Figure 15 are therefore not directly comparable across countries. Nonetheless, our main point here is to compare different indicators within each country.

12 Note that in Iceland a few municipalities have even older population age structures than Skaftárhreppur. Nonetheless, these municipalities have very small population sizes, so that they were not suitable to calculate the indicators shown here.



**Figure 15: Comparing indicators of ageing in five Nordic municipalities.**  
 Source: Own Figure, based on NSIs, Eurostat, Tillväxtverket (SE) and Byggdastofnun (IS).

ratio of those experiencing severe activity limitations and those who do not.

The Real Elderly Dependency Ratio (REDR), which compares the number of people who have reached the end of their lives (i.e. with a statistical remaining life expectancy of less than 15 years) with the number of people who are in employment, displays different trends in different countries. In Finland, this indicator had even higher values than the OADR between 2007 and 2016. In recent years, however, the increase has levelled off and REDR and OADR are at the same level in 2016. In all other countries, the REDR increased slower than the OADR (e.g. in Læsø) or even declined for parts of the period (e.g. in Pajala and Ibestad). It lies below the OADR in all municipalities except Kuhmoinen in 2016. The REDR is influenced both by population ageing and trends in the Nordic economies and labour market. In most examples shown here, the economic recovery and increases in employment

after the global financial crisis of 2007/2008 may have counteracted the effects of population ageing and may be behind the slower increase or even decline of the indicator. In Finland, the comparatively high unemployment levels may be an explanation for the increase in this indicator during the last ten years. Here, gains in employment may not have been able to offset the effects of population ageing as in the other Nordic municipalities.

Finally, the POADR, which compares the number of people who have a remaining statistical life expectancy of 15 years or less is substantially lower than the conventional OADR in all municipalities and has only increased slowly, if at all. In Ibestad, the indicator value in 2016 is even lower than the one measured in 2007.

Overall, the comparison of indicators in Figure 15 shows that our impression of the pace and scope of population ageing, and the challenges connected to it, may strongly depend on the type

of indicator we choose. None of the four indicators shown is more 'accurate' than the others; all visualize different facets of the phenomenon of population ageing and all have advantages and limitations. Other indicators not shown here may indeed even add further perspectives on the implications of population ageing and the magnitude of the challenge. The key implication of this overview is the following: Population ageing is undoubtedly a challenge for the Nordic Region. In the years to come, all Nordic countries and municipalities have to plan for a population with more older people, and the challenges will be particularly pronounced in rural areas. Nonetheless, we should be careful in our choice of indicators when analysing this important demographic trend. The OADR has long been used for too many different purposes – to indicate pressures on pension systems, long-term care systems, the health care sector, the labour market and others – and it is a poor measure for many of them. It compares the size of two large age groups, but these may not necessarily be a good proxy to measure dependency and economic impacts. More nuanced indicators than the OADR such as the ones shown here are available, and it is important to make use of them.

As a final word, the focus of public and policy debates is all too often solely placed on the negative consequences of population ageing. Potential benefits and opportunities receive substantially less attention. In a rare article that highlights positive effects of population ageing, Kluge and colleagues (2014) argue that smaller and older populations of the future may indeed be

- Smarter and more productive (a larger proportion of the population will have higher educational attainment, which may benefit economic growth)
- Greener (an older population may help reduce greenhouse gas emissions, since older people typically have lower consumption patterns)
- Richer (with fewer offspring, inherited wealth becomes concentrated in fewer recipients which could partly compensate for higher public transfers) and
- Healthier (with increasing longevity and better health prospects, people remain active and in good health until higher ages)

Rather than solely planning and preparing for the expected negative impacts of population ageing, attention should also be given to these potential

benefits of ongoing population ageing. This may help to find solutions to upcoming challenges, but also point to perspectives and chances for rural areas and beyond.

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# 4. The working age population in the Nordics: past and future trends

A third demographic trend that is receiving increased attention – in addition to urbanisation and population ageing - is the development of the working-age population in the Nordic Region. The working-age population is defined as the population aged 15 to 64 years, i.e. the age groups that are considered most likely to work (OECD 2019). This chapter will first investigate how the size and age structure of the working-age population has changed during the last decades in the Nordic Region, its countries and municipalities. Next, we will show how it is projected to look like in 2040. In the final section, we will discuss the potential role of older people in the labour market, and in which economic sectors their contributions may be most valuable.

## The working-age population in rural and urban regions: 1990–2017

In the Nordic Region, the size of the total working-age population increased between 1990 and 2017 (Figure 16). In 1990, around 15.3 million people aged 15 to 64 years lived in Norden. In 2017, it was

17.2 million. The pool of potential workers is larger today than at any point during the last 27 years.

The growth in the size of the working-age population between 1990 and 2017 was particularly pronounced in Norway and Iceland (Table 7, next page). In Greenland and on the Faroe Islands, the number of people of working ages was almost the same in 1990, 2003 – the mid-point – and 2017. Finland is the only country where the size of the working-age population increased between 1990 and 2003 but declined since then.

Figure 17 (next page) indicates that the increase in the working-age population in the Nordic Region has been particularly centred in cities. Here, we take a closer look at developments in the more recent past – the last ten years. The figure shows the number of people between ages 15 and 64 that lived in regions which are classified as urban, intermediate or rural in 2007 and 2017. The size of these age groups increased particularly strongly in predominantly urban regions and intermediate regions close to a city (in red and orange) during the last ten years. In the other types of regions,

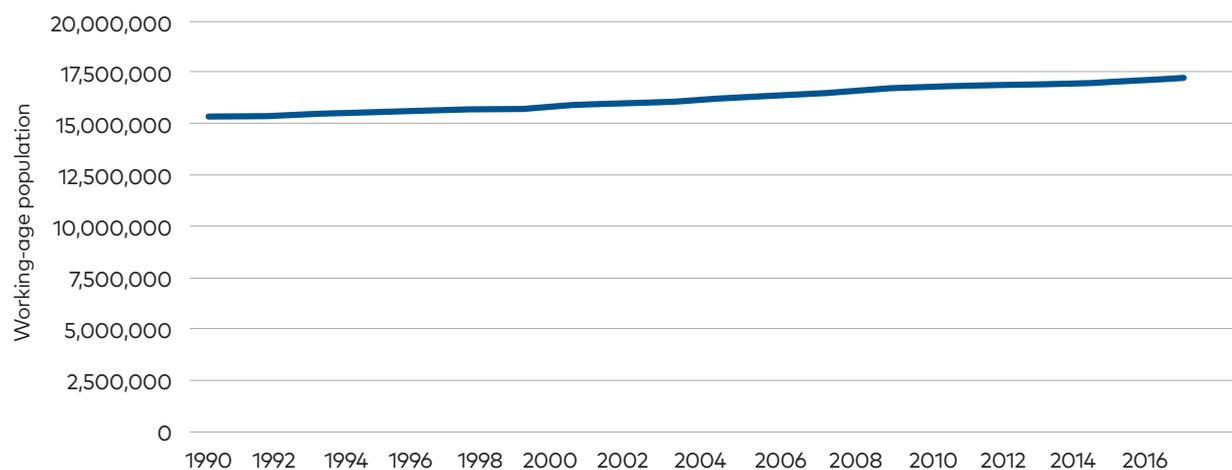


Figure 16: Development of the working-age population in the Nordic Region, 1990–2017.

Source: Own Figure, based on NSIs.

