Social, health, and economic impacts of the COVID-19 pandemic and the epidemiological control measures

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First results from SHARE Corona Waves 1 and 2

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1 Social, health, and economic impacts of the COVID-19 pandemic and the epidemiological control measures

1 Introduction

The COVID-19 pandemic and the measures implemented to prevent the spread of SARS-CoV-2 infections had major effects on the economic and social well-being of the older population: during the pandemic, Europe experienced the largest recession since WWII; free movement, one of the European Union's fundamental achievements, was interrupted; and people avoided seeking medical treatment out of fear of infection. This volume reports on the first results of two special telephone surveys that were conducted by SHARE, the Survey of Health, Ageing and Retirement in Europe, with the aim of improving our understanding of the potential antecedents and the consequences of the pandemic, and investigating the unintended effects of infection control measures on key health, economic, and social outcomes across Europe.

SHARE is a multidisciplinary cross-national longitudinal database of individual-level data on the health, socio-economic status, and social and family networks of individuals aged 50 or older (see Börsch-Supan et al. 2013). The SHARE data address the very age cohort that is most affected by both the pandemic and the epidemiological control measures. Workers aged 50+ – who make up about 25% of the total labour force – are especially vulnerable to job losses. Retirees are very vulnerable to wealth losses. Individuals aged 65+ are exceptionally vulnerable to the disease itself. At older ages, people are often vulnerable because they live alone or in an institution. The SHARE data allow researchers to identify mental health and health inequalities, and to examine the impact of pre-existing health conditions and comorbidities and precarious socio-economic conditions on older adults. The SHARE data are ideally suited for use in analyses of the social, health, and economic impacts of the COVID-19 pandemic and the accompanying infection control measures, as conducting such analyses requires a transdisciplinary, international and longitudinal approach: *transdisciplinary* because the outcome domains – health, economic, social – are highly interconnected; *international* because the pandemic's severity and the epidemic control measures that were implemented dif-

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fered across Europe; and *longitudinal* because we learn the most from systematically comparing the resulting outcomes *before and after* the onset of the pandemic.

SHARE launched the first SHARE Corona telephone survey just four months after the outbreak of the COVID-19 pandemic (Scherpenzeel et al. 2020). Its objective was to ask SHARE respondents about their experiences during the first phase of the pandemic, and thus during a period when countries were implementing different lockdown measures. At that time, people were dealing with health events, such as SARS-CoV-2 infections; health care challenges, such as a lack of access, long waiting times, and overcrowding at health clinics; economic shocks, such as unemployment or income losses; and social shocks, such as experiencing isolation or a lack of help. The key advantage of these new data is their link to the SHARE panel study, which contains life course information on respondents' previous health conditions and economic and social living conditions. The first SHARE Corona telephone survey was fielded in 28 countries from June to August 2020 (N = 57,559). Interviews were conducted by telephone with all respondents who were interviewed from October 2019 to March 2020 as part of SHARE Wave 8. Hence, the data allow for a person-by-person comparison of the respondents' health, economic, and social situations immediately before and after the outbreak of the pandemic.

Funded by the European Commission's Directorate General for Research and Innovation under the SHARE-COVID19 project (Grant No. 101015924), a second SHARE Corona telephone survey was fielded among the same respondents about a year later (N = 49,253). This second round of data allow for distinctions to be made between the short-run and the long-run effects of the pandemic, and for assessments of how the respondents adapted as several further waves of the pandemic hit Europe.

The 30 minute SHARE Corona survey included COVID-19-specific questions, such as the following:

– *Epidemiological questions,* such as: Did you have COVID-19 symptoms? Have you been tested? Did you have COVID-19? Did you have other illnesses during the lockdown? Did your health behaviours change in response to the pandemic (smoking, drinking, wearing a mask, distancing)?
– *Questions about the quality of the health care system,* such as: Were you able to access a doctor in an acceptable amount of time? Did you have to postpone a previously planned operation? Were you treated satisfactorily in the hospital? Did you experience queues? Crowding? Unhygienic conditions?
– *Economic questions,* such as: Did you experience unemployment or short-time work? How much income have you lost? Have your income losses been offset by government transfers or by other means? If self-employed: What happened to your business? Were you unable to pay your monthly bills? Did you need to dip into your savings?

