Abstract for WIC2021

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Changed emigration as a remedy against depopulation

Short abstract

Depopulation and population ageing are interlinked topics of great concern in many countries. To counteract the negative effects of these phenomena, increased fertility and/or increased immigration are often proposed as demographic solutions. However, substantial long-term fertility increases have proved difficult to achieve, and whereas increased immigration usually reduces ageing in the short-term, it may be politically controversial and have limited effects in the long term, because immigrants also age. However, in this discourse and at the national level, changed *emigration* is rarely mentioned.

This paper explores how changed emigration could mitigate the challenges of a country's ageing population. Using cohort-component methods, we create scenarios of future populations and old-age dependency ratios in Norway with reduced levels of emigration. We also estimate how much fertility and immigration would have to change to yield the same effects for population counts and ageing. By comparing how much these components would need to change to avoid population decline and limit the growth in future old-age dependency ratios – while discussing the opportunities of potential policies to substantially affect fertility, immigration, and emigration – we assess how realistic each of these demographic remedies to counteract depopulation and ageing may be.

Extended summary

This study assesses the extent to which changes in emigration could mitigate a country's challenges of decreasing population growth and ageing.

Declining population growth and population ageing are global megatrends. The United Nations (UN) estimate that 55 countries, including large countries like China, Japan and Russia, will have a smaller population in 2050 than in 2020, and that the number of people worldwide aged 65 years or more will double by 2050, from near 730 million persons today to over 1.5 billion (UN DESA, 2020). The old-age dependency ratio (OADR), which equals the number of persons aged 65 years or over divided by the number aged 20 to 64 years (the 'working ages'), is also projected to increase (UN DESA, 2019).

Depopulation and ageing concerns

Depopulation and the closely linked phenomenon of ageing may pose challenges at multiple levels for affected countries, both nationally and regionally. The interlinked relationship between ageing and depopulation is illustrated in Figure 1, which shows the average annual rate of population change and OADRs for all countries worldwide. Although notable exceptions exist, the overall relationship between depopulation and ageing is clearly evident in the figure.

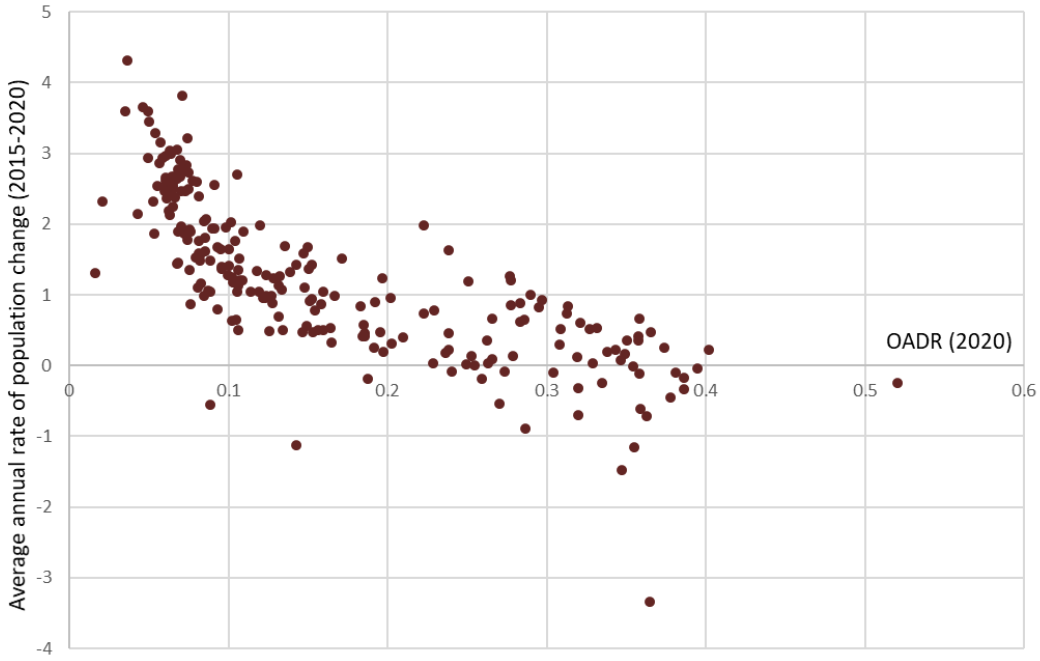

Figure 1 Annual rate of population change and old-age dependency ratios (OADRs) for selected countries worldwide.