**Table 7: Working-age population in Nordic countries and autonomous regions in 1990, 2003 and 2017**

	1990	2003	2017	Change between 1990 and 2017 in %
<b>Denmark</b>	3,454,000	3,572,000	3,692,000	6.9
<b>Finland</b>	3,335,000	3,464,000	3,441,000	3.2
<b>Iceland</b>	164,000	189,000	224,000	37.1
<b>Norway</b>	2,741,000	2,968,000	3,446,000	25.7
<b>Sweden</b>	5,516,000	5,835,000	6,319,000	14.6
<b>Faroe Islands</b>	31,000	30,000	31,000	0.4
<b>Greenland</b>	39,000	39,000	40,000	0.7
<b>Åland</b>	16,000	17,000	18,000	15.5
<b>NORDEN</b>	<b>15,296,000</b>	<b>16,114,000</b>	<b>17,211,000</b>	<b>12.5</b>

Source: Own Table, based on NSIs.

the size of the working-age population either remained roughly the same (intermediate regions in yellow) or declined slightly (rural regions, close to a city or remote, in light and in dark green).

Nonetheless, not all regions that are classified as predominantly rural and remote (in dark green) experienced a decline in the size of their working-age population (Table 8): On the Faroe Islands and Åland, in Greenland, Iceland and Norway, the number of people aged 15 to 64 in remote rural areas has remained relatively stable or even increased during the past ten years. Declines in this population group, however, occurred in Denmark, Sweden and – most strongly – in Finland. In predominantly rural regions that are close to a city (in light green)

and the remote intermediate regions (in yellow), the working-age population decreased everywhere with the exception of Norway. At the other end of the spectrum, the predominantly urban areas (in red) in all countries saw an increase in their working-age populations, and among the intermediate regions that are close to a city (in orange) only Finnish regions experienced a decline. The more urban regions in the Nordic countries hence do seem to have been better at keeping and/or attracting inhabitants of the core working ages, while many rural or remote regions had a smaller potential workforce in 2017 than in 2007. Nonetheless, not all regions follow this pattern.

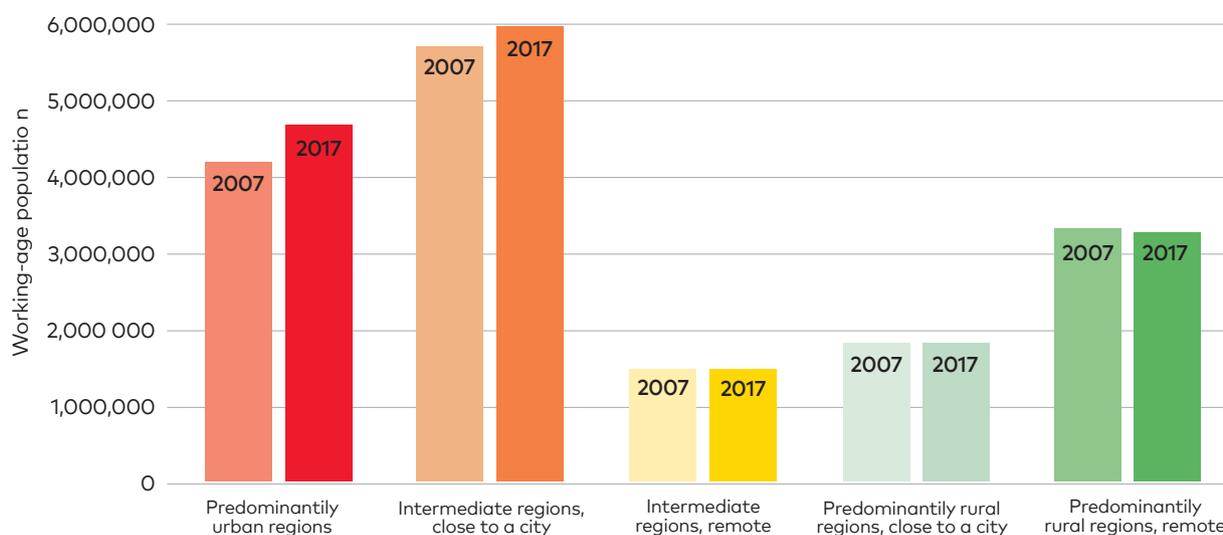


Figure 17: The working-age population (15 to 64 years) in rural and urban regions in 2007 and 2017. Source: Own Figure, based on NSIs.

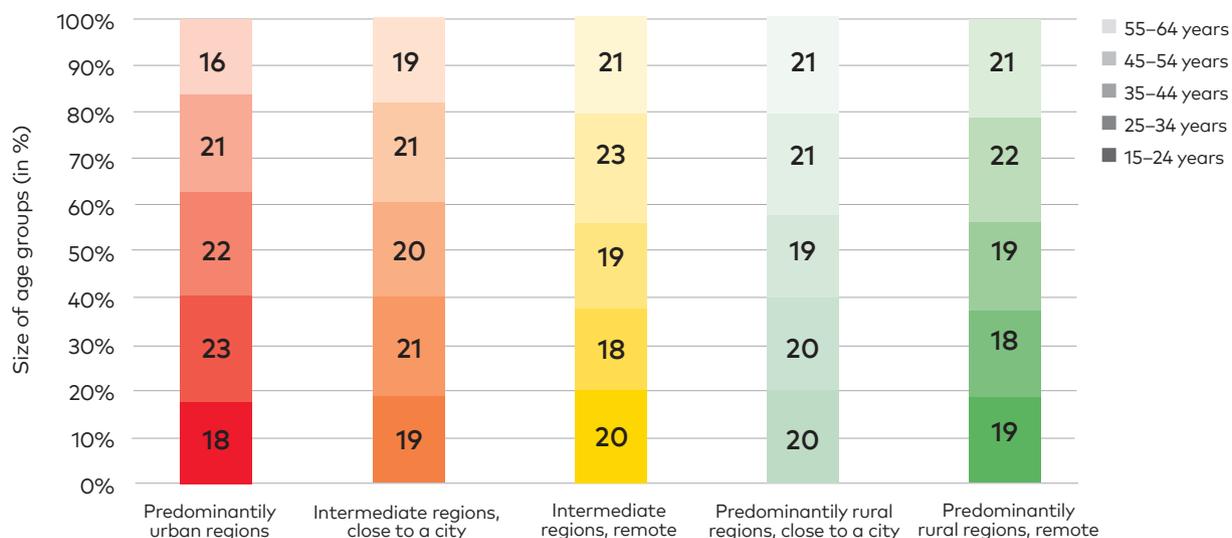
**Table 8: Working-age population by type of region and country, 2007 and 2017 (rounded numbers)**

Urban-rural typology	2007	2017	Change in %
<b>Predominantly urban regions</b>	<b>4,170,000</b>	<b>4,663,000</b>	<b>11.8</b>
in Denmark	1,106,000	1,200,000	8.6
in Finland	1,021,000	1,088,000	6.6
in Norway	723,000	864,000	19.6
in Sweden	1,321,000	1,510,000	14.3
<b>Intermediate regions, close to a city</b>	<b>5,688,000</b>	<b>5,965,000</b>	<b>4.9</b>
in Denmark	812,000	839,000	3.4
in Finland	859,000	847,000	-1.4
in Iceland	130,000	145,000	11.6
in Norway	674,000	773,000	14.8
in Sweden	3,214,000	3,361,000	4.6
<b>Intermediate regions, remote</b>	<b>1,482,000</b>	<b>1,483,000</b>	<b>0.1</b>
in Denmark	773,000	765,000	-1.0
in Finland	120,000	107,000	-10.6
in Norway	426,000	458,000	7.4
in Sweden	163,000	153,000	-5.8
<b>Predominantly rural regions, close to a city</b>	<b>1,843,000</b>	<b>1,828,000</b>	<b>-0.8</b>
in Denmark	376,000	372,000	-1.3
in Finland	851,000	821,000	-3.6
in Norway	268,000	297,000	10.9
in Sweden	347,000	338,000	-2.5
<b>Predominantly rural regions, remote</b>	<b>3,320,000</b>	<b>3,271,000</b>	<b>-1.5</b>
in Denmark	531,000	515,000	-2.9
Faroe Islands	31,000	31,000	-0.6
in Finland	639,000	578,000	-9.5
Åland	18,000	18,000	3.1
Greenland	40,000	40,000	0.1
in Iceland	76,000	80,000	5.4
in Norway	999,000	1,053,000	5.4
in Sweden	988,000	957,000	-3.2
<b>Norden</b>	<b>16,503,000</b>	<b>17,211,000</b>	<b>4.4</b>

Source: Own Table, based on NSIs.