– *Sociological questions,* such as: Who were you in contact with? Who helped you? Did you help someone? Were you isolated? Did you have mental health problems?

The work presented in this volume is part of a major project funded by the European Commission's Directorate General for Research and Innovation under the heading SHARE-COVID19 (Grant No. 101015924). The six substantive sections in this volume are structured by the six work packages of this ongoing project, which, in turn, correspond to six major aims of the project.

Section 2 addresses the *quality of health care*. It aims to identify health care inequalities before, during, and after the pandemic, and their effects across all EU member states. It asks the following questions: To what extent has COVID-19 limited access to essential care services? Which services are most likely to be crowded out in a subsequent epidemic? Who are the individuals most likely to forego or be denied essential care? Who are the individuals whose long-term health will be most severely affected by the changes in health care quality related to the epidemiological control measures?

Section 3 looks at *health and health behaviours*. It aims to understand the effects of the lockdown on health and health behaviours, and asks the following questions: What were the initial effects of the pandemic on people's physical and mental health? How did the levels of lockdown in different countries affect people's physical and mental health? What preventive physical and social distancing and hygienic measures were employed successfully? What can we learn from people's previous vaccination behaviour?

Section 4 analyses the *labour market implications of the lockdown.* It examines the following questions: Did short-time employment aid prevent job losses among people aged 50+, or did it simply postpone them? Did the efficacy of short-time employment aid differ across the EU member states, or by gender, age, health status, or sector? Were there changes in people's retirement decisions? How did working arrangements change, especially remote work, and to what extent did these changes depend on workers' IT skills? Which sectors of the economy have adapted well, and which have adapted less well, to the shift towards remote work? Have the numbers of hours people are working decreased or increased as a result this shift? Did this transition put women in more stressful situations?

Section 5 assesses the impacts of the pandemic and the accompanying lockdowns on *income and wealth inequality.* It investigates the following questions: How were people's income and wealth affected by the epidemiological control measures that were implemented? How well did the existing safety nets work? Were the hastily designed welfare state measures that were introduced effective? To the extent that they were ineffective, who was at risk of falling into poverty?

Did outcomes differ between countries, especially between countries in "old" and "new" Europe? Where were the differences by gender, age, and educational status particularly large, and where do they need to be addressed most urgently? Has the link between income and health inequality been strengthened, and are further policy actions required?

Section 6 focuses on the *social and geographical patterns* during the pandemic. It examines efforts to mitigate the effects of infection control policies on social relationships. It asks the following questions: What were the initial effects of socially oriented epidemiological control measures on the stability of social networks, and on the help given and the help received? To what degree was the stability/instability of social networks related to health behaviours and utilisation of health services during the early months of the pandemic? Moreover, does the Mediterranean social structure explain the high mortality in Italy and Spain? Why was Greece different, and what can Italy and Spain learn from Greece?

Finally, Section 7 looks at people's *housing and living arrangements* – independent, co-residential, or institutional – during the pandemic. It asks the following questions: To what extent can the effects of the pandemic on the health and well-being of individuals be attributed to their housing conditions and living arrangements? Was housing an important mediator of socio-economic inequalities in the impact of the pandemic? Can differences in the spread and the individual effects of the pandemic across European countries be linked to regional variation in housing conditions? Is there an association between people's housing conditions and their propensity to work from home? Will the pandemic change the housing choices and conditions of ageing individuals over the short and the longer run?

