

5 Looking ahead: Current and future labour shortfalls in long-term care

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This chapter presents evidence on current and future labour shortages in the LTC sector. The first section presents evidence on unmet LTC needs and existing staff shortages in LTC. The second section discusses recent policies implemented to mitigate staff shortages. The third section shows projections of labour demand in the LTC sector for the next two decades, as driven by population ageing and economic growth, pointing to the need for strong policy action to prevent staff shortages from accumulating at a very fast pace towards a socially unacceptable level. The last section discusses the potential of new technologies to help address the increasing demand for LTC workers.

Introduction

Shortages of long-term care (LTC) workers have been growing in many OECD countries over the past decades and have intensified during the COVID-19 crisis. Too few workers seem to be ready to take LTC jobs at the current working conditions. Shortages accumulate gradually and structurally as the number of older people, who most often use LTC, increases. This chapter presents evidence on labour shortages in the LTC sector and looks at the growing demand for LTC workers as the key driver of future labour shortages based on demographic, income and productivity effects. Among other factors, technological innovations may help cushion the increasing pressure on LTC workers.

Previous chapters provide important context for labour shortages in LTC. Chapter 2 provides details about the characteristics of LTC work, analyses the determinants of wages for LTC workers and quantifies the extent of low wages. The chapter shows how inefficiencies in wage setting may contribute to labour shortages. Wages are only one part of job quality and Chapter 3 documents poor working conditions in the LTC sector. It also looks into collective bargaining in the LTC sector and its potential role in improving its attractiveness. Chapter 4 highlights the insufficient social recognition of LTC jobs and gender imbalances in the LTC workforce that undermine wider recruitment and retention of staff, while pointing out that migrant workers help mitigate LTC labour shortages in many countries.

This chapter is structured as follows. The first section presents evidence on unmet LTC needs and existing staff shortages in LTC, including the impact of COVID-19. The second section discusses recent policies implemented to mitigate staff shortages. The third section presents projections of labour demand in the LTC sector for the next two decades, as driven by population ageing and economic growth, pointing to the need for strong policy action to prevent staff shortages from accumulating at a very fast pace towards a socially unacceptable level. The last section discusses the potential of new technologies to help address the increasing demand for LTC workers.

Key findings

Shortages of LTC workers

- Only half of older people (aged 65 or more) with severe limitations in activities of daily living receive formal care, while one-quarter receive neither formal nor family care. The prospect of not being able to access good-quality LTC services is felt as a major concern among adults in OECD countries.
- Both LTC needs and receiving professional LTC when needed increase sharply with age. In the OECD on average, 13% of people aged 65-69 report at least one limitation in activities of daily living (whether ADL or IADL) increasing to 53% at age 85-89. At age 65-69, 22% of people with limitation in daily living receive formal LTC, compared with 49% at age group 85-89.
- Job offers for personal care workers and nurses account for a substantial share of total job offers in several countries, at 6% or more in Norway, Sweden the United Kingdom and the United States while it is less than 1% in the Czech Republic, Estonia, Greece, Hungary, Lithuania, Luxembourg and Poland.
- Many countries report structural difficulties in recruiting LTC workers, both at the national and regional level. The COVID-19 crisis magnified both staff shortages and poor working conditions while increased job quits have been observed in the LTC sector after the outbreak the COVID-19 pandemic.
- Staff shortages means that the quantity of workers to be hired exceeds their supply at current working conditions. Not all people who need LTC receive it due to limited access to public funding, underdeveloped LTC institutions and affordability issues faced by households among other factors.

- LTC do not automatically translate into labour demand (at current conditions) and unmet needs into labour shortages. Yet, the insufficient supply of LTC workers aggravates unmet needs. Population ageing will lead to a sharp increase in LTC needs. In countries where the LTC system is not developed, unless there are large changes in policies, this will not translate into equivalent increases in the number LTC job offers, leading to an explosive growth in unmet needs.
- Low pay and more generally poor working conditions, in part related to constraints on public resources, as well as poor social recognition limit the labour supply of LTC workers, contributing to labour shortages.
- Ageing will substantially increase the demand for LTC, which will be harder to meet given that the working-age population is projected to start shrinking, by 2% in the coming decade on average across OECD countries and by more than 10% in Germany, Italy, Korea, Latvia, Lithuania, Poland and the Slovak Republic.
- The demand for LTC workers would increase by 22%, or by 0.41 percentage points of employment in all sectors, over the next decade due to population ageing alone according to central projections. Similar trends will continue over the following decade.
- On top of demographics, economic growth is expected to further raise demand for LTC services due to income effects while slower labour productivity growth in the LTC sector (Baumol effect) will require additional workers as a share of total employment. In the baseline projections, combining demographic changes, higher income and no labour-productivity growth in the LTC sector, the demand for LTC workers would increase by 32%, or by 0.60 percentage points of total employment, over the next decade. An alternative scenario based on annual labour productivity growth of 0.5% in the LTC sector implies a lower increase in labour demand of 27%.
- The projected growth in labour demand is much higher than the actual recorded increase in the number of LTC workers of 0.19 percentage points of total employment over the past decade, suggesting that policy efforts should be strengthened to avoid a sharp increase in unmet needs and labour shortages.
- Recent measures taken by OECD countries to tackle LTC staff shortages include: expansion of financial resources; pay increases; organisational adjustments to improve attractiveness; better LTC training programmes, including for the unemployed; improvements in recruitment processes; and, prioritising LTC workers in visa and work permit application procedures.

New technologies

- Investment in new technologies in LTC remains low. On average across 12 OECD countries for which data are available, IT investments make up only 1.0% of gross value added in LTC, compared to 3.2% in the total economy.
- The introduction of digital technologies is likely to support and supplement LTC workers, but is unlikely to replace LTC workers entirely for core caregiving tasks. It can help limit the looming shortage of LTC workers by facilitating independent living of older people, reducing the strain of LTC work and raising labour productivity, including through maximising the time LTC workers can spend on effectively providing care.
- Cost is an important barrier to the implementation of new technologies in LTC and expensive equipment such as robots are used by only 1% of LTC providers in Japan and the United Kingdom. However, as prices of such advanced equipment are expected to fall, use of technologies such as robots in LTC will likely increase.
- Cheaper technologies are increasingly used in LTC, such as sensors and tablets, which can reduce the time LTC workers spend on administration, co-ordination, monitoring and transport. The reasons for the limited use of cheaper technologies are not entirely clear, but obstacles may include concerns over privacy and data security, and the lack of both LTC providers' awareness of some available technologies and LTC workers' digital skills to operate such tools.
- The improvement of digital skills of both LTC workers and older people is vital for the successful implementation of new technologies.

5.1. Evidence on current unmet needs and staff shortages in long-term care

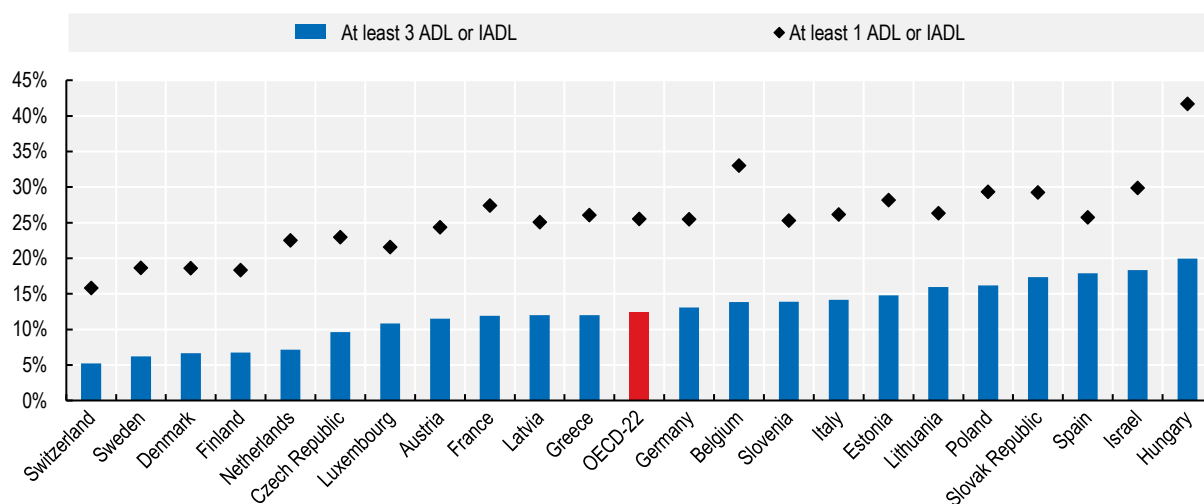
Not all people who need and want long-term care (LTC) receive it. There is a range of reasons for this, including limited access to public funding, underdeveloped LTC institutions and cost faced by households – many households cannot afford to hire care workers under current labour market conditions. Hence, LTC needs do not automatically translate into labour demand and unmet needs into labour shortages, whereby even at current conditions the demand for LTC workers exceeds their supply. This also means that there may be more LTC needs than what the labour-shortage numbers indicate, even though the number of unmet needs is magnified by the insufficient supply of LTC workers.

5.1.1. Many older people experience unmet long-term care needs


A substantial share of older people has LTC needs. One in four people over 65 reports at least one limitation in activities of daily living (ADL or IADL) while one in eight reports at least three limitations (Figure 5.1). The share of 65+ with at least three limitations varies from less than 10% in Denmark, Finland, the Netherlands, Sweden and Switzerland to more than 15% in Hungary, Israel, Lithuania, Poland, the Slovak Republic and Spain. This cross-country variation in LTC needs is thus much lower than that in the number of LTC workers per 1 000 older people discussed in Chapter 2, which ranges from less than 10 in Greece, Latvia, Lithuania, Poland and Portugal to more than 100 in Iceland, Israel, Norway and Sweden.

Figure 5.1. More than 10% of older people face at least three difficulties in daily living

Share of the population 65+ that is limited in their ability to perform at least one or at least three activities of daily living (ADL) or instrumental activities of daily living (IADL), 2020



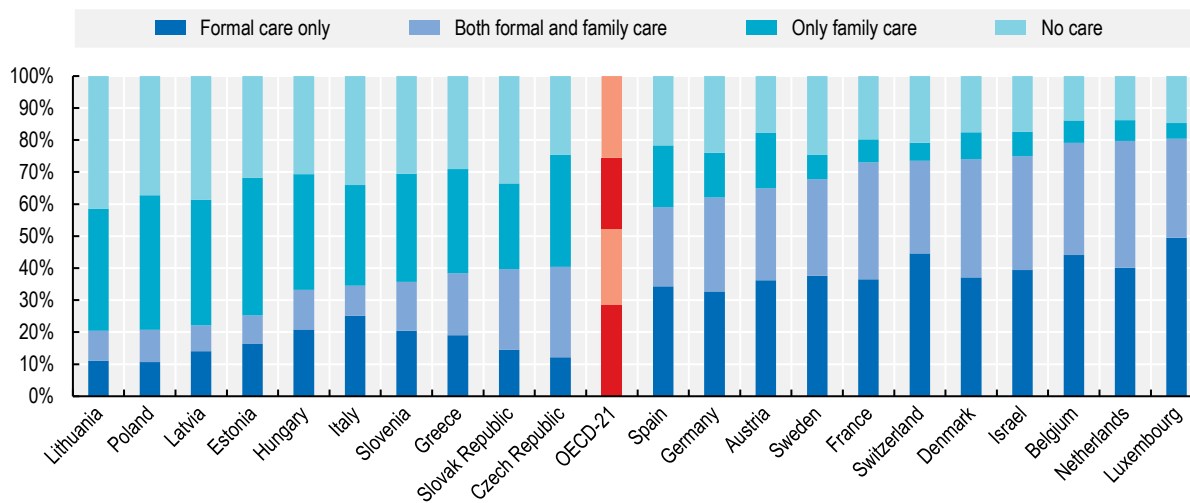
Note: A limitation refers to any difficulty a person has in performing at least one activity from a list of 14 activities as a result of a physical, mental, emotional or memory problem. The 14 activities cover six activities of daily living (ADLs – getting dressed, walking across the room, bathing, eating, getting in/out of bed, going to the toilet) and eight instrumental activities of daily living (IADLs – cooking, shopping, making a call, taking medicine, doing work around the house or garden, managing money, leaving the house independently and using public transport, doing laundry). Source: OECD calculations based on the Survey of Health, Ageing and Retirement in Europe (wave 8).

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Formal care is received by only half of people aged 65 or more with at least three limitations in activities of daily living (ADL or IADL, Figure 5.2). In Estonia, Latvia, Lithuania and Poland, it is even less than one-quarter while it is more than three-quarters in Belgium, Israel, Luxembourg and the Netherlands. Family care can come on top of formal care, yet 25% of people with at least three daily live limitations receive neither formal nor family care. This varies from around 15% in Belgium, Luxembourg and the Netherlands to around 40% in Latvia, Lithuania and Poland.

Figure 5.2. Only half of older people with at least three daily living limitations receive formal care

Share of the population 65+ with at least three ADL or IADL limitations, by type of care received



Note: Family care is received from family and friends; formal care is delivered by paid carers. Countries are sorted by the number of people receiving formal care.

Reading Note: On average across countries, among the 65+ with at least three ADL or IADL limitations, 28% receive formal care only, 24% receive both formal and family care, 22% receive only family care and 26% receive no care.

Source: OECD based on the Survey of Health, Ageing and Retirement in Europe (wave 8).

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Half of older people with at least one limitation in day-to-day activities have unmet needs on average across OECD countries – i.e. they report receiving none or insufficient care – while this applies to 40% of those with three limitations (Figure 5.3). This 40% share is substantially more than the 25% of people with at least three limitations not receiving any care shown in Figure 5.2, implying that a significant part of older people with at least three difficulties do receive some care, but still have unmet needs.

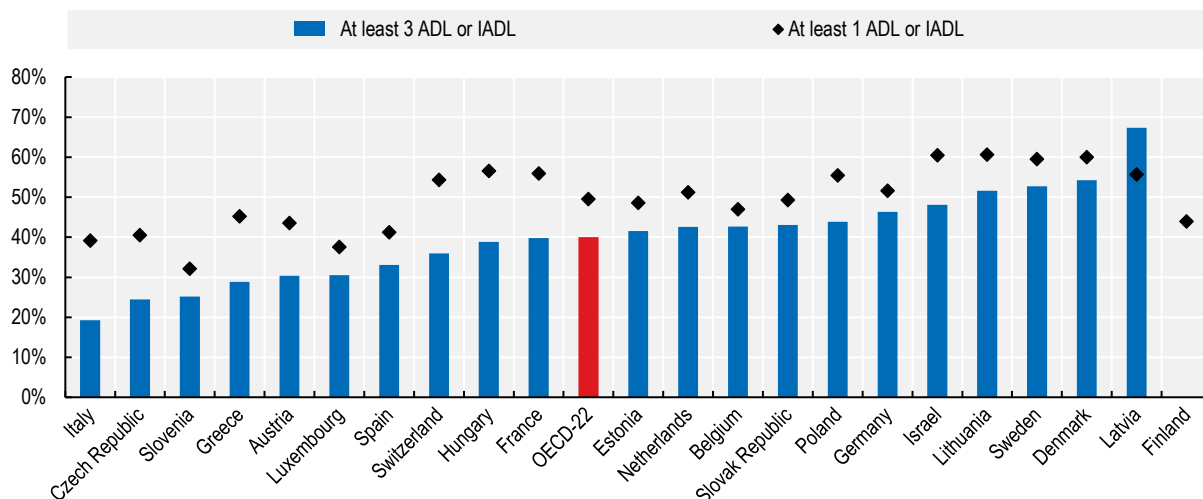
Unmet care needs affect less than 30% of older people with at least three limitations in daily living in Austria, the Czech Republic, Greece, Italy, Luxembourg and Slovenia, but more than 50% in Denmark, Latvia, Lithuania and Sweden. However, given the very low number of people reporting limitations in daily living in Denmark and Sweden (Figure 5.1), the absolute number of people with unmet needs is low in these countries. Moreover, in Sweden, Chapter 2 shows that the number of LTC workers relative to the size of the older population is record high.

