RESEARCH REPORT

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Economic and social inequalities in Europe in the aftermath of the COVID-19 pandemic

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European Foundation for the Improvement of Living and Working Conditions

When citing this report, please use the following wording:
Eurofound (2023), *Economic and social inequalities in Europe in the aftermath of the COVID-19 pandemic*, Publications Office of the European Union, Luxembourg.

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Research project: The impact of COVID-19 on multidimensional inequalities

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Acknowledgements: Michele Consolini and Sanna Nivakoski, for reviewing the draft report

Luxembourg: Publications Office of the European Union, 2023

Print:	ISBN 978-92-897-2310-7	doi:10.2806/66005	TJ-07-23-019-EN-C
PDF:	ISBN 978-92-897-2309-1	doi:10.2806/439913	TJ-07-23-019-EN-N

This report and any associated materials are available online at https://eurofound.link/ef22002

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The European Foundation for the Improvement of Living and Working Conditions (Eurofound) is a tripartite European Union Agency established in 1975. Its role is to provide knowledge in the area of social, employment and work-related policies according to Regulation (EU) 2019/127.

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Abbreviations

ADHD	attention deficit hyperactivity disorder
BMI	body mass index
COVID-19	coronavirus disease 2019
EPSR	European Pillar of Social Rights
EU-LFS	European Union Labour Force Survey
EU-SILC	European Union Statistics on Income and Living Conditions
GDP	gross domestic product
GNI	gross national income
ICT	information and communications technology
IMF	International Monetary Fund
JRC	Joint Research Centre
MIMF	Multidimensional Inequality Monitoring Framework
NEET	not in education, employment or training
OLS	ordinary least squares
PISA	Programme for International Student Assessment
R&D	research and development
SHARE	Survey of Health, Ageing and Retirement in Europe
TSCS	time-series cross-sectional
UK	United Kingdom
UKHLS	UK Household Longitudinal Study
US	United States

Executive summary

Introduction

In the aftermath of the COVID-19 pandemic, policymakers and researchers alike have voiced their concern that inequality among European societies and citizens has increased. This study investigates inequality in income, health, employment and education – especially the shifts evident during the first year of the pandemic – and identifies the social groups most affected. Looking at the relationship between policy measures and inequality in the pre-pandemic period, it examines the main drivers of inequality during the pandemic.

Policy context

In spring 2021, while the pandemic was in the process of undoing a decade-long era of economic progress in the EU, the European Commission launched its action plan for the implementation of the European Pillar of Social Rights (EPSR) – originally unveiled in 2017 – in which it set out targets for 2030. The EPSR aims to reduce social, territorial and economic inequalities in income, health and access to essential services. It also seeks to achieve gender equality in employment and work–life balance, through the availability of high-quality and affordable early childhood education and care. Its revised social scoreboard includes reduced inequalities in education and training.

In 2021, EU policymakers agreed to invest over €800 billion in NextGenerationEU, to make the EU more resilient to crises. Progress is measured through the Recovery and Resilience Scoreboard, which includes measures of both social cohesion and gender equality.

In the same year, the Joint Research Centre developed the EU Multidimensional Inequality Monitoring Framework (MIMF), aimed at measuring and monitoring inequality in 10 different areas of life. The MIMF forms the conceptual framework for this report.

Key findings

- Previous studies found that vertical income inequality (inequality in the distribution of income between households) in the EU increased less than expected in the first year of the pandemic, although inequality between countries rose due to structural factors and existing social protection measures. While the data are preliminary, they do indicate that the decrease in income inequality starting in 2015 seems to have continued into 2020.
- Pre-pandemic country-level data suggest that high government spending on social protection in a given year is associated with low income inequality the following year, when controlling for the country's wealth and education level.
- Before the pandemic, the highest income inequality between social groups was related to education, occupation, employment status and urbanisation. During the pandemic, the unemployed in particular were subject to a fall in income, along with people with low and medium education levels.
- Health inequality is closely related to income inequality. Before the pandemic, the risk of disability for people in the lowest income quintile was already nearly three times that of those in the top 20%. Income inequality contributed to different health outcomes during the pandemic, as accommodation problems, not being able to work from home and pre-existing conditions made lower income groups more likely to contract COVID-19.
- Access to health services was of course reduced for everyone during the pandemic, but even more so for people on a lower income. In 2020, the risk of having an unmet medical need for people in the lowest income quintile was 5.4 times that of those in the highest quintile (up from 4.6 in 2019).
- Education and occupation are also closely related to health inequalities: people without tertiary education and in blue-collar occupations are most likely to have chronic illnesses and lower mental well-being. The gap in access to healthcare in relation to education level has been declining since 2016, but dropped further during the pandemic.
- In both 2019 and 2020, having poor health, living in cities and being in employment were most associated with worsening health. However, during the pandemic, gender differences in worsening health were also found to decrease, explained by the fact that women's health seems to have deteriorated more than men's.
- Those who were young, had a lower education level, worked in the affected sectors and were blue-collar workers were most at risk of job loss during the pandemic. Those who were self-employed or on temporary contracts were also at risk of losing jobs or having their working hours reduced.
- Gender differences in hours worked decreased in 2020, as men's working hours declined. However, single mothers were most likely to have their working hours reduced, due to the closure of schools and childcare facilities.

- The ability to work from home created inequalities between low- and high-income groups, intersecting with gender inequality in childcare and housework.
- The pandemic is expected to have caused learning loss over the long term, resulting in increased inequalities between students based on digital divides and the socioeconomic background of the parents, which affects parents' ability to help their children, particularly students with disabilities.
- Parents and students in better financial situations were more satisfied with online schooling. However, having sufficient equipment to carry it out was the most important factor for satisfaction, regardless of the ability to make ends meet.
- When controlling for other factors, parents and students in rural areas were more satisfied with online schooling (possibly related to not needing to commute), but less likely to have sufficient equipment. Parents' ability to work from home was associated with their higher satisfaction with online schooling.
- Higher government spending on education increased the probability of being satisfied with online schooling. Longer school closures were associated with lower satisfaction for both students and parents.

Policy pointers

- Income inequality may not have increased as a direct result of the pandemic, but needs to be closely monitored, particularly since the emergence of the cost-of-living crisis in 2022.
- Although data are not yet complete in this area, findings suggest that government support overall was able to reach those most in need (although many important country differences exist) – a major consideration for future crises.
- Health and income inequality are closely linked: income is one of the most important predictors of having a chronic illness or disability. Those in lower income groups were affected most by the disruption to healthcare services. Policies focusing on reducing income inequalities can therefore also reduce health inequalities.
- Unmet needs for healthcare seem to have caused physical and mental health inequality during the pandemic, highlighting the importance of providing access to essential services across all income groups.
- While gender differences in hours worked were less in 2020, attention is still needed to reduce gender inequality in certain occupations and to help single mothers, who lost the most working hours during the pandemic.
- The current findings align with previous findings that temporary workers, young people and those in precarious employment are vulnerable to crises. Working from home may become another source of inequality in the long term, affecting these groups differently. It is important for policies to continue to reduce the role of precarious work in the labour market and to further increase the transparency and predictability of working conditions, in a post-pandemic, increasingly flexible world of work.
- Having sufficient equipment to carry out online learning was more important during the pandemic than income, highlighting the importance of tackling inequality in digital skills and access between populations over the long term.
- Given that spending on education was associated with higher satisfaction with online schooling during the pandemic (although other factors may be at play), more government spending in this area could potentially reap rewards and reduce inequalities.
- School closures affected education, highlighting the importance of preserving continued (in-person) education in future crises, such as the fuel and cost-of-living crises.

Introduction

In the aftermath of the COVID-19 pandemic, the scientific and research community anticipated an increase in inequality among European societies and citizens. It is commonly acknowledged that disparities in labour market access, income, health and education, both between and within the Member States, are obstacles to social cohesion and upwards convergence. Although these warnings initially came mainly in the form of commentaries by researchers and policymakers, EU-level empirical data on the first years of the pandemic are now increasingly available. Against this background, this study investigates the extent of multidimensional inequality in EU countries, exploring how the levels of inequality have changed since the start of the COVID-19 crisis in the EU and highlighting the social groups most affected by inequality. It examines to what extent the COVID-19 crisis contributed to changes in inequality and affected the main drivers, as well as focusing on government expenditure as a general driver of inequality.

At the same time as Europe was battling the pandemic, which affected countries, regions and groups of citizens in different ways and halted a decade-long era of economic progress in the EU, the European Commission launched in 2021 the action plan of the European Pillar of Social Rights (EPSR), proposing its targets for 2030 and outlining a plan for implementing the EPSR's principles. Addressing inequality features prominently in the action plan, which includes a target to reduce the number of people at risk of poverty and social exclusion by 15 million by 2030. Through the plan, the Commission also seeks to reduce social, territorial and economic inequalities in health and in access to essential services, its overarching aim being to create a union of equality, in which diversity is a strength and gender equality in employment and work–life balance is helped by the availability of high-quality and affordable early childhood education and care. The EPSR's revised social scoreboard includes reduced inequalities in education and training.

To support recovery from the pandemic, EU policymakers agreed in 2021 to invest over €800 billion in the NextGenerationEU recovery plan, pledging to make the EU more resilient to crises. Progress is measured through the Recovery and Resilience Scoreboard, which includes measures of both social cohesion and gender equality.

In parallel, the Commission also launched the EU Multidimensional Inequality Monitoring Framework (MIMF), a tool developed by the Joint Research Centre (JRC) in 2021 to 'contribute to the measurement, monitoring and analysis of a wide range of different aspects of inequality' in 10 different areas of life.[1]

This study applies the EU MIMF as the analytical framework for multidimensional inequality, focusing on four of its life domains:

1. income and material living conditions
2. health and access to healthcare
3. labour market participation and working conditions
4. skills, knowledge and education

The research questions in these four life domains are explored through a detailed literature review and statistical analyses, both in general and in the context of the COVID-19 pandemic. The empirical quantitative analysis presented in this report uses data from the first year of the pandemic to demonstrate the levels, trends and drivers of inequality before and during the COVID-19 crisis. The results of the literature review outline the state-of-play in this rapidly expanding area of study, with the main focus being the drivers of inequality during the pandemic. The methodological and conceptual approach used in these analyses is presented in Chapter 1.

Chapters 2–5 present the findings on inequality in each of the four life domains of the EU MIMF: income and material living conditions, health, employment and working conditions, and education and learning. Chapters are structured around five elements. Each starts with a systematic literature review of the factors that influenced inequality in the domain in question during the pandemic. It then continues with a discussion of the levels of inequality based on relevant indicators from the EU MIMF, as presented in the section 'Conceptual framework: EU MIMF' in Chapter 1, followed by an analysis of trends in inequality, using a smaller selection of indicators, which were reconstructed for several years. Based on the literature review and the levels and trends, the end of each chapter presents the results of statistical analysis exploring the relationship between government expenditure and inequality in general, as well as the drivers of inequality during the pandemic.

1 More information on the EU MIMF is available at https://knowledge4policy.ec.europa.eu/projects-activities/multidimensional-inequality-monitoring-framework_en

1 Methodology and conceptual framework

This chapter briefly outlines the methodologies used in the research, while a more detailed description can be found in the annexes to this report.[2]

Conceptual framework: EU MIMF

The conceptual framework for this study was adapted from the EU Multidimensional Inequality Monitoring Framework (EU MIMF), which has been developed by the JRC (Alberti et al, 2021). This framework was applied to structure both the literature review and the statistical analyses. Key elements of the analysis of multidimensional inequalities are outlined below.

The framework includes several approaches to the definition and measurement of inequality.

- **Vertical inequality** measures the degree of variability of individual outcomes across whole populations. The most widely used vertical income inequality indicators include the Gini coefficient, which measures inequality on a scale of 0 (perfect equality) to 100 (perfect inequality), and share ratios, which focus on quantiles, for example the interquartile share ratio, which shows the share of total income earned by the top quintile relative to the share earned by the bottom quintile (Annex I). As share ratios focus on specific quantiles of the distribution rather than on the whole, they cannot pick up changes in the distribution happening outside those quantiles; nevertheless, the measurements can be used across various life dimensions.
- **Horizontal inequality** measures inequalities between social groups within societies, based on characteristics such as country of birth, degree of urbanisation of their living location, education, type of work, income, gender and age.
- **Inequality of opportunity** differentiates between factors that individuals have a possibility to influence and circumstances beyond individuals' control, such as gender, age and family background. Inequalities resulting from the latter are termed inequalities in opportunity.
- The **discriminatory norms, attitudes and practices approach** focuses on the quality of the social institutions (laws, social norms and practices) necessary for fair social interactions that can systematically or arbitrarily discriminate between individuals and groups in their access to relevant resources, opportunities and outcomes. The metrics used to measure the features of fairness can include the degree and prevalence of institutions such as oligarchies and plutocracies, corruption, nepotism, patriarchy, racism, classism or other unfair social practices.
- **Intergenerational mobility** is closely related to social mobility and equality of opportunity, with a specific focus on the improvement of outcomes transitioning from one generation to the next. This approach considers the goal of social policies to be the promotion of mobile societies, removing obstacles and ensuring opportunities for upwards mobility of people at the bottom, while at the same time preventing those at the top from hindering social progress and social mobility. The measurement of social mobility requires rich longitudinal datasets accompanied by rich cross-sectional data, ideally including data on the same individuals throughout their life course and/or comparing outcomes of parents and their offspring for intergenerational data.

This report focuses on outcome variables relating to the different approaches described above whenever possible. Many earlier studies on inequality have largely focused on single dimensions, such as income, health or education, influenced partly by the availability of data, such as long time series of income data covering all EU Member States. However, the understanding of inequality as a multidimensional concept has been increasing in prevalence over recent years.

Life dimensions explored in the study

The EU MIMF integrates the multidimensional view of inequality and proposes a combination of approaches described above to study inequalities across 10 key life dimensions (Figure 1).

2 Full details of the methodology and further annexes are published separately in the form of a working paper on the web page for this report at eurofound.link/ef22002. Further references to annexes are to those in that working paper except where otherwise stated.

Figure 1: Dimensions of life of the EU MIMF

Source: *Alberti et al (2021)*

This report explores inequality in 4 of these 10 dimensions of life, with a somewhat extended focus. These are:

1. income and material living conditions
2. health and access to healthcare
3. employment and working life
4. education, knowledge and skills

The overview prepared by the JRC provides a comprehensive list of indicators used to measure inequalities in these domains and discusses the drivers of inequalities and their measurement (Anand et al, 2020; Alberti et al, 2021). These include two broad types of indicators:

1. government policies (for example, expenditure on education, healthcare and social protection)
2. macroeconomic/structural indicators (for example, employment rates and agricultural production)

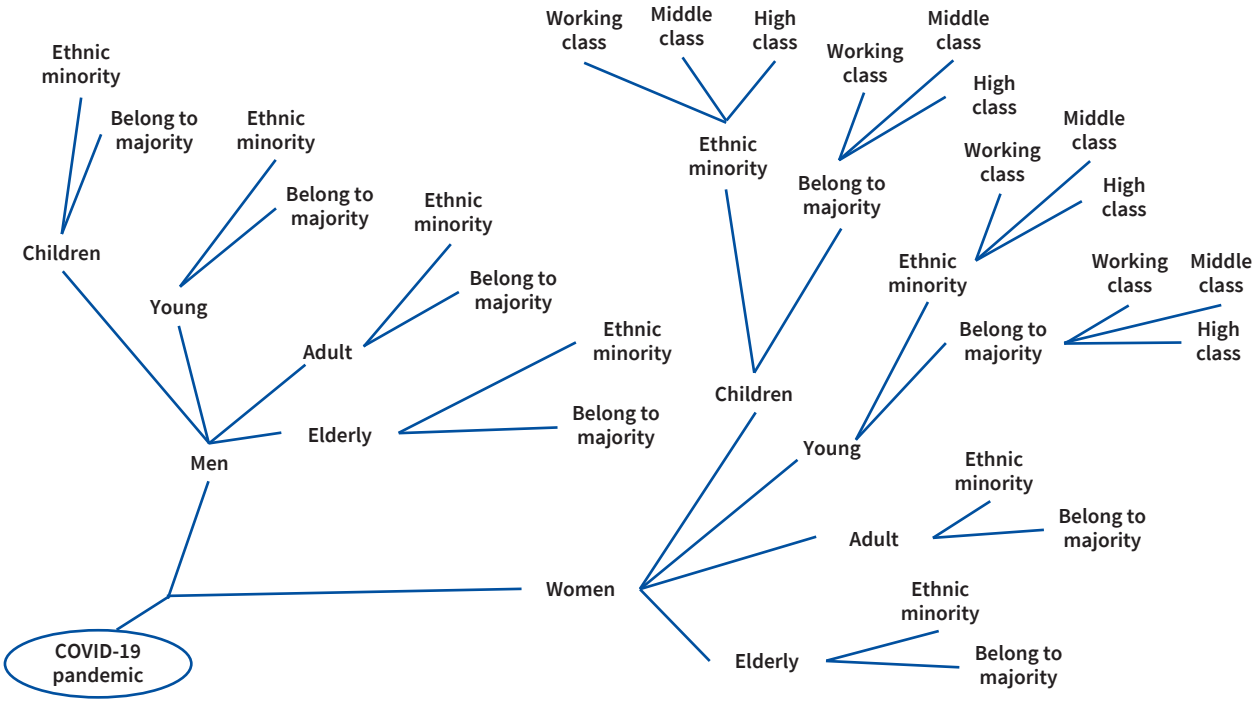
This study explores these macro-level indicators as general drivers of inequality before the pandemic.

Intersectional approach to understanding COVID-19 effects

Intersectionality is an important theoretical approach in inequality studies. It investigates human experiences and life chances as shaped by the interaction between different social factors, including gender, race, ethnicity, social class, age, sexuality, geography, age, disability, migration or refugee status, and religion. As has emerged in gender research (EIGE, 2019), the approach is especially relevant for understanding the impacts of the pandemic.

The pandemic is an example of an intersectional phenomenon: the impact of individual and community exposure to the public health crisis depends on multiple and interrelating structures of inequality. Therefore, to analyse how differently situated groups and populations have been experiencing the effects of this crisis, it is worth focusing on multiple intersecting factors (Figure 2). For example, while evidence shows that the pandemic, on average, had varying effects on women and men in terms of health, work, income and other outcomes, the intersectional approach asks which specific groups of women and men are disproportionately affected. Preliminary studies suggested that different social groups and subgroups faced different risks of contagion and coped differently with the consequences, with some groups especially disadvantaged, leading to increasing inequalities (Bowleg, 2020; Maestripieri, 2021).

Figure 2: Intersectional approach to effects of COVID-19 on inequality



Source: *Maestripieri (2021)*

The uneven negative impacts of the pandemic, intersecting with pre-existing inequalities and vulnerabilities, are likely to lead to increasing problems in the long-term future. For example, school closures coupled with uneven access to online tools and learning resources (Blundell et al, 2021) have heightened the risk of vulnerable children having poor education outcomes and experiencing other negative effects (see 'Literature review' in Chapter 5). Combined with other increased stresses during the pandemic, such as reduced disposable income and worsened living conditions, these factors have the potential to lead to the onset of mental health problems later in life (Virtanen et al, 2016) and for other longer term scarring as a result of the economic impacts of COVID-19 (Eurofound, 2021a; Jones et al, 2021).

Methodology

Each life domain considered in this study – income, health, employment and education – is analysed from multiple perspectives.

First, levels of inequality in the EU were analysed, relying on multiple EU MIMF indicators, including various approaches to inequality.[3] Priority was given to the most recent data available, to adjusted indicators over unadjusted ones[4] and to indicators with the highest policy relevance (see the annexes for more details). The results of the analysis are summarised in **heatmaps**. The right side of each heatmap showcases the measures showing the largest inequalities, whereas the left side presents indicators associated with low levels of inequality. Countries are sorted from top (indicating the lowest levels of inequality) to bottom (the highest levels of inequality). As EU MIMF indicators are largely based on data from 2018 or 2019, they do not cover the impact of the pandemic.

A **trend analysis** was used to show how inequality changed over time up to the first year of the pandemic. Indicators based on aggregate Eurostat data were reconstructed dating back to the year that the underlying data were available. Most of the indicators include data points for 2020; however, 2020 was a rather volatile year and may not yet provide a comprehensive view of the effects of the pandemic. Whenever possible, the analysis captures inequality between different **social groups**, including women and men, natives and non-natives, people in rural and urban areas, those with a tertiary education compared with those without, and people in different age groups. Data disaggregated by

3 Of the 166 measures available across the four dimensions, 66 were included in this study.

4 Unadjusted measures compare statistics between two groups, while adjusted measures also control for other variables that may influence the outcome. For example, an adjusted indicator would control for education, type of work, degree of urbanisation and other variables when studying the gender effect on income.

gender were more readily available than data for other social groups, which somewhat skews the discussion towards gender inequality. While the EU MIMF indicators are often presented as odds ratios, the trends are shown using risk ratios, which show a ratio of a probability that the event will occur in one group over the probability that it will occur in the other (Annex I).

These findings were contextualised by means of a **literature review**, focusing on the pandemic-related drivers of inequality, which finalised the conceptual framework for statistical analysis (presented at the beginning of each chapter). The literature review focused on the following questions.

- How have the levels of inequality changed since the start of the COVID-19 crisis in Europe?
- Which social groups have been affected the most?
- What were the main drivers of inequality in Europe during the pandemic and how has the COVID-19 crisis contributed to changes in inequality?

A systematised review was carried out (Grant and Booth, 2009), including a comprehensive systematic search for sources covering these research questions and domains, but it did not include a formal quality assessment of the sources retrieved. In total, 268 sources were included in the literature review (see the annexes). Sources covering non-EU countries were also included, as most articles were available from the United States (US) and the United Kingdom (UK). Given the notable differences found between countries, this may mean that the findings from the literature review cannot always be generalised for the EU. However, the relationships between inequality and the various factors analysed in those studies are useful for the development of hypotheses to be tested in the further inferential statistical analyses, focusing on the EU27.

Policies that were hypothesised to help reduce inequality were tested on country-level data, as discussed in the sections in each chapter on policies as potential drivers of inequality. EU MIMF indicators showing the largest inequalities were chosen as dependent variables, with policies such as government spending on education, healthcare, family and children, and other areas serving as independent variables. **Regression models** used in the analyses covered in these sections include ordinary least squares (OLS) models using single-year data from EU countries for the adjusted EU MIMF indicators. **Country-level correlations** were limited by the small sample size (27 Member States, depending on data availability), so, in some cases, historical data were either taken directly from Eurostat or reconstructed, yielding time-series cross-sectional (TSCS) data for multiple EU countries across several years. OLS assumptions were tested and the necessary changes to meet those assumptions were implemented (see the annexes for details).

Finally, changes in inequality during the pandemic were explored through regression models using individual and household-level microdata from the European Union Statistics on Income and Living Conditions (EU-SILC), the Survey of Health, Ageing and Retirement in Europe (SHARE) and Eurofound's *Living, working and COVID-19* e-survey. The hypotheses tested were mostly based on the literature review. Both longitudinal and cross-sectional data were used, depending on the type of analysis. For each model, relevant assumption tests were implemented, with the limitations outlined in the annexes (eurofound.link/ef22002).

2 Income inequality

This chapter presents the analysis of inequality in income and material living conditions. It begins with a literature review focusing on the drivers and factors that were found to be important for outcomes in income inequality during the pandemic. Next, levels of inequality in the EU27 before the pandemic are presented, followed by trend data showing how the levels of income inequality have changed throughout the past decade, closing with 2020. The fourth section focuses on policies as general drivers of income inequality, and the final section concentrates on drivers of income inequality during the pandemic.

Literature review

At the start of the pandemic, researchers and policymakers feared that its distributional consequences would deepen the existing economic disparities within and between countries. Their reasoning was that public health crises tend to expose and amplify pre-existing inequalities that shape population health, a primary indicator being income inequality (Bambra et al, 2020). Historical pandemics were shown to have increased income inequality, especially through the lowering of employment rates for those with lower education levels (Furceri et al, 2020).

However, governments swiftly reacted to the COVID-19 pandemic, and many of the unequally distributed risks were somewhat mitigated by generous social transfers and work schemes in several European countries. Some studies even suggest that the policies implemented in some countries have led to decreased income inequalities (Clark et al, 2021), showing how effective social policies can be in addressing unequal distributions of income at societal and global levels (Fiske et al, 2021). However, others are concerned that, as these strengthened social security measures gradually lessen, the inequalities in income will become evident.

Literature findings on the effects of the pandemic on income inequality can be categorised into the following levels (Figure 3).

- **Macro-level factors** are measured at **national and cross-national levels**, such as pre-pandemic levels of income inequality and poverty, strictness of restriction measures, employment regulations, labour market structure, pre-pandemic priorities in government spending and the effectiveness of pandemic-related support measures. Most of these were analysed in macro-level, multi-country studies.
- **Meso-level factors** include **regional or local differences**, such as access to employment and public services, pre-pandemic regional differences in socioeconomic vulnerabilities, skills and income profiles of workers, dependency on sectors most affected by lockdowns and travel bans (such as the service sector), and community type (rural versus urban). These are demonstrated in within-country analyses.
- **Micro-level factors** relate to **individual experiences**, such as employment (and sector, skill level and the possibility to work from home), level of education, age, belonging to a racial/ethnic minority, having a disability and gender identity. Their role is explained in studies based on individual-level microdata.

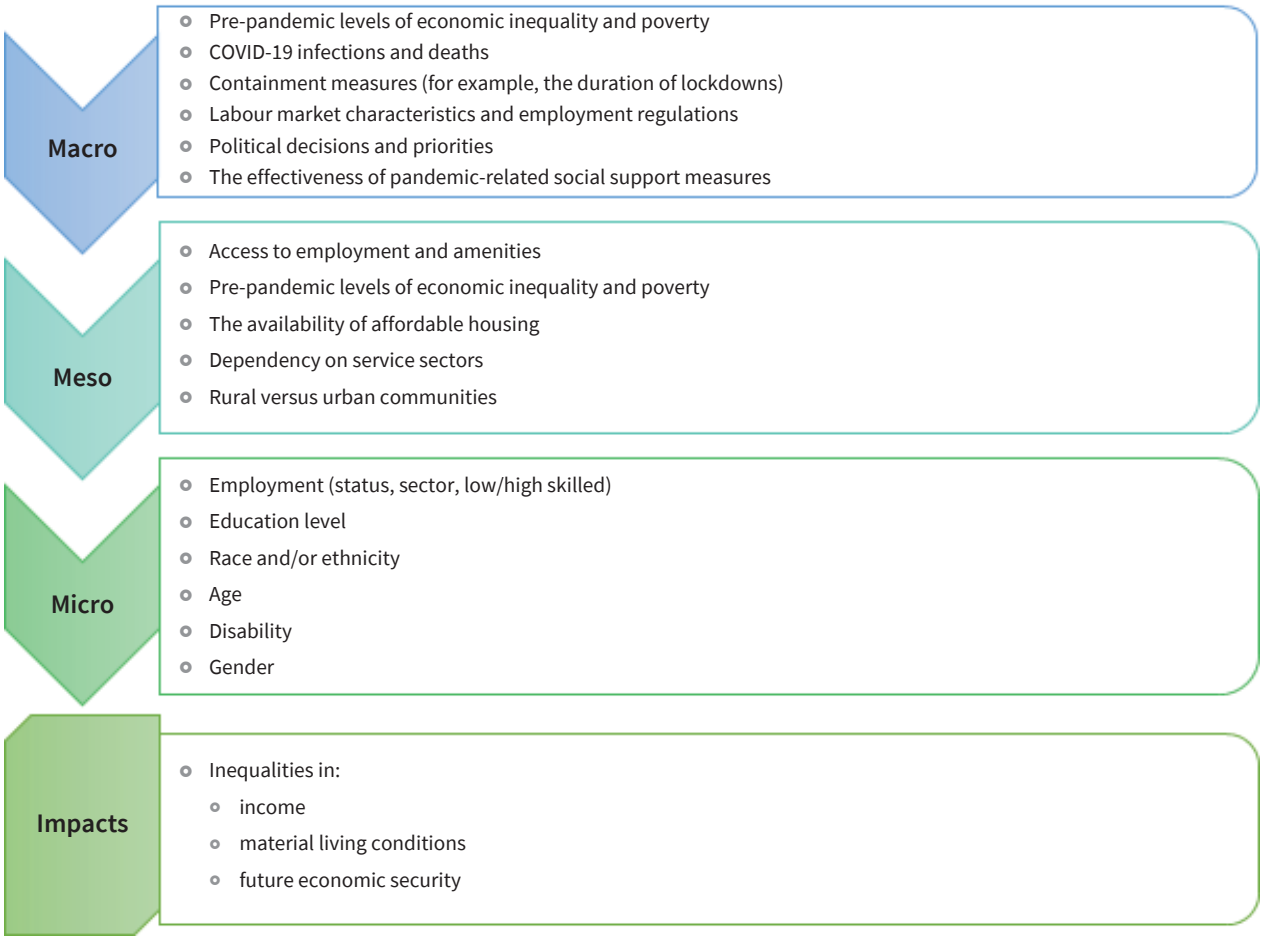
COVID-19 and global income inequality

It was initially assumed that poorer countries would be more badly affected by the COVID-19 pandemic than richer countries due to poorer health conditions, less prepared healthcare systems and living conditions that left people vulnerable to contagion (Stiglitz, 2020). For a while, this assumption was questioned early in the pandemic, when many of the most developed countries suffered higher mortality rates and more severe economic losses than most developing countries. However, these findings were often related to a lack of appropriate measurement in low-income countries and, after a time, the case mortality rates increased in low-income countries.

Some early studies suggested that because of these initial differences in COVID-19 death rates, economic inequality on a global level has decreased. Deaton (2021) suggested that the loss of national income between 2019 and 2020 was strongly positively related to the per capita COVID-19 death count. This study demonstrated that global inequality, if each country is the unit of analysis, continued to decrease, as although the 97 poorest countries lost an average of 5% of their 2019 per capita gross domestic product (GDP), the richest 96 countries lost a corresponding 10%. However, when countries were weighted according to population, global income inequality was found to have increased.

Another study focusing on the 2019–2020 period (Darvas, 2021) argues that, while global inequality has not decreased, it has not increased as much as previously expected, as richer countries had a larger GDP per capita decline than poorer countries. This study concluded that global inequality had increased to a relatively small extent (when including China and India, using weighted populations).

Figure 3: Macro-, meso- and micro-level factors in income inequality during the COVID-19 pandemic



Source: *Authors, based on an overview of the literature*

Findings from the World Bank (Yonzan et al, 2021) are also similar for 2020; however, the data for 2021 suggest that the global divergence in the economic impacts of COVID-19 is increasing over time. In 2020, the richest two deciles of the global income distribution on average lost about 5% of their expected income, while the poorest two deciles on average lost about 6%. However, in 2021, the richest two deciles on average are expected to have recovered nearly half of their 2020 losses, while the poorest two deciles on average are expected to further lose 5% of their income. These findings suggest that, while the pandemic had relatively even economic effects globally, the recovery will be less uniform.

Role of mitigation actions and income inequality

The effects of lockdowns were also more complicated than previously assumed in European countries. In the beginning of the pandemic, a trade-off was often mentioned between the lives saved through lockdowns and restrictions and the devastating impact this would have on the economy. However, scant evidence for such a trade-off has been found (Darvas, 2021). Some of the literature suggests that there is little indication that severe restrictions saved lives, while these had a grave impact on the economy (Coccia, 2021).

Simulation analyses on the distributive effects of lockdowns (Palomino et al, 2020; Perugini and Vladisavljević, 2021) found that countries with higher pre-pandemic income inequality, insecure employment regulations and limited social protection measures would experience more severe effects on income inequality and poverty, due to job losses or reduced working hours. It was also found that the same containment measures may lead to a greater increase in both poverty and inequality in eastern and southern Europe than in northern and central Europe. These between-country differences grew larger with the severity of the restriction measures.

The studies above also suggest that economic and labour market structural factors shape the severity of income inequality and poverty. Countries with low income inequality are less likely to experience large increases, further mediated by employment regulations and labour-market structure. That is, countries with a larger proportion of workers with permanent contracts, fixed hours and salary were less likely to experience job

loss (see 'Literature review' in Chapter 4) and to show increases in income inequality. Meanwhile, countries with a larger share of low-skilled workers, commonly associated with insecure employment contracts, lower wages and an inability to work from home, demonstrated increases in income inequality (Palomino et al, 2020; Perugini and Vladisavljević, 2021).

The extent and effectiveness of the existing social protection measures and the timing and generosity of pandemic-related support measures were also important factors. Clark et al (2021) used panel data to track income inequality during the pandemic in five European countries (France, Germany, Italy, Spain and Sweden). They found that relative inequality increased during the initial outbreak (January to May 2020), then reversed to lower than pre-pandemic levels by September 2020, paired with a decrease in absolute inequality in the same period, suggesting that social protection measures were effective at mitigating the income losses felt by those at the bottom of the distribution.

Other authors show different trends. Aspachs et al (2020) found that, in Spain, there was an initial increase in income inequality, especially among younger and foreign-born individuals and in regions dependent on tourism. While public transfers and unemployment schemes were somewhat effective at offsetting most of the increase in inequality, they did not fully restore it to pre-pandemic levels. Angelov and Waldenström (2021) drew similar conclusions using Swedish population register and survey data. Income inequality increased due to income losses among low-paid workers, while middle- and high-income earners were almost unaffected. COVID-19 support measures, while dampening it, did not fully offset the increase in inequality.

These differences are probably the result of the selection of countries and data used. While Clark et al (2021) used the self-reported disposable income of a few hundred households at four points in time during 2020, Angelov and Waldenström (2021) used monthly and annual tax-registered pre- and post-tax total market income of between five and eight million individuals. Aspachs et al (2020) used bank data on government transfers and labour earnings for all active account holders of the second largest bank in Spain. This highlights that careful consideration should be taken when generalising findings from one country context to another.

Others argue that strong reliance on extraordinary social transfers raises additional risks. Unemployed, low-skilled, young and/or foreign-born workers, along with other economically vulnerable groups, may face an economic shock when the measures are removed (Li et al, 2020). Low-income households were more likely to have taken on new debt, borrowed money from friends or family, and reduced their consumption. This is not reflected in income measures and is likely to pose difficulties when the levels of support are reduced (Brewer and Gardiner, 2020a). Ranci et al (2021) argue that poverty was concentrated in the poorest three deciles, while the lower and middle income groups were more likely to face difficulties in their financial sustainability than low income groups due to expense or debt levels.

Brewer and Gardiner (2020b) also showed that job loss and reductions in earnings were more common in the second and third quintiles of the working-age income distribution than in the bottom quintile, as people who experienced relatively secure economic situations as a result of employment were more likely to be under financial strain due to job and/or income losses. As those at the bottom of the distribution continue to face economic vulnerability, this means that the overall share of the population facing economic insecurity has grown. Another study argues that a gradual transition to pre-pandemic levels of social transfers may mitigate these issues, while an abrupt halt to the extraordinary support measures will significantly increase income inequalities and economic insecurity for both lower and middle-income groups (Brewer and Gardiner, 2020a). This view is corroborated by an Oxfam report, which analysed loans offered by the International Monetary Fund (IMF) to countries struggling to meet their populations' needs during the crisis (Tamale, 2021). This report shows that 85% of the 107 COVID-19 loans negotiated between the IMF and 85 governments indicated stipulations to undertake austerity measures once the public health crisis abates.

Regional differences and within-country income inequality

Examining regional disparities is important for policymakers when choosing policies to mitigate the economic consequences of the pandemic, as regions often faced very different challenges. However, inequality measurements, such as the Gini coefficient or income shares, are calculated at country level (or for large diverse areas), obscuring regional differences in income distribution (Trapeznikova, 2019).

While no extensive research on the effect of COVID-19 on regional income inequalities was found in this review, important factors that may affect these are outlined below.

First, regions in which many workers are employed in the **tourism and hospitality** sectors have been disproportionately affected by the pandemic. These sectors are characterised by precarious employment contracts and low wages, and employ many low-skilled workers, young people and non-natives, who are already economically vulnerable. Aspachs et al (2020) suggests that the loss of income due to job loss or reduced hours may be concentrated in geographical areas dependent on consumer service sectors. Using

bank data on government transfers and labour earnings in Spain and tracking the account holders' place of residence, the authors found clear regional differences in pre-transfer income inequality and that the regions with the highest increase were those dependent on tourism (such as the Balearic Islands and the Canary Islands).

Increases in income inequality may further deepen spatial divides, as **economically vulnerable groups may be forced to leave inner-city areas** (Grodach, 2020, using data from Australia). The inner suburbs of the country's five largest cities have the largest concentration of employees working in the consumer services sector, who are often young and low skilled. To make ends meet in the pandemic, these employees sought more affordable housing in the middle and outer suburbs. This trend points to an increase in income and spatial inequality, in which more low-skilled and low-income workers were pushed out of inner areas that had plentiful employment, access to public services and amenities to lower-cost outer suburbs with poor access to jobs and public services.

The **rural–urban divide** may also affect the ability of low-income workers to deal with material hardship. A US study (Despard et al, 2021) found that lower income households in urban communities were generally better off financially than households in small towns and rural communities. Despite having less income, urban households had higher liquid assets and net worth, while non-urban low-income households were more likely to own a house and/or a car. Thus, despite similarities in income, the balance sheets of households vary by community type, with low-income households in urban areas often better equipped to deal with income losses compared to those in non-urban areas, where income losses may require selling a house or a car.

The **ability to work from home**, which was a common solution to challenges posed by the pandemic, also affected the maintenance of income levels. Studies suggest that workers with higher education levels and income were more likely to work from home than their low-skilled, low-income counterparts, and that regions with a higher share of low-income workers were more affected by restrictions than regions with higher shares of high-income workers. For instance, in Germany, Irlacher and Koch (2021) found that regions with a lower share of work-from-home jobs were also characterised by lower average income levels. Bonacini et al (2021) found similar trends in Italy.

Individual-level factors

As shown above, **low income and low skills** were primary factors in increased income inequality due to job loss and reduced wages. However, these and other individual factors highly intersect with each other, so it is important to examine the intersections of disadvantage (for example, being poor and female) and of both disadvantage and privilege (for example, being poor and male) (Hurtado, 2018). As noted by Fiske et al (2021), people who were socioeconomically (and otherwise) disadvantaged in pre-pandemic times were more prone to loss of income because of COVID-19. This includes people with lower education and income levels, younger people, migrants and ethnic and/or racial minorities, women, people with care responsibilities and people with disabilities.