The age structure of the working-age population also somewhat differs across the various types of regions, as shown in Figure 18. The figure distinguishes between five different age groups and shows the percent of the working-age population that belong to each age group in the different regions in 2017. The youngest age group within the working-age population, the 15- to 24-year olds, is

of relatively similar size in all five types of regions. Between 18% and 20% of the entire working-age population belonged to this group. Many people in this age group may still be in education and therefore less mobile than other age groups. Larger differences between the regions appear when comparing the older age groups. While among the predominantly rural regions (remote and close to



**Figure 18: Age structure of the working-age population by type of region in 2017 (in %, rounded).**  
 Source: Own Figure, based on NSIs.

a city) and the remote intermediate regions 21% of the working-age population belongs to the oldest age category (55-64 years), this percentage is substantially smaller in the predominantly urban (16%) and intermediate regions that are close to a city (19%). The latter two types of regions also have somewhat larger population shares that are between ages 25 and 34 and 35 and 44 years.

In comparison with the urban centres, remote rural areas hence have a somewhat older working-age population, and the numbers of people in core working ages has also declined in several of these regions in the recent past. Exceptions exist, with some remote rural areas experiencing increases in the working-age population. At the same time, declines in the working-age population are not necessarily specific to remote rural areas but are shared by many regions that are classified as intermediate and remote or predominantly rural and close to a city. Nonetheless, many remote rural areas are particularly affected by these trends and characteristics.

### The working-age population in rural and urban municipalities: 1990–2017

Figure 19 (next page) shows how the working-age population in each Nordic municipality has changed between 1990 and 2017. As before, the small map in the bottom corner displays the rural-urban typology that can be used to identify in which type of region each municipality is located.

The strongest declines in the working age population of 25% to 75% occurred in the Northern part of Sweden, in some municipality in Northern Norway and Northern Iceland, and large parts of Finland. Almost all of these municipalities are located in rural regions (remote or close to a city) and remote intermediate regions. The map hence confirms the previous finding that the decline of the potential workforce is not only a topic for the most rural and remote regions. Even a few municipalities in urban and intermediate regions that are close to a city (in red and orange) have experienced a decline in the working-age population between 1990 and 2017, but here the declines were in most cases less pronounced. Examples include municipalities in Östergötland and Jönköping in Sweden, Southwest Finland or Hordaland in Norway.

Some municipalities in the Nordic countries experienced an increase in their working-age population between 1990 and 2017. These are mostly larger cities, towns and their suburbs. Nonetheless, a few small municipalities in rural areas also had a larger number of 15- to 64-year olds in 2017 than they had in 1990. These include Fljótsdalshérað in Iceland, where the increase in the working-age population may have been influenced by the opening of the Kárahnjúkar Hydropower Plant. Åre in Sweden and Hemsedal in Norway have also seen an increase in their working-age population. In both municipalities large investments in local ski resorts have created jobs in the tourism sector.

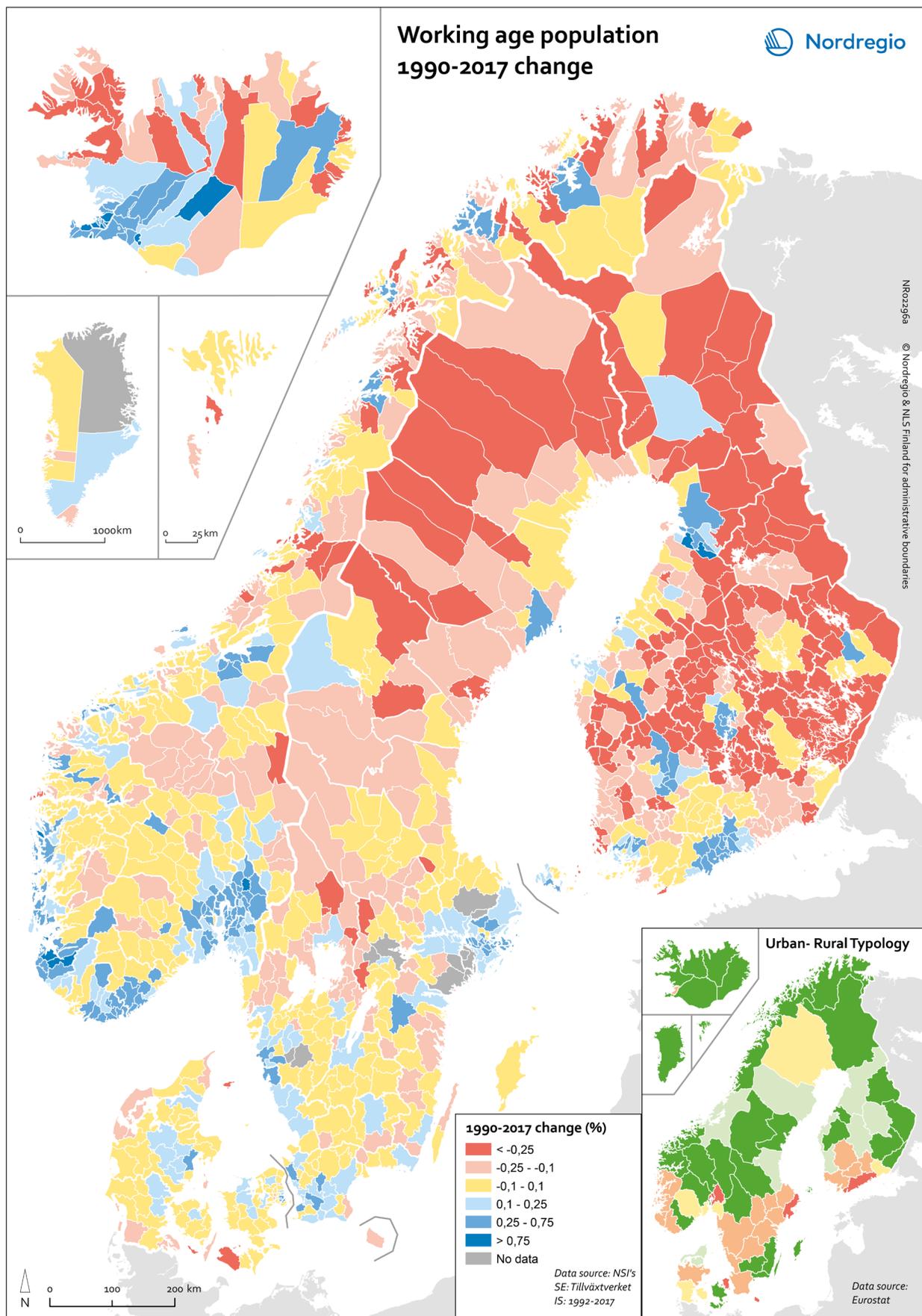


Figure 19: Changes in the working-age population in Nordic municipalities, 1990–2017.