Not being able to access good-quality LTC services is a common concern among adults in OECD countries. Based on Risk-That-Matter surveys measuring the perception of various social risks in OECD countries (OECD, 2021^[11]), covering LTC needs for old-age family members is among the top social needs that people worry about: it is stated by 56% of people on average among OECD countries (Figure 5.4). It compares to the top worry of becoming ill or disabled, which is stated by 61% of individuals.

More than three in four people share concerns about not being able to access good-quality LTC services in Chile, Greece, Mexico, Portugal and Spain.

Figure 5.3. Four in ten older people with at least three daily living limitations have unmet LTC needs

Share of the population 65+ with at least one or at least three ADL or IADL reporting unmet care needs



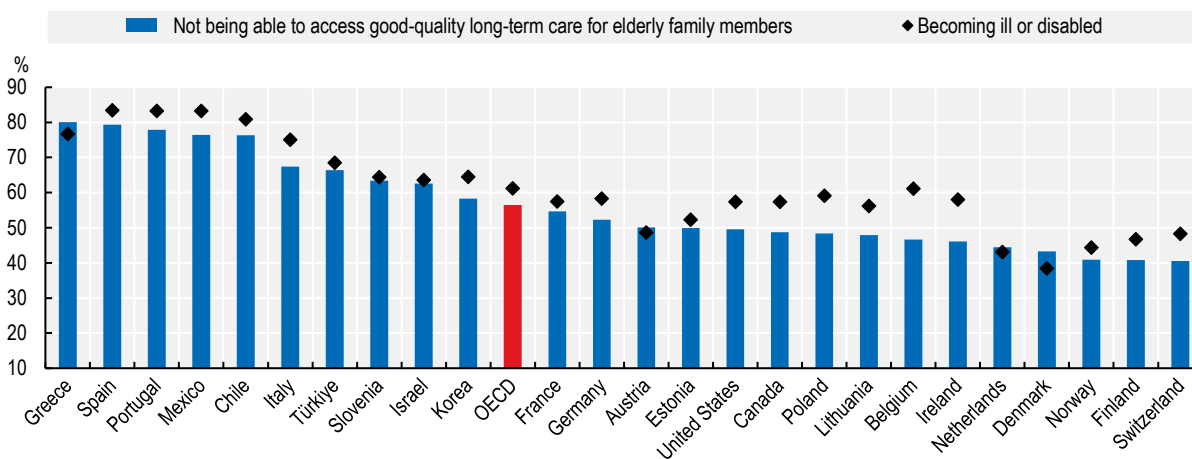
Note: A need is considered unmet if a person declares either to receive no help with these activities or to receive help that does not meet a person's need all the time. The number for Finland is not available due to sample size.

Source: OECD based on the Survey of Health, Ageing and Retirement in Europe (wave 8).

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Figure 5.4. More than half of people are concerned about not having access to good-quality LTC

Percentage of adults indicating they are somewhat concerned or very concerned by each identified risk



Note: Respondents were asked to rate the risks to themselves or their immediate family from a list of nine risks. Respondents had the option of selecting not at all concerned, not so concerned, somewhat concerned, very concerned or can't choose. Percentages shown here present the aggregation of "somewhat concerned" and "very concerned" answer choices.

Source: OECD (2021^[1]), *Main Findings from the 2020 Risks that Matter Survey*, <https://www.doi.org/10.1787/b9e85cf5-en>.

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5.1.2. Shortages of LTC workers are structural and intensified during COVID-19 crisis

Identifying staff shortages is challenging

Staff shortages are closely related to difficulties in finding competent workers for existing vacancies. Difficulties in recruiting people can therefore imply low employment growth in sectors affected by staff shortages. Barnow, Trutko and Schede Piatak (2013^[2]) define staff shortages in a given occupation as a sustained market disequilibrium between supply and demand in which the quantity of workers to be hired exceeds the supply of workers available and willing to work at some particular working conditions, including wages, place and time.

Steady increases in the demand for some products or services may generate shortages. Hence, as argued by Pindus, Tilly and Weinstein (2002^[3]), strong employment growth and fast increases in wages in a given occupation may also be signs of shortages. Firms can react to staff shortages in various ways, such as by increasing recruitment effort, resorting to more overtime, reducing minimum qualifications, fostering the training of workers, restructuring work, substituting workers with machines, improving working conditions including wages, introducing bonuses, etc. Sustainable growth of labour demand that is not accompanied by higher wages is likely to fuel or amplify labour shortages.

Identifying labour market tightness in the overall economy is usually done by comparing vacancies and unemployment (Beveridge curve), as well as quit rates (Causa et al., 2022^[4]). While vacancies give an indication of labour demand for specific occupations, a high number of vacancies per worker in a given sector might result from high turnover or increasing employment rather than actual staff shortages. Furthermore, workers can switch occupations, particularly among those with low skill requirements, and it is not straightforward to define occupational-specific unemployment as well as occupational-specific labour supply.

Many countries report shortages of LTC workers

Many countries have reported shortages of LTC workers in the questionnaire filled in for this report. In Australia, the National Skills Commission (NSC) publishes a Skills Priority List,¹ which provides a labour market rating of current shortages and a future demand rating, for 800 occupations nationally, including occupations that relate to the care sector. The Skills Priority List identifies both care workers and enrolled nurses as occupations with current shortages and strong or moderate future demand growth. Additionally, although nurses in aged care were not considered a shortage occupation in general in Australia, the government identified local shortages of nurses in the aged care. The Canadian Occupational Projection System (COPS) reports strong signs of staff shortages for both nurses and personal care workers for 2019 through 2021 and expects further shortages in 2022-31. In Ireland, 97.4% of respondents to a recent workforce survey conducted by Nursing Homes Ireland (NHI) reported difficulties in recruiting healthcare assistants (HCAs) (Department of Health, 2022^[5]). In Lithuania, the staff-to-patient ratio in many institutions was lower than required by the law even though shortages of nurses and nurse aids are considered to be limited.

In Norway, employers' surveys show substantial recruitment challenges in both LTC and healthcare sectors (NAV, 2022^[6]). Portugal reports shortages of care workers, in particular nurses (MTSSS, 2021^[7]), and the 2030 health strategy in Switzerland acknowledges the existing shortages of care workers. The United Kingdom, recognising the challenges faced to recruit and retain care workers, primarily personal care workers, introduced the Workforce Recruitment and Retention Fund to support the recruitment and retention of adult social care staff in 2022. In the United Kingdom, staff shortages are reported among nurses both in healthcare and LTC, for whom the number of unfilled posts is record high (The Guardian, 2022^[8]). Moreover, LTC workers, both personal carers and nurses, are being recognised as shortage occupations and are given priority for visa processing.² In Europe more generally, nurses and healthcare assistants were reported to be among top shortage occupations in 18 and 11 European Union countries, respectively, in 2021 (ELA, 2021^[9]).³

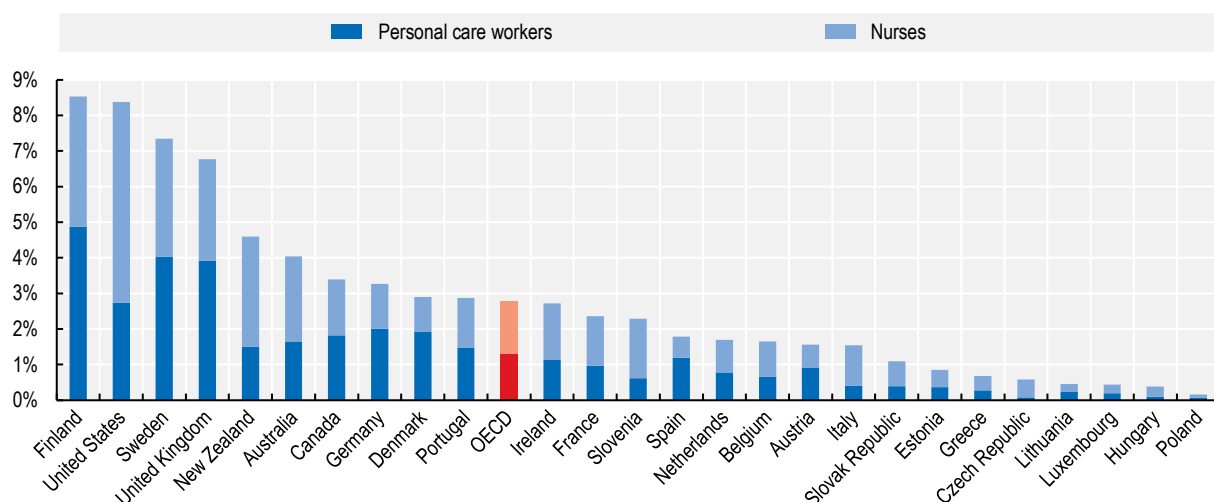
Some countries have identified shortages only for some regions. For example, shortages have been reported for large city areas in Germany and for some regions in the Czech Republic. Eurofound (2020^[10]) reports that in Finland shortages are concentrated in the north and east, while in France recruitment difficulties affect all parts of the country, but especially the border areas with Luxembourg and Switzerland, where wages are higher. In the United States, Barnow, Trutko and Schede Piatak (2013^[2]) found little indications of staff shortages in New York City; however, they found substantial shortages in rural areas of the New York state, where delivering care requires covering larger distances, where people have lower income and where migrant workers are less numerous. Danish municipalities reported labour shortages for social and health assistants in 2007-10, followed by no shortages in 2011-14 and then a progressive increase in shortages in 2014-17 (FOA KL, 2017^[11]).

Simultaneous increases of wages and employment within an occupation illustrate demand pressure, and may even indicate staff shortages according to Barnow, Trutko and Schede Piatak (2013^[2]). Based on the analysis in Chapter 2, employment of LTC workers has increased in the OECD on average over the last decade, while wages of LTC workers have increased in line with the average wage. Over the last decade, simultaneous and substantial employment and wage increases took place in the Czech Republic, Iceland, Portugal and Türkiye.

Differences between OECD countries in the demand for personal care and nurses are large. In Finland, Sweden, the United Kingdom and the United States, the share of online job offers for nurses and personal care workers for healthcare and social care sectors together⁴ in total online job offers is larger than 6% whereas it is less than 1% in the Czech Republic, Estonia, Greece, Hungary, Lithuania, Luxembourg and Poland (Figure 5.5). In 10 out of 26 countries there are more job offers for personal care workers than for nurses, particularly in Denmark and Spain, where there are two job offers for personal care worker for every job offer for nurses. The proportion is inverted in the Czech Republic, Hungary, Italy New Zealand, Slovenia and the United States.

Figure 5.5. Online vacancies of nurses and personal care workers

Share of online job offers for personal care workers and nurses in all online job offers, 2021 or latest year, in percentage of all job offers



Note: Personal care workers are defined as the ISCO code 532.

Source: OECD based on Lightcast.

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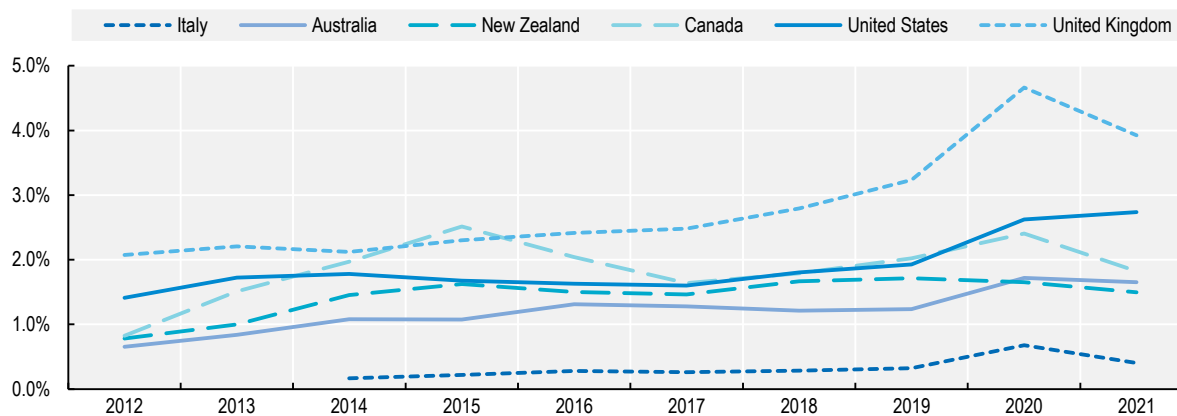
With COVID-19, job offers for LTC workers increased substantially in 2020

The COVID-19 crisis has caused many disruptions in LTC. As a share in total online job offers, job offers for personal care workers surged from 1.3% to 1.7% between 2019 and 2020 before returning to 1.3% in 2021. This relative increase was driven by both the slowdown in the number of total online job offers due to the COVID-related economic crisis and strong increases in the number of offers for personal care workers. The 2020 increase in the share of online job offers for personal care workers was more than 1 percentage point in Finland, Sweden and the United Kingdom.

Longer upward trends in job offers for personal care workers are observed in all countries for which the time series is available, i.e. Australia, Canada, Italy, New Zealand, the United Kingdom and the United States. Even in 2019, in Italy, New Zealand, the United Kingdom and the United States the share in vacancies for personal care workers was higher than in any year before (Figure 5.6). In Australia, the United Kingdom and the United States, the demand for LTC workers remained elevated in 2021 while it returned to pre-COVID-19 levels in other countries. Data show a substantial increase in the demand for LTC workers in Canada in 2012-15. In residential care in the United States, job offers increased while employment dropped in 2020 and 2021 (Hickey, Sawo and Wolfe, 2022^[12]).

Figure 5.6. Job offers for personal care workers increased substantially in 2020

Share of job offers for personal care workers in all job offers, 2012-21, selected countries



Note: Job offers for personal care worker (ISCO 532) as a share of all workers.

Source: OECD based on Lightcast data.

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Staff shortages of LTC workers were magnified by the COVID-19 crisis. In the United States, long-term residential care facilities suffered from immense staffing shortages throughout the pandemic (ASPE, 2022^[13]). Paulin (2022^[14]) lists possible pathways for LTC workers out of their jobs: “some workers have shifted to other healthcare roles in hospitals or private homes. Many have become travel nurses, who typically work on temporary assignments in various short-staffed facilities for higher pay. Others have left for higher wages at places like Amazon and McDonald’s. Some had to take on caregiving responsibilities at home or have opted for early retirement. Many immigrant workers have returned to their home countries”. In the United States, stakeholders proposed some solutions to resolve the emerging shortages of LTC workers, included introducing or increasing minimum staff requirements, introducing training subsidies and tax credits, and expediting the process for temporary nurse aides to become certified nursing assistants (AHCA/NCAL, 2022^[15]). Introducing and increasing staffing ratios are discussed in many other countries as a solution to improve work quality (Rocard, Sillitti and Llana-Nozal, 2021^[16]). In Ireland, the

number of people who were granted some financing of home care but did not receive care due to a lack of workers almost quadrupled between January 2020 and September 2021.

Following the COVID-19 crisis, Australia announced plans to increase LTC staffing, while Spain set up rapid response teams to intervene in certain institutions. Germany raised public spending on LTC, especially to allow to finance higher minimum wages in the sector, promote bonuses for LTC workers and facilitate the distribution of personal protective equipment. France paid out bonuses for workers and to cover part of additional costs faced by institutions (OECD, 2020^[17]).

Deteriorating working conditions and increased job quits have been observed in the LTC sector after the outbreak the COVID-19 pandemic. The surge of job quits following the COVID-19 crisis applies mainly to the jobs that bring little satisfaction, pay little and are of poor quality, especially if conditions deteriorated during the pandemic (ASPE, 2022^[13]). Excess work pressure was said to have increased burnout rates. OECD (2021^[16]) reports that in Canada 77% of nursing homes reported an increase in overtime and 71% an increase in absenteeism.