Pre-pandemic **position in the labour market** is often listed as one of the main predictors of income changes during the pandemic. The macro-level factors related to employment analysed above – such as permanent employment contracts, fixed hours and wages, level of education and income, and sector of employment – are also key variables for individual loss of income during the pandemic, especially during times of restrictive containment measures. Young people and low-income earners (Adams-Prassl et al, 2020), as well as those in blue-collar occupations (De Dominicis, 2020), have been hit hardest, as suggested by most reviewed sources. The impacts on these groups beyond income are further discussed in 'Trends in employment inequality (2010–2020)' in Chapter 4.

Age has been found to be an important predictor within countries. Illustrating the impacts on the young and vulnerable in the Netherlands, van Ophem (2020) found that the households most vulnerable to the economic impact of COVID-19 were mostly made up of young and/or single individuals. These households were characterised by uncertain incomes (for example, atypical arrangements and temporary contracts), a lack of buffers and longer periods of low-income streams.

A prevailing trend before the pandemic was that **ethnic and racial minorities**, including both native-born and migrants, were socioeconomically disadvantaged compared with the majority of people in Western countries (Bakhtiari, 2022). In the US, Perry et al (2021) found that black adults were over three times as likely as white adults to be unemployed, to have been laid off during the pandemic and to have experienced financial deprivation. They also found a greater likelihood of economic hardship among those with low education levels, young people and women. In the UK, several studies found that workers belonging to black, Asian and minority ethnic (BAME) groups have faced more severe economic hardship than white British workers (Adams-Prassl et al, 2020; Brewer, 2020; Gardiner and Slaughter, 2020). In Australia, Raynor and Panza (2021) found that shared house occupants were particularly vulnerable to income losses due to the pandemic, as they were more likely to be young, casually employed and/or working immigrants.

There is less literature available on the economic situation for people with **disabilities**, although a study from the US found that people with disabilities were

particularly affected by food insecurity during the pandemic (Friedman, 2021).

Gender differences have also been studied. Generally, women were demonstrated to be less likely to be in full-time employment and more likely to have fewer hours of paid work and face longer career breaks than men. Although women's employment participation rate has continuously increased over recent decades, leading to declines in the gender wage gap, this gap continues to exist across developed and developing countries (OECD, 2015). COVID-19 lockdowns seem to have made matters worse, at least for some groups of women (see 'Literature review' in Chapter 4).

A crucial factor in the gendered consequences of the pandemic on income inequality has been the closures of childcare facilities, which has exacerbated the disproportionate distribution of care work between men and women (see 'Literature review' in Chapter 4). Malghan and Swaminathan (2020) argue that intra-household gender inequality is crucial to understanding the gendered impact of the pandemic on income. By using over four decades of global data, they showed that intra-household gender income inequality is systematic, which is linked to women's socially enforced position as primary caregivers, which affects their labour market participation and income levels.

In the UK, Zhou et al (2020) found that the pre-existing discrepancy between men and women in terms of care work was aggravated by lockdowns, and the lack of childcare, the working from home guidance and societal expectations of women as the primary homemakers resulted in a disproportionate increase in women's domestic burden. However, this study found no significant difference between men and women in terms of a reduction of hours worked or falls in labour income (in the first lockdown period), perhaps because, at the time, many essential workers who continued working were women. Later studies in different country contexts found that women experienced greater falls in income than men. In Germany, for example, Czymara et al (2021) found that women had a larger reduction in time spent on paid work and a larger increase in time spent on unpaid care work than men, which could potentially contribute to a future widening of the gender wage gap during recovery. Similarly, Kucsera and Lorenz (2021) found that women in Austria were subjected to higher average decreases in market income than men, as short-time work, unemployment and reduced hours affected them more. However, while an increase in unpaid care responsibilities drove women's decrease in income, discretionary policy measures (such as one-off payments for children) helped women more, as it allowed them to stabilise their income during the pandemic. Meanwhile, short-term work schemes in combination with tax relief helped men to a greater extent.

Overall, as shown throughout this section, education level, age, race and/or ethnicity, disability and gender are all individual-level characteristics that shaped the economic impact of the crisis. The literature review indicates that certain social groups faced additional disadvantages, many of which may intersect and compound vulnerability to income and employment loss, poverty and social exclusion.

Finally, the overall results support the hypothesis that the pandemic has affected historically disadvantaged groups disproportionally and thus exacerbated inequality. In addition to direct impacts on current income levels, some studies suggest that the pandemic may worsen future income levels and inequalities, which is related to the life-cycle effects of income fluctuations. For example, the disruption to schooling has affected all children, particularly those from poorer families, which may have long-term effects on their educational progression and labour market performance (Blundell et al, 2021; see also 'Literature review' in Chapter 5). Younger generations that experienced disrupted education may face a tougher labour market than that seen prior to the pandemic. Therefore, some studies suggest that the pandemic has not had similar financial implications for the future across age groups.

Disruptions to labour market participation caused by COVID-19, particularly for vulnerable social groups, may also increase the risk of old-age poverty levels in the future because of insufficient lifetime earnings (Ebbinghaus, 2021). In addition, the fiscal pressures put on public investment by the COVID-19 pandemic may further reduce minimum provisions of pension income, potentially leading to unintended repercussions on income for current and future pensioners.

Income inequality before the pandemic

Levels of income inequality in the EU were analysed using 18 EU MIMF indicators that span three different approaches to inequality: inequality of opportunity, vertical inequality and horizontal inequality (Table 1).

Table 1: Indicators selected for the income inequality analysis

Inequality approach	Indicators	
Inequality of opportunity	Ex ante inequality of opportunity in having problems to make ends meet (50+ years)	
Vertical inequality	Gini coefficient of equivalised disposable income	
	Income quintile share ratio (S80/S20) for equivalised disposable income*	
Horizontal inequality	Odds ratio of a household having problems to make ends meet, adjusted for individual characteristics	Ages 18–29 years versus 30–49 years
		Ages 50–69 years versus 30–49 years
		Ages 70+ years versus 30–49 years
		Native versus foreign born
		Tertiary education versus no tertiary education
		White-collar versus blue-collar workers
		Rural versus urban
	Odds ratio of being satisfied with the availability of good affordable housing in the area where they live, adjusted for individual characteristics	Women versus men
		Ages 18–29 years versus 30–49 years
		Ages 50–69 years versus 30–49 years
		Ages 70+ years versus 30–49 years
		Native versus foreign born
		Tertiary education versus no tertiary education
		Rural versus urban
		Poorest 40% versus richest 60%

Note: **The income quintile share ratio or the S80/S20 ratio is a measure of the inequality of income distribution. It is calculated as the ratio of total income received by the 20% of the population with the highest income (the top quintile) to that received by the 20% of the population with the lowest income (the bottom quintile) (Eurostat).*
Source: *Authors, based on EU MIMF*

Indicators associated with **vertical inequality** indicate the largest gaps in the EU for income (Figure 4). Based on the pre-pandemic Gini coefficient of equivalised disposable income, EU countries are quite diverse: in Bulgaria, for example, income is concentrated almost twice as much as in Slovakia. Alongside Bulgaria, Lithuania and Latvia exhibit the highest levels of income inequality in the EU. Similar findings emerge regarding the interquartile share ratio. According to this indicator, the richest 20% of the populations in Bulgaria, Romania and Lithuania have an income more than seven times greater than the poorest 20%.

Differences in the ability to make ends meet were analysed to measure **horizontal inequality** among different social groups. Inequality in this indicator was the largest between people of different educational backgrounds (tertiary education versus no tertiary education), followed by types of work (white- versus blue-collar workers). Those in rural and urban areas also significantly differed. Meanwhile, the inequality in the ability to make ends meet was smaller between women and men, between different age groups and between natives and foreign-born individuals (Figure 4).

Figure 4: Heatmap showing the results of income inequality indicators by country, 2018–2019, EU27 and the UK

	housing_rural	ends_senior	housing_poorest	housing_junior	ends_junior	ends_elderly	housing_senior	housing_female	ends_native	housing_tertiary	housing_elderly	housing_native	lOp50_meet	income_s80s20	ends_rural	ends_white	ends_tertiary	income_gini
Slovenia	1.45	1.10	0.92	1.16	1.03	0.91	1.12	0.83	0.73	0.76	1.57	1.09	0.07	3.38	n.a.	0.55	0.48	0.23
Poland	1.06	1.04	1.21	1.06	0.85	1.03	1.45	1.13	0.92	0.90	1.07	0.26	0.05	4.25	1.19	0.70	0.32	0.28
Austria	1.54	0.90	0.67	1.28	1.01	0.74	0.99	1.20	0.48	1.19	1.21	1.23	0.03	4.04	0.85	0.54	0.58	0.27
Sweden	3.46	0.65	0.89	1.09	1.15	0.79	1.10	0.98	0.25	0.88	1.58	1.32	0.02	4.13	0.81	0.56	0.66	0.27
Slovakia	1.58	1.08	1.01	1.17	1.05	1.37	1.39	1.02	0.98	1.31	2.12	n.a.	0.06	3.03	1.12	n.a.	0.39	0.21
Belgium	1.42	0.84	0.74	0.99	0.62	0.71	0.89	1.07	0.39	1.26	1.42	0.76	0.04	3.79	1.02	0.64	0.28	0.26
Germany	1.14	0.95	0.73	0.81	0.63	0.80	0.81	1.66	0.88	1.02	0.85	0.89	0.02	5.07	n.a.	0.54	0.50	0.31
France	1.01	0.72	1.00	0.75	0.94	0.57	1.48	0.62	0.64	1.11	1.39	1.04	0.04	4.23	1.07	0.52	0.35	0.28
Croatia	1.22	1.09	0.70	0.74	1.16	0.81	0.88	1.05	0.96	1.32	0.72	0.96	0.03	5.00	1.48	0.53	0.37	0.30
Netherlands	1.48	1.03	1.14	0.43	0.75	0.78	0.87	0.89	0.51	0.93	1.05	1.34	n.a.	4.05	n.a.	0.55	0.48	0.27
Lithuania	0.72	0.99	1.92	0.90	0.78	1.46	0.98	1.08	0.80	1.05	0.82	n.a.	0.04	7.09	1.23	0.58	0.44	0.37
Malta	1.15	0.80	1.06	0.58	1.30	0.68	1.09	0.82	1.21	0.82	1.56	1.03	0.05	4.28	n.a.	0.60	0.42	0.29
Spain	1.13	0.78	0.68	1.09	1.14	0.56	0.98	1.40	0.54	1.25	1.39	0.73	0.04	6.03	1.02	0.61	0.40	0.33
Latvia	1.22	1.24	0.93	0.86	0.86	1.62	1.67	1.14	0.74	0.99	2.00	0.61	0.06	6.78	1.08	0.66	0.43	0.36
Ireland	1.48	0.72	1.11	1.51	0.79	0.45	1.08	0.89	0.65	0.91	1.80	1.53	n.a.	4.23	1.21	0.62	0.55	0.29
Italy	1.95	0.84	0.68	0.91	1.12	0.83	1.28	1.33	0.54	1.19	1.24	0.87	0.09	6.09	1.03	0.53	0.44	0.33
Portugal	2.76	0.79	0.93	1.34	1.08	0.60	1.18	0.85	1.01	0.77	1.64	0.98	0.12	5.22	1.07	0.47	0.35	0.32
Estonia	2.86	1.01	0.83	1.71	0.83	1.12	2.02	0.83	0.51	1.02	4.26	0.48	0.04	5.07	1.22	0.66	0.51	0.31
Finland	2.30	0.69	1.15	1.26	0.68	0.40	1.48	0.90	0.45	1.08	2.15	n.a.	0.03	3.65	1.11	0.70	0.60	0.26
Greece	1.85	0.73	1.08	0.88	1.36	0.51	1.09	0.98	0.66	1.20	1.87	1.16	0.04	5.51	0.88	0.46	0.40	0.32
Denmark	4.29	0.61	0.88	1.26	0.40	0.49	0.99	0.89	0.47	0.55	2.64	1.86	0.01	4.11	0.90	0.81	0.54	0.28
Hungary	3.24	1.05	1.19	0.59	1.56	0.85	1.09	0.91	1.13	0.69	1.42	n.a.	0.03	4.35	1.26	0.52	0.35	0.29
United Kingdom	0.95	0.58	0.84	0.98	0.78	0.31	0.90	0.85	0.54	0.75	1.17	0.87	n.a.	5.63	0.91	0.54	0.49	0.34
Cyprus	1.64	0.52	1.06	0.84	1.22	0.29	0.74	0.74	1.37	0.77	1.22	0.79	0.08	4.29	1.15	0.36	0.35	0.29
Luxembourg	0.89	0.78	0.88	1.23	1.49	0.28	1.32	0.88	0.53	1.22	1.97	1.08	0.04	5.72	0.71	0.46	0.36	0.33
Romania	3.37	0.99	0.79	1.13	1.04	1.25	1.00	0.85	n.a.	0.72	2.13	n.a.	0.04	7.21	0.83	0.53	0.36	0.35
Bulgaria	2.11	0.94	0.83	0.83	0.86	1.34	1.37	0.94	2.03	1.57	2.42	n.a.	0.05	7.66	1.11	0.54	0.39	0.40
Czechia	n.a.	0.78	n.a.	n.a.	0.96	0.81	n.a.	n.a.	0.77	n.a.	n.a.	n.a.	0.04	3.32	0.95	0.70	0.31	0.24

Doing worse — Doing better

Notes: *Countries are ordered from the best performance (top) to the worst performance (bottom); indicators are also ordered from the best performance (left) to the worst performance (right). The five colours in the heatmap are based on the transformed dataset containing the normalised values for each indicator. An explanation of the EU MIMF indicator labels used in this figure is given in the annex at the end of this report.*
Source: *EU MIMF*

EU MIMF indicator labels

Not having a tertiary education and working in blue-collar jobs reduces one's chances of making ends meet in all EU Member States. However, whether living in **rural areas** is a disadvantage or not depends on the country. In Croatia, Hungary and Lithuania, those residing in the countryside are much more likely to report having problems making ends meet, but the opposite is true in Luxembourg, Sweden and Romania. This could be related to the fact that agriculture in Luxembourg and Sweden accounts for a much smaller share of the GDP than in other countries (Eurostat [nama_10_a10]), suggesting that the farm

structure and who lives in the countryside in these countries may differ compared with more agricultural countries.[5]

Inequality in difficulties making ends meet is generally less pronounced between different **age groups**. Nevertheless, country exceptions exist: people aged 70 years and over are significantly better off than adults in the middle age range (30–45 years) in Luxembourg, Cyprus, Finland and Ireland, but this is not the case in eastern European countries. Meanwhile, young people (18–29 years) are more likely than adults in the next age range (30–45 years) to have problems making ends meet in Hungary and Luxembourg, yet young people seem substantially better off than older adults in Denmark, Belgium, Germany and Finland. This, at least in part, may be explained by greater financial support for university students in these countries. In Denmark, for example, in 2019, financial aid to tertiary education students accounted for 5.2% of total public expenditure (the highest in the EU), whereas this aid accounted for 0.1% in Luxembourg (the lowest in the EU after Greece).[6]

Inequality in making ends meet according to **birth country** is also relatively low. One exception is Sweden, where foreign-born individuals are four times as likely to struggle to make ends meet than natives. However, gaps are larger when it comes to the availability of good and affordable housing, especially in Denmark, while non-natives are more satisfied with good and affordable housing than natives in Poland and Estonia. This may be related to the composition of those who are foreign born in those countries.

In several countries, income does not appear to significantly influence satisfaction with housing. In Slovakia, France, Malta, Portugal, Greece and Cyprus, those in the top 60% of the income distribution have almost the same chance of being satisfied with their housing as those in the bottom 40%. The latter, however, are substantially less likely to be satisfied with their housing in Austria, Spain, Italy, Croatia and Germany. These countries all seem to have a mismatch between the supply (limited) and demand (high) for housing (Housing Europe, 2021).

Importantly, **education, type of work and living location** play a greater role in determining who struggles to make ends meet than factors that are outside individual control (such as sex, age and family background[7]). This contrasts with life dimensions discussed in later chapters of the report, where the largest gaps are seen as regards inequality of opportunity.

Trends in income inequality (2010–2020)

To analyse the trends of inequality in material living conditions, including during the COVID-19 pandemic, the share ratio and the Gini coefficient were used (see the annexes for definitions).

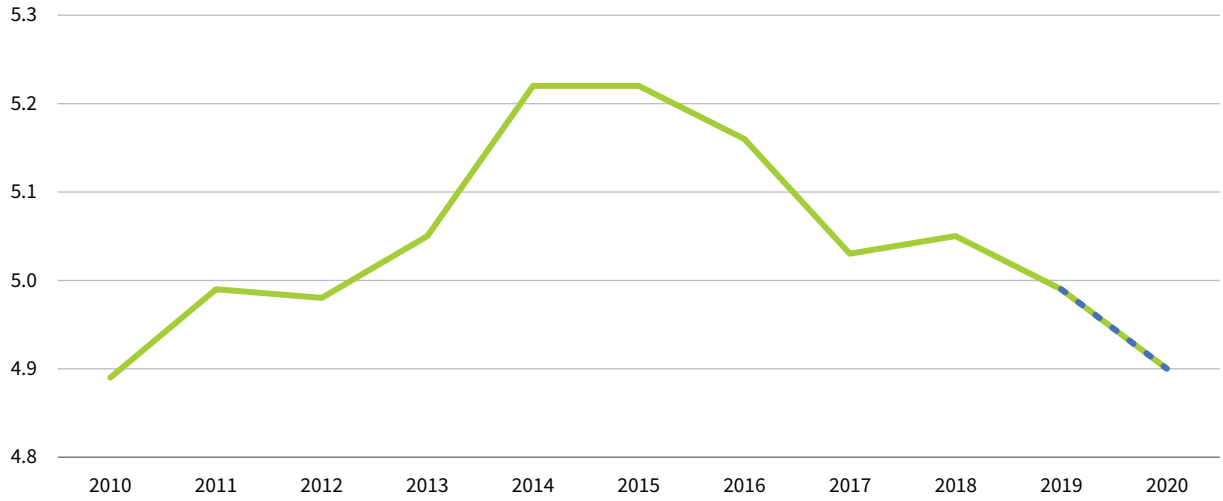
In 2020, the income quintile share ratio in the EU stood at 4.9, meaning that the total income held by the richest fifth of the population was 4.9 times greater than the total income held by the poorest fifth. This marks a decrease compared with 2019 (when the ratio was 5.0 – see Figure 5). While this seems to suggest that the pandemic has not significantly affected the trend of decreasing income inequality, it is important to note that COVID-19 interrupted the data collection activities on which these results are based, and some countries (e.g. Germany) introduced changes to the methodology. This means that 2020 data may not always be directly comparable to the data of previous years. Thus, it remains to be seen whether this effect will be lasting.

5 However, this does not explain the advantage of living in the countryside observed in Romania, especially as urban unemployment is lower than rural employment in Romania. Urban–rural differences in housing may partially explain the findings: rural households in Romania are significantly more likely to be satisfied with the availability of good affordable housing than urban households, and more so than in most other EU countries (see the 'housing_rural' indicator in Figure 4). Rural households are also much more likely to own a house, whereas urban dwellers are more likely to rent. This may provide rural households with added financial security, especially if the house was inherited mortgage free.

6 Own estimates based on Eurostat [educ_uoe_fina01].

7 Family background includes the number of books in a family's home, the household owning its own home, the financial situation of the household, the main breadwinner having a white-collar job and the father being unemployed for several months.

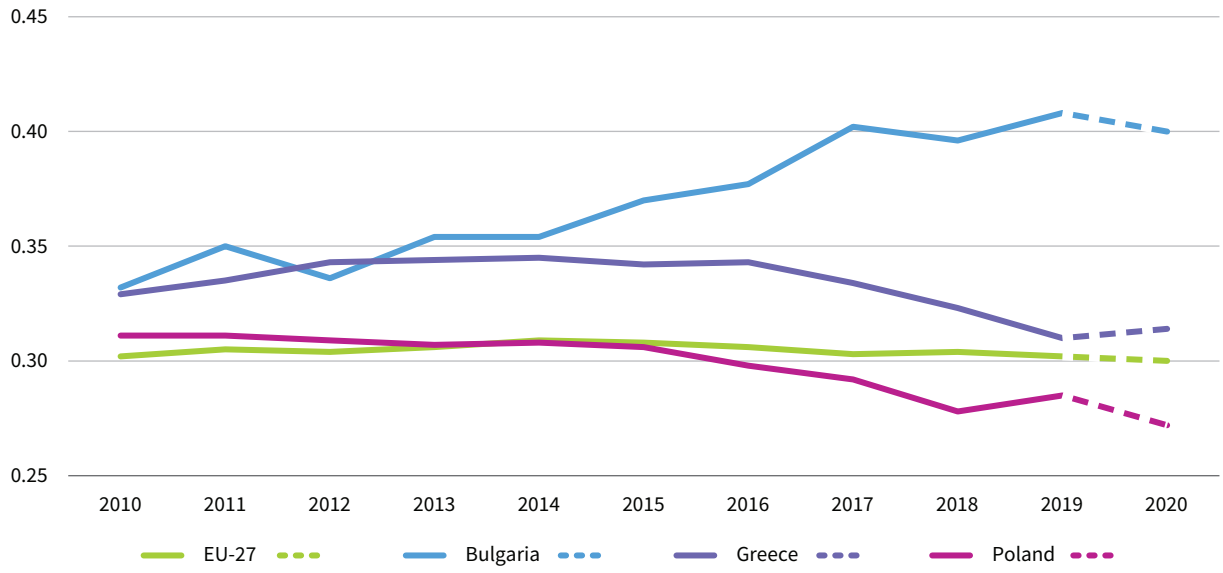
Figure 5: Income quintile share ratio (S80/S20) for equivalised disposable income, EU27



Note: *COVID-19 interrupted the data collection activities on which these results are based, and some countries (e.g. Germany) introduced changes to the methodology. This means that 2020 data may not always be directly comparable to the data of previous years.*
Source: *Eurostat, Income quintile share ratio S80/S20 for disposable income by sex and age group – EU-SILC survey [ilc_di11]*

The trends in income inequality over time were also observed by estimating the Gini coefficient (Figure 6). In 2020, the EU27 Gini coefficient was 0.30. For reference, the highest Gini coefficient recorded globally was 0.62 in South Africa (2017, latest data; OECD, 2022) and the lowest Gini coefficient recorded was 0.21 in Slovakia (2020 data; Eurostat [ilc_di12]). The EU27 Gini coefficient was relatively stable during 2010–2020, but differences were measured at country level. For example, in Bulgaria, inequality steadily grew from 2010 to 2020 (the Gini coefficient increased from 0.3 to 0.4). Meanwhile, in Poland, the Gini index decreased from 0.31 in 2010 to 0.27 in 2020. In both countries, income inequality decreased during the pandemic. Similarly to the income quintile share ratio, these results should be interpreted with caution owing to breaks in the time series.

Figure 6: Gini coefficient of equivalised disposable income, EU27, Bulgaria, Greece and Poland



Note: *COVID-19 interrupted the data collection activities on which these results are based, and some countries (e.g. Germany) introduced changes to the methodology. This means that 2020 data may not always be directly comparable to the data of previous years.*
Source: *Eurostat, Gini coefficient of equivalised disposable income – EU-SILC survey [ilc_di12]*

While information is limited on changes in income distribution for different social groups during the pandemic, experimental statistics produced by Eurostat show that workers aged 16–34 experienced larger drops in income than 35- to 64-year-olds (Eurostat, 2021), probably because they were more likely to see their hours reduced or be laid off given their lack of professional experience.

Policies as potential drivers of income inequality

This section explores government policies as potential drivers of horizontal and vertical income inequality before the pandemic. Based on findings in the previous section regarding inequality levels, the following EU MIMF indicators were selected:

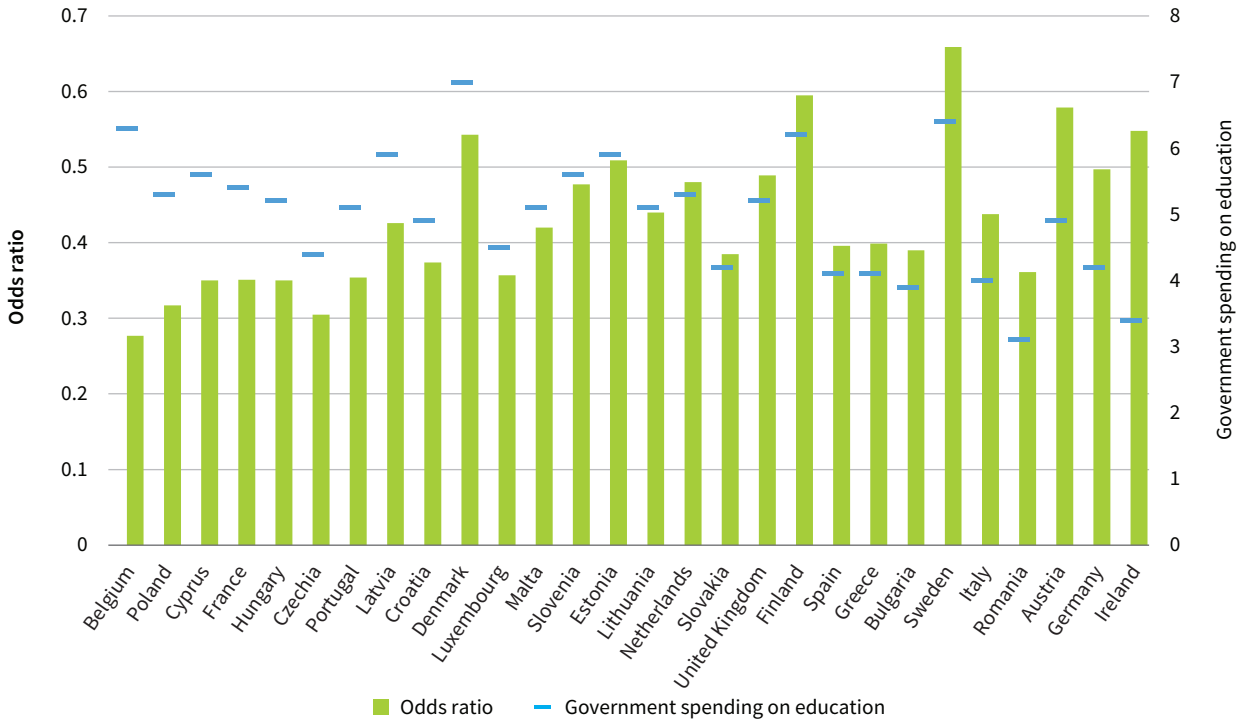
- The first analysis explores the relationship between education and social protection expenditure and inequality in the ability to make ends meet between people with and without a tertiary education.
- The second analysis investigates how the same drivers relate to vertical inequality, as measured by the Gini coefficient of equivalised disposable income.
- The final analysis focuses on inequality in making ends meet between people living in rural and urban areas, and how this relates to investment in agricultural research and development (R&D) and the ability to work from home.

Inequality between households containing people with and without a tertiary education

For this analysis, the odds ratio of a household having problems making ends meet was chosen among EU MIMF measures, as all EU countries appear to be facing challenges reducing this type of inequality.

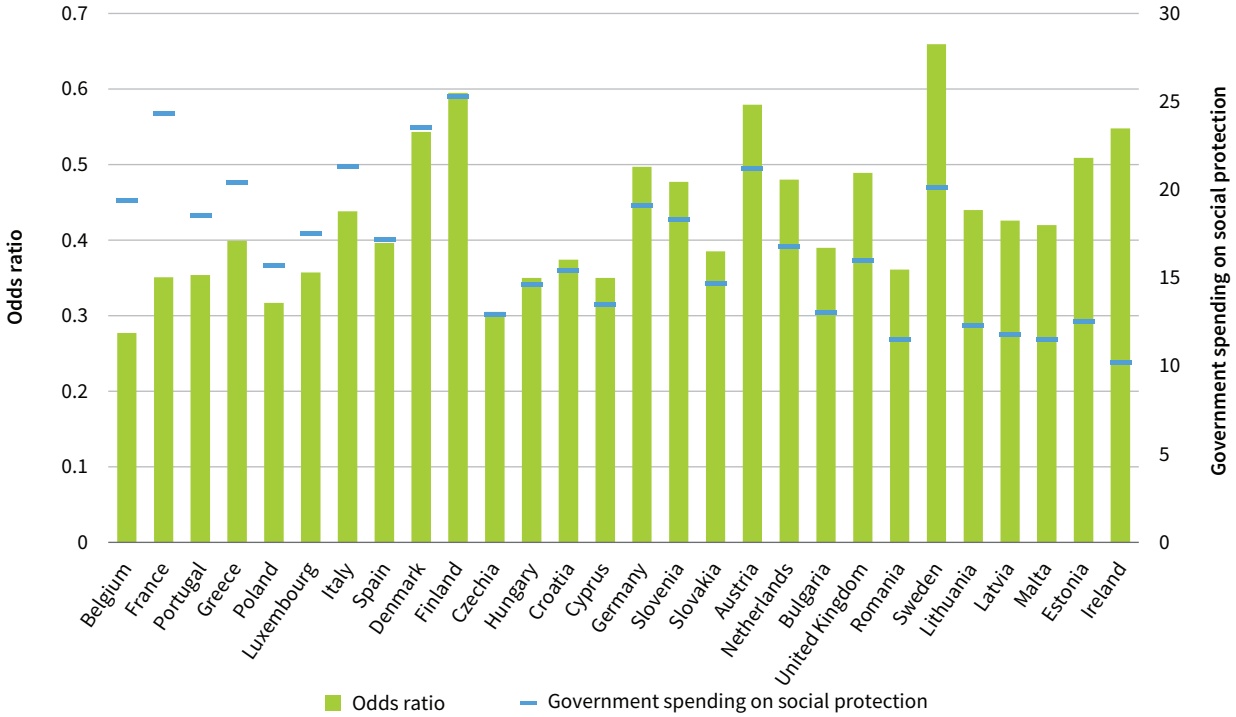
Figures 7 and 8 show these odds ratios alongside spending on education and social protection. Across all countries, the odds ratio is less than 1, meaning that households in which people have a tertiary education tend to have fewer problems in making ends meet than those without a tertiary education. There seems to be a good deal of country variation regarding the relationship between the odds ratio and government spending on education and social protection. In most countries, higher government spending for both education and social protection seems to align with low inequality. Ireland is an example in which government spending on education and social protection is relatively low and income inequality between education groups is high. Exceptions include Belgium and France, which have relatively high levels of expenditures on both education and social protection, but high inequality according to education levels in terms of making ends meet. This could signal that, in these countries, spending is currently high with the aim of addressing inequality.

Figure 7: Odds ratio of a household having problems making ends meet (with versus without a tertiary education, 2018) against spending on education (2015, % of GDP), EU27 and the UK



Note: *Bars and dashes are ordered from the largest gap (in terms of ratio; left) to the smallest (right).*
Source: *EU MIMF and Eurostat, General government expenditure by function (COFOG) [gov_10a_exp]*

Figure 8: Odds ratio of a household having problems making ends meet (with versus without a tertiary education, 2018) against spending on social protection (2015, % of GDP), EU27 and the UK



Note: *Bars and dashes are ordered from the largest gap (in terms of ratio; left) to the smallest (right).*
Source: *EU MIMF and Eurostat, General government expenditure by function (COFOG) [gov_10a_exp]*

A simple country-level correlation shows that the odds ratio is positively correlated with spending both on education (r=0.27) and on social protection (r=0.29), although neither correlation is statistically significant. When controlling for gross national income (GNI) per capita and the population with a tertiary education (Table 2), the association between government spending on both education and social protection and income inequality according to education remains statistically insignificant.[8]

Meanwhile, the coefficient of GNI per capita was found to be positive and significant at the 10% level.[9] This suggests that income inequality between households containing tertiary-educated people and those without decreases as the wealth of the country increases, in contrast with previous findings showing that increases in GNI are typically associated with rises in income inequality (Causa et al, 2014). One possible explanation is that the positive association may be a consequence of the higher costs of living impacting on urban areas more, where more households contain people with a tertiary education.[10]

8 Government spending was lagged by three years, given that the effect on income inequality may not be immediate. GNI per capita was not lagged to see if the country's wealth correlates with income inequality at the same time as GNI per capita is measured.

9 The 10% threshold was chosen instead of the standard 5% because of the small sample size, which increases the probability of a Type II error, that is, finding no significant effect when there should be one (Mudge et al, 2012).

10 According to Eurostat [edat _lfs_9915], 23% of tertiary-educated people in the EU27 lived in rural areas in 2020, while 42.4% lived in cities and 28.9% lived in towns or suburbs.

Table 2: OLS regression model exploring the relationship between government spending and inequality in making ends meet according to education level

	Odds ratio of a household having problems making ends meet (tertiary versus non-tertiary educated), adjusted, 2018
Government spending on education (2015, % of GDP)	0.014
Government spending on social protection (2015, % of GDP)	–0.000
Log (GNI per capita in USD, 2018)	0.079*
Population with tertiary education (% of total population, 2015)	–0.000

Notes: ** p<0.1. For more details, see Table 9 in Annex I.*
Source: *Authors, based on EU MIMF, Eurostat and World Bank data*

Inequality in equivalised disposable income according to education level

Given that the lack of significant results may be due to the small sample of countries, a TSCS analysis of the drivers of income inequality was performed using a measure of the Gini coefficient of equivalised disposable income. The TSCS regression covers the 27 EU Member States over a period of 25 years (1995–2020), thus improving the inferential powers of the analysis thanks to the increased number of observations.

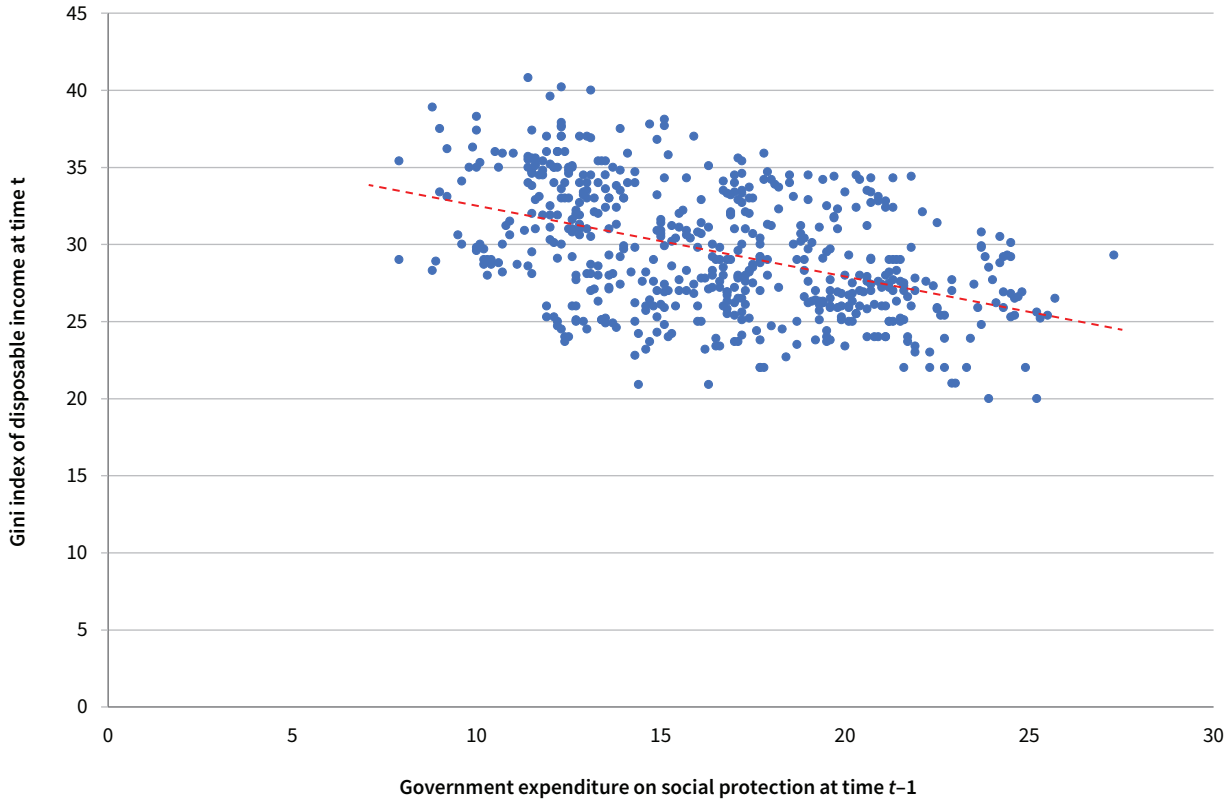
This analysis explored how government expenditures on education and social protection affect the Gini coefficient of income inequality, both for their values in the previous year and when lagged by three years (Table 3). The regression findings showed that government spending on social protection is negatively and significantly correlated with income inequality, as also shown in Figure 9. This suggests that social protection measures may be successful in reducing income inequalities in the EU. A 1 percentage point increase in social protection may help reduce income inequality (measured by the Gini coefficient) by up to 0.08 points, holding other variables constant. Nevertheless, the result is only significant at the 10% level when lagged by one year and becomes insignificant at a lag of three years, so inferences should be made with care.

Table 3: Panel OLS regression exploring general drivers of income inequality (1995–2020), EU27

	Gini coefficient of equivalent disposable income	
	Model 1 (lagged dependent variable + one-year lag)	Model 2 (lagged dependent variable + three-year lag)
Gini coefficient	0.719***	0.683***
Government spending on education (% of GDP)	0.210	0.210
Government spending on social protection (% of GDP)	–0.075*	–0.029
Population with a tertiary education (% of total population)	0.000	–0.006
Log (GNI per capita in USD)	0.812***	0.585**

Notes: ** p<0.1, ** p<0.05, *** p<0.01. For more details, see Table 10 in Annex I.*
Source: *Authors, based on Eurostat and World Bank data*

Figure 9: Scatterplot of government spending on social protection (% of GDP at time *t*–1) relative to the Gini index of disposable income at time *t* (1995–2020), EU27



Source: *Eurostat, Gini coefficient of equivalised disposable income – EU-SILC [ilc_di12]; and General government expenditure by function (COFOG) [gov_10a_exp]*

No significant relationship was found between education spending and income inequality at country level. Rather, the wealth of a country, as measured by GNI per capita, seems to be a strong general driver of income inequality. This echoes a study by Rodríguez-Pose and Tselios (2009), which found that economic development merely increases the occupational choices and earning opportunities of the rich, rather than of the population as a whole.