Kontiolahti is the only municipality in North Karelia (Finland) where the working-age population increased between 1990 and 2017. Here, the close proximity to the regional capital Joensuu and the presence of the Finnish army may have helped to attract people in the core working ages. Some noticeable cases hence exist. Nonetheless, most municipalities in remote rural areas in Norden that already had small population sizes in 1990 had even fewer inhabitants in the core working ages in 2017.

### The working-age population in rural and urban regions: Projections for 2017–2040

An analysis of population projections from National Statistical Institutes suggests that the working-age population in the Nordic Region increase

in the years to come, even though at a low pace. As shown in Figure 20, the number of people aged 15 to 64 is expected to increase from currently 17.2 million people in 2017 to around 17.7 million in 2040. Most of this increase is projected to occur until 2025. After that, the size of the working-age population is expected to remain roughly stable.

Between 1990 and 2017, the working-age population had increased particularly strongly in Iceland and Norway, but also in Sweden and on Åland (see first section of this chapter). Until 2040, the size of the working-age population is expected to continue increasing in all of these countries and regions (Table 9). The other countries and regions – Denmark, Finland, the Faroe Islands and Greenland – will have smaller working-age populations in 2040 than they have today. While the number

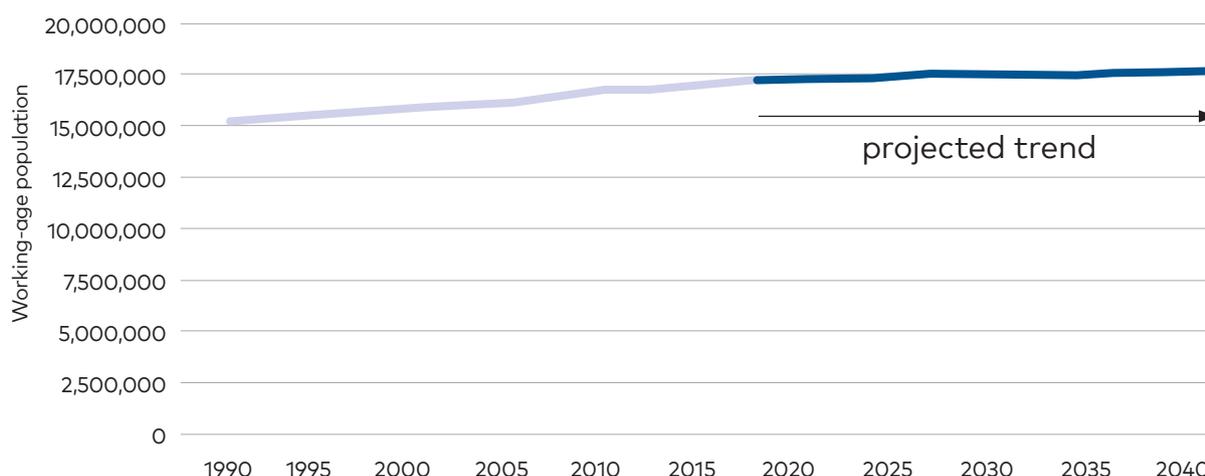


Figure 20: Past and projected development of the working-age population in the Nordic Region, 1990–2040. Source: Own Figure, based on NSIs, Tillväxtverket (SE) and Byggdastofnun (IS).

Table 9: Working-age population in Nordic countries and autonomous regions in 2017 and 2040

	2017	2040	Change in %
Denmark	3,692,000	3,659,000	-0.9%
Finland	3,441,000	3,434,000	-0.2%
Iceland	224,000	264,000	18.0%
Norway	3,446,000	3,634,000	5.5%
Sweden	6,319,000	6,629,000	4.9%
Faroe Islands	31,000	30,000	-3.1%
Greenland	40,000	34,000	-14.1%
Åland	18,000	20,000	8.9%
<b>NORDEN</b>	<b>17,211,000</b>	<b>17,704,000</b>	<b>2.9%</b>

Source: Own Table, based on NSIs, Tillväxtverket (SE) and Byggdastofnun (IS).

of people in core working ages is hence expected to increase in Norden in the years to come, not all countries share in this trend. In fact, the Nordic countries fall into two groups with diverging projected trends.

Moving to an urban-rural perspective, we can also see diverging trends. Figure 21 shows the size of the working-age population that lives in urban, intermediate and rural regions in Norden today, and its projected size in 2040. The figure reveals that the trends observed in the past decades (see above) will largely continue in the future. The number of people between ages 15 and 64 is expected to increase particularly strongly in predominantly urban regions (in red), but also in intermediate regions that are near a city (in orange). In all other types of regions, the working-age population is expected to decrease, and the decrease will be strongest in the rural and remote regions (in dark green). There, the number of inhabitants aged 15 to 64 years is expected to decline from currently 3.3 million people to 3.1 million in 2040.

The decline in the working-age population is expected to occur in rural and remote regions in all Nordic countries and autonomous regions (Table 10). The only exception is Åland. The entire island region is classified as remote and rural, but here - in contrast to all other regions of the same category - the number of people in the core working ages

is projected to increase from currently 18.000 to 20.000 people in 2040. In all other rural and remote regions, the working-age population will be smaller in 2040 than it is today. The working-age population is also expected to decline in almost all predominantly rural regions that are close to a city (in light green) and intermediate remote regions (in yellow). The only exception is Norway, where the number of people in the core working ages is expected to be larger in 2040 than it is today. At the other end of the spectrum, the working-age population is expected to increase in all predominantly urban regions until 2040. In the majority of the Nordic countries, the working-age population is also expected to become larger in intermediate regions that are close to a city (in orange). Exceptions are Denmark and Finland, where this part of the population is projected to decline.

Overall, the rural-urban comparison hence suggests that trends observed in the past decades will also characterise the coming years. While the working-age population in the Nordic Region as a whole is projected to increase further - albeit at a slow rate - this growth will largely be concentrated in urban regions and their surrounding areas. Only Norway and Åland stand out as cases where rural and/or remote regions are expected to attract a growing number of people in working-ages in the future.

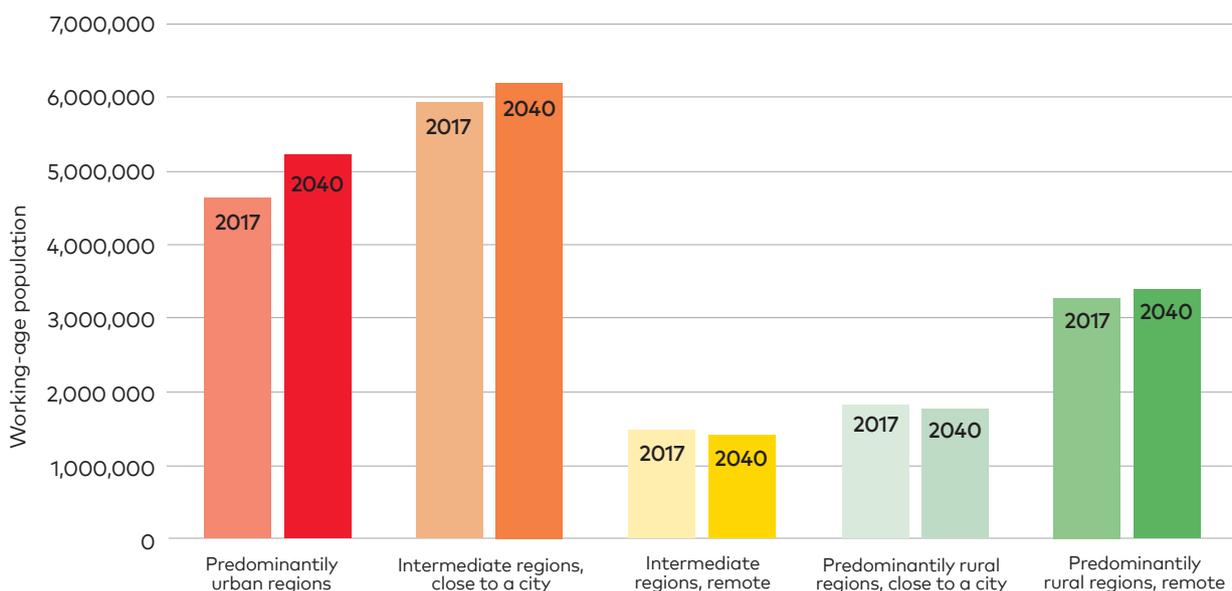


Figure 21: The working-age population (15 to 64 years) in rural and urban regions in 2017 and 2040. Source: Own Figure, based on NSIs, Tillväxtverket (SE) and Byggdastofnun (IS).