The research presented in this volume helps to answer these questions. The articles reflect a broad range of topics covered by SHARE at the intersection of health, the social environment, and behaviour. As the authors come from various countries as well as different disciplines, this volume mirrors the interdisciplinary approach to investigating ageing that guides SHARE. All of the authors highlight the implications of their findings for the formulation social policies, and make recommendations for strengthening European societies during pandemics. Taken together, the contributions paint a broad picture of the social, health, and economic consequences of the COVID-19 pandemic, and of the infection control measures that accompanied it. A key message is that the risks faced by older European adults during the pandemic differed depending on their age group, with the young old, who were still economically active, having a much higher risk of experiencing a crisis-induced job loss, and subsequent economic hardship. However, the risk levels faced by the young old also differed depending on their socio-economic characteristics, job profiles, and countries of residence. Most papers found that the pandemic has increased levels of economic, social, and health inequality. The oldest old responded to their higher mortality risk by engaging in more pronounced precautionary behaviour, which often led to social isolation, and threatened their psychological well-being.

Finally, we note that the contributions in this volume are based on the SHARE Corona survey, the eight preceding SHARE waves, the SHARELIFE histories, and the SHARE end-of-life interviews. These data cover the initial phase of the pandemic. Originally, we, like so many others, had hoped that the pandemic would be history after the two SHARE Corona telephone surveys had been completed. As we now know, this wish has not come true; at the time of this writing (November 2022), SARS-CoV-2 infections are still widespread, but dealing with the virus has become part of our daily routine. In this new environment, data collection for the next "normal" Wave 9 of SHARE has just been finished. The data will be released in 2023, and should further enhance our understanding of the interdependent dynamics of the pandemic and societal reactions to it, and provide more evidence on the long-term social, health, and economic effects of the COVID-19 pandemic, and of the infection control measures that were imposed to limit the spread of the virus.

2 Quality of health care

The COVID-19 pandemic forced European health systems to reorganise their operations, and to allocate health care resources to prevent the spread of SARS-CoV-2 and its adverse health effects, especially among older adults. Consequently, health care providers sometimes had to postpone or deny medical treatments to patients, leading to sizeable reductions and discontinuities in medical care provision for conditions not related to COVID-19. In addition, many older adults decided to forego medical treatments out to fear of being infected with SARS-CoV-2. What were the immediate effects of the pandemic on the quality of health care? What were the characteristics of the individuals who were most likely to report unmet health care needs? Can we detect health care inequalities before and during the pandemic, and their effects across the EU? To answer these and many more important questions, and to provide specific policy recommendations aimed at improving the resilience of the health systems of EU member states in the event of future health emergencies, several researchers analysed the data from two waves of the SHARE Corona survey, as well as data from previous SHARE waves. The second section of this book presents the results of their initial investigations.

Šime Smolić and his co-authors studied the persistence of limited access to health care for older Europeans during the COVID-19 pandemic. They found that many SHARE respondents from European countries and Israel experienced persistent barriers to health care access throughout the pandemic. The authors reported that older adults and occupationally active individuals had lower odds of repeatedly having medical treatments postponed and denied. However, they also found that individuals who had poor overall health, who were vaccinated against COVID-19, or who had COVID-19-related health symptoms, were more likely to report having ongoing problems accessing health care. The authors recommended that access to health care services be improved for vulnerable populations: i.e., for women, people in poorer health, and economically deprived individuals.

Julien Bergeot and Florence Jusot investigated the impact of having unmet health care needs on people's self-assessed health and functional limitations during the first wave of the COVID-19 pandemic. They found that many Europeans reported having unmet health care needs during the pandemic, and that having unmet health care needs was associated with having a lower self-assessed health status and an increase in the severity of functional limitations. The authors warned that the detrimental effects of having unmet care needs on the health status of older adults might persist over the long term. They concluded by noting that continuity of care is important to prevent potentially long-lasting adverse health effects, especially for older individuals.

In their chapter, Louis Arnault and Florence Jusot examined inequality of opportunity in the risk of suffering from persistent symptoms of COVID-19. They found that individuals' social backgrounds and current circumstances, such as their current socio-economic status or chronic conditions, had a significant impact on inequalities in the likelihood of reporting persistent symptoms of COVID-19. Their results indicate the need for efficient public policies – regardless of their potential costs or collateral effects – to protect individuals who face the highest risk due to circumstances beyond their control. However, as the authors also observed that the probability of reporting persistent symptoms of COVID-19 also depends on the efforts individuals make to avoid suffering from persistent symptoms of COVID-19, such as respecting barrier gestures and vaccination recommendations, they suggested that some of the public policies that are implemented should also be based on individual responsibility.