As labour market conditions have been tighter and economy-wide labour shortages have increased in many OECD countries, the surge in quits from poor-quality and low-paid jobs, the so-called great resignation has spurred debates. OECD (2022^[18]) notices that increased quits in the United States are not due to people not participating any longer in the labour force; rather, there has been a high mobility within sectors having a tight labour market rather than significant outflows from specific sectors, which seems to be driven by changes in workers' preferences. Gittleman (2022^[19]) reported that healthcare and social assistance sectors in the United States were among sectors which contributed most to the increased quit rates in 2021. In the United Kingdom, surveys in 2021 found that as much as three in four professionals want to change their jobs (CVLibrary, 2021^[20]), but evidence about this actually happening is limited. In Australia, the number of nurses in aged care declined in 2021. According to Causa et al. (2022^[4]), in 2021, an increasing share of firms reported production constraints due to labour shortages in many OECD countries, a number of countries faced recruitment tensions in health and care-related jobs and quit rates were particularly high in low-paid and low quality service jobs in the United States. European Commission (2022^[21]) shows that economy-wide labour shortages started to increase in 2013 with a pause related to the COVID-19 crisis and the population ageing has recently contributed to shortages.

5.2. Recent measures taken to address LTC staff shortages

Pressure from shortages of LTC workers has already pushed several countries to take policy action. This section discusses some key measures decided among OECD countries. Recognising the need to tackle the issues raised by the insufficient availability of LTC workers at current labour market conditions is essential. Strong commitment towards further policies is therefore critical to avoid that the imbalances from excess demand for LTC services build up to socially unacceptable levels. The next section provides projections of increases in the demand for LTC workers over the next two decades.

Expanding financial resources to enhance job quality, including wages, is essential to attract LTC workers and tackle both current and future shortages driven by fast ageing. Failure to do so will translate into lower quality of both LTC services and jobs, which would have snowballing effects on the insufficient supply of workers. However, securing sufficient and sustainable financing is a challenging task.

Minimum wages in the care sector set above economy-wide minimum wages raises the attractiveness of LTC jobs. Both the Scottish and Welsh Governments have implemented a minimum hourly wage for care workers about 10% above the economy-wide statutory minimum, after having secured the financial resources to cover publicly financed LTC jobs (MAC, 2022^[22]). Low LTC wages mean that economy-wide minimum wage arrangements affect a substantial part of LTC workers and higher minimum wages make formal employment more attractive. Portugal assessed that 40% of LTC workers receive the economy-wide

minimum wage, which level increased from 36% to 47% of the average wage between 2011 and 2021.⁵ Over this period, increases in minimum wages were common among other OECD countries, and by more than 5 percentage points of the average wage in Chile, Colombia, Costa Rica, the Czech Republic, Japan, Korea, Mexico, New Zealand, Poland, Spain, Türkiye and the United Kingdom.⁶

Some countries have attempted to raise the attractiveness of LTC employment through improvements in job quality. Canada increased public funding of LTC for 2020-25 in order to develop standards in the LTC sector, ameliorate the supervision of LTC facilities, improve working conditions – including wage increases – of LTC workers and upgrade LTC infrastructure. Germany implemented laws (ger. *Pflegepersonal-Stärkungsgesetz* in 2019 and *Gesundheitsversorgungsweiterentwicklungsgesetz* in 2022) to improve working conditions in the care sector; this was done through promoting collectively agreed pay standards and improving occupational safety. In the Netherlands a new quality framework (ned. *Kwaliteitskader Verpleeghuiszorg*) was introduced in LTC for older persons in 2017, which, among others, imposes a higher staff-to-client ratio. Greece has created support groups for people working with patients having Alzheimer’s disease, while Hungary introduced an additional leave for workers across the social sector during the COVID-19 pandemic.⁷

Better job quality might also result from improved work organisation. Ireland is aiming at reorganising care professions to provide more professional advancement to carers. Since 2022 in Germany, nursing staff has been given more responsibility, and they will be able to prescribe nursing aids make more independent decisions in home care. The United Kingdom has increased funding for investing in digital technologies in social care and in the LTC workforce. In Australia, as part of the Aged Care Action plan for 2022-25, qualification requirements and job roles are being reviewed, vocational training will be strengthened, and new tools to manage workforce planning are being implemented (Department of Health, 2022_[23]).

Formalising LTC work is a prerequisite for improving job quality, including wages. Vouchers to formalise undeclared work can be very effective in increasing the supply of formal LTC work (OECD, 2021_[24]). In Denmark, the 1993 “home service scheme” was key in tackling undeclared work in home care. Home service recipients receive 50% of the invoiced amount, but only if the provider is included in the home service scheme by the Danish Business Authority. Similar voucher-based solutions were also introduced in Austria, Belgium, France and Slovenia. Apart from vouchers, Austria has been successful in formalising live-in care workers. Italy introduced a collective bargaining framework negotiated between unions’ and employers’ federations to raise professional LTC work in 2013. However, in practice, many families still do not declare live-in carers as the stipulated salary may be considered too high, even though it is one of the lowest minimum rates among collective agreements (Eurofound, 2020_[10]).

Immigration policy is often used to tackle general labour markets shortages, and care work has been recognised as a shortage area in some countries. Particularly, Australia and Germany put nurses on shortage occupation lists which enable or facilitate immigration procedures. This is less frequent for personal care workers. However, personal care workers were added to the shortage occupation list in the United Kingdom in 2022. Before that, in 2021, 47% of visas for skilled workers were granted to health (mainly) and care workers in the United Kingdom (Sumption and Strain-Fajth, 2022_[25]). In 2019, Japan had included care workers among in the “Specified Skilled Worker” list.

Providing training to upgrade skills required in LTC jobs is instrumental to broaden the pool of LTC workers. Eurofound (2020_[10]) details how Denmark, Norway and Sweden have expanded their training programmes for care workers. Some countries, including Japan, the Netherlands, Norway, the United Kingdom and the United States, offer LTC training programmes to the unemployed, and Denmark, from 2021, has increased unemployment benefits by 10% for those undertaking vocational education related to in-demand occupations including LTC jobs (OECD, 2020_[17]). In the United States, a community service and work-based job training programme for older workers – the Senior Community Service Employment Program – provides training for low-income, unemployed workers aged over 55. Participants may gain work experience in a variety of community service activities at non-profit and public facilities, including

schools, hospitals, day-care centres, and senior centres. Japan has introduced basic LTC training courses targeting middle-aged and older workers to both facilitate returning to work after a long break and support beginners to take LTC training courses. This contributed to a fast increase in the number of LTC workers between 2011 and 2015. In Canada and the United States, more financial resources are being shifted towards financing LTC training programmes within active labour market policies.⁸ The Australian Government partnered with local governments to finance additional vocational training for 180 000 of people in 2023 in priority jobs including LTC. Informal carers belong to priority groups to qualify for the programme.⁹

Efforts have been made to improve recruitment processes of LTC workers. For example, in 2019, Germany established a specialist agency for skilled labour in health and care occupations, DeFa (ger. *Deutsche Fachkräfteagentur für Gesundheits- und Pflegeberufe*). It is the first point of contact for health and care providers intending to recruit skilled staff abroad, facilitating visa applications and the recognition of professional qualifications and work permits (Eurofound, 2020_[10]). As an interesting case, amid redundancies in the context of the COVID-19 crisis in the Netherlands, the airline KLM and the care organisation Actiz have enabled airline personnel (mostly flight attendants) to switch to a career in LTC. Airline personnel was given a job guarantee, free professional nursing education and a similar salary to that which they received in their previous role and 270 out of 5 000 dismissed employees expressed their interest in this programme (NOS, 2020_[26]).

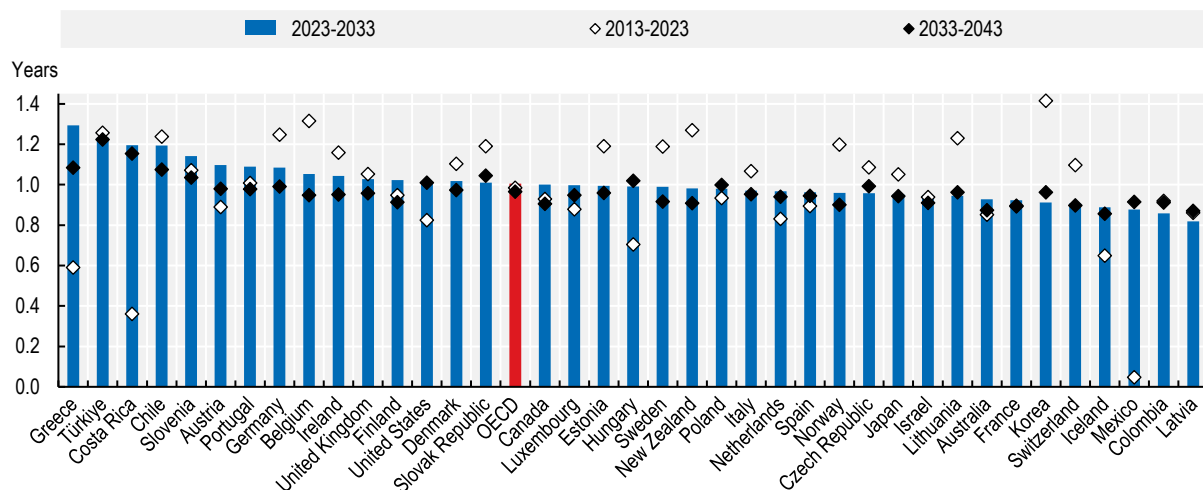
Retaining staff is probably easier and cheaper than recruiting and training new workers (OECD, 2020_[17]). The US Bureau of Health Workforce initiated the Geriatric Workforce Enhancement Program in 2015, providing funding to communities to develop new curricula and geriatric care experience and involving collaborations between various professions and partners. Estonia implemented the Nurse Back to Health Care Programme for nurses working in other fields to return to healthcare. Germany launched Concerted Action on Nursing in 2018, involving employers and job centres, which seeks to promote retraining into the profession using full-time funding for professional training courses.

5.3. Key drivers of higher labour demand for LTC workers over time

Improvement in longevity is one main factor increasing the number of older people over the long term. Life expectancy at older ages have increased in all OECD countries, at the average pace of 1 year per decade from age 65 in 2013-23 despite the COVID-19 crisis (Figure 5.7). On average across OECD countries, remaining life expectancy at age 65 declined from 19.8 years in 2019 to 19.2 years and 19.1 years in 2020 and 2021, respectively, but it is projected to be back to the pre-COVID trend at 20.2 years in 2023. Life expectancy developments from age 65 in Costa Rica, Hungary, Greece and Iceland have been much below the average pace over the last decade, and Mexico has barely recorded any improvement on average, while remaining life expectancy increased by 1.4 years in Korea. The average pace of life-expectancy gains is projected to be similar over the next two decades as the effects of the pandemic are expected to be largely temporary based on UN projections (Figure 5.7).


Figure 5.7. Life expectancy is projected to increase by one year per decade on average

Changes in period life expectancy at age 65 in OECD countries



Note: Data show period life expectancy.

Source: OECD calculations based on UN (2022^[27]), *World Population Prospects 2022*, <https://population.un.org/wpp/>.

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This section discusses key factors that are expected to drive the rising demand of LTC workers, potentially contributing to labour shortages if supply does not adjust adequately. It starts by discussing both demand and supply factors affecting the employment of LTC workers. Then the focus turns to demand factors and to documenting both the past and projected pace of ageing. Finally, projections are made about future demand of LTC workers, based on demographic changes depending on the extent of healthy ageing, GDP growth and productivity improvements in the LTC sector.

5.3.1. Several factors generate shortages of LTC workers

Shortages of LTC workers arise from imbalances between the demand for LTC services and supply of LTC workers. Demand for LTC services is largely driven by demographic changes due to longer lives and the ageing of the baby boomer generations, especially if additional life years are not spent in good health. The total supply of workers is determined by different factors, including the size of working-age population, policies to raise labour market participation and working conditions including pay levels. The supply of LTC workers can be constrained by societal changes and limited fiscal space to expand public financing. For example, both more common nuclear families and the development of female employment limit the supply of family care and contribute to increasing demand for formal LTC. Moreover, at the sectoral level, low pay and more generally poor working conditions as well as poor social recognition tend to limit the labour supply of LTC workers, in particular if better jobs are available elsewhere (Chapters 2-4).¹⁰ When long-term trends of raising demand for LTC are not accompanied by supply-side responses, shortages become structural.

Policy measures taken in some countries to broaden the access to publicly financed LTC allow more people to afford formal LTC and therefore increase the demand for LTC workers. For example, substantial improvements in LTC funding in Ireland led to strong increases in the demand for LTC workers. While between 2014 and 2021 the budget for home-support services for older people increased by 130%,¹¹ basically all respondents to a recent workforce survey (97% of them) conducted by Nursing Homes Ireland (NHI) reported difficulties in recruiting healthcare assistants (Department of Health, 2022^[5]). In the United States, there have been several legislative changes expanding the eligibility to home care covered

by Medicare and Medicaid. As a result, Medicaid spending on home and community-based care nearly doubled between 2000 and 2006, increasing demand for LTC workers (Barnow, Trutko and Piatak, 2013^[28]). Similarly, other public policies such as those raising staff-per-patient ratios sustain the labour demand for LTC workers.

Market forces should in principle eliminate staff shortages over time through wage increases, an improved work environment or both. If working conditions, including wages, do not adjust, staff shortages can become persistent. Chapter 2 discusses potential reasons for obstacles to the functioning of these market forces, explaining why wages may not adjust despite staff shortages, at least in the short-to-medium term. In particular, as the funding of LTC services is mainly public, higher wages often require additional public funding. Also, labour market adjustments take time and abrupt increases in demand or declines in supply can result in temporary staff shortages. This was the case, for example, when the minimum staff-per-patient ratio was increased in California (United States) in 1999 (Matsudaira, 2014^[29]). In addition, limited geographical mobility, in particular between rural and urban areas, can lead to local mismatches between the demand and supply of LTC workers, and in the end to local staff shortages (Dotson, Dave and Cazier, 2012^[30]). For example, the supply of LTC workers may be limited because, among others, reliable transportation is often not available, thereby hindering workers' commute (Barnow, Trutko and Schede Piatak, 2013^[2]).

Nurse shortages can last longer than for personal care workers as training the former and building their skills take more time while the pool of potential workers is smaller. To accelerate the development of skills, some countries, including Belgium, Denmark and the United States, introduced on-the-job training routes for lower-skilled workers with experience in LTC to become nurses. In Belgium, the project "Formation 600", initially targeted at 600 participants in early 2000 exceeded this target through multiple renewals; it finances the wage of personal care workers who decided to study nursing full-time and suspended their work for nine months per year for up to 4 years (Sociale Zekerheid, 2020^[31]). Montana (United States) allows nursing assistants to become nurses after having completed a special add-on training (Harmuth, 2002^[32]).

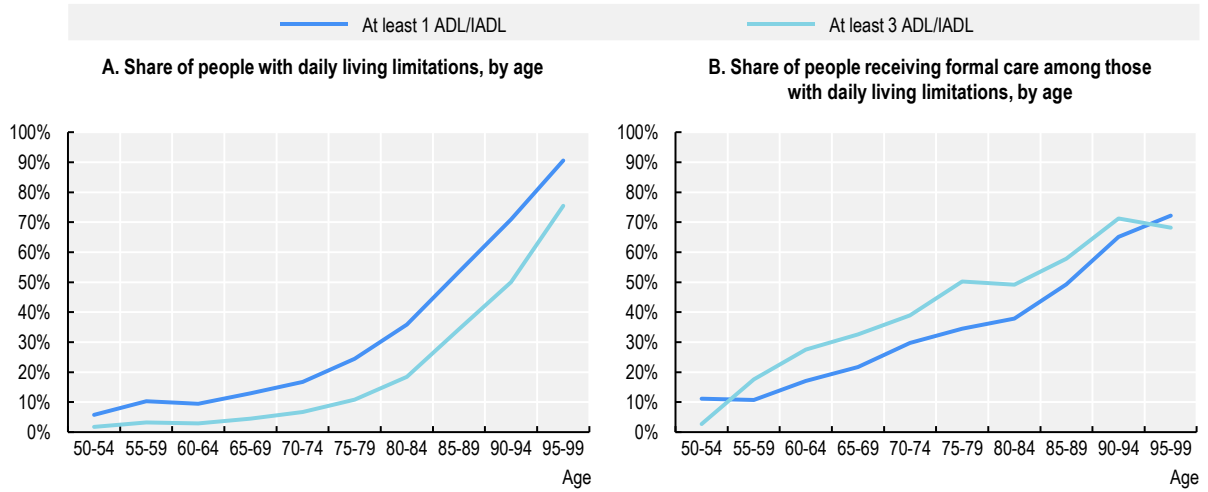
5.3.2. Ageing boosts LTC needs and inhibits their fulfilment

LTC needs increase very strongly with age. In the OECD on average, 13% of people aged 65-69 report at least one limitation in activities of daily living (whether ADL or IADL)¹² and 4% at least three limitations, increasing to 24% and 11%, respectively, at age 75-79, and further to 53% and 34% at age 85-89 (Figure 5.8, Panel A). Less than 10% of people aged 95 or more do not report any limitations of activities in daily living. The expected duration at age 50 of living with no limitation in activities of daily living (ADL or IADL) or with two limitations maximum is 25.8 years and 29.2 years, respectively, on average across OECD countries covered in the SHARE data. This compares to average life expectancy at age 50 of 32.4 years.¹³

Not everyone with limitations in daily living receives formal LTC, in particular at less-advanced ages. At age 60-64, only 17% of people with one and 28% with three limitations in daily living (ADL or IADL) receive formal LTC, compared with 49% and 58% at the age group 85-89, respectively (Figure 5.8, Panel B). Even when reporting a given number of limitations in daily living, people at younger ages are likely to have less severe limitations as well as less care needs, while older people more often live alone.

