



Megatrends and the Future of Social Protection



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Foreword

Sociodemographic, economic, technological and environmental changes will affect both the need for, and the financing of, social protection systems in OECD countries over the coming decades. To provide adequate and sustainable support, the shape, size and funding of social programmes will need to anticipate and adapt to these “megatrends”.

Current economic challenges – including labour shortages and the cost-of-living crisis – brought forward the repercussions of megatrends that had been expected in the medium term. Labour shortages are starting to curtail economic activity and public service provision even before the full effect of demographic change has set in. Similarly, planned climate change mitigation policies will result in higher energy prices in the coming years. However, the sudden and dramatic spike in energy prices in many OECD countries following Russia’s war of aggression against Ukraine demonstrated how keenly energy price rises are felt by households and firms. Once again, governments mobilised significant resources to cushion the impacts, but going forward, targeting is key, given limited fiscal space coming out of the COVID-19 pandemic and higher interest rates that constrain public borrowing.

This report – ***Megatrends and the Future of Social Protection*** – forms part of the OECD’s *Future of Social Protection* programme of work, overseen by the OECD Employment, Labour and Social Affairs Committee. It presents a broad stocktaking of key megatrends impacting the future of social protection in OECD countries – ageing populations, changing patterns of labour supply, new and emerging employment forms, changes in household composition and unpaid work, the effects of new technologies on employment and wages, as well as the effects of climate change and the net zero transition – with an eye towards informing future reforms.

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Executive summary

Sociodemographic, economic, technological and environmental changes will affect the form and funding of social protection in the coming decades. This report presents a stocktaking of megatrends impacting social protection systems in OECD countries.

Population ageing squeezes social protection from both contribution and expenditure angles

Fertility rates have been declining for decades and are below the replacement rate in almost all OECD countries. At the same time, life expectancy is rising. These trends imply a rapid increase in the number of over 65-year-olds, a decline in the working-age population and increasing expenditure on pensions, health- and long-term care. Countries have responded by raising statutory retirement ages, which should be underpinned by measures enabling longer careers.

Women's disproportionate provision of unpaid care contributes to their lower labour force participation and earnings. If formal child- and long-term care remain underprovided, unpaid long-term care obligations will likely further impede women's employment at a time when a full workforce is essential. The share of adults living alone – with an associated higher poverty risk – is also rising.

Women's labour force attachment strengthens, while men increasingly work part-time

Women's labour force participation rate grew from 58% in 1995 to 66% in 2022, on average, across OECD countries, while the share of women working *part-time* is on a downward trajectory, declining from 23% in 1995 to 20% in 2022.

Men remain much less likely to work part-time than women. Nevertheless, men's part-time rate rose from 6% to 7%, on average, since the late 1990s. Rises in part-time work were particularly striking in the Netherlands (8 percentage points), Finland (7 percentage points), and Korea, Germany and Austria (6 percentage points). Increases in part-time rates among men and women are partly driven by increasing educational enrolment of young people, but prime-aged men's part-time rates also increased.

Labour market slack, caregiving or leisure preferences?

Men's part-time rates accelerated with the Great Financial Crisis (GFC), in line with indicators of underemployment. However, while underemployment fell with the economic upturn, men's part-time rate did not return to pre-GFC levels. Men may have curtailed work to participate in unpaid care, but this is difficult to assess with available data. Workers may also increasingly value leisure as wages increase. This is consistent with part-time work increasing most in higher-income countries. While women's rising labour

force participation alleviates labour shortages and improves their social protection entitlements, the rising incidence of part-time work among men has the opposite effect. Should this trend continue, it could depress aggregate labour supply and affect the financial stability of pension systems.

Concerns about new and emerging forms of work loom large

Self-employment has been on a slow decline throughout the OECD since 1950. Despite concerns that the number of independent contractors, in particular platform workers, is rising, evidence indicates that only a small share of workers are affected, and that earnings often supplement other income.

Self-employed workers have less access to social protection, and therefore often rely on general-revenue funded benefits in the event of income loss. Better aligning contributions and benefits across employment forms also helps to prevent employers lowering labour costs by choosing work arrangements with fewer social protection entitlements.

Automation has not yet led to (net) job destruction, and technology-driven productivity growth can support social protection funding

Recent advances in robotics and Artificial Intelligence (AI) have been accompanied by concerns about worker displacement. New technologies may act as labour substitutes or compliments. Technological progress is changing the occupational composition of the workforce, but there is no evidence yet pointing to net job destruction. Evidence on wages is mixed – advances in robotics seem to have somewhat depressed the wages of affected workers, while AI seems to have had a zero or slightly positive effect on wages, with workers at the lower end of the wage distribution benefiting *more*.

In the absence of population growth, rising productivity through technological progress is the only way to achieve long-term economic growth, which is necessary for the continued funding of public expenditure in a non-zero interest rate environment. Governments can help to ensure that workers benefit from the productivity gains and cost savings generated by AI, which will also support social protection funding that in many countries mostly relies on labour income, e.g. through education and training or by supporting collective bargaining. Countries may want to reconsider their tax mixes should technology-driven productivity growth mostly accrue to capital.

Carbon taxes generate space for redistribution

Because low-income households spend more of their income, they are more exposed to consumption taxes like carbon taxes. But because higher-income households have higher *absolute expenditure* (and therefore tax liability), redistributing the carbon tax revenue equally across households would make households at the bottom of the income distribution better off. To achieve public support for increases in carbon prices, compensation policies need to be immediate, transparent and of sufficient size. Countries are increasingly using new data and digital technologies to increase their capabilities to provide benefits that are easy to claim, timely and responsive to changing circumstances.

The net-zero transition will necessitate income replacement and active labour market policies

Current estimates forecast a slightly negative effect of the net-zero transition on employment. Workers in high-emission industries are, on average, more likely to have low educational attainment and participate less in life-long learning, but earn comparatively high wages. They are more likely to be older, male, and

live in rural areas than the average worker – a combination with high costs of job reallocation and risks of long-term unemployment.

Accessible and adequate unemployment insurance schemes are a first line of defence, but affected workers may require substantial re-skilling and may face lower wages upon re-employment. Additional income support policies may be necessary.

Climate change may imply additional housing support

Adaptive home renovations require large up-front investments, and for rented homes, there is a disconnect between costs borne by landlords and benefits reaped by renters. Programmes for low-income households and renters may therefore be needed. Areas affected by the loss of brown jobs, or by environmental degradation, will likely require government support for relocation.

1 Overview

Valerie Frey and Raphaela Hyee

Sociodemographic, economic, technological and environmental changes will affect both the need for, as well as the financing of, social protection systems in OECD countries over the coming decades. This chapter provides an overview of key megatrends impacting the future of social protection in OECD countries – ageing populations, changing patterns of labour supply, new and emerging employment forms, changes in household composition and unpaid work, the effects of new technologies on employment and wages, as well as the effects of climate change and the net zero transition – with an eye towards informing future reforms. It puts an emphasis on the funding of social protection.

Sociodemographic, economic, technological and environmental changes will affect both the need for, as well as the financing of, social protection systems in OECD countries over the coming decades. To provide adequate and sustainable support, the shape, size and funding of social programmes will need to anticipate and adapt to these “megatrends”.

Current economic challenges – including labour shortages and the cost-of-living crisis – brought on the repercussions of megatrends that had been expected in the medium-term. Labour shortages, a result of a drop in labour supply among some groups of workers in the wake of COVID-19 (Salvatori, 2022^[1]), have started to curtail economic activity and public service provision in some countries even before the full effect of demographic change sets in. Social protection systems must also adjust to the continuing trend towards part-time work, which extends beyond mothers temporarily reducing working hours to provide care.

Similarly, while planned climate change mitigation policies will result in higher energy prices in the coming years, the sudden and dramatic spike in energy prices in many OECD countries following Russia’s war of aggression against Ukraine demonstrated how keenly energy price rises are felt by households and firms today. Once again, governments mobilised significant resources to cushion the impacts, but going forward, they are attempting to better target support.

This report presents a broad stocktaking of key megatrends impacting the future of social protection in OECD countries – ageing populations, changing patterns of labour supply, new and emerging employment forms, changes in household composition and unpaid work, the effects of new technologies on employment and wages, as well as the effects of climate change and the net zero transition – with an eye towards informing future reforms. In the context of limited fiscal space coming out of the COVID-19 pandemic and higher interest rates, it puts an emphasis on the funding of social protection. This chapter summarises the report’s main findings.

1.1. Populations are ageing quickly

Shifts in the age composition of the population reflect the combined effect of persistently low fertility rates and people living longer. While the rate of decline in fertility has slowed, fertility rates are nevertheless falling across the OECD on average and are below the replacement rate in almost all OECD countries. At the same time, longevity – remaining life expectancy at age 65 – increased at a pace of about 1.5 years per decade from the 1990s to the 2010s. This pace has slowed down to around one year by decade; the slowdown predates the COVID-19 pandemic, which amplified it although it is too early to disentangle precisely the structural changes. Longevity is however expected to continue to increase in the future.

These combined trends have resulted in a rapid increase in the number of over 65-year-olds, as well as a decline in the working-age population, in most OECD countries. The number of over 65-year-olds per 100 people of working age – the old-age to working-age ratio – increased from around 20:100 in the early 1990s to 31:100 in 2022, and this ratio is expected to rise to 54 people over 65 years old per 100 working-age people in 2052.

The main policy lever countries have used to address the pressure population ageing puts on pension budgets is the upward adjustment of statutory retirement ages. Current labour market entrants, expecting to retire in the 2060s, will face a statutory retirement age of 66 across the OECD, on average, if current legislation is implemented, compared to around 64 for those retiring today. Women’s retirement ages will increase more than men’s, as countries increasingly equalise pensionable ages for men and women. However, this increase in retirement ages falls short of stabilising the split between time spent in work and in retirement – while retirement ages are slated to increase by two years, life expectancy at 65 is predicted to increase by almost five years (OECD, 2023^[2]).

As past pension reforms have raised retirement ages and educational attainment has risen among workers across cohorts, the age of labour market exit has increased over the last 20 years, reversing the downward

trend that prevailed since the 1970s. However, in many OECD countries, early retirement schemes mean that average labour market exit ages are much below the statutory retirement age (OECD, 2023^[2]).

Older people have a higher poverty risk than other age groups in two-thirds of OECD countries, but in most countries, differences are minor. The average gap is driven by significantly elevated old-age poverty risks in Korea, Estonia, Latvia and Lithuania. Older women are more likely to be poor (17%) than men (11%). Women have lower own earnings-related pension income than men. Also, as they live longer, they are more likely to be widowed and live alone at some point in retirement, possibly reliant on a survivor pension.

1.2. Population ageing squeezes social protection systems from both the contribution and the expenditure angles

Population ageing is a major challenge for social protection systems. It squeezes pension systems from two directions, as rising life expectancy may mean more aggregate expenditure on pensions, and lower fertility means fewer working-age people are available to pay contributions. It is also expected to increase spending in the health and the long-term care system. Increasing effective retirement ages is the main lever currently used to deal with increasing longevity and limit the pressure on public budgets. Higher statutory retirement ages need to be underpinned by occupational health promotion, life-long learning and other employment measures to enable workers to extend their careers further.

1.3. Women’s labour force attachment continued to strengthen both at the extensive and intensive margin...

Over the past quarter of the century, women’s labour force participation rate grew from 58% in 1995 to 66% in 2022 across OECD countries. The share of women working part-time is also on a downward trajectory: while it increased slightly at the beginning of the 2000s up until shortly after the Great Financial Crisis (GFC), it has been dropping since the beginning of the 2010s, from 23% to 20% across the OECD on average over that period.

There is no clear link between rising women’s labour force participation and a higher incidence of part-time work. Some countries, notably Austria, Korea, Finland or Italy, did experience rising women’s labour force participation combined with rising part-time employment among women. This is consistent with a narrative of the rising incidence of part-time work being a consequence of increasing women’s labour force participation (a composition effect): as the share of working women rises, the additional women entering the labour force are more likely to have a lower number of desired working hours. However, other countries experienced an equivalent increase in women’s labour force participation combined with a *decrease* in part-time work. Examples include Canada, Switzerland, France, Mexico, and Israel. Indeed, the countries with the highest increases in women’s labour force participation had either low or no increases in the incidence of part-time work (Hungary, the Netherlands), or even strong decreases (Luxembourg).

1.4. ... while men increasingly work part-time

The incidence of part-time work among men is still much lower than that of women. Nevertheless, men’s part-time rate rose in almost all OECD countries from 6% to 7%, on average, from 1995 to 2022, with most of the increase taking place during and shortly after the GFC. Rises in men’s part-time work were particularly striking in the Netherlands (8 percentage points), Finland (7 percentage points), and Korea, Germany and Austria (6 percentage points). Portugal, New Zealand, and the United States were the only countries where men did *not* increase their rate of part-time work. Increases in part-time rates among men

and women are partly driven by young (15- to 24-year-old) workers, and likely connected to increasing educational enrolment. However, while prime-aged (25- to 54-year-old) women's part-time rates decreased from 21 to 17% between 1995 and 2022 across the OECD on average, prime-aged men's part-time rates increased from 3 to 4%. Late-career men and women show similar patterns.

1.5. Labour market slack, leisure preferences and caregiving likely contribute to the increasing incidence of part-time work among men

Labour market slack did contribute to the rising propensity of men to work part-time during the Great Financial Crisis (GFC), but underemployment cannot explain the persistent increase in male part-time work. At the beginning of the GFC, the share of men working part-time who could not find a full-time job increased significantly, and this labour demand effect is clearly visible in the overall incidence of men's part-time employment, which increased steeply at the onset of the GFC and dipped in the boom years leading up to the COVID-19 crisis. However, men's part-time rate did not decline in line with underemployment during the economic recovery following the GFC.

It may be the case that men are more likely to work part-time because they are taking on more unpaid care duties. This is difficult to assess with available data sources, but there seems to be only a weak relationship between men's unpaid caregiving and reduced working hours. Only 7% of part-time working men in European countries with available data stated that they work part-time to care for children or adults with care needs, compared to 19% of part-time working women. Another possible explanation for the increasing propensity to work part-time is an increasing preference for leisure – rising real wages as a result of economic growth could mean that workers increasingly value leisure. The fact that increases in male part-time work are concentrated in high-GDP European countries bolsters this idea. Further work, e.g. using time-use data, should explore the reasons for men working increasingly part-time.

1.6. Strengthening female labour force attachment broadens the financing base for social protection systems, but a trend towards part-time work may undermine it

Rising women's labour force participation can alleviate labour shortages in the short- and medium term. It also means that women increasingly acquire their own social protection rights, though their social security contributions tend to be lower as women are still disproportionately more likely to work part-time.

The increasing propensity towards part-time work among men has much the opposite effect: it diminishes labour supply at a time of labour shortages, and weakens rights to contribution-based benefits, including pensions. Should this trend continue in the future, it would have important effects not only on aggregate labour supply, but also on the financial stability of pay-as-you-go pension systems that are already jeopardised by the shrinking of the working age population.

1.7. Overall, self-employment is on a downward trajectory, but concerns about new and emerging forms of work loom large

Self-employment has been on a slow decline in developed economies throughout the second half of the 20th century and into the 21st century, primarily driven by the decline in share of the labour force working in agriculture, as well as small craft and retail businesses. It has declined in almost all OECD countries. There are, however, concerns that the number of independent contractors or freelancers who work for few or even only one client, in particular those whose work is mediated by online platforms (so-called platform

workers), is rising. Quantifying the extent of this phenomenon is not straightforward, but available evidence indicates that only a small share (under 10%) of workers are affected, and that earnings are often or even mostly used to supplement other income.

1.8. Self-employed workers still have insufficient access to social protection

Self-employed workers generally have less access to social protection than dependent employees, which means that they often rely on general revenue-funded minimum income benefits in the event of an income loss. Self-employed workers control the success of their businesses in ways that employees do not. However, while running a business does – and should – imply risk, not all self-employed activity is equally entrepreneurial. Some self-employed workers are economically dependent on one or very few clients. For instance, platform workers, like other self-employed workers, have limited access to social protection, employment protection or minimum wages, but unlike other self-employed workers, they operate with little or no business capital, and may be dependent on a few or only one client.

In cases of straightforward misclassification of dependent employees as independent contractors, labour law (when properly monitored and enforced) may be sufficient to ensure the adequate protection of workers, and more often than not platform workers have been found to be employees by courts. Ensuring that workers are correctly classified also helps to prevent the erosion of social protection financing bases through regulatory arbitrage – employers lowering labour costs by choosing work arrangements with fewer social protection entitlements, and thus lower social security contributions. Where possible, both contributions and entitlements should therefore be aligned across employment forms.

1.9. Automation does not (yet) seem to have led to (net) job destruction

Recent years have seen impressive advances in robotics and Artificial Intelligence (AI). This rapid progress has been accompanied by concern about the possible effects of AI and robotics deployment on the labour market, including on worker displacement. Whether technological progress leads to worker displacement depends on whether the technologies are substitutes or complements to labour – whether they have the potential to *replace* workers, or make them *more productive*, ultimately leading to higher output and employment. Empirical evidence points to technological progress changing the task content of jobs, and the occupational composition of the labour force, but there is no evidence yet pointing to job destruction. These empirical estimates are, of course, necessarily backwards looking and cannot account for the future deployment of new technologies across OECD economies. Evidence on wages is mixed – advances in robotics seem to have somewhat depressed the wages of workers affected by the technology, while advances in AI seem to have had a zero or even slightly positive effect on wages, with workers at the lower end of the wage distribution benefiting *more* from AI deployment (Georgieff and Hye, 2021^[3]; Georgieff, 2024^[4]).

1.10. Productivity growth through technological progress is essential for the sustainable funding of social protection

In the absence of population growth, rising productivity through technological progress is the only way to achieve long-term economic growth, which is necessary for the continued funding of public expenditure in a non-zero interest rate environment. Public policies can help to ensure that workers benefit from the productivity gains and cost savings generated by AI, which will also support social protection funding that in many countries mostly relies on labour income. For instance, worker skills will be a crucial determinant of the extent to which new technologies increase worker productivity and wages, and governments should

support relevant training programmes. Public policy can also support collective bargaining and a fair distribution of productivity gains within firms (OECD, 2023^[5]). Countries may also want to reconsider their tax mixes should technology-driven productivity growth mostly accrue to capital.

1.11. Women continue to carry the brunt of unpaid care work, and insufficient care infrastructures remain a barrier to women's employment

Women continue to provide the bulk of unpaid childcare, a barrier to paid employment contributing to lower labour force participation, wages, and women's higher poverty risks throughout the life course. At the same time, in the absence of significant investments in public provision, the impending surge in demand for long-term care for older people is likely to fall on unpaid caregivers – mostly women.

As populations continue to age in all countries across the OECD, care needs will increase. OECD estimates suggest that employment in long-term care (as a percentage of total employment) would need to rise by 32% over the next ten years to meet the expected increase in demand for caregiving (OECD, 2023^[6]). Declining family sizes and increased geographical mobility suggest there may be fewer people to provide unpaid care in the future. If high-quality, long-term care and childcare remain inaccessible or unaffordable, unpaid care obligations will likely increasingly depress women's ability to work outside the home, at a time when tapping the full potential of the workforce is essential. This highlights the increasing need for public investments in the formal care economy, including home-based and community care, and in social programmes that (financially) support unpaid caregivers.

1.12. Household forms are changing, with implications for private risk-pooling

Parents of dependent children are increasingly unlikely to be married, which further undermines the rationale of offering tax advantages to married couples regardless of whether or not they have children. Unmarried partners do not have access to alimony in the case of a separation, or survivors' benefits in the case of the partner's death, leaving especially women vulnerable, as they are often the main caregivers of children.

The share of adults living alone is also rising, partly driven by population ageing. Without the protective effect of a second earner's income, and unable to benefit from consumption economies of scale, single adult households face a relatively high risk of poverty across OECD countries. Access to adequate social protection is therefore all the more important. From a social protection funding perspective, the absence of private risk pooling may mean increasing reliance on public income support.

1.13. To reach the net zero target, carbon prices will have to increase substantially – an unpopular policy

Carbon pricing is a major policy to combat climate change. They are easy to implement and administer, and directly incentivise reductions in fossil fuel consumption by firms at households. In contrast to other taxes, e.g. labour or capital, a reduction of demand is desirable. Carbon tax revenues may therefore be used to lower other (distortionary) taxes, compensate households for carbon taxes paid, and/or subsidise green investments.

However, according to current estimates, carbon prices would have to rise substantially to reach the zero-emission target – significantly more than the 2022 price surge, that caused a government response of support measures totalling 1.5% of GDP in the median OECD economy. Carbon taxes are highly salient – price increases are immediately obvious to consumers – and perceived to be punitively regressive. Even

when they support the net zero transition, people tend to prefer subsidies, bans or regulations that push up prices or costs in a more opaque manner, or in a way that makes it difficult to identify winners and losers (Blanchard, Gollier and Tirole, 2023^[7]).

1.14. While their relative impact is higher on low-income households, high-income households would pay more carbon tax in absolute terms

Because lower income households spend a higher share of their income than higher-income households, they are ex-ante more exposed to consumption taxes (such as a carbon tax) in relation to their income. But higher income households may still have higher *absolute expenditure* (and therefore tax liability in absolute terms) – the relative as well as absolute burden of a carbon tax therefore depends on total expenditure and the carbon intensity of consumption (both directly on household energy and transportation, and indirectly through emissions “embodied” in goods and services throughout the production process) across the income distribution.

Empirically, the richest 10% of households spend about three to nine times as much as the poorest 10% of households, and CO₂ emissions closely track expenditure – that is, the richest households “consume” three to nine times as much CO₂ as poor households. This implies that a carbon tax places a higher absolute burden on high income households – redistributing the carbon tax revenue equally across the population, without any targeting by income, would make households at the bottom of the income distribution better off. Without such a redistributive policy, the relative burden on low-income households would be higher, as they save less, and also tend to spend a higher *share* of their income on energy and transportation.

To achieve public support for considerable increases in carbon prices, compensation policies need to be immediate, transparent and of sufficient size. Carbon taxes can certainly generate the fiscal space for such compensation. The COVID-19 pandemic has shown that processing payments to a large share of the population in a short period of time can strain even mature social protection systems. Countries are increasingly using new data and digital technologies to increase their capabilities to provide benefits that are easy to claim (or even paid automatically), timely (that is, any conditionalities are established quickly) and responsive to changing circumstances. These investments will increase the credibility of carbon tax compensation payments.

Carbon tax revenues could also be recycled to lower other distortive taxes, e.g. on labour, to boost economic growth and to counteract lower productivity growth as economies adjust to higher carbon prices. Options include co-financing of social protection schemes, e.g. pensions, to lower contributions.

1.15. Improving housing quality to lower energy consumption

Housing construction and household-related energy consumption are major contributors to greenhouse gas emissions. Adaptive home renovations require large up-front investments and are often not undertaken even when economically viable. Homeowners may delay profitable investments due to present bias and liquidity constraints. For rented homes, there is a disconnect between landlords shouldering the cost of the investment and renters reaping the rewards of lower energy consumption that might not be well-mediated through the market.

Carbon pricing alone might therefore not be enough to solve the problem of insufficient long-term investments, and additional programmes to support adaptive home renovations for low-income households and those living in rented accommodation, including standards and bans, may therefore be needed. It is, however, essential that the cost-effectiveness of such policies be assessed in advance.

1.16. Around one in five workers may be affected by the green transition

The net effect of the net-zero transition on employment depends on the size and design of climate change mitigation policies, the labour intensity of new technologies and production processes, and consumer and firm responses to changed market conditions. Current estimates forecast a slightly negative net employment impact of the green transition. Before the onset of the COVID-19 crisis, around 6% of workers work in occupations that are concentrated in greenhouse gas intensive sectors, so-called “brown jobs”. About 20% of all workers worked in “green-driven” occupations, that are either directly connected to the green transition (e.g. Solar Photovoltaic Installers), will see their jobs change because of the green transition (e.g. Architects) or will see the demand for their skills increase (e.g. Construction Workers, (OECD, 2024^[8])).

Both high-emissions and green-driven jobs are concentrated in transport, manufacturing, utilities and mining, high-emissions jobs are additionally overrepresented in agriculture, and green-driven jobs in construction. This sectoral overlap means that men are overrepresented in both green-driven as well as high-emission occupations, while women are overrepresented in services, and thus less exposed to the green transition. But this also means that women are worse positioned to take advantage of job opportunities emerging in the green transition – for instance, women are under-represented in STEM fields which may hinder their participation in these expanding industries.