Source: United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019, custom data acquired via website.

An absolute or a relative decline in the number of individuals in working ages, the latter indicated by rising OADRs, might result in a reduced labor force along with a reduced tax income for governments. Consequently, population ageing will put increased financial pressure on old-age support systems, especially if current patterns of taxation and benefits remain unchanged. Older people need both physical and economic security, and an increased number of elderly will result in rising pension costs and put more pressure on the health systems as multimorbidity increases with age (UN DESA, 2019). Public transfers are high in many countries in Europe and Latin America, whereas they are relatively low in many countries of Southern and South-Eastern Asia. In the latter countries, individuals and families are under pressure to find means of financing welfare at older ages, since the burden of providing these securities will be falling on a smaller portion of the population.

Hence, the prospects of higher OADRs have been met with concern in many countries, particularly in the Western world and in Eastern Asia. Several measures are discussed to counteract or manage the consequences of population shrinking and ageing. Some of these are non-demographic, such as lifelong education and health care for all, facilitating savings and healthy lifestyles, promoting employment among women and other low-employment groups, and raising retirement ages. Other measures aim at altering the demographic trends through affecting the determinants of demographic change. In this extended abstract we discuss such demographic measures. We will also present our first analyses, which focus on changed emigration as a measure to counteract declining population growth and population ageing at the national level.

Demographic remedies against ageing

There are, strictly speaking, only four determinants of demographic change in a country, working in tandem with the age- and sex-distribution to shape the future size and composition of a population: Fertility, mortality, immigration and emigration. Of these four components, fertility and immigration have dominated the debate about how to demographically meet the challenges of depopulation and ageing at the national level. Both of these remedies have, however, marked drawbacks that warrant consideration and discussion.

Increased fertility: Hard to achieve

The decline of fertility to below 2 children per woman has been met with concern in several advanced economies (UNFPA, 2019). In 2015, 66 percent of the European governments and almost 40 percent of Asian governments had policies to raise fertility or at least impede further decline. However, substantial long-term fertility increases have often proved difficult to achieve. Policies aimed at increasing fertility tend to have a larger observed effect on the *timing* of births than on the *number* of children (Bergsvik et al., 2020). Although studies do find some correlation between extensive public support to families and higher fertility (e.g. Wood et al., 2016), it is not obvious whether the higher fertility is caused by the costly policies or by the favourable economic conditions that made such policies possible. And although (quasi-)experimental studies suggest that certain policies do affect fertility, future effect of these tools may be limited if their coverage is already wide (such as day-care in many Western countries), or they may have unwanted side effects (for instance, transfers may act as a disincentive to paid work and hamper female employment (Bergsvik et al., 2020)).

Increased immigration: Controversial

Increased immigration boosts population growth and can reduce ageing in the short-term, since immigrants often arrive in their 20s or 30s. Measure to increase immigration may, however, be politically controversial. Furthermore, increased immigration has limited effects against ageing in the long term, because immigrants also get older and 'age in place'. Studies on replacement migration generally conclude that in order to prevent low-fertility countries from ageing, the needed volumes of immigration would be entirely out of line with both past experience and reasonable absorption capacity (UN DESA, 2001; Bijak et al., 2008; Sanchez Gassen & Heleniak, 2016). Bujard (2015) and Murphy (2016) have also found that in the long run, immigration affects population size far more than it affects age structure.