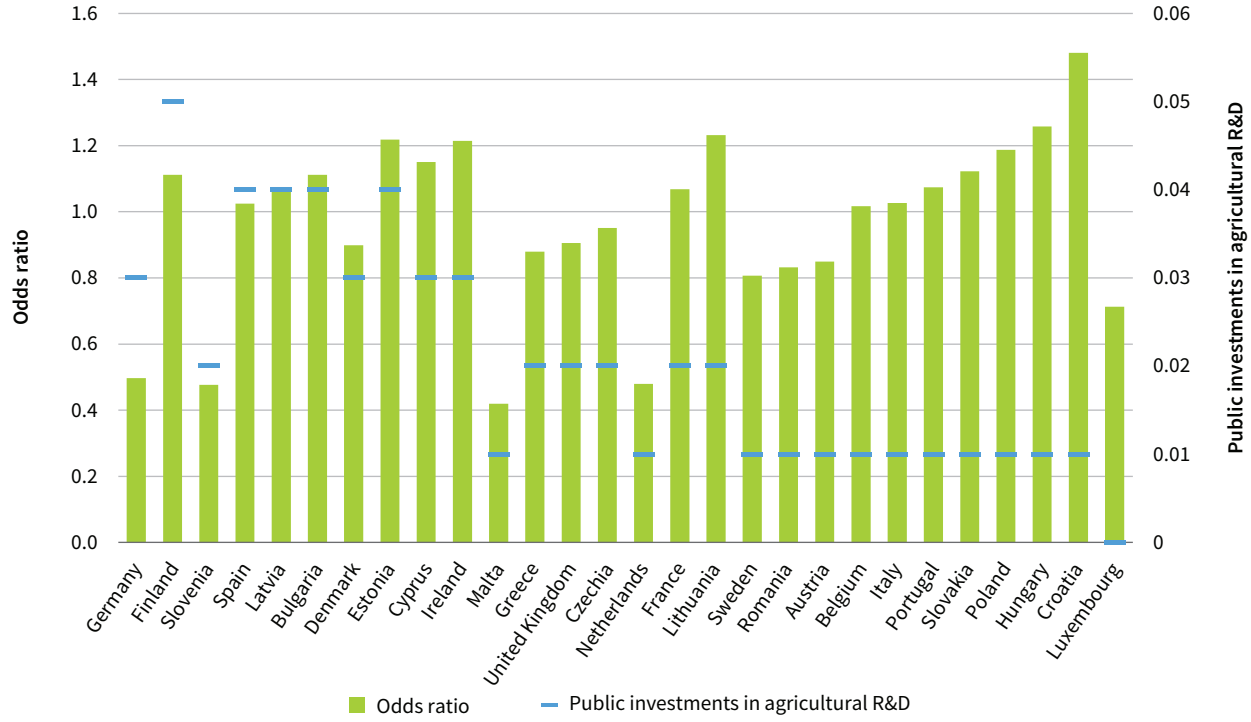
Inequality between rural and urban households

To analyse inequality in making ends meet between rural and urban households, two variables of interest were assessed:

1. Public investments in agricultural R&D may help improve living standards in rural areas, thus reducing inequality between rural and urban areas.
2. The ability to work from home may help reduce income inequality between rural and urban households, serving as an alternative form of employment in rural areas, where well-paid employment opportunities may be limited.

Figure 10 shows that there are several countries in which rural households have more problems in making ends meet than urban households (odds ratio >1). Although this is most clear in eastern European Member States (Croatia, Hungary, Lithuania and Estonia), several western Member States (for example, Ireland, France and Portugal) also present odds ratios greater than 1, suggesting that here, too, rural households have more difficulty in making ends meet than urban households.

Figure 10: Odds ratio of households having problems making ends meet (rural versus urban, 2018) against public investments in agricultural R&D (2015, % of GDP), EU27 and the UK



Notes: *Bars and dashes are ordered from the largest gap (in terms of ratio; left) to the smallest (right). The odds ratios for Germany, Malta, the Netherlands and Slovenia are imputed based on geographical similarities.*
Source: *EU MIMF and Eurostat, GBARD by socioeconomic objectives (NABS 2007) [gba_nabsfin07]*

The correlation between public investments in agricultural R&D and inequality in making ends meet between rural and urban households is positive but weak (r=0.19). Furthermore, the correlation between the ability to work from home and the odds ratio is negative and statistically significant (r=–0.38), which is in line with the hypothesised relationship.

However, when controlling for other important factors that may also help increase the living standards in rural areas (all lagged by three years), such as the gross value added from agriculture, forestry and fishing (as a percentage of GDP) and the percentage of the rural population having a tertiary education, these effects are no longer significant (Table 4). As such, no clear-cut inferences on the effects of inequality-reducing government measures can be drawn from these findings.

Table 4: OLS regression model exploring drivers of income inequality between rural and urban households

	Odds ratio of households having problems to make ends meet (rural over urban), adjusted, 2018
Public investments in agricultural R&D, 2015	1.430
Log (employed persons working from home) (% of total employment), 2015	0.010
Gross value added from agriculture, forestry and fishing (% of GDP), 2015	0.072
Rural population with a tertiary education (% of rural population), 2015	0.002

Note: *For more details, see Table 9 in Annex I.*
Source: *Authors, based on Eurostat and World Bank data*

Income inequality during the pandemic

To understand how the COVID-19 pandemic contributed to changes in income inequality, data from three pan-European surveys were used: EU-SILC, SHARE and Eurofound's *Living, working and COVID-19* e-survey.

1. EU-SILC covers individuals aged 16+ and collects cross-sectional and longitudinal data on income, poverty, social exclusion and living conditions. In 2020, EU-SILC was implemented in all EU27 countries, but the data for Germany and Italy were not yet available at the time of the analysis. These two countries are thus excluded from all the results relating to EU-SILC.
2. SHARE covers people aged 50+, the aim being to study the effects of health, social, economic and environmental policies over the life course. Its most recent wave (2020) was implemented in all EU27 countries except Ireland.
3. Eurofound's *Living, working and COVID-19* e-survey was implemented online across the EU27 in five rounds between spring 2020 and spring 2022.

Whenever possible, whether the results of these three surveys hold true for different types of populations was cross-checked.

The following section first investigates whether groups of people who typically earn less saw greater drops in their incomes during the pandemic, as this would suggest rises in income inequality. Second, it explores the extent to which government spending helped alleviate the fall in income.

Change in income inequality during the pandemic

The literature review in this chapter underlined that, while inequality between high-income and low-income countries may have decreased during the pandemic, groups of people who are typically disadvantaged (low-income earners, those with a lower education level, migrants, women and people with disabilities) suffered more during the pandemic, based on data from outside the EU. Meanwhile, trends based on Eurostat data (see 'Trends in income inequality (2010–2020)') suggest decreases in income inequality throughout the EU, but these data are subject to limitations owing to breaks in the time series caused by the pandemic. This section aims to assess whether income inequality increased, relying on microdata from the EU-SILC and SHARE surveys.

The first step was understanding which groups of people tend to have lower income, using a linear regression using EU-SILC data, with equivalised disposable household income in 2019 as the dependent variable and various sociodemographic and country controls.[11] The results were largely in line with expectations: living in a particular country had the largest effect on one's income, with people based in central and eastern Europe having lower incomes than those in the rest of Europe (see full model in Annex I). When it comes to individual characteristics (Table 5), having a low education level, being a non-EU citizen and living in a household in which at least one member is unemployed, disabled or otherwise inactive[12] had the largest negative effect on household income. Many other characteristics were also negatively associated with income, but the effect was smaller, including living in a single-parent household or in a household with two adults and three or more dependent children; living in a household in which at least one person is not a citizen; living in a household in which at least one person is retired or a student; and living in a rural area.

Unsurprisingly, households without dependent children in 2019 on average had the highest disposable incomes, especially those with two adults under the age of 65. Overall, age was positively associated with income – the older the individuals, the higher their disposable income – although there was also a small, yet significant, negative effect on squared age, suggesting that age is positively associated with disposable income only up to a certain age.

11 In this regression, 2019 income was chosen to avoid the pandemic's influence on the results, given that the pandemic is a one-off event and income in 2020 may not reflect which socioeconomic groups typically have low incomes.

12 This refers to being inactive for reasons other than retirement, studies or having a disability.

Table 5: OLS regression model exploring income inequality by individual characteristics

	Log of equivalised disposable household income, 2019
Household type (reference: one-person household)	
Two adults, both under 65 years	0.256*
Two adults, at least one being 65+ years	0.226*
Other households without dependent children	0.277*
Single-parent household	–0.0971*
Two adults, one dependent child	0.189*
Two adults, two dependent children	0.116*
Two adults, three or more dependent children	0.0439*
Other households with dependent children	0.197*
Other	0.139*
Economic status: at least one person in the household is …	
… employed	0.296*
… unemployed	–0.374*
… a student	–0.0875*
… retired	–0.0283*
… disabled	–0.162*
… otherwise inactive	–0.249*
Highest level of education achieved in a household (reference: high (ISCED 5–8))	
Low (ISCED 0–2)	–0.453*
Medium (ISCED 3–4)	–0.282*
Mean age of all household members, excluding those under 16 years	0.0146*
Mean age	–0.0000831*
Squared mean age	–0.153*
At least one household member is a non-EU citizen	–0.285*
Urbanisation (reference: densely populated area)	
Intermediate area	–0.0586*
Thinly populated area	–0.131*

Notes: ** p<0.001. ISCED, International Standard Classification of Education. For more details, see Table 11 in Annex I.*
Source: *EU-SILC (cross-sectional), 2019*

The next step was assessing whether the same groups were more likely to experience declines in income in 2020, as this would be indicative of growing income inequality. The research question was addressed in three different ways:

1. based on absolute levels of reported income in EU-SILC (as the percentage year-on-year change)
2. based on the categorical question of whether the income of EU-SILC respondents decreased compared with the previous year[13]
3. based on SHARE data to identify the groups of people most likely to dip into savings in 2020

Results from the cross-sectional EU-SILC analysis are summarised in Table 6, while the other regressions can be found in Tables 12–14 in Annex I.

13 Note that 34% of EU-SILC respondents were interviewed in January–March of 2020 – before the pandemic. The findings may therefore underestimate the effect of the pandemic.

Table 6: Logistic regressions on income inequality by individual characteristics

	Income decreased in 2020 versus 2019, self-reported [1]	Income decreased due to COVID-19 [2]
Log of equivalised disposable household income, 2020	**0.00642**	**0.0167**
Household type (reference: one-person household)		
Two adults, both under 65 years	0.156***	0.289***
Two adults, at least one being 65+ years	–0.150***	0.263***
Other households without dependent children	0.0182	0.438***
Single-parent household	0.0901	–0.114
Two adults, one dependent child	0.153***	0.262**
Two adults, two dependent children	0.0328	0.352***
Two adults, three or more dependent children	–0.00930	0.175
Other households with dependent children	0.0951	0.367***
Other	0.0258	0.415
Economic status: at least one person in the household is …		
… employed	0.402***	1.255***
… unemployed	0.929***	0.0608
… a student	–0.0532	0.101
… retired	–0.0992**	–0.434***
… disabled	–0.0167	–0.569***
… otherwise inactive	0.0597	–0.126*
Highest level of education achieved in a household (reference: high (ISCED 5–8))		
Low (ISCED 0–2)	0.112**	0.223**
Medium (ISCED 3–4)	0.158***	0.230***
Mean age of all household members	–8.46e-10***	–9.69e-10***
At least one household member is an EU citizen, but not a citizen of the survey country	0.120	0.0826
At least one household member is a non-EU citizen	0.139*	0.00935
Urbanisation (reference: densely populated area)		
Intermediate area	–0.0342	–0.226***
Thinly populated area	–0.0692**	–0.176***

Notes: [1] *This is based on EU-SILC variable HI011. In some countries (Bulgaria, Cyprus, Greece, Malta, Poland, Romania and Slovakia), respondents were optionally asked to indicate whether their income changed compared with the previous year (with the following possible answer options: 'increased', 'remained more or less the same' and 'decreased'). The variable was transformed into the binary decreased or not, whereby the category 'not' includes both people who said that their incomes had increased and those whose incomes did not change.* [2] *This is based on EU-SILC variable HI012. Respondents who said that their incomes had decreased compared with the previous year were optionally asked to indicate whether the decrease was the result of COVID-19. * p<0.05, ** p<0.01, *** p<0.001. ISCED, International Standard Classification of Education.*
Source: *EU-SILC (cross-sectional), 2020*

Overall, the results suggest that some of the typically disadvantaged groups were indeed more likely to experience drops in income in 2020, although this was not the case for all of the groups of people who were most likely to have low incomes. The results consistently show that households in which at least one person was unemployed in 2020 were more likely to report decreases in income. This was also the case for households in which the highest level of education achieved was medium or low compared with households with people with a high level of education.[14]

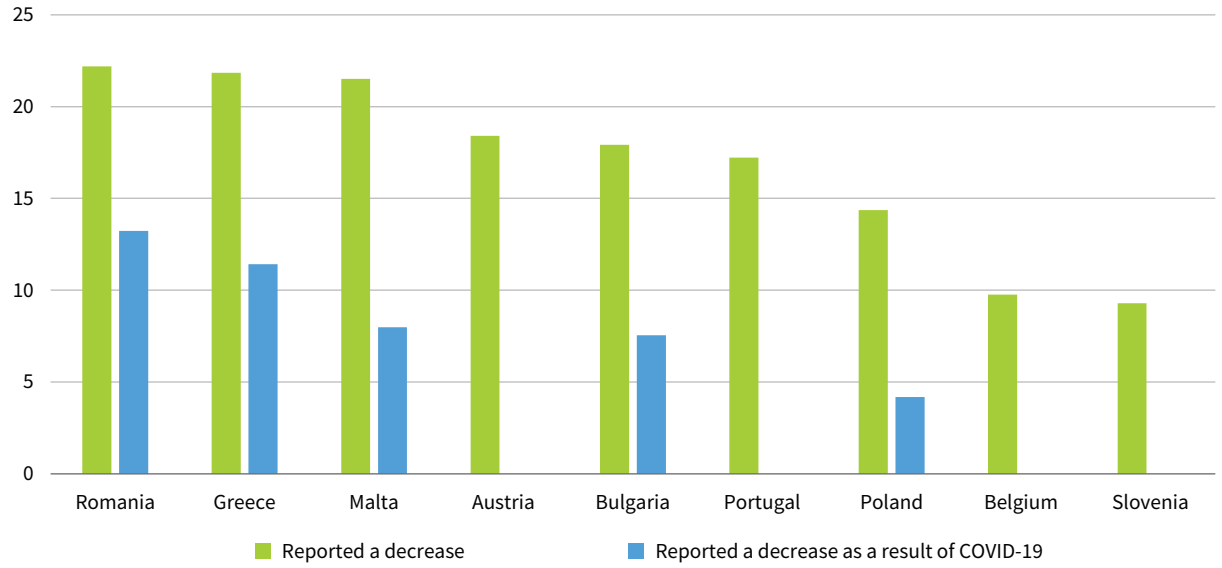
14 This is based on EU-SILC data. The education effect was not observed in the SHARE data, most likely because fewer people aged 50+ have a high level of education than in younger cohorts.

Regarding other groups that typically have lower income, the results are mixed. Households in which at least one person was disabled were more likely to dip into savings than others, according to the SHARE data, and were more likely to see their incomes drop, according to models based on absolute levels of income reported. However, they were not more likely than others to report that their incomes decreased in 2020 compared with the previous year when asked about it directly. Meanwhile, households with retirees were less likely to say that their incomes decreased when asked directly, but models based on absolute levels of income reported suggest the opposite (the SHARE data show no significant results for retirees, probably because most of the households in this dataset contain retired people). Results are similarly inconclusive regarding households in rural areas compared with those in big cities or people in different household types.

Drops in income were not felt evenly across the EU. Whereas 22% of households in Romania reported that their income decreased compared with the previous year, half as many did so in Belgium and Slovenia (Figure 11). These results should be interpreted with caution until more data become available. According to Eurostat's experimental statistics, the largest decreases in median income were in Cyprus, Italy, Belgium and Greece, while median income either increased or stayed the same in the remaining Member States (Eurostat, 2021). Equivalent non-experimental statistics could not be produced using EU-SILC at the time of the analysis.[15]

Importantly, not everyone attributes these drops to COVID-19. As illustrated by the orange bars in Figure 11, between one-third (in Poland) and two-thirds (in Romania) of households that reported a decrease in income stated that the decrease was due to the pandemic. A regression analysis shows that households that typically earn lower incomes (those with retired or disabled members and rural households) were less likely to say that their incomes dropped because of the pandemic. The largest positive effect was observed among households in which at least one person was employed (Table 13 in Annex I). These findings suggest that, although disproportionate negative income effects were observed for some disadvantaged groups in 2020, these effects are not necessarily the result of the pandemic. Rather, the pandemic most severely affected those who were typically employed.

Figure 11: Households that reported that their income decreased in 2020 compared with the previous year by country (%), selected Member States



Notes: *Information for other Member States is not available because the question was included in EU-SILC on an optional basis. Data for Cyprus and Slovakia are not presented here due to very high item non-response (44% for Cyprus and 72% for Slovakia). For the countries presented in the figure, item non-response was at or below 1%.*
Source: *EU-SILC microdata*

15 This is because breaks in the time series occurred in a number of EU-SILC countries due to the COVID-19 pandemic, when data could no longer be collected in person. This drawback could in theory be overcome with the use of longitudinal data only (namely, by observing how incomes changed for people who were interviewed in both 2019 and 2020). However, at the time of the analysis, longitudinal weights were not yet available from Eurostat, so the results would not be representative of the country populations.

However, responses to whether or not the pandemic caused the fall in income should be interpreted carefully. Apart from directly losing the ability to work due to lockdowns, the spread of COVID-19 had various economic consequences that respondents may not necessarily attribute to the pandemic. For example, childcare and healthcare services may have incurred increased costs due to the pandemic, which might have resulted in increased fees. Respondents may find it difficult to connect these extra charges to the pandemic when asked about changes to their incomes. Thus, it is possible that observed drops in income were largely due to COVID-19, even if people did not perceive this to be the case.

Role of government support payments

The effectiveness of government policies aimed at alleviating pandemic-induced financial hardship was investigated using data from two surveys: the SHARE Corona survey and Eurofound's *Living, working and COVID-19* e-survey.

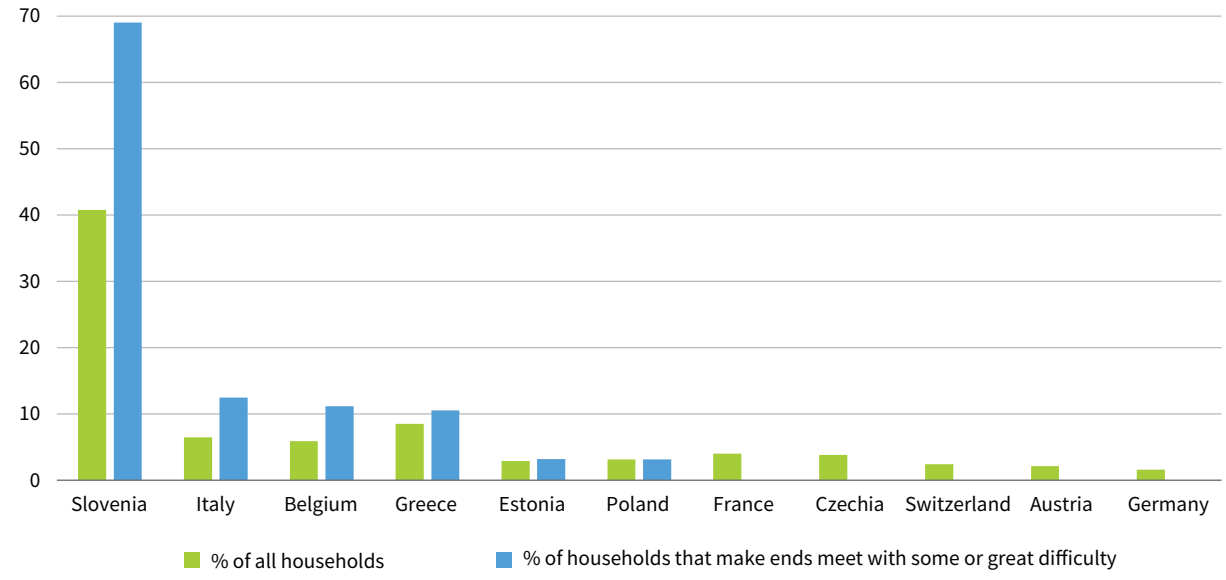
First, the SHARE Corona survey (which covers the population aged 50+) measured whether people had to dip into savings (by means of a question to those who had reported difficulty making ends meet) and whether they received financial support from the government due to the pandemic. Government support was measured through the following question: 'Did you or any other household member receive additional financial support due to the outbreak of Corona from your employer, the government, relatives, friends, and/or others?' (it was possible to specify the source of support, for example government).

Regression results show that older people who received government support were more likely to dip into savings during the pandemic than those who did not, even when controlling for household income and other characteristics (Table 14 in Annex I). This suggests that, at EU level, government support did indeed reach those most in need, at least among the population aged 50+.

Nevertheless, government support was not accessible to older people equally across countries. Slovenia was among the first countries to provide large-scale financial relief, enacting a package of support measures for pensioners, students, large families, those temporarily laid off, businesses and others on 2 April 2020 (Euractiv, 2020). As a result, 41% of Slovenian households containing people aged 50+ received some government support in 2020 (Figure 12). In other countries, however, the proportion of households that received support was significantly lower.

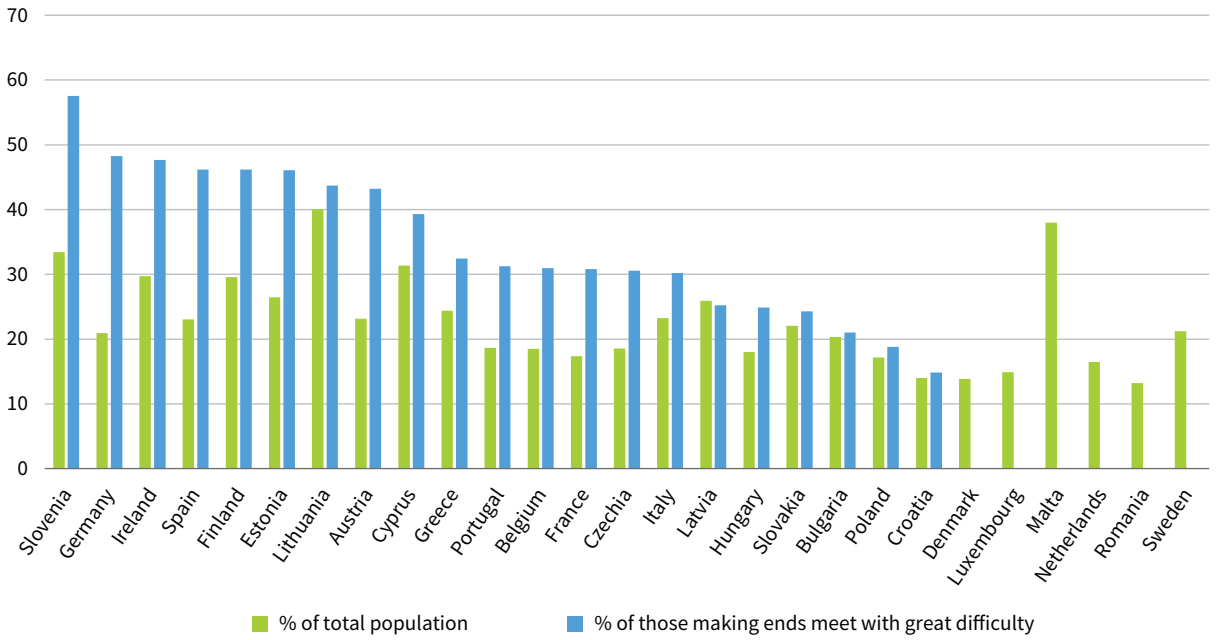
Eurofound's *Living, working and COVID-19* e-survey, which covers all adults aged 18+, measured government support by asking whether respondents had received specific types of support since the outbreak of the pandemic, namely unemployment benefit, wage support, sick/care leave, state aid to businesses and other support to help with living expenses or household needs (for example, benefits, allowances, vouchers and food).

Figure 12: Households containing people aged 50+ that received financial support from the government due to the pandemic by country (%), selected European countries



Notes: *The SHARE Corona survey targeted those aged 50+. Estimates for other Member States and blue bars for five of the countries are not shown due to a limited number of observations. Green bars for Austria, France, Germany and Switzerland, and blue bars for Belgium, Estonia and Poland are based on a small sample size and may be less reliable.*
Source: *SHARE Corona survey*

Figure 13: Recipients of pandemic-related government support by country, EU27 (%)



Notes: *Blue bars for Denmark, Luxembourg, Malta, the Netherlands, Romania and Sweden are not presented due to insufficient sample size. Estimates represented by blue bars for Ireland, Finland, Estonia, Austria, Belgium, France, Czechia, Italy, Latvia and Poland are based on a small sample size and may be unreliable.*
Source: Living, working and COVID-19 *e-survey, spring 2021*

Figure 13 shows the proportion of respondents who received any of the above types of support since the outbreak of the pandemic. Despite different definitions of what constitutes government support in the Eurofound and SHARE surveys, Slovenia again appears among the countries providing the most generous financial support, especially to those making ends meet with great difficulty.

Figure 13 also shows that countries differ in their effectiveness in providing relief to those in greatest need. While just 21% of people in Germany had received some sort of government support since the outbreak of the pandemic by spring 2021, over double (48%) did so among people who make ends meet with great difficulty. This suggests that Germany, as well as several other countries, prioritised providing support to those who were likely to struggle the most during the pandemic. By contrast, in Croatia and five other countries, the proportion of government support recipients among the general population and among those making ends meet with great difficulty were very similar, suggesting that governments in these countries may not have been targeting or reaching low-income individuals when providing pandemic-related support. Box 1 presents some examples of national policies targeting some of the most vulnerable people.

Box 1: National policy examples targeting income inequality

The **Finnish** EU Regional and Structural Policy Programme for 2021–2027 includes actions in the area of equal inclusion. Among these, the programme sets out that material aid for purchasing food and basic commodities services are to be provided to the unemployed and other vulnerable socioeconomic groups.

Two new instruments have changed the way in which income inequalities are tackled in Italy. Citizenship income, established in 2019, gives income support provided the recipients take part in a programme to encourage social inclusion. The single and universal allowance for dependent children is a means-tested benefit approved in 2021 that is available to families who do not have access to the household allowance.

In Lithuania, to tackle the economic consequences of the pandemic, the threshold to be eligible to receive state-supported income (which is the basis of social benefits in the country) was increased. The value of property was temporarily excluded for determining benefit eligibility. Subsidies compensating the costs of heating were also increased. One-off benefit payments were also made to families to support new parents during the pandemic (Richardson et al, 2020).

3 Health inequality

This chapter focuses on inequality in health outcomes and access to healthcare, starting with a literature review, which focuses on the drivers and factors that were found important for outcomes regarding health inequalities during the pandemic. The next section presents the levels of inequality in the EU27 before the pandemic using the EU MIMF indicators, followed by analyses showing how the levels of health inequalities changed throughout the decade up to 2020. The final two sections analyse policies as general drivers of health inequality and the specific drivers of health inequality during the pandemic.

Literature review

Of all dimensions examined in the EU MIMF, the most direct impact of COVID-19 has been on health and healthcare. The pandemic has become both a factor further affecting health inequalities at all the levels and one of the outcomes, in terms of the unequally distributed morbidity and mortality rates among different societal groups.

Historical evidence from earlier pandemics highlights the role of social inequalities in increasing the spread of infection and its health impacts. Public health crises can amplify the predisposing conditions related to living and working environments, which then create pandemic hot spots (Ahmed et al, 2020; Ali et al, 2020). The COVID-19 pandemic provided another illustration of these effects.

Based on the literature, factors affecting health outcomes can be categorised into the following levels (Figure 14):

- **macro-level factors**, such as healthcare systems, the sociopolitical environment, social values related to equity and fairness, political priorities and decisions, the distribution of wealth and power, and levels of poverty, marginalisation and discrimination
- **meso-level factors**, for example local economic and work conditions, the physical environment, learning opportunities, accessibility of services, and social and cultural conditions
- **micro-level factors**, namely individual experiences, such as employment, income, education, housing, pre-existing health conditions and belonging to communities

Effects of income inequality on health outcomes

Health and income inequalities are closely related. The literature suggests that pre-existing income inequality was a key factor in the spread of contagious diseases and in the disparities in health outcomes during COVID-19, both at country and individual levels. This produced a 'second pandemic' and led to other forms of devastation that ran in parallel with COVID-19 (Fiske et al, 2021). Several authors found that the pandemic increased existing structural inequalities, resulting in worse health for the most disadvantaged groups in Europe.

Initially, developed countries were affected as much, if not more, by the health crisis as lower income countries (Breznau et al, 2020; Shahbazi and Khazaei, 2020), and similar findings were reported at regional level (Mogi et al, 2020; Consolazio et al, 2021; Islam et al, 2021). However, a global study found that, while new infections shot up in high-income countries, case mortality rates increased in lower income countries. This analysis pointed to an important gap in testing capacities, healthcare services and the general outbreak response between rich and poor countries, finding that health inequality between them was amplified by the COVID-19 pandemic (Aung et al, 2021).

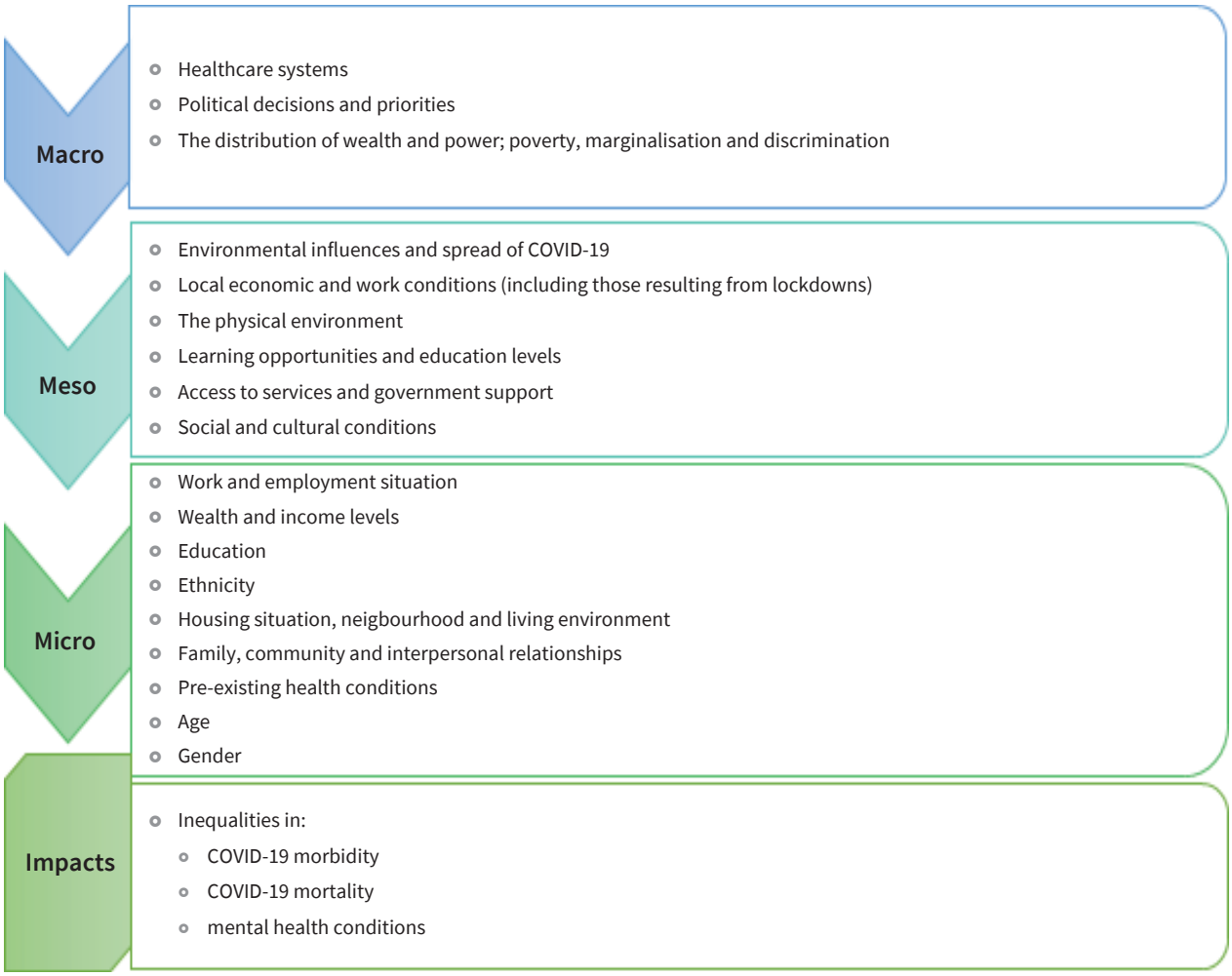
Studies that treated income inequality as a country-level factor for COVID-19 morbidity and mortality outcomes consistently found links between higher income inequality and worse COVID-19 outcomes. Of these, Davies (2021) found that an older population, fewer hospital beds, a lack of universal tuberculosis vaccination and greater urbanisation were all associated with higher mortality, along with the Gini coefficient. Other studies have also shown a link between income inequality and worse COVID-19 outcomes (for example, Barrera-Algarín et al, 2020; Elgar et al, 2020; Wildman, 2021; Sánchez-Páez, 2022).

Effects of government policies

Several recent studies have examined how government policies, either as part of the healthcare system or aimed at dealing with the pandemic, relate to inequality in the COVID-19 morbidity and mortality rates.

Barrera-Algarín et al (2020) found correlations between lower public spending on health (per capita) and higher COVID-19 deaths per million inhabitants, as well as lower coverage of hospital beds and lower numbers of doctors, in European countries. Low expenditure also correlated with a high Gini coefficient, showing multiple links between income inequalities, policies and health outcomes.

Figure 14: Macro-, meso- and micro-level factors in health inequality during the COVID-19 pandemic



Source: *Authors, based on NHS Health Scotland (2015), Bambra et al (2020) and the reviewed literature*

A US study examined the relationship between pandemic-related policy measures and inequality in health outcomes. The authors found that containment increased income inequality, but also strongly reduced mortality rates for both low-income (31%) and high-income workers (27%) (Eichenbaum et al, 2021).

In the EU, both government and transnational support measures were implemented to mitigate the consequences of the pandemic, such as reinforcements of healthcare systems and subsidies for those whose earnings had been reduced. Some authors argue that, while these ad hoc measures partially alleviated economic problems for people, structural factors (such as housing, working conditions, good access to digital tools and information infrastructure, social networks and health conditions in general) seem to have had a bigger impact on their ability to cope (Fiske et al, 2021).

Many authors called for policy action and reform (for example, Marmot et al, 2020; Bambra and Lynch, 2021).

Coronini-Cronberg et al (2020) warned that, while managing disease outbreaks is one of the key components of public health, another fundamental purpose is the reduction of health inequalities, that is, avoidable, unfair and socially unjust systematic differences in health between different subgroups of a population. Combating health inequalities requires pragmatic approaches through an intersectionality framework and robust data science (Iyanda et al, 2021), although some artificial intelligence algorithms using large datasets have been shown to contain biases that can augment existing inequality (Leslie et al, 2021).

While healthcare inequality in the world is vast, healthcare became internationally interdependent as never before. Authors suggested that tackling the pandemic requires internationally harmonised solutions (Puaschunder and Beerbaum, 2020).

Individual-level factors

A widening body of publications – although often not based on empirical studies – examine individual-level factors that are linked to both socioeconomic inequality and worse health outcomes during the pandemic (Ajilore and Thames, 2020; Nassif-Pires et al, 2020; Khayat et al, 2021; Okonkwo et al, 2021).

Housing has been shown to be a risk factor during the pandemic. People with lower income are more likely to live in overcrowded and/or multigenerational accommodation, which is a risk factor for respiratory tract infections and reduces the possibility to comply with social distancing (Cardoso et al, 2004). Several studies in France (Goutte et al, 2020), Sweden (Joelsson and Ekman Ladru, 2021), the UK (Kenway and Holden, 2020), Canada (Maaranen and Stapleton, 2021) and the US (Ghosh et al, 2021; Reitsma et al, 2021), as well as a cross-country study involving all EU Member States (Fenoll and Grossbard, 2020), have demonstrated that overcrowdedness and multigenerational housing are independent risk factors for suspected COVID-19 infection (Paremoer et al, 2021), as well as other health-related risks, such as domestic violence, harmful behaviours and deteriorations in mental health (Gurney, 2021).

Furthermore, **low-pay occupations** often do not allow for remote working (see 'Trends in employment inequality (2010–2020)' in Chapter 4). This includes jobs that were essential during the lockdowns, such as retail workers and public transport drivers. Findings from various countries, including Canada (Rao et al, 2021), the UK (Windsor-Shellard and Nasir, 2021), the US (Pathak et al, 2021) and several European countries (Steiber and Muttarak, 2020), suggest that people in essential elementary, care or service occupations shouldered a disproportionate burden of transmission and deaths. In stark contrast with the experience of low-income populations, high-income individuals were significantly more likely to keep their jobs and telework after social distancing guidelines were implemented, reducing their risk of infection.

Similar findings were shown regarding **education levels**. A German survey showed that people of all education levels practised increased hygiene and mask wearing. However, highly educated respondents were much more likely to work from home during the pandemic (45%) than those with an intermediate (17%) or low education level (11%), suggesting that education-based inequalities in the risk of COVID-19 infection stem from the inability to practise social distancing at work, rather than differences in health behaviour (Hoenig and Wenz, 2021).

Debt burdens may also have contributed to differences in COVID-19 infections by disproportionately increasing low-income people's cost of reducing their mobility after the start of the pandemic. Authors of a US study found that this debt burden could have contributed to 2.7% more COVID-19 cases (Davydiuk and Gupta, 2020).