1.17. The need for income replacement and active labour market policies

OECD research shows that workers in high emission industries are, on average, more likely to have low educational attainment, and participate less frequently in formal and non-formal education and training programmes. At the same time, they are less likely to earn wages at the bottom of the wage distribution, and more likely to earn higher wages, than other workers, reflecting firm-wage premia (more generous wage-setting practices in these firms compared to the average firm). They are also somewhat older than the average worker, more likely to be men, and more likely to live in rural areas. This combination of high wages with low skills, low participation in life-long learning, and living in areas with few other job opportunities, points to high costs of job reallocation: these workers are likely to find it more difficult than the average worker to re-skill after job displacement, they live in areas with low labour demand, and are more likely to face wage losses after transitioning to a new job.

Accessible unemployment insurance schemes with adequate replacement rates and durations can act as a first line of defence against earnings losses following job displacement. But given the characteristics of these workers, they are at risk to remain unemployed longer, and may require substantial re-skilling, and may need help to relocate to areas with more job opportunities (Section 6.3). They may also face lower wages after transitioning to a new job in the long term. Thus, in addition to re-skilling efforts by public employment services, additional income support policies may be necessary. For instance, wage insurance programmes partially cushion wage losses when transiting to a new, lower wage, and have been shown to be effective in incentivising jobless workers to accept new employment.

Additionally, extreme weather events such as floods, fires or extreme heat may cause unsafe working conditions and lead to work stoppages, and thus earnings losses, for workers. Some countries already provide insurance for this risk through their social protection systems.

1.18. Supporting affordable housing during the green transition

In regions where high-emission industries are concentrated, local housing markets may deteriorate or even collapse, trapping workers and their families in their mortgages and preventing them from moving towards

better jobs. Climate change may also directly damage or destroy homes and communities, e.g. through extreme weather events. So-called “managed retreat” programmes, and/or home buyouts, may therefore be necessary for some areas. Also, regions with a high concentration of carbon-intensive jobs are often not economically diversified. Investments in local economic development may therefore be needed to improve job prospects in these areas. Conversely, in areas with greater labour demand, the need for access to affordable and/or social housing, as well as public transit, educational infrastructure and other social services transport, may increase.

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2 Ageing populations put pressure on social protection systems

Andrew Reilly

OECD countries are ageing quickly through a combination of increasing life expectancy and falling total fertility levels. Changes in individuals' lifestyle preferences, in family formation and increasing housing and childcare costs have resulted in women having fewer children. In parallel, life expectancy at age 65 increased quickly between the mid-1990s and the early 2010s. This combination raises the old-age to working-age ratio, putting pressure on pension systems as the size of the working-age (20-64) population is projected to decline in about two-thirds of OECD countries. To counteract this, many countries are increasing their retirement ages to try and limit the pressure on public budgets due to longer lives. Higher statutory retirement ages need to be underpinned by occupational health promotion, life-long learning and other employment support to enable workers to extend their careers further.

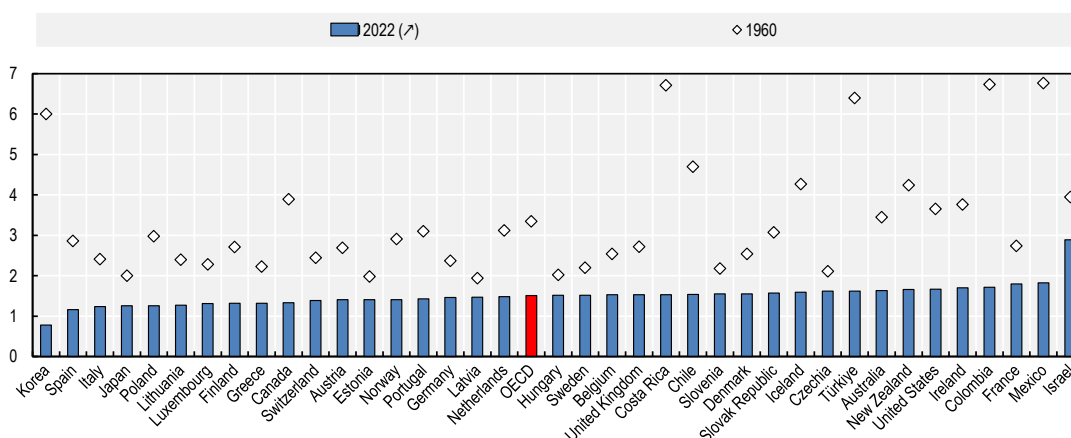
Population ageing – caused by rising life expectancy and low fertility – is perhaps the most commonly-cited challenge for the future funding of pension systems in OECD countries. But the impacts go beyond pensions – the shrinking labour force will intensify labour shortages and imply lower contributions across social programmes and increases in life expectancy will imply increases in long-term care needs (Chapter 4).

2.1. OECD countries are ageing quickly

While population ageing is a common trend across OECD countries, its starting point and pace vary greatly across countries. Population declines are the result of the combined effect of persistently low fertility rates and longer lives.

Figure 2.1. Fertility rates have been declining across OECD countries

Total fertility rates, 1960 and 2022



Note: 2021 instead of 2022 for Chile, Colombia, Costa Rica, Mexico and the United Kingdom.

Source: OECD (2024^[1]), *Society at a Glance: OECD Social Indicators*, <https://doi.org/10.1787/918d8db3-en>.

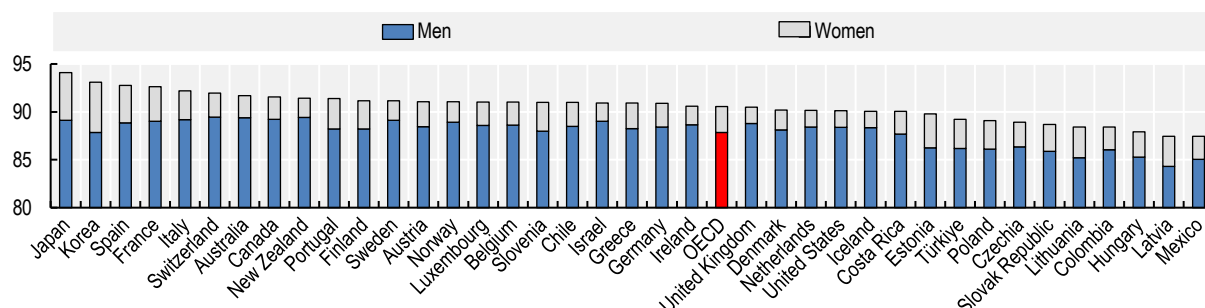
Fertility rates have fallen considerably since the 1960s. In 1960, the average total fertility rate across the OECD was 3.3 on average, more than double its current value (1.5 children per woman, Figure 2.1). The decline was steepest between 1960 and 2000, when fertility rates fell from 3.3 to 1.7. It continued to fall, but less quickly, to 1.59 in 2022 (OECD, 2024^[1]). Projections suggest that it will remain at this level, which is below replacement, for the next few decades (OECD, 2023^[2]).

Low fertility rates reflect changes in individuals' lifestyle preferences, in family formation, and in constraints of everyday living, such as those driven by labour market insecurity, difficulties in finding suitable housing and a lack of affordable childcare (OECD, 2024^[1]).

At the same time, life expectancy has increased. The remarkable rise in old-age life expectancy is one of the greatest achievements of the last century. In 2022, life expectancy at age 65 averaged 83.0 years for men and 86.2 years for women. On average across OECD countries, remaining life expectancy at age 65 is projected to increase by 4.4 years among women and 4.9 years among men by 2065 (Figure 2.2).

Figure 2.2. Projected life expectancy at age 65, by the year 2065, in years

Average age to which people aged 65 could expect to live if they experienced the age- and sex-specific mortality rates prevalent in their country, 2022



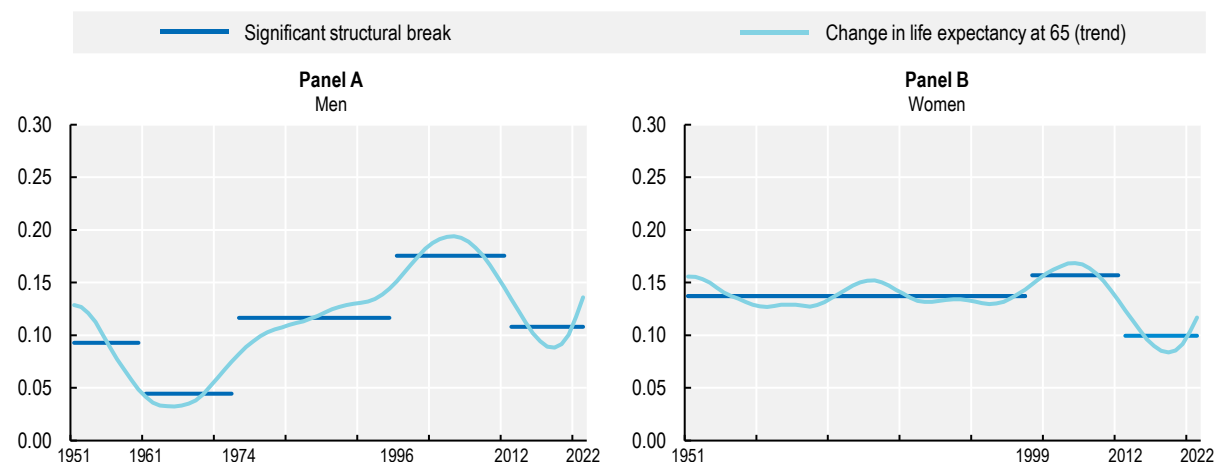
Source: United Nations, Department of Economic and Social Affairs, (2022^[3]), *World Population Prospects 2022*, [wpp2022_summary_of_results.pdf \(un.org\)](https://www.un.org/wpp2022_summary_of_results.pdf)

Life expectancy at age 65 increased quickly between the mid-1990s and the early 2010s, at a pace of around 1.5 years per decade for men and 1.4 years for women (Figure 2.3).

Since 2012, this pace has slowed to 1.0 per decade for men and 0.8 years for women, with the break in the trend magnified by COVID-19. It is still unclear, however, whether the pandemic has affected the trend increase in longevity.

Figure 2.3. Life expectancy gains have been smaller over the last decade

Annual change in remaining life expectancy at age 65 in the OECD on average, in years



Note: The breaks are significant at the 99% confidence level. To limit interferences from short-term fluctuations in change in period life expectancy, the breaks are estimated on the Hodrick-Prescott filtered trend series ($\lambda=100$).

Source: See (OECD, 2021^[4]), *Pensions at a Glance 2023*, Figure 6.4, <https://stat.link/kqwb6l>.

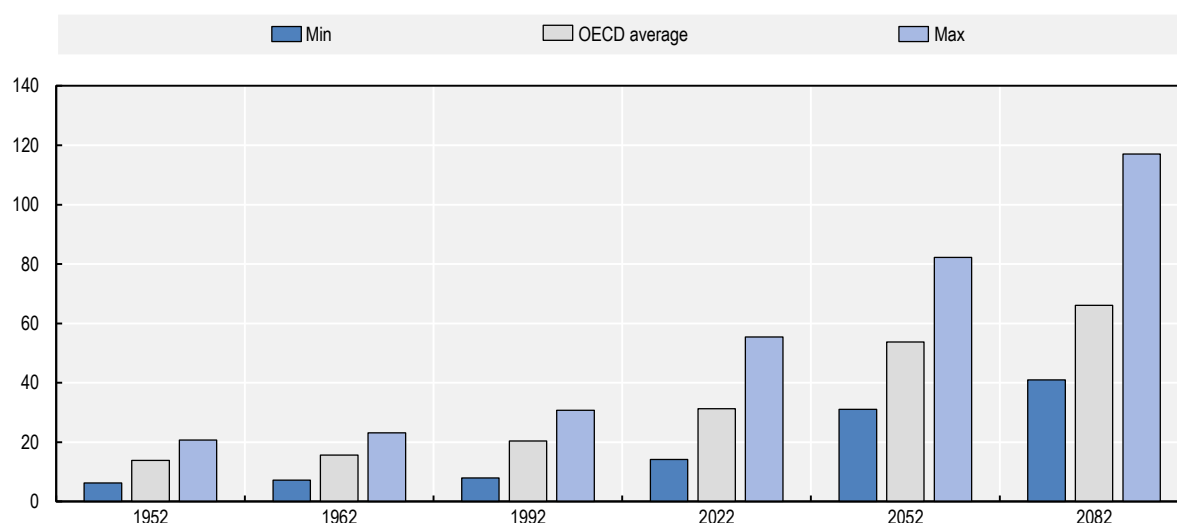
Rising life expectancy and below-replacement fertility combine to raise the old-age to working-age ratio, putting pressure on pension systems. The future evolution of these ratios depends on mortality rates, fertility rates and migration. On average across all OECD countries, the old-age to working-age ratio increased rapidly beginning in the early 1990s, from 20.4 people aged 65+ per 100 aged 20-64 in 1992 to

31.3 in 2022 (OECD, 2023^[2]). This pace is projected to accelerate, with the ratio reaching 53.8 by 2052 (Figure 2.4).

While old-age to working-age ratios are rising in all OECD countries, the pace of the increase varies considerably. In 1952, Ireland was the demographically oldest country based on this metric, with 20.7 people aged 65+ for every 100 working-age people, while Korea was the youngest at 6.3. In 2022, Ireland's old-age to working-age ratio had modestly increased to 25.8, while Korea has surpassed Ireland at 26.3. Korea is projected to reach a ratio of 82.3 in 2052, at which point it will be the oldest country in the OECD, and 117.0 by 2082. In contrast, Ireland is projected to age more slowly, reaching an old-age dependency ratio of 51.2 in 2052, and 61.4 in 2082.

Figure 2.4. The demographic old-age to working-age ratio is increasing at a fast pace

Number of individuals aged 65 and over per 100 people aged between 20 and 64

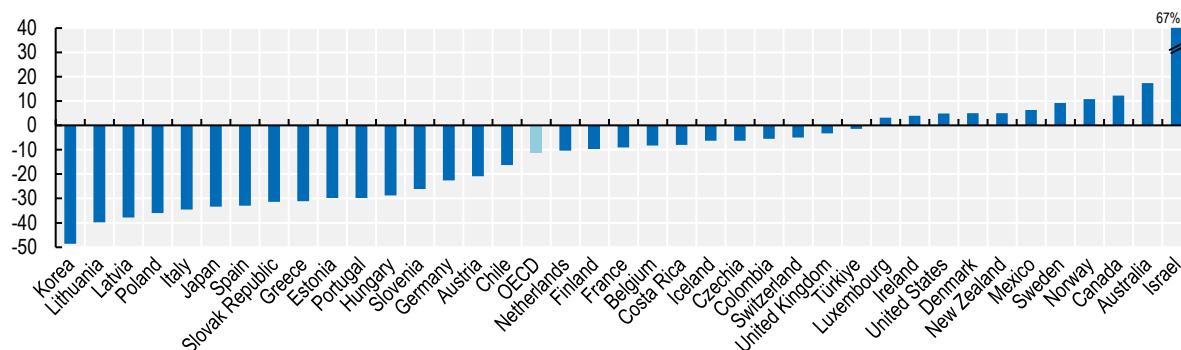


Source: United Nations, Department of Economic and Social Affairs (2022^[3]), *World Population Prospects 2022*, Online Edition (for future periods: medium-variant forecast).

While all countries anticipate a sharp increase in the proportion of individuals aged 65 and over, the size of the working-age (20-64) population is projected to *decline* in about two-thirds of OECD countries. On average, over the next 40 years the working-age population is projected to contract by 11%. Overall, only 11 countries are not projected to see a decline in the workforce. Korea is projected to experience the strongest contraction at 49%, in contrast, Israel is projected to see an expansion in the working-age population of 67%, by far the largest increase and a clear outlier, given that the second highest increase will be 17% in Australia (Figure 2.5).

Figure 2.5. The working-age population will decline in many OECD countries

Change in the working age population (20-64), 2022-62, percentage



Source: United Nations, Department of Economic and Social Affairs (2022^[3]), *World Population Prospects 2022*, Online Edition.

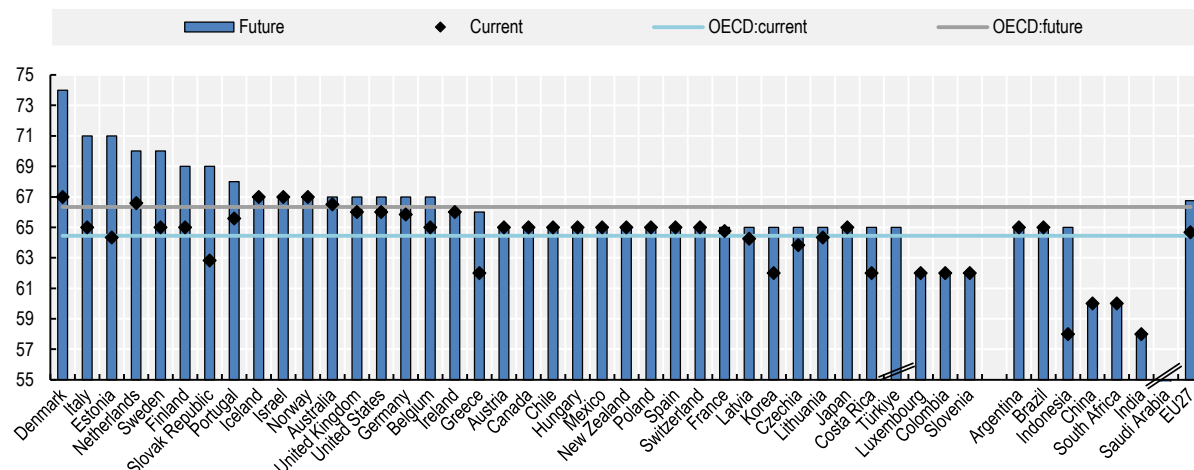
2.2. Retirement ages have been increasing

The main policy lever to deal with increasing longevity has been to raise statutory retirement ages. For those retiring today, the normal retirement age – the earliest age an individual can receive a pension without penalty after an uninterrupted career starting at age 22 – averages 64.4 years across OECD countries for men and 63.6 years for women. For those starting their careers today, who are expected to retire in the 2060s, the normal retirement age will increase, based on current legislation, to 66.3 years for men and 65.8 years for women (Figure 2.6). The larger increase for women results from reforms in a few countries – Austria, Lithuania and Switzerland – equalising the retirement ages between men and women, and also Israel narrowing this gap from five to two years. Only Colombia, Costa Rica, Hungary, Israel, Poland and Türkiye are currently set to maintain lower statutory retirement ages for women.

While policy makers have increased retirement ages for those entering the labour market now, the increases fall short of stabilising the split between time spent in work and in retirement. For instance, the retirement age for men across the OECD average is set to increase by 1.9 years over the next 45 years, but the remaining life expectancy of men at age 65 is projected to increase by 4.9 years (Figure 2.2). Hence, the average legislated increase in men's normal retirement ages accounts for about 40% of the average projected increase in old-age life expectancy.

Figure 2.6. Current and future normal retirement ages for a man with a full career from age 22

Current and future refer to retiring in 2022 and entering the labour market in 2022, respectively



Note: NRA: current and NRA: future refer to retiring in 2022 and entering the labour market in 2022, respectively. For better visibility, the scale of this chart excludes the lowest observed values of 52 for current normal and current earliest in Türkiye. Credits for educational periods are not included.

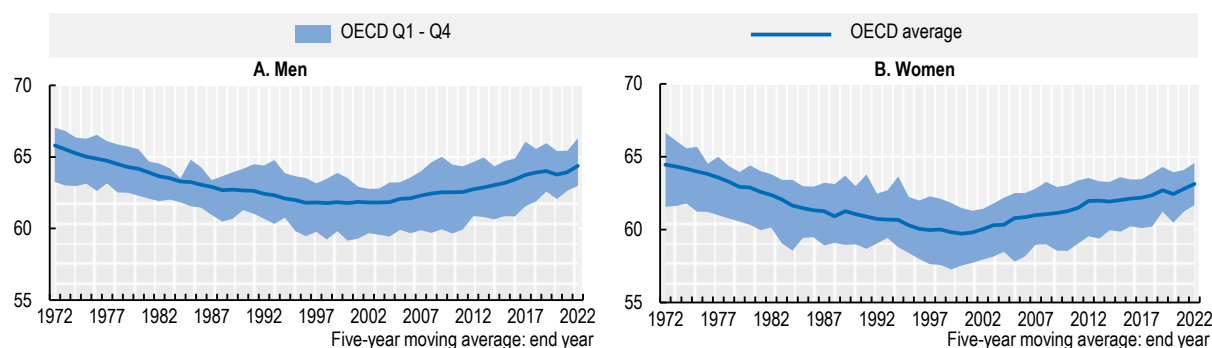
Source: (OECD, 2023^[2]), *Pensions at a Glance 2023*, <https://doi.org/10.1787/678055dd-en>.

The normal retirement age of those entering the labour market now will increase in 20 out of 38 OECD countries for men, and in 23 of 38 countries for women. Assuming that legislated retirement-age links to life expectancy are applied, the retirement age would increase substantially in Denmark (from 67.0 to 74.0 years), and Estonia (from 64.3 to 71.0 years). Similarly, Finland, Greece, the Netherlands, Portugal, the Slovak Republic and Sweden are also linking the retirement age to life expectancy, with increases of between 2.5 and 6 years expected over the next 50 years. The lowest future normal retirement age for men is 62 in Colombia, Luxembourg and Slovenia (OECD, 2023^[2]).

As past pension reforms have raised retirement ages and educational attainment has risen among workers across cohorts, labour market exit ages have increased over the last 20 years, reversing the downward trend that prevailed since the 1970s. Increased retirement ages mean that individuals have to work longer to access a pension; while improved educational attainment defers the start of the career it raises employment opportunities throughout the career. However, in many OECD countries, early retirement schemes mean that labour market exit ages are much below the normal retirement age.

The average age of labour market exit in 2022 was 64.4 years for men and 63.1 years for women (Figure 2.7). It reached its lowest level around the year 2000 for both men and women, on average across countries. In 1972, the average effective exit age was 65.8 years for men and 64.4 years for women, against 61.8 and 59.7 years, respectively, in 2000. Since then, there has been a steady increase, apart from a minor decline due to COVID-19.

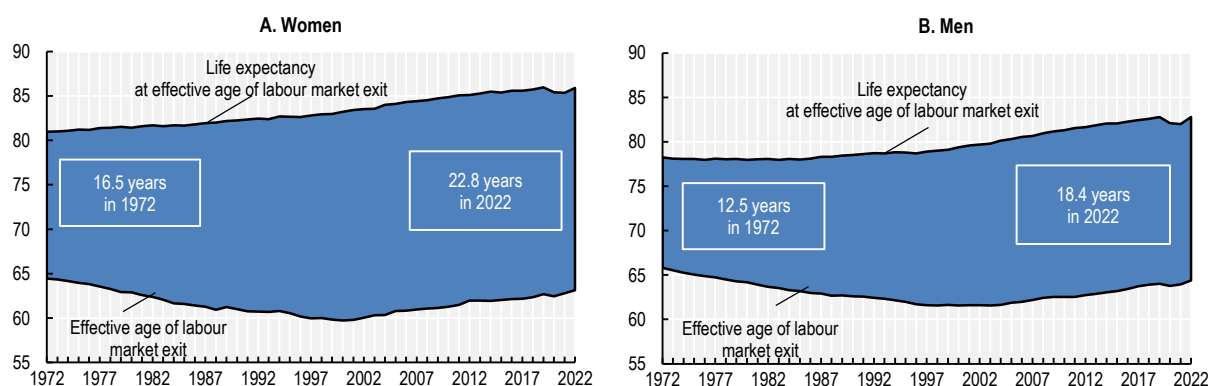
Figure 2.7. Average effective age of labour market exit in OECD countries, 1972-2022



Source: OECD estimates based on the results of national labour force surveys, the European Union Labour Force Survey and, for earlier years. In some countries, national censuses, (OECD, 2023^[5]), <https://doi.org/10.1787/e4d8d9b3-en>.

Because of longer lives and earlier retirement, the duration of expected life after labour market exit has risen significantly over the last 50 years, especially during the first part of this period as the effective exit age was falling. In 2022, on average across the OECD, life expectancy at labour market exit was 18.4 years for men and 22.8 years for women, about six years longer than in 1972 (Figure 2.8). Since 2000, expected life years after exit from the labour market have rather stabilised as continuing life expectancy gains in old age have been offset by increases in labour market exit ages.