Alice Delerue Matos and her co-authors looked at how economic and health system policies during the pandemic affected the mental health of older adults. The authors found large variation in the proportions of older adults who reported experiencing depression/sadness during the COVID-19 pandemic in 26 European countries and Israel. They also showed that economic support policies reduced the chances of older adults reporting depression/sadness. They concluded that the restrictive measures aimed at controlling the spread of COVID-19 and the preventive health measures implemented by governments during the pandemic did not affect the mental health of the older population. Finally, the authors recommended that preventive public health and containment measures be accompanied by policies aimed at strengthening the health system's response capacity to ensure that individual health problems are not neglected.

3 Health and health behaviours

The COVID-19 pandemic has been a major threat to people's health and life, especially with advancing age. To limit the spread of the virus, governments imposed lockdowns, hygienic social distancing measures, and restrictions on social activities with families and friends. SHARE provides unique data on how the COVID-19 pandemic affected the mental health of Europeans.

Abramowska-Kmon and colleagues analysed data from CATI-1 and CATI-2. They found that for older adults, having less contact with their children and friends was negatively associated with mental health, as was having no contact with their friends or experiencing a deterioration in their personal financial situation.

Using data from CATI-1 and CATI-2, Gruber and Atzendorf looked at changes in older adults' mental health over time, and found that their feelings of depression lessened over time, while their loneliness levels were unchanged. The analysis of the CATI-1 data showed that a high mortality rate and a greater number of days with stringent epidemic control measures significantly increased the respondents' feelings of depression, but not of loneliness. In contrast, the analysis of the CATI-2 data indicated that increased feelings of loneliness were significantly associated with a higher mortality rate.

While these results are based on the CATI-1 and CATI-2 interviews that were conducted shortly after the two major waves of the COVID-19 pandemic, Wester et al. compared mental health data from the CATI-1 with pre-pandemic data. They found that while loneliness increased from the pre-pandemic Wave 8 to CATI-1, older adults' feelings of depressive symptoms and sleep problems decreased. They also showed that stricter policy measures attenuated the positive results. Their findings underline the importance of having longitudinal data, such as the SHARE survey data, to understand what can happen to people when Europe is under threat.

As well as advanced age, behavioural risk factors (BRFs), such as smoking, episodic heavy drinking, physical inactivity, obesity, and unhealthy food intake, increases individuals' risk of having poor outcomes if they are infected with SARS-CoV-2. In a previous study based on CATI-1 data, Hannemann et al. found an association between behavioural risk factors and less adherence to handwashing and sanitising, but not to mask wearing and social distancing. Here, they present the results of their analysis of the CATI-2 data, in which they show that being engaged in 3+ BRFs was significantly associated with a decreased likelihood of distancing from others.

Having lingering symptoms for months after a COVID-19 infection is common, and can lead to several disabling symptoms. Out of 3156 respondents who had tested positive for COVID-19, 22% reported having at least one disabling symptom, with fatigue, pulmonary symptoms, and pain being the most prevalent. Respondents aged 70+ and those with a medium or lower educational level were at higher risk of having disabling symptoms. Moreover, SHARE respondents who had been hospitalised because of a COVID-19 were 26 times more likely than those who had not to have disabling symptoms.

The chapter by Scheel-Hincke et al. examined sex differences in changes in social activities, self-rated health, and mental health based on data from the CATI-1 survey. They found that women had a higher risk than men of reducing their social activities across all measures, with the largest difference being observed for the probability of going shopping, and the smallest difference being observed for the probability of going for a walk. Similar sex differences were found for poorer self-rated health and the three mental health outcomes (feeling more nervous, feeling more depressed, having more sleep problems). The patterns of gender differences were similar across European regions.