Decreased life expectancy: Not on the political agenda

For completeness we should also mention the effect of a stable or reduced life expectancy on depopulation and population ageing. Higher mortality will have opposite effects on depopulation and ageing: It will increase depopulation, but at the same time increased mortality, especially in the older age groups where deaths most commonly occur, would counteract ageing. However, measures to actively prevent further increases in remaining life expectancies are not on the political agenda and are unlikely to be placed there. Most countries instead aim to uphold or increase remaining life

expectancies also in older age groups. This is reflected in national policies where a high(er) life expectancy is considered a hallmark of a good society and a central aim of many health policies.[1]

Changed emigration: Hardly investigated

We have not been able to find any studies that investigate how changed emigration can affect population growth and ageing on the national level in Western countries. This may have several explanations: First, many of today's ageing nations are characterized more by immigration than by emigration, and while immigration has received much attention, there is generally a lack of research on emigration from Western countries. Second, data on emigration are inadequate in many countries, and hence many countries must rely on net migration data when, for instance, projecting future migration (Cappelen et al. 2015), making it difficult to make projection scenarios where only the rates of emigration change. Third, most Western countries have traditionally not implemented policies that aim to affect emigration, probably since leaving a country is considered a fundamental human right (although many countries have policies in place that may unintentionally affect the incentives to emigrate or to stay). However, compared to discussions on the regional level, where a number of policies aim directly at affecting out-migration from shrinking and ageing regions, the lack of discussions around how changed emigration can affect ageing at the national level, is striking. Thus, this study aims to examine the extent to which changes in emigration could mitigate the challenges of lower population growth and an ageing population, using Norway as a case.

The Norwegian context

In Norway, population growth is on the decline, and a considerable population ageing is expected over the next decades (Syse et al., 2020). Elderly aged 65 or over comprise 18 percent of the population today, but are projected to comprise 28 percent by 2060, according to the main alternative in Statistics Norway's population projections (ibid). At the same time, the OADR is projected to increase from 0.30 today to 0.55 in 2060.

Health care standards in Norway are increasing, resulting in higher costs. The Norwegian returns from the petroleum sector are expected to decrease after 2050, resulting in less resources for health- and eldercare. The future long-term care demands are feared to exceed the resources of the family, the welfare state, and other caregivers, both in quantity and in complexity (Muir, 2017; Lorenzoni et al., 2019), and to influence the sustainability of the welfare state (OECD, 2019). As a result, national politicians, including the Norwegian prime minister, have expressed concerns about declining fertility due to its detrimental effect on the ratio between the elderly and those in working ages, encouraging Norwegian couples to have more babies (Solberg, 2019). Changed emigration has not been mentioned in the discourse about remedies against ageing in Norway.

Analytical approach

We use cohort-component methods to create scenarios of future population and future OADRs with differing levels of emigration, using the official Norwegian population projection's model and their medium projections as a starting point (hereafter referred to as the *Main alternative*). In this model, emigration is projected using observed emigration rates for different subgroups by age, sex, immigrant background and (for immigrants) area of origin and duration of stay in Norway). People who do not emigrate, stay in the country and experience age-and-sex-specific probabilities of both dying and giving births. As most emigrants are of child-bearing age, decreased emigration may have a notable effect also on the number of births.

First, we assess how much a general reduction in the emigration rates affects the total population as well as the population ageing. Second, we will estimate how much fertility or

[1] While it is clearly unethical to actively aim to reduce life expectancy, priority discussions regarding how much resources should be spent as well as the potential benefits and harm it may entail for the elderly themselves, may emerge as the number of individuals in their 90s and 100s will increase nearly exponentially in the coming years. Such discussions pertain primarily, however, to elderly in exceptionally poor health, with high needs and a questionable quality of life, and can be linked to current research on 'overtreatment' (van Bruchem-Visser et al., 2020).

immigration would have to change in order to yield the same effects on population ageing as a certain change in emigration. The first, preliminary results of this exercise are shown below.