Figure 2.8. Expected life years after labour market exit, OECD average 1972-2022



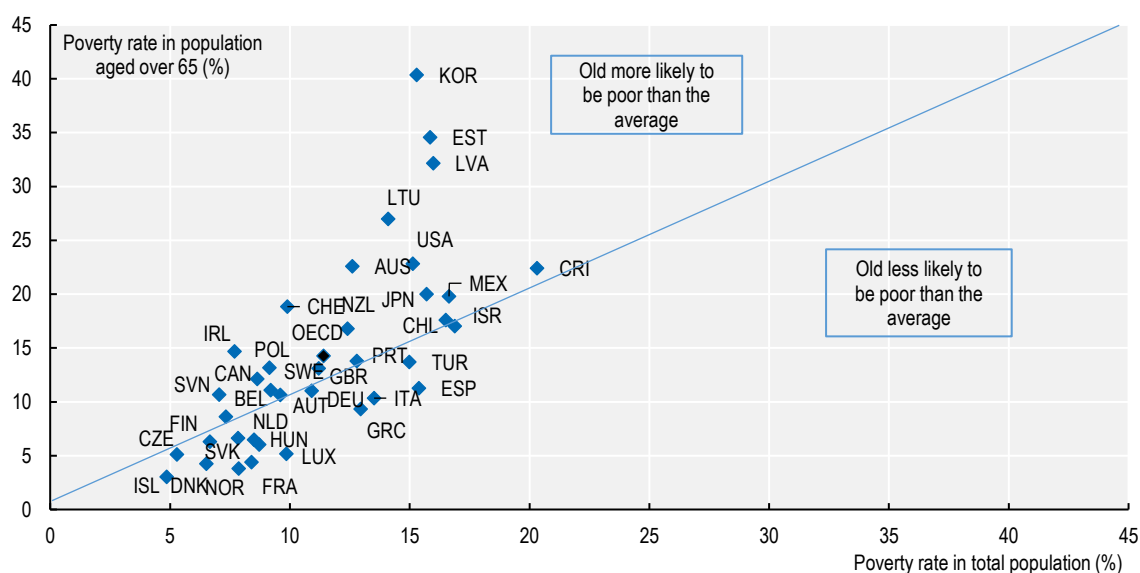
Note: Life expectancy at labour market exit is based on period-specific mortality rates.

Source: OECD calculations based on United Nations Population Prospects (2022^[3]), 2022 Revision.

2.3. Poverty rates tend to be higher at older ages

Across the OECD on average, 14% of people over age 65 live in poverty compared to 11% in the general population.¹ Older people have higher poverty risks than other age groups in around two-thirds of countries (Figure 2.9), but in most countries differences across ages are minor, and the gap is driven by significantly elevated old-age poverty risks in Korea, Estonia, Latvia and Lithuania.²

Figure 2.9. Income poverty rates by age: older vs. total population, 2020 or latest available year



Note: Data are for 2020 except for some countries; see note of Table 7.1 in (OECD, 2023^[2]), <https://stat.link/pv3isj>.

Source: OECD Income Distribution Database, www.oecd.org/social/income-distribution-database.htm (June 2023 version).

Poverty among the “younger old” (aged 66-75) is less frequent (13%) than among the “older old” (aged 76 and over, 17%). As many benefits are indexed to price inflation, their relative value tends to decline throughout retirement as wage growth tends to outstrip inflation. Older women are more likely to be poor (17%) than men (11%). Women have lower own earnings-related pension income than men. Also, as they live longer, they are more likely to be widowed and live alone at some point in retirement, possibly reliant solely on survivor pensions, which are often considerably lower than the benefit entitlement when part of a couple. Older women are at greater risk of poverty than older men in all OECD countries except Chile, Costa Rica and Iceland.

2.4. What implications for social protection?

Population ageing is a major challenge for social protection systems – it squeezes pension systems from two directions, as rising life expectancy typically means more aggregate expenditure on pensions, and lower fertility means fewer working-age people to pay contributions. It is also expected to increase spending in the health and the long-term care system and add to unpaid work obligations, threatening gender equality (see Section 4.1). While immigration can slow down the shrinkage of the working age population, migration at levels necessary to meaningfully counteract the trend might not be politically palatable.

Increasing effective retirement ages seems to be the main lever currently available to limit the pressure on public budgets due to longer lives. Higher statutory retirement ages need to be underpinned by occupational health promotion, life-long learning and other employment support to enable workers to extend their careers further.

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Notes

¹ Relative poverty threshold according to the OECD definition of 50% of the national median equivalised household disposable income.

² The latest available data from Lithuania delegates indicates that poverty levels for the elderly have declined from 23.9% in 2022 to 19.2% in 2023, but it is too early to know whether this will be reflected in the forthcoming EU-SILC updates.

3

Changing patterns of labour supply

Raphaela Hyee and Jasmin Thomas

The world of work continues to evolve. Changes in labour demand combine with demographic shifts to shape labour supply decisions of men and women. At the same time, new business models and evolving worker preferences contribute to the emergence of new forms of work that depart from the traditional norm of full-time dependent employment. These broad shifts have important implications for the sustainability of social protection systems. This chapter looks at long-term trends in the labour market, including trends in labour force participation and part-time employment of men and women between 1995 and 2022 in OECD countries. It also examines trends in self-employment, with a special focus on platform- and other forms of freelance work.

The world of work continues to undergo significant changes. Technological progress, including advances in artificial intelligence (AI), as well as the effects of climate change and associated mitigation measures, are changing skills requirements. At the same time, new business models and evolving worker preferences, including the shift to telework in the wake of the COVID-19 pandemic, contribute to the emergence of new forms of work that depart from the traditional norm of permanent full-time dependent employment. These broad shifts have important implications for the sustainability of social protection systems. For instance, new technologies that lower transaction costs and allow firms to outsource more have facilitated new forms of work, including platform- and other forms of freelance work. These new forms of working create new opportunities, but also new risks in terms of economic security (OECD, 2019^[1]; OECD, 2018^[2]). Similarly, ageing populations are already causing labour shortages across many OECD countries, not only resulting in upward pressure on wages, but also in additional incentives to invest in further automation (Araki et al., 2023^[3]).

This chapter looks at long-term trends in the labour market, starting out with long-term trends in labour force participation and part-time employment (Section 3.1) followed by self-employment, with a particular focus on platform- and other forms of freelance work (Section 3.2).

3.1. Long-term trends in labour force participation and part-time work

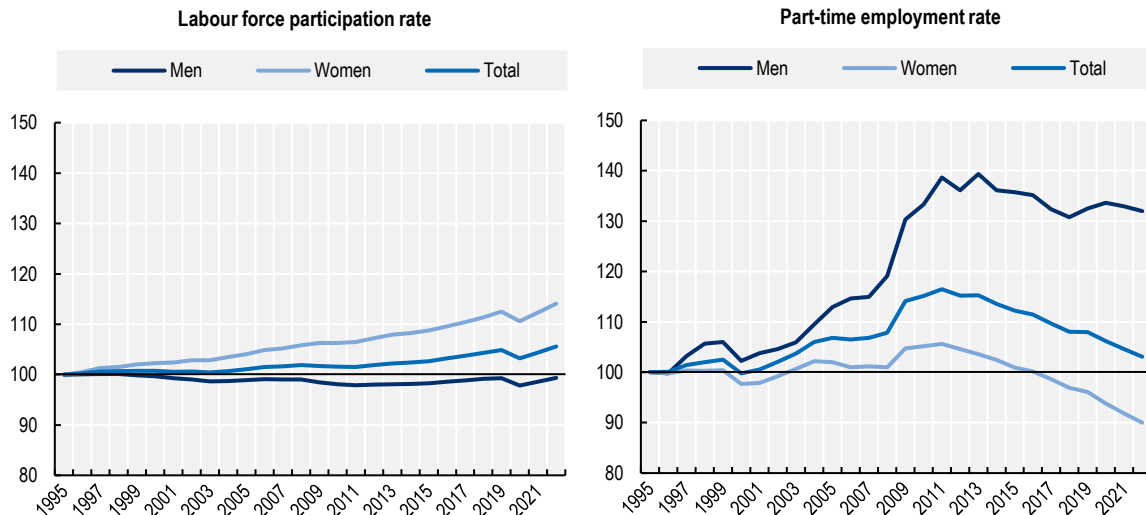
Women's labour force participation has continued to rise since 1995 across the OECD on average,¹ from 58% to 66% in 2022 (Figure 3.1, left panel). It rose in all countries except the United States, where the labour force participation rate was already at 70% in 1995 (69% in 2022). Men's labour force participation, in contrast, remained stable (81% in 1995 and 2022 across the OECD on average). It significantly increased only in Hungary – from the very low level of 68% in 1995 to 82% in 2022.²

3.1.1. *Women's labour force attachment strengthened both at the intensive and extensive margin*

Women's stronger labour market attachment is also apparent in the decline of part-time work, defined as under 30 hours per week (see Box 3.1): while the share of women working part-time increased slightly at the beginning of the 2000s up until shortly after the Great Financial Crisis (GFC), it has been on a downward trajectory since the beginning of the 2010s, dropping from 23% to 20% over that period across the OECD on average (Figure 3.1, right panel).

Figure 3.1. Women’s labour force attachment continues to strengthen

Index of labour force participation (left panel) and part-time employment rates (right panel), men and women aged 15-64 years, OECD average, 1995=100, 1995-2022



Note: The OECD average for labour force participation rates excludes Chile, Colombia, Lithuania, Latvia, and Slovenia because of a lack of consistent available data for this long timeline. The OECD average for part-time employment rates excludes Australia, Chile, Colombia, Costa Rica, Estonia, Japan, Latvia, Lithuania, Poland, and Slovenia. These OECD countries do not have available data back to 1995. Korea does not have data on dependent employment by full- and part-time status, so data on total employment by full- and part-time status are substituted. Part-time in this figure is defined as dependent employees who usually work fewer than 30 hours per week in their main job. Source: OECD Stat.

Box 3.1. Defining part-time work

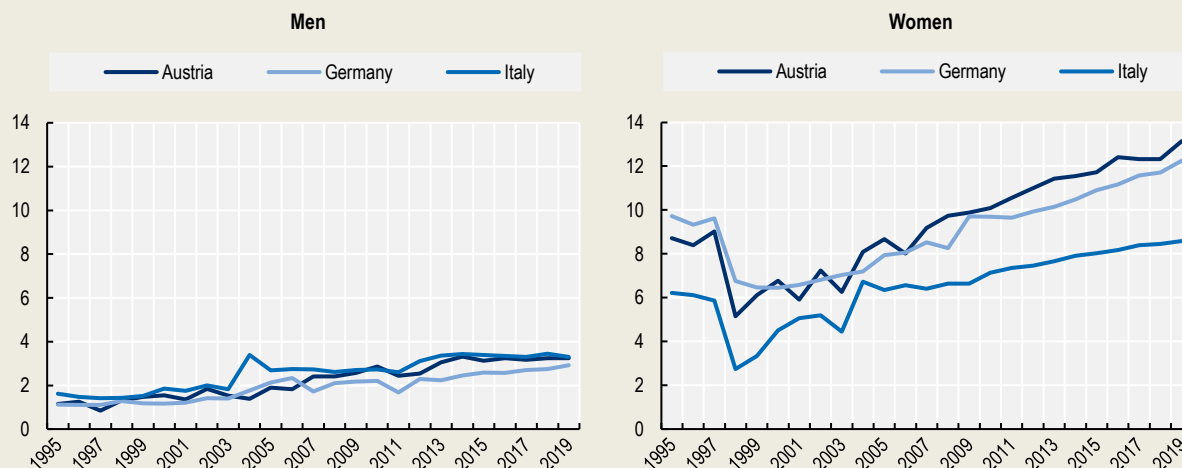
The OECD defines part-time work as usually working fewer than 30 hours per week in a main job. But national definitions of part-time work vary considerably. There are three main approaches.

- a classification based on the worker’s perception of his/her employment situation;
- a cut-off (generally 30 or 35 hours per week) based on usual working hours; and
- a comparable cut-off based on actual hours worked during the reference week.

Compared to usual hours, a criterion based on actual hours generally yields a higher part-time rate, particularly if there are temporary reductions in working time as a result of holidays, illness, etc. Estimates based on workers’ perceptions, however, could be higher or lower. Changing the threshold from 30- to 35- hours, however, clearly increases part-time rates. In 1995, for example, using a benchmark of 35 hours instead of 30 hours increases the estimated part-time employment rate for women in Austria, Germany, and Italy by 6-10 percentage points (Figure 3.2). The impact for women is even stronger in 2022, ranging between 8-14 percentage points. This suggests that a greater share of people were working between 30 and 35 hours in 2022 than in 1995 and highlights that changing the benchmark from 30 hours to 35 hours affect not only the levels but also the trends.

Figure 3.2. Differences across definitions of part-time employment rates

Difference (percentage points) between part-time employment rates using a definition of 30 hours versus 35 hours, men and women aged 15-64 years, Austria, Germany, and Italy, 1995-2019



Note: Part-time employment rates are calculated using the European Union (EU) Labour Force Survey (LFS) microdata from prior to the methodological change in 2021. Estimates in these graphs may not match public data tables perfectly. For more details, see the statistical annex of (OECD, 2023^[4]). Difference is calculated as the 35-hour benchmark less the 30-hour benchmark.

Source: OECD Stat and ELS calculations using EU-LFS microdata pre-methodological change in 2021.

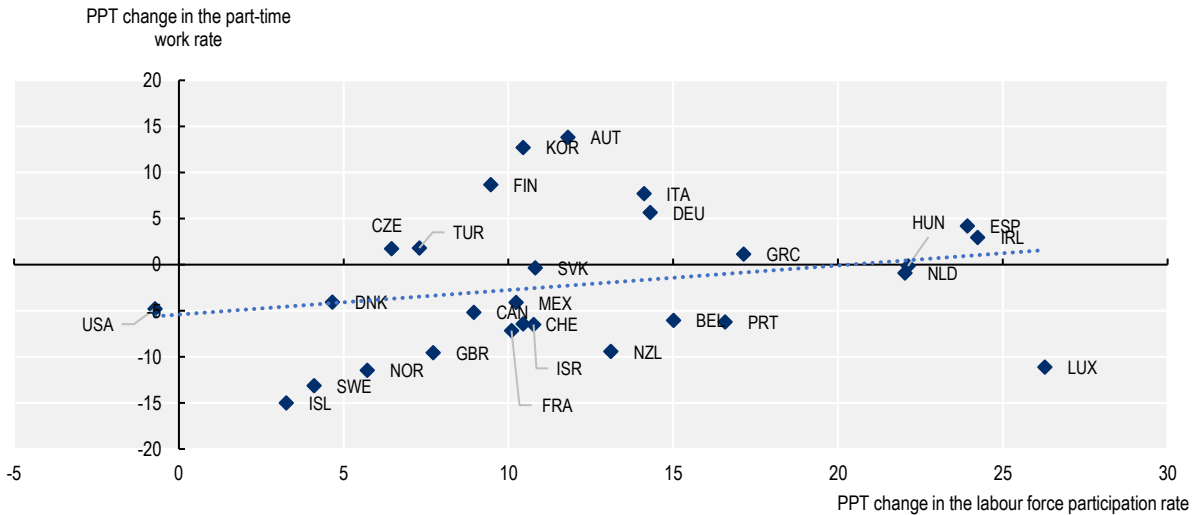
There is no clear link between rising women's labour force participation and a higher incidence of part-time work. Some countries, notably Austria, Korea, Finland, or Italy, did experience rising women's labour force participation (in the range of 10-15 percentage points) combined with rising part-time employment among women (in the range of 9-14 percentage points, Figure 3.3).

This is consistent with a narrative of the rising incidence of part-time work being a consequence of increasing female labour force participation (a composition effect): as the share of working women rises, the additional women entering the labour force are more likely to have a lower number of desired working hours (OECD, 2019^[5]).

However, other countries experienced an equivalent increase in women's labour force participation combined with a decrease in part-time work. Examples include Canada, Switzerland, France, Mexico, or Israel, where labour force participation increased by 10-15 percentage points, while the share of women working part-time decreased by around 4-7 percentage points. Indeed, the countries with the highest increases in labour force participation (20 percentage points and more) had either low (below 5 percentage points, Spain, Ireland) or no increases in the incidence of part-time work (Hungary, the Netherlands), or even strong decreases (more than 10 percentage points, Luxembourg).

Figure 3.3. The link between increases in women's labour force participation and part-time work is weak

Percentage point changes in labour force participation and the part-time rate, 1995-2022, women aged 15-64



Note: Part-time in this figure is defined as dependent employees who usually work less than 30 hours per week in their main job. Korea does not have data on dependent employment by full- and part-time status, so data on total employment by full- and part-time status are substituted. Source: OECD Stat.

3.1.2. ...while men increasingly work part-time

Men, in contrast, increasingly work part-time, although their part-time rate is still much lower than that of women (Figure 3.4, top panel). The incidence of part-time work among men rose in almost all countries with the exception of the United States, New Zealand and Portugal, from 6% to 7% from 1995-2022 (Figure 3.4, bottom panel), with most of the increase taking place during and shortly after the GFC (Figure 3.1, right panel). Against the backdrop of stagnant labour force participation (Figure 3.1, left panel), this suggests a total decrease in the labour supply of men, on average, across OECD countries. Rises in part-time work were particularly striking in the Netherlands (8 percentage points), Finland (7 percentage points), and Korea, Germany and Austria (6 percentage points).

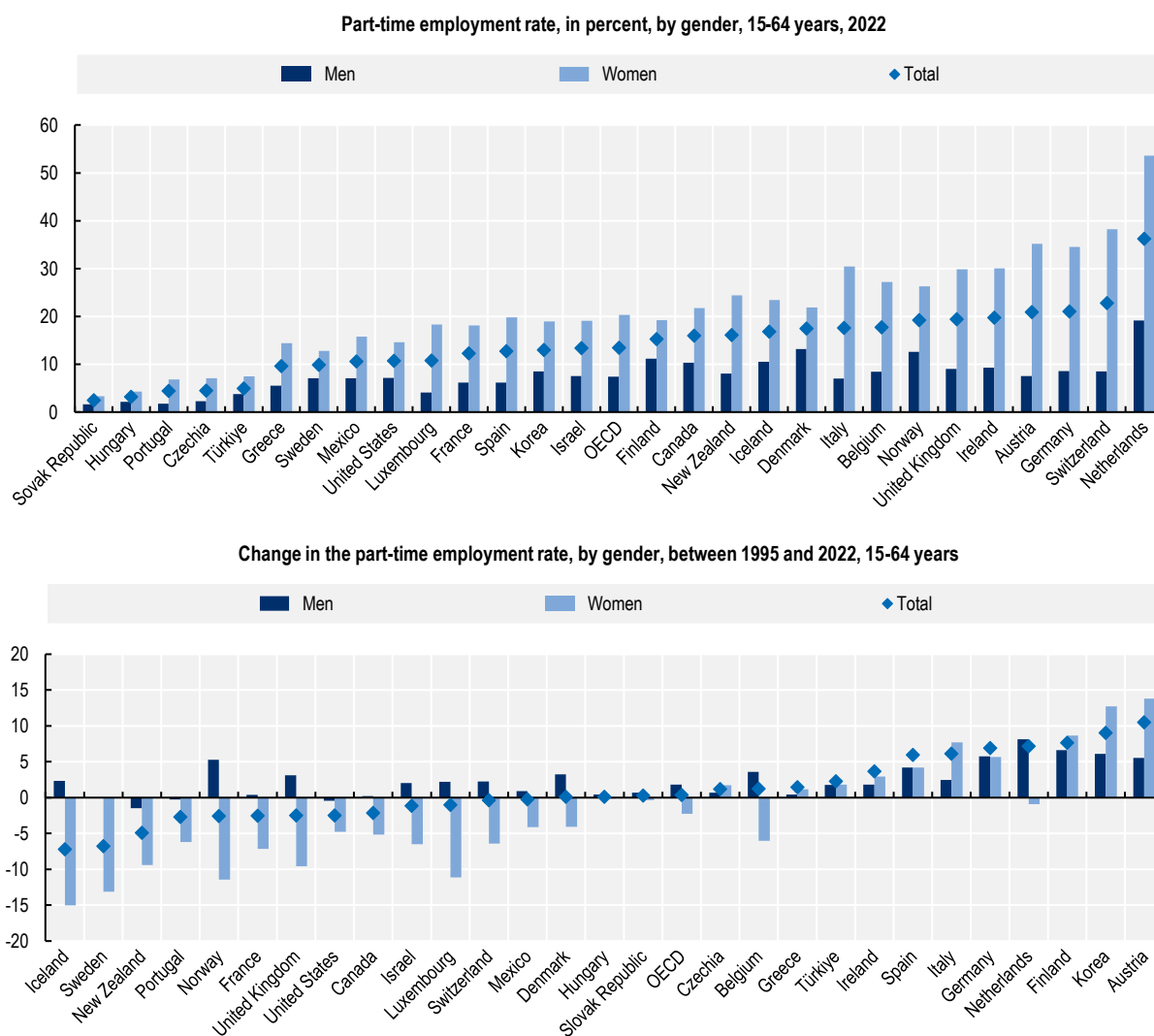
For both sexes, rises in part-time rates were driven by young workers (15-24): across the OECD on average, the part-time rate increased from 18 to 24% between 1995 to 2022 for young men, and from 28 to 37% for young women, likely driven by rising post-secondary education enrolment rates (Annex Figure 3.A.1). The stronger effect for women is likely connected to women's enrolment in post-secondary and tertiary education catching up with male enrolment: in all OECD countries, women are now more likely than men to start a post-secondary programme (OECD, 2023^[6]).³

For prime-aged men and women, however, the gender difference becomes apparent: prime-aged (25-54) women's part-time rates decreased from 21 to 17% across the OECD average, and for older women (55-64), part-time rates decreased from 29 to 24%, showing increasingly robust late-career labour force attachment. Prime-aged women's part-time rates decreased in almost all countries, except Austria (+11 percentage points), Korea (+9 percentage points, from a very low level in 1995) and Italy (+6%, Annex Figure 3.A.1, bottom panel).

In contrast, part-time rates for prime-aged men rose from the low level of 3 to 4%, and 7 to 8% for older men. Changes were small and positive in most countries, with the notable exception of Sweden (significant

decrease in the part-time rate for late-career men). Increases for prime-aged men were highest in high income countries Finland and Denmark (+5 percentage points), Norway, Germany, Korea and Austria (+4 percentage points, Annex Figure 3.A.1, top panel).

Figure 3.4. While men's part-time employment rates increased in nearly all countries, the picture is more mixed for women



Note: Part-time in this figure is defined as dependent employees who usually work less than 30 hours per week in their main job. Korea does not have data on dependent employment by full- and part-time status, so data on total employment by full- and part-time status are substituted. The OECD average for labour force participation rates excludes Chile, Colombia, Lithuania, Latvia, and Slovenia because of a lack of consistent available data for this long timeline. The OECD average for part-time employment rates excludes Australia, Chile, Colombia, Costa Rica, Estonia, Japan, Lithuania, Latvia, Poland, and Slovenia because of the lack of available data back to 1995.

Source: OECD Stat.

3.1.3. Labour market slack, caregiving, or preference for leisure?

Labour market slack did contribute to the rising propensity of men to work part-time during the GFC, but underemployment cannot explain the persistent increase in male part-time work. At the beginning of the GFC, the share of male part-time workers who could not find a full-time job increased from 19% in 2008 to

23% in 2009 and remained elevated until 2015, when it started to decline (OECD, 2024^[7]). This labour demand effect is clearly visible in the overall incidence of male part-time employment, that increases steeply at the onset of the GFC and dips in the boom years leading up to the COVID-19 crisis (Figure 3.1, right panel). However, the male part-time rate did not decline in line with underemployment during the economic recovery following the GFC. In 2022, the share of male part-time workers who could not find a full-time job was back at 16%, lower than before the GFC – in fact, at the lowest level since 2001, when the male part-time rate was 5.8%. Yet, in 2022, yet the male part-time rate was 7.4%, the same as at the height of the GFC.

The extent to which men reduced their working hours to share unpaid care more equally with their partners is less obvious from the aggregate results, but also more difficult to examine with readily available data sources. For instance, in Europe, the part-time rates of men with and without children evolve in parallel over the business cycle, with men without children being *more* likely to work part-time – this could of course be due to other confounding factors (such as men without children being younger).⁴

The EU-LFS (Eurostat, 2023^[8]) provides survey evidence on reasons for part-time work, but a high share of respondents (more than half on average across countries) choose vague answers, including “other personal reasons”, “other family reasons” or “other reasons”. With this caveat in mind, on average across 27 EU countries, Norway, Switzerland, and the United Kingdom, around a quarter⁵ of part-time workers report working part-time because they could not find a full-time job – this share reaches 50% and more in Spain, Italy and Romania (2022). Around 17% of part-time workers combine work with education or training, significantly more men (25%) than women (15%). In contrast, more women work part-time to care for children or adults with care needs (19%), compared to only 7% of men. Given the incidence of non- and vague replies, as well as the introduction of a new answer category (“other family or personal reasons”) in 2021, it is difficult to interpret changes in these shares over time. Zooming in on prime-aged men in countries where part-time increased the most and for which data are available results in a mixed picture. In Denmark, where the share of prime-aged men working part-time increased by 5 percentage points, the share of men working part-time because of care responsibilities did not increase. In Germany and Austria, where male part-time rate increased by 4 percentage points, the share of prime-aged men working part-time because of care responsibilities increased from 3% to 7% in Germany, and from 5 to 7% in Austria.⁶

Astinova et al. (2024^[9]) decompose the decline of working hours in European countries across socio-economic groups. They also find that the decrease in working hours is mostly driven by the young (connected to longer periods in education) and by men. In European countries and between 2003 and 2019, men’s average weekly working hours declined by 1.12 hours on average more than women’s. Men with children under the age of five experienced an additional decline of 0.5-0.8 hours per week. Thus, of the overall trend decline in men’s working hours, less than half is driven by men with young children. They also show that the share of men with children under the age of five who say that they work part-time because of caring responsibilities increased somewhat between 2006 and 2019, although still only a quarter of part-time working men with children under five give that as the reason. Future research should explore men’s reasons to work part-time in more detail. For instance, time-use data could reveal how much time part-time working men spend doing unpaid care work.