4 Labour market implications

This section of the book investigates the long-term and more persistent effects of the pandemic on labour market outcomes, and especially on transitions into unemployment or retirement for individuals aged 50 or older. It also looks at the role of specific income policies aimed at protecting individuals against (temporary) income losses resulting from the adverse economic conditions during the COVID-19 crisis. It describes the different patterns that emerged, partly due to the spread of the virus itself affecting the behaviour of workers and firms, and partly due to the lockdowns and restrictive measures imposed by different countries in conjunction with mitigating policies.

Thanks to the innovations introduced in the second SHARE Corona telephone survey, a more precise mapping of the labour market status of older Europeans is possible, including in relation to the timing of the spread of the virus. While the pandemic affected the retirement behaviour of older workers, its effects varied depending on the characteristics of the worker and the type of job. Although the average retirement age increased, specific population groups anticipated their labour force exit, especially in response to mental health-related conditions, but also in response to the restrictions imposed in many countries. Working from home was found to be associated with later retirement, which suggests that having access to remote working may provide a bridge to retirement, and extend working life (Bassoli, Belloni, Brugiavini, and Gao, Buia, Cavapozzi, Pasini and Simonetti).

Most European countries introduced containment measures that can be quantified through the stringency index, a summary measure of these restrictions that varies by country and by day. While it appears that when these specific restrictions were lifted, the overall working patterns of older workers were restored (Theodoropoulos and Voucharas), an analysis focusing on the specific group of workers who experienced work interruptions in the first wave of the COVID-19 pandemic showed that this group of workers faced a higher likelihood of entering unemployment or exiting the labour market. Furthermore, women and less educated workers represented more vulnerable categories of workers. This was especially the case for individuals with interruptions of longer duration (more than eight weeks): i.e., longer spells away from work were often associated with a permanent exit from the labour force (Brugiavini, Buia, Ferrari, Gao and Simonetti).

At a more "macro" level, the characteristics and actions of workers, as well as the characteristics of the labour market and health policies, were important drivers of resilience on the job: four main homogeneous groups of workers/countries (clusters) were defined, with less skilled, less educated, and older workers living in a country with a higher incidence of infections appearing to be more vulnerable. However, the distribution of these clusters shows that the individuals who were least affected in terms of job disruptions were those living in Central and Eastern European countries. An important point is that vaccination was found to be positively correlated with the cluster of individuals who did not report having any major work disruptions (Chłoń-Domińczak, Holzer-Żelażewska, Strzelecki and Taracha).

These results highlight the role played by policies in shaping labour market outcomes. However, in addition to lockdowns and heath policies, income support programmes aimed at workers, firms, and households were crucial during the pandemic. In most SHARE countries, levels of short-time employment aid (STEA) were especially high during the first wave of the COVID-19 pandemic. STEA typically covered more vulnerable individuals (i.e., those who were less educated, previously unemployed, or in the lowest income tercile) who were still experiencing a decrease in their working hours in the second phase of the pandemic, despite the relaxation of containment measures. In the longer run, STEA may have extended the life of unproductive companies, which might, in turn, have contributed to the incidence of unemployment, especially for older workers (Börsch-Supan, Kutlu-Koc and López-Falcón). These findings suggest that a more careful targeting of short-term income policies is needed.

One of the important lessons learned during the pandemic is that remote working, when viable, represents not just a short-term response to an emergency situation, but one of the multiple facets of future work arrangements for older workers. However, we show that there are important differences in the types of jobs and the tasks performed in remote work arrangements, as the digital divide plays a crucial role in the likelihood of older workers exiting the labour market into unemployment, even when other factors are taken into account, such as age, gender, and education (Brugiavini, Buia, Ferrari, Gao and Simonetti).

Labour market outcomes are not the only measures of welfare that depend on information and technology skills. During the pandemic, older people increasingly used the internet to search for health-related information, to conduct online banking, and to purchase goods and services (Principe and Weber). Hence, policy measures that provide older people with IT training may prevent them from having longer unemployment spells or exiting the labour market early, and could have positive spill-over effects on other life domains.