In further work, we plan to investigate the effect of changes in emigration in subgroups such as immigrants vs natives, or limited to certain age groups. To make our scenarios more realistic, we will also make projections where lower emigration leads to lower return immigration (particularly among natives), and scenarios where lower emigration leads to lower first-time immigration (particularly among Europeans).

In parallel with this project, we also conduct research where we discuss how legal regulations may impact emigration. From this work, we will be able to assess the potential to affect emigration rates by policy measures in a society based on human rights and liberal values. By combining this with what is known about the possibilities of politically influencing the levels of fertility and immigration, and the results from our estimations where we compare how much each of these components would have to change to, for instance, limit the growth in future OADRs, we will assess how realistic each of those demographic remedies to counteract ageing and increase population growth would be.

Preliminary results

Table 1 shows the results from our first, crude analyses, where the Norwegian population projections' main alternative in 2060 is compared to a projection where all future emigration rates from Norway are either increased by or reduced by 50%; future total fertility rate (TFR) is either increased by ¼ (up to nearly 2.0) or reduced by ¼ (to around 1.5) compared with in the main alternative (TFR 1.74); future immigration figures to Norway are either increased by 25% or reduced by 25%; or lastly (and for demographic completeness) mortality rates are either increased by 20% or reduced by 20% as compared to in the official projections' main alternative. Table 1 presents the population counts, the OADRs, along with the numbers and shares of individuals in working age (age 20-64 years) and elderly persons (age 65+ years). As is evident from the table, the imposed changes are fairly pronounced and are clearly visible in both the total population figures as well as in the various age distribution measures.

Table 1. A comparison of populations and demographic measures in various age groups in different scenarios in 2060.

		Emigration		Fertility		Immigration		Mortality	
	MMM	+ 50%	- 50%	+ 15%	- 15%	+ 25%	- 25%	+ 20%	- 20%
Number aged 65+ years	1722252	1633151	1833800	1723509	1723509	1759573	1687453	1630695	1836344
Number aged 20-64 years	3159197	2862317	3533969	3309746	3071294	3382791	2933606	3151832	3164592
Total population count	6073637	5574124	6702589	6447822	5810950	6430908	5716201	5973605	6193544
OADR	0.545	0.571	0.519	0.521	0.561	0.520	0.575	0.517	0.580
Share aged 65+ years	28.4	24.4	27.4	26.7	29.7	30.8	29.5	27.3	29.6
Share aged 20-64 years	52.0	42.7	52.7	51.3	52.9	59.2	51.3	52.8	51.1

As shown in the table, four scenarios yield similar OADRs in 2060 (around 0.52): A 50% decrease in emigration rates, or a 15% increase in fertility (equals a TFR increase of ¼), or 25% higher immigration, or 20% higher mortality rates. This is lower than the OADR of 0,545 in the official population projection's main alternative (MMM), but still considerably higher than today's OADR (0.30).

The next three figures underscore our main messages. Figure 2 shows the results of the impact on the total population count. As the figure clearly shows, reducing the emigration results in a higher future total population as compared to the main alternative. So does increasing the fertility or increasing the immigration, whereas a change in the mortality matters the least for the overall population figures.[2] Similarly, the greatest *reduction* in population size is observed for the alternative with 50% higher emigration, especially in the medium run.

[2] The increased growth is greater for younger age groups than for older age groups. Normally, this will result in a higher total GDP. However, since Norway has an 'oil fund', it will also likely result in a reduction in income per capita as the returns from the fund needs to be split on more people.