Figure 5.8. Care needs and care use increase strongly with age

OECD average, 2019



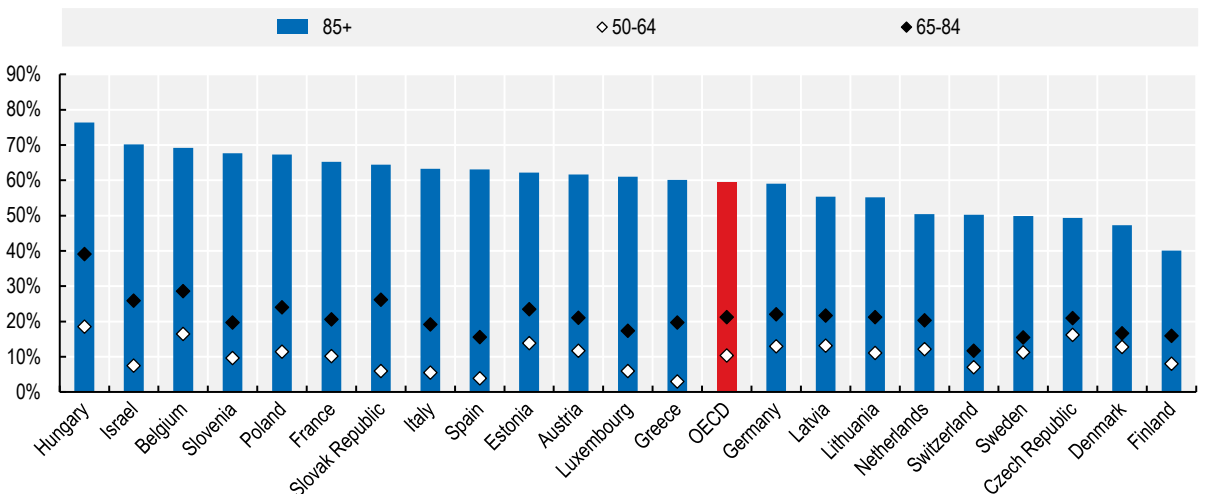
Note: Only 22 OECD countries are covered by these data.
Source: OECD calculations based on SHARE, wave 8.

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This strong age pattern is common to all countries. Among people aged 50-64 between 3% (in Greece) and 19% (in Hungary) report having at least one limitation in daily living (ADL or IADL), while this is the case for between 40% (in Finland) to 76% (in Hungary) among people aged 85 or more (Figure 5.9). For the latter, the Czech Republic, the Netherlands, Nordic countries and Switzerland report the lowest rates.

Figure 5.9. In all countries care needs increase steeply with age

Share of people reporting at least 1 ADL or IADL by age groups, 2019



Source: OECD calculations based on SHARE, wave 8.

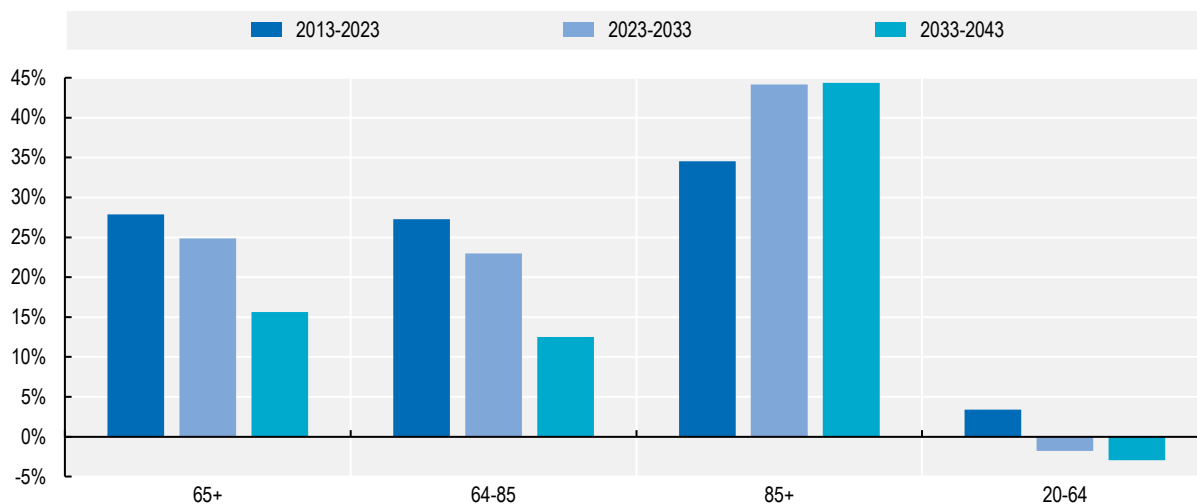
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The number of people aged 65 years or older will continue to increase at a fast pace over the forthcoming decade and is projected to slow somewhat after that. The average growth across OECD countries in the number of people aged 65 or more has increased by 28% between 2013 and 2023, and the pace would be similar at 25% in 2023-33, before slowing to a projected 16%-increase in 2033-43, given a marked slow-down of the population aged 65-84 (Figure 5.10).¹⁴ By contrast, the number of people aged 85 years or more, who most often need LTC, is projected to accelerate, from an increase of 35% in 2013-23 to 44% in both 2023-33 and 2033-43.¹⁵

On top of that, the size of working-age population has started to shrink in many countries, limiting the overall labour supply, and therefore the potential supply of LTC workers. On average across OECD countries, population aged 20-64 increased by a cumulative 3% over the past decade, while it is projected to decline by 2% between 2023-33 and by 3% more in 2033-43. In 2023-33 the decline is projected to be at least 10% in Germany, Italy, Korea, Latvia and Lithuania, Poland and the Slovak Republic. Annex 5.A provides these demographic changes by country.

Figure 5.10. The size of the oldest age groups will accelerate while working-age populations have started to shrink

Relative change of selected population size in selected decades



Source: OECD calculations based on UN (2022^[27]), *World Population Prospects 2022*, <https://population.un.org/wpp/>.

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5.3.3. Extent of healthy ageing and demographic effects on labour demand in LTC

Given the steep increase with age in the share of people receiving professional LTC, population ageing will put a substantial pressure on the demand for LTC workers. The estimated impact of population ageing on the demand for LTC workers is calculated based on a pessimistic, an optimistic and an average scenario, depending on the extent to which longevity gains are free of limitations in daily living (i.e. the extent of healthy ageing). The following sub-section shows how income and productivity trends affect the future demand for LTC workers. Methodological assumptions behind these scenarios are discussed in Box 5.1.

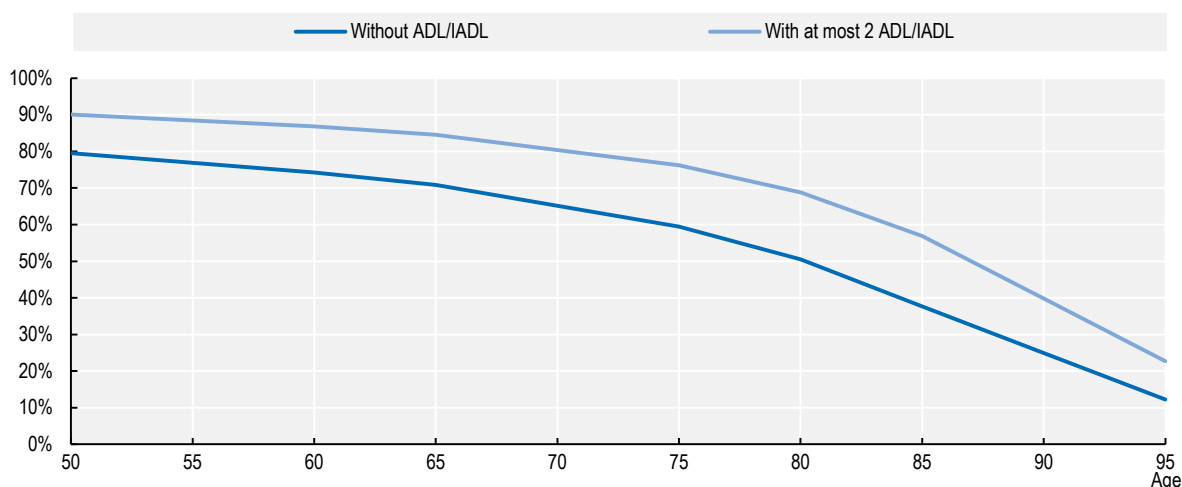
The pessimistic scenario is meant to capture an automatic impact by assuming that, despite longevity gains, the shares of people with limitations in daily living remain constant at given ages, as well as the shares of formal care recipients among people with limitations in daily living and the staff ratios. An

optimistic scenario about healthy ageing assumes that the incidence of having limitations in daily living depends only on remaining life expectancy. This scenario basically implies that all life expectancy gains are disability-free. An intermediate scenario has been computed by averaging the pessimistic and the optimistic scenarios.

Observed data suggest that the reality is in between the pessimistic and the optimistic scenarios. On average across 22 OECD countries, the share of disability-free years in remaining life expectancy declines with age from 80% at age 50 to 74% at age 60 and 38% at age 85 (Figure 5.11). The expected share of remaining life without severe limitation (at most two ADL/IADL) is higher, at 90% and 57% at age 50 and 85, respectively.¹⁶

Figure 5.11. The share of remaining life expectancy without limitations is lower at older ages

Remaining life expectancy without any or at most two limitations in daily living as share of remaining life expectancy by age



Note: Statistics were calculated based on period life expectancy in 2019.

Source: OECD based on SHARE and UN data for 22 countries.

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Box 5.1. Methodology of projecting demand for LTC workers

The demand for LTC workers (L^D) is broken down based on one-year age groups (a) into different components:

- the number of people in this age group N_a ;
- the share of people with limitations in daily living, $\frac{N_a^*}{N_a}$;
- the share of formal care recipients among people with limitations in daily living, or take-up rate, $\frac{C_a^*}{N_a^*}$; and,
- the staff ratio (number of LTC workers per person receiving formal care), $\frac{L_a^D}{C_a^*}$.

$$L^D = \sum_{a \in A} N_a \frac{N_a^*}{N_a} \frac{C_a^*}{N_a^*} \frac{L_a^D}{C_a^*}$$

The share of projected labour demand for LTC workers in total employment in year y is

$\frac{L_y^D}{E_y}$, where total employment is taken from the OECD long term economic projections (OECD, 2021_[33]).

Five scenarios are considered in total. The first three refer to the demographic shift alone. The fourth scenario is the baseline taking into account the impact of economic growth. The last scenario measures on top the impact of higher productivity growth in the LTC sector.

The three demographic scenarios are akin to “no policy change” scenarios, simply assuming that both the share of formal care recipients among people with limitations in daily living and staff ratios are constant. They imply that the demand for LTC workers increases proportionally to the number of people needing LTC: this means low increases in absolute terms in countries where the initial number of LTC workers is low. This reflects the idea that population ageing does not automatically induce changes in LTC provisions and, in particular, in the share of informal care provisions and of unmet needs. In the recent past, in countries that have faced fast ageing, ageing per se has not led to the development of formal care: over the last decade, there has been no tendency of countries with very low share of LTC workers in total employment to catch up with countries employing more LTC workers (Chapter 2).

The first scenario assumes that all age-specific ratios remain constant while sizes of age groups N_a follow UN (2022_[27]) demographic projections. It shows how demographic changes alone are expected to impact the demand for LTC workers. This is a pessimistic scenario as it implicitly assumes that there are no improvements in either disability rates at given ages (despite improvements in longevity) or care coverage (despite economic developments).

The second scenario is an optimistic scenario. It assumes that the share of people with limitations in daily living by age $\frac{N_a^*}{N_a}$ is no longer constant but follows life-expectancy improvements such that the average duration of life without limitations is kept constant. For example, when life expectancy at age 80 improves by one year, the share of people with limitation in daily living at age 81 is assumed to be as it was at age 80. This is an optimistic scenario as it assumes that basically all additional years of life are without limitation in daily living. This second scenario is implemented through fitting a model explaining the share of people with limitations by age with the remaining life expectancy (RLE) by age. Based on observed data, the following fitted equation was obtained:

$$\ln \frac{N_a^*}{N_a} = 0.25 - 0.20 \ln RLE_a - 0.20 \ln^2 RLE_a$$

These estimates were used to calculate the share of people with limitation in daily activity based on projected life expectancy by age.

The third scenario – average scenario – assumes that half of life expectancy improvements are free of limitations in daily living, which is broadly consistent with Figure 5.11. It is therefore calculated as the average of first and second scenarios.

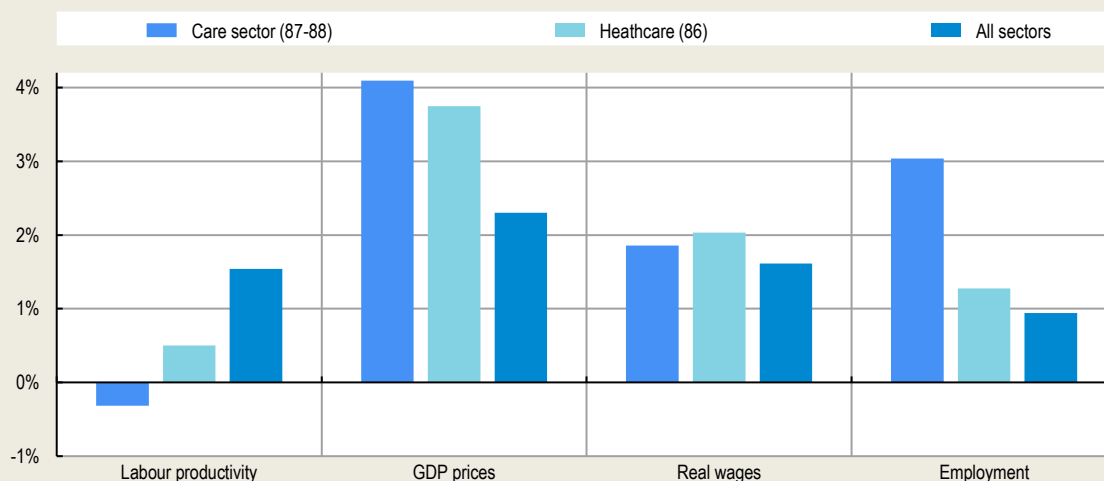
The fourth scenario – baseline scenario – takes into account the impact of economic growth, as measured by changes in real GDP-per-capita. The impact of economic development on labour demand in LTC results from two effects, an income effect and a relative productivity effect. As countries get richer, the income effect implies that the demand for all goods and services, including LTC, increases depending on elasticities, which raises take-up or quality of formal care $\frac{C_a^*}{N_a^*} q$, where q denotes quality. It implies higher projected economic growth results in faster increase in the demand for LTC workers as economic growth is likely to reduce informal care and unmet needs. The relative productivity effect, or Baumol effect, is based on lower labour productivity growth in LTC than in the overall economy. As technological progress saves more labour in other sectors, labour is shifted to the LTC sector to meet higher demand financed by higher income. Labour productivity in the LTC sector (adjusted for quality)

is captured by $\frac{L_a^D}{q c_a^*}$. This fourth scenario is calculated by assuming 0.6 elasticity to GDP-per-capita, estimated for high-income OECD countries, and zero productivity growth in LTC (see below). Following Baumol (1967^[34]) specification, this implies that higher income leads to proportionally higher demand for both LTC services and LTC workers. The projected changes in real GDP-per-capita come from OECD long-term economic projections (OECD, 2021^[33]).