5 Impact on income and inequality

The pandemic, and the accompanying lockdown measures, had a major impact on economic activity, and on the financial situations of the population. Governments introduced financial support measures that, together with the existing safety net provided by the welfare state, should have protected individuals and households from financial distress. This section of the book presents an analysis of the effectiveness of these policies.

Andrea Bonfatti, Greta Pesaresi, Guglielmo Weber, and Nancy Zambon investigated the economic impact of the first wave of the pandemic on Europeans aged 50+ by constructing a financial distress indicator that captures income losses, difficulties making ends meet, and delays in paying bills. They found that experiencing financial distress was largely associated with having a low SES or experiencing a job interruption. Individuals above retirement age were better protected than younger adults thanks to the income they received from the public pension system.

Agnieszka Chłoń-Domińczak and Dorota Holzer-Żelażewska showed that a number of indicators of economic stress varied across individuals and countries during the first wave of the pandemic. Their key finding was that while most variability was at the individual level, country differences, as measured by the human development index (HDI), were also important. Individuals living in countries with a higher HDI suffered less from economic stress, possibly because they had more savings, or because they had access to more generous welfare benefits.

Alexander Schumacher and Arne Bethmann used data from both Corona surveys to compare changes in income and in difficulties making ends meet at different stages of the pandemic. They found that there were large income declines, particularly among the relatively poor and people in Southern and Eastern countries, and that these declines grew over time. The authors also showed that changes for the worse in difficulties making ends meet exhibited a strong socioeconomic and geographic gradient, which, however, became less marked over time. They also noted that the different dynamics of these two indicators is an interesting finding that calls for an explanation.

Debdeep Chattopadhyay, Francesco Maura, Greta Pesaresi, and Guglielmo Weber investigated whether such an explanation could be found in the COVID-19-related economic support provided during the pandemic by looking at the determinants of the changes over time in the financial distress indicator described above. Their key result was that financial support measures that were introduced to alleviate the economic impact of the COVID-19-related restrictions were indeed effective in reducing the financial distress of households, particularly those hit by job interruptions during the first wave of the pandemic.

Finally, Ivo Bakota's chapter builds upon the analyses described above to ask an important question: As pandemic lockdowns have benefits and costs that vary across the population, which groups are most likely to favour tighter lockdown measures? After introducing differences in employment and health risks into a hybrid epidemiological/economic model, he found major differences in preferences for government-imposed lockdown policies. In particular, he observed that retired and high-income individuals preferred stricter lockdown policies, as did service sector workers, even though they bore a higher economic cost of lockdowns.

6 Social and geographical patterns

The social, cultural, and national contexts in which people live shape their day-to-day behaviours as well as their feelings, beliefs, and opportunities. Do these same contexts influence people's lives differently during a national crisis, such as that caused by the COVID-19 pandemic? The SHARE data uniquely provide researchers with the means to address this crucial question. Thus, several investigators explored various social and geographical patterns in relation to the infection control measures that were imposed in response to the pandemic, and their corresponding effects. This section of the book presents the results of their initial investigations.

Michael Bergmann and Melanie Wagner looked at the situations of older people who were receiving care at home at the outbreak of the pandemic and in the months that followed. They found that the health of the care recipients, both physical and mental, was initially affected by the pandemic. Fortunately, however, by the second study period, which was one year after the first SHARE Corona telephone survey, care services for older adults were more widely available. Equally important, they found that unmet care needs had declined over this period.

Andrej Srakar also looked at home care recipients, but from a different perspective. He examined the effects of the lockdown measures on the receipt of home care, and found that responses to the pandemic and their effects on home care provision varied considerably across different countries. The author also observed that the differing responses were conditioned by several factors, including the welfare regime, the long-term care system, and the pandemic response characteristics in each country.

Christian Tolstrup Wester and colleagues performed a geographical comparison in their chapter, but in relation to a different outcome: namely, COVID-19 vaccine take-up. They reported that people who prayed daily were generally more hesitant to take the vaccine than people who did not. Moreover, they found that among people who prayed daily, those in Western, Northern, and Eastern Europe were indeed more likely to be vaccine-hesitant, while those in Southern Europe were not. The authors concluded that religiosity may be related to vaccine scepticism, and called for more research to explain this association.