Another possible explanation for the increasing propensity to work part-time is an increasing preference for leisure – rising real wages as a result of economic growth could mean that workers increasingly value leisure as their wages increase. Using data on working hours over the past 150 years across 15 OECD countries, Boppart and Krusell (2020^[10]) show that hours worked fell at a steady rate of about 0.3-0.5% a year, consistent with steady productivity growth and a set of preferences that mean that the income effect of higher labour productivity dominates the substitution effect: as workers become richer through productivity growth, they prefer more leisure time to increased consumption. Astinova et al. (2024^[9]) also show that countries with higher GDP per capita have fewer average working hours, pointing to a dominant income effect: as wages and thus income increase, workers opt for more leisure time.

3.1.4. What implications for social protection?

The continued strengthening in women's labour force attachment – both on the extensive as well as on the intensive (hours) margin – broadens the financing base for social protection systems across OECD countries. It may also help alleviate labour shortages that start to emerge because of population ageing, at least in the short and medium term, and until labour force participation rates of men and women are broadly aligned.

It also means that women increasingly acquire their own social protection rights, which will support their income security, especially in old age. This should ameliorate some of the pressures on means-tested last-resort pensions, given that an increasing number of older people (especially women) live alone, often without a survivor's pension (see Chapter 4).

At the same time, the still high incidence of part-time work among women – consistently higher than among men – leaves them less economically secure than full-time workers (OECD, 2019^[5]). Women work part-time in large part due to the uneven sharing of care and housework responsibilities (Chapter 4). This means women continue to accumulate fewer entitlements to contribution-based benefits, in particular old-age pensions, and might not acquire sufficient rights to out-of-work support such as unemployment or sickness benefits to lift them above the poverty line.

The increasing propensity towards part-time work among men has much the opposite effect, diminishing labour supply at a time of labour shortages, and weakening rights to contribution-based benefits, including pensions. However, if this trend is indeed driven by an income effect, this would mean that part-time working men would still make higher contributions, and therefore enjoy more economic security in the event of job loss than women who work part-time because of caring responsibilities and have more fragmented careers as a result.

If the income effect is indeed the driver, however, it could be the case that the increased labour force attachment of women is a transitory effect, driven by women catching up with men in terms of education and wages, and that they, too, might decrease their working hours in the long term when they reach a sufficient wage level.

A persistent trend towards part-time work would negatively impact the main funding source for social protection, the aggregate wage bill, already diminished by population ageing. The sustainability of pay-as-you-go pension systems in particular hinges on productivity growth compensating for negative population growth *even if* labour supply is constant (Aaron, 1966^[11]). This means that even higher productivity growth would be necessary to preserve social protection funding if the incidence of part-time work increases in the long term.

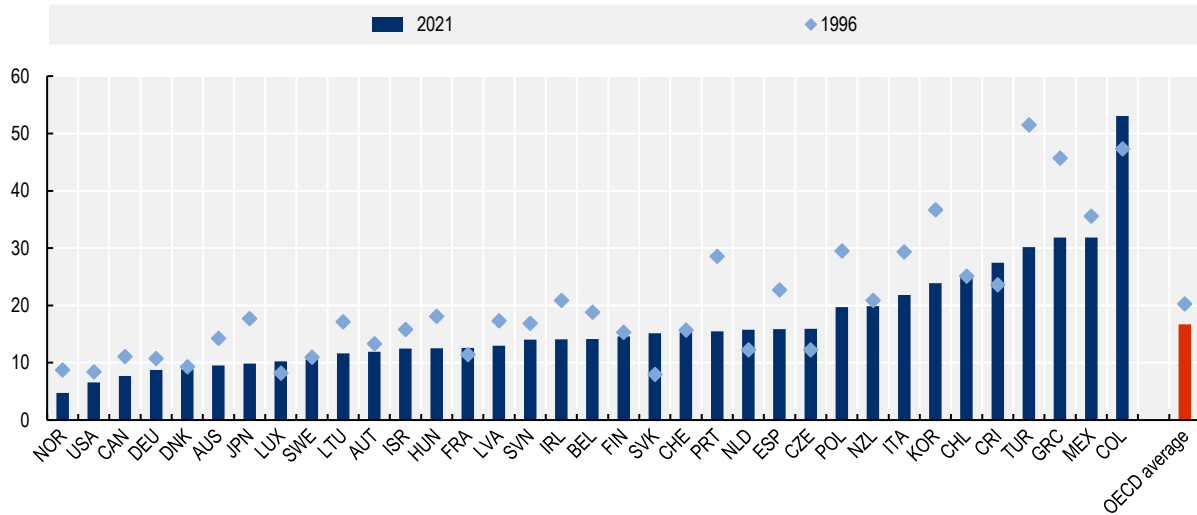
3.2. Trends in self-employment

3.2.1. Overall, self-employment is trending downwards

Self-employment has been on a slow decline in developed economies throughout the second half of the 20th century and into the 21st century. For instance, the share of self-employed workers⁷ in the US labour force fell from over 20% in 1948 to 11% in 1973. This decline was driven primarily by the decline in share of the labour force in agriculture, as well as small craft and retail businesses (Steinmetz and Wright, 1989^[12]). There was a slight increase in self-employment in most OECD countries during the 1970s and 1980s, mostly among self-employed workers without employees, likely connected to labour market slack weak labour demand (Gottschall and Kroos, 2007^[13]; Blanchflower, 2000^[14]). Since the mid-1990s, however, the incidence of self-employment has decreased in almost all OECD countries, with the exception of Columbia, Costa Rica, Czechia and the Slovak Republic (Figure 3.5).

Figure 3.5. The incidence of self-employment is declining in many OECD countries

Self-employment in percent of total employment, 1996 and 2021 or nearest available year



Note: No data available on Estonia. The earliest year available is 1998 for Latvia, 2000 for the Slovak Republic and Türkiye, 2003 for France, 2004 for Luxembourg, 2005 for Mexico, 2007 for Colombia and 2010 for Switzerland, Chile and Costa Rica. The latest available year is 2015 for the Slovak Republic and 2020 for Türkiye.

Source: OECD (2023^[15]), "Labour Force Statistics: Summary tables", *OECD Employment and Labour Market Statistics (database)*, <https://doi.org/10.1787/data-00286-en>.

3.2.2. Measuring freelancing/independent contracting and platform work is not straightforward...

There are however concerns that the number of independent contractors or freelancers who work for few or even only one client, in particular those whose work is mediated by online platforms (so-called platform workers), is rising. They, like other self-employed workers, have limited access to social protection (see below), are not covered by employment protection or minimum wages, and are typically not allowed to engage in collective bargaining. Unlike other self-employed workers, they also operate with little or no business capital, and if they are dependent on a few or only one client (as often is the case with digital labour platforms), they also do not enjoy entrepreneurial freedoms, e.g. setting their own prices or working hours (OECD, 2018^[2]).

Quantifying the extent of this phenomenon is complicated by several factors:

1. Labour force and household surveys do not typically distinguish between freelancers/platform workers and other self-employed workers. On aggregate, the incidence of self-employment according to labour force surveys shows a downward trend in most OECD countries (see also Figure 3.5); however, a decline in "regular" self-employed workers could mask a concurrent rise in freelancing/platform work. Indeed, self-employed workers without employees have grown as a share of all self-employed workers in about half of all OECD countries since the beginning of the century. However, even in the group of solo-self-employed workers, there is considerable heterogeneity: it includes occupations such as farmers and childminders, as well as taxi drivers and lawyers (Boeri et al., 2020^[16]).
2. Some freelancers, in particular those who work for only one client (and may in fact be misclassified) may state that they are dependent employees when asked (Abraham et al., 2023^[17]).

3. Independent contracting or gig-work, including work mediated by online platforms, is often used to supplement income from other sources, as opposed to being the main income source, leading to underreporting in survey data (because of its low salience). This may explain the increasing discrepancy between stagnant numbers of self-employed workers in labour force surveys and increasing self-employment income in tax data: the number of workers who earn additional income through self-employment is growing, but not the number of workers who are self-employed as their main job (Abraham et al., 2021^[18]).
4. Income from self-employment is often underreported in tax returns, and strategic reporting of income particularly widespread among the self-employed, making administrative sources less reliable. For instance, about half of all workers who reported having self-employment income in the US Labour Force Survey (Current Population Survey, CPS) between 1996 and 2015 did not report any self-employment income in the same year in their tax returns (Abraham et al., 2021^[19]). At the same time, about two-thirds of those who declared income from self-employment in their tax returns did not report being self-employed the labour force survey (Abraham et al., 2021^[19]).

Garin, Jackson and Koustas (2022^[20]) show that about 60% of the rise in declared income from self-employment in US tax data between 2000 to 2018 can be explained by an increase in self-reported earnings by individuals who can benefit from Earned Income Tax Credits (EITC) payments by reporting the income. This strategic behaviour has increased over time as knowledge of the EITC has spread. This highlights that administrative data is not necessarily superior to survey data, at least as far as measuring self-employment is concerned.

3.2.3. ... but available evidence indicates that only a small share of workers are affected, and that earnings are often used to supplement other income

There are few dedicated surveys with a sample size sufficient to enable robust estimates of the share of gig- and freelance workers. In the United States, the Contingent Worker Supplement of the Current Population Survey (CPS) estimates the share of independent contractors and freelancers (including, but not limited to platform workers) to be around 6-7% of total employment, with no growth in alternative work arrangements between 2005 and 2017 (Bernhardt et al., 2022^[21]; Abraham et al., 2023^[17]). It has, however, not been repeated since the 2017 wave.

Abraham et al. (2023^[17]) contracted Gallup to administer a contract work module yielding around 60 000 respondents in the United States in 2018/19. They find that around 9-11% of all respondents who initially state that they are dependent employees reveal themselves to be independent contractors following further probing. This almost doubles the share of contingent workers compared to the CPS Contingent Worker Supplement. Workers who misclassify themselves are more likely to have low education, and to belong to a racial or ethnic minority.

The 2016 Canadian Labour Force Survey included a question on whether the respondent had offered services on a digital, peer-to-peer ride service such as Uber or Lyft (0.3% had) or offered private accommodation services, such as via AirBnb (0.2% had) (Statistics Canada, 2017^[22]).

Jeon, Liu and Ostrovsky (2021^[23]) seek to identify freelancers, platform workers and others with unreliable or “gig” income by looking at unincorporated self-employed workers without a business number in Canadian tax data. They find that the share of workers who report such income increased from 5.5% to 8% between 2005 and 2016, that around half of these workers also had income from wage or salaried employment, and that income from self-employment was low, with a median of CAD 4 300.

Collins et al. (2019^[24]) look at independent contractors who received income for work contracted by firms, or mediated by firms, in US tax data. They are able to identify online labour platforms using employer names. They find that in 2016, about 1% of the workforce received income through labour platforms, and that most of these workers have income from other sources, with a median income from platform work of

USD 2 500. Similarly, Bernhardt et al. (2022^[21]) find that 1.4% of workers in California had income from online platforms in 2016.

3.2.4. What implications for social protection?

Self-employed workers generally have less access to social protection than dependent employees. For instance, in 2020, only 11 of 36 OECD countries with available information offered self-employed workers the same unemployment protection as dependent employees; another seven offered partial access, i.e. with lower amounts and/or more stringent eligibility criteria than for dependent employees. In five countries, the self-employed had the option to join a voluntary unemployment insurance scheme, but membership rates were often low – under 1% of all self-employed workers in Austria and Korea, 3% in the Slovak Republic and 10-15% in Finland⁸ (European Commission, 2022^[25]; Park, 2020^[26]). 13 countries did not offer any unemployment insurance benefits for self-employed workers (Denk and Königs, 2022^[27]). Self-employed workers also contribute less to old-age pensions than employees and receive lower pension benefits when they retire. OECD research shows that, in 2015-2017 and on average across 15 OECD countries, the median self-employed worker's pension was 22% lower than the median dependent worker's (OECD, 2019^[28]).

The COVID-19 pandemic brought the lack of social protection coverage of self-employed workers back into focus, as countries had to introduce new programmes to support them at speed. Often, these emergency support measures lead to overpayments due to the difficulty setting up new infrastructures to establish previous earnings histories, they were also necessarily not balanced by contributions. As a result, a number of countries have extended, or are considering to extend the social protection coverage of the self-employed, e.g. Belgium, Ireland, Italy, Latvia, Luxembourg or Portugal (OECD, 2023^[29]; Eurofound, 2024^[30]).

One argument against unemployment protection for the self-employed is that running a business does – and should – imply risk, because self-employed workers control the success of their businesses in ways that employees do not. Providing them with unemployment insurance can therefore be prone to significant moral hazard – with no employer to confirm a layoff, it is difficult to establish whether a loss of income is caused by a (prior) lack of effort, or external circumstances leading to business failure (OECD, 2018^[2]).

However, not all self-employed activity is equally entrepreneurial, some self-employed workers are economically dependent on one or very few clients, and moral hazard can also be a challenge for dependent employees. Careful policy design and complementary measures can mitigate moral hazard, e.g. making benefit receipt conditional on active job search and other activation measures, including monitored job-search and training (OECD, 2023^[31]).

As countries seek to ensure effective social protection in a changing world of work, one pragmatic way to circumvent moral hazard problems would be to insure self-employed workers only for income losses during sector- or even economy-wide shocks, as opposed to idiosyncratic ones (Franzini and Raitano, 2020^[32]). This would limit moral hazard (although seasonality needs careful consideration), and provide protection in future crises, as along with access to activation, training and employment support services. Only partially insuring the risk of job loss can also lower contributions relative to standard workers, an advantage given that the self-employed are necessarily liable for both employee and employer contributions.

Concerns about a rising incidence in platform work centre around workers being classified as independent contractors, although they may end up enjoying few of the advantages of self-employment – such as setting their own prices and working hours, and determine details of service provision such as working attire (OECD, 2018^[2]). Some platforms intervene in gig-workers' price setting, working time and work organisation to such an extent that they have been found to be the de facto employers by national courts. Many jurisdictions have "primacy of facts" principles that allow workers to be classified as employees if they meet minimum standards of dependency on and accountability. In European Union Member States,

320 judgements and relevant administrative decisions were issued between 2015 and 2022 (Eurofound, 2024^[30]). Platform workers have been found to be employees by courts more often than not, e.g. food delivery drivers in Spain in 2020, as the platform was deemed to determine their working conditions, or Uber drivers in France, as drivers could not independently access clients, and while they could choose their working hours, the platform determines prices, monitors execution and imposes sanctions on drivers. Similarly, in the United Kingdom, a decision to classify Uber drivers as “workers” was confirmed on appeal in 2021 (Aloisi, 2022^[33]). In cases of straightforward misclassification of dependent employees as independent contractors, labour law (when properly monitored and enforced) may thus be sufficient to ensure the adequate protection of workers.

Ensuring that workers are correctly classified also helps to prevent the erosion of social protection financing bases through regulatory arbitrage – employers lowering labour costs by choosing work arrangements with fewer social protection entitlements, and thus lower social security contributions. For workers, non-standard employment is especially attractive if contributions are lower than for standard dependent employment, while benefit entitlements are broadly similar. Where possible, both contributions and entitlements should therefore be aligned across employment forms.

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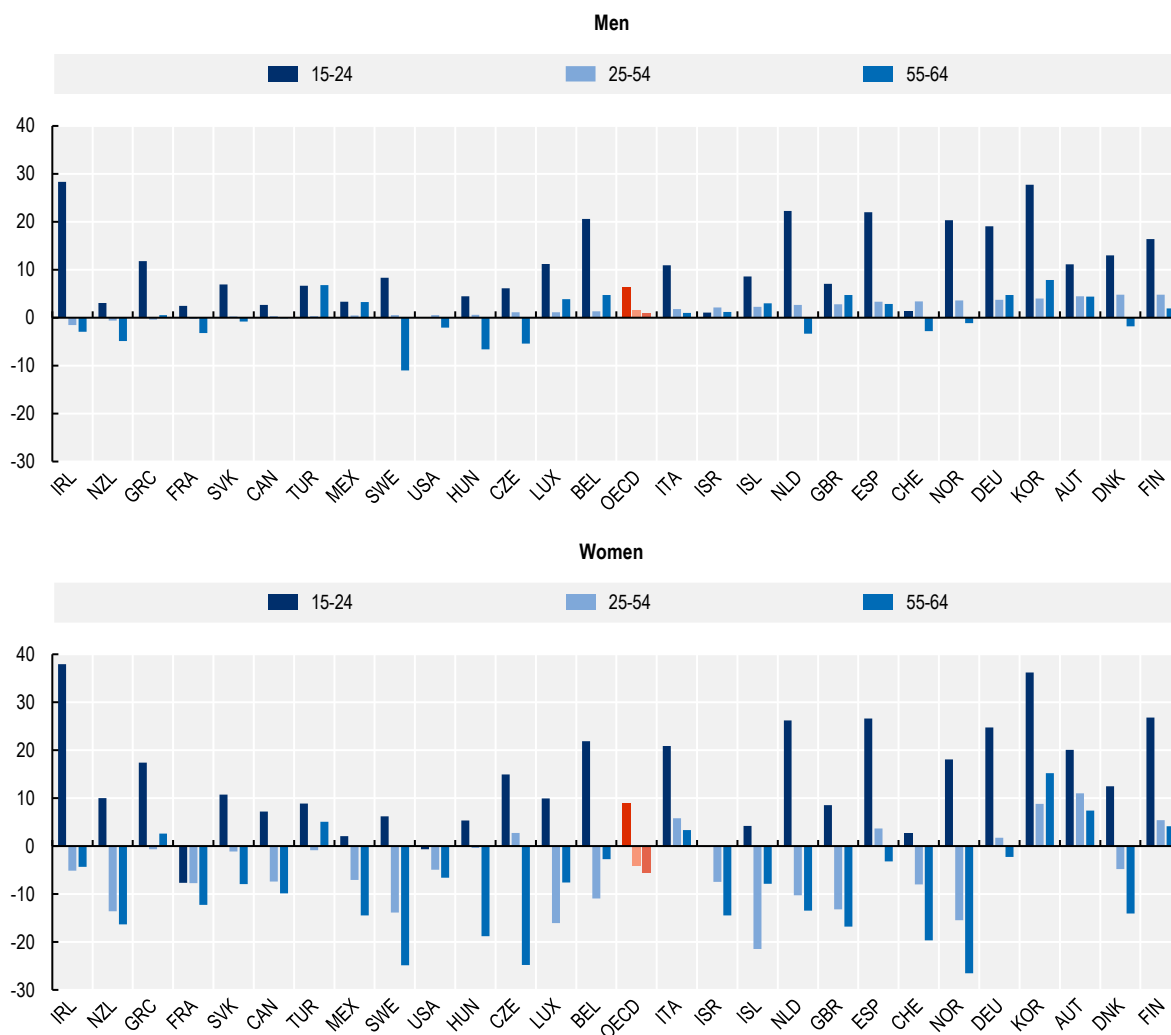
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Annex 3.A. Additional statistics

Annex Figure 3.A.1. The incidence of part-time work among prime-aged and late-career women fell in almost all countries

Percentage point difference in the part-time rate in 2022 and 1995, by gender and age-group



Note: No data for Australia, Chile, Colombia, Costa Rica, Estonia, Japan, Lithuania, Latvia, Poland, and Slovenia. For Korea, figures include total employment, not just dependent employment.

Source: OECD stat.

Notes

¹ 1995 is chosen to maximise the number of OECD countries with consistent data (29 countries). The OECD average excludes Chile, Colombia, Lithuania, Latvia, and Slovenia.

² Note that “significantly” refers to a change of more than 10%.

³ The incidence of mental health problems among young people appears to have increased in recent years – chronic depression among 15-24 year-olds rose by one-fifth between 2014 and 2019 on average across EU countries with available data; during the COVID-19 crisis young people’s mental health deteriorated more than the population average (OECD, 2022^[34]; OECD, 2021^[35]). While health problems can cause a withdrawal from the labour market, there is currently no robust evidence that mental health problems are a significant contributor to young people increasingly working part time.

⁴ Secretariat calculations of part-time rates of men with and without children under the age of 15, unweighted average of 24 European countries with available data and the United States, from the EU-LFS and the US CPS, not shown.

⁵ This share is higher than the incidence of involuntary part-time workers across the OECD on average, 14%, roughly the same as in 1995 (OECD, 2024^[7]).

⁶ Secretariat calculations based on the EU-LFS, not shown.

⁷ Including unpaid family helpers.

⁸ Note that unemployment insurance for dependent employees is also voluntary, albeit with higher enrolment rates.

4 Changing societies, changing social policies

Valerie Frey, Raphaela Hyee and Jasmin Thomas

As populations age, elder care demands will likely grow, further stretching already-insufficient formal caregiving supply. In the short-term, much of this unpaid care work will likely fall to women, whose career progression and remuneration are still highly constricted by societal norms and unpaid caregiving responsibilities. At the same time, family forms are changing. The traditional, married, two-parent household is far less common than it was two decades ago, with implications for tax-benefit systems that have historically privileged this family structure. People increasingly live alone – particularly in old age – heightening their economic risk. This chapter takes stock of these broad societal trends affecting social protection systems going forward.

Accompanying demographic transitions and the evolving labour force are changes in how – and with whom – people live. Though women have made tremendous strides in working for pay outside the home (Chapter 3, (OECD, 2023^[1])), they still experience a motherhood penalty in wages and labour force participation due to unpaid childcare obligations, and they face a higher poverty risk than men in working age and old age. Going forward, at least in the short run, women will likely also continue to bear a significant share of the burden of societies' impending unpaid *elder* care demands.

While unpaid work persists and expands, the structure of families is shifting away from married couples towards more diverse family types, including unmarried two-parent households, adults living alone, and single-parent households. These changes have implications for socio-economic outcomes: for example, single-parent households, often headed by women, face higher poverty risks than two-parent households across OECD countries. Governments should therefore continue to monitor unpaid care obligations and reassess governments' role in publicly supporting childcare and long-term care infrastructure, to ensure that all people can achieve economic security.

This chapter explores the pressure of childcare and growing eldercare demands on unpaid work obligations (Section 4.1), the shift away from two-parent households in OECD countries (Section 4.2), and the rise in single-adult households (Section 4.3), closing with a discussion of the implications of these changes for social policies (Section 4.4).

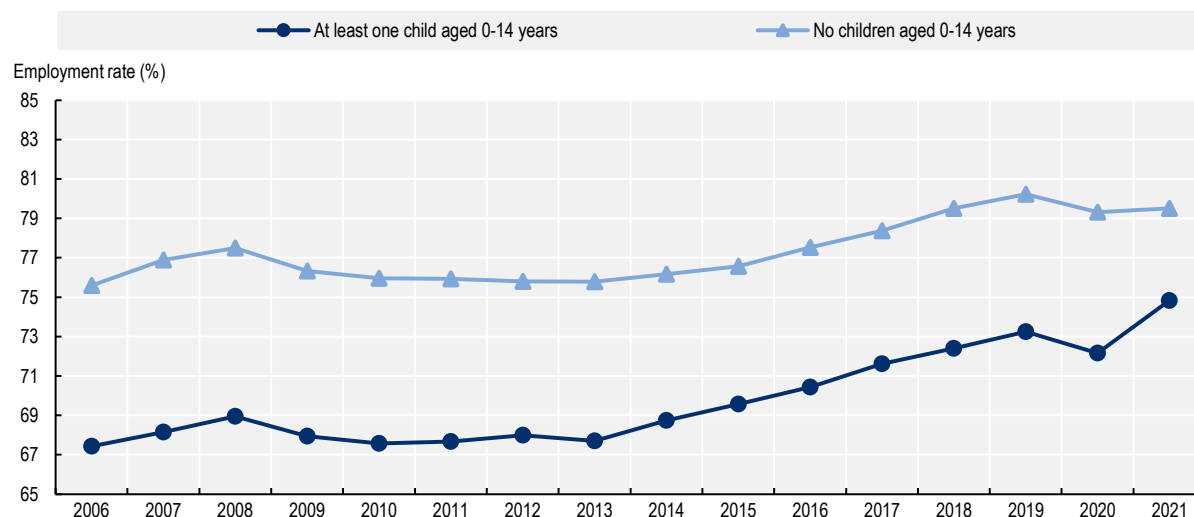
4.1. Motherhood penalties meet eldercare demands

A historic, ongoing and likely future barrier to gender equality is “traditional” family norms around unpaid work. Throughout the world, gender inequalities in workforce participation, hours, pay, unpaid work and household responsibilities increase when women become mothers. Looking ahead, obligations around childcare are likely to combine with growing obligations around eldercare, preventing certain groups – particularly women – from engaging fully in paid work. Women with both childcare and eldercare responsibilities are often referred to as “sandwich caregivers” (Lei, Leggett and Maust, 2022^[2]).