Different levels of **mobility** were found to have an impact on COVID-19 outcomes. A US study found that high-income, predominantly white and white-collar zip codes had a greater response to the lockdown and reduced vehicular traffic by nearly 50%, while the least affluent zip codes showed only a 15% traffic decrease and had COVID-19 rates nearly 10 times higher. Income and occupation were both associated with COVID-19 outcomes across all stages of lockdowns (Mendoza et al, 2021).

However, in another US study, a lower rate of infection but a higher death rate were found in counties with higher poverty and disability, due to lower levels of mobility, but a higher rate of comorbidities and difficulties with healthcare access (Abedi et al, 2021). This study also showed that **pre-existing disparities in health conditions and healthcare access** were further exacerbated by the pandemic, leading to further increases in morbidity and mortality among socioeconomically disadvantaged groups.

Some studies showed that people with lower **socioeconomic status** tended to seek healthcare services at a later stage, resulting in poorer health outcomes (Cookson et al, 2016).

Poorer health outcomes were also found among **economically disadvantaged older people**. A Belgian study found that excess deaths of both men and women aged 65+ were more than twice as high in the bottom income decile than in the top income decile (Decoster et al, 2021).

People of lower socioeconomic status suffer from more **comorbidities** that increase their risk of COVID-19 infection and hospitalisation (Patel et al, 2020). Poverty is a known factor for cardiovascular disease, obesity, diabetes and hypertension (Marmot et al, 2010; Goodman et al, 2021), conditions that are risk factors for death from COVID-19 (Wu et al, 2021). Mortality rates linked to diseases such as cancer are also higher among people from disadvantaged economic and social backgrounds. Researchers warned that COVID-19 may increase these disparities (Balogun et al, 2020).

Healthcare access

During the pandemic, European countries experienced a reduction in available healthcare services: on average, 40% of essential health services were partially or completely disrupted (WHO, 2020a). This often had a disproportional effect on the most vulnerable groups.

The literature identified the following factors that influence or correlate with inequality in access to healthcare: socioeconomic status (low income, difficulties making ends meet and loss of work), poor health or underlying medical conditions pre-pandemic, and urban–rural and digital divides. Inequality also disproportionately affected young adults, older people and unpaid caregivers for adults.

Several European studies focused on healthcare access inequalities in older populations. Health inequality was experienced more often by older adults in France, Italy and Spain, where, due to a lack of resources, decisions about admission of patients to intensive care units were made based on age, disfavouring them (Miralles et al, 2021).

A study based on SHARE data (Arnault et al, 2021) investigating unmet healthcare needs among people aged 50+ found that poorer older people were more likely to forego care and to fail to get an appointment, but no significant difference was found in the probability of postponement of scheduled care. Additionally, poorer people with worse health prior to the pandemic experienced even larger inequalities in access to healthcare during the pandemic.

A UK study found no difference in the utilisation of health services based on need in hospital care, regardless of income level. However, systematic inequality was found in general practitioner visits, the use of helplines and the fulfilment of prescriptions, which the authors attributed to tighter time constraints for lower income groups, but they found that this reduced as the pandemic progressed, explained by the introduction of the furlough scheme and media focus on health issues (Davillas and Jones, 2021).

In the US, González-Touya et al (2021) found that 45% of people in families who lost their work or work-related income during the pandemic reported unmet healthcare needs due to the costs or fear of contracting COVID-19. Another study found that people with underlying medical conditions, racial minorities, young adults, people with disabilities and unpaid caregivers for adults were more likely to delay or avoid medical care (Czeisler et al, 2020).

Kranz et al (2020) found that living in an urban area was associated with higher odds of delayed dental care during the pandemic. The same study found no evidence that race or ethnicity affected the delay in dental care.

Notably, some healthcare services were only provided remotely during the pandemic (Mehmi et al, 2020), excluding populations without internet access or the necessary digital skills (Nouri et al, 2020).

Mental health inequalities

An increasing body of literature also establishes increasing mental health inequality due to the pandemic. Most authors agree that the pandemic has triggered mental health issues for many, and people from worse socioeconomic backgrounds often experienced worse mental health outcomes.

Links between relative poverty and mental health issues were made prior to the pandemic. A recent study in 30 European countries showed that the impact of financial hardships and social exclusion on mental health status was significant (Gómez Sánchez, 2020). In the context of COVID-19, an article based on an overview of earlier psychiatric research suggested that socially disadvantaged groups (for example, racial/ethnic minorities and people with low income) would experience more psychiatric morbidity related to the pandemic than socially advantaged groups (Purtle, 2020). Lower socioeconomic status, which correlates with an increased likelihood of unstable work conditions and incomes, also leads to increased stress levels (Algren et al, 2018).

In the lockdowns, stressors increased most for the most vulnerable. A study conducted in six European countries found a strong positive relationship between sudden economic hardship during the COVID-19 lockdown and feelings of depression and health anxiety, the degree of which depended on occupation (Witteveen and Velthorst, 2020). In Spain, economic stability was shown to be among the most important factors for depression, anxiety and post-traumatic stress disorder during COVID-19 (González-Sanguino et al, 2020). A US study also linked low assets and financial stressors with higher odds of probable depression (Ettman et al, 2021), while a UK study linked unemployment with severe psychological stress (Kousoulis et al, 2020).

Mental health problems can become one of the comorbidities worsening the COVID-19 morbidity and mortality among disadvantaged groups, with several studies linking mental health disorders with COVID-19 outcomes. Psychological stress is known to weaken the immune system and increase the likelihood of health risk behaviours (Segerstrom and Miller, 2004). Poverty, therefore, may not only increase one's exposure to COVID-19, but, through increased mental stress, may also reduce the immune system's ability to combat it, further increasing health inequalities.

Health inequalities relating to the pandemic based on gender have also been found. While women's physical health seems to have been less severely hit by COVID-19, women were at higher risk of suffering more negative economic consequences of the pandemic. This is because of both their greater vulnerability on the labour market (see Chapter 4) and the burden of housework and childcare, which increased substantially during the lockdown (Profeta, 2020). This may have contributed to the increase in mental health issues for women.

Several empirical studies based on survey data suggest that pandemic lockdowns have translated into increased health inequalities between men and women. A UK survey found that women's mental health was worse than men's three months after the first lockdown, and that women were more concerned about contracting and spreading COVID-19, which they perceived as more prevalent and lethal than men did (Oreffice and Quintana-Domeque, 2021). Another study building on the data of the UK Household Longitudinal

Study (UKHLS) found that young women seem to have been affected the most by the general increase in the prevalence of psychological distress during the first wave of the pandemic (Davillas and Jones, 2021).

Researchers found that, during the pandemic, mental health problems disproportionately affected working women. Another study based on the UKHLS data showed that, during lockdowns, single mothers fared the worst in the labour market and had the highest risk of depression (Zhou et al, 2020). Data from an online survey in Germany showed that mothers were more likely than fathers to feel exhausted, nervous and insecure, as they had to organise childcare and home schooling more often than fathers (Ohlbrecht and Jellen, 2021). A qualitative study of Irish working mothers revealed that they have been negatively affected by COVID-19 in relation to their psychological well-being, experiences of negative emotions and the redefinition of family dynamics, in which working mothers have adopted an additional and disproportionate care burden (Clark et al, 2021). Similar trends were observed in Australia and Canada, where, during the pandemic, women in households with children were more likely to report experiencing poorer mental health than men (Johnston et al, 2020).

Health inequality before the pandemic

The EU MIMF includes several health and healthcare indicators, representing various approaches to inequality (Table 7). Apart from these, unmet medical care needs and mental health indicators were included in the analysis, because these issues were so important during the pandemic (see 'Literature review' in previous section).

Table 7: Indicators selected for the health inequality analysis

Inequality approach	Indicators	
Inequality of opportunity[16]	Ex ante inequality of opportunity in having a general activity limitation (50+ years)	
	Ex ante inequality of opportunity in having one or more limitations with activities of daily living (50+ years)	
	Ex ante inequality of opportunity in having two or more chronic diseases (50+ years)	
Norms, attitudes and practices	Legal framework not protecting women's reproductive health and rights	
	Percentage of partnered women of reproductive age (15–49) who want to cease or delay childbearing but are not using any method of contraception	
Vertical inequality	Gini coefficient of body mass index (BMI) values	
Horizontal inequality[17]	Odds ratio of people reporting a chronic health condition, adjusted for individual characteristics	Women versus men
		Young adults (18–29) versus adults in middle age range (30–45)
		Native versus foreign born
		Tertiary education versus non-tertiary education
		White-collar workers versus blue-collar workers
		Rural versus urban
	Odds ratio of people reporting unmet medical care needs, adjusted for individual characteristics	Women versus men
		Young adults versus adults in middle age range
		Elderly (70+) versus adults in middle age range
		Native versus foreign born
		White-collar workers versus blue-collar workers
		Rural versus urban

Source: *Authors, based on EU MIMF*

16 Other indicators are available, with 2011 data, or yield similar results as discussed in this section.

17 Other indicators are available, with 2017 data, or yield similar results as discussed in this section.

As with employment and education (Chapters 4 and 5, respectively), vertical inequality (inequality measured across the whole population) and inequality of opportunity (inequality based on factors outside an individual's control, such as sex, age or family background) are the most important in the health dimension (Figure 15).

Vertical inequality was measured with the Gini coefficient of BMI values, as it is the only EU MIMF indicator measuring vertical health inequality. The relative gap between the highest and lowest BMI values is large in most EU countries, except Greece, Italy and Romania, where the gap is moderate.

Figure 15: Heatmap presenting the results of health inequality indicators, 2018–2019, EU27 and the UK

	law_reproductive	medical_elderly	illness_native	illness_rural	medical_white	medical_native	illness_female	illness_junior	medical_rural	medical_junior	medical_female	illness_tertiary	illness_white	practice_reproductive	IOp50_adl	IOp50_activity	IOp50_chronic	BMI_gini
Sweden	0.00	0.72	1.00	1.00	0.86	0.68	1.38	0.81	0.85	1.55	1.21	0.90	0.88	0.10	0.02	0.05	0.07	0.09
Czechia	0.00	0.83	1.06	1.05	0.78	0.69	1.11	0.84	0.91	0.74	0.81	0.50	0.83	0.04	0.04	0.06	0.07	0.09
Denmark	0.00	0.41	0.76	0.99	0.59	0.36	1.19	0.91	0.77	1.34	1.07	0.92	0.82	0.10	0.02	0.04	0.06	0.10
France	0.00	0.21	0.91	1.04	0.86	0.84	0.94	0.58	1.37	0.94	0.83	0.73	0.91	0.04	0.04	0.06	0.08	0.10
Finland	0.25	1.67	1.52	0.90	1.03	0.57	1.32	0.64	0.67	0.61	1.24	0.77	0.92	0.08	0.02	0.04	0.06	0.09
Portugal	0.00	0.88	1.23	1.02	0.69	0.97	1.40	0.51	0.88	0.80	1.30	0.74	0.72	0.08	0.03	0.07	0.04	0.10
United Kingdom	0.75	0.81	1.33	0.92	1.09	0.99	1.04	0.59	0.88	0.81	1.29	0.78	0.82	0.06	n.a.	n.a.	n.a.	0.10
Luxembourg	0.00	n.a.	1.04	1.03	1.98	0.38	1.21	0.73	0.76	0.48	1.08	0.80	0.84	n.a.	0.02	0.05	0.06	0.10
Estonia	0.00	1.20	0.70	0.99	0.89	0.79	1.08	0.87	0.67	0.90	1.16	0.66	0.73	0.12	0.05	0.07	0.08	0.10
Germany	0.00	0.43	1.07	n.a.	0.76	0.57	1.04	0.47	n.a.	0.48	0.93	0.80	0.86	0.10	0.03	0.04	0.07	0.10
Slovenia	0.00	1.56	0.93	n.a.	0.85	0.87	1.15	0.63	n.a.	1.13	1.08	0.70	0.78	0.09	0.03	0.07	0.07	0.10
Poland	0.50	0.50	0.71	0.81	0.79	0.74	1.18	0.57	0.85	0.84	0.84	0.58	1.02	0.10	0.04	0.07	0.07	0.10
Latvia	0.00	1.23	0.93	0.98	0.66	0.93	1.29	0.56	0.99	0.77	0.88	0.66	0.75	0.17	0.05	0.09	0.08	0.10
Austria	0.00	1.15	1.03	0.81	0.38	1.86	1.11	0.69	1.04	n.a.	0.75	0.71	0.67	0.10	0.04	0.06	0.08	0.12
Croatia	0.00	0.85	1.08	0.88	0.69	0.93	1.06	0.31	0.83	0.10	0.76	0.66	0.80	0.11	0.03	0.08	0.08	0.09
Belgium	0.00	0.30	0.85	1.12	1.07	0.38	1.26	0.47	1.16	0.45	1.08	0.57	0.77	0.07	0.04	0.05	0.06	0.10
Ireland	0.75	0.77	0.94	0.87	0.86	0.73	0.97	0.35	0.94	0.70	1.29	0.67	0.82	0.11	n.a.	n.a.	n.a.	0.09
Greece	0.00	0.45	0.92	0.85	0.64	0.48	1.15	0.30	1.16	0.94	0.95	0.66	0.79	0.10	0.03	0.09	0.10	0.08
Slovakia	0.00	1.45	0.87	1.04	n.a.	1.91	1.13	0.39	0.83	0.48	0.97	0.57	n.a.	0.09	0.01	0.07	0.08	0.09
Hungary	0.25	0.49	0.89	0.97	0.78	0.63	1.25	0.50	0.84	0.56	0.76	0.68	0.82	0.09	0.03	0.08	0.08	0.10
Bulgaria	0.00	1.06	0.97	1.15	0.73	1.90	1.22	0.39	1.97	1.26	0.91	0.73	0.89	0.14	0.06	0.10	0.09	0.09
Spain	0.00	0.37	1.30	0.95	0.97	0.55	1.18	0.50	0.47	0.78	0.75	0.66	0.79	0.12	0.05	0.07	0.09	0.09
Italy	0.00	0.80	1.82	1.01	0.46	0.52	1.21	0.45	0.86	0.51	1.09	0.78	0.71	0.11	0.03	0.09	0.10	0.08
Malta	1.00	1.55	1.53	n.a.	0.92	2.05	0.97	0.37	n.a.	n.a.	1.47	0.93	0.80	0.05	0.02	0.05	0.06	0.10
Netherlands	0.00	1.33	0.93	n.a.	1.59	1.03	1.24	0.61	n.a.	1.54	0.73	0.79	0.80	0.08	n.a.	n.a.	n.a.	0.09
Lithuania	0.00	1.19	0.69	1.29	0.61	1.19	1.28	0.39	0.94	0.48	1.04	0.61	0.78	0.13	0.05	0.07	0.08	0.10
Romania	0.00	5.22	n.a.	1.04	0.71	n.a.	1.57	0.32	1.15	0.38	1.32	0.60	0.86	0.10	0.05	0.07	0.07	0.07
Cyprus	0.25	0.21	2.05	0.88	0.77	0.86	1.06	0.31	0.74	0.53	0.81	0.57	0.78	0.08	0.05	0.08	0.09	0.10

Note: *An explanation of the EU MIMF indicator labels used in this figure is given in the annex at the end of this report.*
Source: *EU MIMF*

However, Greece and Italy, along with Bulgaria, are among the countries where inequality of opportunity in having two or more chronic diseases is the greatest. Although all inequality of opportunity indicators show that the EU is struggling to close these gaps, in terms of disability it is comparatively low in Slovakia, Denmark and Sweden. By contrast, when it comes to having two or more chronic diseases, inequality of opportunity is high in all countries.

It is important to mention norms, attitudes and practices as a source of inequality related to women's reproductive health. Despite the presence of a legal framework protecting women's reproductive health and rights across the EU (with some exceptions in Cyprus, Finland, Hungary, Ireland, Malta and Poland), many women in the EU are not able to practise these rights. Despite wanting to avoid or delay childbearing, between 4% (in Czechia and France) and 17% (in Latvia) of 15- to 49-year-old women are not using any method of contraception (see the 'practice_reproductive' indicator in Figure 15), including modern or traditional methods. Reasons for this may vary, including limited access to the method of choice, insufficient information, side effects, cost, low autonomy to make decisions, religious reasons and cultural influences. There is relatively little literature on this phenomenon in the EU, as most literature on this topic concerns African countries, where the situation is more acute (Tessema et al, 2017; Alayande et al, 2019; Feyissa et al, 2019), or focuses on subpopulations, such as refugees in Germany (Inci et al, 2020). More research is needed to explore these reasons, particularly in Bulgaria, Croatia, Estonia, Ireland, Italy, Latvia, Lithuania and Spain, where more than 1 in 10 women are not using any method of contraception despite wishing to avoid or delay having children.

Horizontal inequality in health (gaps between social groups) is lower in the EU than the above-described inequality measures, although some groups remain disadvantaged. Regarding chronic illness, differences are highest between white-collar and blue-collar workers and between people with and without a tertiary education. This type of inequality is highest in Austria and Italy, where blue-collar workers have, respectively, 1.5 and 1.4 times the odds of white-collar workers to develop a chronic illness, suggesting that the type of work significantly influences one's probability of developing a chronic health condition. Further investigation is needed regarding which chronic illnesses develop due to work-related reasons and what could be done to prevent these.

Prevention appears particularly important given that access to medical care is similar among both white-collar and blue-collar workers in most EU countries (see the indicator 'medical_white' in Figure 15), suggesting that healthcare cannot address some of their chronic conditions. Medical access also differs by sex, although, in some countries, women appear disadvantaged in this regard, while men seem to be disadvantaged in others. In Malta, Romania, Portugal, Ireland and Finland, women are between 1.2 and 1.5 times more likely to report unmet medical care needs than men (Figure 16). By contrast, in Austria, Croatia, Czechia, Hungary, the Netherlands and Spain, men are much more likely than women to report unmet medical care needs.

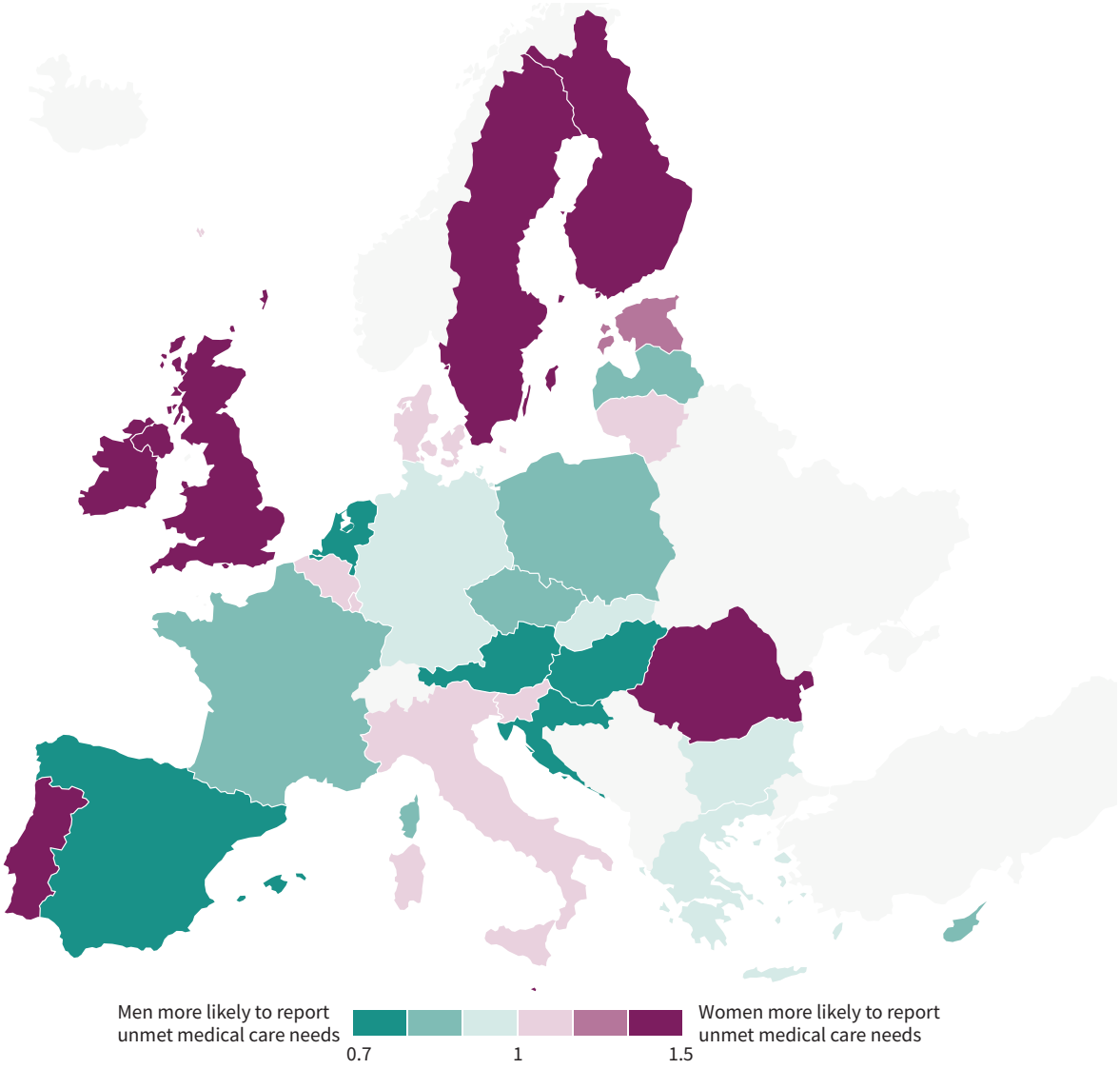
Regarding age, in half of the EU countries, the likelihood of reporting unmet medical care needs is significantly higher for adults in the middle age range (30–49 years) than for young adults (18–29 years), particularly in Croatia, Germany, Lithuania, Luxembourg, Romania and Slovakia. Differences in access to medical care are smaller when comparing those aged 30 to 49 years to older adults. Exceptions include Belgium, Cyprus and France, where older people have substantially lower odds of reporting unmet medical needs than those in the middle age range, which may suggest that healthcare in these countries is particularly tailored to serve older people. Notably, Belgium and France have some of the highest healthcare expenditures (as a share of GDP) among the EU countries and have near universal coverage of public healthcare.[18]

Meanwhile, in Romania, the opposite was found: people aged 70+ are 5.2 times more likely to have unmet medical care needs than people aged 30–49 years, illustrating a severe inability to provide care for those in greatest need. Evidence from the World Health Organization (WHO, 2020b) suggests that healthcare services available to older people are not comprehensive and many require out-of-pocket payments. Long-term care in Romania is heavily reliant on family and other unpaid caregivers (especially women), rather than the healthcare system. Access to residential institutions is limited for persons who do not have the financial resources to cover the monthly fee for institutional care.

Across the EU, there are relatively small differences in problems accessing healthcare and the likelihood of developing a chronic health condition between urban and rural and between native and foreign-born groups.

18 Country health profiles are available at https://ec.europa.eu/health/state-health-eu/country-health-profiles_en

Figure 16: Map of odds ratios of people reporting unmet medical care needs (women versus men, adjusted), 2018



Source: *EU MIMF*

Considering all inequality indicators discussed thus far, health inequality is greatest in Cyprus, Romania and Lithuania, and lowest in Sweden, Czechia and Denmark. The largest difference between these countries is that out-of-pocket expenses are significantly higher among countries where health inequality is highest, whereas countries with low levels of health inequalities have lower out-of-pocket expenses (WHO, 2020b).

Mental health

The COVID-19 pandemic has had a significant influence on worsening mental health outcomes (see 'Mental health inequalities' in the earlier 'Literature review' section of this chapter), so it is important to understand which groups were most at risk before the pandemic began, analysed through the adjusted odds ratio of feeling depressed (Figure 17).

EU MIMF data show that depression is more prevalent among women than men (except for Greece). The highest difference is in Portugal, where women have double the odds of feeling depressed of men. The likelihood of depression increases with age, except in France, Luxembourg and Sweden. Age plays an important role in Greece and Portugal, where people of retirement age have double the odds of feeling depressed of adults aged 30–49 years, and the latter have almost double the odds of young people.

Blue-collar workers are more likely to feel depressed than white-collar workers (except in Czechia), while those without a tertiary education are more likely to do so than those with a higher education. Depression is also more common among non-native populations, except in a handful of countries (Bulgaria, Cyprus, Czechia, Lithuania and Portugal).

Figure 17: Heatmap of odds ratio of feeling depressed for different social groups, 2018–2019, EU27 and the UK

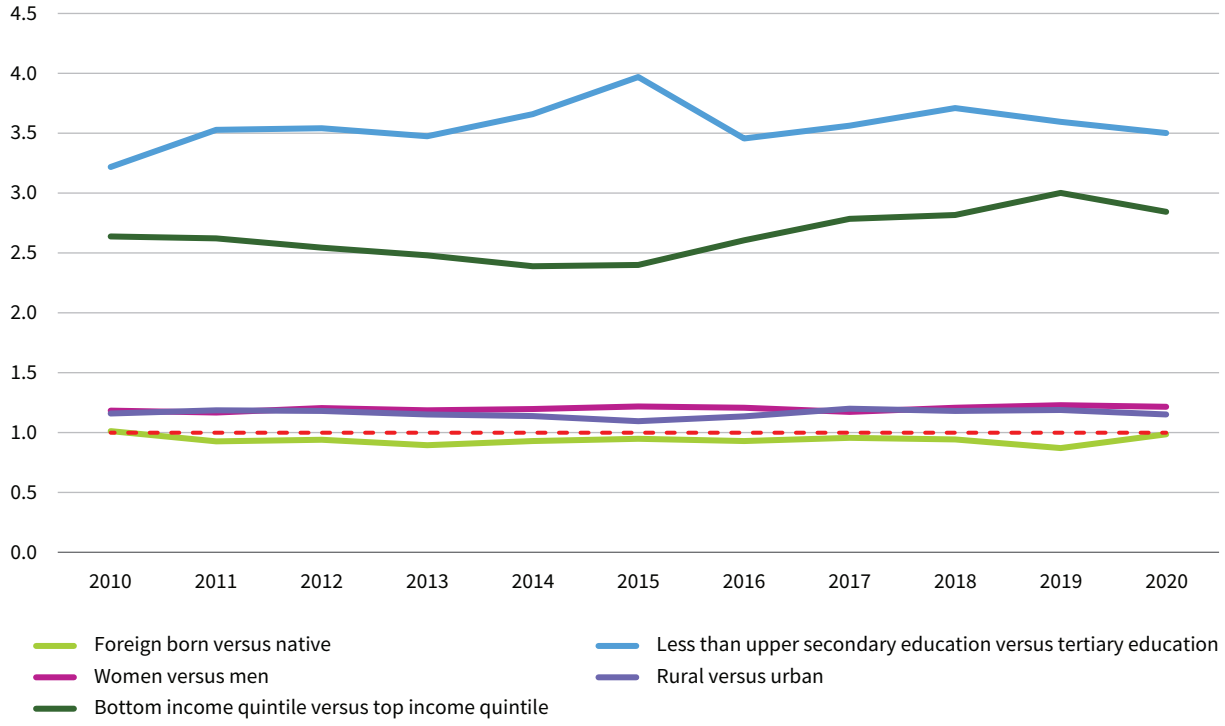
	depressed_junior	depressed_senior	depressed_elderly	depressed_female	depressed_native	depressed_tertiary	depressed_white
Luxembourg	1.00	0.99	0.95	1.52	0.75	0.84	0.76
Malta	0.92	1.22	1.16	1.21	0.91	0.66	0.81
Netherlands	1.08	0.95	0.77	1.37	0.74	0.85	0.86
France	0.99	1.21	1.11	1.88	0.84	0.75	0.85
Estonia	0.69	1.36	1.62	1.10	0.88	0.90	0.89
United Kingdom	0.76	1.03	0.73	1.41	1.04	0.71	0.74
Sweden	1.11	1.01	1.17	1.70	0.44	0.90	0.72
Germany	0.75	1.08	1.00	1.58	0.79	0.73	0.78
Czechia	0.55	1.04	1.18	1.47	1.12	0.44	1.00
Latvia	0.81	1.48	1.73	1.32	0.96	0.67	0.88
Cyprus	0.66	1.33	0.96	1.19	1.28	0.63	0.80
Finland	1.11	1.10	1.47	1.65	0.68	0.84	0.81
Belgium	0.60	0.99	0.76	1.42	0.68	0.59	0.90
Denmark	1.17	0.88	0.61	1.44	0.37	0.86	0.82
Romania	0.59	1.23	1.56	1.01	n.a.	0.66	0.85
Ireland	0.51	1.24	0.83	1.25	0.74	0.58	0.89
Croatia	1.07	1.50	1.31	1.05	1.10	0.58	0.71
Poland	0.80	1.36	1.39	1.27	0.65	0.64	0.89
Lithuania	0.63	1.38	1.53	1.42	1.07	0.65	0.72
Bulgaria	0.77	1.43	1.69	1.13	1.27	0.65	0.85
Slovakia	0.47	1.25	1.54	1.07	0.95	0.56	n.a.
Greece	0.56	1.41	2.02	0.99	0.75	0.63	0.86
Italy	0.66	1.32	1.66	1.22	0.72	0.65	0.68
Spain	0.57	1.26	1.34	1.54	0.76	0.61	0.75
Austria	0.72	1.38	1.64	1.73	0.65	0.80	0.72
Slovenia	0.90	1.53	1.94	1.51	0.77	0.54	0.83
Hungary	1.00	1.52	1.77	1.34	0.87	0.54	0.66
Portugal	0.59	1.67	2.13	2.07	1.28	0.57	0.70

Doing worse — Doing better

Note: *An explanation of the EU MIMF indicator labels used in this figure is given in the annex at the end of this report.*
Source: *EU MIMF*

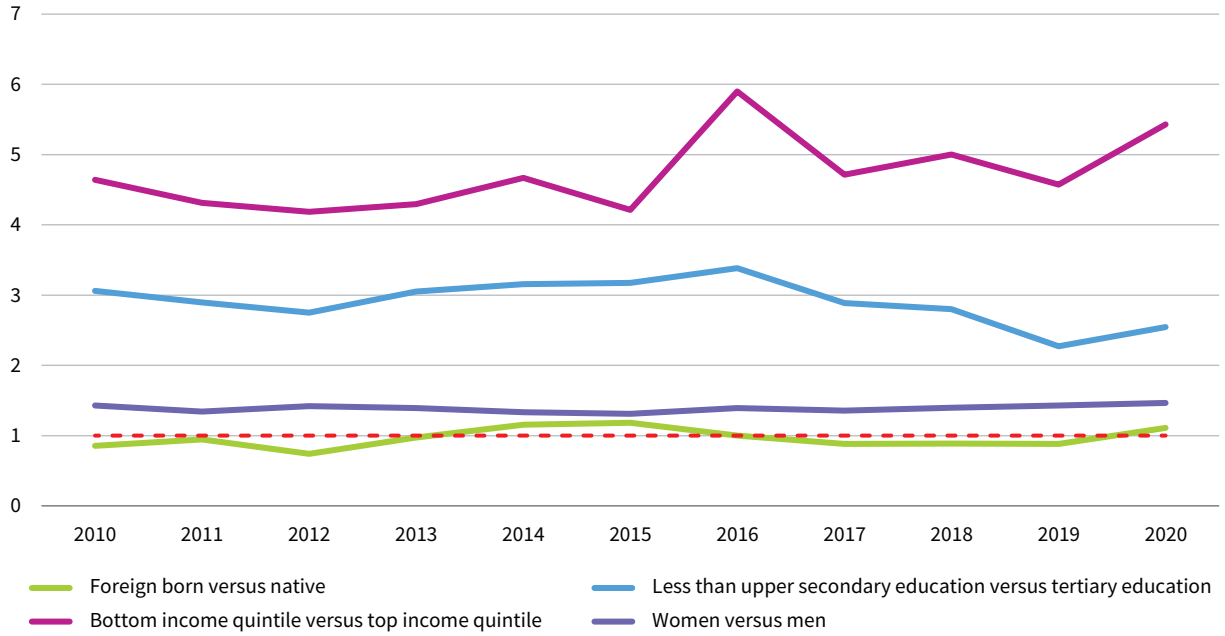
Inequality in depression outcomes appears higher in some countries (Hungary, Portugal and Slovenia) than others (Luxembourg, Malta and the Netherlands), which highlights the importance of policies addressing mental health.

Figure 18: Risk ratios of having a severe long-standing limitation in usual activities (disability) due to a health problem for various social groups (2010–2020), EU27



Note: *The red dashed line indicates a risk ratio of 1, where the two compared groups have the same risk.*
Source: *Eurostat, Self-perceived long-standing limitations in usual activities due to health problem by sex, age and groups of country of birth [hlth_silc_27]; and Self-reported unmet needs for medical examination by sex, age, main reason declared and income quintile [hlth_silc_08]*

Figure 19: Risk ratios of having an unmet medical need due to high cost, distance to travel or waiting lists for various social groups (2010–2020), EU27



Notes: *Figures 18 and 19 are based on the population aged 16+. The red dashed line indicates a risk ratio of 1, where the two compared groups have the same risk. A risk ratio greater than 1 indicates that the social group listed first in the legend (for example, women in 'Women versus men') has a greater likelihood than the group listed second of reporting having an unmet medical need. A risk ratio less than 1 indicates the opposite. COVID-19 interrupted the data collection activities on which these results are based, and some countries (e.g. Germany) introduced changes to the methodology. This means that 2020 data may not always be directly comparable to the data of previous years.*
Source: *Eurostat [hlth_silc_29]; and Self-reported unmet needs for medical examination by sex, age, main reason declared and income quintile [hlth_silc_08]*

Trends in health inequality (2010–2020)

Figures 18 and 19 show inequality trends in disability (severe long-standing limitations in usual activities) and unmet needs for healthcare (due to high cost, distance to travel or waiting lists) between various social groups, where risk ratios above 1 indicate that the group listed first in the legend (for example, women in 'Women versus men') has a greater risk than the group listed second.

In both indicators, inequality is greatest in relation to education and income, rather than gender, urbanisation or country of origin. In 2020, those with a lower education level were 3.5 times more likely to have a severe disability and 2.5 times more likely to have unmet healthcare needs than people with a tertiary education. Similarly, the bottom 20% of the population based on income had a 2.8 times greater risk of a severe limitation and a 5.4 times greater risk of an unmet healthcare need than those in the top 20%. Meanwhile, inequality between foreign-born individuals and natives was very low throughout the period analysed. Women and those living in rural areas were at a slightly greater risk regarding both indicators. The findings are in line with similar indicators discussed in the previous section on levels of inequality and do not seem to have changed much during the pandemic.

Inequality between top and bottom income groups in terms of having a disability has increased during the past decade, but decreased slightly in 2020. In 2010, people in the lowest income quintile had 2.4 times the risk of a disability than those in the highest income quintile, a risk that increased to 3.0 times by 2019. This is because the share of people with a disability in the bottom quintile slightly increased, while the share of those in the top quintile held steady. In the first year of the pandemic, there was no change in the share of people in the bottom quintile who had a severe disability, while the proportion in the top quintile increased by 0.2 percentage points. This decrease in inequality is quite small, and it remains to be seen whether this trend holds in 2021.

By contrast, in terms of access to healthcare, people in the bottom income quintile seem to have been affected more in 2020. In the top quintile, unmet medical needs held constant at 0.7% in 2020, while in the lowest quintile this indicator jumped from 3.2% in 2019 to 3.8% in 2020.

The pandemic seems to have also reversed the trend of decreasing inequality in medical access between those with lower education levels and those with a tertiary education. This gap had been declining since 2016, and unmet need was decreasing among both education groups (by 1.9 percentage points for those with a lower education level and by 0.2 percentage points for those with a tertiary education). In 2020, no change was seen among those with a tertiary education, while unmet care needs increased by 0.3 percentage points among those with a lower education level.

Policies as general drivers of health inequality

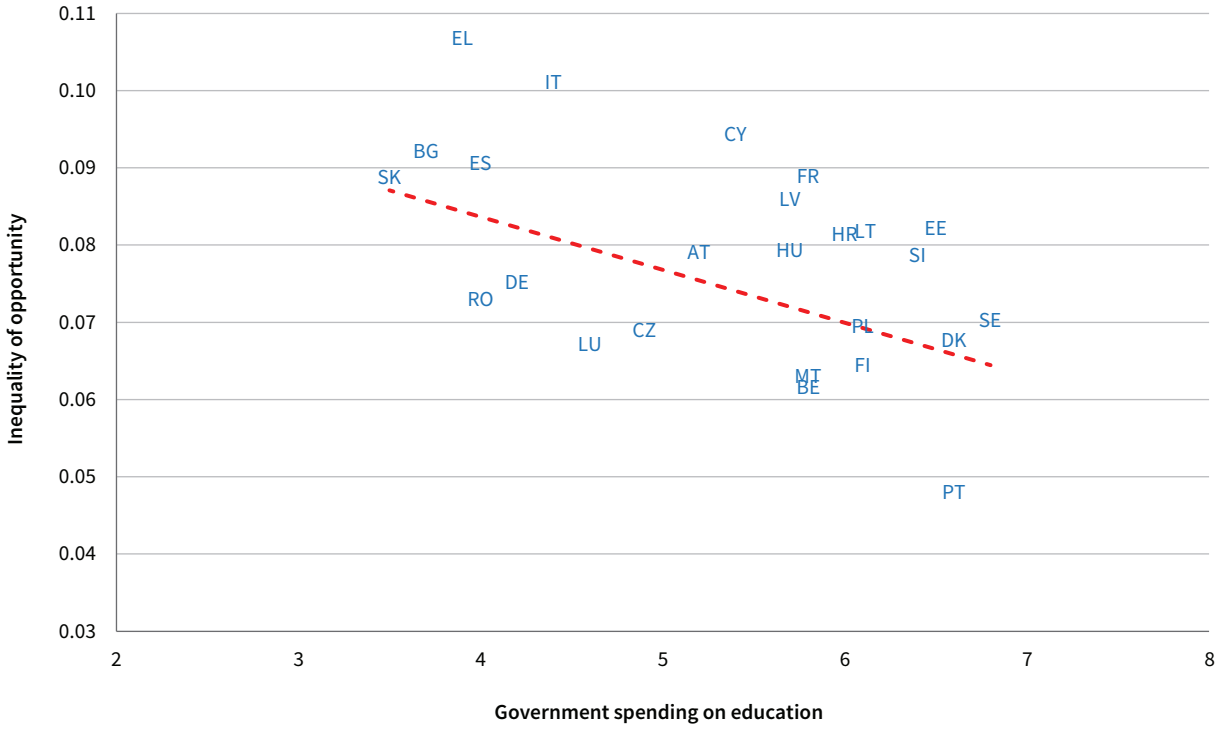
Government policies may play a role in inequality of opportunity. To examine this, the relationships between government spending on families and children, on the one hand, and government spending on education, on the other, using the EU MIMF indicator (ex ante inequality in having two or more diseases for people aged 50+[19]), were analysed. While spending on healthcare and spending on social protection would seem to be natural variables of interest, the JRC analysis did not find statistically significant associations between these variables and health inequality.[20]

Inequality of opportunity in chronic disease seems to be negatively correlated with government spending on education (r=–0.49, Figure 20), using the earliest data available (2002). Greece, Bulgaria and Slovakia have the highest levels of health inequality relative to the lowest spending on education, whereas Sweden, Denmark and Portugal have the highest spending on education at the lowest levels of health inequality. The correlation with spending on families and children (r=–0.31) is not statistically significant.