Lasse Scheel-Hincke and his co-authors performed a different kind of geographical study, in which they compared two specific countries in relation to the governmental response to the COVID-19 pandemic. Although similar in background and culture, Sweden and Denmark implemented lockdown measures that differed in their levels of strictness. Nevertheless, a year or more after the outbreak, there were only minor health and mental health differences between older Swedes and Danes. The authors therefore observed that governmental recommendations seem to have been as effective as more severe restrictions.

In their chapter, Sharon Shiovitz-Ezra and her co-investigators examined whether the stringency of the epidemiological control measures that were enacted in different countries was related to “how old” people in each country felt. They found that strict epidemiological control measures at the country level were indeed associated with older subjective age, but moderate control measures were not. Since older subjective age may have negative health consequences late in life, the risks associated with implementing strict control measures should be taken into account.

7 Housing and living arrangements

The lockdown policies imposed in spring 2020 made home the centre of life for Europeans. Even after lockdowns were lifted, the pandemic disruptions and the fear of contagion persisted. This triggered a renewed interest in the housing conditions of older Europeans.

The chapter by Šime Smolić, Stipica Mudražija, Nikola Blaževski, and Margareta Fabijančić concentrates on living arrangements. Relying on self-reported health data, the authors found that older adults who were living alone were more likely to report a decline in health during the COVID-19 pandemic than their counterparts who were living with others, while more generous health and social protection expenditures were related to a more moderate decline in health.

Along the same lines, Ivan Čipin, Petra Međimurec, and Dario Mustač showed that the risk of testing positive for COVID-19 was highest in households in which respondents co-resided with their children and grandchildren. They also found that the effect of household composition on morbidity was larger in "old" than in "new" European countries, which points to the need to fine-tune policies aimed at reducing COVID-19 transmission.

Yarine Fawaz, Anne Laferrère, Pedro Mira, and Elizaveta Pronkina found that nursing home residents were more likely to develop COVID-19 symptoms or to test positive for the virus than older people living in private homes with a similar observed health status before the pandemic. For those living in the community, living in an apartment rather than a house increased the likelihood of contracting COVID-19. Being active as usual in the labour market, or having an active spouse, especially if the partner did not work remotely, also increased the risk of contagion.

Finally, Inés Berniell, Anne Laferrère, Pedro Mira, and Elizaveta Pronkina went beyond a sole focus on the direct effects of the virus on health by also examining the potential associations between lockdown policies and the mental well-being of Europeans aged 50+, and how they were mediated by housing conditions. They found that living in an apartment in a city, which was previously linked to feeling less lonely, was associated with higher levels of loneliness and depression, especially for women. Closeness to adult children also became more important. Relative to that of the general population, the mental well-being of married individuals declined, particularly if they were living only with their spouse.

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Part I Quality of health care

Edited by Florence Jusot and Šime Smolić

Šime Smolić, Ivan Čipin and Petra Međimurec

2 Persistence of limited access to health care for older Europeans in the course of the COVID-19 pandemic

Key points

- Over 7% of SHARE respondents from 27 European countries and Israel experienced lasting barriers to health care access throughout the pandemic, with notable differences by country in reports of having medical care postponed or denied.
- The odds of having medical treatments postponed or denied repeatedly were lower for older adults and occupationally active individuals.
- Recurring limits to health care access were reported more frequently by respondents who had poor overall health, who were vaccinated against COVID-19, or who had COVID-19-related health symptoms.
- Access to health care services should be improved for vulnerable populations, including for women, people in poorer health, and economically deprived individuals.