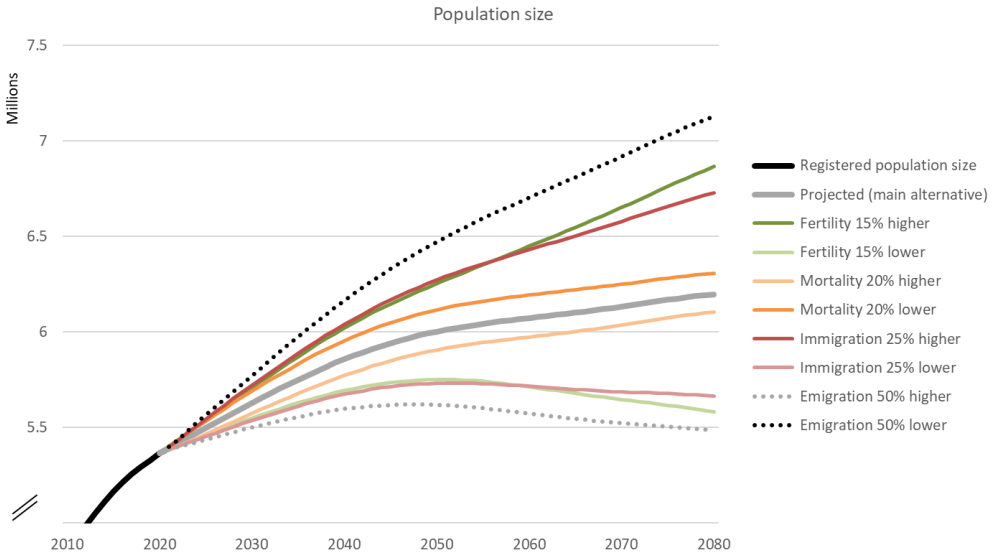

Figure 2 Registered and projected population size in Norway, 2012-2080, in the official population projections' Main alternative (grey) and in alternative scenarios with higher or lower emigration (dotted), fertility (green), mortality (orange), and immigration (red).

Figure 3 shows the age structure for 2020 as well as for various projection scenarios in 2060. The scenarios shown here all contributes to a reduced ageing (i.e. lower emigration, and higher fertility, immigration and mortality). As is evident from the figure, population ageing appears inevitable. All these alternatives show an increase in the number of elderly as compared to today's figures, even though they were chosen to illustrate how ageing might be counteracted. This is due to the inherent 'momentum' in the existing age structure of the Norwegian population: As years go by, most individuals will become older and remain in place, also in the hypothetical scenarios we have created for this paper.

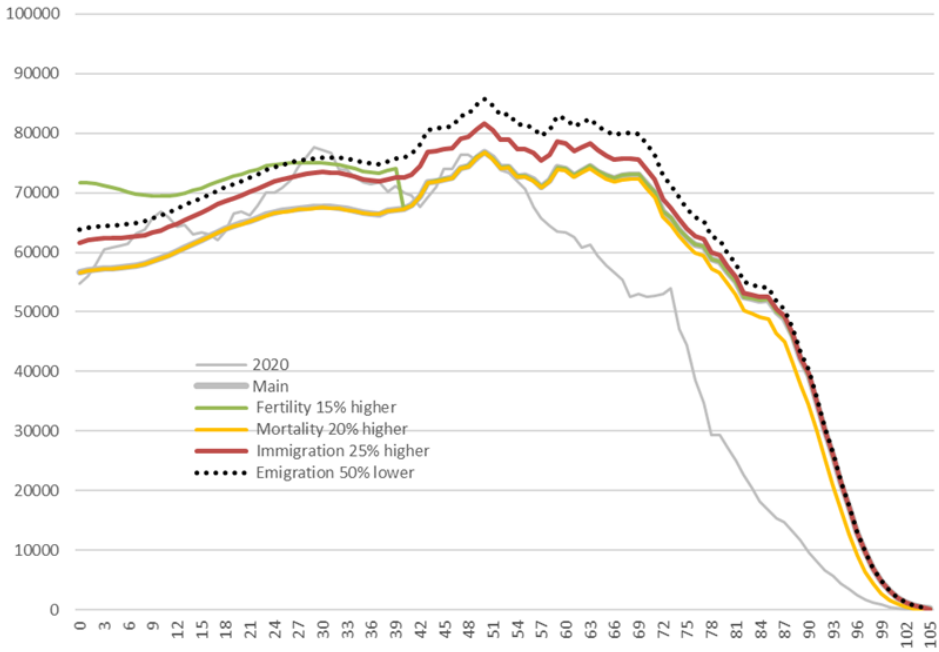

Figure 3 Registered (2020, thin grey line) and projected age structure in Norway in 2060 in the official population projections' Main alternative (grey) and in alternative scenarios with lower emigration (dotted), or higher fertility (green), mortality (orange), or immigration (red)