On average among OECD countries, the value added in volume per hour worked, or labour productivity, in the care sectors (NACE 87-88)¹⁷ declined slightly by 0.3% per year in 1995-2019 on average, compared to an increase of 0.5% in healthcare and 1.5% in the total economy (Figure 5.12). Consistent with the Baumol model of unbalanced growth (Hartwig, 2010^[35]; Baumol, 1967^[34]),¹⁸ slow productivity growth led to large annual price increases of 4.1% in the care sectors compared to 3.8% in healthcare and 2.3% in all sectors on average. Real wages grew at similar paces across sectors. More precisely, they grew slightly faster in the care sectors and healthcare sectors, at 1.9% and 2.0% per year, respectively, compared to 1.6% in all sectors on average. Given the increasing demand for care services and no productivity growth in the LTC sector, employment in this sector grew by 3.0% per year on average, compared to 0.9% in the whole economy.


Figure 5.12. Prices and employment increased strongly in the care sectors

Average yearly changes, 1995-2019 or similar, OECD average



Note: Real wages are calculated by deflated nominal wages with the GDP deflator. The following periods were used: 1995-2019 (Austria, the Czech Republic, Denmark, Greece, Finland, Ireland, Italy, Luxembourg, the Netherlands, Slovenia and the Slovak Republic), 1995-2018 (Germany, Lithuania, Portugal, Spain, Sweden, the United Kingdom), 2000-18 (France), 2000-16 (Estonia), 2010 -2019 (Hungary) and 2005-18 (Poland).

Source: OECD based on EU-KLEMS.

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The fifth scenario assumes that labour productivity in the LTC sector increases by 0.5% a year leading to the reduction of the staff ratio, i.e. $\frac{L^*}{c_a^*}$, while maintaining the quality of LTC services, while other factors are held constant.

Ratios are calculated from SHARE data, wave 8, for five-year age groups from age 50 averaged across all countries and interpolated to one-year age groups. The past and future sizes of age groups come from UN (2022^[27]) population projections and historic data.

The impact of these demographic scenarios does not assume that ageing per se triggers the development of LTC systems. That is, ageing is assumed to affect neither the share of formal care recipients among people with limitations in daily living nor staff ratios (Box 5.1). In that sense, these scenarios should be thought as “no policy change” scenarios. More precisely, this means that ageing is estimated to increase the number of people with LTC needs, leading to proportional effects on numbers of both LTC workers and family care providers, and therefore on the number of people experiencing unmet needs. This thus implies low increases in the absolute number of LTC workers (or as a share of total employment) in countries where the initial number of LTC workers is low as the projections do not include any automatic catch-up phase in the development of LTC systems. Differences across countries in the estimated impact of ageing on the demand for LTC workers as a share of total employment thus reflect differences in the pace of demographic changes and in the initial size of the LTC workforce. This is consistent with the fact that countries with very low share of LTC workers in total employment did not hire more LTC workers to reduce family care and unmet needs over the past decade, as shown in Chapter 2. It is of course possible that fast population ageing results in stronger increases in the demand for LTC workers in countries where the number of LTC workers is low, but there is no evidence to back this possibility.

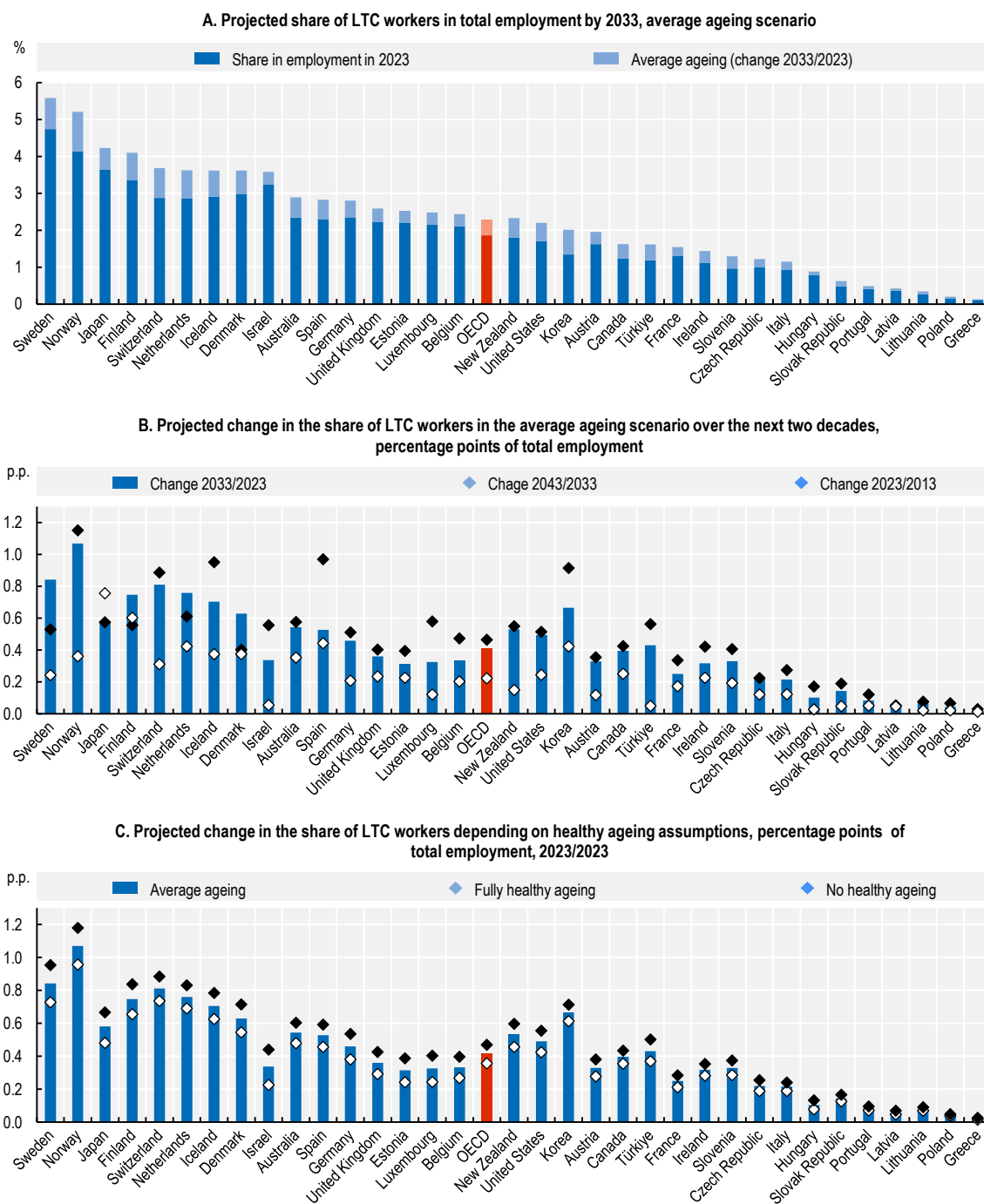
According to the average ageing scenario, higher demand for LTC workers is projected to increase their share in total employment by 0.41 percentage points between 2023 and 2033 and 0.47 percentage points more in the following decade on average across countries, or about 22% per decade (Figure 5.13, Panel A). The number of LTC workers would increase from 1.9% to 2.3% of total employment between 2023 and 2033 and to 2.7% of total employment by 2043 on average in OECD countries.

Demographic pressure is expected to be substantially stronger than in the previous decade when it is estimated to have increased the demand for LTC workers by 0.18 percentage points of total employment (Figure 5.13, Panel B). This acceleration in demand may be harder to meet given that the working-age population is projected to start shrinking, by 2% in the coming decade on average across OECD countries and by more than 10% in Germany, Italy, Korea, Latvia, Lithuania, Poland and the Slovak Republic. Among the driving factors, the baby-boomer generations reaching older ages plays a role that is at least as important as that from longevity trends. In the forthcoming decade, increases would be at most equal to 0.3 percentage points of total employment in Central and Eastern European countries (CEECs), France, Greece and Italy but amount to more than 0.8 percentage points in Norway Sweden and Switzerland.

Very low currently observed numbers of LTC workers in CEECs and in Southern European countries might be related to substantial shares of LTC being classified as healthcare and to larger shares of LTC being provided informally, by family members for example. For example, in 2001, Estonia separated LTC from healthcare by, among others, turning small hospitals into nursing-care homes (Paat and Merilain, 2010^[36]), and, in 2021, LTC workers made 2.2% of total employment compared to ten times less in Latvia, Lithuania or Poland. Additionally, Estonia pays caregivers’ national insurance contributions and social tax (Paat-Ahi and Masso, 2018^[37]) which is likely to result in larger care formalisation.

Comparing the projected impact across the different demographic scenarios illustrates the extent to which healthy ageing may limit the increase in the demand for LTC workers. In the absence of healthy ageing, the average increase in the demand for LTC workers would equal 0.47 percentage points of total employment instead of 0.41 percentage point in the average scenario, while it would be 0.36 percentage points under full healthy ageing (Figure 5.13, Panel C). Hence, full healthy ageing would result in lowering the increase in the demand for LTC workers by about one-quarter compared to the pessimistic scenario between 2023 and 2033. This also means that most of the increase in demand does not depend on whether ageing is healthy or not, but rather more directly on the larger sizes of cohorts reaching older ages. Differences across countries are very similar across scenarios.

Figure 5.13. Population ageing would increase the demand for LTC workers by almost 0.41 percentage points of total employment per decade, or about 22%, in the average demographic scenario



Note: Countries in Panels B and C sorted as in Panel A. Projections are based on age-specific incidence of limitation in activities of daily living and receiving formal care by age common to all countries (Box 5.1). The average scenario assumes that the age-specific incidence of both receiving care and having limitations in daily living, as well as patient-staff ratios and labour productivity in LTC remain constant (no growth), and that half of longevity improvements are free of limitations in daily living (Box 5.1). Changes in the demand for LTC workers are expressed in percentage points of total employment, which is based on projected changes in total employment (OECD, 2021^[33]).

Source: OECD based on SHARE and 2022 UN demographic projections.

Projections by Kotschy and Bloom (2022^[38]) published in the International Social Security Review show somewhat lower impacts of demographic changes on LTC needs. They estimate that LTC needs would increase by 47% between 2020-40 on average across 30 (mainly OECD) countries. Their projections assume that the share of people with at least two limitations in daily living in two age groups (65-79 and 80+) will not change over time, which is consistent with the pessimistic scenario above. However, projections in this report are based on the percentage of both limitations in daily living and the use of formal care in five-year age groups, which both steeply increase with age (Figure 5.8, Panel A and Panel B), compounding their effects. As a result, the projections herein lead to a higher increase of 66% on average across the OECD between 2023 and 2043 in the corresponding pessimistic scenario.¹⁹

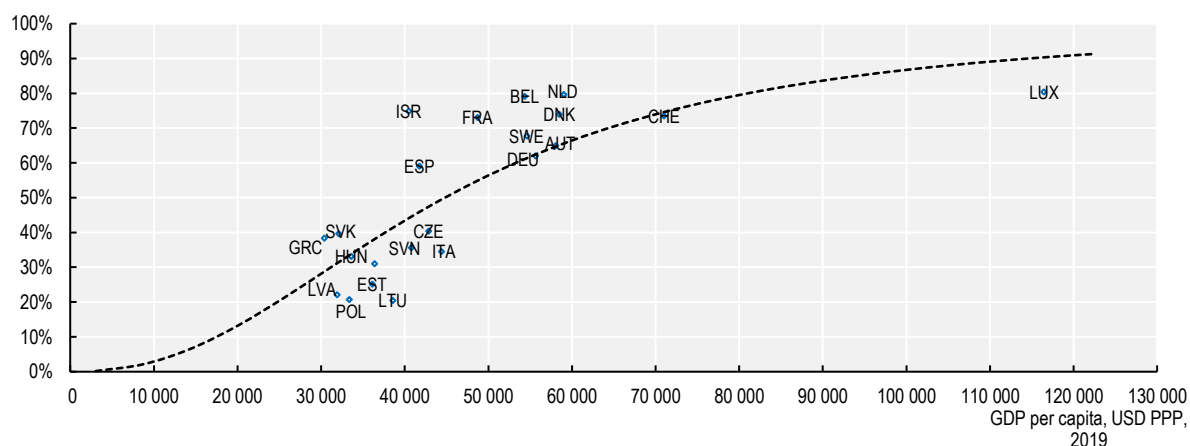
5.3.4. Income and productivity growth effects on the demand for LTC workers

Higher levels of economic development may raise the take-up and/or quality of formal LTC services. Higher incomes increase consumption of LTC services similar to other goods and services. The delivery of informal care may also shrink substantially in some countries due to income-related changes in both family formation and social norms. Fewer children and more people living alone limit the provision of family care, thereby increasing the demand for LTC workers. Moreover, as discussed in Chapter 2, home-based care has been expanding much faster than residential care, additionally increasing demand for LTC workers.

Data across European countries support a strong link between economic development, measured e.g. by GDP-per-capita, and the coverage of people with LTC needs by formal care. In particular, countries in Southern and Central and Eastern Europe have a relatively low take-up of LTC services (Figure 5.14). Yet, while Luxembourg and Switzerland have high income per capita, at least 20% of people with at least three limitations in daily living in both countries do not receive formal LTC, possibly due to individual preferences or financial constraints.

Figure 5.14. Take-up of formal LTC is associated with economic development level

GDP-per-capita and the share of formal care recipients among people with at least three ADL/IADL, 2019



Note: Dotted line is estimated with logistic regression, resulting the following parameters estimates: $\ln\left(\frac{c}{1-c}\right) = -25.0 + 2.3 \ln(\text{GDP per capita})$, where c is the share of formal care recipients among people with at least three limitations in daily living. That is, an increase of e.g. 10% in real GDP per capita would lead to an increase of 23% in the $c/1-c$ ratio; that is, if the take-up ratio is initially at 50%, it would increase by about 6 percentage points to 56%. Overall, model estimates imply income elasticities of LTC varying from 0.6 to 1.8 for 75% and 25% take-up rates, respectively. The R^2 of the fitted logistic regression line is 59%.

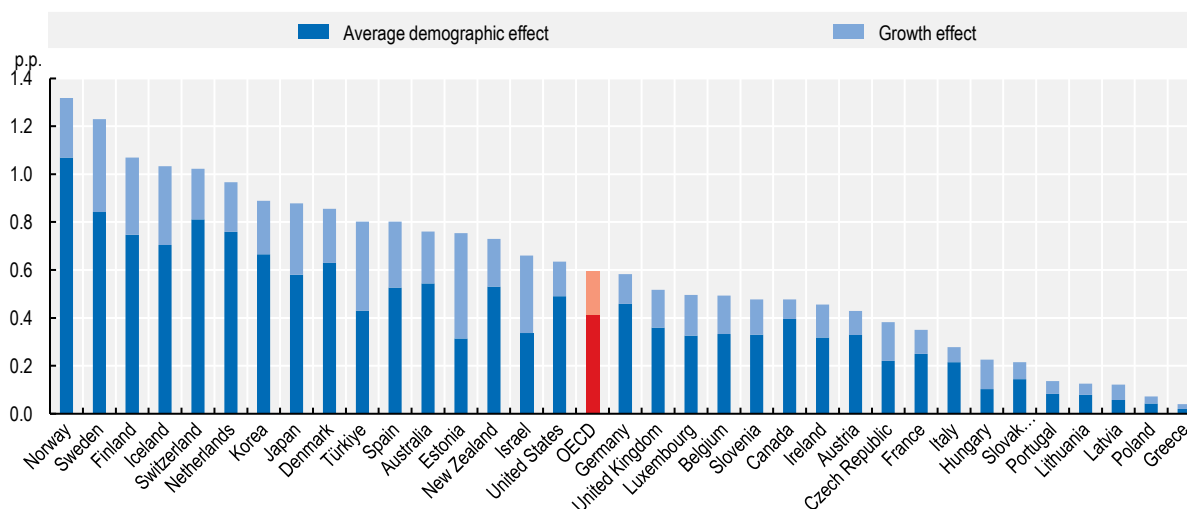
Source: OECD based on SHARE data and OECD (2021^[33]), "Long-term baseline projections, No. 109 (Edition 2021)", <https://doi.org/10.1787/cbdb49e6-en>.