**Table 10: Working-age population by type of region and country, 2017 and 2040 (rounded numbers)**

Urban-rural typology	2007	2040	Change in %
<b>Predominantly urban regions</b>	<b>4,663,000</b>	<b>5,247,000</b>	<b>12.5</b>
in Denmark	1,200,000	1,276,000	6.3
in Finland	1,088,000	1,201,000	10.3
in Norway	864,000	993,000	15.0
in Sweden	1,510,000	1,777,000	17.7
<b>Intermediate regions, close to a city</b>	<b>5,965,000</b>	<b>6,210,000</b>	<b>4.1</b>
in Denmark	839,000	836,000	-0.4
in Finland	847,000	840,000	-0.8
in Iceland	145,000	190,000	31.3
in Norway	773,000	814,000	5.3
in Sweden	3,361,000	3,529,000	5.0
<b>Intermediate regions, remote</b>	<b>1,483,000</b>	<b>1,420,000</b>	<b>-4.3</b>
in Denmark	765,000	713,000	-6.8
in Finland	107,000	91,000	-14.7
in Norway	458,000	477,000	4.1
in Sweden	153,000	139,000	-9.3
<b>Predominantly rural regions, close to a city</b>	<b>1,828,000</b>	<b>1,766,000</b>	<b>-3.4</b>
in Denmark	372,000	345,000	-7.1
in Finland	821,000	791,000	-3.6
in Norway	297,000	311,000	4.5
in Sweden	338,000	319,000	-5.8
<b>Predominantly rural regions, remote</b>	<b>3,271,000</b>	<b>3,061,000</b>	<b>-6.4</b>
in Denmark	515,000	488,000	-5.2
Faroe Islands	31,000	30,000	-3.1
in Finland	578,000	510,000	-11.7
Åland	18,000	20,000	8.9
Grenland	40,000	34,000	-14.1
in Iceland	80,000	75,000	-6.3
in Norway	1,053,000	1,039,000	-1.3
in Sweden	957,000	865,000	-9.6
<b>Norden</b>	<b>17,211,000</b>	<b>17,704,000</b>	<b>2.9</b>

Source: Own Table, based on NSIs, Tillväxtverket (SE) and Byggöastofnun (IS).

While trends of growth or decline in the working-age population hence differ between predominantly urban and remote and rural regions, the age composition of this population group is expected to be similar in the different types of regions in 2040. Figure 22 again looks at the combined Nordic working-age population living in all five types of regions and shows the fractions that

belong to different age groups. As can be seen, the age structure of the workforce will be similar in all types of regions in 2040. Between 18% and 20% of the working-age population will belong to the oldest (55–64 years) and youngest (15–24 years) age groups. The middle age groups (25–34 years, 35–44 years and 45–54 years) are expected to be somewhat larger and constitute between 19% and

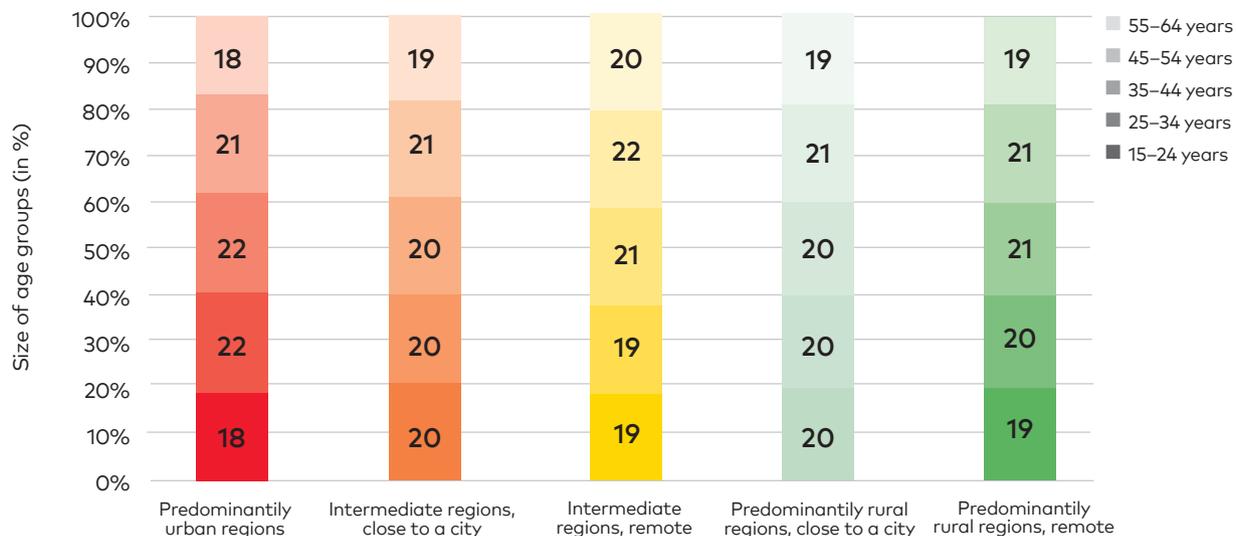


Figure 22: Age structure of the working-age population by type of region in 2040 (in %, rounded). Source: Own Figure, based on NSIs, Tillväxtverket (SE) and Byggdastofnun (IS).

22% of the working-age population in each type of region.<sup>13</sup> In this respect, different types of or regions in Norden face similar prospects.

### The working-age population in rural and urban municipalities: Projections for 2017–2040

Moving from a regional to a local perspective, we next compare projected changes in the working age population until 2040 in Nordic municipalities. Some trends that we already observed in the past (see section on municipal trends between 1990 and 2017 above) are expected to persist in the coming years: Strong declines in the working-age population are expected in particular in the Northern parts of Iceland, Sweden and large parts of Finland, i.e. in rural and/or remote regions. Increases in the number of 15- to 64-year olds are predicted especially in the larger cities and their suburbs, such as Oslo, Stockholm and Reykjavik. The projection data hence suggest that metropolitan areas will remain magnets for people in the core working ages while many rural and remote municipalities may further lose people in these age groups.

13 These similarities do not disappear when considering different regions in the Nordic countries separately (data not shown here, but available upon demand). From Hovedstaden in Denmark to Lappi in Finland, the age structure of the working-age population varies and differs somewhat from the averages shown in Figure 14, but no clear difference in age-structures between urban and rural regions appears.