Although women are increasingly likely to be in the labour force (Chapter 3), the gap in the employment rate between mothers of dependent children and women without dependent children remains remarkably persistent (Figure 4.1). Looking at labour force inactivity, on average across 27 EU countries, 26% of inactive women aged 25-54 years report that their main reason for not seeking work is to care for children or adults with disability;¹ among men, only 4% point to care obligations as their main reason for inactivity.

Figure 4.1. Despite gains over time, mothers of dependent children remain much less likely to work than other women

OECD-21 unweighted average employment rate (%) for women (25- to 54 years-old) with at least one child aged 0-14 and without any children aged 0-14



Note: Unweighted average of the 21 OECD countries for which comparable data are available between 2006 and 2021: Austria, Belgium, the Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Poland, Portugal, the Slovak Republic, Slovenia, Spain and the United States.

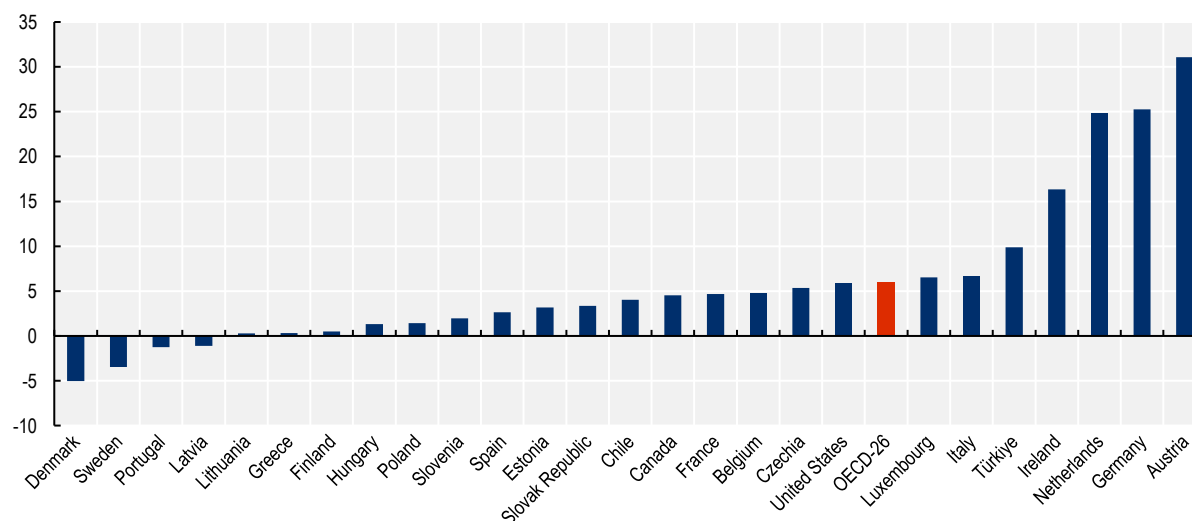
Source: Secretariat estimates of LFS microdata.

Even after decades of public investments, the supply of good-quality, affordable childcare and out-of-school hours (OSH) care is still insufficient to meet demand in most OECD countries, and mothers and grandmothers fill the bulk of this gap. Fewer than four in ten young children (under the age of three) are enrolled in formal early childhood education and care (ECEC) across OECD countries (OECD, 2023^[3]).

When mothers *do* engage in paid work, the so-called motherhood penalty in many countries results in lower working hours (Figure 4.2) for mothers than for women without dependent children (OECD, 2019^[4]). Mothers also garner lower earnings than women without children (Budig and England, 2001^[5]; Budig and Hodges, 2010^[6]; Correll, Benard and Paik, 2007^[7]; Gough and Noonan, 2013^[8]) – a result that holds even after accounting for selection effects into motherhood, i.e. a woman's decision to become a mother (Miller, 2009^[9]). The combination of paid and unpaid work hours can impede mothers' work-life balance and hamper their career advancement.

Figure 4.2. Mothers of dependent children are more likely to work part-time than other women in most OECD countries

Difference between part-time employment rate of women with and without children aged 0-14 years, in percentage points, 2021



Note: Part-time in this figure is defined as dependent employees who usually work less than 30 hours per week in their main job.

Source: ELS calculations using EU-LFS.

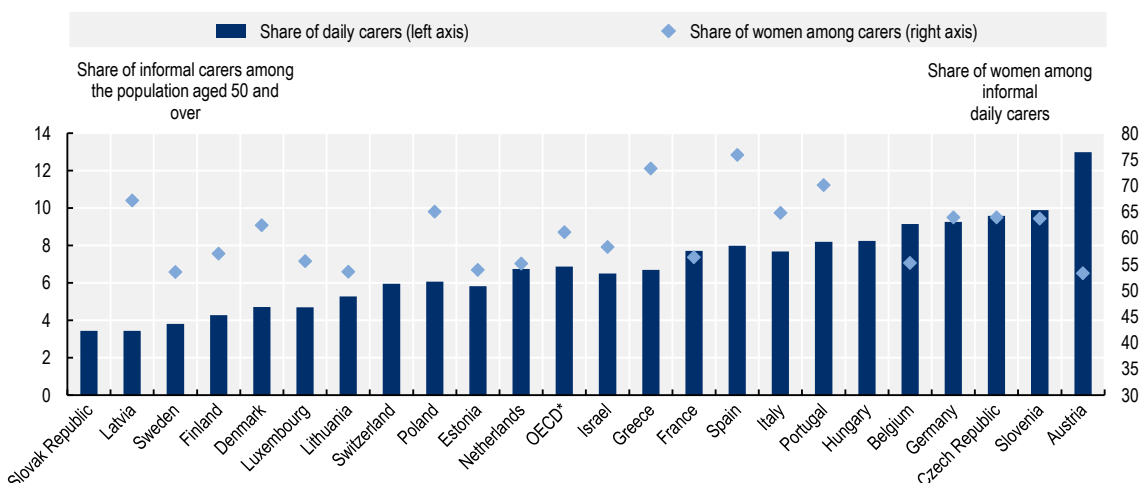
Of course, childcare is not the only unpaid care obligation in OECD countries. Unpaid care covers an important share of *long-term* care needs. These demands are expected to grow in the future alongside increases in life expectancy (OECD, 2023^[10]; Pinkus, Jensen and Borsch-Supan, 2023^[11]). Recent OECD estimates suggest that employment in long-term care (as a percentage of total employment) would need to rise by 32% over the next ten years to meet the expected increase in demand for caregiving (OECD, 2023^[10]).

Unpaid² long-term care is often provided by family and friends, acting both as complement to and a substitute for formal care. In 2019, around 13% of people over 50 years old provided some type of unpaid care at least weekly (OECD, 2021^[12]), and around 7% provide care every day (Figure 4.3). This estimate includes all forms of unpaid care – including childcare, care for people with a disability, and care for elderly people. As with all caregiving activities, unpaid caregiving is highly gendered, with women representing over 62% of people aged 50 years or over (in a comparison of 25 OECD countries) providing daily unpaid care Figure 4.3). Over half of those providing unpaid care are providing this care to their spouse or their parents.

Yet despite these considerable (unpaid) commitments of time and effort, 32% of people who suffer from limitations on daily activities report unmet care needs in a study of seven EU countries (Pinkus, Jensen and Borsch-Supan, 2023^[11]). Rates of unmet care needs are higher among people living alone.

Figure 4.3. Over 1 in 10 older individuals have daily caregiving responsibilities and the burden of caregiving largely falls on women

Share (%) of unpaid carers among the population aged 50 and over providing daily (left axis), and share of women among unpaid daily carers aged 50 and over (right axis), 2019 or latest



Note: The definition of unpaid carers differs between surveys. See “Definition and comparability” box in OECD (2021_[12]) for more details. *No data on the share of women among unpaid carers for Switzerland, Hungary, and the Slovak Republic. OECD is the average of 23 countries for the share of daily carers, and 20 countries for the share of women.

Source: OECD (2021_[12]), *Health at a Glance 2021: OECD Indicators*, <https://doi.org/10.1787/ae3016b9-en>

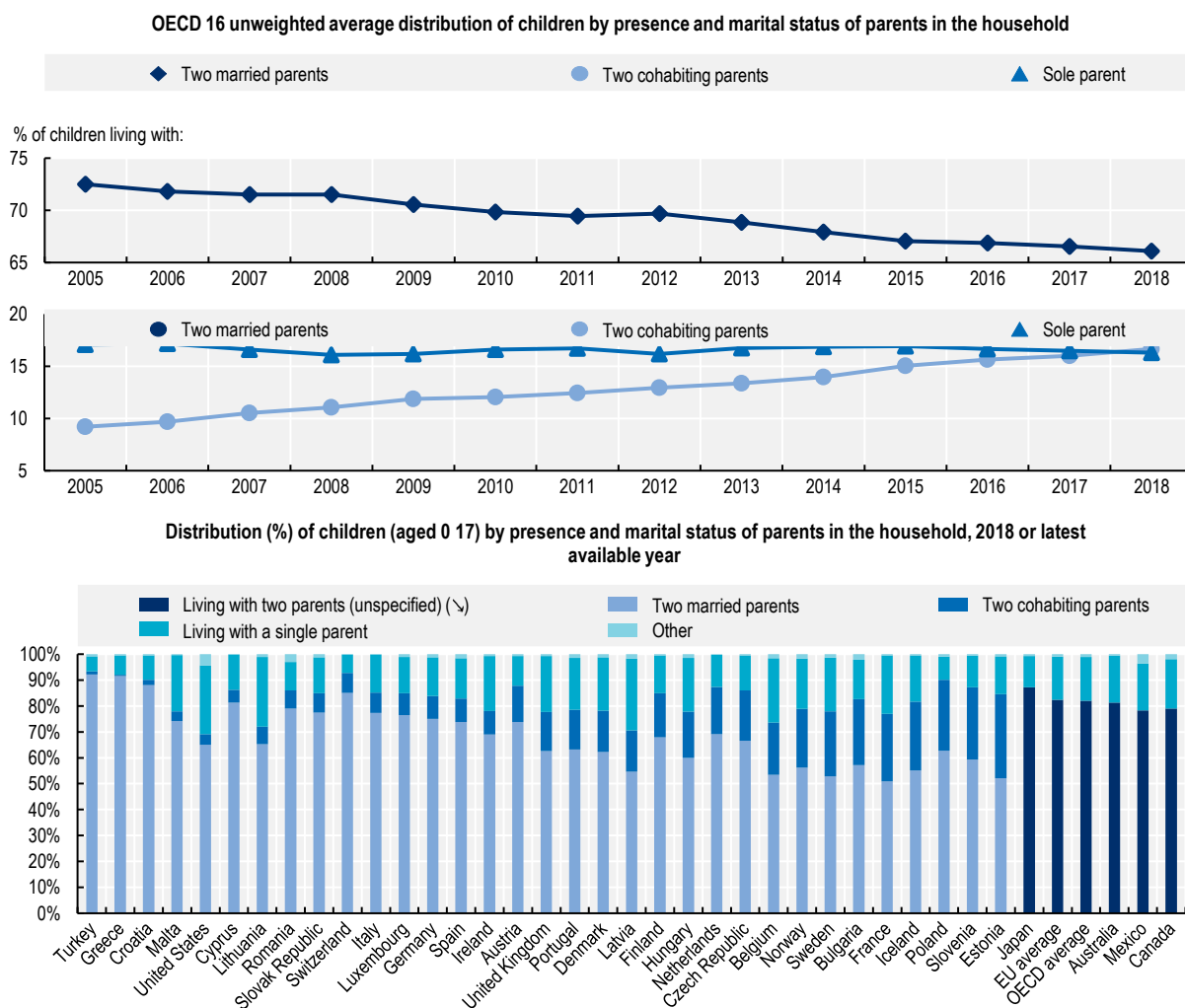
The extent to which unpaid caregiving reduces labour supply depends largely on the type and frequency of the care required. Across countries, caregiving tasks tend to be divided by gender (OECD, 2021_[13]; OECD, 2017_[14]), with older women more likely to perform tasks that are considered stereotypically “feminine”, such as housework (e.g. meal preparation, house cleaning, laundry) and personal care, and scheduling and co-ordinating appointments. Older men are more likely to perform tasks traditionally associated with men, such as house maintenance and outdoor work (Arriagada, 2020_[15]). Unpaid caregiving has the most negative effect on labour supply if it is provided often, e.g. on a daily basis or over 20 hours per week. Less frequent unpaid caregiving has weaker effects on labour supply (Ciccarelli and Van Soest, 2018_[16]; Carmichael and Charles, 1998_[17]).

Unpaid caregiving plays a critical role for elderly people and people with disability because the public provision of long-term care is insufficient in most OECD countries. The total cost of formal long-term care can be very high – around 1.5 to three times an older person’s median income, according to an OECD study of long-term caregiving in Europe. The same study found that in at least ten EU countries, older people with severe care needs would on average have to spend more than half of their income to pay for home care *even after* receiving public benefits and services for long-term care (OECD, 2023_[18]).

4.2. Changing family structures and the need to adapt tax-benefit systems

Most children still live in households with two parents. Over 80% of all children in most OECD countries, ranging from around 70% in the United States to 90% and over in Türkiye, Switzerland, and Greece (OECD Family Database), live in a two-parent home. Indeed, the share of single-parent households has been stable at around 16-17%, on average, over the past two decades (Figure 4.4).

Figure 4.4. Children increasingly likely to live with two unmarried, cohabitating parents



Note: Figure presents the unweighted average of the 16 OECD countries for which data are available for all years from 2005 to 2018. These 16 countries are: Austria, Belgium, Czechia, Denmark, Estonia, Finland, Germany, Greece, Italy, Latvia, Lithuania, the Netherlands, Poland, Slovenia, Spain, Sweden. Age definitions and year of data collection vary slightly by country; for detailed notes, see OECD Family Database Indicator SF1.2.A (www.oecd.org/els/soc/SF_1_2_Children_in_families.pdf), "Children in Families." "Parents" generally refers to both biological parents and step-, adoptive parents. "Living with two married parents" refers to situations where a child lives in a household with two adults that are considered parents and these parents are married to each other. "Living with two cohabiting parents" refers to situations where a child lives in a household with two adults that are considered parents and these parents are not married to each other. "Living with a single parent" refers to situations where a child lives in a household with only one adult that is considered a parent. "Other" refers to a situation where the child lives in a household where no adult is considered a parent. Age definitions and year of data collection vary slightly by country; for detailed notes, see OECD Family Database Indicator SF1.2.A (www.oecd.org/els/soc/SF_1_2_Children_in_families.pdf), "Children in Families."

Source: OECD Family Database, Indicator SF1.2.A.

The biggest shift in families' living arrangements has been the move from cohabitating married couples or couples in a registered partnership to unmarried, cohabitating couples. The share of children living with their (unmarried) parents increased from below 10% across 16 OECD countries with available evidence in 2005 to 17% in 2018. Indeed, children are more likely to be raised by two parents in the same home today than they were two decades ago – but, on average, the probability that these parents are married or in a civil union has gone down. The share of children living with their unmarried parents was highest in Estonia (32%), but also Slovenia, Poland, Iceland, France, Bulgaria and Sweden had shares of over 25%. The

share of children living with unmarried parents was lowest in Greece and Türkiye (around 1%) but also the United States (5%, Figure 4.4).

On average across OECD countries, 17% of children live in single-parent households, with rates highest in Belgium, the United States, Latvia and Lithuania (where around one in four children live in a single-parent household). The share of children living with just one parent was lowest in Türkiye, Switzerland, and Poland (fewer than one in ten children). With only one adult available to earn a living and to care for children, children living in single-parent homes face the highest risks of poverty and social exclusion (Miho and Thévenon, 2019^[19]). As shown below (Figure 4.6), 44% of single parents with dependent children were at risk of poverty or social exclusion in 2022, compared to 16% of households with two adults and one dependent child and 17% of households with two adults and two dependent children.

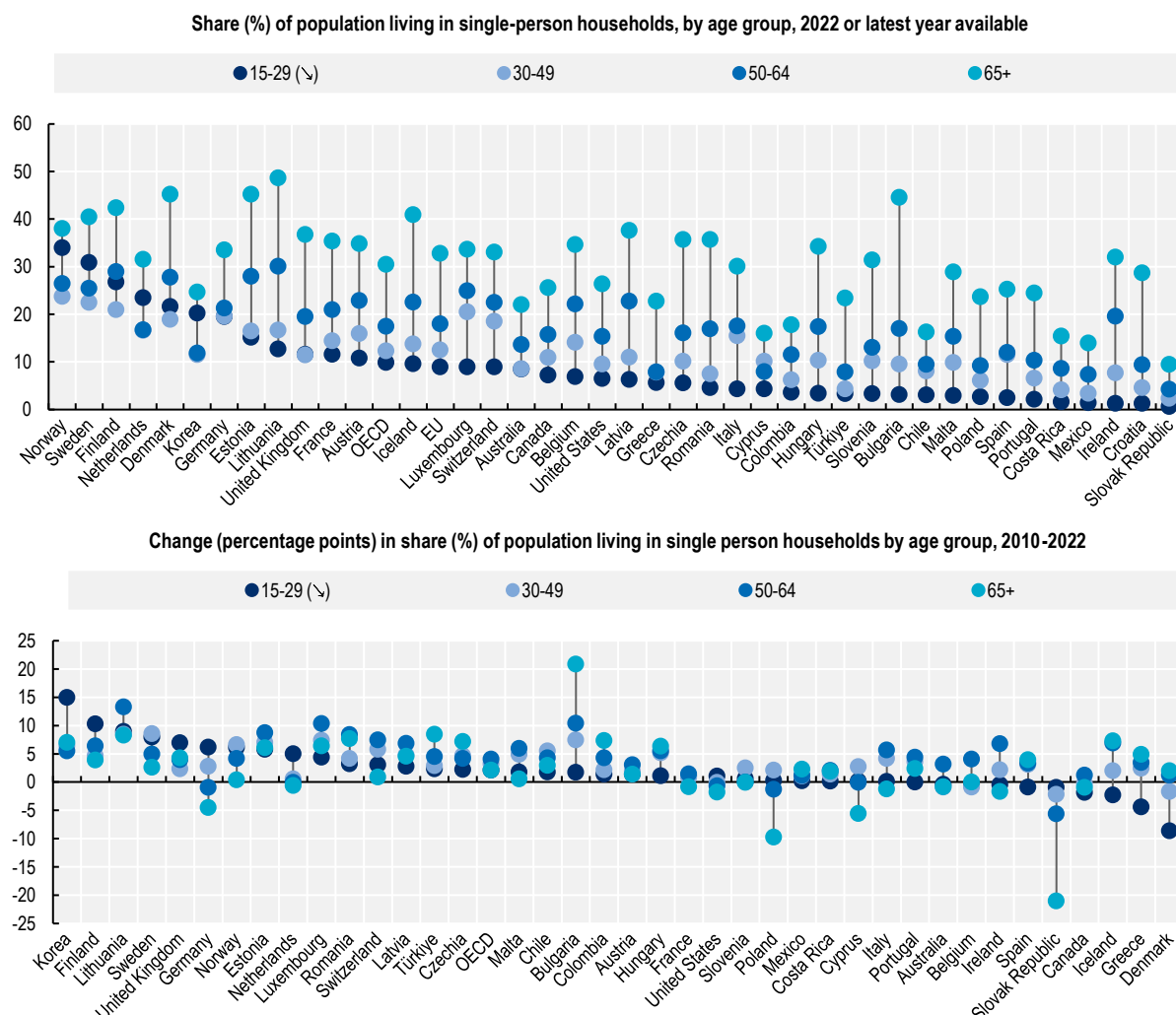
Despite the rising incidence of unmarried couples raising children, fewer than two-thirds of OECD countries allow non-married couples to register their partnership, and many countries continue to provide tax-benefit advantages only to married couples (Miho and Thévenon, 2019^[19]) (Section 4.4).

4.3. People increasingly live alone, facing a higher economic risk

Over time, there has been a strong shift toward a greater number of one-person households across OECD countries. In the United States, for example, 28% of all households were one-adult households, up from 8% in 1940 (U.S. Census Bureau, 2023^[20]). There are similar patterns across the OECD, including in the European Union (Eurostat, 2023^[21]), Canada (Statistics Canada, 2022^[22]), Australia (Australian Institute of Family Studies, 2015^[23]), and Korea (Park and Choi, 2015^[24]).

This is driven, in part, by a composition effect associated with population ageing. Older individuals, who make up an increasing share of the population, are more likely to live alone than younger individuals as they become widowed (Figure 4.5). Younger people are also increasingly likely to live alone, however. Among the 27 OECD countries with data available over the past decade, the share of the population living in one-person households rose across the entire age distribution in many countries (Figure 4.5, Panel B).

Figure 4.5. Across nearly all OECD countries and all age groups, people are increasingly likely to live alone



Note: In Panel A, data for Australia, Canada, Korea, Switzerland, the United Kingdom and the United States refer to 2021, for Norway and Türkiye to 2020 and for Iceland to 2018. In Panel B, data for Australia are for 2010-21, data for Canada are for 2010-21, data for Chile are for 2011-22, data for Colombia are for 2012-22, data for Iceland are for 2010-18, data for Korea are for 2010-21, data for Norway are for 2010-20, data for Switzerland are for 2010-21, data for Türkiye are for 2011-20, data for the United Kingdom are for 2010-21, data for the United States are for 2010-21. Data for the United States are calculated using experimental weights due to the lack of representativeness of the pandemic edition of the ACS. Although these weights partially correct for the problem of representativeness, they are not consistent with weights used in previous editions of the ACS. Therefore, 2020 data from the United States should be considered as a break in the series.

Source: Indicator 1.4.A1 in HM1.4 “Living arrangements by age groups,” Indicators on the Housing Market, OECD.

Without the protective effects of a second earner’s income, and unable to benefit from consumption economies of scale, single-adult households face a relatively high risk of poverty across OECD countries (Figure 4.6). In EU countries, for example, about one in three one-adult households is at risk of poverty or social exclusion. Among one-adult households, single-parent households (i.e. those with children) are most at risk of poverty or social exclusion.

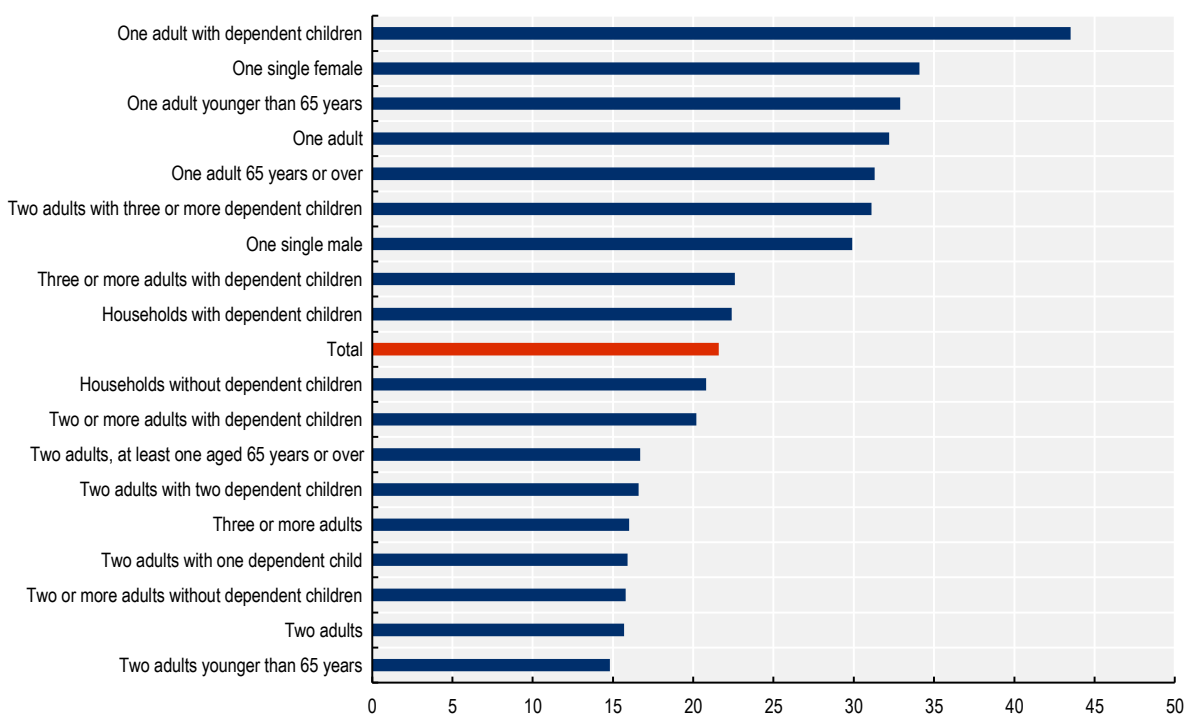
One way in which one-adult households can be disadvantaged in social protection systems is social housing. In Ireland, the supply of social housing “does not reflect the type of people on waiting lists,” with mostly three- and four-bedroom houses being acquired or built by local authorities, despite the fact that

single people account for the majority of those on waiting lists (Burns, 2018^[25]). The OECD Affordable Housing Database indicates the different priority groups that have been identified for social housing across countries, and single adults are not usually a priority group unless they meet other criteria, such as disability (OECD, 2023^[26]). At the same time, there is an undersupply of social housing in every OECD country, and housing authorities have considerable discretion in determining who is housed.