19 Values for Ireland and the Netherlands were imputed based on geographical patterns.

20 This is based on online supplementary material accompanying Alberti et al (2021).

Figure 20: Government spending on education in 2002 (% of GDP) relative to ex ante inequality of opportunity in having two or more chronic diseases in 2019 (aged 50+), EU27



Source: *EU MIMF and Eurostat, General government expenditure by function (COFOG) [gov_10a_exp]*

When controlling for the country's wealth (GNI per capita), the negative association between government spending on education and inequality in chronic disease for those aged 50+ remains significant. The regression results indicate that a 1 percentage point increase in education spending in 2002 led to a 0.006-point decrease in the outcome variable in 2019 (Table 8).

This suggests that expenditure on education may help offset some of the disadvantages that are beyond individual control at birth, such as family background, gender and others, which manifest in poorer health outcomes. The coefficient for expenditures on family and children is not significant.

Table 8: OLS regression model exploring the relationship between government expenditure and inequality in chronic disease

	Ex ante inequality of opportunity in having two or more chronic diseases (age 50+), 2019
Government expenditure on education (2002, % of GDP)	–0.006*
Government expenditure on family and children (2002, % of GDP)	–0.000
Log (GNI per capita in USD, 2019)	–0.005

Notes: * *p<0.05. For more details, see Table 17 in Annex II.*
Source: *Authors, based on EU MIMF and Eurostat data*

Health inequality during the pandemic

The COVID-19 pandemic has put a strain on healthcare systems throughout Europe, resulting in unmet healthcare needs for millions of citizens. However, the degree to which people were affected by health issues during the pandemic differed depending on their background, their personal experience with the pandemic and the different policies put into place by governments to address healthcare needs – all of which may have resulted in increased inequality in health.

To understand how people perceived changes in their health during the pandemic, data from EU-SILC and SHARE were used. EU-SILC measures general health, including physical, social and emotional functioning (European Commission, 2020, p. 267).[21] SHARE also includes information on both physical and mental health and specifies whether respondents perceived changes in health compared with before the outbreak of the pandemic. Thus, information provided in the two surveys gives a comprehensive overview of different health indicators.

Potential determinants of health inequality during the pandemic that were analysed included respondents' background, respondents' personal experience with the pandemic and government policies relating to healthcare and social protection.[22] To ensure better comparability of results across the two surveys, the same response variable was used in each survey, to capture whether respondents experienced a worsening in their perceived health status (physical or mental) since the COVID-19 outbreak.[23]

Demographic background and worsening health

There is widespread evidence that public health crises amplify risk factors related to the living environment, which are exacerbated by differences in socioeconomic status (see 'Literature review' in the earlier part of this chapter). This section explores how demographics, pre-existing medical needs, and living and working situations determined which groups of people were most likely to experience worsening health.

Results from the regression analysis show that essentially the same demographic factors explained deterioration of health before the pandemic and during the pandemic. Having poor health, living in cities and being employed were consistently robust predictors of perceived worsening of health in both 2018–2019 and 2019–2020, based on EU-SILC data. Results for worsening health between 2019 and 2020 are shown in Table 9.

However, slightly different results were found for gender effects. Men in the EU-SILC survey had slightly higher odds of worsening health than women both before and during the pandemic, although the effect was only half as strong in 2020 as in 2019. This suggests that women's health started deteriorating more in 2020 than in 2019, compared with men's. Additionally, women in SHARE were more likely than men to report worsening physical and mental health when directly asked to compare it with their physical and mental health before the COVID-19 outbreak, and this effect was strongest among women under 75 years of age. This could be partially explained by evidence that women perceived COVID-19 to be more of a threat than men did, which may have affected the self-assessment of their health status (Oreffice and Quintana-Domeque, 2021). Women were also more likely to be burdened by childcare and home schooling, and had to give up more free time to take care of both paid work and housework (Eurofound, 2021b), which might have increased their stress level more than men. Meanwhile, older women were more likely to live alone during the lockdown, which might also have been detrimental to their mental health.

While respondents' poor health before the pandemic was a strong predictor of worsening health during the pandemic, this was less applicable to mental health. Although many who experienced depression in the month before the survey perceived worsening mental health during the pandemic (60%), this was even more common among people without recent depression symptoms (69%). Past experiences of depression reduced the odds of worsening mental health by 33%, according to SHARE data. This suggests that inequality in mental health was not driven by previous mental health conditions to the same extent as was the case for physical health.

21 To differentiate between effects on health that could be more strictly related to the pandemic and general trends in health, changes in health between 2019 and 2020 and between 2018 and 2019 were analysed.

22 Detailed multilevel regression models can be found in Table 18 and Table 19 of Annex II. Table 20 of Annex II includes some descriptive statistics relating to government expenditures in healthcare and social protection.

23 Variables CAH002_ for physical health and CAMH802_ for mental health (only for people who were depressed in the month before the interview) from SHARE are measured on a three-level scale ('Improved', 'About the same' and 'Worsened' health status; and 'More so', 'About the same' and 'Less so' depressed). In the EU-SILC longitudinal dataset, variable PH010 measures self-reported health on a five-level scale, from 'Very bad' to 'Very good'. These were transformed to a three-level scale then compared across the two years to measure the change between 2019 and 2020 (and between 2018 and 2019). Variables for both SHARE and EU-SILC were then given a value of 1 if health worsened and 0 otherwise.

Table 9: Multilevel logit regression model on worsening health between 2019 and 2020

	Perception of worsening change in health between 2019 and 2020
Government expenditure on healthcare (% of GDP) in previous year	0.073
Government expenditure on social protection (% of GDP) in previous year	0.049
Health status in previous year (reference: very good)	
Very bad	20.533**
Bad	19.714**
Fair	18.702**
Good	17.252**
Positive increase in sickness benefits	–0.238**
Positive increase in disability benefits	–0.471**
Level of education (reference: high (ISCED 5–8))	
Low (ISCED 0–2)	–0.412**
Medium (ISCED 3–4)	–0.167**
Gender (reference: female)	
Male	0.029*
Age group (reference: 75+)	
18–24	1.796**
25–34	1.492**
35–44	1.121**
45–54	0.791**
55–64	0.558**
65–74	0.336**
Economic status (reference: employed)	
Disabled	–1.093**
Other inactive	–0.291**
Retired	–0.306**
Student	–0.021
Unemployed	–0.253**
Equivalised household size	0.098**
Degree of urbanisation (reference: densely populated area)	
Intermediate area	–0.015
Thinly populated area	–0.079**

Notes: ** p<0.05, ** p<0.001. ISCED, International Standard Classification of Education. For more details, see Table 18 in Annex II.*
Source: *EU-SILC*

Personal experiences with the pandemic and worsening health

As seen in the literature, the pandemic increased inequalities in healthcare access. Restricted access to healthcare can widen existing gaps in health because of unmet urgent medical needs. This section investigates how respondents' personal experience with the pandemic affected changes in perceptions about their health.

Among people over 50 years of age, those who were refused a medical appointment during the pandemic had higher odds of experiencing a worsened change in both physical (by almost two and half times) and mental health (53% higher), even when controlling for previous health status (Table 10). Furthermore, people in poor health pre-pandemic were denied medical appointments at a rate over twice as high as those whose health was good. This increase in health inequality between those who needed urgent care and

Table 10: Multilevel logit regression models on worsening health and mental health between 2019 and 2020

	Health	Mental health
Government expenditure on healthcare (2019, % of GDP)	0.032	–0.102
Government expenditure on social protection (2019, % of GDP)	0.112	0.190
Asking for, but not getting, a medical appointment	0.875***	0.427***
Financial support from the government during the pandemic	–0.010	–0.029
Self-perceived health status before the pandemic (reference: excellent)		
Poor	2.295***	–0.256
Fair	1.528***	–0.128
Good	0.657***	–0.090
Very good	0.189	0.029
Testing positive for COVID-19	2.012***	0.600
Having a close person die from COVID-19	0.431***	0.526**
Becoming unemployed, being laid off or closing one's business	0.181	0.335*
Frequency of contact with people outside one's home (reference: daily)		
Never	0.051	0.061
Less often	–0.085	0.064
About once a week	–0.151*	0.035
Several times a week	0.006	0.056
Gender (reference: female)		
Male	–0.246***	–0.255***
Age	0.202***	–0.154***
Level of education (reference: high (ISCED 5–8))		
Low (ISCED 0–2)	–0.049	–0.063
Medium (ISCED 3–4)	–0.110*	0.057
Economic status (reference: employed)		
Disabled	0.139	–0.094
Homemaker	0.045	–0.036
Unemployed	0.030	–0.222
Retired	0.027	0.131
Other	0.130	–0.166
Degree of urbanisation (reference: big city)		
Rural	–0.161*	–0.227**
Urban	–0.087	–0.062
Felt depressed in the last year (Euro-1 classification)		–0.400***

Notes: ** p<0.05, ** p<0.01, *** p<0.001. ISCED, International Standard Classification of Education. For more details, see Table 19 in Annex II.*
Source: *SHARE*

those in better health may have been caused by hospital overcrowding and restricted access to appointments.

The pandemic affected health inequality in other ways, too. Testing positive for COVID-19 had a strong positive effect on the probability of worsening physical health compared with before the pandemic outbreak. Having a close relative or friend die from COVID-19 had a strong negative impact on respondents' mental health, while their physical health was also affected. This finding is in line with studies showing that the incidence of 'broken-heart syndrome' (a stress-induced heart condition that relates to emotional distress, such as the death of a close person) grew five-fold during the pandemic (Jabri et al, 2020). In a similar vein, losing one's job because of COVID-19 increased the odds of

worsening mental health by almost 60% compared with others (model 4 in Table 19 of Annex II).

People's social lives during the pandemic also affected perceptions about their health status. Respondents who never had physical contact with people outside their household were more likely to perceive worsening mental health than those who had daily physical contact. The impact was particularly strong for respondents with poor health pre-pandemic, who were half as likely to have daily physical contact with people outside their household than those in good health (5% versus 11%, respectively) and were twice as likely to have no physical contact at all than those in good health (43% versus 21%, respectively). This suggests that physical isolation due to lockdowns may have increased the strain on mental health for people who already experienced health problems. Electronic contact did not have similar effects, while neither type of contact had a relationship with physical health.

Healthcare policies and changes in health during the pandemic

To examine the relationships between healthcare and social protection policies and changes in health during the pandemic, both preventive and corrective measures were included.

Preventive measures are those implemented before the pandemic, which may have put the country in a better position to cope with the pandemic's health implications. Government spending on healthcare and social protection in the year before the pandemic were included in the models tested (Eurostat [gov_10a_exp]), as a better-funded national healthcare system may help avoid overcrowded facilities, while higher social protection spending may create a safety net in cases of radical economic shifts. However, the relationship between these expenditures and health changes were not statistically significant (Table 18 and Table 19 of Annex II), which suggests that the pandemic similarly affected respondents' (perceived) health, regardless of their country's healthcare and welfare systems.

Among the **corrective** measures implemented as a direct response to the pandemic, the first was blanket financial support given to households to better cope with the changing circumstances of the labour market. No significant relationships were found between this indicator and physical and mental health (Table 19 of Annex II), suggesting that while such government support helped families navigate financial difficulties during the pandemic (see 'Income inequality during the pandemic' in Chapter 2), it may not have had a direct effect on people's well-being, which may instead be mediated by other factors.

Traditional sickness and disability benefits were also analysed, based on EU-SILC data. The findings suggest that an increase in disability or sickness benefits between 2019 and 2020 was associated with a lower likelihood of worsening health (Table 18 of Annex II). This could mean that people in already poor health were the main recipients of benefits: for recipients of disability benefits, respondents in good health accounted for only 21% of the total. People in poor health may not have perceived their health to have further worsened, even if their disability benefits increased. Sickness benefits were less dependent on the recipient's health status; a reason for this might be that respondents may have recovered by the time they were surveyed, even if they had claimed sickness benefits earlier in the year. The same negative effect between disability and sickness benefits and the likelihood of worsening health was found in the years before the pandemic, suggesting that it may be part of a general trend rather than a pandemic-specific corrective measure.

Box 2 presents some examples of national policies aimed at promoting healthcare and increasing access among disadvantaged groups.

Box 2: National policy examples targeting health inequality

In **Ireland**, outreach policies are a component of the Healthy Ireland strategic action plan for 2021–2025, which features 'reducing health inequalities' as one of its six components. Targeted actions that will be part of this area will be guided by research, to tailor these to the needs of the population. Among other measures, policies tackling obesity and smoking will be reviewed to address inequalities, and areas will be targeted in order of deprivation level (Government of Ireland, 2021). Furthermore, one of the actions set out in the Irish Child Guarantee national action plan is to develop a child health workforce with an initial focus on highly populated and disadvantaged areas. A pilot model will be used to inform further measures.

Spain's recovery and resilience plan includes a law with measures promoting equity, universality and cohesion in its national health services. The new law aims to broaden the rights of those groups of the population that so far have not had effective access to healthcare, for example by limiting co-payments. The reform programme also broadens the services that are part of public healthcare, reinforcing dental care, early childhood intervention and orthotic and prosthetic services.

Digital technologies have been used to increase the accessibility of healthcare services in different countries (Eurofound, 2014, 2020a). In **Greece**, a national e-health program for the prevention and management of overweight and obesity in childhood and adolescence provides guidance to all primary healthcare physicians on personalised management. Its evaluation shows that it is effective at reducing the prevalence of obesity after one year of intervention (Tragomalou et al, 2020).

4 Inequality in employment and working conditions

This chapter looks at inequality in employment, working conditions and working lives more broadly, starting with a literature review of the drivers and factors that were found to be important for inequalities in working lives during the pandemic. This is followed by the presentation of levels of employment inequality in the EU27 before the pandemic, as well as how employment inequality changed between 2010 and 2020. The fourth section focuses on government policies as general drivers of working life inequality, while the final section focuses on the drivers during the pandemic.

Literature review

The initial stages of the COVID-19 pandemic led to restrictions on social and economic activity in European countries, including stay-at-home orders and the closure of non-essential businesses. Lockdowns, introduced in spring 2020 and then again in autumn 2020 and early 2021, resulted in a major economic and employment shock. To mitigate their effects on the financial stress of employees and households, governments implemented various schemes to support the newly unemployed or furloughed workers. However, evidence suggests that these measures were not always able to prevent the deepening of pre-existing inequalities in labour markets.

The groups of people most affected by unemployment and related issues were largely the same as those who experienced worse job security and working conditions prior to the pandemic. There is significant interplay between many of these individual-level characteristics in explaining the inferior labour market outcomes. Various quantitative studies from Europe (Adams-Prassl et al, 2020; Campa et al, 2021) and beyond (Ong et al, 2020; Witteveen, 2020; Gray et al, 2022) showed that the groups most affected included women, young people, people from ethnic minorities, blue-collar workers and people in non-standard working arrangements.

Evidence from past epidemics shows that the epidemics led to a lower employment ratio for workers with lower education levels and pushed people into precarious employment, self-employment and work in the informal sector (Furceri et al, 2020). Studies comparing the impact of the COVID-19-related crisis on labour markets with the impact of the 2008 financial crisis (for example, Perry et al, 2021) found that less educated workers had worse outcomes in both crises, but the difference between them and more highly educated groups during COVID-19 were higher. In addition, while men were most likely to lose jobs in the financial crisis, in several countries women suffered more during the COVID-19 crisis (Fazzari and Needler, 2021).

These findings are not consistent across the countries covered in the present research, indicating the importance of macro-level and structural factors (Figure 21). Through a simulation analysis of the distributive effects of lockdowns in European countries, Perugini and Vladisavljević (2021) showed that countries with high pre-pandemic levels of inequality, insecure employment regulations and limited social protection measures would experience more severe effects on income inequality and poverty levels due to job losses or reduced working hours. Geography, industrial mix and divergent policy responses also shaped the experiences of the pandemic at meso-level (Herod et al, 2021).

Most of the studies reviewed are based on individual data and concentrate on the following aspects:

- groups of workers most vulnerable to the effects of the pandemic
- inequalities in the possibility to work from home
- occupational inequalities among groups with non-standard types of employment
- gender inequalities in paid work and unpaid housework and childcare

Vulnerable worker groups

Lower earning, lower educated and blue-collar workers were most likely to experience job loss at the beginning of the pandemic. Data from real-time surveys in Italy from the first lockdowns showed that low-income and low-skilled workers fared notably worse in terms of labour market and financial outcomes than highly educated and white-collar workers (Galasso, 2020). Moehring et al (2021) demonstrated that low-wage workers were also severely affected by furlough and job loss in Germany, based on panel data. A study using European Union Labour Force Survey (EU-LFS) data from six EU countries (Czechia, Germany, Italy, the Netherlands, Slovakia and Spain) demonstrated that those in lower paid and lower skilled occupations were two to three times more likely to experience job loss, income loss and workload decline than those in higher-paid and -skilled jobs (Witteveen and Velthorst, 2020).

Figure 21: Macro-, meso- and micro-level factors in inequality in working life outcomes during the COVID-19 pandemic

New hiring was also differently affected regarding regions and occupational skill levels. Job-vacancy postings in the US showed that firms had cut back on postings for highly skilled jobs more than for low-skilled jobs, with small firms nearly halting their new hiring altogether. Cuts and down-skilling were most pronounced in low-income areas and in areas with greater income inequality (Campello et al, 2020).

Young people experienced stronger negative effects of the pandemic, which is supported by many studies. Worries about notable reductions in upwards social mobility in the longer term prompted the media to coin the term 'generation COVID' (Major et al, 2020).

Most evidence comes from the UK. A study by Adams-Prassl et al (2020) using survey data collected early in the pandemic found that job losses, related drops in earnings and problems paying bills hit young and low-income earners hardest. The Institute for Fiscal Studies confirmed findings that younger and less educated people were more affected by the fall in employment resulting from the pandemic (Blundell et al, 2021). In the retail industry, the pandemic accelerated the shift towards online retail rather than in-store purchases, resulting in more lay-offs and less potential future employment for young people. An autumn 2020 survey in the UK estimated that employees aged 16–25 were over twice as likely to have suffered job loss (over 10%) as older workers, while almost 60% saw their earnings fall. These losses were more pronounced for women, self-employed people and those who grew up in a poor family (Major et al, 2020). Meanwhile, a Swedish study found that the two demographic factors most associated with higher unemployment in the pandemic were being young and being foreign born (Campa et al, 2021).

Youth unemployment during the pandemic may have longer term implications for inequality, as longer spells of unemployment may have scarring effects, as do learning losses and failures to achieve the grades needed to pursue the next steps in education or employment (see 'Literature review' in Chapter 5; Major and Machin, 2020). Economic and educational inequalities are interdependent and reinforce each other to determine future social mobility levels, especially for the worst off.

The impact of **ethnicity and race** on working life was mostly analysed in the US and the UK. In the US, Fazzari and Needler (2021) argued that, in both the Great Recession and the COVID-19 crisis, white workers fared better than other groups. They also indicated intersecting inequalities of race and gender, showing that black and Hispanic women were especially vulnerable. Bokun et al (2020) found that higher shares of Latin, black and lower income children were affected

by their parents losing income. In the UK, an early-pandemic study (Witteveen, 2020) suggested that those with relatively high earnings (generally male and white) were first to be furloughed to reduce labour expenses, while women and racial/ethnic minorities were more likely to be employed in essential occupations (healthcare, grocery and retail fields) and, therefore, were somewhat protected against income loss at the very beginning of the pandemic. However, Bowyer et al (2020) found that racial and ethnic minorities were more susceptible to loss of employment and poorer working conditions, as they were more likely to work in closed down sectors and were overrepresented in precarious work.

Possibility to work from home

Evidence shows that inequality in working lives was related to the possibility of working remotely. Inequalities in access to remote jobs intersect with income, education and gender inequalities and operate on individual level, as well as on macro and meso levels.

Prior to the pandemic, working from home arrangements were unequally distributed across groups based on income and education level. In 2018, a quarter of EU workers in the top income quartile worked at least some of their working time remotely, while only 10% of low-income workers did so. Workers with higher education levels were three times more likely to work remotely (JRC, 2020).

During the pandemic, similar trends were observed. Dingel and Neiman (2020) estimated, based on survey data, that 37% of jobs in the US could be done from home; these jobs were higher paying and constituted 46% of all US wages, a finding that was also evident at macro-level. Applying the same methodology to 85 other countries, they showed that lower income economies had a smaller share of jobs that could be performed at home. Similarly, Garrote Sanchez et al (2021) estimated that, in low-income countries, only 1 in 26 jobs could be done from home. Similar trends were shown at regional level by Irlacher and Koch (2021) in Germany. The substantial regional variation in teleworkability coincided with variation in income levels, suggesting that the COVID-19 pandemic might affect poorer regions to a greater extent.

Young, lower educated, blue-collar and low-income workers, as well as those working in smaller firms and those on temporary contracts, were less likely to work from home and were therefore more vulnerable to labour market shocks. This was confirmed in global-level analyses (Brussevich et al, 2020) and in studies covering specific countries, including Italy and China (Galasso, 2020) and Germany (Hoenig and Wenz, 2021; Moehring et al, 2021).

The possibility to work remotely also intersects with gender inequality; however, the direction of this relationship depends on the labour market structure and the sharing of household work and childcare responsibilities between men and women. In the US, women were more likely to work remotely during the pandemic (Lewandowski, 2020; Couch et al, 2021), while evidence from Germany shows that women were more likely to work on site than from home (Möhring et al, 2021). A study from the Netherlands (Yerkes et al, 2020) found no such gender gaps among Dutch parents (see Chapter 4).

These differences resulted in less favourable labour market outcomes for people unable to work from home. Workers in non-teleworkable occupations experienced larger employment losses and income decreases, as demonstrated in Canada (Gallacher and Hossain, 2020), the US (Liu and Mai, 2020), Italy (Galasso, 2020) and Spain (Farré et al, 2020). Irlacher and Koch (2021) also revealed a substantial wage premium for workers performing their job from home in Germany after controlling for workplace characteristics (see 'Literature review' in Chapter 2).

Differences in the possibility to work from home between workers with different education levels showed inequalities in the risk of infection with COVID-19, explained by an inability to practice social distancing at work, rather than by differences in individuals' health behaviour (Hoenig and Wenz, 2021; see 'Literature review' in Chapter 3).

Occupational inequalities in non-standard work

People in non-standard working arrangements were more likely to have lost their jobs, been furloughed and suffered a decrease in earnings than others (Adams-Prassl et al, 2020; Gray et al, 2022). An early-pandemic UK survey showed that the self-employed had been hit particularly hard, with approximately three-quarters reporting less work in April 2020 than usual (Blundell and Machin, 2020). The findings showed that the largest reductions in working hours and income were among lower income and older self-employed people without employees. They also revealed that those trapped in precarious employment were among the most negatively affected: app-based or platform work was found to increase the risk of infections. In the aftermath of the pandemic, precarious work is expected to increase in scope, with working conditions further deteriorating (Matilla-Santander et al, 2021).

The prevalence of precarious employment worsened employment outcomes at country level. A study using EU-LFS data from six countries showed that those countries hardest hit by infections (Spain, Italy and the UK) suffered the worst employment implications of lockdowns, which was amplified by their prevalence of precarious work, especially temporary contracts, among other factors (Fana et al, 2020).

However, part-time and short-time arrangements may have contributed to saving jobs: employees in Germany were substantially less likely to be affected by the crisis than those in other countries, which was attributed to a well-established short-time work scheme (Adams-Prassl et al, 2020).

Regarding irregular working arrangements, the different impacts felt were related to the type and skill levels of jobs. In the UK, among the self-employed, higher income workers were more likely to apply for government income support schemes than low-income workers (Blundell and Machin, 2020). Additionally, the support scheme announced for the self-employed was not that well received: 30% of self-employed workers believed they were ineligible, due to either profit levels or incomplete tax returns, and only 39% intended to apply for support (Gardiner and Slaughter, 2020).

Gender inequalities in paid and unpaid work

Researchers were unequivocal about the worsening working conditions and employment outcomes for women, especially mothers, with some calling the crisis a 'she-cession' (Bluedorn et al, 2021) and warning that the COVID-19 pandemic may have long-term implications for gender inequality. Only a Swedish study found that gender played no role in working life inequalities, probably due to institutional factors and labour market structure and because in Sweden schools and childcare facilities remained open (Campa et al, 2021).

When it comes to loss of paid work, in the EU overall, unemployment rates increased more for men than for women during the pandemic. A global study (Bluedorn et al, 2021) found that, in two-thirds of the 38 countries studied, women's employment rates declined more than men's, but these differences lasted for only one or two quarters of the year and were limited to specific sectors. However, other studies found worse labour market outcomes for women. A study based on data from China, Italy, Japan, South Korea, the UK and the four largest states in the US found that women were 24% more likely to permanently lose their job than men because of the pandemic (Dang and Nguyen, 2021). Women were found to suffer a higher incidence of job and income loss in Austria (Christl et al, 2022), Germany (Möhring et al, 2021), France (Lambert et al, 2020) and Spain (Farré et al, 2020; Hupkau, 2020). In addition, in a study covering Germany, Singapore and the US (Reichelt et al, 2021), differences in gender inequality depended on whether women were more likely to work on site (in Germany) or to work remotely (in the US) early in the pandemic.

However, in the UK, men were more often furloughed or dismissed from work than women (Witteveen, 2020). Zhou et al (2020) suggested that because women are more likely to work in healthcare and social care, they represented 60% of essential workers in the UK. However, they found no significant gender differences in the reduction of hours worked or in falls in earnings. A study covering the Netherlands had similar findings (Yerkes et al, 2020). Conversely, in the US, women were less likely to work in essential occupations than men, which widened the unemployment gap (Couch et al, 2021).

Parenthood was an important factor in gender inequality during the pandemic. In the US, Landivar et al (2020) found that mothers were more likely to become unemployed or suffer a reduction of working hours than fathers, even when they could work remotely. Job loss among women with young children due to the burden of additional childcare was estimated to account for 45% of the increase in the gender gap between April and November 2020 in the US (Fabrizio et al, 2021). Dias et al (2020) also showed that fathers were less likely to lose their job than mothers, men without children and women without children. Collins et al (2021) found that mothers with primary school-age or younger children reduced their work hours four to five times more than fathers. Looking at the whole of 2020, Couch et al (2021) found that job loss and the reduction of work hours negatively affected women with school-age children, but not those with younger children.

Intersecting inequalities were found in job loss: less educated women with young children were the most adversely affected during the first nine months of the crisis (Fabrizio et al, 2021). Similar conclusions were reached in Canada by Fuller and Qian (2021). Another study in the US indicates that black and Hispanic women were especially vulnerable to job loss during the pandemic (Fazzari and Needler, 2021).

Gender intersected with the ability to work from home and self-employment. In the UK, no gender differences were found in decreases in working hours among the self-employed, probably because women were more likely to be able to work from home. However, among people who could work from home, women were more negatively affected than men (Blundell and Machin, 2020).

For many women, the reduction in paid work coincided with an increased workload in unpaid domestic work and childcare. Findings were unanimous in this regard: while men became somewhat more involved in domestic and care work, this increase was considerably larger for women. This has been demonstrated in Spain (Farré et al, 2020), the Netherlands (Yerkes et al, 2020), the UK (Zamberlan et al, 2021), Italy (Meraviglia and Dudka, 2021) and other countries. Often this was related to more women working remotely in non-critical sectors or not working (Frontoni, 2020; Hupkau, 2020; Lyttelton et al, 2020). Some authors suggest that this may have a long-term impact on gender equality, as changes in the division of household labour drive a shift in gender-role attitudes (Reichelt et al, 2021).

Childcare infrastructure was important for gender equality. For 13% of Spanish couples with dependant children, fathers became the main care providers while their partners worked in critical jobs. However, 44% of mothers employed in critical jobs had partners also working in critical jobs, and 10% of them did not have a partner (Hupkau, 2020). The participation of women in essential jobs in the labour market was highly influenced by the availability of childcare services. The finding that single mothers in the UK were most likely to stop working (Zhou et al, 2020) is likely related to increased childcare responsibilities (Fuller and Qian, 2021).

School closures also had a negative effect on the labour market participation of primary carers. In the US, mothers' labour force participation rate fell by more than that of fathers across states. This gap grew by five percentage points in states where schools offered remote education (in states with hybrid or in-person instruction, mothers' labour force participation dropped less and the gender gap remained similar to in 2019). Longer school closures may result in reduced occupational opportunities and lifetime earnings for mothers (Collins et al, 2021). These disproportionate impacts also made women vulnerable to deteriorations in mental health (see 'Literature review' in Chapter 3).

Employment inequality before the pandemic

Ten EU MIMF indicators were considered in the analysis of levels of inequality in employment and working life, covering different approaches to inequality (Table 11).

Based on these measures, vertical inequality (inequality measured as variability across the whole population) and inequality of opportunity (inequality based on factors outside one's control) are more pronounced in the EU than other types of inequality in working life (Figure 22). Regarding vertical inequality, differences in job satisfaction are greatest in Bulgaria, Croatia and Slovakia. This is interesting because Slovakia has the lowest levels of income inequality, as measured by both the Gini coefficient and the income quintile share ratio. Meanwhile, inequality of opportunity in having a white-collar job is the greatest in Hungary, Latvia and Slovakia, meaning that, in these countries, circumstances beyond individual control (for example, sex, age, origin and education of parents) have the greatest influence on someone's ability to acquire a white-collar job.

Table 11: Indicators selected for the employment inequality analysis

Inequality approach	Indicators	
Intergenerational mobility	Probability of transition from blue-collar parents to white-collar children (age group: 30+)	
Norms, attitudes and practices	Proportion of the population that believes that children will suffer when women work for pay outside the home	
Inequality of opportunity	Ex ante inequality of opportunity in having a white-collar job (30- to 49-year-olds)	
Horizontal inequality[24]	Odds ratio of being in managerial jobs (adjusted)	Women versus men
		Young adults (18–29) versus adults in middle age range (30–45)
		Elderly (70+) versus adults in middle age range
		Native versus foreign born
		Tertiary education versus non-tertiary education
		Rural versus urban
Vertical inequality	Absolute Gini of job satisfaction scores	

Source: *Authors, based on EU MIMF*

24 Other measures of horizontal inequality include odds ratios of being in employment, being unemployed, being satisfied with one's job and being in a white-collar job. The first two listed here were excluded because they are unadjusted, but were included in the trend analysis. The latter two were already included in other inequality measures (however, if they are included here, the results are the same).

Figure 22: Heatmap showing results of working life inequality indicators, 2018–2019, EU27 and the UK

	upward_white	manager_native	manager_rural	manager_senior	manager_tertiary	manager_junior	mother_working	manager_female	lOp30_white	job_abs_gini
Netherlands	0.74	1.05	n.a.	1.02	3.33	0.14	0.15	0.34	0.06	0.75
Ireland	0.55	1.05	0.92	1.31	1.97	0.37	0.26	0.54	0.06	0.99
Belgium	0.64	1.00	0.97	1.25	3.65	0.61	0.32	0.48	0.07	0.81
United Kingdom	0.66	1.18	1.19	1.16	1.94	0.29	0.31	0.53	0.06	1.16
Italy	0.51	1.44	0.90	1.34	2.13	0.56	n.a.	0.46	0.07	0.92
Sweden	0.63	2.68	0.82	1.12	1.84	0.30	0.32	0.56	0.07	1.00
Austria	0.56	1.57	0.96	1.51	2.30	0.44	0.58	0.49	0.07	0.93
Germany	0.66	1.25	n.a.	1.09	2.71	0.21	0.32	0.41	0.05	1.15
Denmark	0.65	1.49	0.86	1.33	3.06	0.42	0.22	0.28	0.06	1.12
Greece	0.40	2.34	0.87	1.00	1.66	0.69	n.a.	0.51	0.08	1.13
Latvia	0.42	1.18	0.94	0.87	4.74	0.38	0.59	0.62	0.10	1.00
France	0.59	1.48	0.67	1.15	5.91	0.34	0.35	0.38	0.07	0.92
Estonia	0.42	2.12	0.91	0.79	3.52	0.36	0.24	0.53	0.09	0.97
Malta	0.49	0.81	n.a.	1.01	5.56	0.25	n.a.	0.46	0.04	0.97
Luxembourg	0.46	0.76	1.18	1.82	2.81	0.79	n.a.	0.49	0.09	0.98
Lithuania	0.45	1.03	0.75	1.16	6.33	0.43	0.43	0.52	0.09	1.16
Portugal	0.37	0.69	0.99	1.15	2.55	0.33	0.57	0.41	0.07	1.17
Romania	0.29	n.a.	1.10	1.06	14.35	0.69	0.34	0.40	0.07	1.02
Spain	0.46	1.24	0.65	1.39	3.48	0.21	0.27	0.35	0.08	0.97
Czechia	0.46	0.75	1.20	1.47	17.95	0.42	0.33	0.37	0.07	1.05
Slovenia	0.55	1.13	n.a.	1.79	6.39	0.16	0.27	0.41	0.08	1.06
Finland	0.54	4.82	0.62	1.16	6.36	0.12	0.21	0.35	0.08	0.70
Hungary	0.41	1.17	0.88	1.39	7.93	0.19	0.51	0.63	0.10	1.09
Croatia	0.43	0.92	0.77	1.21	4.65	0.00	0.34	0.33	0.07	1.23
Bulgaria	0.37	0.47	0.65	1.04	5.87	0.32	0.56	0.47	0.09	1.30
Cyprus	0.51	1.80	0.84	3.46	11.24	0.23	0.38	0.25	0.08	1.01
Poland	0.35	1.38	0.87	1.49	37.70	0.38	0.59	0.46	0.08	1.09
Slovakia	0.53	n.a.	n.a.	n.a.	n.a.	n.a.	0.33	n.a.	0.09	1.20

Note: *An explanation of the EU MIMF indicator labels used in this figure is given in the annex at the end of this report.*
Source: *EU MIMF*

Intergenerational mobility in working life is relatively high in the EU: between one-third (in Romania) and three-quarters (in the Netherlands) of Europeans acquire white-collar jobs even though they were born to blue-collar parents (Figure 22). The same is true for the odds of becoming a manager, although this varies by social group and country.

On average, natives have similar odds of becoming managers as non-natives (except in the Scandinavian countries), as do rural populations when compared with urban populations (except in Bulgaria, Finland, France and Spain). At EU level, no differences are seen according to age or education in becoming a manager, although differences can be observed in several

countries. In Poland, those with a tertiary education have 38 times greater odds of becoming managers than people without a higher education. In Croatia, young people have almost no chance of becoming managers. Gender is the strongest driver of being in a managerial position: in 20 of the 27 EU countries, women have half the odds of being managers of men. Additionally, most people in Austria, Bulgaria, Hungary, Latvia, Poland and Portugal believe that children will suffer when women work for pay outside the home (see the indicator 'mother_working' in Figure 22).

Considering all indicators, inequality in working life appears to be the lowest in the Netherlands, Ireland and Belgium, and the highest in Poland, Cyprus and Bulgaria. While inequality also appears high in Slovakia, the data to measure half of the working life indicators in Slovakia are insufficient.

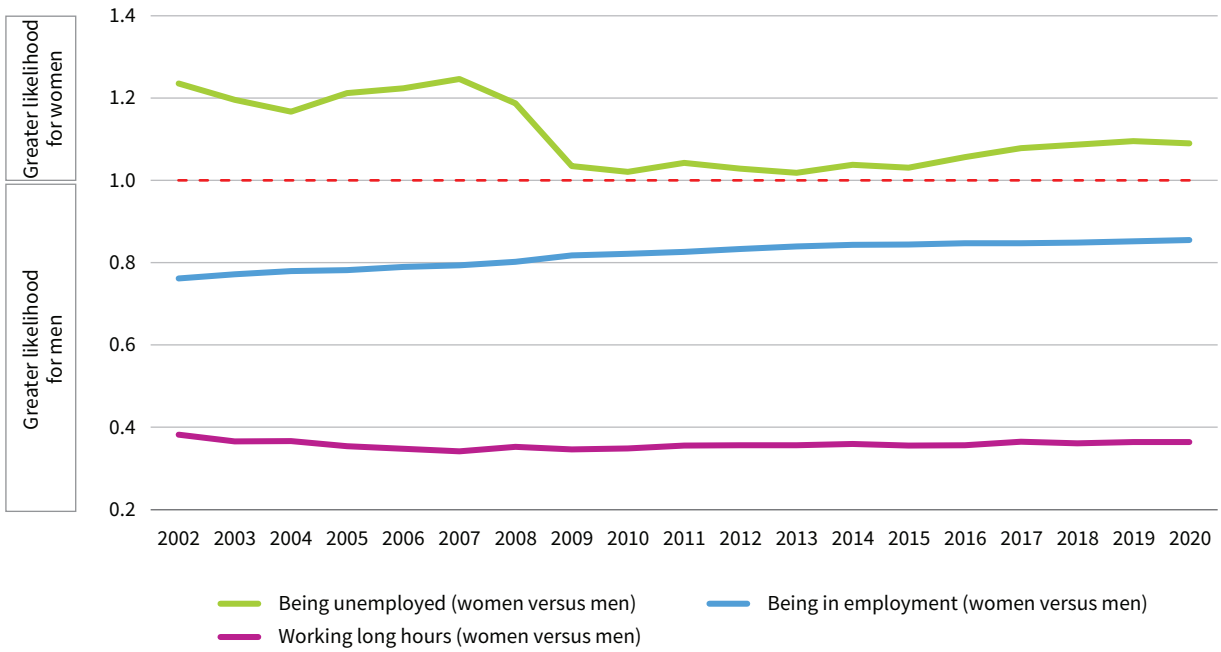
Trends in employment inequality (2010–2020)

Between 2010 and 2020, women and men had similar **unemployment rates**. Figure 23 shows that women were more likely than men to be unemployed before the financial crisis, but during 2009–2015, the unemployment rates for women and men were almost the same. From 2015, the risk of being unemployed increased slightly more for women, but inequality slightly reduced in 2020. Unfortunately, this was driven not by the decrease in women's unemployment rate, but rather by the increase in men's. Gender inequality in long-term unemployment shows a similar pattern.