On top of improving take-ups and/or quality (income effects), economic growth affects the labour demand in the LTC sector through relative productivity growth (Baumol effect). Productivity growth is one key driver of economic growth, and labour productivity growth in LTC is slower than in the overall economy, which means that technological progress saves relatively more labour in other sectors. As a result, labour is shifted to the LTC sector to meet higher demand financed from higher income. This scenario, which is the baseline projection, assumes a 0.6 elasticity of labour demand to GDP-per-capita, estimated among high-income OECD countries (Figure 5.14), and zero productivity growth in LTC (Box 5.1).

Over the next decade, economic growth alone is projected to raise the demand for LTC workers by 0.18 percentage points of total employment on average across OECD countries on top of the demographic effects discussed above (Figure 5.15). The income and productivity effects are the strongest in countries with projected fast growth in GDP-per-capita. In the following decade (2033-43), economic growth would add a further 0.24 percentage points of total employment on average. Overall, based on baseline projections including effects from both demographics and economic growth, the LTC employment share would sharply increase from about 1.9% in 2023 to 2.5% in 2033 and 3.2% in 2043.

Figure 5.15. On top of demographics, economic growth would drive up demand for LTC workers

Changes in the LTC employment share according to baseline projections including effects of demographics and GDP-per-capita growth, in percentage points of total employment, 2023-33



Note: Projections based on unit income elasticities of LTC and projected GDP-per-capita growth rates based on OECD (2021^[33]). The growth effect is computed as the total effect minus the demographic effect.

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While aggregate data based on national accounts reveal hardly any labour-productivity gains in the LTC sector (Box 5.1), this measure of labour productivity may not fully capture improvements, in particular due to not accounting for changes in quality of care or in the underlying needs (Yang, Forder and Nizalova, 2016^[39]). In England, while (unadjusted) productivity has fallen, the annual decline in the quality-adjusted productivity index of LTC was 0.2 percentage point smaller than the change in the unadjusted productivity index over 2011-21 (ONS, 2022^[40]).

Improvements in labour productivity within LTC, which may in particular be driven by labour saving innovations discussed in Section 5.4, would lower labour demand and help meet future shortages. These productivity gains would result in lower staff-to-patient ratios, or reduced needs for personal care, without lowering quality (Box 5.1). Compared to the baseline, assuming that labour productivity in the LTC sector

grows by 0.5% a year would reduce the total increase in the LTC share in total employment by about 0.09 percentage point per decade on average across countries, hence reducing the total increase from 0.60 percentage points in the baseline to 0.51 percentage point over 2023-33 for example.

The model helps explain why labour shortages may have intensified over the past decade. When applied to the 2013-23 period, the baseline projection assumptions show an increase in the LTC labour demand of 0.36 percentage points of total employment. Based on observed data, the employment share of LTC increased by only 0.20 percentage points in 2011-21 on average across OECD countries (Chapter 2). This actual change was basically equal to the estimated demand effect from demographic changes alone (0.22 percentage points). That is, it does not account for income and productivity (Baumol) effects. This means that the supply of LTC workers, and therefore LTC employment, has not responded to the estimated total demand pressure, potentially contributing to labour shortages given low productivity growth in the sector. With the projected acceleration in demographic changes in the forthcoming decades, attracting more workers in the LTC sector is one policy priority to avoid further significant increases in employment shortages.

5.4. How new technologies may limit labour shortages in long-term care

In the face of an increasing number of older people in need of LTC, the introduction of new technologies can mitigate shortages of LTC workers. Not only can the implementation of new technologies boost the productivity of LTC workers, it can make their jobs less arduous and thus reduce the dropout of workers from the sector. Some technologies can even curb the growing need for LTC by boosting the capacity of older people with health problems to continue living independently. The new technologies available in the LTC sector can be divided into four categories as highlighted by OECD (2020^[41]) (Table 5.1):

- Assistive technologies: devices that allow a caregiver to perform tasks or that increase ease and safety for the patient.
- Remote care and disease management technologies: software to monitor diseases treatment in the home.
- Self-management technologies: services that enable older people to take control of personal health and care management.
- Social technologies: devices that facilitate social support and help connect with family, peers and the community.

Table 5.1. Types of new technologies

Type of new technologies	New technologies	Examples
Assistive technologies	Information and Communication Technology (ICT)	Online platforms, intercom, smartphones, and tablets
	Electronic monitoring of recipients	Personal alarm button, sensor, GPS
	Mobility devices	Wheelchairs, stair lifts
	Robotic technology	Communication robots, surveillance and companionship robots
	Electronic monitoring of LTC workers	Tracking of the real-time location of home-care workers
Remote care and disease management technologies	Telehealth/telecare	Health or disease management applications Clinical (medical) monitoring
	Mhealth (Wireless technology)	Mobile phones and other wireless technology mainly used in medical care
	Electronic (medical) records (EMR)	Digital versions of paper charts
	Touchscreen technology	Applications that can be used for reminiscence therapy
Self-management technologies	Ambient assisted living (AAL)	Medication management tools, medication reminders, fall detection systems
	Assistive technologies for older people	Voice recognition software, text telephones, speech recognition software
	Smart home technology	Sensors for doors and lighting, an on/off switch for various appliances
Social technologies	Digital interaction technologies	Social media, communication platforms
	Virtual reality	Applications and games usually used with a headset to provide immersive experiences

Source: OECD (2020^[41]), *Who Cares? Attracting and Retaining Care Workers for the Elderly*, <https://www.doi.org/10.1787/92c0ef68-en>, with examples given in European Commission (2020^[42]), *Social Situation Monitor The Role of New Technologies in Modernising Long-term Care Systems A Scoping Review*, <https://ec.europa.eu/social/BlobServlet?docId=23362>.

5.4.1. New technologies are available to help workers in most LTC tasks

New technologies are available for most LTC tasks (Table 5.2), even though LTC workers perform a diverse and complex range of tasks. This includes activities of daily living (ADL) and instrumental activities of daily living (IADL), providing psychological support and the management and reporting tasks (OECD, 2020^[41]). For ADL for example, on which LTC workers spend much of their time, robots and mobility devices can be used to support LTC workers, although most of these technologies are expensive. For IADL, many new technologies can be introduced inexpensively, such as touchscreens and smart-home appliances which can even be controlled by older people themselves. For example, transporting older people, a task that is part of ADL can use mobility devices and robotic technology, such as wheelchairs and stair lift.

Table 5.2. Technologies available for LTC tasks

	Task	Availability of new technologies	Examples
ADL	Positioning, lifting, and turning older people	Mobility devices Robotic technology	Mobile lift Power assist suit
	Transporting older people	Mobility devices Robotic technology	Wheelchairs Stair lift
	Assisting care recipients with personal hygiene, feeding and dressing	Mobility devices Robotic technology	Bath lift Power assist suit
IADL	Maintaining older people's environmental hygiene standards	Electronic monitoring (recipients) Smart home technology	Sensor Smart home
	Planning, purchasing, preparing, or serving meals	ICT	Meal recording application
	Scheduling and accompanying older people on errands	ICT	Scheduling application
	Preparing care recipients for examination or treatment	ICT	Smartphones to contact relatives of care recipients
	Providing oral medications to care recipients	Ambient assisted living (AAL)	Medication management tools medication reminders
Communication	Providing psychological support through conversation and reading aloud	ICT Robotic technology Smart home technology Virtual reality	videotelephony software communication robot
Management and reporting	Managing interactions between family caregivers and health practitioners	ICT	Online platform connecting family caregivers and health practitioners
	Maintaining records of care and changes in condition or behaviour	Electronic (medical) records (EMR)	Patient record management system
	Maintaining records of responses to care and treatment	Electronic (medical) records (EMR)	Patient record management system
	Reporting concerns or providing referrals to health or social services	ICT Mhealth (Wireless technology)	Online platform connecting LTC workers and health or social services
	Implementing care plans established by health professionals	ICT Electronic monitoring (LTC workers)	Care planning software

Source: Examples collected by the authors.

Communication with older people and psychological support are also important tasks. For communication, a variety of options can be used, from ICT to AI and robots. Progress has been made to replace human communication by AI and other new technologies that talk with older people. This effort has yet to spread significantly, as many older people are somewhat resistant to interacting with robots (MIC, 2015^[43]; NRI, 2016^[44]).

LTC workers spend a lot of time on management and reporting activities, and many providers are implementing new technologies to support these tasks (NHS, 2019^[45]). Electronic (medical) records and ICT are helpful for these tasks and can be easily implemented inexpensively. All these technologies serve to support LTC workers and older people, thereby improving both efficiency and the quality of LTC services, but do not completely replace the work of LTC workers.

5.4.2. The use of new technologies in LTC is limited, but some are promising

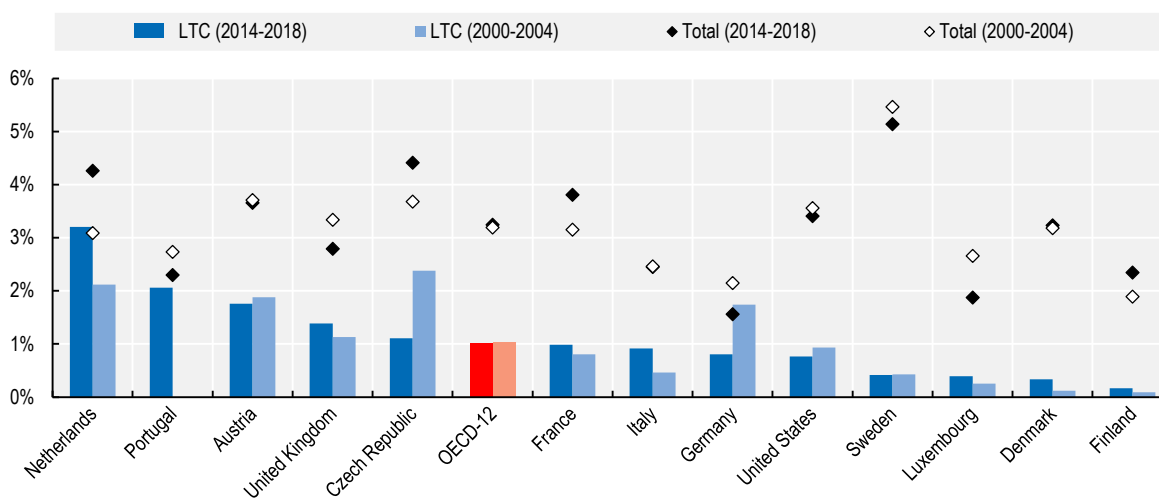
Low IT-related investments in the LTC sector

The use of new technologies is still not as well-developed in LTC²⁰ compared to other sectors. For example, IT-related investments – which include communications equipment (ICT), computer software, databases and computing equipment, and can serve as a proxy for investments in new technologies – are low in the LTC sector as a percentage of gross value added (GVA). IT-related investments in LTC average 1.0% of GVA in OECD countries for which data are available, and they are below 2% in most countries (Figure 5.16).²¹ By comparison, overall across sectors, IT-related investment is 3.2% of GVA on average in these countries.

Between 2000-04 and 2014-18 the GVA share of IT-related investments in the LTC sector was stable in the available OECD countries on average. It increased in Denmark, Finland, France, Italy, Luxembourg, the Netherlands and the United Kingdom; only the Czech Republic and Germany show large decreases (Figure 5.16). By comparison, the share of IT-related investments in all industries, while also stable on average across countries over the same period, declined in Germany, Luxembourg, Portugal, Sweden, the United Kingdom and the United States.

Figure 5.16. IT-related investments are much lower in the LTC sector than overall in the economy

Share of IT-related investments in gross value added



Note: The OECD average is the average for the 12 countries for which data exist for both periods. Data on IT-related investments in LTC are missing for Portugal for the period 2000-04, so Portugal is not included in the average. The data for Italy refer to the period 2014-17.

Source: Bontadini et al. (2021^[46]), *EUKLEMS & INTANProd: methods and data descriptions*, <https://euklems-intanprod-lee.luiss.it/>, based on EU Klems and Intanprod database.

StatLink  <https://stat.link/rkdjy6>

Most new technologies used in the LTC sector are inexpensive and easy to implement

LTC is a very labour intensive, low value-added sector. It invests a higher percentage of its IT-related investments in ICT such as mobile phones that are relatively inexpensive. Indeed, the share of ICT in total IT-related investments is equal to 20.0% in LTC on average across countries, compared with 14.8% for the whole economy. This pattern has been broadly stable since the early 2000s (Bontadini et al., 2021^[46]).

Cheaper technologies, such as simple smartphones, alarm systems, cameras and sensors, are increasingly being used in LTC and are simple to install. Slightly less than half of Japanese LTC providers make use of online communication tools (CWF, 2021^[47]), and in the United Kingdom, 53% and 86% of LTC providers have implemented monitoring equipment with sensors and video-calling software, respectively (Skillsforcare, 2021^[48]). LTC providers' unawareness of the availability of certain technologies and worries over their workers' ability to use them are important barriers to the implementation of new technologies in LTC (CWF, 2021^[47]). Moreover, privacy concerns may reduce the willingness of care recipients to use digital technologies. Privacy concerns are a recurring finding in research on older people's use of digital technologies across countries and types of technologies (Boise et al., 2013^[49]; Nguyen et al., 2021^[50]; Wang et al., 2019^[51]).

Most of the new technologies that will be adopted in the near future are likely to remain inexpensive. LTC providers have limited financial resources, making it difficult for them to invest aggressively in new technologies, especially expensive ones. For example, in the United Kingdom, 57% of providers cite budget as an obstacle for the implementation of new technologies (Skillsforcare, 2021^[48]). However, among the new technologies that are inexpensive and can be introduced, some are promising for LTC providers in many OECD countries, as is the case in Denmark, Finland, Germany, Japan and the United States (Table 5.3).

Table 5.3. Examples of new inexpensive technologies implemented in LTC sector

Type of new technologies	Country	Good examples	Summary	Source
Self-management technologies	Denmark	DigiRehab	DigiRehab is a cost-effective digital training platform for at-home rehabilitation and physical exercise, which has been implemented in a large number of Danish municipalities, including Aalborg, Viborg, and Kerteminde. The tablet or smartphone-based solution provides a screening of the citizens' physical ability and makes a personally tailored exercise programme for them. The exercises are performed twice a week in the citizens' own homes for 12 weeks. About 70% of users experience reduced need for home care after the programme is completed. Training for 10-12 hours results in a 50-75 hour reduction in the need for home care.	(Healthcare Denmark, 2019 ^[52])
Remote care and disease management technologies	Finland	Remote Care	In Helsinki, Finland, Remote Care has been introduced to provide remote access to nursing and care services. Helsinki residents can contact a care professional using an easy-to-use computer and a pivoting camera. Care recipients are not only monitored and their medications checked, but also joint lunch meetings are held.	(The Guardian, 2019 ^[53]) (The Economist, 2020 ^[54])
Self-management technologies	Germany	Smart Service Power	The Smart Service Project is a programme that was implemented in Dortmund, Germany, to assist older people in their daily lives by providing them with a smart home system. The installed sensor system monitors older people and predicts the deterioration of their health based on collected data.	(Count me in, 2019 ^[55])
Assistive technologies for LTC workers	Japan	Night-time monitoring of older people	A variety of monitoring equipment has been installed at a LTC provider in Tokyo. Sensors installed under the mattresses of beds estimate the depth of sleep. Sensors worn on the lower abdomen to predict urination use ultrasonic waves to detect the bulge of the bladder and measure the amount of urine. A sensor installed on the ceiling detects if the care recipient falls over or falls off the bed. As a result, the system has reduced the burden on facility staff, who now spend 37% less time watching over patients at night.	(NHK, 2022 ^[56])
Remote care and disease management technologies	United States	WellSky Personal Care	WellSky Personal Care is a software-as-a-service that provides a comprehensive set of functions necessary for the operation of a home care agency. It offers a variety of services such as scheduling tools, caregiver training tools, recruiting tools, care co-ordination tools, billing management tools, marketing tools, customer relationship management etc. all in one place.	(WellSky, 2022 ^[57])

However, the use of complex and expensive technologies such as robots is still uncommon among LTC providers. Only around 1% of LTC providers in Japan (CWF, 2021^[47]) and in the United Kingdom (Skillsforcare, 2021^[48]) make use of expensive equipment such as robots. This is likely the result of budget constraints and a concern among LTC providers that the returns on such technologies are not high enough.