In the area of long-term care, the longstanding deficit in public support for elderly caregiving is keenly felt in single-adult elderly households, which report higher rates of unmet care needs in a study of seven EU countries (Pinkus, Jensen and Borsch-Supan, 2023^[11]). Older people living alone may be more likely to rely on unpaid care from working-age family members – with implications for labour supply.

Figure 4.6. Single-adult households both with and without children are the most likely to be at risk of poverty

Share (%) of households at risk of poverty or social exclusion by household composition, EU countries, 2022



Note: The risk of poverty and social exclusion includes three types of people: a) persons who are at risk of poverty (i.e. equivalised disposable income below the at-risk-of-poverty threshold, or 60% of national median equivalised disposable income after social transfers); b) persons who suffer from severe material and social deprivation (i.e. cannot afford at least seven out of 13 deprivation items, where six relate to the individual and seven to the household, and which are considered by most people to be desirable or even necessary to lead an adequate quality of life; and c) persons (aged less than 65 years) living in a household with very low work intensity (i.e. those living in households where adults worked for 20% or less of their total combined work-time potential during the previous 12 months).

Source: Eurostat (ilc_peps03n) based on the European Union Statistics on Income and Living Conditions (EU-SILC).

4.4. What implications for social protection?

As populations continue to age in all countries across the OECD, care needs will increase. The projected need for a 32% increase in the formal long-term caregiving workforce (as a percent of total employment) over the next decade, to meet impending care demands, is a challenging target (OECD, 2023^[10]). In the absence of large investments in formal long-term care, this care work will need to be provided by family,

friends and neighbors. Yet declining family sizes and increased geographical mobility – leading to greater distances between family members – suggests there may be fewer people to provide unpaid care in the future (OECD, 2021^[12]).

In addition, access to affordable high-quality childcare and out-of-school hours care remains limited in most countries (Frey, 2024^[27]). This is a major barrier to work for many working-age people, especially women, at a time when the working-age population is shrinking and tapping the full potential of the workforce is essential. If long-term care or childcare supports are inaccessible or unaffordable, these factors could potentially coalesce to impact women's ability to work outside the home, force shorter working hours, lead to burnout and stress, and worsen physical and mental health (Colombo et al., 2011^[28]).

These simultaneous demands around childcare giving and long-term caregiving for adults highlight the increasing need for investments in the formal care economy, including better pay and work conditions for care workers (OECD, 2023^[10]), and in social programmes that support unpaid caregivers (OECD, 2023^[10]). Indeed, OECD (2021^[12]) finds that fewer people provide daily care in countries with stronger formal long-term care systems, suggesting a substitutability between unpaid and paid care.

With an increasing share of children growing up in families with unmarried parents, social policy should consider approaches that would help create a more level playing field between cohabitating and married couples. Countries should re-assess the rationale behind offering tax advantages to married couples, regardless of the presence of children. Many OECD countries still confer sometimes substantial tax advantages upon married couples regardless of children, e.g. Czechia, France and Germany. In Belgium, Greece, Finland, Iceland and Italy, cohabiting couples are eligible for the same tax treatment as married couples only if they have children together (Miho and Thévenon, 2019^[19]).

Unmarried partners also often are not entitled to survivor benefits, or alimony in the case of separation. This usually disadvantages women, as they are often the financially weaker partner and more likely to be the primary caregiver of children. As discussed in Chapter 3, stronger female labour force attachment will also mean that women will increasingly have poverty-protecting pension entitlements of their own.

The increasing incidence of one-adult households mean that a higher share of the population lacks the protection of a second income. Access to adequate social protection is therefore all the more important. From a social protection funding perspective, the absence of private risk pooling may mean increasing reliance on public income support. Older people living alone also likely have even greater need for formal long-term care support, as otherwise they may need to rely on working-age family members.

Other family types may also experience barriers to access to social protection programmes or lack sufficient support, including multigenerational households, reconstituted family (stepfamilies) households, three-parent households and same-sex-parent households. Multigenerational households, for example, may be constituted out of necessity or to give or receive care or as a response to housing shortages. To ensure that social protection systems treat all families equally as societies and economic conditions change, policies and programmes must be regularly reviewed to adapt to emerging family types and household arrangements.

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Notes

¹ These two groups – adults with disability and children – are aggregated within one survey response and it is not possible to disentangle results for them separately.

² To note, this report refers to “unpaid care” when referencing care provided by family, friends, and neighbours who may or may not receive a subsidy from the government. As the rest of this report focuses on social protection, the term “informal” is dedicated to paid workers who are not covered by social security. In contrast, some of the literature on long-term care refers to unpaid family, friends and neighbours as “informal” carers.

5

Technological change and the labour market

Raphaela Hyee

Recent years have seen impressive advances in robotics and Artificial Intelligence, that seemed set to transform the world of work. This rapid progress has been accompanied by concern about the possible effects of AI and robotics deployment on the labour market, including worker displacements. This chapter reviews the available (and necessarily backwards-looking) evidence on the effect of automatisisation and AI on employment and wages, and discusses potential implications for social protection systems.

Recent years have seen impressive advances in robotics and Artificial Intelligence (AI), that seemed set to transform the world of work. AI, in particular, has advanced at an astounding pace in the areas of image and speech recognition, natural language processing, translation, reading comprehension, computer programming and predictive analytics (Georgieff and Hyee, 2021^[1]). This rapid progress has been accompanied by concern about the possible effects of AI and robotics deployment on the labour market, including on worker displacement.

However, employment levels have been rising in most OECD countries for decades (see Section 3.1), even as advances in robotics and information technology have enabled the automation of some tasks. While employment growth has a variety of different contributing factors, upward trends in employment rates seem at odds with fears around technological unemployment.

Indeed, empirical evidence on how past waves of technological change have impacted labour markets document positive net effects on job creation (see below). In general, technological progress improves labour efficiency by (partially) taking over/speeding up tasks performed by workers. This leads to an increase in output per effective labour input and a reduction in production costs. The employment effects of this process are ex-ante ambiguous: employment may fall as tasks are automated (substitution or displacement effect). On the other hand, lower production costs may increase output if there is sufficient demand for the good/service (productivity effect).¹ New technologies may also create new tasks, leading to the emergence of new jobs (reinstatement effect). Thus, while some jobs may disappear and tasks within jobs may change, new jobs can also be created (Georgieff and Hyee, 2021^[1]). Which of these effects dominates is an empirical question.

5.1. Automation does not (yet) seem to have led to (net) job destruction

In response to a widely cited prediction that 47% of US jobs were at risk of being automated over the next 10-20 years (Frey and Osborne, 2017^[2]), the OECD created an alternative measure of automation risk by occupation that placed greater emphasis on the heterogeneity of task-content within occupations (Nedelkoska and Quintini, 2018^[3]). This approach argues that an occupation consists of a bundle of tasks requiring different skills that are performed together, some of which continue to be difficult or impossible to automate, e.g. social intelligence (the ability to effectively negotiate complex social relationships) and perception and manipulation (the ability to carry out physical tasks in an unstructured work environment). This approach resulted in a much-reduced estimate of jobs at high risk of automation: an average of 14% across countries, and 10% for the United States in 2012.

Georgieff and Milanez (2021^[4]) look at whether countries and jobs that were deemed to be at high risk of automation back in 2012 experienced employment declines over the subsequent decade using data from labour force surveys from 21 countries at the occupation level (38 occupations) over the time period 2012 to 2019. The results show no support for net job destruction at the broad country level. All countries in the study saw employment growth over the observation period (2012 to 2019), and countries that faced higher overall automation risk in 2012 did not experience lower employment growth until 2019. In fact, countries where occupations faced higher automation risk back in 2012 experienced higher occupational employment growth over the subsequent period. This is consistent with a story in which automation contributes to positive employment growth through productivity growth: increases in labour productivity lead to lower prices on consumer goods; and lower prices boost consumer demand, which in turn increases employment levels (even if the amount of labour per unit has declined).

Within countries, the majority of occupations also saw employment growth. However, occupations that were at higher risk of automation experienced lower employment growth or even modest declines in employment levels. On average across countries, employment among the riskiest half of occupations grew by 6% compared to 18% among the least risky. Thus, there is evidence that automation has worsened employment prospects for some workers. The occupations that saw employment declines include: skilled

agricultural workers; clerical support workers; skilled forestry, fishing and hunting workers; handicraft and printing workers; and metal and machinery workers. These declines are even more striking given that they occur against a backdrop of rising employment across countries.

Doorley et al. (2023^[5]) similarly find only small negative effects of robot penetration in 14 European countries between 2006 and 2018. They also look at the effects on wages, and find stronger effects, with wage losses concentrated in the bottom half of the wage distribution. Income support programmes cushioned this negative effect, especially in Western European countries.

5.2. But will AI be different?

There are reasons to believe that its impact on employment may be different from previous waves of technological progress. Autor, Levy and Murnane (2003^[6]) postulated that jobs consist of routine (and thus in principle programmable) and non-routine tasks. Previous waves of technological progress were primarily associated with the automation of routine tasks. Computers, for example, are capable of performing routine cognitive tasks including record-keeping, calculation, and searching for information. Similarly, industrial robots are programmable manipulators of physical objects and therefore associated with the automation of routine manual tasks such as welding, painting or packaging (Raj and Seamans, 2019^[7]).² These technologies therefore mainly substitute for workers in low- and middle-skill occupations.

Tasks typically associated with high-skilled occupations, such as non-routine manual tasks (requiring dexterity) and non-routine cognitive tasks (requiring abstract reasoning, creativity, and social intelligence) were previously thought to be outside the scope of automation (Autor, Levy and Murnane, 2003^[6]; Acemoglu and Restrepo, 2020^[8]).

However, recent advances in AI mean that non-routine cognitive tasks can also increasingly be automated (Lane and Saint-Martin, 2021^[9]). In most of its current applications, AI refers to computer software that relies on highly sophisticated algorithmic techniques to find patterns in data and make predictions about the future. Analysis of patent texts suggests AI is capable of formulating medical prognosis and suggesting treatment, detecting cancer and identifying fraud (Webb, 2020^[10]). Thus, in contrast to previous waves of automation, AI might disproportionately affect high-skilled workers. Importantly, AI can learn from its actions, and improve its predictions and recommendations over time (OECD, 2023^[11]).

5.3. So far, there is no hard evidence on worker displacement by AI

Georgieff and Hye (2021^[1]) look at the links between AI and employment growth in a cross-country context. They adapt the AI occupational impact measure proposed by Felten, Raj and Seamans (2018^[12]; 2019^[13]) – an indicator measuring the degree to which occupations rely on abilities in which AI has made the most progress in recent years – and extend it to 23 OECD countries by linking it to the Survey of Adult Skills, PIAAC. This indicator, which allows for variations in AI exposure across occupations, as well as within occupations and across countries, is matched to Labour Force Surveys to analyse the relationship with employment growth. It is important to point out, however, that their measure pre-dates the most recent advances in generative AI applications (ChatGPT for example) – both the occupational range and extent of AI exposure might rapidly become larger as generative AI use is increasingly incorporated into production processes and new, more powerful AI systems are developed.

Georgieff and Hye (2021^[1]) find that business professionals, managers, chief executives and science and engineering professionals are most exposed to AI. This follows intuitively from recent AI progress in non-routine, cognitive tasks. In contrast, “Food preparation assistants,” “Agriculture, forestry and fishery labourers” and “Cleaners, helpers” are the least exposed to AI.

Georgieff and Hyee (2021^[11]) find that, over the period 2012-19, there is no clear relationship between AI exposure and employment growth across all occupations. Moreover, in occupations where computer use is high, AI appears to be positively associated with employment growth. There is also some evidence of a negative relationship between AI exposure and growth in average hours worked among occupations where computer use is low. While further research is needed to identify the exact mechanisms driving these results, one possible explanation is that partial automation by AI increases productivity directly as well as by shifting the task composition of occupations towards higher value-added tasks. This increase in labour productivity and output counteracts the direct displacement effect of automation through AI for workers with good digital skills, who may find it easier to use AI effectively and shift to non-automatable, higher-value tasks within their occupations. The opposite could be true for workers with poor digital skills, who may be unable to interact efficiently with AI and thus miss all potential benefits of the technology.

Felten, Raj and Seamans (2019^[13]) look at the effect of exposure to AI on employment and wages in the United States at the occupational level. They do not find any link between AI exposure and (aggregate) employment, but they do find a positive effect of AI exposure on wage growth, suggesting that the productivity effect of AI may outweigh the substitution effect. This effect on wage growth is concentrated in occupations that require software skills and in high-wage occupations.

Even at lower levels of aggregation, there is currently no detectable effect of AI on aggregate employment. Acemoglu et al. (2022^[14]) examine employment changes from AI using differences in AI exposure by US commuting zones by industry, and separately, variation by detailed occupation. In all specifications they find no statistically significant effect of AI exposure on employment between 2010 and 2017 (industry) and 2018 (occupation). Fossen and Sorgner (2022^[15]) estimate the effect of AI exposure on the probability of leaving employment using short panels of individual workers in the United States between 2011 and 2018. They find that exposure to AI decreases the probability of workers to exit employment.

Surveys of firms' AI adoption and ensuing employment changes similarly find no detectable decreases in employment. In a survey of 759 managers of firms in the United Kingdom, Hunt, Sarkar and Warhurst (2022^[16]) find that AI is leading to greater turnover, but when the researchers look at net employment changes, the results are inconclusive as firms are equally likely to report net employment gains and losses compared to firms not adopting AI. Similarly, an OECD survey of firms in manufacturing and finance across seven OECD countries finds that most firms adopting AI say that it did not change employment (Lane, Williams and Broecke, 2023^[17]). Slightly more firms report employment decreases compared to increases, but these differences are not statistically significant. These results accord with national surveys of firms that adopt AI. A random sample of over 300 000 employer businesses in the United States from the U.S. Census Bureau collected information on firms' adoption of advanced technologies from 2016 to 2018. The majority of firms reported no changes in employment levels due to advanced technologies but, of the firms adopting AI, 26% said that this caused them to increase employment compared to less than 10% which saw their employment levels decrease (Acemoglu et al., 2022^[18]).

5.4. ... and evidence on wages is mixed slanting towards positive

Much like the effect of new technologies on employment, the effects on wages are also ex-ante indetermined: if the substitution effect dominates, AI could exert downward pressure on wages, or it could increase wages through a productivity effect. To harness this productivity effect, workers need to both learn to work effectively with the new technology and to adapt to the changing task composition that puts more emphasis on tasks that AI cannot yet perform. Such adaptation may be costly and will depend on worker characteristics (e.g. education, familiarity with other digital technologies, etc. (Georgieff, 2024^[19]).

While high-skilled workers may be more exposed to recent advances in AI, they also rely more than other workers on high value-added abilities for which AI is not yet very advanced, such as inductive reasoning, creative or social intelligence (Lane and Saint-Martin, 2021^[9]; Lassébie and Quintini, 2022^[20]). Moreover,

high-skilled workers often find it easier to adapt to new technologies because they are more likely to already work with digital technologies and participate more in training, which puts them in a better position than lower-skilled workers to reap the potential benefits of AI (Georgieff and Hyee, 2021^[11]).

To date, most empirical studies on the wage effects of automation technology have focused on industrial robots, and most of these studies suggest that substitution effects prevail (Georgieff, 2024^[19]). Acemoglu and Restrepo (2020^[21]) find a negative relationship between the adoption of industrial robots and wages across US commuting zones. Dauth et al. (2017^[22]) extend this analysis to Germany and find similar results for medium-skilled workers in machine operating occupations. Webb (2020^[10]) finds that US occupations heavily exposed to industrial robots have experienced wage declines.

The emerging evidence on the impact of AI on wage inequality so far is mixed (Georgieff, 2024^[19]). Two studies show that exposure to AI is positively associated with wage growth at the occupation level (Felten, Raj and Seamans, 2019^[13]) and the individual level (Fossen and Sorgner, 2019^[23]), particularly among those with higher wages and/or higher levels of education. However, Acemoglu et al. (2020^[24]) find no relationship between exposure to AI and wage growth at the occupation or industry level.

Automation does not only affect inequalities *between* occupations, but can also affect inequalities within occupations. For example, van der Velde (2020^[25]) shows that computerisation has increased differences in performance between workers in a given occupation. This could be due to a combination of two effects: i) computerisation reduces the prevalence of routine tasks in an occupation; and ii) differences in skill levels among workers performing more routine tasks have a lower impact on output (Jung and Mercenier, 2014^[26]) – notably because routine tasks leave workers with little autonomy (Oldenski, 2012^[27]; Marcolin, Miroudot and Squicciarini, 2016^[28]) and few opportunities to exploit their creativity (Frey and Osborne, 2017^[2]).

By contrast, there is evidence that the use of (generative) AI can *reduce* differences in performance between workers within an occupation (Brynjolfsson, Li and Raymond, 2023^[29]; Choi and Schwarcz, 2023^[30]; Dell’Acqua et al., 2023^[31]; Haslberger, Gingrich and Bhatia, 2023^[32]; Noy and Zhang, 2023^[33]; Peng et al., 2023^[34]), which could diminish wage inequality. This could be explained by the fact that AI systems are trained to predict good outcomes, and will therefore embody the practices of high performers (Brynjolfsson, Li and Raymond, 2023^[29]). Low performers therefore have more to gain from using AI. AI can also reduce performance differences within an occupation through a selection effect, if low-performing workers leave their job because they are unable to adapt to AI tools by shifting their activities to tasks that AI cannot automate. For example, some stock analysts who were unable to adapt to AI-based prediction tools by shifting their work to more social activities may have left the profession (Grennan and Michaely, 2017^[35]).

Georgieff (2024^[19]) looks at the link between AI and wage inequality in a cross-country context. It uses the cross-country measure of occupational exposure to AI derived by Georgieff and Hyee (2021^[11]) from that developed by Felten, Raj and Seamans (2019^[13]). He matches this measure to the Structure of Earnings Survey (SES) and US Current Population Survey (CPS) data to analyse the relationship with wage inequality. He finds that there is no indication that AI has affected wage inequality between occupations over the period 2014-18. However, AI may be lowering wage inequality within occupations – consistent with the above-mentioned literature that AI might be performance enhancing for lower-productivity workers. However, this does not appear to affect gender or age wage gaps: within occupations, exposure to AI is not associated with changes in wage inequality between demographic groups.

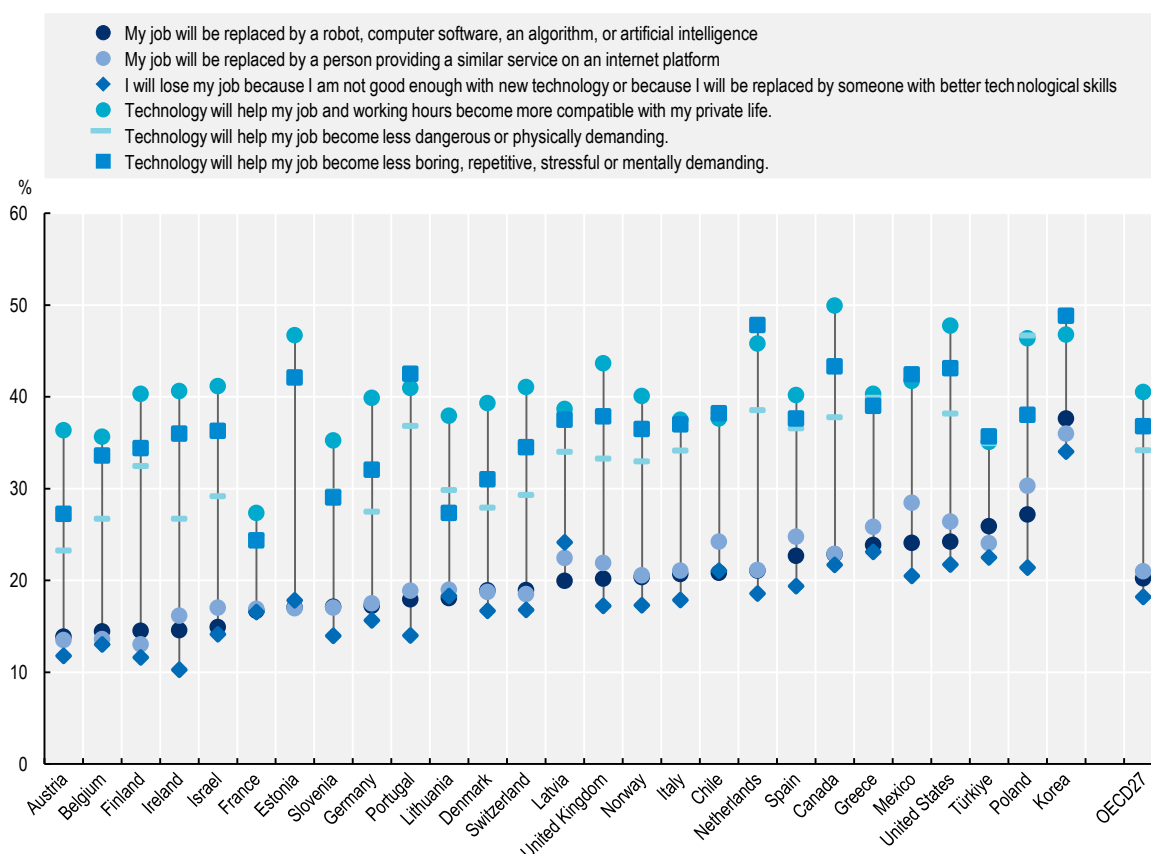
However, it is important to note that the above quoted empirical evidence is necessarily backwards looking, using data, although recent, from a time when AI adoption was still relatively low. Given the speed with which AI and its adoption in the economy progresses, these results should be interpreted with caution.

5.5. Workers are optimistic regarding the effect of new technologies on their working lives

Results from the OECD's 2022 Risks that Matter Survey show that, across 27 countries, people generally believe that technology will *help* them in their jobs, with 34-40% of people, on average, believing that technology will either a) make their working hours more compatible with their private life, b) make their job less dangerous or physically demanding, or c) make their jobs less boring, repetitive, stressful or mentally demanding. This compares to an average of about 18-21% of people who believe that they will likely *lose* their job due to technology.