Gender inequality in **employment rates** has generally decreased over time, with no major changes during the pandemic. Since the early 2000s, women's employment rates have grown faster than men's, helping to reduce inequality in employment rates from 24% in 2002 to 14% in 2020 (Figure 23).

Despite women's increased access to the labour market, men have continued to **work more hours** throughout this period. In 2020, men on average worked 5.4 more weekly hours than women (5.7 hours more in 2019; Eurostat [lfsa_ewhuis]). Among full-time employees, the difference was smaller, but persisted: in 2020, men on average worked 1.9 more hours per week than women (Eurostat [lfsa_ewhuis]). Men are also more likely to work long hours (49+ hours per week). In 2020, men were 2.7 times more likely to work long hours than women; this has remained nearly unchanged since 2002.

Figure 23: Risk ratios of gender inequality in various dimensions of working life (2002–2020), EU27



Notes: *This figure is based on the population aged 20–64. The red dashed line indicates a risk ratio of 1. A risk ratio greater than 1 indicates that women have a greater likelihood than men. A risk ratio less than 1 indicates the opposite. Long hours are defined as working 49 hours or more per week.*
Source: *Eurostat, Unemployment rates by sex, age, country of birth and degree of urbanisation [lfst_r_lfur2gacu]; Employment rates by sex, age, educational attainment level, country of birth and degree of urbanisation [lfst_r_eredcobu]; and Long working hours in main job by sex, age, professional status and occupation [lfsa_qoe_3a2]*

Figures 24 and 25 summarise inequality between other social groups. Inequality in unemployment rates is the greatest according to **education**, particularly since the financial crisis, although in 2020 the unemployment rate of those with a tertiary education increased slightly. Similar findings were found regarding inequality in employment rates: in 2020, people with lower education levels were 35% less likely to be employed than people with a tertiary education, which is the largest gap among the various social groups analysed.

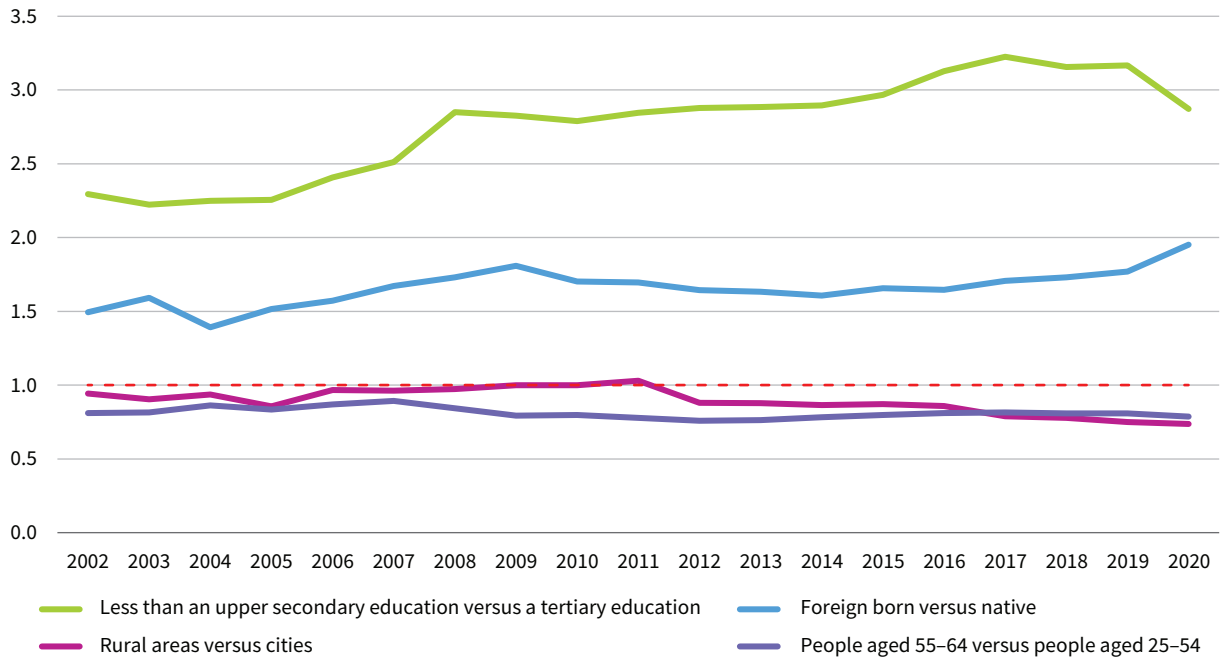
In 2020, people with a **migrant background** experienced larger changes in employment and unemployment rates than natives. While, in 2019, non-natives were 1.8 times more likely to be unemployed than natives, in 2020 the difference increased to 1.95 times. Meanwhile, inequality in employment and unemployment rates between other groups either remained constant during the pandemic or decreased.

The greatest reduction in inequality in employment rates was observed among different **age groups**.

In 2002, people aged 55–64 were 52% less likely to be employed than those aged 25–54, although this had dropped to 25% by 2020. Age differences in unemployment rates have stayed relatively constant, while the inactivity rate of the older cohort dropped from 61% in 2002 to 37% in 2020 (Eurostat [lfsa_ipga]), suggesting that more people are choosing to work at an older age, which is likely influenced by the rising retirement age across the EU. Women are more likely to continue to work longer: while only 27% of women aged 55–64 were employed in 2002, twice as many (53%) were employed in 2020. Older men's employment rates also increased, but at a slower pace: 46% of 55- to 64-year-old men were employed in 2002, compared with 66% in 2020 (Eurostat [lfst_r_eredcobu]).

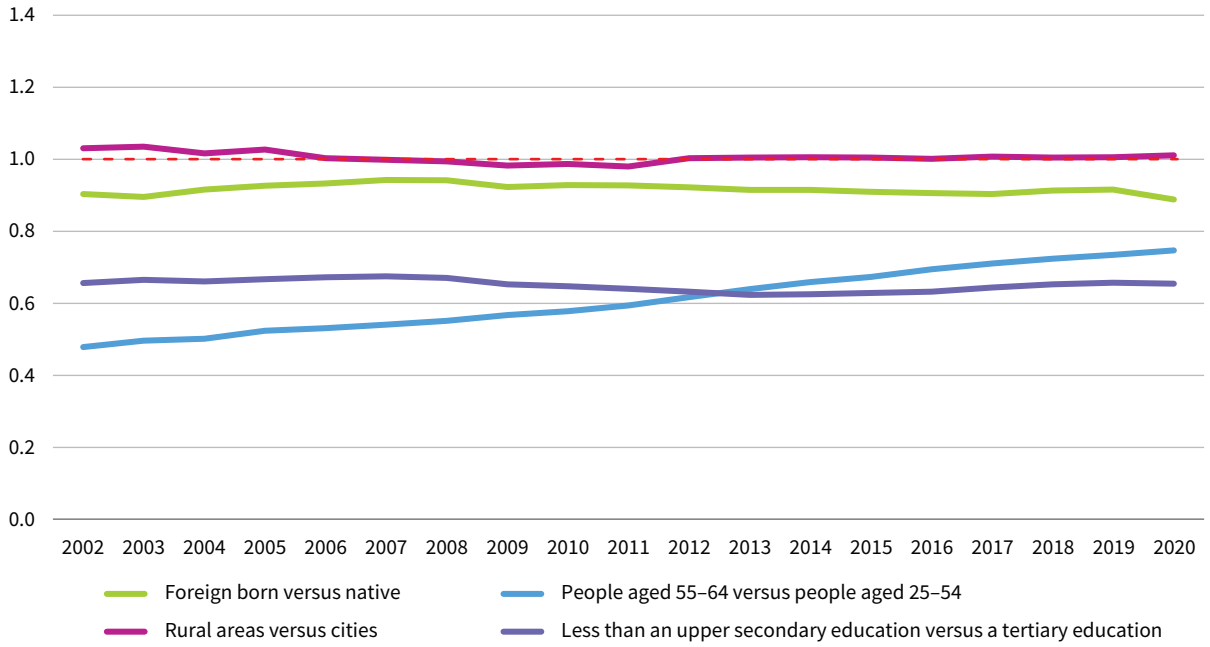
While there have been few **rural–urban** differences in employment rates for the last 20 years, the unemployment rate in rural areas has been lower than in cities since 2012. The pandemic does not seem to have affected this trend.

Figure 24: Risk ratios of unemployment rates among various social groups (2002–2020), EU27



Notes: *This figure is based on the population aged 15–74, except the risk ratio that measures inequality between those aged 55–64 and 25–54. The red dashed line indicates a risk ratio of 1. A risk ratio greater than 1 indicates that the social group listed first in the legend (for example, foreign born in 'Foreign born versus native') has a greater likelihood than that listed second to be unemployed. A risk ratio less than 1 indicates the opposite.*
Source: *Eurostat, Unemployment rates by sex, age and educational attainment level (%) [lfsa_urgaed]; and Unemployment rates by sex, age, country of birth and degree of urbanisation [lfst_r_lfur2gacu]*

Figure 25: Risk ratios of employment rates among various social groups (2002–2020), EU27



Notes: *This figure is based on the population aged 20–64, except the risk ratio that measures inequality between those aged 55–64 and 25–54. The red dashed line indicates a risk ratio of 1. A risk ratio greater than 1 indicates that the social group listed first in the legend (for example, foreign born in 'Foreign born versus native') has a greater likelihood than that listed second to be employed. A risk ratio less than 1 indicates the opposite.*
Source: *Eurostat, Employment rates by sex, age, educational attainment level, country of birth and degree of urbanisation [lfst_r_eredcobu]*

Policies as potential drivers of inequality in employment and working conditions

This section explores the potential impact of government policies on two types of inequality. The first analysis explores the relationship between government spending on education and on family and children and inequality of opportunity in having a white-collar job for people aged 30–49, as this indicator showed high levels of inequality. The second analysis explores policies promoting work–life balance for new mothers in relation to gender inequalities in being in a managerial position (and in employment more generally). This variable was also explored in a panel analysis for 2006–2020.

Inequality of opportunity in having a white-collar job

The inequality of opportunity in having a white-collar job varies significantly across the EU Member States (see 'Literature review' in this chapter). A simple correlation suggests that government policies on education and on family and children are not related to this outcome, with the coefficient lying close to zero for both types of expenditure.

When controlling for GNI per capita with inequality of opportunity at country level as a dependent variable (Table 12), the coefficients for education and family are both insignificant. Meanwhile, GNI per capita has a significant negative effect, suggesting that there are greater opportunities to work in a white-collar job in wealthier countries than in poorer countries, regardless

Table 12: OLS regression model exploring the relationship between government expenditure and inequality in opportunity in having a white-collar job

	Ex ante inequality of opportunity in having a white-collar job (ages 30–49), 2011
Government expenditure on family and children (2011, % of GDP)	0.003
Government expenditure on education (2011, % of GDP)	0.001
Log (GNI per capita in USD, 2011)	–0.013*

Notes: * *p<0.05. For more details, see Table 22 in Annex III.*
Source: *Authors, based on EU MIMF and Eurostat data*

Table 13: OLS regression model exploring the relationship between gender inequality in occupations, childcare and paid leave at country level

	Odds ratio of women being in a managerial job over men (adjusted), 2018
Children under three years of age in formal childcare for a minimum of one hour a week (2018, %)	–0.001
Total paid maternity leave available to mothers (2018)	0.001
Log (GNI per capita in USD, 2018)	0.000

Note: *For more details, see Table 22 in Annex III.*
Source: *Authors, based on EU MIMF, Eurostat and World Bank data*

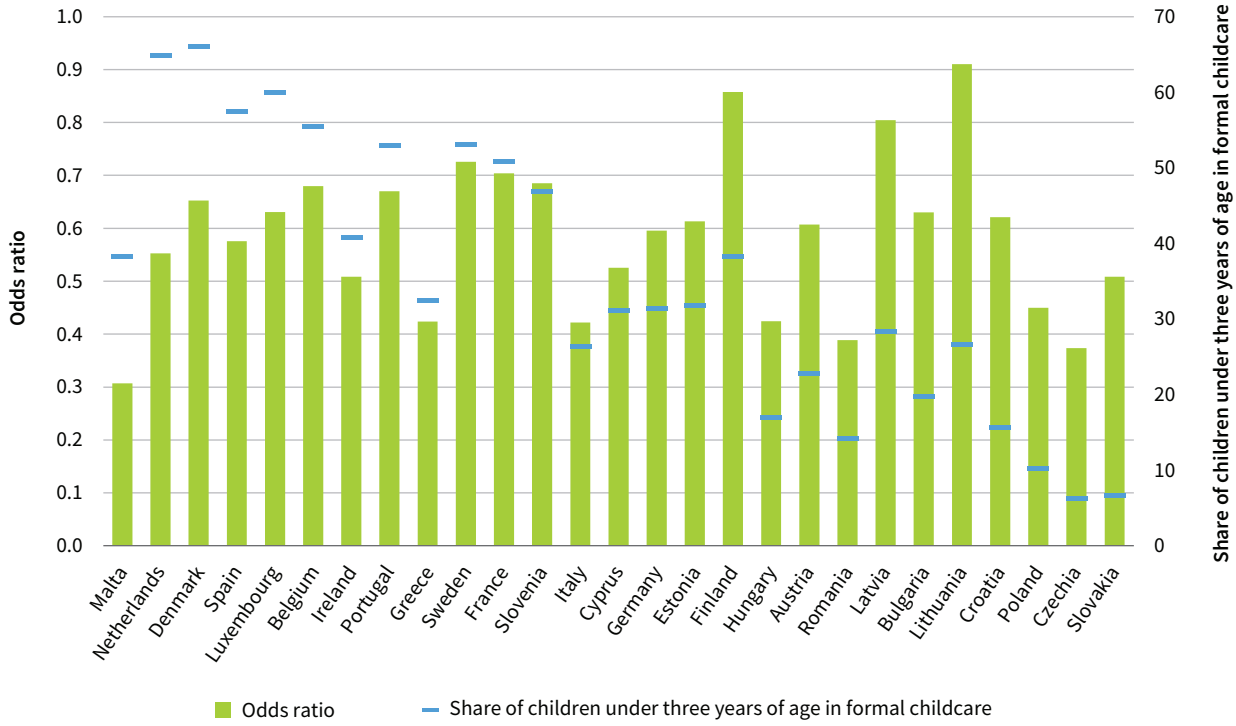
of background. As richer countries tend to employ more people in white-collar jobs, the barriers to acquire such jobs are probably lower.

Gender inequality in becoming a manager and being employed

Given the prevalence of gender inequalities in working life (Chapter 4), regression analyses were used to explore whether the availability of childcare and of paid parental leave to new mothers helps reduce these inequalities. The results show no significant relationship between the proportion of children under three years of age in childcare and inequality between women and men in being a manager. Countries with more generous paid leave policies also do not seem to have lower levels of gender inequality when it comes to management positions (Table 13).

A possible reason for these non-significant results could be that structural and cultural inequalities play a role in preventing career advancement for women. A second analysis exploring whether the availability of formal childcare and paid leave policies makes it easier for women to remain in the workforce found a positive and significant correlation for the availability of formal childcare for children below three years of age (r=0.39, when the variable is lagged by three years). Figure 26 shows that this correlation is particularly strong in Malta, the Netherlands and Denmark. However, this relationship is weaker in eastern Member States, which may be related to the longer paid leave available in these countries.

Figure 26: Odds ratio of women being in employment versus men (2019) against the share of children under three years of age in formal childcare (2019, %), EU27



Note: *Bars and dashes are ordered from the largest gap (in terms of ratio; left) to the smallest (right).*
Source: *EU MIMF and Eurostat, Children in formal childcare or education by age group and duration – % over the population of each age group – EU-SILC survey [ilc_caindformal]*

Table 14: OLS regression model exploring the relationship between gender inequality in being employed, childcare and paid leave at country level

	Model 3: odds ratio of women being in employment over men (adjusted), 2019
Children under three years of age in formal childcare for a minimum of one hour a week (2019, %)	0.005*
Total paid maternity leave available to mothers (2019)	0.001
Log (GNI per capita in USD, 2019)	–0.016

Note: * *p<0.1. For more details, see Table 22 in Annex III.*
Source: *Authors, based on EU MIMF, Eurostat and World Bank data*

Regression analyses confirmed that the availability of formal childcare correlates with lower inequality between women and men regarding their employment rates. The results are consistent using both cross-sectional models (Table 14) and TSCS specifications when the explanatory variables are lagged by three years (Table 23 in Annex III).[25] After controlling for GNI per capita, a one percentage point increase in the share of children under three years of age in formal childcare increases the odds ratio of new mothers being in employment by 0.005 points. This suggests that childcare arrangements help women maintain their jobs after having children or to re-enter the labour market after leaving it, even if such support is insufficient to help reach management positions.[26]

The same variables were tested in a random effects within–between model to capture both the effect between countries and the effect within the countries over time (Table 15). The results support the finding that childcare has a positive and significant effect both over time and across countries. Total paid maternity leave remains non-significant.[27]

Table 15: Random effects within–between model showing the relationship between gender inequality in employment, over time and between countries

	Odds ratio of women being in employment over men (ages 20–64) (lagged dependent variable + one-year lag)
Mean – % of children under three years of age in formal childcare for a minimum of one hour a week	0.006*
Distance from mean – % children under three years of age in formal childcare for a minimum of one hour	0.003*
Mean – total paid maternity leave available to mothers	0.001
Distance from mean – total paid maternity leave available to mothers	0.002
Mean – log (GNI per capita in USD)	–0.000
Distance from mean – Log (GNI per capita in USD)	0.000

Notes: * *p<0.05. See Bell and Jones (2015) for more information on the random effects within–between model. For more details, see model 5 in Table 23, Annex III.*
Source: *Authors, based on EU MIMF, Eurostat and World Bank data*

25 This result is not significant when the variable is lagged by one year, potentially because countries that allow mothers to have more paid leave are also less likely to have many children under three years of age in formal childcare, as mothers take care of them at this stage. As paid maternity leave rarely goes beyond two years, it becomes necessary to put children in formal childcare by their third year of age. When variables are lagged by three years, a positive effect is seen, as many children move into formal childcare.

26 However, the relationship could work in the opposite direction: the more women enter the labour market (for reasons other than childcare arrangements), the more children are placed into formal childcare.

27 The findings hold if the variables are lagged by three years. If a lagged dependent variable is added to the model, childcare remains significant within countries, but loses its significance between countries.

Inequality in employment and working conditions during the pandemic

One of the most severe consequences of the pandemic was the shock it created in the labour market, with millions of people being laid off or having to close their businesses, and an overnight change in culture that led to the widespread adoption of remote working. However, not all working people were equally affected by the effects of the pandemic. According to the literature, the most vulnerable workers included the following: young people; lower earning, blue-collar and less-educated workers; those working in hospitality, entertainment and non-teleworkable jobs; workers in temporary or precarious employment; and women, who were further burdened by the increased workload relating to homemaking and childcare.

Inequality in employment during the pandemic was investigated in terms of both the number of working hours, to identify pre-pandemic inequalities, and changes in working hours compared with the previous year, to measure how severe the effect of the pandemic was for different groups of workers. The analysis used both longitudinal and cross-sectional data from EU-SILC. Each respondent's working hours in 2019 were compared with those in 2020 and then this change was compared with the change between 2018 and 2019. This multi-year comparison allowed for the identification of the effects of the pandemic on the number of working hours, disentangling these from more general trends.[28]

This analysis aims to identify the groups of people who were most affected by the pandemic and to explore how the working lives of parents, especially mothers, were affected.

Groups most affected by the pandemic in their working lives

The literature review identified three groups of people who were most vulnerable to changes in the labour market: less-educated workers, temporary workers and women.

Regression results show that, when controlling for demographic characteristics and the number of hours worked in the previous year, people with lower education levels worked fewer hours than those with a tertiary education in both 2019 and 2020 (Table 16). However, this effect was much more pronounced in 2020 than in 2019: while people with low and medium education levels worked, respectively, one-quarter and

Table 16: Multilevel linear regression model on the number of hours worked in 2019 and 2020

	Hours worked in 2020	Hours worked in 2019
Government spending on family and children in the previous year (% of GDP)	–0.118	0.029
Share of the population under working age in the previous year (% of the total population)	–0.099	–0.203***
Weekly hours worked in the previous year	0.672***	0.661***
Temporary job (reference: permanent)	–0.379***	–0.127
Female (reference: male)	–0.874***	–0.906***
Age group (reference: 45–54)		
18–24	0.047	0.311*
25–34	0.134*	0.149*
35–44	–0.026	0.025
55–64	–0.306***	–0.327***
65–74	–1.703***	–1.419***
75+	–2.928***	–4.824***
Educational attainment (reference: high)		
Low	–0.370***	–0.237***
Medium	–0.214***	–0.142**
Equivalent household size	0.006	0.019
Degree of urbanisation (reference: densely populated area)		
Intermediate area	0.136**	–0.055
Thinly populated area	0.115**	–0.043

Note: * *p<0.05, ** p<0.01, *** p<0.001.*
Source: *EU-SILC (longitudinal)*

28 All analyses employ multilevel regression models. See Annex III for detailed results and descriptive statistics relating to government expenditures on family and children and to the shares of the population under working age in 2019 and in 2020.

Table 17: Multilevel linear regression model on the change in the number of hours worked between 2018 and 2019 and between 2019 and 2020

	Change in the number of hours worked between 2019 and 2020	Change in the number of hours worked between 2018 and 2019
Government spending on family and children in the previous year (% of GDP)	–0.177**	–0.054
Share of the population under working age in the previous year (% of the total population)	0.076**	–0.010
Temporary job (reference: permanent)	0.130	0.292***
Female (reference: male)	0.185***	0.244***
Age group (reference: 45–54)		
18–24	0.495***	0.915***
25–34	0.159**	0.180*
35–44	0.020	0.043
55–64	–0.104	–0.112
65–74	–0.667***	–0.363*
75+	0.606	–1.269*
Educational attainment (reference: high)		
Low	–0.118	0.102
Medium	–0.105*	–0.028
Equivalent household size	0.074*	0.075
Degree of urbanisation (reference: densely populated area)		
Intermediate area	0.157**	–0.012
Thinly populated area	0.121*	–0.036

Note: ** p<0.05, ** p<0.01, *** p<0.001.*
Source: *EU-SILC (longitudinal)*

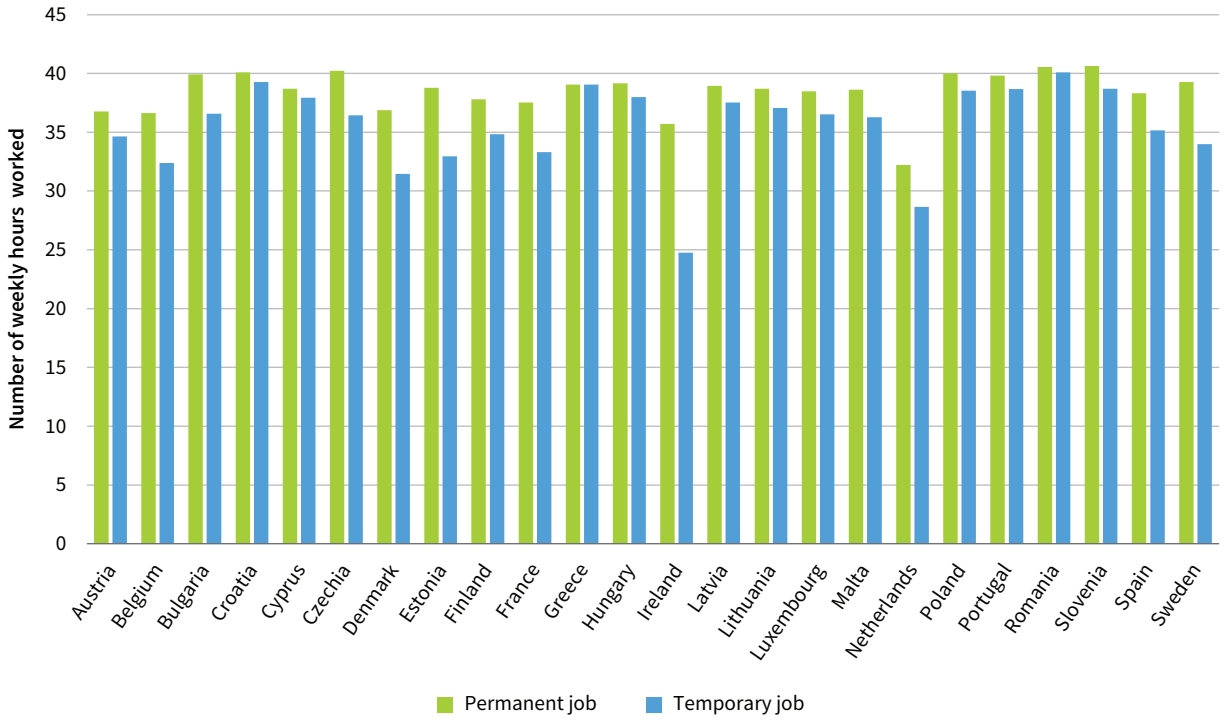
one-fifth of an hour less than tertiary-educated people in 2019, the difference was 1.5 times greater for both categories in 2020. A potential reason for this is that those with low and medium levels of education are also most likely to work in non-teleworkable jobs and sectors.

In terms of the change in the number of working hours, the effect was particularly pronounced for people with medium education levels. The difference in the change in working hours between 2019 and 2020 was also almost four times greater than the difference between 2018 to 2019, when compared with highly educated people (Table 17). These results suggest not only that the pre-existing disparities in education translated into fewer hours worked during the pandemic, but also that the pandemic disproportionately affected workers with medium levels of education in terms of their ability to work, thus exacerbating inequality in employment.

A potential reason why people with a medium level of education were more affected by the pandemic than people with a low education level is that the latter group are more likely to be retired and out of the workforce. Among the 65+ years cohort, 44% have a low education level, 18% have a high education level and 38% have a medium education level (these percentages are 55%, 15% and 30%, respectively, for people aged 75+). Likewise, among people with low education levels, almost 50% are aged 65+, while only 27.7% of people with a medium education level belong to these older cohorts.

The analysis found no significant differences in the hours worked between temporary and permanent job holders in 2019. However, in 2020, those in temporary jobs worked significantly fewer hours than those in permanent jobs, supporting findings that the pandemic increased inequalities between those in more stable and less stable employment (Figure 27). Temporary workers were also more likely to see an increase in their working hours between 2018 and 2019 than permanent employees, but this difference disappeared in 2020, probably because fewer temporary jobs were available.

Figure 27: Average number of weekly hours worked in 2020 by country and contract type, selected EU Member States



Note: *No data were available for Germany, Italy and Slovakia at the time of the analysis.*
Source: *EU-SILC microdata*

As suggested in the previous section, 'Policies as potential drivers of inequality in employment and working conditions', men always have higher odds of being in employment than women. The literature review is also unequivocal about the gender imbalances in general but notes that, during the pandemic, the effects were mixed. Regression analyses using EU-SILC data suggest that women worked fewer hours than men in 2020, but that the gender difference in the number of hours worked was smaller than in 2019 (Table 17). This is because the average number of hours worked in 2020 decreased for men. Regression results show that, while women's average weekly working hours stayed similar between 2019 and 2020, men's decreased by 21 minutes on average. The difference between the working hours of men and women decreased from 4.41 in 2019 to 4.04 in 2020.

Regression results also highlighted the negative effects of the pandemic on the youngest workers, regarding their employment opportunities, in line with findings from previous Eurofound reports (Eurofound, 2021a) and others. Workers in the youngest age cohort (18–24) were among those that worked the most hours in 2019, after controlling for the number of hours worked in the previous year and other demographic characteristics. They also experienced the largest increase in hours worked between 2018 and 2019. However, these effects were significantly reduced during the pandemic.

For young people, the effect on the number of working hours in 2020 was almost one-tenth that in 2019, while the effect did not substantially change in any other working age group (Table 17). Likewise, the effect on the change in the number of working hours halved for the youngest cohort between 2018 and 2019 and between 2019 and 2020, suggesting that they were among those most hard hit by the pandemic. One explanation is that younger workers are more likely to hold temporary jobs (48% of 18- to 24-year-olds hold temporary jobs, compared with 16% of older working age groups), that is, jobs that the analysis showed to be more susceptible to the effects of the pandemic than permanent jobs. Young people also have fewer skills and work experience than older workers, meaning that they are less likely to be hired when fewer temporary and low-skilled jobs are available. Losing their jobs or work experience during the pandemic may have important long-term implications for inequality, such as skills losses, long-term unemployment and difficulties in overcoming barriers to social mobility.

As seen also in the section 'Health inequality during the pandemic' in Chapter 3, the pandemic appears to have affected workers living in densely populated areas more than others. While city dwellers tended to work more hours in 2019 and experienced an increase in working hours between 2018 and 2019, this trend completely reversed in 2020, when it was people living in rural and

intermediate areas who tended to work longer. One reason for this may be the reduced need for social distancing rules outside densely populated areas. Another explanation is that jobs are concentrated in cities, so the reduction in the number of available jobs was strongest there. This may also explain some of the earlier findings in terms of health inequality (see 'Health inequality during the pandemic' in Chapter 3): people living in rural areas not only benefit from a healthier lifestyle (less pollution, less overcrowding, a slower pace and more nature), but they were also less affected by the loss of available jobs. Stress-induced situations due to labour market shifts hit city-dwelling workers more strongly, highlighting the interrelationships between income, health and employment inequalities.

Box 3 presents some examples of national policies aimed at enhancing employment opportunities among certain groups.

Working lives of parents during the pandemic

As the literature suggests, working parents were among those most affected by the pandemic in terms of working life. EU-SILC cross-sectional data were used to analyse how parents coped with the consequences of the pandemic.[29]

The literature shows that the increased household workload during the pandemic affected more women, which may have a long-term impact on their careers. Regression analyses looking at how women in different types of households were affected by the pandemic in terms of paid working hours suggest that it was single mothers who lost the most. In 2019, women living in households with two adults and two or more dependant children worked fewer hours than women in households with only one dependant child, presumably because of increased childcare duties. Meanwhile, single mothers

Box 3: National policy examples targeting employment inequality

Having care responsibilities and a lack of care services are barriers to employment. About 5.5% of the EU's population between 18 and 64 years of age is not seeking (full-time) employment because of care responsibilities and, for a fifth of them, the reason they are not seeking (full-time) employment is a lack of affordable care services (Eurofound, 2018, p. 16). Therefore, four million people in the EU would consider full-time employment if affordable services were made available to them. Nearly all of these people are women.

In North Rhine-Westphalia in **Germany**, family day care centres integrate education and care services for children with existing family support services. These centres support and encourage children and families to develop their capacities, and provide a wide range of services such as family education, family counselling and childcare, as well as integrative services for families with a migrant background. This helps to ensure a better work–life balance and supports families individually and in a needs-based way. These centres work primarily with families at a high risk of exclusion and poverty. Their work has been the focus of an extensive evaluation (Stöbe-Blossey et al, 2019).

A high number of early childhood education and care (ECEC) staff work part time, and the share of staff looking for another job is higher in this sector than in others according to the EU-LFS. One of the reasons for this is the low wages in the sector, with salaries usually lower than in schools. **Estonia** has addressed this salary gap by increasing the salary of core practitioners in ECEC to 90% of that of primary school teachers (European Commission, 2021b).

There is also a strong gender divide in the workforce in many services for children, with the recruitment and retention of men being a particular challenge. Less than 8% of ECEC workers and teachers' aides are men, who are overrepresented in supervisory positions. This gender gap has implications for the sustainability of the workforce, as it reduces the recruitment pool. In **Denmark**, this gender gap has been addressed by providing informal employment opportunities (for example, working as an assistant) in the sector for young men in their gap year in education (European Commission, 2020).

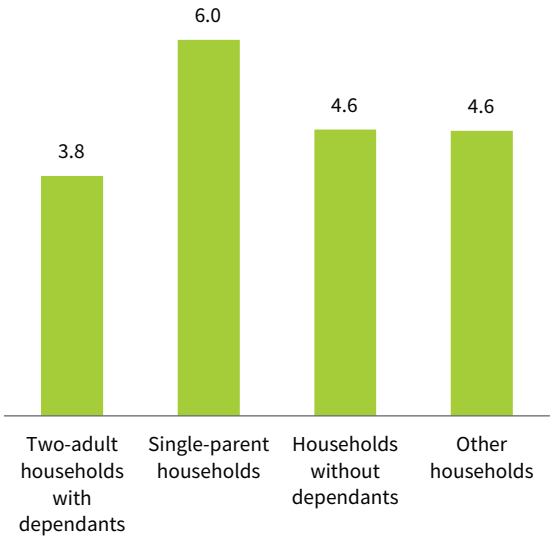
29 The disadvantage of using cross-sectional data is that no comparisons of the same respondents can be made across years. However, the large number of observations (36,000–47,000 per country) allows for some generalisation.

worked more hours than women in any two-adult households (Eurofound, 2019). In 2020, women in two-adult households with two or more dependant children still worked fewer hours than those with only one child, and this difference became statistically insignificant for single mothers.

Single mothers often need to work more than women in two-adult households, sometimes taking on multiple jobs (Figure 28). They are also more likely to have temporary jobs and to work longer hours in additional jobs. In 2019, 21% of single mothers had a temporary job, compared with an average of 19% for women in two-adult households. The average working hours in second or third jobs was 10.8 per week for single mothers and 9.5 per week for women in two-adult households. As the pandemic wiped out less secure jobs, many single mothers could not work more hours, even if they wanted to.[30] The necessity to take care of children due to closures of childcare services, social distancing and the sparser availability of temporary jobs meant that the pandemic contributed to exacerbating the already difficult position of working single mothers.

In conclusion, as the analysis of trends in 'Trends in employment inequality (2010–2020)' in this chapter suggested, the pandemic may have laid the basis for greater increases in inequality for those groups that are most susceptible to changes in the labour market, that is, young, blue-collar and non-tertiary-educated workers, as well as single mothers.

Figure 28: Proportion of women who held second or third jobs by household type, 2020 (%)



Source: *EU-SILC microdata*

30 In 2020, the average number of hours worked in non-primary temporary jobs for single mothers was 10.2 per week, while it was 11.2 per week in 2019.

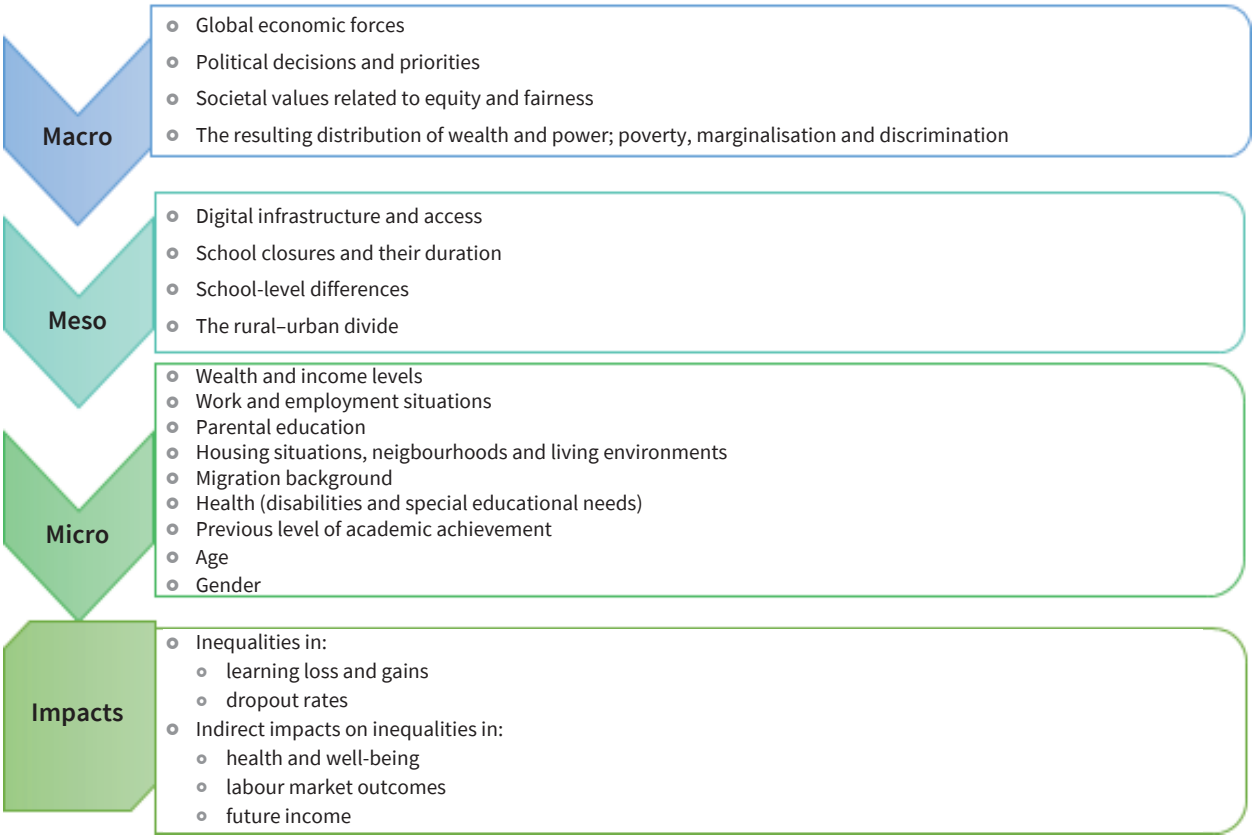
5 Inequality in education and learning

This chapter outlines findings regarding inequality in education and learning, starting with a literature review of drivers of inequality in education during the pandemic. This is followed by the presentation of the levels of education inequality before the pandemic, as well as how these changed between 2010 and 2020. The fourth section focuses on policies as potential drivers of educational inequality, and the final section focuses on the drivers of education inequality during the pandemic.