Figure 4 shows the OADRs for the alternatives that helps reduce the burden of ageing, i.e. increased fertility, mortality, and immigrations, as well as reduced emigration. As also seen in the table; to achieve an OADR similar to what a 50% reduction in emigration would produce, fertility needs to be increased by 15% (i.e. ¼ child), mortality increased by 20% and immigration increased by 25%. In the long run, however, the alternative with increased fertility has the strongest effects on reducing ageing.

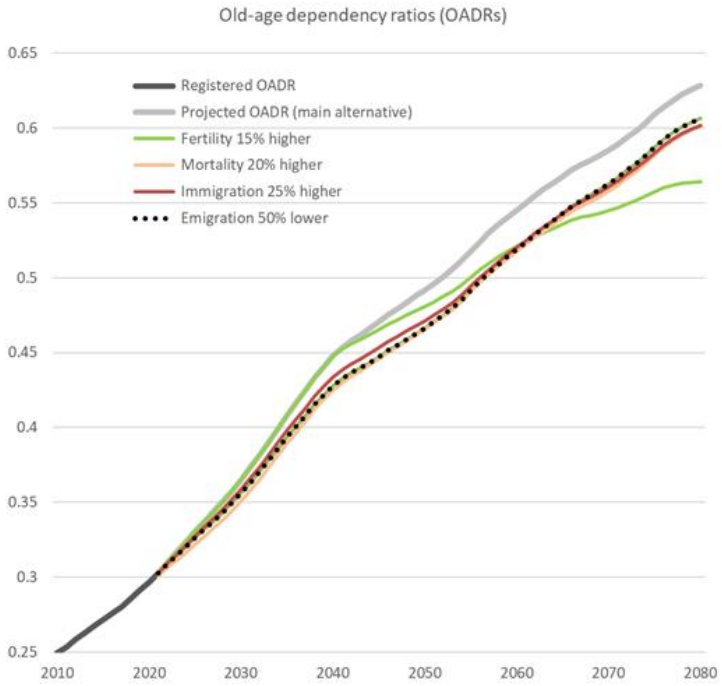

Figure 4 Registered and projected old-age dependency ratios (OADRs) in Norway, 2012-2080, in the official population projections' Main alternative (grey) and in alternative scenarios with lower emigration (dotted), or higher fertility (green), mortality (orange) and immigration (red)

Regional variations

As can be seen from our preliminary analyses, whereas ageing is highly likely in Norway, depopulation is less likely. Fairly dramatic changes in either fertility, immigration or emigration would need to occur for the population to begin shrinking at the national level. However, although Norway has experienced a marked population growth at the national level, in percent more pronounced than what has been observed in many other European countries (UN DESA 2019; Syse et al. 2020), the growth is vastly concentrated in central areas. Consequently, many rural areas experience depopulation, coupled with a pronounced ageing.[3] This is mostly due to the ongoing centralization (Leknes & Løkken 2020), which is mirrored also in many other countries. In short, there tends to be an outward migration of young adults to central areas, for education, work and family formation, while older persons remain in the countryside. Albeit the general notion is that there is a 'flight' from rural to central areas (i.e. net outward internal migration), the moving patterns are more varied, in part due to pronounced rural ageing, which deters outward migration. Many rural municipalities experience an excess of deaths, as there are relatively few women in childbearing age in rural areas (their fertility levels are typically somewhat higher than the national TFR). Rural areas thus uphold their populations primarily due to positive net international migration. Figure 5 shows how both the mean age and the OADR increases successively (and almost linearly) across centrality levels in Norway. In