In some respects, future trends will however also differ from the experience of the last decades. First, fewer municipalities than in the past will experience increases of more than 10% in their working age population (compare Figure 19 and Figure 23, next page). In Denmark, for instance, the working-age population had increased by at least 10% between 1990 and 2017 in Aalborg, Aarhus and Odense as well as some of their surrounding municipalities. In the coming years, this population group is expected to remain stable or even decline in all of these areas. In Finland and Iceland, too, the number of municipalities with an expected increase in their working-age population is smaller than in the past.

Second, declines of more than 25% in the working-age population will occur in regions that were not or less strongly affected by these trends than in the past. Several municipalities in the Southern parts of Norway and Sweden, for instance, are now expected to experience declines of more than 25% in their working-age populations until 2040. In the past (1990 to 2017), much fewer municipalities in these regions experienced this kind of decline. In Southern Norway, declines in the working age-population are expected for instance in many municipalities of Buskerud and Hedmark. In Southern Sweden, several such cases are located in Värmland.

Just as in the past, some outliers exist. For instance, Árneshreppur in Vestfirðir (IS), Båtsfjord

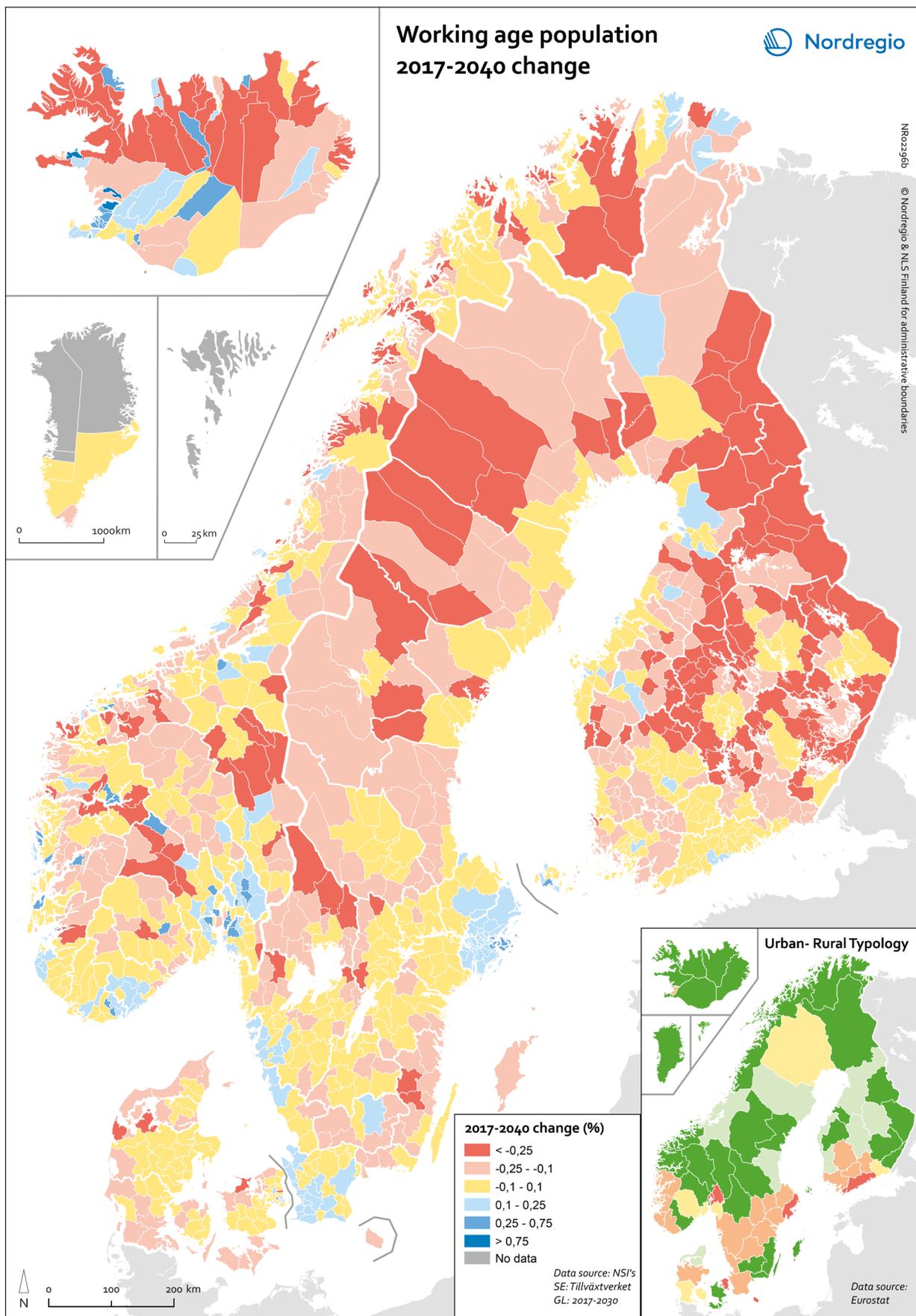


Figure 23: Projected changes in the working-age population in Nordic municipalities, 2017–2040

and Gamvik in Finnmark (NO) and Kittilä in Lappi (FI) are all projected to have a larger number of inhabitants between ages 15 and 64 in 2040 than they have today. Nonetheless, these exceptions are few. Current projections suggest that small municipalities in rural and remote regions will have to plan with a further declining pool of potential workforce in the future.

## Discussion: The role of older people in the labour market

The working-age population includes the age groups at which men and women are considered most likely and able to work – from 15 years to 64 years. With this population group projected to decline in many rural and remote Nordic municipalities, new strategies on how to fill emerging gaps and augment the number of potential workers need to be considered. One is trying to attract people of working ages from other municipalities or from abroad by providing good working conditions, salaries and attractive living environments. Another strategy could be to encourage employees to continue working beyond the traditional retirement ages. To differing degrees, people aged 65 to 74 years already continue working in the Nordic countries. Figure 24 shows separate employment rates for men and women in all regions in Denmark, Finland, Norway and Sweden.<sup>14</sup> Note that the rates are not directly comparable across the Nordic countries, since the underlying statistics do not use exactly the same definition to classify people as employed.<sup>15</sup>

In all Nordic countries, the employment rates of men aged 65 to 74 are higher than those of women. Gender differences appear to be stronger in Norway and Denmark than in Finland, with Sweden placed in the middle. The only exception in the

Nordic Region is Åland (not shown in Figure 24) where employment rates of elderly women (10%) surpass those of men (7%). When comparing employment rates in rural and urban regions within each country, no clear pattern emerges. In Denmark, the highest employment rates are reached in the urban and intermediate regions close to a city (Hovedstaden and Midtjylland). In Finland, too, Uusimaa (the region including the capital Helsinki) has higher employment rates among the elderly than most other regions, with the exception of Pohjanmaa where men reach even higher employment levels. In Norway and Sweden by contrast, the highest employment levels are reached in rural and remote regions (Sogn og Fjordane in Norway and Jämtland in Sweden). The differences in employment levels across regions may reflect different opportunity structures for elderly people, different levels of demand for their work, but also differences in economic trends and general employment levels.

Among the four Nordic countries shown in Figure 24, Finland has by far the lowest employment rates among people in the post-retirement ages. To some extent, the difference to the other countries could be caused by differences in definitions and data sources, but this is not likely to completely explain the existing gaps. As shown in this section and other parts of this report, trends of population ageing and declines in the working-age population are projected to be particularly strong in many Finnish municipalities. Engaging older citizens and encouraging them to remain active members of the labour force beyond traditional retirement ages could be a crucial strategy for these municipalities. In comparison to the other Nordic countries, there is ample room to catch up and learn especially from Sweden, which currently appears to have the highest employment rates among this population group. Iceland, Åland and the Faroe Islands (not shown in Figure 24) in part also have very high employment rates among the elderly and could provide interesting learning experiences (IS: 44% - men, 27% - women, FA: 54% - men, 40% - women, AX: 7% - men, 10% - women).