Literature review

During the initial outbreak of COVID-19, governments across the globe closed schools and universities, and these shifted to remote learning. School closures were among the key drivers of widening inequalities during the pandemic, as a result of increased learning loss or risks of dropping out for some groups more than others. The factors identified in the literature as drivers of education inequality are summarised in Figure 29. Most studies published in early 2022 focused on digital inequality and on students' socioeconomic background and characteristics.

Figure 29: Macro-, meso- and micro-level factors in inequality in education and learning during the COVID-19 pandemic



Source: *Authors, based on the literature review*

Box 4: Measuring learning loss

Learning loss was originally calculated to estimate how much knowledge students use over summer breaks using differences in standardised test scores. Cooper et al (1996) estimated that a summer break results in one month of learning loss, with students from lower socioeconomic backgrounds tending to have greater losses. Reading skills typically increase for students with higher socioeconomic status and decline for those with lower status. These general tendencies were confirmed by more recent studies (for example, Kim and Quinn, 2013; Alexander et al, 2016).

Learning loss calculations have been applied to assess the impact of school closures in the context of the COVID-19 pandemic. While remote learning cannot be equated with the total absence of teaching, it resulted in significant gaps: in Germany, over half of school students had online classes less than once a week (Hanushek and Woessmann, 2020).

Learning losses and gains are most often measured as standard deviations of test scores. Based on findings from various countries, a link between learning losses/gains and income was established (Hanushek and Woessmann, 2008; Psacharopoulos and Patrinos, 2018; Maldonado and De Witte, 2021). Generally, one additional year of schooling results in a learning gain equal to approximately one-third of a standard deviation of the scores in the test populations, which then leads to an average 7.5% to 10% increase in life earnings (Hanushek and Woessmann, 2020).

Source: *Authors, based on Hanushek and Woessmann (2020)*

Learning loss among the most vulnerable learners can result in worse outcomes for them in the future (Box 4). Azevedo et al (2020) estimated that students who were in school at the time of the outbreak (referred to as 'generation COVID') may lose USD 10 trillion in labour earnings over their working lives, which amounts to one-tenth of global GDP.

Research from Belgium and the Netherlands has estimated that, in terms of learning loss, students lost 0.08 to 0.19 standard deviations in some subjects during school closures. This is most likely a low estimate across the EU, as these countries had relatively short periods of school closures and high levels of internet connectivity. In regions where schools experienced problems with remote teaching, higher learning losses are likely, and these are also likely to be unequally distributed across students based on their socioeconomic status. According to a report by the European Commission (2022), learning loss measured in various European countries and in different subjects ranged from 0.03 to almost 0.3 standard deviations; however, some learning recovery was measured during the second year of the pandemic.

Another potential, but not yet measured, outcome of the pandemic is increased dropout rates, as found in previous pandemics (Meyers and Thomasson, 2017). During COVID-19, it was estimated that around 10 million school students could dropout globally due to the pandemic-induced income shock (Azevedo et al, 2020). School closures exerted additional pressure through unequal access to digital resources and decreased motivation to continue, although the lack of alternatives during the period of economic closures may have mitigated some of this impact.

Post-secondary level students, especially those with a lower socioeconomic background, can be more prone to discontinuation of education, although most of the literature has focused on primary and secondary education. A Cedefop report (Cedefop, 2020) on vocational education and training in seven European countries demonstrated that students from disadvantaged backgrounds had lower access to distance learning, increasing their risk of dropping out.

School closures also affected the health and well-being of the most vulnerable groups. Children with disadvantaged backgrounds were particularly vulnerable during the pandemic, as they rely on school as a source of meals (Darmody et al, 2021), affecting both their health and their educational achievement. Previous research has demonstrated that healthy nutrition at school improves learning outcomes (Belot and James, 2011).

Digital divides

Through the pandemic, as formal learning moved online, pre-existing digital divides had the potential to reinforce inequality in access to education, the learning process and the educational outcomes of different groups within societies.

Schools in several EU countries, including Estonia, Latvia and Romania, had difficulties shifting to online teaching. In Romania, 32% of children did not have any access to online learning. Similar problems were faced in Slovenia and Spain (Eurochild, 2020). Difficulties with transferring to remote learning were also reported in Germany, where over 50% of students had online classes less than once a week during school closures, and only 6% of students had classes every day (Hanushek and Woessmann, 2020).

Katz et al (2021) highlighted three interlinked levels of digital inequality: access to broadband and electronic devices, digital skills and usage, and outcomes of using digital access and digital skills.

Access to broadband and electronic devices is often restricted for learners from a disadvantaged background. In the US, around 30% of public-school students lacked adequate access either to the internet or to devices prior to the COVID-19 pandemic (Chandra et al, 2020). In the UK, large digital inequalities existed between students depending on the school. In the most deprived schools, 32% of teachers reported that more than 20% of their students did not have proper access to devices, while only 5% of teachers in the most advantaged schools and 3% in private schools reported the same problem (Hanushek and Woessmann, 2020).

Blaskó et al (2021) demonstrated large inequalities in digital access between 22 EU countries. While Scandinavian countries, Austria, Ireland and Lithuania had relatively few students without access to resources that enabled distance learning,[31] in Bulgaria, Croatia, Cyprus, Czechia, France, Germany and Italy these issues were more common.

Digital skills are strongly related to socioeconomic background. Results from seven countries (Chile, Denmark, Finland, France, Germany, Italy and South Korea) showed that pre-COVID-19 information and communications technology (ICT) skills were higher for children from advantaged backgrounds, natives and girls. The authors also found high variation in ICT infrastructure between schools within countries (van de Werfhorst et al, 2020).

A US study estimated that engagement with digital resources doubled during the pandemic but was not equal among social groups. Regions with higher income, better internet access and fewer rural schools saw substantially larger increases in engagement, measured by search intensity. This is expected to widen achievement gaps along these dimensions, given schools' and parents' differing engagement with online resources to compensate for lost school-based learning time (Bacher-Hicks et al, 2021).

In terms of **outcomes of digital access and skills**, access to digital devices was found to be an important driver of grade point average in the US pre-pandemic (Reisdorf et al, 2020) and this relationship is expected to have strengthened with the move to online learning. A recent US study on tertiary-level students demonstrated that remote learning proficiency was significantly lower for students with limited digital access, as well as for those who reported economic hardship during the pandemic (Katz et al, 2021).

As demonstrated by these findings, digital inequalities intersect significantly with socioeconomic inequalities.

Socioeconomic background and learning inequality

As schools moved to remote teaching, the responsibility for the organisation of the learning process shifted to parents. Home-schooling experiences varied for children, depending on socioeconomic factors such as parental income, education and employment status.

In Canada, using earlier methods to calculate learning losses during summer breaks, researchers predicted that 15-year-old students with lower socioeconomic status might experience an eight-point decrease in Programme for International Student Assessment (PISA) reading scores equal to two months of studying, while children from better-off families would see a 12.8-point gain, equal to 3.2 months. This could increase the score gap between students from the lowest and highest quintiles by 30% (Haeck and Lefebvre, 2020). This method was devised for the complete absence of teaching, while, in the pandemic, school closures were accompanied by remote teaching. However, due to digital inequalities and lack of parental help, not all students received online education.

In the EU, inequalities in learning losses were also predicted within countries. A pre-pandemic rural–urban divide in several eastern Member States was expected to worsen during the crisis. In countries with large pre-COVID-19 socioeconomic inequalities in education (Bulgaria, Hungary, Lithuania and Slovakia), Blaskó et al (2021) predicted that between-school variations would account for 30% to 40% of educational inequalities related to parental education.

Parental income is one of the most important factors determining inequality in knowledge and skills. Higher income is associated with better access to educational resources ranging from books and laptops to private schools and extracurricular help from tutors. During the COVID-19 shift to homeschooling, material living conditions became even more critical. First, parental income is closely related to digital inequality, influencing access to resources that support remote learning, such as computers (Bol, 2020). Income also affects housing conditions. Overcrowded housing negatively affects overall academic performance (Goux and Maurin, 2005) and is a reality for many EU citizens: in Bulgaria, Latvia and Romania, more than 40% of the population live in overcrowded dwellings (Dimopoulos et al, 2021).

31 This was measured as 'access to internet, access to a separate room to study, availability of reading material, being regularly hungry when arriving to school as well as a proxy of parental support'.

A poor learning environment was shown to be a significant factor in time spent on homeschooling by students in Germany (Dietrich et al, 2021). The amount of time students spend on learning affects their future opportunities. In the UK, children from more advantaged families spend 30% more time learning at home than children from a less advantaged background. Andrew et al (2020) estimated that 34 days of school closings will create a gap in learning time between higher- and lower income students equivalent to seven full school days. This might be detrimental in the long run, given that even one extra hour a week significantly affects learning outcomes.

In tertiary education, US students from the lowest income background lost 52% of their normal teaching hours as a result of lockdown, while those from the highest income groups lost 40% (Major et al, 2020).

In the US, links have also been established between race, wealth and remote learning time (Francis and Weller, 2021). During school closures, black and Hispanic students spent more time studying, on average, than white students, but they were less likely to have access to digital devices, which decreased their remote learning time. This is expected to widen the existing racial gap in educational outcomes in the US.

The level of parental education significantly influences the educational experiences of children. Children of parents with a low education level were found to already have a disadvantage in cognitive and socioemotional skills at pre-school level (Doyle et al, 2009). In the pandemic, it is expected that pre-existing inequalities linked to parental education level have increased (Anders et al, 2020). Parental education also correlates with income (see, for example, Coady and Dizioli, 2018).

The amount of time parents spend with their children also determines learning outcomes. During school closures, parental time spent helping children with schoolwork varied according to parents' education. A study from Northern Ireland found that, during lockdowns, parents with a higher education were more likely to teach their children than those with lower education levels (Walsh et al, 2020). In the UK, 80% of parents with a higher education spent at least four days a week homeschooling, compared with 60% of parents with a lower education level (Anders et al, 2020). These differences are related to the varying levels of confidence in assisting with schoolwork. In the Netherlands, 70% of parents with a tertiary education felt capable of helping their children in secondary school, while only 40% of parents with lower education levels had the same confidence (Bol, 2020). In Ireland, while no significant differences were found in homeschooling time between parents with low and high levels of education, children of less-educated parents were less likely to receive resources from teachers and to use educational apps than those of parents with a higher education (Doyle, 2020).

The time students spent on learning also differed depending on parental education. Dietrich et al (2021) showed that students in Germany who had parents with low levels of education (defined as a father without a vocational degree) spent around 72% less time on homeschooling than those with higher educated parents.

Parental employment also played a role during the pandemic. As seen in the previous chapter, flexibility of employment and the possibility of working from home intersected with inequalities in income and education. Although quantitative evidence on the effect of parental employment status on learning outcomes is lacking, a qualitative study from Canada showed that full-time working parents and those with strictly structured online employment had fewer opportunities to assist their children (Raby et al, 2021). This can put the children of parents with non-flexible employment arrangements at a disadvantage.

Evidence is unequivocal that the above socioeconomic disparities had significant effects on learning outcomes. In the Netherlands (where administrative data on test scores of primary school students and their socioeconomic background were available), Engzell et al (2021) showed that 7- to 11-year-old students experienced a 3 percentage point or 0.08 standard deviation learning loss during the eight-week school closure. For children of less-educated parents, learning losses were up to 60% larger. Circumstances in the Netherlands can be treated as the best-case scenario, given that school closures were relatively short in this country and it has the highest rates of broadband penetration in Europe.

Another Dutch study (Haelermans et al, 2021a) found that, following school closures, learning growth was much lower for students with a low socioeconomic background. The same authors conducted a study covering a full year of educational disruption (Haelermans et al, 2021b) and found that, generally, learning growth was lower than in the year before the pandemic and ranged from 0.06 standard deviations in spelling to 0.12 in mathematics and 0.17 in reading. In Belgium, Maldonado and De Witte (2021) found a decrease of 0.17 standard deviations for mathematics and 0.19 standard deviations for Dutch (reading, writing and language) among sixth-grade students. Learning loss was larger for schools with larger shares of students with low parental education (based on the mother's education level) and students who receive financial support.

Two Danish studies focused on socioeconomic differences in changes in students' reading behaviour. Jæger and Blaabæk (2020) used digital library data to show that students whose parents have a lower level of income or education experienced an overall decrease in library takeout during the pandemic. Reimer et al (2021) investigated data on students' daily reading time from a

digital reading application and found a short-term increase in inequality in lower secondary school students' reading behaviour, depending on their socioeconomic background: inequality increased only during the first lockdown, when teaching was entirely online, and normalised during the next lockdown.

Other individual-level factors

In terms of **gender**, prior to the COVID-19 outbreak, girls had higher levels of ICT skills, which became especially relevant during the pandemic (van de Werfhorst et al, 2020). During the pandemic, a Dutch study found that parents of schoolchildren felt less capable of helping their sons than their daughters (Bol, 2020). However, in terms of educational outcomes, most empirical studies did not find any significant gender differences. Only one Dutch study found small differences between learning losses of boys and girls in reading and mathematics (Haelermans et al, 2021a).

Younger students are generally more prone to learning losses in summer breaks and this was also true during the COVID-19-related school closures. Tomasik et al (2021) found that, in Switzerland, learning gains were much smaller for primary school students, and the effect of distance teaching was not significant for secondary school students, who were able to compensate for learning loss on their own.

School closures affected children with a **migration background** in several ways. First, they affected their integration into societies of their host countries. A qualitative study from Poland showed that migrant children experienced difficulties in adapting to remote learning and to their life in a new country due to social isolation (Popyk, 2021). Second, distance learning increased social inequalities between migrant and non-migrant students, who faced language constraints and barriers arising from underdeveloped digital literacy and inadequate technical equipment, as found in Slovenia (Gornik et al, 2020). Finally, interviews with schoolchildren in Canada revealed issues with parental help due to their limited proficiency in the language (Raby et al, 2021).

While native children had better ICT skills (van de Werfhorst et al, 2020), Kuhfeld et al (2020) found only minor differences in learning loss between learners from different backgrounds. In the Netherlands, the association between migration background and learning loss disappeared when controlling for parental education level, as children with a non-Western migration background were more likely to have lower-educated parents (Haelermans et al, 2021a).

A qualitative study by Raby et al (2021) discussed the experiences of students with **disabilities**. While some students reported benefits (for example, someone with hearing loss found online classes advantageous), for others it meant additional difficulties. Students with attention deficit hyperactivity disorder (ADHD) found it more difficult to focus due to distractions in a homeschooling setting (Raby et al, 2021). Another study by Gandolfi et al (2021) also demonstrated that remote learning can create additional pressures for students with ADHD and anxiety. Several studies found that children with special educational needs experienced a regression in social skills and behaviour during school closures (Barron and Emmett, 2020; Inclusion Ireland, 2020; O'Connor et al, 2020).

A UK study found that digital access differed for students in **private and state schools** (Hanushek and Woessmann, 2020), while another demonstrated that, during lockdowns, nearly three-quarters of private school pupils benefited from full school days, almost twice the proportion of state school pupils benefiting from the same thing (Major et al, 2020). Cullinane and Montacute (2020) found that half of the teachers in private schools in England reported that they received more than 75% of homework back, while only 27% of teachers in the most advantaged state schools and 8% in the most disadvantaged state schools did.

Based on a survey of Dutch parents, Bol (2020) found that, during school closures, children from an academic track received more support from school than those on a **pre-vocational track**.

A study in Germany demonstrated that while, on average, students reduced their daily learning time by about half, the reduction was significantly larger for **low achievers**, who disproportionately replaced learning time with activities such as TV or computer games rather than with activities more conducive to child development. The learning gap was not compensated by parents or schools, who provided less support for low-achieving students (Grewenig et al, 2021). Another empirical study from Germany found that low-achieving students experienced larger learning loss because of school closures (Schult and Lindner, 2021).

Education inequality before the pandemic

To assess inequality in education in the EU, both tertiary education attainment and PISA test scores were analysed, from different perspectives associated with inequality studies (Table 18).

Table 18: Indicators selected for inequality in education analysis

Inequality approach	Indicators	
Inequality of opportunity	Ex ante inequality of opportunity in tertiary education attainment (30–49 years)	
	Ex ante inequality of opportunity in tertiary education attainment (50+ years)	
Intergenerational mobility	Probability of transition from non-tertiary-educated parents to tertiary-educated children	
	Probability of transition from non-tertiary-educated grandparents to tertiary-educated parents or children	
Vertical inequality	Number of times the lowest PISA mathematics score among the top 10% of students is larger than the highest score among the bottom 10%	
	Number of times the lowest PISA reading score among the top 10% of students is larger than the highest score among the bottom 10%	
Horizontal inequality[32]	Odds ratio of underachievement in mathematics	Women versus men
		Native versus first-generation immigrant
	Odds ratio of underachievement in reading	Women versus men
		Native versus first-generation immigrant
	Odds ratio of tertiary education attainment, adjusted for individual characteristics	Women versus men
		Native versus foreign born
		Rural versus urban
		Ages 50–69 versus 30–49
		Ages 70+ versus 30–49

Source: *Authors, based on EU MIMF*

PISA scores are available only to assess differences based on students' gender and immigration background. They show that differences between the top and bottom student scores (vertical inequality) are greater than differences between students of different genders or immigration backgrounds (horizontal inequality). This is illustrated by the indicators showing how many times the lowest PISA mathematics or reading score among the top 10% of students is larger than the highest score among the bottom 10%. Other indicators tell a similar story: the analysis of the odds of attaining a tertiary education between women and men, natives and foreign-born individuals, rural and urban populations, and populations of different ages shows that vertical education inequality in the EU is greater than horizontal inequality (Figure 30).

While this may suggest that education policies focusing on low-performing students as a whole can be effective, horizontal inequality remains pronounced in some countries. Men in Czechia have 2.6 times greater odds of attaining a tertiary education than women, while women have twice greater odds in Estonia and Latvia.

In Bulgaria, Malta and Portugal, foreign-born individuals are roughly twice as likely to be highly educated, while the opposite is true in Belgium, France, Italy and Slovenia, most likely reflecting differences in immigration trends in these countries. The odds of acquiring a higher education are 6.25 times greater for urban populations in Poland than for rural populations. Overall, differences in tertiary education attainment are largest between different age groups, reflecting increased access to higher education among younger generations.

Inequality of opportunity in education is relatively high in the EU. In most Member States, sex, age, origin and family background (that is, parents' home ownership, financial situation and education level) explain a large part of inequality in tertiary education attainment. This type of inequality is highest in Belgium, Luxembourg and Finland and lowest in Malta, Romania and Italy (IOp30_tertiary in the heatmap).

Overall, across the indicators measured, inequality in education is lowest in Ireland, Croatia and Estonia, and highest in Bulgaria, Malta and Finland.

32 While other horizontal inequality indicators are available in the EU MIMF, the results discussed in this section are largely the same regardless of the indicator used.

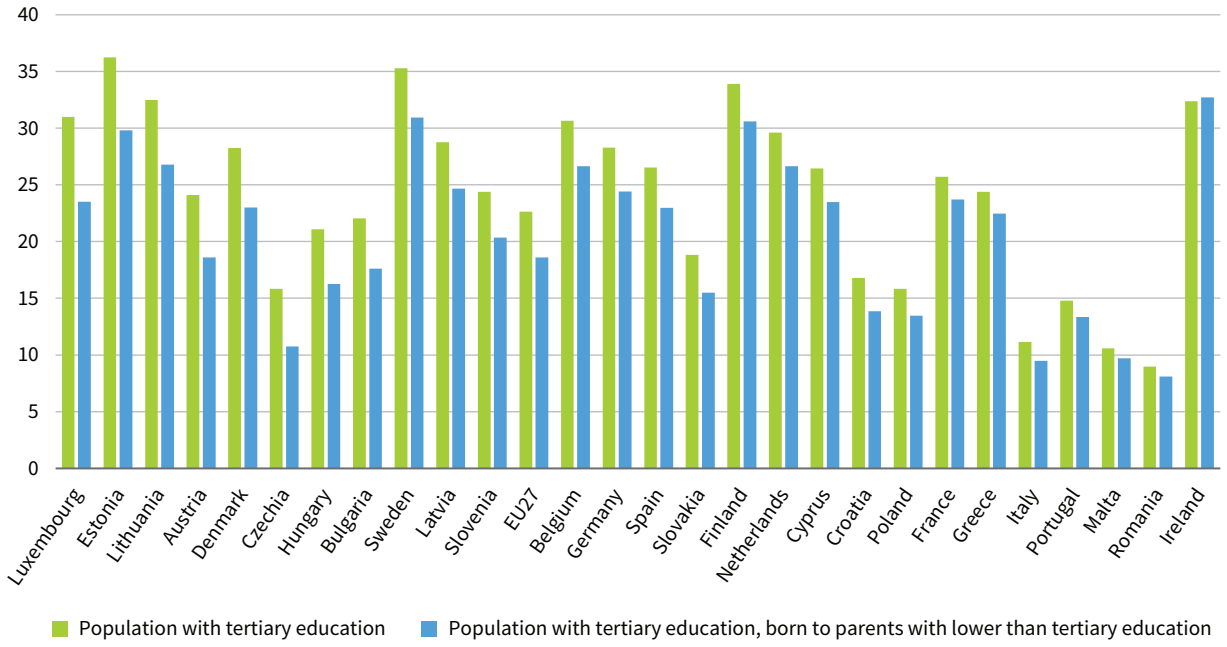
Figure 30: Heatmap showing results of education inequality indicators, 2018–2019, EU27 and the UK

	G2-G3_tertiary	maths_female	family_tertiary	tertiary_female	maths_native	reading_native	tertiary_native	tertiary_rural	tertiary_senior	tertiary_elderly	IOp50_tertiary	IOp30_tertiary	reading_female	reading_p90p10	maths_p90p10
Ireland	0.25	1.00	n.a.	0.94	1.00	0.83	0.68	0.81	0.40	0.17	n.a.	0.07	0.49	1.59	1.51
Croatia	0.19	1.00	0.35	1.00	0.95	0.80	1.30	0.37	0.45	0.40	0.06	0.04	0.45	1.64	1.63
Estonia	0.20	1.00	0.41	2.00	0.40	0.24	1.06	0.43	0.69	0.49	0.07	0.07	0.46	1.60	1.50
Hungary	0.17	1.05	n.a.	1.17	0.82	1.00	0.58	0.31	0.50	0.48	0.05	0.06	0.59	1.74	1.66
Latvia	n.a.	1.00	n.a.	2.00	0.87	1.06	1.15	0.54	0.44	0.31	0.08	0.06	0.44	1.65	1.53
United Kingdom	n.a.	1.21	n.a.	1.04	0.73	0.63	0.70	1.45	0.48	0.30	n.a.	0.07	0.71	1.70	1.63
Italy	0.15	1.12	0.24	1.00	0.46	0.40	1.94	0.53	0.54	0.24	0.05	0.04	0.63	1.73	1.66
Denmark	0.21	0.92	0.58	1.15	0.37	0.23	0.60	0.55	0.40	0.18	0.09	0.06	0.47	1.63	1.53
Luxembourg	0.21	1.05	0.39	0.93	0.53	0.49	0.65	0.84	0.41	0.26	0.09	0.09	0.61	1.88	1.73
Austria	0.20	1.06	0.40	0.64	0.26	0.25	1.20	0.49	0.43	0.27	0.08	0.05	0.54	1.75	1.65
Greece	0.27	0.92	0.53	0.82	0.36	0.28	1.57	0.28	0.51	0.18	0.07	0.04	0.44	1.79	1.69
France	0.26	1.00	0.47	0.91	0.27	0.30	1.96	0.61	0.27	0.09	0.09	0.07	0.58	1.75	1.65
Portugal	0.21	1.00	0.33	1.54	0.24	0.44	0.51	0.44	0.39	0.16	0.04	0.05	0.53	1.69	1.70
Sweden	0.19	1.00	0.49	1.66	0.16	0.15	1.13	0.55	0.45	0.28	0.09	0.07	0.55	1.78	1.62
Germany	0.18	0.94	0.42	0.51	0.19	0.14	0.87	n.a.	0.82	0.89	0.08	0.07	0.61	1.79	1.66
Spain	0.21	1.00	0.32	1.08	0.41	n.a.	1.61	0.44	0.43	0.14	0.05	0.06	n.a.	n.a.	1.63
Netherlands	0.20	0.86	0.47	0.73	0.17	0.18	1.09	n.a.	0.44	0.26	n.a.	0.06	0.57	1.81	1.62
Belgium	0.24	1.21	0.56	0.92	0.31	0.24	2.38	0.70	0.34	0.14	0.10	0.09	0.70	1.77	1.67
Slovakia	n.a.	0.95	n.a.	1.15	n.a.	n.a.	0.96	0.38	0.38	0.29	0.05	0.05	0.52	1.81	1.73
Slovenia	0.26	0.86	0.42	1.40	0.18	0.22	2.27	n.a.	0.37	0.21	0.06	0.06	0.39	1.65	1.59
Czechia	0.13	0.94	0.25	0.38	0.25	0.32	1.54	0.35	0.25	0.10	0.06	0.04	0.50	1.70	1.64
Lithuania	n.a.	0.85	n.a.	1.37	0.86	0.70	1.19	0.25	0.39	0.24	0.08	0.07	0.40	1.70	1.65
Poland	0.17	0.85	0.40	1.13	n.a.	n.a.	0.67	0.16	0.20	0.07	0.06	0.05	0.44	1.66	1.58
Cyprus	n.a.	0.77	n.a.	0.86	1.04	1.09	1.05	0.42	0.29	0.15	0.06	0.07	0.42	1.88	1.76
Romania	n.a.	1.08	n.a.	0.94	n.a.	n.a.	n.a.	0.21	0.36	0.19	0.03	0.04	0.58	1.86	1.79
Finland	n.a.	0.73	n.a.	1.51	0.22	0.15	0.82	0.49	0.54	0.27	0.08	0.07	0.32	1.66	1.53
Malta	n.a.	0.68	n.a.	0.86	1.05	1.00	0.53	n.a.	0.30	0.19	0.03	0.04	0.45	2.01	1.79
Bulgaria	n.a.	0.96	n.a.	1.51	n.a.	n.a.	0.46	0.23	0.60	0.54	0.07	0.06	0.48	1.92	1.81

Note: *An explanation of the EU MIMF indicator labels used in this figure is given in the annex at the end of this report.*
Source: *EU MIMF*

While Figure 30 includes data on intergenerational mobility in education, more recent data is available from the 2021 Labour Force Survey (Figure 31). Compared with findings regarding occupations (Chapter 4), intergenerational mobility in education is more limited in the EU. Among people aged 55-74, between 9% (in Romania) and 33% (in Ireland) of children born to non-tertiary-educated parents acquire a tertiary education. Overall, 23% of Europeans aged 55–74 had a tertiary education in 2021 (Eurostat [LFSO_21EDUC08]). Differences between tertiary education attainment among the whole population and those born to parents with a lower education appear the greatest in Luxembourg, Estonia, Lithuania and Austria (Figure 31).

Figure 31: Difference in tertiary education attainment as a whole in 55- to 74-year-olds and those with parents with a lower than tertiary education (2021)



Source: *Eurostat, Population by educational attainment level of the parents, sex, age, migration status and educational attainment level [LFSO_21EDUC08]*

Trends in education inequality (2010–2020)

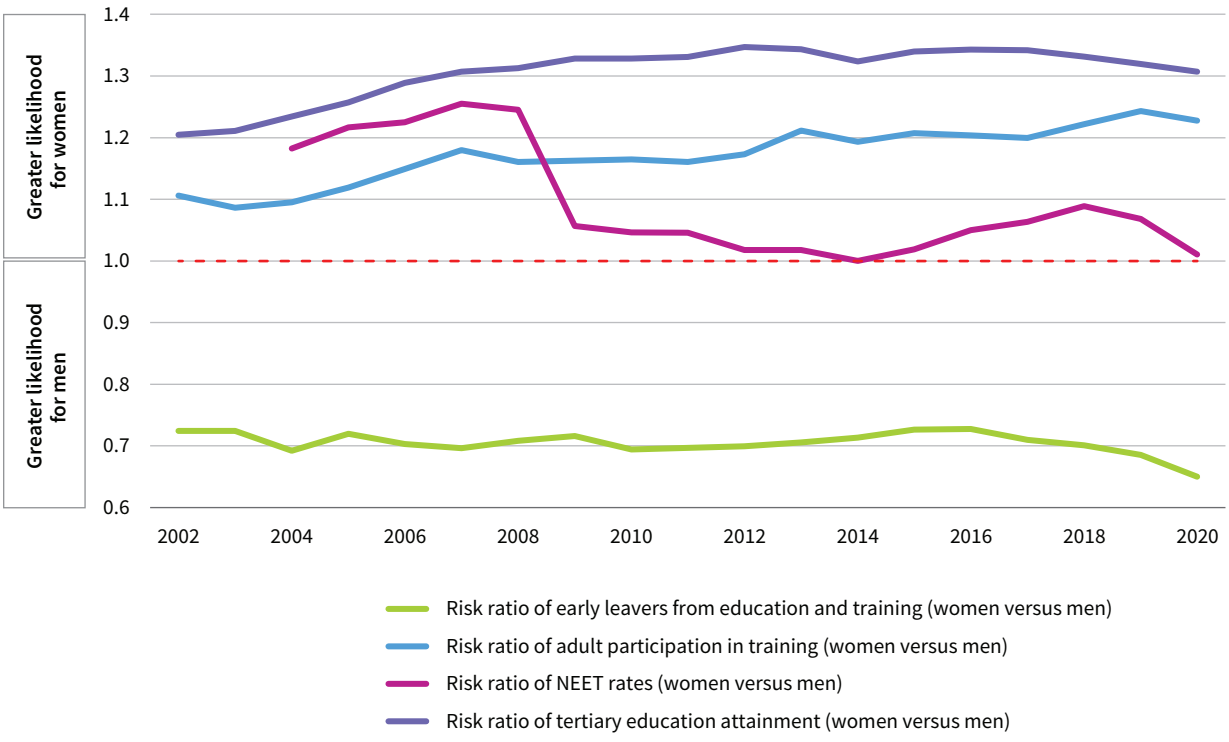
Trends in inequality in education were explored between women and men, between urban and rural populations, and between foreign-born individuals and natives.

The extent of gender inequality in education differs depending on the indicator used (Figure 32). Young women in the EU27 have been less likely than young men to leave education and training early; this trend has held relatively steady over the last two decades and has been reinforced during the pandemic. In 2020, the risk of leaving education or training early for women was 32% lower than for men. Women were also more likely to acquire a tertiary education than men, an inequality that has somewhat increased over the last decade.

However, young women were at a slightly greater risk of not being in employment, education, or training (NEET), particularly prior to the Great Recession, after which the gap started narrowing. This reduction was driven by the increase in NEET rates among young men, from 9.8% in 2007 to 13.0% in 2012 (Eurostat [edat_lfse_35]). Women's NEET rate also increased during this period (from 12.0% in 2007 to 13.2% in 2012; Eurostat [edat_lfse_35]). NEET rates for both genders started slowly dropping after 2012, faster for men than for women, which led to increasing inequality after 2014. During the initial crisis in 2020, the increase in NEET rates were nearly identical for men and women.

Women are more likely to participate in training. Over time, this inequality slightly increased. While, in 2003, adult women were 8% more likely than men to participate in training, by 2020 the gap grew to 20%, with the risk ratio steadily increasing after 2017. In 2020, this reversed, as, in the pandemic, training participation decreased among both men and women, but the reduction was a little more pronounced for women than for men (1.9 versus 1.5 percentage points, respectively).

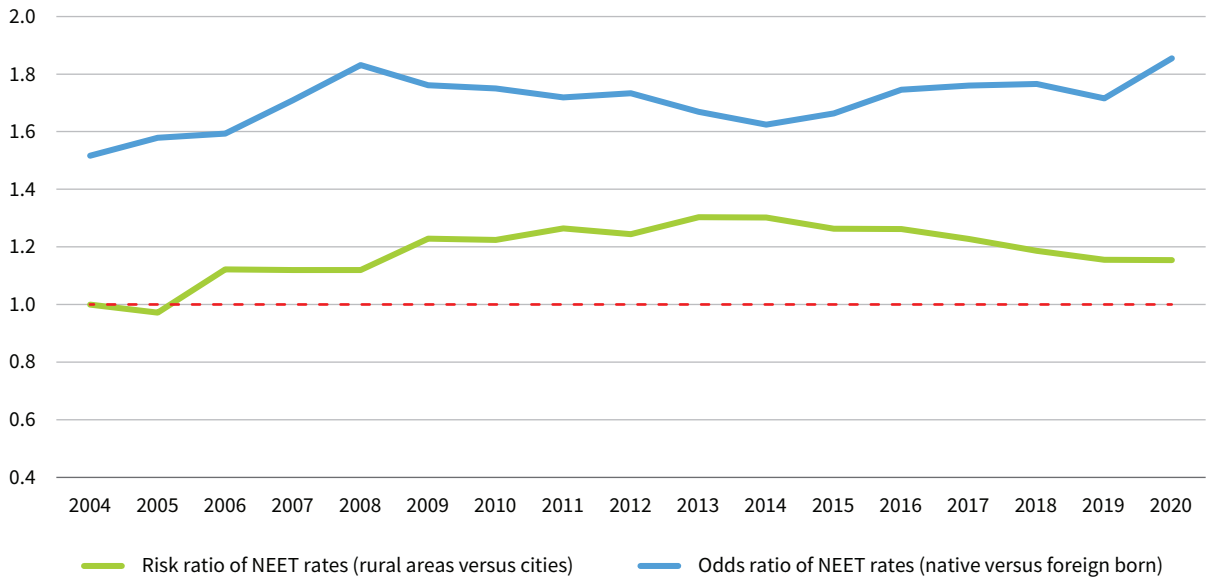
Figure 32: Trends regarding inequality in education between women and men (2002–2020), EU27



Notes: *The ages of the population considered by each indicator are, from top to bottom in the legend, 18–24, 15–24, 25–64 and 25–34, respectively. The red dashed line indicates a risk ratio of 1, where the two compared groups have the same risk. A risk ratio greater than 1 indicates that women have a greater likelihood than men of leaving education and training; not being in employment, education or training (NEET); or participating in education as adults. A risk ratio less than 1 indicates the opposite.*
Source: *Eurostat, Early leavers from education and training by sex and labour status [edat_lfse_14]; Young people neither in employment nor in education and training by sex, age, country of birth and degree of urbanisation (NEET rates) [edat_lfse_35]; Adult participation in learning by sex [sdg_04_60]; and Tertiary educational attainment by sex [sdg_04_20]*

Since 2005, young people in rural settings have been slightly more likely to be NEET (Figure 33), although the rural–urban divide in NEET rates has been decreasing since 2014, when people from rural areas had a 26% higher risk of being NEET than those living in cities, which dropped to 14% by 2020. Unlike the trends

Figure 33: Risk and odds ratios of NEET rates between various social groups (2004–2020), EU27



Notes: *This figure is based on the population aged 15–74. The red dashed line indicates a risk ratio of 1, where the two compared groups have the same risk. A risk ratio greater than 1 indicates that the social group listed first in the legend (for example, rural in 'rural areas versus cities') has a greater likelihood of being NEET than that listed second. A risk ratio less than 1 indicates the opposite.*
Source: *Eurostat, Young people neither in employment nor in education and training by sex, age, country of birth and degree of urbanisation (NEET rates) [edat_lfse_35]*

regarding gender inequality, this was driven by the reduction in NEET rates for both rural and urban populations (1.8 percentage point reduction for urban populations and 3.4 percentage point reduction for rural populations from 2014 to 2019; Eurostat [edat_lfse_35]), until 2020 when NEET rates ticked up slightly for both groups again.

The trend is the opposite for natives compared with those who are foreign born. Inequality in NEET rates between these two groups has largely grown since 2014 (when the risk ratio stood at 1.63) and increased especially during 2020 (when the risk ratio reached 1.85).

Overall, in the first year of the pandemic, inequality in NEET rates increased between native and non-native populations, and progress in NEET rates between rural and urban populations slowed.

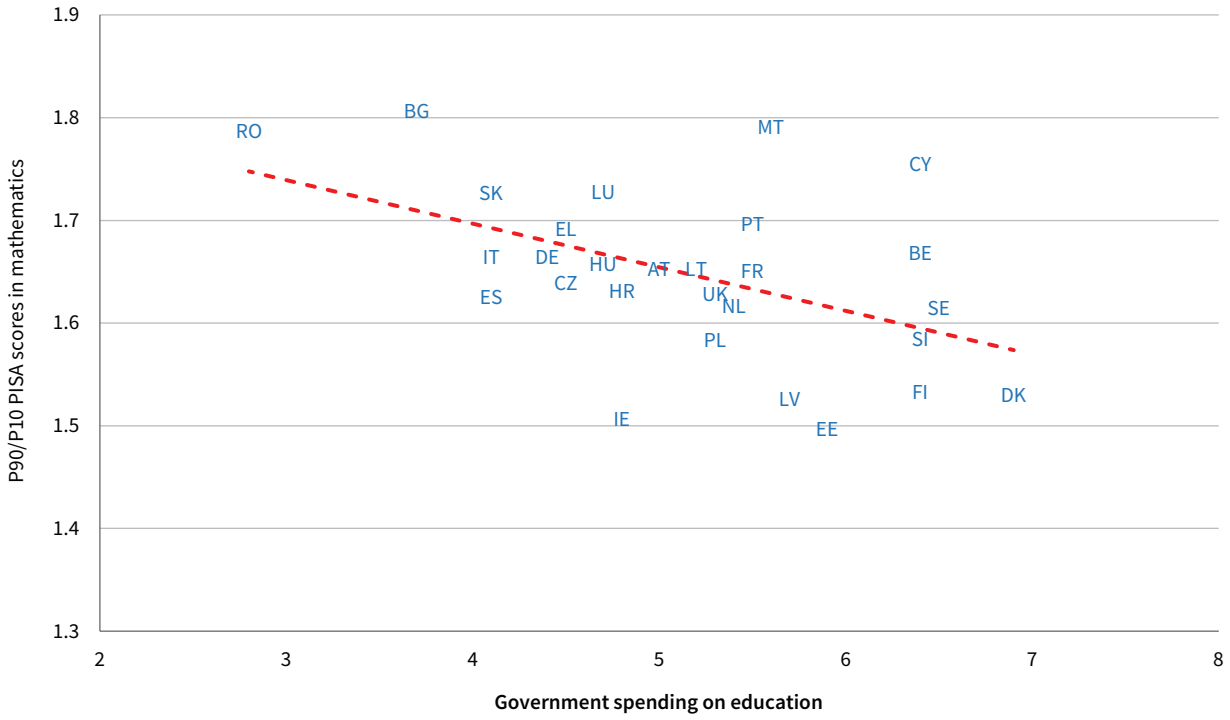
Policies as potential drivers of inequality in education and learning

As vertical inequality was found to be highest, the relationship between government spending and inequality in PISA scores in mathematics and reading between the top and the bottom students was explored.