[3] Norway is a relatively small, but long-stretched, country. The average number of inhabitants/km2 is only around 14. Altogether, there are 356 municipalities in Norway, ranging in size from below 200 inhabitants to close to 700,000 inhabitants. About 59% of the municipalities (N=209) may be considered rural. Rural municipalities comprise 72% of the area in Norway but hold only 14% of the population. As a result, the population is scattered, and many areas are sparsely populated. Most rural municipalities are in Northern and Western Norway, as well as in the mountain and inland areas in Southern Norway, especially along the Swedish border. Around half of the population in these parts live in sparsely populated areas.

the future, the relative number of tax payers is expected to decline, whereas both the relative and the absolute number of older people is projected to rise substantially. As Figure 5 shoes, the OADR is 0.42 in rural areas and 0.25 in the most central areas today. In 2050, they are projected to rise to 0.66 and 0.44, respectively (Leknes & Løkken 2020).

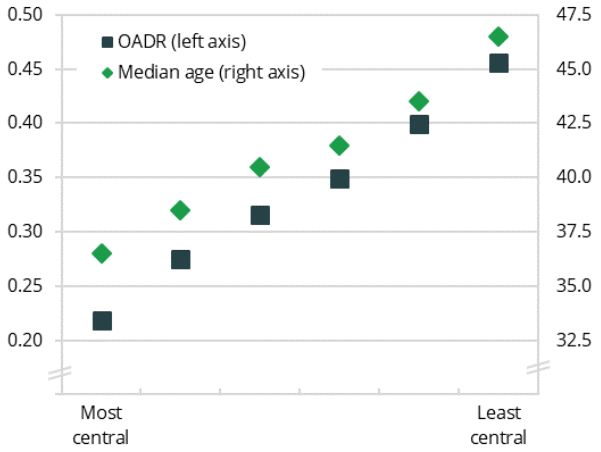

Figure 5 Old-age dependency ratios (OADRs) and median age in 2020 across different levels of centrality in Norway

Regional depopulation and ageing have implications for economic growth, labour supply, and service provision (including formal care for ageing populations), and thus represent fundamental challenges for the sustainability of rural municipalities. According to Syssner (2018), shrinking places need an active adjustment policy that is transparent, long-term and developed in dialogue with the people affected by it. Norway has an explicitly stated political goal that the whole country should be inhabited. The Government's overriding aim is to facilitate equal living conditions throughout the country and to maintain the main features of the settlement pattern. In 2020, two Government white papers were published to assess and suggest policies to achieve this aim (NOU 2020:12; NOU 2020:15). In summary, both publications concluded that policies that encourage moves from central areas to districts are likely to halt population decline in certain areas, but it is unlikely that it will be sufficient to deter ageing. Consequently, rural areas need to prepare for declining populations, where elderly in certain locations will outnumber the working age population. To uphold labour supply and tax income, continued investments in youths appears warranted (NOU 2020:15).

Concluding remarks

The changes in the demographic components employed in these preliminary analyses are large and, admittedly, not the most plausible ones, but the relation between them can provide useful information about changed emigration as a remedy to counteract declining population growth and ageing. As we have shown, population ageing is likely to be a more pronounced concern than depopulation in the coming decades in Norway at the national level, whereas depopulation is becoming an increasingly relevant topic at the regional level.

On the national level, our analyses have shown that even a dramatic decrease in emigration from Norway (a 50% reduction in all emigration rates) will only slightly reduce ageing, but it will have a considerable effect on population size, in all age groups. Hence, reducing emigration may be a more forceful remedy against depopulation than against ageing. Similar conclusions may be drawn for increased immigration, whereas the effect of increased fertility has a more long-term effect also on a society's ageing.

In future work, we plan to explore the effects of differential changes in emigration for different subgroups, such as immigrants vs. natives, and to make the scenarios more realistic (for instance, taking into account the interlinkage between immigration and emigration). We also aim at discussing more in detail how feasible it is for politicians to implement policy changes to change these components. Whereas it has proven difficult for democratic politicians to increase a country's fertility/immigration/mortality, decreasing emigration may be no less difficult.

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