A task for economic planning is to forecast the potential demand for work force in different sectors and to estimate where shortages of labour are likely to appear. It is beyond the scope of this report to calculate such estimations on a regional level for the Nordic countries. Nonetheless, Table 11 may give a first impression of sectors in which

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14 Employment rates for this age group by region were not available in Iceland and not available at all in Greenland.

15 To give two examples: In Denmark, an employee is defined as a person "who works for a public or private employer and who receives compensation in the form of wages, salaries, payment by results or payment in kind. Non-conscript members of the armed forces are also included." The Danish data used for Figure 24 refer to age groups 65 to 74. In Norway, employed persons are defined as "persons performing at least one hour of income-producing work during the week or day referred to, as well as persons who have this sort of work, but who were temporarily absent due to sickness, vacation, paid leave etc. Persons in the civil service and conscripts are considered employed persons. Involuntary laid off persons, with a continuous duration of up to three months, are defined as employed and temporarily absent." The Norwegian data used for Figure 24 refer to age groups 67 to 74 years.

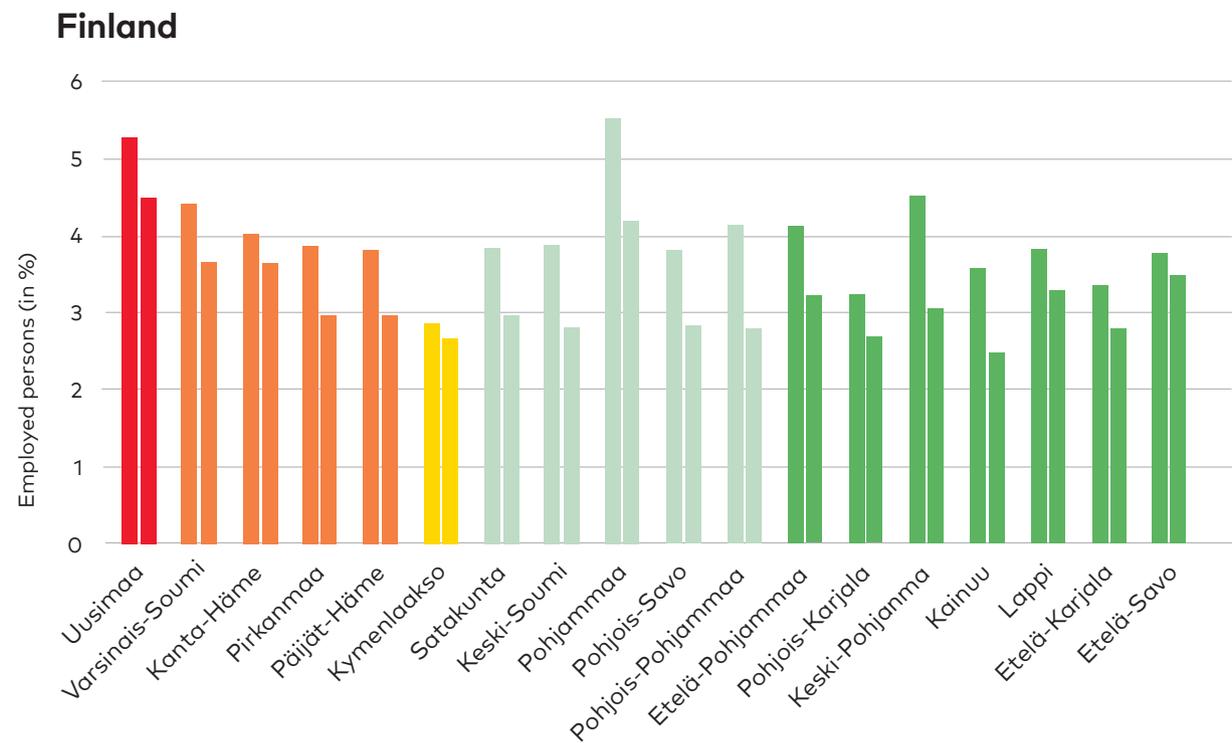
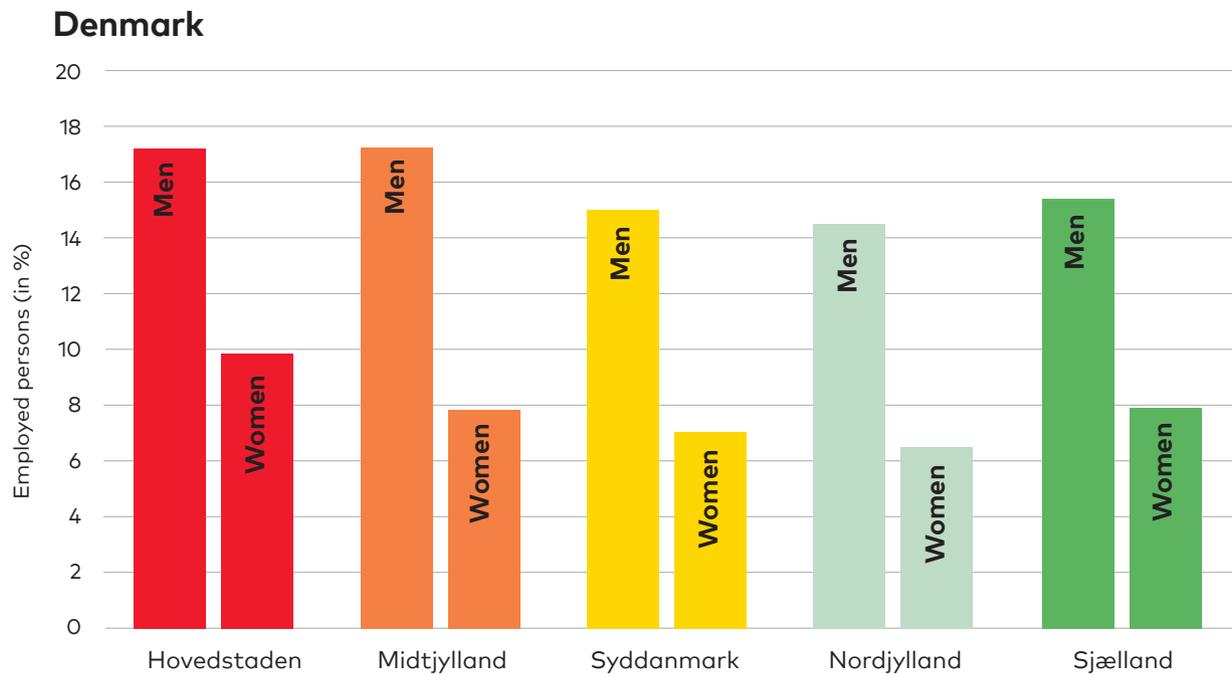


Figure 24 a: Employment rates of men and women aged 65 to 74 years , by region. Denmark and Finland.  
Source: Own Figure, based on NSIs.