As robot technologies are relatively expensive, some LTC providers in Japan are overcoming budget constraints by renting robots rather than purchasing them (Box 5.2). More than half of providers in the United Kingdom have adopted desktop PCs, laptops, video-calling software, mobile tablets, smartphones, digital care records, planning software, monitoring equipment with sensors, and alarm systems, while only 19% of providers are considering the introduction of robots (Skillsforcare, 2021^[48]). In Japan, only 16% of providers consider the introduction of robots to be critical in the future (CWF, 2021^[47]). Various reasons could play a role in the relatively small share of providers thinking that the introduction of robots will be critical in the future. Yet, these reasons are likely specific to robotic technologies (e.g. cost or scepticism about older people's willingness to engage with robots) rather than related to concerns about the introduction of new technologies more generally (e.g. LTC workers' digital skills or data security), as at the same time more than half of Japanese providers consider the introduction of ICT technologies as critical in the future.

Box 5.2. A good practice of robotic technologies in Japan

In Japan, most care robots such as PALRO can be rented rather than purchased, which is also considered cheaper than hiring more LTC workers. PALRO, a humanoid robot, is a communication robot that can be handled with one hand, measuring 40 cm in length, and weighing 1.8 kg. PALRO can communicate with older people through nursing care recreation and daily chats and can also serve as an instructor for health exercises. PALRO is a particularly useful social tool during the COVID-19 pandemic as it reduces the risk of droplet infection when LTC workers communicate directly with older people. Thanks to PALROs taking care of such communication and recreation, LTC workers can concentrate on caring tasks (MHLW and ATA, 2021^[58]; FUJISOFT, 2022^[59]).

Specifically, the purchase cost is around USD 5 500 (JPY 737 000), and the monthly rental cost is around USD 250 (JPY 33 000) (FSI, 2022^[60]). By contrast, the wages of Japanese care workers are USD 2 375 (JPY 323 190) per month on average (MHLW, 2022^[61]). The monthly rental cost is relatively low, and renting can be stopped immediately if not effective. However, as robots cannot replace, at least today, most tasks accomplished by LTC workers, they only play a supporting role, with its main effect being to reduce the workload.

One local government in Japan has loaned robots to LTC providers in the form of rentals, and many providers reported that the psychological burden on LTC workers was reduced as a result; LTC workers were able to accurately assess the care recipients' situation, and to provide appropriate care in a timely manner. In addition, while only around 10% of LTC providers were aware of the robot's availabilities for LTC tasks prior to its use, about half of LTC providers were positive about the future use of robots after their experimentation (MHLW, 2022^[62]).

Robotic technology could be used for a variety of tasks in LTC

Currently, the introduction of robot technologies in the LTC sector has made little progress. However, there are still many tasks in the LTC sector for which robotic technologies could be used today (Table 5.4). This includes mobility support in a variety of settings, as well as collecting and transmitting data for monitoring and communication.

Table 5.4. Main tasks for which robotic technologies could be used in the LTC sector

Task	Examples
Transfer support	Robotic power assist devices to assist a LTC worker in lifting an older person.
Mobility Assistance	Walking support equipment that supports older people in going out and safely carrying luggage (non-wearable). Walking support equipment that supports older people in moving around indoors and sitting up, especially to and from the toilet and maintaining posture in the toilet (non-wearable). Wearable mobility aids that support older people in going out, preventing falls, and assisting with walking.
Toiletry support	Toilets with adjustable installation positions. Equipment to predict when an older person will defecate and guide the person to the toilet at the right time. Equipment to support a series of movements in the toilet, such as putting on and taking off undergarments.
Monitoring and communication	Platform devices equipped with sensors and external communication functions for use by LTC providers. Platforms for home care equipment equipped with fall detection sensors and external communication functions. Lifestyle support devices to communicate with older people.
Bathing support	Equipment to assist an older person in a series of movements when entering and exiting the bathtub.
Support for LTC workers	Equipment to collect and store information associated with LTC tasks, including monitoring, mobility support, and elimination support, and use this information as the basis for necessary support for older people.

Source: MHLW (2017^[63]), *Priority Areas in the Use of Robot Technologies for the LTC sector*, <https://www.mhlw.go.jp/stf/houdou/0000180168.html>.

Looking forward, several OECD countries are actively supporting the development of robot technologies in the LTC sector. In the EU, a funding programme aimed at the development of innovations that improve the quality of life of older people and enable them to lead more healthy lives (Active Assisted Living Programme) has funded more than 300 projects since 2008.²² Japan promotes the development of LTC robotic technologies in 13 priority areas (MHLW, 2017^[63]).

The use of robots in LTC is likely to increase for several reasons. A fall in the price of the robots will probably boost the introduction of robot technologies in the LTC sector. Also, based on the past and recent diffusion of other technologies, it is likely that the resistance to robots will fade as robots become more versatile and people gain experience with them. In European countries with ageing populations, robots that extend the independent living capabilities of older people are likely to be available for purchase within the next decade (Whiting, 2022^[64]). Japan is at the forefront in this area.

According to the Development Bank of Japan (2014^[65]), Japan's LTC robot market would be five times larger by 2035 compared to 2020. Another report predicts major cost-effective developments in robot technologies including artificial intelligence (AI) in the next decades (MRI, 2020^[66]). However, the technological difficulty of providing robots to assist with tasks such as transfers and bathing is still large in order to accommodate the various physical conditions of people who need care. Over time, the use of robots may become the norm in LTC to maintain and improve the quality of life of older people through independence support and to reduce the burden on LTC workers (Japan Association of GHSF, 2020^[67]). Avatar (alter ego) robots are also rarely used today but may have a promising future in the LTC sector. Avatar robots can perform tasks remotely, with a person in another location to operate them. Although Avatar robots require a person to operate it, it may allow people who were previously unable to provide LTC to do so. For example, a healthy older person or a person who is unable to leave the house due to childcare or nursing care could operate the robot to provide LTC. Since Avatar robots are operated by a person rather than being programmed robots, older people and their families may feel more comfortable with them. It may thus help alleviate the labour shortage in the LTC sector (Nikkei, 2020^[68]).

5.4.3. New technologies may help limit the demand for LTC workers in the future

New technologies may help limit the demand for LTC workers in the future. Working conditions of LTC workers are subpar as their wages are low compared to those in other sectors (Chapter 2), the work is physically demanding and both night work and work overload are common (Chapter 3). New technologies can reduce the workload of LTC workers and increase the quality of the care provided. To the extent that

new technologies develop within LTC, political preferences will shape how this labour-saving effect is used to reduce labour shortfalls, improve working conditions and raise the quality of services.

New technologies may reduce demand for LTC workers and improve working conditions

Implementing new technologies in the LTC sector is likely to contribute to raising labour productivity. In the United Kingdom, 75% of surveyed care providers answered that new technologies led to productivity gains (Skillsforcare, 2021^[48]). Also, in a Japanese survey, 61% of LTC providers reported an increase in the amount of time their staff spent in direct care, and 61% of LTC providers as well reported a reduction in the workload of their staff (MHLW, 2020^[69]).

Even in the future, while new technologies are unlikely to replace completely the work of LTC workers, they may serve to supplement it. Indeed, based on PIAAC data the risk of automation for LTC jobs is relatively low compared to jobs in other sectors: health associate professionals and personal care workers are estimated to have jobs that have similar risks of automation as ICT professionals, meaning that these risks are low compared with those applying to workers in mining, construction, manufacturing, transportation, or sales for example (OECD, 2020^[41]).

There are examples in OECD countries where new technologies have contributed or are likely to contribute to reducing the workload of LTC workers. However, few studies have quantitatively investigated whether new technologies can replace or reduce caregiving time (European Commission, 2020^[42]). Moreover, emerging technologies may facilitate LTC provision yet be less capable of mitigating the workforce shortage (Chapman S, Miller J, Spetz J, 2019^[70]). By contrast, some estimates suggest that the Netherlands will lack 67 300 workers in LTC in 2031, and that wider implementation of existing technologies can compensate for 64 500 of these (FME, 2022^[71]). For example, implementing new technologies in reporting and communications could replace about 27 000 workers. In Japan, the introduction of new technologies, such as alarms and monitoring sensors warning the LTC provider when assistance is required, has reduced the amount of time spent looking after recipients at night by 37%. During night-time, LTC workers were previously assigned at a ratio of 1 per 10 recipients, but because of these new technologies, the ratio was reduced to 1 per 20 recipients (NHK, 2022^[56]).

The spread of telecare in the future may maximise direct care provision, in particular in home-care settings, and greatly reduce the demand for LTC workers. Remote Care in Finland (Table 5.3 above) currently has 800 home care recipients and workers make 24 000 telecare visits per month. This is because Remote care can perform more than 50 virtual visits during one home-care shift (The Guardian, 2019^[53]). Overall, telecare can reduce the time LTC workers spend traveling, improving their productivity.

Technologies can be implemented to reduce the time LTC workers spend on non-direct-care tasks, such as administration and co-ordination, which are an important source of work overload in LTC workers (OECD, 2020^[41]). Tablet- and smartphone-based online tools for home care providers can reduce administrative and managerial workloads. An application used in the United Kingdom for instance simplifies planning and co-ordination of care provision. Comprehensive software services can include home care scheduling tools, billing management tools, payroll management tools, and tools to manage interactions with care recipients, and thus reduce the amount of time spent on paperwork Table 5.3. The introduction of an electronic record for medication administration in several Canadian LTC facilities reduced medication delivery times and medication incidents, resulting in LTC workers having more time for direct care provision and an overall safer care environment for older people (Fei, Robinson and Macneil, 2019^[72]). In surveys of LTC workers in Japan (MHLW, 2020^[73]) and the United Kingdom (Skillsforcare, 2021^[48]), a large majority of staff indeed indicates that the introduction of new technologies have increased the amount of time they effectively spend providing care. Despite this experience, 38% of the surveyed LTC workers in the United Kingdom expressed concerns about new technologies replacing face-to-face care (Skillsforcare, 2021^[74]).

New technologies can also alleviate the arduousness of care work. Robots can reduce the physical burden on LTC workers by taking over the most physically demanding tasks. One Japanese-developed robot, for instance, can lift people, tackling one of the main sources of physical arduousness of LTC work as discussed in Chapter 3.

New technologies may facilitate independent living of older people

New technologies can contribute to increasing the length of time older people can live independently, which would result in reducing the demand for LTC or improving both working conditions and the quality of care. The use of social and self-management technologies can contribute to the maintenance of cognitive as well as physical functions, improving older people's ability to continue living independently (Carretero, 2015^[75]).

Cognitive decline is an important driver of care needs among older people, but the decline can be slowed down through rehabilitation and cognitive training.²³ New technologies are increasingly becoming effective and easy-to-use tools for both rehabilitation and cognitive training. One smartphone application originating in the United States, for instance, contains easily accessible tools for assessing the cognitive function, and provides cognitive training and lifestyle advice to improve cognitive function. New technologies can also help older people to continue living independently even after the decline of cognitive functions. For example, medication management tools can help people with mild dementia take their medications correctly without the need for human assistance.

While falling is a major physical health hazard and source of care needs among older people, the risk of falling can be reduced through the use of social technologies.²⁴ Social technologies are promising tools for fall prevention. For instance, a route planner that provides the safest route for pedestrians based on falling risk (Minakata et al., 2022^[76]) or applications with exercises that improve strength and balance to reduce falling can contribute to reducing the number of older people requiring care as a result of falling.

Self-management technologies can reduce the need for LTC by helping older people to live independently. This includes smart home technology that comprehensively implements ICT in various aspects of daily living (Box 5.3). Smart home technologies such as door and light sensors and on/off switches of various home appliances can enable some older people to continue living in their own homes in comfort and safety, which can have a positive impact on mental health and reduce loneliness (Marikyan, Papagiannidis and Alamanos, 2019^[77]).

Box 5.3. An example of a smart home in Japan

In Japan, smart home technologies have increasingly been implemented in residential facilities for older people in recent years. For example, one such facility in Tokyo has introduced smart curtains, open/close sensors, environmental sensors, smart remote controls, and smart speakers to assist older people in living independently. The smart curtains automatically open and close to support a regular lifestyle and improve the quality of sleep. The open/close sensor detects the opening and closing of doors and windows and notifies LTC workers to prevent accidents. The environment sensors are four sensors that detect temperature, humidity, brightness, and human movement, and allow LTC workers to remotely monitor conditions in the room, for instance to prevent heat stroke, as well as to monitor when the user leaves the room or is using the restroom as reduced toilet visits may indicate a health issue. The smart remote control can check the operating status of the air conditioner in real time and remotely control it and can also be used in conjunction with the smart speaker to control multiple home appliances at once through voice commands. Smart speakers can be linked to other smart home appliances such as the curtains or the air conditioner so that the user can operate them using voice commands.

Source: KURACI (2022^[78]), 新型コロナウイルス感染症や防災対策万全の災害対応型ホーム。[Disaster-responsive homes with full measures for new corona infections and disaster prevention], <https://www.kuraci.co.jp/house/familia/hikariqaokako/en/>.

5.4.4. Needed skills to successfully implement new technologies

Acquiring standard digital skills is the first step

LTC workers need to first have digital skills to be able to use new technologies properly. Digital skills range from using tablets and smartphones, sending emails, and using software to advanced skills such as coding (OECD, 2019^[79]). LTC workers do not require advanced digital skills in many cases, as the setup of equipment is not done by LTC workers even when using complex technologies such as robots. The digital skills LTC workers do need include the ability to find and manage information, to share data digitally, to use digital technology and to make use of e-learning (Skillsforcare, 2016^[80]). These skills enable LTC workers to use assistive technology, such as fall monitors; to securely store care records; and, to use telecare systems, such as remote prescribing and remote consultation.

Many LTC workers indicate that their level of digital skills is insufficient. In the United Kingdom, only about half of the LTC workforce is confident in their digital skills, and nearly half of LTC providers are concerned about their staff's lack of digital skills (Skillsforcare, 2021^[74]). Important barriers for LTC workers to learn digital skills include a lack of time available to develop the skills and employers not providing the required training, as indicated by respectively 21% and 16% of LTC workers in the United Kingdom (Skillsforcare, 2021^[74]).

Providing sufficient training is essential to make sure that all workers can adjust to the implementation of new technologies. Computer skills of older LTC workers are somewhat weaker than those of their younger colleagues (Konttila et al., 2019^[81]; Yu, Li and Gagnon, 2009^[82]) in line with differences in ICT use between generations in general (OECD, 2020^[83]). Progress is under way as, for example, older staff members in the United Kingdom are more likely than younger staff members to want to improve their digital skills: 68% of those aged 55+ and 64% of those aged 45-54 want to improve their digital skills compared to 54% of those aged 18-34 (Skillsforcare, 2021^[74]). However, data from a Japanese survey warn against relying solely on on-the-job training for LTC workers to get accustomed to using new technologies: some LTC workers with a high level of proficiency with digital equipment may experience having to teach workers with less proficiency as a burden as it slows them down and does not allow them to make full use of the technology available (CWF, 2021^[47]). This illustrates the important role formal training programmes play for the successful introduction of new technologies.

Boosting older people's digital skills to improve use of new technologies

Stronger digital skills of care recipients can contribute to reducing LTC needs fulfilled by LTC workers. With sufficient digital skills and health literacy, older people can make use of social and self-management technologies. Health literacy refers to the degree to which individuals can find, understand, and use information and services to inform health-related decisions and actions for themselves and others (CDC, 2022^[84]). Through self-management technologies older people can monitor their health status, identify any needs, and access appropriate services. Social technologies are relevant not only to boost informal support networks, but also because social interaction is an important driver for many older people to start learning to work with digital technologies, which can provide the basic digital skills needed to start working with self-management technologies (Pihlainen et al., 2022^[85]).