Figure 5.1. People generally expect that technology will help them in their jobs more than it will hurt them

Share (%) responding that they believe the following statements are “Likely” or “Very likely,” 2022



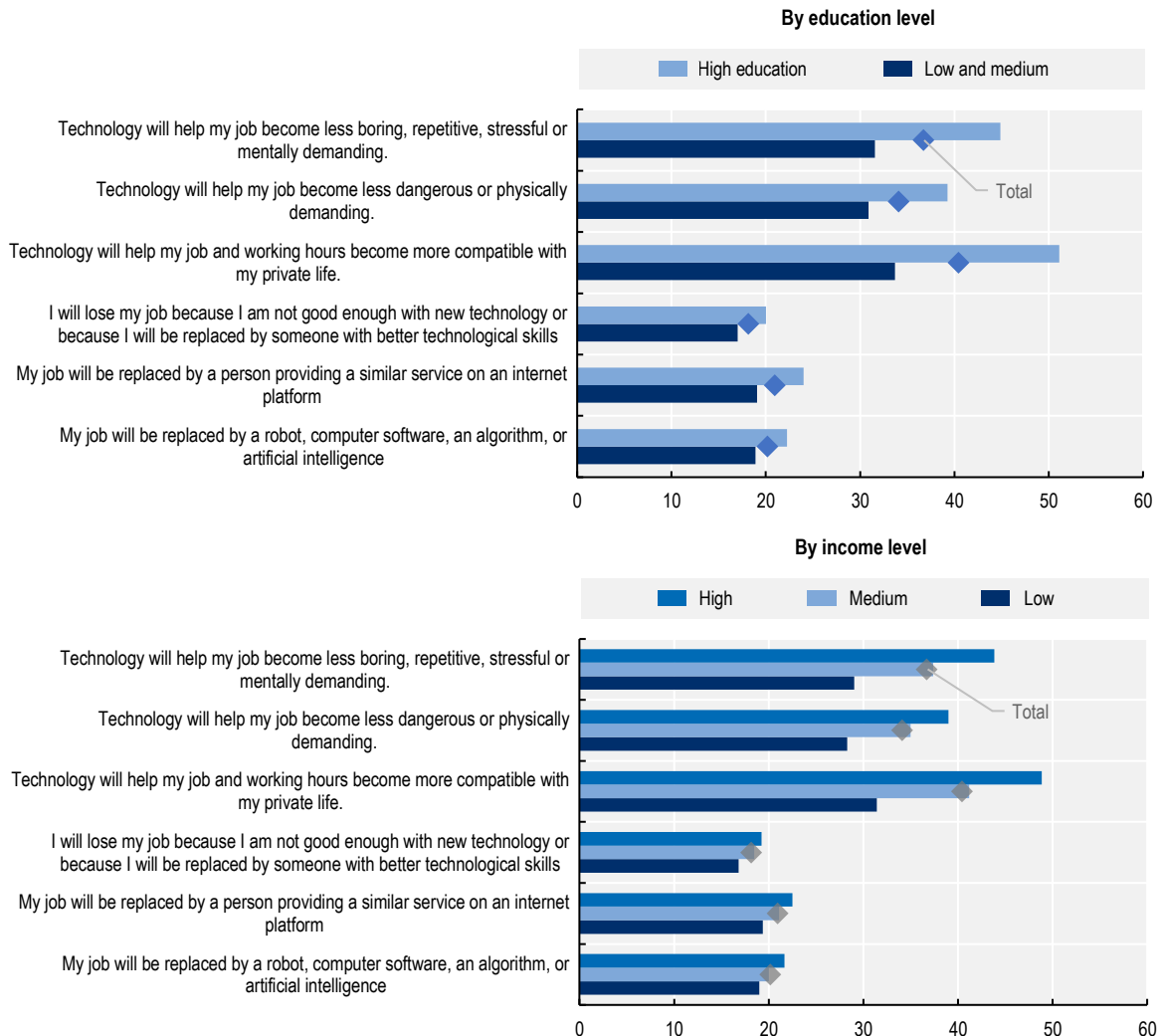
Notes: Respondents were asked how likely they believed the following statements would be: a) My job will be replaced by a robot, computer software, an algorithm, or artificial intelligence, b) My job will be replaced by a person providing a similar service on an internet platform, c) I will lose my job because I am not good enough with new technology or because I will be replaced by someone with better technological skills, d) Technology will help my job and working hours become more compatible with my private life, e) Technology will help my job become less dangerous or physically demanding, f) Technology will help my job become less boring, repetitive, stressful or mentally demanding. Response options were “Very unlikely,” “Unlikely,” “Likely,” “Very likely,” and “Can’t choose.”

Source: OECD 2022 Risks that Matter Survey.

These sentiments did, however, vary considerably across the education and income distribution. Those with higher levels of education (i.e. tertiary) were significantly more likely to believe that technology would have a positive impact on their job. It is noteworthy that people with higher education were also more likely to believe that their job would be replaced by technology, although these gaps were much smaller.

Figure 5.2. Higher levels of education and income are associated with stronger beliefs in both the potential positive and negative impacts of technology

Share (%) responding that they believe the following statements are “Likely” or “Very likely,” 2022



Notes: Respondents were asked how likely they believed the following statements would be: a) My job will be replaced by a robot, computer software, an algorithm, or artificial intelligence, b) My job will be replaced by a person providing a similar service on an internet platform, c) I will lose my job because I am not good enough with new technology or because I will be replaced by someone with better technological skills, d) Technology will help my job and working hours become more compatible with my private life, e) Technology will help my job become less dangerous or physically demanding, f) Technology will help my job become less boring, repetitive, stressful or mentally demanding. Response options were “Very unlikely,” “Unlikely,” “Likely,” “Very likely,” and “Can’t choose.”

Source: OECD 2022 Risks that Matter Survey.

5.6. What implications for social protection?

To date (and this evidence is necessarily backwards looking), worries about widespread technology driven job displacement have not been borne out, and the evidence on the effects of AI on wages, though mixed, seems to be indicating that if there is an effect, it seems to be positive, and attenuating inequality.

In the absence of population growth, rising productivity through technological progress is the only way to achieve long-term economic growth, which is necessary for the continued funding of public expenditure in a non-zero interest rate environment (Arslanalp and Eichengreen, 2023^[36]). Together with higher labour supply (through longer working lives and tapping the full potential of women and part-time workers, see Chapters 2 and 3), increased productivity through technological progress may therefore be necessary for the sustainability of social protection systems.

Public policies can help to ensure that workers benefit from the productivity gains and cost savings generated by AI, which will also support social protection funding that in many countries mostly relies on labour income. For instance, worker skills will be a crucial determinant to the extent that new technologies including AI increases worker productivity and wages. Governments should support training within companies as well as through formal education institutions including life-long learning. Public policy can also support collective bargaining and a fair distribution of productivity gains within firms (OECD, 2023^[11]).

Countries may also want to reconsider their tax mixes should a higher share of the technology-driven productivity growth accrue to capital. To date, evidence on whether the labour share of income is falling is mixed (see, e.g. (Gutiérrez and Piton, 2020^[37]; Bergholt, Furlanetto and Maffei-Faccioli, 2022^[38])), but increased automatisisation certainly has the potential to drive down the share of GDP claimed by workers. Rebalancing labour and capital taxation may therefore be necessary to protect social protection funding if productivity gains do not translate into higher employment and wages.

The relative taxation of capital and labour may also directly influence AI adoption. Many countries apply a lower effective tax rate on capital than on labour. Social security contributions, which are typically only levied on labour income, contribute to this imbalance. Where effective taxes on labour are higher than on capital, firms can be pushed to automate above the level they would in the absence of this implicit tax subsidy (OECD, 2023^[11]).

AI could also be used to improve the administration of social protection systems, e.g. by automating tasks such as data entry and document processing, saving staff time and lowering costs. Some countries are using AI for fraud detection in benefit claims, improving the targeting of benefits. AI may also increase the accessibility of social benefits, e.g. through chatbots that can answer personalised questions and assist claimants through the claims process (OECD, 2024^[39]).

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Notes

¹ This can only be the case if an occupation is only partially automated, but depending on the price elasticity of demand for a given product or service, the productivity effect can be strong. For example, during the 19th century, 98% of the tasks required to weave fabric were automated, decreasing the price of fabric. Because of the highly elastic demand for fabric, the demand for fabric increased as did the number of weavers (Bessen, 2015^[40]).

² AI may however be used in robotics (“smart robots”), which blurs the line between the two technologies (Raj and Seamans, 2019^[7]). For example, AI has improved the vision of robots, enabling them to identify and sort unorganised objects such as harvested fruit. AI can also be used to transfer knowledge between robots, such as the layout of hospital rooms between cleaning robots (Nolan, 2021^[41]).

6 Climate change and the future of social protection

Raphaëla Hyee, Valerie Frey and Marissa Plouin

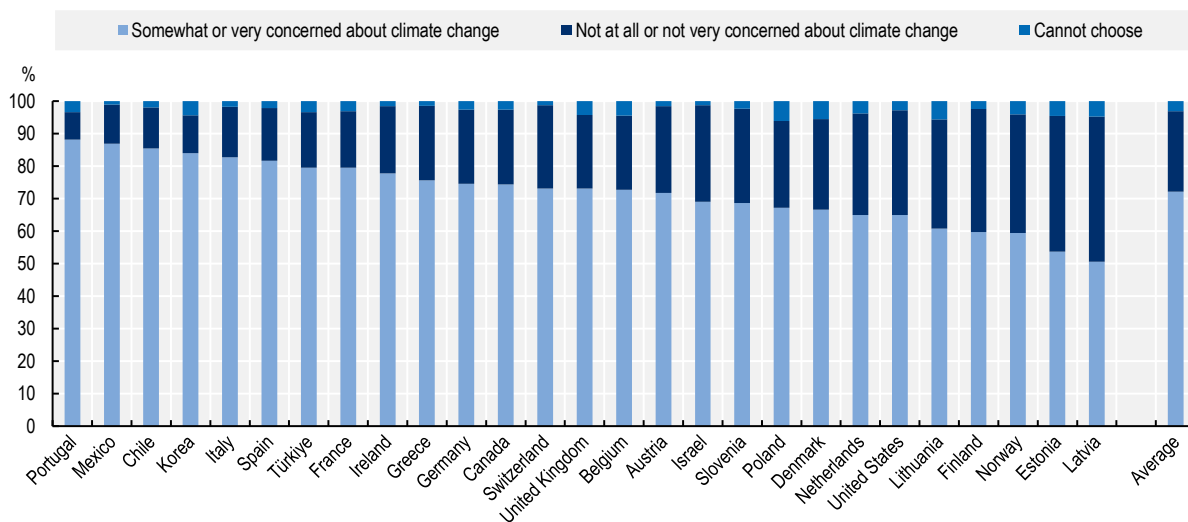
Climate change, and climate change mitigation, have direct implications for social protection. To reach net zero targets, carbon prices will need to increase substantially, with distributional and political implications. While the employment effects of the green transition are uncertain, projections suggest job losses in certain sectors, necessitating income support and active labour market policies. Housing, too, is an area where social programmes will be increasingly implicated. Public support may be needed to improve housing quality for lower energy consumption, especially for low-income families, and some households may need help relocating in response to dramatic changes in climate like floods, wildfires and extreme heat.

The need to combat climate change has been on the policy agenda for decades, and the window of opportunity to limit the rise in temperature to 1.5 degrees, as agreed in the Paris climate accord, is closing. Many OECD countries are adopting ambitious strategies and commitments to achieve net zero greenhouse gas emissions by 2050. Russia's attack on the Ukraine has made it even more urgent for countries to wean themselves off fossil fuels.

Across the OECD, a significant number of people are deeply concerned about climate change. The OECD's 2022 Risks that Matter Survey (<https://www.oecd.org/en/topics/social-and-economic-risks.html>), conducted in 27 countries, finds that, on average, 72% of respondents are somewhat or very worried about climate change (Figure 6.1). Concerns are highest in Portugal, Mexico, Chile, Korea, Italy and Spain, where more than eight in ten respondents express concern.

Figure 6.1. Most people in OECD countries are worried about climate change

Share (%) of respondents who are not at all, not very, somewhat, or very concerned about climate change, 2022



Note: Average refers to the unweighted average of the 27 OECD countries for which data are available. Respondents were asked: "How worried are you about climate change?" Respondents could choose "Not at all concerned," "not very concerned," "somewhat concerned," "very concerned," or "cannot choose". "Somewhat or very concerned" responses are aggregated here, as are "not at all or not very concerned" responses. RTM data include respondents aged 18-64 with a representative sample n=1 000 per country.

Source: OECD Risks that Matter Survey 2022, <https://www.oecd.org/en/topics/social-and-economic-risks.html>

Environmental policies and social policies are linked in two basic ways. First, pollution and climate change have heterogeneous effects on people and households, often affecting more vulnerable and less resilient communities the most. Second, a successful green transition will involve significant transition costs. It will require significant shifts across sectors and in production processes, including job destruction and generation and changes in relative prices. This will affect aggregate employment (and thus the funding base of social protection), but will also affect households, depending on how exposed they are to high emission sectors both through their employment and their consumption decisions, and to what extent they can adjust both their jobs and their consumption baskets to the changed conditions.

The degree to which these costs are shared fairly across social groups will affect governments' ability to build and maintain public support for climate change mitigation (CCM). The following sections give an overview of how carbon pricing may impact household budgets, and the scope for policy intervention to

compensate low-income households, the employment effects of the green transition, and the implications of climate change on government support for affordable and energy-efficient housing.

6.1. Carbon pricing and household budgets

Carbon pricing (including excise taxes, emissions trading systems, and carbon taxes) is a major policy instrument to combat climate change. Taxing the carbon content of energy sources, such as fossil fuel or natural gas, increases the price of fossil fuels and fossil-fuel generated electricity. It therefore directly provides incentives for firms and households to reduce their fossil fuel consumption. This includes the consumption of consumer goods and services, as taxes on emissions generated throughout the value chain are carried forward to the final price. As carbon pricing increases the price of carbon, it also increases the price polluters are willing to pay for access to green carbon alternatives, which in turn promotes research and development in green technologies. Carbon pricing also incentivises investments in energy savings, e.g. building insulation and energy efficiency renovations.

Carbon taxes, in particular, are straightforward and technically simple to implement and administer, even in emerging economies, as most countries already levy taxes on fossil fuels at the source. Finally, a carbon tax is a tax on a good that creates a negative externality, which means that reducing demand for this good is desirable. The revenue created through such a tax therefore avoids harmful distortions in the economy that other taxes, e.g. on labour or investment, create. Carbon tax revenues may be used to lower other (distortionary) taxes, compensate households for carbon taxes paid, or subsidise green investments (Blanchard, Gollier and Tirole, 2023^[1]; Parry, 2019^[2]). Given that carbon taxes are instituted to reduce carbon emissions, revenues are necessarily expected to decline over time.

6.1.1. To reach the net zero target, carbon prices will have to increase substantially in some countries

If carbon taxes are to curb energy consumption to the degree necessary to reach the goals of the Paris climate accord, they will pose significant burdens on households. According to OECD research covering 72 countries that are jointly responsible for 80% of all greenhouse gas emissions, including all OECD members, only 42% of emissions were at all priced in 2021, mainly through excise taxes. Only 16% of emissions were priced at more than EUR 30 per tonne of CO₂ emissions, and only 7% above EUR 60 (OECD, 2023^[3]). These price levels fall significantly short of common estimations of price levels necessary to reach net zero emissions by 2050. For instance, a Network of Central Bank supervisors estimated that reaching this goal would mean a carbon price of over USD 100 in 2025, increasing to nearly USD 600 in 2050 (NGFS, 2023^[4]). Demand elasticities to carbon prices depend on the sector and will crucially depend on technological progress and the future availability and price of green alternatives to greenhouse gas emitting energy sources. However, in the short term, to reach the net zero emissions target by 2050, significant price increases will be necessary (D’Arcangelo et al., 2022^[5]).

To relate this to current levels of energy prices, the price per tonne of CO₂ emissions in 2021 was around EUR 100 in France, EUR 90 in Germany, EUR 60 in Poland, and about EUR 20 in Mexico, Türkiye, Australia and the United States (OECD, 2024^[6]). Thus, even in the short-term, an increase in the price of carbon in line with the net zero emission target would imply price increases of around 500% in countries with currently low prices – a very painful adjustment for household budgets.

By way of comparison, the 2022 surge in energy prices, caused by a recovering world economy and fuelled by Russia’s war of aggression against Ukraine, almost doubled total end use expenditure in OECD countries on average as a share of GDP. Countries responded with support measures totalling 1.5% of GDP over 2022 and 2023 in the median OECD economy, and over 5% in hard-hit European countries such as Austria, Poland and Greece (Hemmerlé et al., 2023^[7]). Increasing carbon prices to levels

required to reach the net zero target would therefore mean price increases substantially larger than the recent shock.

6.1.2. Carbon taxes are unpopular – but communication matters

Even when they support the goal of the net zero transition, people tend to prefer non-price policies such as subsidies for green infrastructure and technologies, subsidies for thermal insulation, or bans, e.g. of specific high-pollution cars that are more opaque and do not have as clearly identifiable winners or losers, although they also generate costs and may be just as regressive as a carbon tax, but likely less effective (Blanchard, Gollier and Tirole, 2023^[11]). Carbon taxes are also seen as highly regressive, although this is not the case in all countries and for all tax bases (e.g. in lower-income countries, richer households may consume more petrol, see below (Ewald, Sterner and Sterner, 2022^[8])).

People tend to overestimate their own exposure to the tax, and struggle to correctly assess the impact of compensatory payments. For instance, (Douenne and Fabre, 2022^[9]) ask a representative sample of 3 002 French households about their support for a carbon tax of EUR 50 per tonne of CO₂, the proceeds of which would be uniformly distributed. This results in a progressive reform with 70% of all households being net gainers, but only 14% of households think they would gain, and the large majority of respondents thinks that the reform is regressive. Consequently, only 10% of respondents would support such a reform, whereas 70% oppose it. (Douenne and Fabre, 2022^[9]) conclude that the rejection of carbon taxes is not due to a lack of support for environmental policy, but rather due to “pessimistic beliefs” – French households do not trust the government to implement a tax that will be effective as well as distributionally neutral or progressive. Indeed, it is well established that support for climate change policies increases with trust in government (Ewald, Sterner and Sterner, 2022^[8]), though these variables are highly correlated.

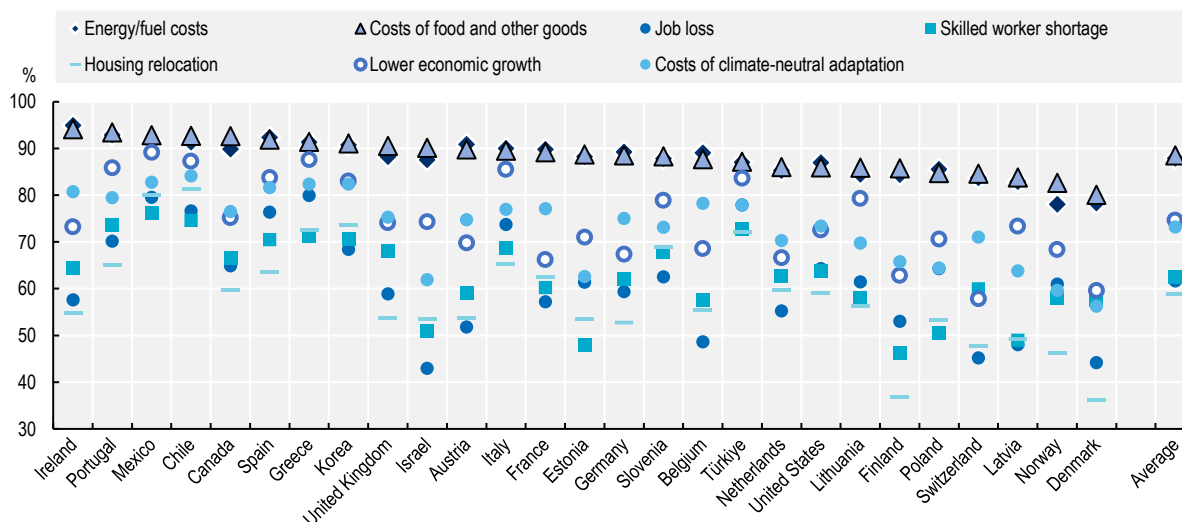
Importantly, public support for carbon taxes depends on accompanying policy measures. A recent OECD survey of 20 countries finds that respondents are much more likely to support a carbon tax combined with subsidies to low carbon technologies or green infrastructure programmes than they are to support a carbon tax combined with an equal cash transfer to all households (Dechezleprêtre et al., 2022^[10]). This suggests that the design of and communication around carbon taxation should carefully consider priorities in the affected population.

6.1.3. While their relative impact is higher on low-income households, high-income households would pay more carbon tax in absolute terms

Carbon taxes are perceived to be punitively regressive, one of the main reasons why they are often met with public opposition (Blanchard, Gollier and Tirole, 2023^[11]). Indeed, rising energy costs and rising costs of food are the most oft-cited concerns raised by people in OECD countries when prompted to think about the climate transition. RTM survey respondents in 27 OECD countries were reminded of their government’s role in environmental regulation and asked to what degree they were concerned about economic consequences including rising costs, housing relocation and effects on jobs. On average, nearly nine out of ten respondents identified rising costs of foods/goods and energy/fuel prices as concerns (Figure 6.2), compared to around six in ten who worry about housing relocation due to environmental degradation or a lack of workers to fill green jobs.

Figure 6.2. Energy and food costs are top concerns when considering economic effects of climate change mitigation

Share (%) of the population concerned about potential social and economic consequences of government action to combat climate change, 2022



Note: Average refers to the unweighted average of the 27 OECD countries for which data are available. Survey question 45 stated “The government can take a number of environmental regulatory steps to reduce [country’s] contribution to climate change, such as building up green infrastructure, emissions limits and carbon taxes. But these environmental measures to mitigate climate change can have social and economic consequences on people today. Keeping in mind the effects of different environmental policies to combat climate change, what degree are you concerned about the following possible economic outcomes in [country]?” Respondents chose “Not at all concerned,” “not very concerned,” “somewhat concerned,” “very concerned,” or “cannot choose” for each issue in the following list (randomly rotated in the survey interface): rising energy/fuel costs, rising costs of food and other goods, a loss of jobs in industries that have negative environmental impacts (such as coal, mining and oil extraction), having enough workers to fill demand for green jobs, housing relocation away from environmentally-degraded spaces, lower economic growth, costs of (mandatory) climate-neutral adaptation of heating and cooling systems (e.g. renewable energy systems or energy efficiency renovations). RTM data include respondents aged 18-64 with a representative sample n=1 000 per country.

Source: OECD Risks that Matter Survey 2022, <https://www.oecd.org/en/topics/social-and-economic-risks.html>.

A carbon tax is a consumption tax, and lower-income households save less and spend more of their income than higher-income households. They are therefore ex-ante more exposed to consumption taxes in relation to their income. But higher-income households may still have higher *absolute expenditure* (and therefore tax liability in absolute terms). Assuming that greenhouse gas emissions are taxed equally across emission sources,¹ the relative as well as absolute burden of a carbon tax therefore depends on total expenditure and the carbon intensity of consumption across the income distribution.

(OECD, 2024^[6]) analyses the carbon intensity of spending patterns of households in Germany, Finland, France, Mexico, Poland and Türkiye, including both direct spending on CO₂ emissions (electricity, heating and motor fuels), and emissions that are “embodied” in goods and services through the production process. They find that households’ total expenditure aligns very well with their carbon footprint.

Across the six countries on average, the richest 10% of households spend 4.5 times as much as the poorest 10%. Spending inequality was the lowest in France and Poland (the richest 10% of households spend three times as much as the poorest 10%) and highest in Mexico (where the richest 10% spend nine times as much as the poorest).

On average across countries, CO₂ emissions closely track total expenditure. That is, on average, the richest 10% of households “consume” about 4.5 times as much CO₂ as the poorest 10%, the same as the

disparity in total consumption. In Germany and France, spending in the top decile is somewhat less carbon intensive than that of the remainder of the income distribution, whereas in Mexico it is somewhat higher, likely reflecting that car ownership is less prevalent among poorer households than in Germany or France. Note that these are average values across income deciles – at the very top of the income distribution, patterns of emission intensity could be different – e.g. (Starr et al., 2023^[11]) find outsized carbon footprints for the top 0.1% of households in the United States.

This implies that a carbon tax places a higher *absolute* burden on high-income households. Such a tax could therefore be made progressive by a lump-sum redistribution of revenues – dividing the carbon tax revenue equally across the population, without any targeting by income, would make households at the bottom of the income distribution better off.

However, without a redistributive policy accompanying a carbon tax, the relative burden on low-income households would be higher, as they spend more of their income, and therefore do not have the space in their budget to adjust to the tax. Low-income households do tend to spend a higher *share* of their income on energy and transportation. (OECD, 2024^[6]) find that overall, energy consumption makes up about half of all household greenhouse gas emissions across the six countries studied. The share of expenditure for electricity, heating and motor fuels decreases with income in all countries except Mexico, with the poorest 10% of households spending over 20% of their income on energy in Poland and Türkiye, and over 15% in Germany and France.

Targeting the compensation payment to low and middle-income households, or to households who are more affected by the tax – e.g. households in rural areas with less access to public transport and green household energy sources – would generate further fiscal space. For example, Austria already distributes revenue from its EUR 32 per tonne of CO₂ emission tax to households via direct cash transfers. Transfers only vary by area, with households with less access to public transport receiving higher payments (OECD, 2024^[6]). Such targeting can, however, weaken incentives to make major, one-off lifestyle adjustments that reduce emissions in the long run, such as moving to more densely populated areas with better access to public transport.