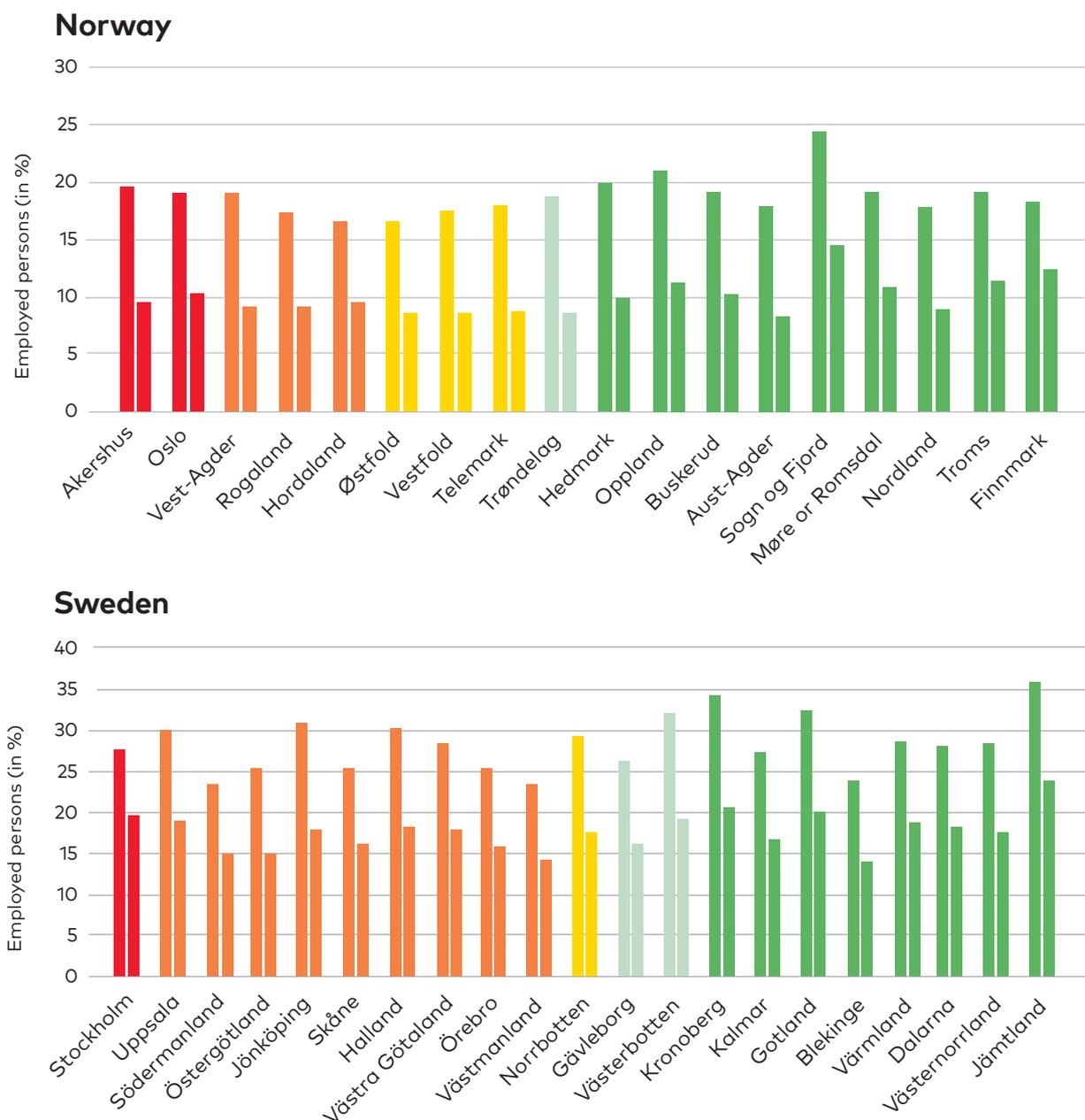


Figure 24 b: Employment rates of men and women aged 65 to 74 years<sup>16</sup>, by region. Norway and Sweden. Source: Own Figure, based on NSIs.

the contributions of elderly workers may be particularly valuable in the coming years. The table focuses on the regions in the Nordic countries that are classified as remote and rural according to the typology we used in this report.<sup>17</sup> It identifies the sectors where most people (across all ages) were employed in 2007/2008 and in 2015/2016. In the

last column, the Table also shows the sector where the largest number of jobs were created between those years. The economic sectors identified here hence have a large demand for workforce, have had a high demand in the recent past, or have been in a process of expansion which may create further jobs in the future. The contribution of elderly people may be valuable in these sectors, in particular if the supply of younger workers diminishes. Note that Nordic countries cannot be directly compared to each other, since they follow partly differing systems of classifying economic sectors.

16 In Norway, the statistics apply to age group 67–74 years.  
 17 In Iceland, information on the number of employees per sector was not available for the regions classified as rural and remote.

The results shown in Table 11 (next page) could be influenced by these different definitions.

Overall, it appears that health care and social care sectors are important employers in remote and rural regions in the Nordic countries. These sectors appear in one or the other category in almost all regions shown in Table 10. Health care and social care work encompasses many different occupations which require different levels of education and skills and entail different levels of responsibilities and tasks. Many occupations in this sector are considered physically demanding, which may be a particular challenge for older employees.

Reducing physical burdens on staff and making different types of occupations in these sectors more accessible for an older workforce should therefore be an important priority. The exchange of knowledge and good practices across regions could be a useful topic for further Nordic cooperation.

## References

OECD (2019): Working age population (indicator), available at: <https://data.oecd.org/pop/working-age-population.htm> (Accessed on 04 March 2019).

**Table 11: Sectors with large numbers of employees or important job growth in rural and remote Nordic regions**

Rural remote regions in four Nordic countries	Sector with the largest number of employees (2007/2008)	Sector with the largest number of employees (2015/2016)	Sectors which created the largest number of jobs between 2007/2008 and 2015/2016	
<b>DK</b>	Sjælland	Wholesale and retail trade	Human health activities	
<b>FI</b>	Etelä-Pohjanmaa	Manufacturing	Human health and social work activities	
	Pohjois-Karjala	Manufacturing	Human health and social work activities	
	Keski-Pohjanmaa	Manufacturing	Human health and social work activities	
	Kainuu	Human health and social work activities	Human health and social work activities	
	Lappi	Human health and social work activities	Human health and social work activities	
	Etelä-Karjala	Manufacturing	Human health and social work activities	Administrative support and service activities
<b>NO</b>	Etelä-Savo	Human health and social work activities	Activities of households as employers	
	Hedmark	Human health and social work activities	Human health and social work activities	
	Oppland	Human health and social work activities	Human health and social work activities	
	Buskerud	Human health and social work activities	Human health and social work activities	Construction
	Aust-Agder	Human health and social work activities	Human health and social work activities	Human health and social work activities
	Sogn og Fjordane	Human health and social work activities	Human health and social work activities	Human health and social work activities
	Møre og Romsdal	Human health and social work activities	Human health and social work activities	Human health and social work activities
	Nordland	Human health and social work activities	Human health and social work activities	Human health and social work activities
	Troms	Human health and social work activities	Human health and social work activities	Human health and social work activities
	Finmark	Human health and social work activities	Human health and social work activities	Human health and social work activities
	<b>SE</b>	Kronoberg	Mining, quarrying, manufacturing	Mining, quarrying, manufacturing
		Kalmar	Mining, quarrying, manufacturing	Human health and social work establishments
Gotland		Human health and social work establishments	Human health and social work establishments	
Blekinge		Mining, quarrying, manufacturing	Human health and social work establishments	
Värmland		Mining, quarrying, manufacturing	Human health and social work establishments	
Dalarna		Mining, quarrying, manufacturing	Human health and social work establishments	
Västernorrland		Human health and social work establishments	Human health and social work establishments	
Jämtland		Human health and social work establishments	Human health and social work establishments	
FA		Health and social services	Public administration: Municipalities etc.	Public administration: Municipalities etc.
AX		Transportation and storage	Human health or social work activities	Human health or social work activities
GR	Public administration and service	Public administration and service	Public administration and service	

Source: Own Figure, based on NSIs.







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