In order to successfully implement self-management technologies, it is important to improve digital skills and health literacy of older people. On average in the European Union, 24% of people aged 55-74 have not used internet in the three months prior to being surveyed, in particular people with lower and medium education attainment, with 42% and 21%, respectively (OECD, 2022^[86]). At the same time, at least one-third of the population in OECD countries may have low levels of health literacy (OECD, 2020^[41]).

LTC workers can help older people improve their health literacy and digital skills. Through teaching them basic smartphone usage, for instance, LTC workers can boost older people's digital skills and enable them

to use cognitive training applications on their own. Also, teaching older people how to access health information online could improve their health literacy. Several OECD member countries have developed guidelines and toolkits to improve health literacy. For example, in the United States, the Agency for Healthcare Research and Quality has developed a Health Literacy Universal Precautions Toolkit that includes evidence-based guidance for communication so as to improve care recipients' health literacy (The Agency for Healthcare Research and Quality, 2020^[87]).

It is important that LTC workers support older people in selecting and adopting technology that meets their needs. New technologies range from cognitive training apps to tools to assist medication use, and LTC workers can provide guidance to find appropriate tools fulfilling older people's needs. Many LTC workers are able and willing to play this role: 65% of surveyed staff providing direct care in the United Kingdom indicate that they could assist caregivers in choosing the technology that best suits their needs (Skillsforcare, 2021^[48]).

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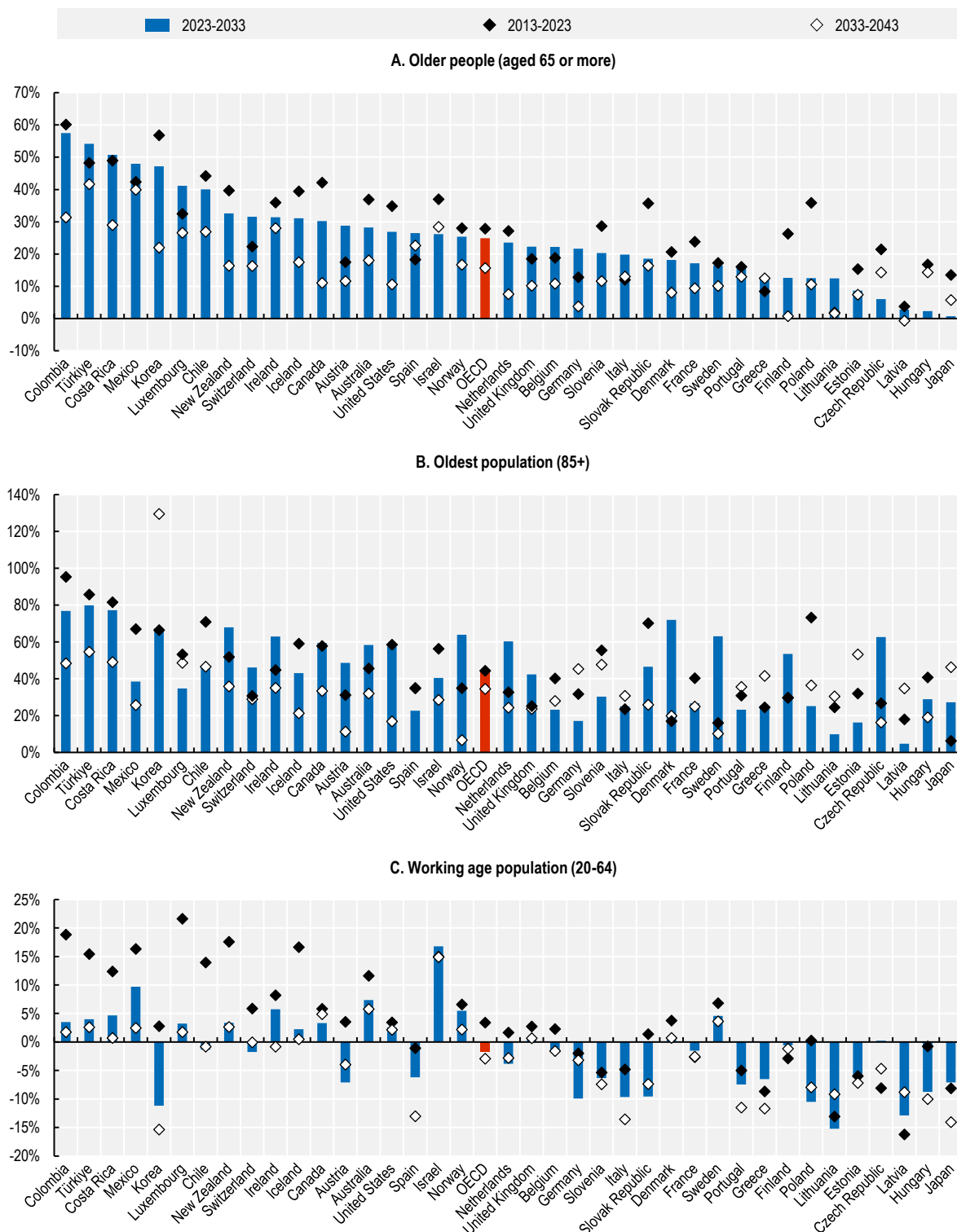
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Annex 5.A. Projections of the number of people in selected age groups

Annex Figure 5.A.1. Oldest population grows fast while working-age population starts to shrink

Relative change of selected population size in selected decades



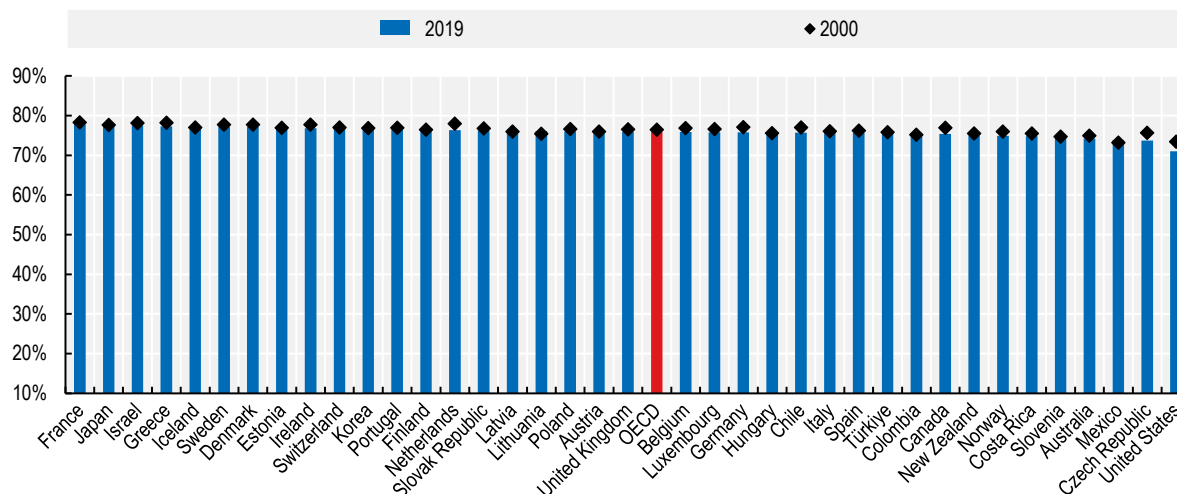
Note: Countries in all panels are sorted by change in population 65+ in 2022-32 (Panel A).

Source: OECD calculations based on UN (2022_[27]), *World Population Prospects 2022*, <https://population.un.org/wpp/>.

Annex 5.B. Longevity and disability-free years of life

Annex Figure 5.B.1. Share of healthy years in remaining life expectancy at age 60, WHO measure

Disability-free life expectancy as a share of remaining life expectancy at age 60 in 2000 and 2019, WHO measure



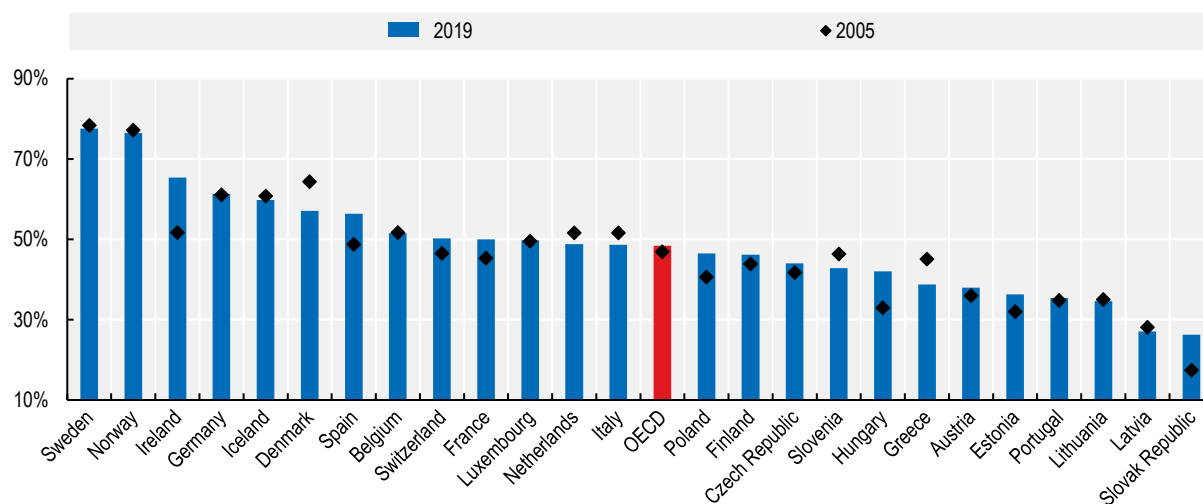
Note: WHO defines healthy life expectancy as (HALE) as follows: the average number of years in full health a person (usually at age 60) can expect to live based on current rates of ill-health and (period) mortality. The HALE calculation uses the equivalent lost healthy measure which is estimated as the all-cause years lost due to disability (YLD) rate per capita, adjusted for independent comorbidity, by age, sex and country. Sullivan's method uses the equivalent lost healthy year fraction (adjusted for comorbidity) at each age in the current population (for a given year) to divide the hypothetical years of life lived by a period life table cohort at different ages into years of equivalent full health and equivalent lost healthy years, <https://www.who.int/data/gho/data/indicators/indicator-details/GHO/gho-ghe-hale-healthy-life-expectancy-at-age-60>.

Source: OECD calculations based on WHO data.

StatLink  <https://stat.link/fsom01>

Annex Figure 5.B.2. Share of healthy years in remaining life expectancy at age 65, EUROSTAT measure

Healthy life expectancy a share of remaining life expectancy at age 65 in 2005 and 2019, Eurostat



Note: EUROSTAT measures health life expectancy (HLE) as the number of remaining years that a person of specific age is expected to live without any severe or moderate health problems. The notion of health problem for Eurostat's HLE is reflecting a disability dimension and is based on a self-perceived question which aims to measure the extent of any limitations, for at least six months, because of a health problem that may have affected respondents as regards activities they usually do (the so-called GALI – Global Activity Limitation Instrument foreseen in the annual EU-SILC survey, https://ec.europa.eu/eurostat/cache/metadata/en/hlth_hlye_esms.htm). Due to series breaks periods differ for some countries.

Source: OECD calculations based on Eurostat data.

StatLink  <https://stat.link/g0ou7x>

Notes

¹ <https://www.nationalskillscommission.gov.au/topics/skills-priority-list>.

² <https://www.gov.uk/government/publications/skilled-worker-visa-eligible-occupations/skilled-worker-visa-eligible-occupations-and-codes> (retrieved on 29 March 2023).

³ This is based on data from administrative sources, including Public Employment Services and national occupational forecasts.

⁴ Job offers for personal care workers from all sectors are analysed together because data by sectors are missing for many job offers and workers are mobile between sectors.

⁵ Based on the questionnaire filled in by Portugal for this report.

⁶ OECD Statistics: <https://stats.oecd.org/Index.aspx?DataSetCode=MIN2AVE>.

⁷ Based on the questionnaire filled in by countries for this report.

⁸ Based on the questionnaire filled in by countries for this report.

⁹ <https://www.dewr.gov.au/skills-reform/fee-free-tafe>.

¹⁰ This implies that especially in periods of low unemployment and economic boom potential LTC workers might be attracted by other sectors. Additionally, high turnover in LTC sector, for which evidence is mixed (Chapter 3), would reduce the effective care time because of inevitable frictions related to recruitment and onboarding of new workers.

¹¹ Over 2013-21, the cumulative inflation was 3.7% in Ireland.

¹² A limitation refers to any difficulty a person has in executing a one activity from a list of fourteen activities as a result of a physical, mental, emotional or memory problem. The fourteen activities cover six activities of daily living (ADLs – getting dressed, walking across the room, bathing, eating, getting in/out of bed, going to the toilet) and eight instrumental activities of daily living (IADLs – cooking, shopping, making a call, taking medicine, doing work around the house or garden, managing money, leaving the house independently and using public transport, doing laundry).

¹³ These durations are based on period mortality rates for 22 OECD countries in 2019. At younger ages, e.g. 50 years, the low incidence applies to a larger group of people given increasing mortality with age. For example, about 50% and 30% of people being 50 years old in 2023 would survive until age 85 and 90, respectively, on average across OECD countries.

¹⁴ A few countries are expected see the number of people aged 65 or more increasing by more than 40% by 2033: Chile, Colombia, Costa Rica, Korea, Luxembourg, Mexico and Türkiye, while it is projected to increase by less than 10% in the Czech Republic, Estonia, Hungary, Japan and Latvia (Annex 5.A).

¹⁵ Over the last decade in Korea, the number of people aged 85 or more increased by 130%, more than twice than in second Türkiye (55%). Strong increases of more than 60% are projected for this decade in

relatively young countries: Colombia, Costa Rica, Türkiye, and also in Canada, the Czech Republic, Denmark, Ireland, Korea, New Zealand, Norway, the Netherlands and Sweden (Annex 5.A)

¹⁶ Similarly, the WHO's metric of disability-free life expectancy increased by 1.8 years on average across OECD countries between 2000 and 2019, out of the 2.6-year gains in life expectancy at age 60. Hence, 72% of the increases in remaining life expectancy at age 60 were free of disability, which is very similar to the 74% value reported above. Furthermore, Eurostat numbers show less optimistic picture. According to them, at age 65, 50% of life expectancy was disability-free in 2019 and disability-free life expectancy increased by 66% of improvements in longevity between 2005 and 2019 in European OECD countries. Cross-country differences in the WHO and Eurostat measures are shown in the Annex 5.B.

¹⁷ Care sectors include LTC sectors as discussed in Chapter 2.

¹⁸ The Baumol model shows that sectors with slow productivity growth are likely to see strong employment growth because demand for products or services is set independently from productivity developments. Additionally, sectoral wages tend to follow economy-wide rather than sector-specific productivity trends.

¹⁹ In the pessimistic scenario the demand for LTC workers is projected to increase from 1.9% to 3.1% of total employment between 2023 and 2043.

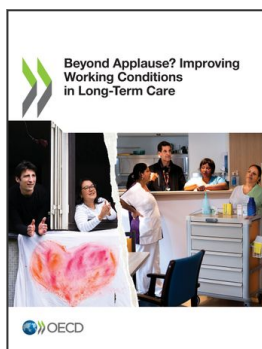
²⁰ LTC is defined based on NACE sectors: LTC sector comprises both Q87 residential care and Q88 non-residential care.

²¹ Investments are measured as Gross fixed capital formation (GFCF) values and reported numbers are based on EU Klems and the Intanprod database (Bontadini et al., 2021_[46]).

²² AAL is co-financed by the European Commission and 17 countries (AAL, 2020_[88]).

²³ Dementia is one of the main causes of care needs in older people, with one in four older care recipients in Japan requiring care as a result (MHLW, 2019_[89]).

²⁴ The WHO estimates that over 40 million people worldwide require medical attention each year due to falls, many of whom are older people (WHO, 2021_[90]), and the care needs of one in eight older Japanese care recipients are the result of falling (MHLW, 2019_[89]).



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