Some households would invariably lose purchasing power even in a uniform carbon tax regime in which all carbon tax revenue were redistributed equally to all households – but it would be higher-income households with carbon-intensive lifestyles, which should make such a tax more politically palatable.

It is also important to note that other climate change mitigation policies that often garner more public support than carbon taxes, such as subsidies and bans, are also often regressive, but in a less transparent way. For instance, subsidies for electric vehicles are more likely to benefit higher-income households who can afford more expensive cars, and urban households who have better access to charging infrastructure (OECD, 2021^[12]; Caulfield et al., 2022^[13]).

6.1.4. What implications for social protection? Cushioning the impact of carbon taxes for households ill-equipped to afford them

To achieve public support for the considerable increases in carbon prices thought necessary to achieve net zero emissions, compensation policies need to be immediate, transparent and of sufficient size. Carbon taxes can certainly generate the fiscal space for such compensation. As social protection agencies have the capabilities and experience to track incomes, establish entitlement to benefits and process conditional transfers, designing and administering compensation payments will be in their purview.

The COVID-19 pandemic has shown that processing payments to a large share of the population in a short period of time can strain even mature social protection systems (OECD, 2020^[14]). Countries are increasingly using new data and digital technologies to increase their capabilities to provide benefits that are easy to claim (or even paid automatically), timely (that is, any conditionalities are established quickly) and responsive to changing circumstances (see (OECD, 2024^[15]) for country strategies). Investments in

the administrative capacities of agencies administering social benefits will increase the credibility of carbon tax compensation payments, and therefore their public acceptability.

Carbon tax revenues could also be recycled to lower other distortive taxes, e.g. on labour, to boost economic growth and to counteract lower productivity growth as economies adjust to higher carbon prices. Options include co-financing of social protection schemes, e.g. pensions, to lower contributions.

6.1.5. What implications for social protection? Improving housing quality to lower energy consumption

Housing construction and household-related energy consumption are major contributors to greenhouse gas emissions (OECD, 2023^[16]) and weigh heavily on household budgets. Improving housing quality and energy efficiency is therefore important both for the green transition and for the financial security of low-income households, which are disproportionately negatively affected by housing quality and energy costs (OECD, 2024^[17]; OECD, 2023^[16]). Indeed, across OECD and EU countries, low-income households are systematically more likely to report difficulties keeping their homes warm relative to middle-income households, with more than 15% of households in the bottom income quintile reportedly struggling with energy poverty in 11 countries (OECD, 2024^[17]).

There are a number of policy tools to support the decarbonisation of the housing sector, including carbon pricing, environmental regulation, subsidies and financial support (OECD, 2023^[16]; OECD, 2024^[18]). While many of these policies extend beyond traditional measures of social protection, there is scope for social programmes to address the specific challenges relating to low-income and other vulnerable households in the decarbonisation of the housing sector, who are more likely to be liquidity constrained and struggle with energy poverty.

Most OECD governments have programmes in place to support energy efficiency upgrades, such as subsidies or interest-free or subsidised loans (OECD, 2024^[17]); these may be in addition to direct support to low-income households to help cover energy costs. Nevertheless, homeowners may delay profitable investments due to present bias and liquidity constraints. Adaptive home renovations such as building insulations require large up-front investments that households may not undertake even when economically justified.

In particular, for rented homes, there is a disconnect between landlords shouldering the cost of the investment and renters reaping the rewards of lower energy consumption that might not be well-mediated through the market. Assuming a complete and well-functioning rental market with perfect information, renters could use energy performance certificates to gauge energy expenditure associated with different properties, and landlords could command higher rents for more energy efficient dwellings. Rental markets do not function so well in practice, however, and studies confirm that owner-occupied properties are more likely to be well-insulated. Carbon pricing alone might therefore not be enough to solve the problem of insufficient long-term investments, and additional social programmes to support adaptive home renovations for low-income households, and those living in rented accommodation, including standards and bans, may be needed (OECD, 2023^[16]; Blanchard, Gollier and Tirole, 2023^[11]).

Social programmes to support low-income households can be conceived to support broader efforts to upgrade the quality of the housing stock. One notable approach in Lithuania was, in a reform to 2023 legislation, to condition the continued reception of the means-tested heating compensation benefit (cash support to households to cover spending related to heating, drinking, and hot water) on the household's agreement to participate in the government's housing renovation scheme (OECD, 2023^[19]).

Changes in settlement patterns caused by the net zero transition will also affect property values. For most homeowners, their home represents the bulk of their wealth (Causa, Woloszko and Leite, 2019^[20]). the densification of cities and prevent urban sprawl and its consequences, such as automobile commuting and the expansion of paved surfaces) may raise property values in cities, while higher carbon prices or a ban

on some vehicle classes is likely to depress the value of some suburban or rural housing. These unequal positive and negative rents might need to be rebalanced, maybe through some form of capital gains tax (Blanchard, Gollier and Tirole, 2023^[1]).

Social programmes should also support broader policies to promote the densification of cities and prevent urban sprawl and its consequences (such as automobile commuting and the expansion of paved surfaces). Governments should keep the climate transition in mind when building new social and affordable housing, and when undertaking renovations of the existing social housing stock. Social and affordable housing should embed energy efficiency, be adapted for current realities (e.g. high heat), and consider public transit needs vis-à-vis available jobs.

Finally, it is essential that the cost-effectiveness and distributional consequences of climate mitigation policies be assessed in advance. When designing subsidies for building renovations in particular, the fact that they will be capitalised in the value of the dwelling, and therefore benefit the owner, should also be taken into account. Low-income households, as well as those renting their homes, tend to benefit less from subsidies for green home improvements (OECD, 2021^[12]). These distributional consequences should be considered alongside broader efficiency considerations: for instance, in the United States, rooftop photovoltaic panels are much less cost effective than large-scale grid-based panels, yet rooftop panels are being subsidised, both directly and through metering subsidies. Similarly, retrofitting poorly insulated buildings can come at a high price per tonne of CO₂ saved, except for the most poorly insulated buildings (Blanchard, Gollier and Tirole, 2023^[1]).

6.2. Employment effects of the green transition

The green transition will mean a sectoral shift away from greenhouse gas emission intense activities and sectors, in particular fossil fuels, towards sectors that help decarbonise the economy, such as renewable energy generation or improving the energy efficiency of buildings. This will lead to job losses in high emission sectors and job creation in others.

6.2.1. The net effect employment effect of the green transition is uncertain, but projections slant towards losses

Whether the net effect on employment is positive or negative depends on a variety of factors, including the size and design of climate change mitigation policies (such as the amount of carbon taxes levied, and the way the revenue is recycled), the labour intensity of new technologies and production processes in low emission or “green” sectors, and how firms and consumers respond to new relative prices and changed market conditions. This uncertainty means that the net effects on employment are difficult to forecast (OECD, 2024^[21]), but depending on modelling assumptions, forecasts point to a slightly negative net impact of the green transition on employment. For instance, recent OECD work using the general equilibrium model ENV-Linkages (Borgonovi et al., 2023^[22]) estimates the effects of the EU Fit for 55 package, an ambitious set of measures adopted by the European Union to reduce the EU greenhouse gas emissions by 55% by 2030 compared to 1990 (corresponding to a carbon tax of USD 202 per ton of CO₂ in the model). They find that the Fit for 55 package decreases employment growth between 2019 and 2030 by more than half (from 3% in the baseline scenario without the package, to 1.3% accounting for the package). Modelling by the European Commission (2020^[23]) and Eurofound (2023^[24]) find modest net employment gains or losses, depending on how carbon tax revenues are recycled. See (OECD, 2024^[21]) and (Vandeplas et al., 2022^[25]) for a short overview of recent modelling efforts. This is keenly felt: more than six in ten respondents to Risks that Matter 2022 worry about job losses related to the green transition (Figure 6.2).

6.2.2. Around one in five workers may be affected by the green transition

While macroeconomic modelling allows forecasts on which economic sectors are expected to contract in the green transition, and the occupations that are concentrated in these industries – so called “brown jobs” – it is difficult to gauge which occupations are in expanding industries. This is because the results of currently published models are not very detailed, and bundle together low-emission sectors. The OECD (2024^[21]) therefore proposes a new measure of “*green-driven occupations*” that identifies a set of occupations that are likely to expand and/or being transformed by the transition. It makes use of the US Department of Labor’s Occupational Information Network, O*NET, Greening of the World Project (Dierdorff et al., 2009^[26]; 2011^[27]).

Green-driven occupations include:

1. Green New and Emerging occupations with unique tasks and worker requirements that are directly needed for the green transition, e.g Carbon Trading Analysts or Solar Photovoltaic Installers.
2. Green-Enhanced Skills occupations, existing occupations whose skills, tasks and external factors (e.g. credentials) may change because of the green transition, e.g. Architects, Automotive Specialty Technicians or Farmers and Ranchers. Demand for these occupations might not necessarily increase in the green transition, but rather the jobs will be altered, with more emphasis on greener tasks that may require new skills and credentials.
3. Green-Increased Demand occupations, that will increase in demand due to the green transition, but without significant changes to skills or task requirements. This group contains existing green occupations, e.g. Forest and Conservation Workers, but most of them are support occupations the demand for which will expand due to the green transition, e.g. Construction Workers.

Therefore, *green-driven occupations* do not only encompass occupations that directly contribute to the greening of the economy, or that will grow in demand because of the green transition (both of which can be found in all three sub-categories above), but *all occupations which will be affected by the green transition*, either because they will emerge to facilitate it, they will see their skills and other requirements change because of it, or they will rise in demand because of the general restructuring of the economy towards green sectors (OECD, 2024^[21]).

Across 27 OECD countries with available data,² about 20% of all workers were in green-driven occupations before the onset of the COVID-19 crisis. Only about 3% are in new and emerging occupations (1). The biggest share (9%) are in green-enhanced skills occupations (2) that are not necessarily expected to expand in the short term but will likely see their jobs change, while about 8% are in green increased demand occupations (3). Around 6% of workers work in occupations that are concentrated in greenhouse gas intensive sectors, so-called “brown jobs”.

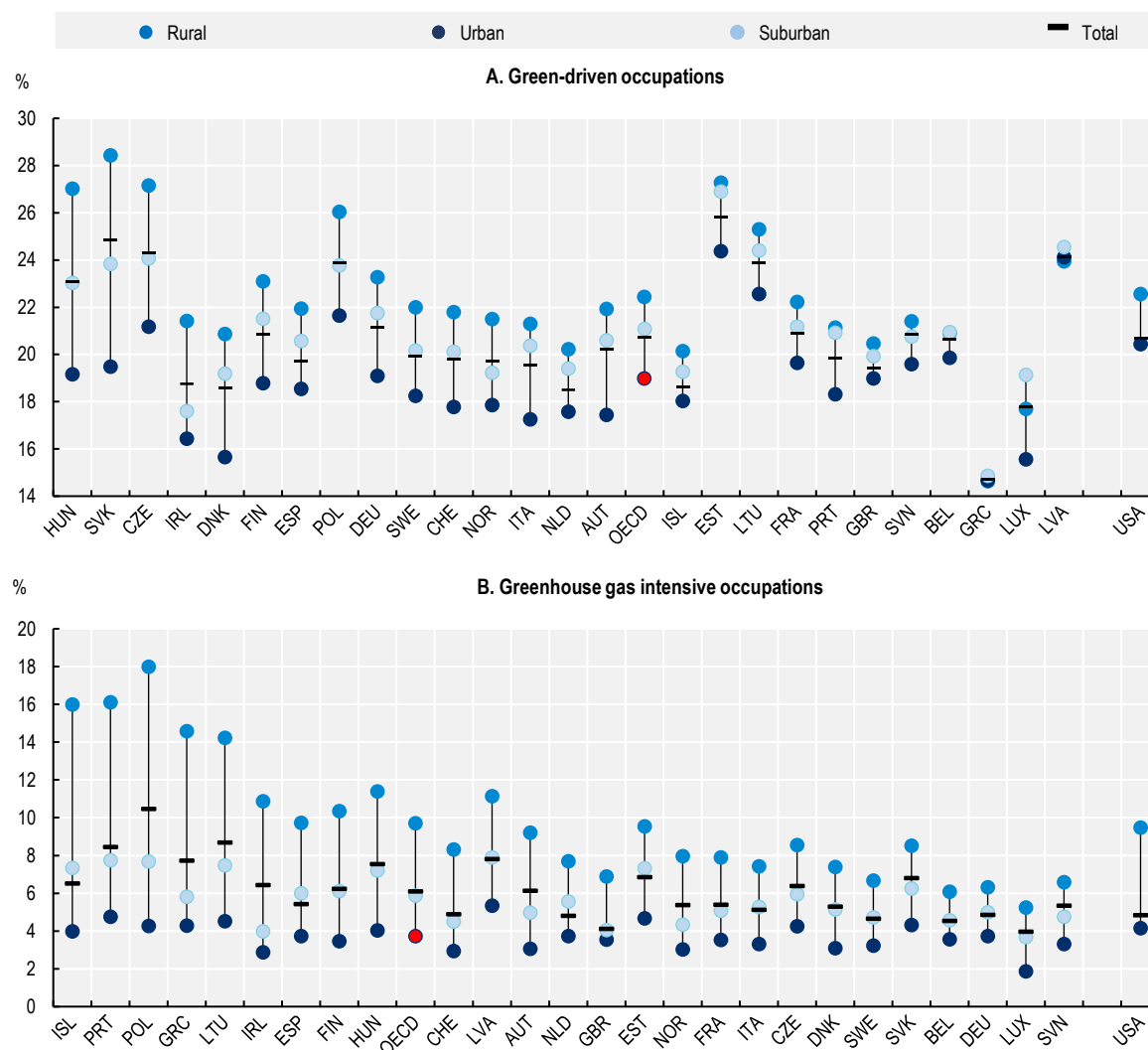
Green-driven occupations are concentrated in construction, manufacturing, utilities and mining, and transport. Greenhouse gas emissions-intensive or brown jobs are concentrated in agriculture, transport, as well as manufacturing, utilities and mining. Because of this sectoral overlap, green-driven occupations may be found in greenhouse gas intensive sectors (empirically mostly green-enhanced skills and Green increased demand occupations). Other services, representing more than two-thirds of employment on average, are not expected to be impacted by the green transition.

This sectoral gradient in both green-driven and high-emissions occupations translates into the socio-economic characteristics of the workers likely to be positively or negatively affected by a decarbonisation of the economy. In most countries with available data, rural areas, where agriculture, manufacturing and mining are concentrated, are more exposed to the green transition, both in terms of greenhouse gas intensive occupation, as well as in terms of green-driven occupations (Figure 6.3). However, new and emerging occupations which tend to employ more high-skilled workers and tend to pay higher wages tend to be concentrated in urban areas (OECD, 2024^[21]).

Men are overrepresented in both green-driven as well as high-emission occupations, while women are overrepresented in services, and are thus less exposed to the green transition. But this also means that women are worse positioned to take advantage of job opportunities emerging in the green transition – for instance, women are under-represented in STEM fields which may hinder their participation in these expanding industries (OECD, 2021^[12]; OECD, 2024^[21]).

Figure 6.3. Both green-driven and greenhouse gas intensive occupations are more widespread in rural than in urban areas

Share of green-driven and greenhouse gas-intensive occupations by rural/urban area, average 2015-19



Note: Countries are ranked by decreasing gap of the share in rural areas compared to total. For European countries, the degree of urbanisation is defined on the share of local population living in urban clusters and in urban centres, it classifies into three types of area: thinly populated area (rural area); intermediate density area (towns and suburbs/small urban area), and densely populated area (cities/large urban area). In the United States, rural and urban areas are defined as non-metropolitan and metropolitan areas respectively.

Source: From (OECD, 2024^[21]). Estimates based on version 24.1 of the O*NET database and the following country-specific sources: United States: Current Population Survey; All other countries: EU Labour Force Survey.

Another way in which the green transition may act as a job creator that is often overlooked is the emerging trend for sustainable consumption. Preserving resources by buying less, but better-quality consumer

products, or buying restored or refurbished consumer durable goods, means that the demand for labour-intensive products in developed countries might rise again. This trend has the potential to create jobs in a variety of sectors: from technicians who restore or refurbish used appliances, to classic handicraft occupations such as cobblers and dressmakers. These are also occupations that are little susceptible to being automated, because they involve a high share of non-routine, manual tasks (Georgieff and Hye, 2021^[28]).

6.2.3. What implications for social protection? The need for income replacement and active labour market policies

The green transition will lead to job-reallocation away from high-emission industries. While these industries only account for a small segment of total employment, workers in these sectors may feel the effects of job displacement more keenly than the average worker. OECD research (OECD, 2024^[29]) shows that workers in high emission industries are, on average, more likely to have low educational attainment, and participate less frequently in formal and non-formal education and training programmes. At the same time, they are less likely to earn wages at the bottom of the wage distribution, and more likely to earn higher wages, than other workers, reflecting firm-wage premia (more generous wage-setting practices in these firms compared to the average firm). They are also somewhat older than the average worker, more likely to be male, and more likely to live in rural areas. This combination of high wages with low skills, low participation in life-long learning, and living in areas with few other job opportunities, points to high costs of job reallocation: these workers are likely to find it more difficult than the average worker to re-skill after job displacement, they live in areas with low labour demand, and are more likely to face wage losses after transitioning to a new job.

Accessible unemployment insurance schemes with adequate replacement rates and durations can act as a first line of defence against earnings losses following job displacement. But given the characteristics of these workers, they are at risk to remain unemployed longer, and may require substantial re-skilling, and may need help to relocate to areas with more job opportunities (Section 6.3). They may also face lower wages after transitioning to a new job in the long term. Thus, in addition to re-skilling efforts by Public Employment Services, additional income support policies may be necessary. For instance, wage insurance programmes partially cushion wage losses when transiting to a new, lower wage, and have been shown to be effective in incentivising jobless workers to accept new employment (OECD, 2024^[29]).

In addition, regions with a high concentration of carbon-intensive jobs are often not economically diversified and often have a workforce with low levels of education and sector-specific skills (OECD, 2023^[30]). Investments in local economic development are often necessary to improve job prospects in the area (IEA, 2021^[31]; Sheldon, Junankar and De Rosa Pontello, 2018^[32]), as well as to shore up the local housing market.

Finally, extreme weather events such floodings, fires or extreme heat may cause unsafe working conditions and lead to work stoppages, and thus earnings losses, for workers. Some countries already provide insurance for this risk through their social protection systems. In Austria, for example, “bad weather compensation” is a separate social insurance programme that provides income support of the same amount of unemployment benefits in the event of “bad weather” (including snow, frost, or extreme heat) that make taking up or continuing work either impossible or unreasonable for workers. Contributions are shared equally by employers and workers. Job retention schemes can also be adapted to this emerging risk as an alternative to a separate programme, e.g. in Czechia, Belgium or Spain, short-time work schemes are already used in cases of stoppages due to natural disasters or extreme heat.

6.3. Relocating homes and livelihoods in response to climate change

Climate change may necessitate additional housing policies to ensure adequate support for workers and their families for two principal reasons. First, local housing markets in areas experiencing a widespread loss of brown jobs may deteriorate or even collapse. A decline in local housing prices can trap workers and their families in their current homes and mortgages, preventing them from selling, limiting their ability to buy in other areas, and preventing them from moving to better jobs. Conversely, in areas with greater labour demand, the need for access to affordable and/or social housing may increase.

In areas where educational, health and social services rely heavily on local funding, the closure of carbon-intensive industries in rural areas can also deal a blow to the provision of schooling and public services that had depended on tax revenue from those industries. For instance, the loss of coal tax revenues, royalties and fees to state and local governments has severely negatively affected Appalachian communities in the eastern the United States following the closure of coal mines there (Roemer and Haggerty, 2021^[33]).

The second likely need for support for affordable housing is related to the direct, physical effects on homes and communities. Extreme weather events such as droughts, fires and flooding are an increasing risk for people and homes in many parts of OECD countries, irrespective of their employment situation. Climate change is degrading many communities and is making homes inhabitable due to rising sea levels. Around the world, sea levels may rise by one metre (or more) this century, leading to increased flood and erosion risks and permanently inundating some areas and communities (OECD, 2023^[34]). A recent study suggests that in the United States alone, between 31 000 and 171 000 properties around 32 major coastal cities are experiencing coastal subsidence – sinking land in the face of rising sea levels (Ohenhen et al., 2024^[35]).

Extreme temperatures, more frequent droughts and the increasing likelihood of wildfires pose additional risks. Across OECD and OECD partner countries, the number of people exposed to days with maximum temperatures exceeding 35°C increased by an estimated 11% in the period 2018-22 compared to the 1981-2010. As a result, in 2022, over 45% of the people in OECD and OECD partner countries experienced at least two weeks of extreme temperatures (OECD, 2023^[34]). This may result in a greater number of relocations away from very hot regions. Groundwater shortages are becoming more common as well. To address groundwater shortages in drought-prone areas, some cities and regions have begun limiting new home building (see for example Arizona in the United States (Flavelle and Healy, 2023^[36]). This has implications for housing supply, which is already insufficient to meet demand in many countries.

These effects of climate change are expected to disproportionately affect low-income households (see, for instance (Hallegatte and Rozenberg, 2017^[37]; Hallegatte et al., 2015^[38])) and will pose increased risks for the *unhoused* as well, particularly people who are sleeping rough (Bezgrebelna et al., 2021^[39]). Large-scale displacement could also lead to an increase in housing instability and homelessness if housing markets are not able to adapt to increased demand.

6.3.1. What implications for social protection?

It is essential that a just environmental transition includes plans for affordable housing and community development. Governments will need to support workers and their families to relocate away from areas dominated by “brown” jobs. This may be complicated by declining house prices in some areas – as owner-occupied housing is the main asset for many, workers may find themselves locked into their mortgages amid falling prices. Those living in areas where environmental degradation may become so severe that households are required to relocate may suffer from this asset devaluation as well. Therefore, so-called “managed retreat” programmes, and/or home buyouts, may be necessary for some areas. In addition, increased public investment in social housing, public transit, educational infrastructure and other social services may be necessary in communities to which workers relocate (see, for instance, (Petz, 2015^[40]);

(Hino, Field and Mach, 2017^[41]); (O'Donnell, 2022^[42])). National governments will also likely need to intervene to prevent a “fiscal death spiral” related to the loss of tax revenues and fees from industries that had previously supported local public services (Roemer and Haggerty, 2021^[33]).

As part of Germany's well-known transition away from coal in the Ruhr region, a tripartite agreement between coal companies, trade unions and local and federal government led to a range of measures including early retirements, reskilling, and the relocation of around 10 600 workers to other coal-producing activities. The policy response in the Ruhr is widely considered to be one of the more successful transitions in OECD countries (Sheldon, Junankar and De Rosa Pontello, 2018^[32]; World Resources Institute, 2021^[43]). When the local coal economy shut down in The Valleys, in South Wales, the United Kingdom, some workers were offered retraining, relocation allowances and state-funded housing – though overall this transition suffered from a lack of strategic planning and the area suffered high unemployment and the depression of local businesses for decades (Sheldon, Junankar and De Rosa Pontello, 2018^[32]).

Also, the increasing risks caused by climate change, including flooding, fires and mudslides, have been associated with the retreat of private home insurers in markets where climate risks are perceived as too high (see (Bellman, 2016^[44])). As some private insurers are scaling back coverage, significantly increasing their rates, or eliminating coverage in high-risk communities altogether, some governments are introducing, strengthening or retooling government-run insurance schemes for flood damage or wildfires, for instance. Housing represents both a major expense and asset for households, with the impacts of climate change heightening risks of damage and destruction to housing and communities.

Across the employment, energy and housing risks associated with climate change (and climate change mitigation), identifying the people who will be negatively affected is a key component of increasing public acceptability of reform. With information on likely “winners” and “losers” of climate change mitigation policies in hand, governments are better-equipped to design social protection via new or existing social protection tools. Pre-planning can also inform communication around social policies supporting climate change mitigation – a critical component impacting the likely success of reform (Malerba, 2022^[45]).

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Notes

¹ This is not the case for current carbon pricing policies – e.g. currently, the road transport sector faces the highest carbon tax rates, whereas in the industry and building sector remain largely unpriced, or are even subject to carbon subsidies (OECD, 2024^[6]).

² 26 European countries and the United States.

Megatrends and the Future of Social Protection

Ageing populations, changing labour markets, and climate change are affecting economies and societies across OECD countries. What challenges do these “megatrends” pose for social protection systems? What are the implications of these trends for the coverage, the effectiveness, and – critically – the funding of social protection today and tomorrow? With an eye towards informing future reforms, this report presents a broad stocktaking of population ageing, changing patterns of labour supply, new and emerging employment forms, changes in household composition and unpaid work, the effects of new technologies on employment and wages, and the effects of climate change and the net zero transition on social protection systems in OECD countries.



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