Inequalities in PISA mathematics scores for 15-year-olds are calculated by looking at how many times the lowest score among the top 10% of students is larger than the highest score among the bottom 10% (European Commission, 2021a). At country level, a statistically significant negative correlation (r=–0.49) was found between government spending on education and inequality in mathematics scores five years later (Figure 34), suggesting that increased education expenditure may play a role in decreasing inequalities. This effect is particularly clear in the Scandinavian countries (Denmark, Finland and Sweden), but also in Slovenia and some Baltic countries. The correlation with spending on family and children is also negative, albeit weaker (r=–0.30).

When controlling for GNI per capita, a negative association is confirmed between government spending and inequalities in PISA scores in mathematics (Table 19). In this model, a one percentage point increase in education spending generates a decrease in inequalities in PISA scores in mathematics of 0.036 points.

Figure 34: Government spending on education (2013, % of GDP) against P90/P10 PISA scores in mathematics (2018), EU27 and the UK



Source: *EU MIMF and Eurostat, General government expenditure by function (COFOG) [gov_10a_exp]*

Table 19: OLS regression model exploring the relationship between government spending and inequality in PISA scores

	P90/P10 ratio of PISA scores in mathematics	P90/P10 ratio of PISA scores in reading
Government expenditure on family and children (2013, % of GDP)	–0.006	–0.016
Government expenditure on education (2013, % of GDP)	–0.036*	–0.031
Log (GNI per capita in USD, 2018)	–0.013	0.027

Notes: * *p<0.1. For more details, see Table 29, Annex IV.*
Source: *Authors, based on EU MIMF, Eurostat and World Bank data*

In simple correlations, inequality in PISA scores in reading is also negatively correlated with government spending on education (r=–0.30) and on family and children (r=–0.21). However, when controlling for GNI per capita, neither coefficient is significant (Table 19).

PISA inequality scores are a measure of vertical inequality in outcomes. Government spending on policies concerning families' and children's welfare and educational progress may help some families send their children to better schools, it may help teachers and students alike to make use of better structures and educational tools, and it may even incentivise children to pursue their interests. However, while such measures reduce disparities in inequalities of opportunities, they only indirectly act on inequalities of outcomes. Higher spending alone may not ensure that outcomes will also tend to converge.

Inequality in education and learning during the pandemic

As individual data on educational outcomes are not yet available, this section investigates people's satisfaction with the quality of online schooling and their ability to carry it out at home, based on data collected for Eurofound's *Living, working and COVID-19* e-survey, carried out in July 2020 among people aged 18+ in all EU Member States.

The analysis focuses on groups of people who experienced difficulties in adapting to online schooling and if government policies were helpful in reducing inequalities in education. The outcome variables, all measured on a three-level ordinal scale,[33] are the following:

- parents' satisfaction with the quality of their children's online schooling
- the satisfaction of tertiary education students with the quality of online education
- whether households had sufficient equipment to carry out online schooling[34]

Adaptation to online schooling

Regression models were used to estimate which groups of people experienced the most difficulty adapting to online schooling, with dependent variables including (1) parents' satisfaction with the quality of online schooling, (2) tertiary education students' satisfaction with the quality of online schooling and (3) whether households had sufficient equipment to carry it out. Results of the model on parents' satisfaction are shown in Table 20.

Analysis of both parents and students shows that those living in households that easily made ends meet were always more likely to be satisfied with the quality of online schooling.[35] This association was particularly strong when the household had sufficient equipment for carrying out online schooling at home, suggesting that the pandemic exacerbated inequalities in education between better- and worse-off households.

33 These variables were originally on a five-level scale, ranging from 'Strongly disagree' to 'Strongly agree' (Annex IV). Models using a binary response variable ('Agree' versus others, Table 39 in Annex IV) also support the findings. Descriptive statistics are shown in Tables 32, 33, 34 and 35 in Annex IV.

34 Multilevel regression models were used, except for the indicator regarding students' satisfaction, for which a single-level model was preferred owing to the lower number of observations (models 2 and 4 in Table 39 of Annex IV). Statistical tests also showed that there was no significant difference between the single- and multilevel models. See Annex IV for more details.

35 See Table 36 and models 1 and 2 in Table 39 of Annex IV; see also Table 38 and models 3 and 4 from Table 40 of Annex IV for results with a binary dependent variable.

Table 20: Determinants of respondents' satisfaction with the quality of their children's online schooling (multilevel ordered logit model)

	Model 1: null model	Model 2: education expenditures	Model 3: school closures
Disagree/neutral	–0.361***	0.834*	–0.459*
Neutral/agree	0.645***	1.841***	0.541*
Government expenditures on education (2019, % of GDP)		0.182*	
Weeks of school closures (30 June 2020)			–0.029*
Household has sufficient equipment to carry out online schooling (reference: agree)			
Disagree		–1.079***	–1.080***
Neutral		–0.432***	–0.427***
Respondent's level of education (reference: high (ISCED 5–8))			
Low (ISCED 0–2)		0.276	0.266
Medium (ISCED 3–4)		–0.126	–0.113
Urbanisation (reference: cities)			
Rural areas		0.317**	0.310**
Small and large towns		0.032	0.024
Household's ability to make ends meet with ease (reference: with difficulty)		0.377***	0.384***
Respondent has worked from home during the pandemic		0.343***	0.351***

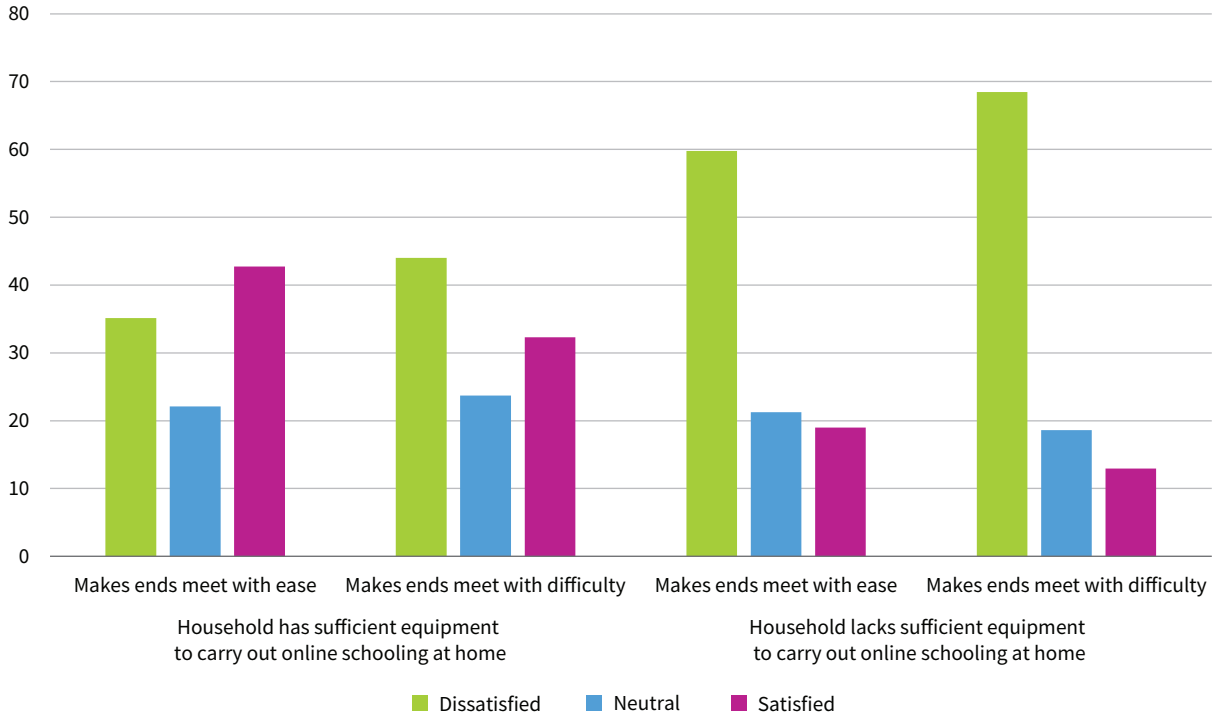
Notes: ** p<0.05, ** p<0.01, *** p<0.001. ISCED, International Standard Classification of Education. For more details, see Table 36 in Annex IV.*
Source: *Authors, based on Eurofound's Living, Working and COVID-19 e-survey, Eurostat and UNESCO*

Having sufficient equipment was more important for satisfaction with online schooling than having difficulty making ends meet (Figure 35). In households that had sufficient equipment, the proportion of parents satisfied and dissatisfied with the quality of online schooling was relatively similar across households of different income levels. By contrast, in households without sufficient equipment, the majority of parents were dissatisfied with the quality of online education, regardless of whether the household could make ends meet with ease or difficulty. Regression results support this finding: the odds of parents being satisfied with the quality of online schooling for their children were almost three times as high in families that had sufficient equipment to carry out remote learning than in those that did not (Table 20). The equivalent odds were 1.46 for households that made ends meet with ease versus those that made ends meet with difficulty. This may suggest that, if governments provide sufficient equipment for online schooling, income-related inequalities in online education could be at least partially overcome.

Parents and students living in rural areas were more likely to be satisfied with the quality of online schooling or education than those in cities, which could be related to the lack of the usual commute: previous studies have shown how some children living in rural areas skipped certain classes before the pandemic if they were not compatible with the schedules of public transport (Jusiené et al, 2021).

However, respondents living in rural areas were less likely to have sufficient equipment to properly carry out online schooling. Internet access may be important in this regard, which in 2020 was, on average, 92% in cities, 90% in towns and suburbs and 86% in rural areas (Eurostat [isoc_ci_in_h]; data for France from 2019). Furthermore, supply chain shortages during the pandemic meant that schools based in rural areas were less able to secure large orders of computers for their students because they required less equipment than schools in cities, which was less profitable for the equipment providers (Salman, 2020).

Figure 35: Parents' satisfaction with the quality of online schooling for their children, EU27 (%)

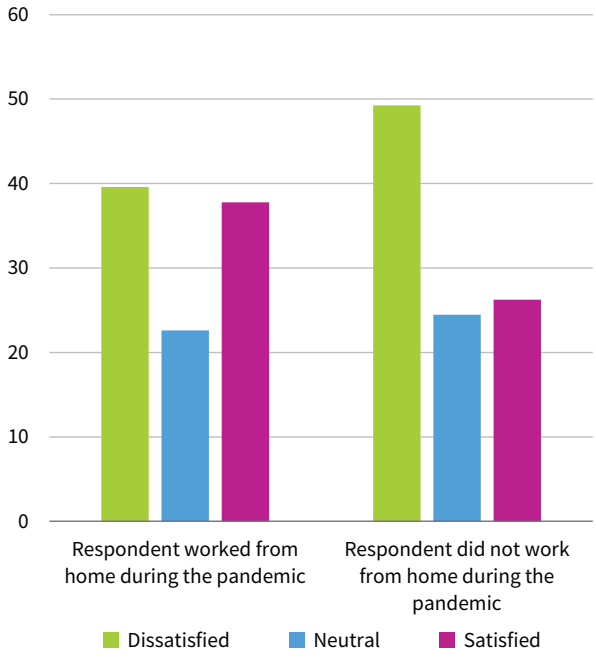


Note: *Values for the respondent being neutral about the household having sufficient equipment are not shown for ease of interpretation.*
Source: Living, working and COVID-19 *e-survey*

Working from home was associated with parents having higher satisfaction with online schooling, allowing them to better help their children to carry it out (Figure 36). Among respondents who did not work from home, almost twice as many were dissatisfied (49%) than satisfied (26%), whereas the difference was much smaller among those respondents who worked from home (40% dissatisfied versus 38% satisfied). Children whose parents were absent from home during remote learning may have suffered from educational deficits because of the lack of supervision, thus widening inequalities in education and learning (Raby et al, 2021).

Among tertiary education students (Table 39 in Annex IV), older students were more likely to be satisfied with the quality of online education, possibly because postgraduate level students are usually less involved with classes and more likely to work independently regardless of the pandemic. Students in good or very good health were also more likely to be satisfied with the quality of online education. This is perhaps because remote learning often cannot cater to the needs of disabled students, as seen in the literature review, particularly regarding physical disabilities and ADHD (Gandolfi et al, 2021; Raby et al, 2021). No differences between genders or between education levels were found after controls, although the odds of having sufficient equipment was higher among those in tertiary education.

Figure 36: Parents' satisfaction with the quality of their children's online schooling depending on whether they worked from home or not during the pandemic, EU27 (%)



Source: Living, working and COVID-19 *e-survey*

Role of government policies in education inequality during the pandemic

The relationship between government spending and inequalities in education were also analysed at individual level, including three potential explanatory factors.

1. **Government expenditures on education** in the year before the pandemic (% of GDP; Eurostat [gov_10a_exp]). Higher spending could be indicative of a better educational infrastructure: fewer students per classroom, more teachers and the necessary technology and digital skill sets to undertake online schooling.
2. The **length of school closures**, measured in weeks up to 30 June 2020 (before the survey was conducted).[36] Longer school closures could increase inequalities over time, as seen in the literature review.
3. **Income support policies**, which could be helpful for levelling the playing field by allowing households to purchase the equipment to carry out online schooling, using data from Mathieu et al (2022) measured as a three-fold category: no support, support covering less than 50% of the lost salary and support covering more than 50% of the lost salary.[37] By 30 June 2020, 21 EU countries covered over 50% of citizens' lost salary, five countries covered less than 50% and Latvia was the only country providing no income support.

Notably, there is a negative correlation between educational expenditure and length of school closures (*r*=–0.48). This may be because countries with lower spending are usually southern Member States, many of which experienced an earlier outbreak.

When controlling for individual characteristics, higher government spending on education increased the probability of respondents being satisfied with the quality of online schooling (Table 20). A shift from the lowest to the highest levels of expenditure on education (from 3.1% to 6.9% of GDP) was associated with a decrease in parents' dissatisfaction from 54% to 43% and an increase in satisfaction from 25% to 34%, on average, suggesting that countries with more expenditure were better prepared to overcome the digital divide, in terms of both equipment and skills.

Box 5 presents some examples of national policies aimed at closing the digital divide among disadvantaged groups.

Box 5: National policy examples targeting inequality in education

The digital divide between different groups of children has been widened by the pandemic and has affected their education. Estimates show that the take-up of distance learning among Roma children has been lower than among other groups due to a lack of skills or parental support, access to the internet or Wi-Fi coverage, computers or other electronic devices, or even electricity at home (FRA, 2020).

Some Member States have addressed barriers to online learning through the purchase of digital devices. **Greece** put in place, in 2021, a digital support programme (*Psifiaki Merimna*), which consists of a voucher scheme to purchase digital devices that can be used to access education and enhance digital skills. The programme is aimed at children and young people up to 24 years of age who are at risk of poverty and social exclusion. Large families as well as children and young people with disabilities attending primary and secondary education can also avail of this programme. In 2021, 258,992 children and young people received this support.

Other countries have also undertaken similar efforts during the pandemic. In **Estonia**, the project 'Computer for every schoolchild' (*Gale koolilapsele arvuti)* started as a volunteer citizens' initiative in 2020 that involved the Estonian Union for Child Welfare and provided almost 2,000 computers that year to children who did not have easy access to computers at home. The Ministry of Education and Research also funded the purchase of almost 2,800 computers for children to attend school in the academic year 2020/2021 (Estonian Ministry of Social Affairs, 2022).

The **Lithuanian** Education Ministry bought and leased 35,000 computers for children with a low socioeconomic status in 2020 (UNICEF, 2021). It allocated €9.2 million for this purchase, which also included internet services.

36 This is based on UNESCO's dashboard on global monitoring of school closures caused by COVID-19, which is available at https://covid19.uis.unesco.org/global-monitoring-school-closures-covid19/

37 These data are taken from https://ourworldindata.org/covid-income-support-debt-relief

Meanwhile, longer school closures were associated with lower satisfaction with the quality of online schooling. Holding everything else constant, school closures of up to 16 weeks increased the probability of respondents being dissatisfied with the quality of their children's online schooling by 10 percentage points (from 39% to 49%) and decreased the probability of being satisfied by 9 percentage points (from 38% to 29%), on average, suggesting that lengthy school closures may have increased parents' frustration about online schooling.[38]

In terms of households' ability to carry out online schooling at home, neither government expenditure on education nor income support policies during the pandemic showed any significant effect across all countries (models 2 and 4 in Table 40 of Annex IV).

Overall, the results highlight that the lockdowns and the pandemic exacerbated inequalities in education and learning. Disadvantaged groups had more difficulty adapting to online schooling during the pandemic (which was especially true among tertiary education students with disabilities and parents who were not working from home), in their ability to gather sufficient equipment to properly carry out online schooling (for households in rural areas) or both (for respondents having difficulty making ends meet). However, the analyses also showed that, in some cases (for example, higher spending on education), government policies could be successful in tackling such inequalities, and that ensuring sufficient equipment for remote learning can help reduce income-related inequalities in satisfaction with online schooling.

38 Neither education expenditures nor the average duration of school closures had any effect whatsoever on students' satisfaction with the quality of online education. This may suggest that the implementation for universities and for schools was carried out differently.

6 Conclusion

One of the primary concerns of policymakers during the pandemic was that the pandemic would lead to increases in inequalities in different life domains. Various aspects of the crisis have affected different groups of people more than others, which is an issue that is explicitly addressed by the European Pillar of Social Rights action plan and the NextGenerationEU recovery plan. This report has investigated recent trends in inequality in income, health and healthcare, employment and education, as well as the main drivers of inequality and how inequality was affected by the COVID-19 pandemic based on the earliest cross-European data that have become available.

The following conclusions summarise the main findings on the general drivers of inequality, the impact of the pandemic on inequality and the potential impact of social and economic policies on inequality in general and during the pandemic. The chapter also summarises some examples of intersectionality in inequality found in this report.

What were the pre-pandemic trends and drivers of inequality?

Income inequality

In contrast with other life domains, factors that individuals can in theory control (education, work and location) play a greater role than those they cannot control (such as sex, age and family background) in income inequality. At individual level, in general, country of residence, a low education level, being a non-EU citizen and living in a household in which at least one member is unemployed, disabled or otherwise inactive had the largest negative effects on household income.

Health inequality

While factors that people are unable to control (sex, age and family background) have a significant impact on health outcomes, health inequality is closely related to income and education. People in the lowest income quintile had almost three times the risk of having a chronic illness or a disability with severe limitation than those in the top 20%. Gaps have also been shown between white-collar and blue-collar workers.

In terms of access to healthcare, gender and age play an important role in inequality, but this is different across countries: for example, in Ireland and Portugal, women are more likely to have unmet healthcare needs than men, while in Austria, Czechia and Hungary it is men who are more likely. Unmet healthcare needs increase with age, particularly in the progression from being young to middle aged, and to a smaller extent from middle to older age. However, in Belgium, Cyprus and France, older people have lower odds of reporting unmet medical need than younger people.

When it comes to mental health, generally, blue-collar workers, those with lower education levels, women, non-EU citizens and older people have a higher risk of depressive symptoms, although several country exceptions have been found.

Inequality in employment and working conditions

This report found that horizontal inequality in employment is high according to gender, which seems to be the aspect that has the greatest impact on acquiring a managerial position: women have half the odds men do. Horizontal inequality in employment is low when it comes to urbanisation, place of birth, age and education, although country differences are strong.

Gender inequality in employment rates has been improving over the long term, but inequality in working hours remains, with men much more likely than women to work longer hours.

Inequality in unemployment rates is highest between people with different education levels.

Inequality in employment rates between different age groups has been decreasing steadily, with more people, particularly women, choosing to work at an older age.

One positive finding is that intergenerational mobility in working life in the EU is relatively strong. For example, between one-third and three-quarters of Europeans born to blue-collar parents have a white-collar job.

Inequality in education and learning

In terms of education outcomes, this report has shown that vertical inequality (between the highest and lowest scorers) is higher than horizontal inequality (between groups), suggesting that some policies aimed at low-performing students in general may be effective.

However, in many countries, there are large differences between groups; for example, in Belgium, France, Italy and Slovenia, foreign-born people are much less likely to be higher educated and, in Poland, there are large differences between urban and rural populations.

Intergenerational mobility in education is limited in the EU when compared with intergenerational mobility in working life (previous section). Among those aged 55–74, only 8% to 33% of those with non-tertiary-educated parents acquired a tertiary education.

Gender disparities are pronounced in education. The risk of leaving school early has been consistently higher for men than for women, and women are more likely to acquire a tertiary education and to participate in training than men. However, young women are at a higher risk of being NEET (not in employment, education, or training).

How has the pandemic affected inequality?

Income inequality

To date, the literature on the impact of the pandemic on income inequality is mixed. On a global scale, income inequality seems to have increased less than expected (and some say it has decreased), as the richest countries with the highest proportions of elderly citizens implemented the strictest lockdowns. However, many studies found that groups of people who are typically disadvantaged (low-income earners, those with lower education levels, migrants, women and people with disabilities) were affected more than others.

This report found no evidence that the pandemic significantly affected overall income inequality in the EU. However, interruption to data collections had an impact on the reliability of 2020 data and it is important to continue to monitor income inequality to more clearly identify trends.

During the pandemic, it was households in which at least one person was unemployed in 2020 and households with no higher-educated members that were most likely to see their income decrease. However, disadvantaged groups were less likely to attribute these drops directly to the pandemic when asked.

People who received government support during the pandemic were also more likely to dip into their savings, suggesting that support overall targeted those most in need (based on data for people aged 50+).

Health inequality

The impact of the pandemic was most clear in terms of inequalities in health and access to healthcare. Global studies highlighted measurement issues when it came to COVID-19 mortality in low-income countries, and they found a strong association between income inequality and COVID-19 mortality.

At an individual level, inequality in health outcomes is generally largest between different income groups, and this has not changed during the pandemic, when low income groups were more at risk of contracting COVID-19 due to accommodation problems, not being able to work from home and pre-existing conditions.

During the pandemic, the same factors had the greatest impact on worsening health as before the pandemic (already having poor health, living in cities and being employed). However, gender inequality in (perceived) health decreased in 2020, which seems to be explained by a faster deterioration in women's health.

The pandemic had a widespread impact on the deterioration of mental health, which was particularly strong among people without depressive symptoms pre-pandemic. Having someone close die from COVID-19 had a negative impact on mental health, as did getting laid off because of the pandemic and not having physical contact with people outside the household, especially for those who already had health problems.

The pandemic seems to have increased inequality in access to healthcare services, as access for those in the lowest income quintile was affected at a disproportionate rate. The pandemic also seems to have reversed a trend of decreasing inequality in healthcare access by education level. Furthermore, people who were refused a medical appointment had higher odds of worsening physical and mental health, after controlling for previous health status.

Inequality in employment and working conditions

The early stages of the pandemic resulted in the closure of non-essential businesses, causing an employment shock, which was mitigated by government support for those who were unemployed and furloughed workers. Young people, low earners and those with non-standard contracts were more likely to stop working.

Gender inequality in unemployment decreased during the pandemic, but this was driven by an increase in men's unemployment. Similarly, gender inequality in working hours decreased. Non-native people were also disproportionately affected: their unemployment rate increased more than that of natives.

The analysis in this study shows that, during the pandemic, people with medium education levels were most likely to see a reduction in their working hours, amplifying pre-existing disparities and increasing inequality. The pandemic also increased inequalities between people on temporary and permanent contracts: while they worked similar hours pre-pandemic, disparities appeared in 2020. The analysis also suggests that this could be one of the reasons why the number of working hours decreased significantly for the youngest cohort.

Although working from home expanded during the pandemic, the literature shows that young, lower educated and low-income workers, as well as those working in smaller firms and those on temporary contracts, were less likely to work from home, partly due to the nature of their jobs.

Being a parent affected the possibility of continuing to work during lockdowns, and evidence from the literature points to mothers suffering a greater reduction in working hours than fathers, even with the possibility of working remotely. Disproportionate increases in childcare and household responsibilities together with shifts in paid employment have also made women a particularly vulnerable group when it comes to the deterioration of mental health.

The analysis showed that single mothers suffered most from the reduction of working hours due to the necessity of taking care of children.

Inequality in education and learning

Schools and universities were among the first institutions to close, as students shifted to remote learning. Literature shows that this resulted in learning losses that widened inequalities in education. Various levels of the pre-existing digital divide were among the main drivers of learning loss, which was also influenced by parental income and employment.

This report showed that people in households that found it easy to make ends meet were more satisfied with online schooling, and they were more likely to agree that they had sufficient equipment. This illustrates that the pandemic affected families with different incomes in different ways when it comes to children's schooling. Additionally, the availability of equipment was shown to be a potentially more important driver, as, in households with adequate equipment, satisfaction was similar across different income levels.

Respondents in rural areas were less likely to have adequate equipment, which, according to the literature, could be a result of internet access and supply chain issues.

Working from home seems to have increased parents' satisfaction with the quality of online schooling, suggesting that children whose parents were absent from home (or unable to provide support) were more likely to suffer learning loss.

Among students themselves (aged 18 or over), those who were older and those who were in good health were more likely to be satisfied with online education. This suggests that remote learning may not have been suitable for some students with disabilities or mental health issues or for younger students who needed more support and class-based work.

According to trend data, the pandemic seems to have reduced gender inequalities in NEET rates, while increasing inequalities between foreign-born people and natives and between rural and urban populations.

Training participation decreased in all groups at a similar rate in 2020, presumably due to the general halting of training activities.

Examples of intersectionality in inequality during the pandemic

- Widening health inequalities are related to the intersection with wealth inequality. Economically disadvantaged people with poor health were most likely to experience restricted access to healthcare, creating a cycle in which economically disadvantaged people are more likely to have their medical needs unmet. This, in turn, increases health inequalities and hence reduces the opportunities for people with poor health to improve their socioeconomic condition.
- Another intersectional phenomenon was single mothers on reduced working hours. Many single mothers need to work more, which often entails taking on multiple jobs, as shown in this report. They are also more likely to have temporary jobs and to work longer hours on average. With the pandemic wiping out less secure jobs, single mothers could not work more hours, even if they wanted to. This, coupled with the necessity of taking care of children and the closure of childcare services, meant that the pandemic greatly contributed to exacerbating the already difficult position of working single mothers.
- Lower educated women with young children were more likely to lose their jobs than other workers.
- For urban populations, health, income and employment were heavily intersected through the possibility of working remotely. City dwellers, who usually work longer hours, worked fewer hours than people in rural areas during the pandemic, partly due to the increased need for social distancing and possibly also because the decrease in the number of available jobs was strongest in densely populated areas. Therefore, people in rural areas not only benefited from a potentially healthier lifestyle (less pollution, less overcrowding and a slower pace) and reduced commuting due to the availability of remote work, but also, in many cases, were less affected by the loss of available jobs during the pandemic. Therefore, stress-induced situations due to the shifts in the labour market mostly hit urban workers, highlighting the strong intersections between income, health and employment inequalities.

How have economic and social policies influenced inequality?

Income inequality

This study found that, while the strongest driver of inequality is GNI per capita – richer nations foster more distributional inequality – there is some evidence that government spending on social protection is correlated with a decrease in income inequality.

Previous studies have suggested that social security measures have reduced the extent to which income inequalities have increased, although the removal of these short-term measures (for example, pandemic payments for the unemployed) poses a risk of economic shock.

Although limited data were available, findings from this study suggest that government support, overall, was able to reach those most in need, although there are considerable country differences in this respect. Germany, Ireland and Slovenia, in particular, seem to have succeeded in reaching those most likely to struggle. This study found that (among those aged 50+), financial transfers were able to target those most in need during the pandemic.

Health inequality

Earlier studies have found many connections between policies, structural factors and inequalities in health outcomes. During the pandemic, it was found that while restrictive measures increased inequality in employment and income, they strongly reduced the COVID-19 mortality rate across all income groups. In the EU, a lot of measures were implemented to mitigate both the income and the health impacts of the pandemic, which included the reinforcement of healthcare systems. However, given that the literature finds that structural issues, for example housing and (digital) infrastructure, had stronger impacts on people's ability to cope, many have called for a reform of systems, concentrating on social determinants, among other things.

This study showed that government spending on education is associated with health inequality, as such spending counteracted some of the disadvantages beyond individuals' control that would otherwise have resulted in worse health outcomes.

An increase in disability or sickness benefits between 2019 and 2020 was associated with a lower chance of worsening health, although other associations with spending were not found in this study.

Inequality in employment and working conditions

This report highlighted important aspects of gender inequality in working life, including intersections with the ability to work from home and balancing this with careers and childcare.

Having a white-collar job seems to have been the factor that was most influenced by GNI per capita, and no association with government spending was found.

However, this report found that childcare availability played an important role. While no significant relationship was found between either childcare availability or paid leave policies and the odds of women becoming a manager, a positive correlation was demonstrated between the availability of childcare for those under three years of age and the odds of women remaining in the workforce. Additionally, the availability of childcare appears to reduce gender inequality in employment rates.

Inequality in education and learning

When investigating the impact of government policies on student outcomes, this report found a strong and significant negative correlation between inequality in PISA mathematics scores and government spending on education five years previously, which was confirmed when controlling for the country's wealth. This effect was strongest in the Scandinavian and Baltic countries and in Slovenia. A weaker correlation was also found with spending on families and children. For PISA reading scores, no significant associations were found.

When it comes to learning loss during the pandemic, while more research is needed to measure long-term effects, this study demonstrates the importance of equipment as a factor in generating satisfaction with online schooling (more significant for learning loss than households making ends meet). This suggests that if governments could provide adequate equipment, income-related inequalities in online education could be at least partially overcome.

This report has also shown that government spending on education was associated with increased satisfaction with online schooling. Not surprisingly, longer school closures had a negative effect on satisfaction. However, government spending and income support policies during the pandemic did not seem to have an impact on households' ability to carry out online schooling at home.

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Annex: EU MIMF indicator labels

Label in heatmaps	Indicator name
	Income inequality (Figure 4)
IOp50_meet	Ex ante inequality of opportunity in having problems to make ends meet (age group 50 years or over)
income_gini	Gini coefficient of equivalised disposable income
income_s80s20	Income quintile share ratio S80/S20 for equivalised disposable income
ends_junior	Odds ratio of household having problems to make ends meet (young adult over middle-aged adult, adjusted)
ends_senior	Odds ratio of household having problems to make ends meet (senior over middle-aged adult, adjusted)
ends_elderly	Odds ratio of household having problems to make ends meet (elderly over middle-aged adult, adjusted)
ends_native	Odds ratio of household having problems to make ends meet (native over foreign born, adjusted)
ends_tertiary	Odds ratio of household having problems to make ends meet (having tertiary education over not having tertiary education, adjusted)
ends_white	Odds ratio of household having problems to make ends meet (white-collar over blue-collar worker, adjusted)
ends_rural	Odds ratio of household having problems to make ends meet (rural over urban, adjusted)
housing_female	Odds ratio of being satisfied with the availability of good affordable housing in the area where they live (female over male, adjusted)
housing_junior	Odds ratio of being satisfied with the availability of good affordable housing in the area where they live (young adult over middle-aged adult, adjusted)
housing_senior	Odds ratio of being satisfied with the availability of good affordable housing in the area where they live (senior over middle-aged adult, adjusted)
housing_elderly	Odds ratio of being satisfied with the availability of good affordable housing in the area where they live (elderly over middle-aged adult, adjusted)
housing_native	Odds ratio of being satisfied with the availability of good affordable housing in the area where they live (native over foreign born, adjusted)
housing_tertiary	Odds ratio of being satisfied with the availability of good affordable housing in the area where they live (having tertiary education over not having tertiary education, adjusted)
housing_rural	Odds ratio of being satisfied with the availability of good affordable housing in the area where they live (rural over urban, adjusted)
housing_poorest	Odds ratio of being satisfied with the availability of good affordable housing in the area where they live (poorest 40% over richest 60%, adjusted)
	Health inequality (Figure 15)
IOp50_activity	Ex ante inequality of opportunity in having a general activity limitation (age group 50 years or over)
IOp50_adl	Ex ante inequality of opportunity in having one or more limitations with activities of daily living (age group 50 years or over)
IOp50_chronic	Ex ante inequality of opportunity in having two or more chronic diseases (age group 50 years or over)
law_reproductive	Legal framework not protecting women's reproductive health and rights
practice_reproductive	Percentage of currently married or in-union women of reproductive age (15–49 years) who want to cease or delay childbearing but are not using any method of contraception
BMI_gini	Gini coefficient of BMI values
illness_female	Odds ratio of people reporting a chronic health condition (female over male, adjusted)
illness_junior	Odds ratio of people reporting a chronic health condition (young adult over middle-aged adult, adjusted)
illness_native	Odds ratio of people reporting a chronic health condition (native over foreign born, adjusted)
illness_tertiary	Odds ratio of people reporting a chronic health condition (having tertiary education over not having tertiary education, adjusted)
illness_white	Odds ratio of people reporting a chronic health condition (white-collar over blue-collar worker, adjusted)
illness_rural	Odds ratio of people reporting a chronic health condition (rural over urban, adjusted)
medical_female	Odds ratio of people reporting unmet medical care needs (female over male, adjusted)
medical_junior	Odds ratio of people reporting unmet medical care needs (young adult over middle-aged adult, adjusted)

Label in heatmaps	Indicator name
	Health inequality (Figure 15)
medical_elderly	Odds ratio of people reporting unmet medical care needs (elderly over middle-aged adult, adjusted)
medical_native	Odds ratio of people reporting unmet medical care needs (native over foreign born, adjusted)
medical_white	Odds ratio of people reporting unmet medical care needs (white-collar over blue-collar worker, adjusted)
medical_rural	Odds ratio of people reporting unmet medical care needs (rural over urban, adjusted)
	Mental health inequality (Figure 17)
depressed_female	Odds ratio of feeling depressed (female over male, adjusted)
depressed_junior	Odds ratio of feeling depressed (young adult over middle-aged adult, adjusted)
depressed_senior	Odds ratio of feeling depressed (senior over middle-aged adult, adjusted)
depressed_elderly	Odds ratio of feeling depressed (elderly over middle-aged adult, adjusted)
depressed_native	Odds ratio of feeling depressed (native over foreign born, adjusted)
depressed_tertiary	Odds ratio of feeling depressed (having tertiary education over not having tertiary education, adjusted)
depressed_white	Odds ratio of feeling depressed (white-collar over blue-collar worker, adjusted)
	Working life inequality (Figure 22)
IOp30_white	Ex ante inequality of opportunity in having a white-collar job (age group 30–49 years)
upward_white	Probability of transition from blue-collar parents to white-collar children (age group 30 years or over)
mother_working	Percentage of the population that believes that children will suffer when women work for pay outside the home
job_abs_gini	Absolute Gini of job satisfaction scores
manager_female	Odds ratio of being in managerial jobs (female over male, adjusted)
manager_junior	Odds ratio of being in managerial jobs (young adult over middle-aged adult, adjusted)
manager_senior	Odds ratio of being in managerial jobs (having tertiary education over not having tertiary education, adjusted)
manager_native	Odds ratio of being in managerial jobs (rural over urban, adjusted)
manager_tertiary	Odds ratio of being in managerial jobs (having tertiary education over not having tertiary education, adjusted)
manager_rural	Odds ratio of being in managerial jobs (rural over urban, adjusted)
	Education inequality (Figure 30)
IOp30_tertiary	Ex ante inequality of opportunity in tertiary education attainment (age group 30–49 years)
IOp50_tertiary	Ex ante inequality of opportunity in tertiary education attainment (age group 50 years or over)
G2-G3_tertiary	Probability of transition from non-tertiary educated parents to tertiary educated children
family_tertiary	Probability of transition from non-tertiary educated grandparents to tertiary educated parents or tertiary-educated children
maths_p90p10	P90/P10 ratio of PISA scores in mathematics
reading_p90p10	P90/P10 ratio of PISA scores in reading
maths_female	Odds ratio of underachievement in mathematics (female over male)
maths_native	Odds ratio of underachievement in mathematics (native over first-generation immigrant)
reading_female	Odds ratio of underachievement in reading (female over male)
reading_native	Odds ratio of underachievement in reading (native over first-generation immigrant)
tertiary_female	Odds ratio of tertiary education attainment among individuals aged 30 years or over (female over male, adjusted)
tertiary_senior	Odds ratio of tertiary education attainment among individuals aged 30 years or over (senior over middle-aged adult, adjusted)
tertiary_elderly	Odds ratio of tertiary education attainment among individuals aged 30 years or over (elderly over middle-aged adult, adjusted)
tertiary_native	Odds ratio of tertiary education attainment among individuals aged 30 years or over (native over foreign born, adjusted)
tertiary_rural	Odds ratio of tertiary education attainment among individuals aged 30 years or over (rural over urban, adjusted)

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TJ-07-23-019-EN-N

The COVID-19 pandemic had varying impacts on social groups, depending on existing disadvantages, and it was widely believed that it triggered a rise in inequalities across different areas of life. Using indicators from the EU's Multidimensional Inequality Monitoring Framework (MIMF), this report shows how inequality in the spheres of income, health, employment and education changed between 2010 and 2020. It also examines the main drivers of this change during the pandemic and explores the relationships between government policies in several domains and inequality.

The European Foundation for the Improvement of Living and Working Conditions (Eurofound) is a tripartite European Union Agency established in 1975. Its role is to provide knowledge in the area of social, employment and work-related policies according to Regulation (EU) 2019/127.

Publications Office
of the European Union

ISBN 978-92-897-2309-1
doi:10.2806/439913