1 Introduction

In 2019, almost 24% of the EU population aged 65 or older had self-reported unmet health care needs, for reasons including financial costs, distance to health care facilities, lack of transportation, or being placed on a waiting list. Across the EU, the share of the population aged 65+ who had unmet health care needs was the highest in Portugal (41.4%) and the lowest in Cyprus (7.5%) (Eurostat, 2022). Therefore, it appears reasonable that the issue of barriers to health care access for older adults has attracted considerable attention from public health authorities and policymakers. In general, having limited access to health care could result in adverse health outcomes, and thus in a reduction in health status (Andersen, 1995). Furthermore, many studies have confirmed that older adults with unmet health care needs tend to be at a higher risk of morbidity and mortality.

The ongoing COVID-19 pandemic and the measures used to control its spread have limited access to health care at almost all levels of health care provision. Although we can identify barriers to health care access across entire populations, we should emphasise that individuals differ substantially in the extent of the difficulties they experience in accessing care (Patel et al., 2020). Previous studies have suggested that the degree to which people had limited access to health care during the

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COVID-19 pandemic depended on many individual characteristics, such as health and socio-economic status (Arnault, Jusot and Renaud, 2022). Moreover, access to health care varied depending on the conditions in each country, especially those related to the epidemic control measures or the institutional framework of the health care system, such as the stringency of the epidemic control measures or the organisation of the health care system. Research papers that have used data from the first SHARE Corona Survey (SCS1) have shown that occupationally active people, women, better educated people, and people living in urban areas were more likely to report having unmet health care needs in the early stages of pandemic (Smolić, Čipin and Međimurec, 2022). In addition, accessing health care was more challenging for older adults who were economically vulnerable and in poorer health even before the outbreak (Arnault, Jusot and Renaud, 2022).

The main goal of this chapter is to explore the persistence of unmet health care, and two different dimensions of unmet health care needs in particular, among older adults who participated in the SHARE Corona Surveys (SCS1 and SCS2). To measure the unmet health care needs of the respondents in each SCS, we use variables that indicate that these older adults experienced a postponement or a denial of health care services because of the pandemic by either health care facilities or health care professionals. We distinguish between a) older adults who reported facing ongoing barriers to health care access both after the outbreak and between the two interviews; and b) older adults who did not report having any unmet care needs, who faced barriers to access but reported receiving deferred medical treatment between the two interviews, or who reported having unmet health care needs after the outbreak, but not in the SCS2. We then investigate the characteristics of older Europeans who experienced lasting barriers to health care access, focusing mainly on socio-demographic and health-related variables. Finally, we discuss our findings regarding the persistent unmet health care needs of older Europeans during the COVID-19 pandemic, and the policies that could address those needs.

2 Data and methods

In this study, we combine SCS1 and SCS2 data with additional information on respondents from earlier ("regular") SHARE waves (to this end, we use SHARE Wave 8 and a harmonised SHARE dataset that combines into a single database all data from SHARE Waves 1–7). We restrict the sample to respondents aged 50+ at the SCS2 interview. The outcome is a dichotomous indicator of whether each respondent experienced lasting barriers to accessing health care. For example, if a respondent reported having a medical appointment postponed or denied in SCS1 and SCS2,[1] the indicator was coded 1, and was otherwise coded 0. The strategy for defining the outcome variable is presented in Figure 1.

The first group of predictors is comprised of variables on basic socio-demographic characteristics: age, gender, living arrangements (living alone vs not living alone), area of residence (rural vs urban), and education (low, medium, or high). Information on the respondent's area of residence and education level is obtained from SHARE Wave 8 or, if unavailable, from the Harmonised SHARE[2] dataset containing data from previous SHARE waves. Other variables are taken from the SCS2. The second group is comprised of measures of socio-economic status: self-reported job situation (retired, working, or another employment status) and the ability to make ends meet since the outbreak (easily vs with difficulty). Again, the source for both variables is SCS2. Finally, the third group is comprised of health-related variables: current self-assessed health (SAH) (excellent, very good, or good vs fair or poor), SAH before the outbreak (excellent, very good, or good vs fair or poor), an indicator of whether the respondent was vaccinated against COVID-19, an indicator of whether the respondent had COVID-19 symptoms since the last Corona interview (yes vs no), the number of chronic conditions (none or 1 vs 2+), and an indicator of whether the respondent reg-

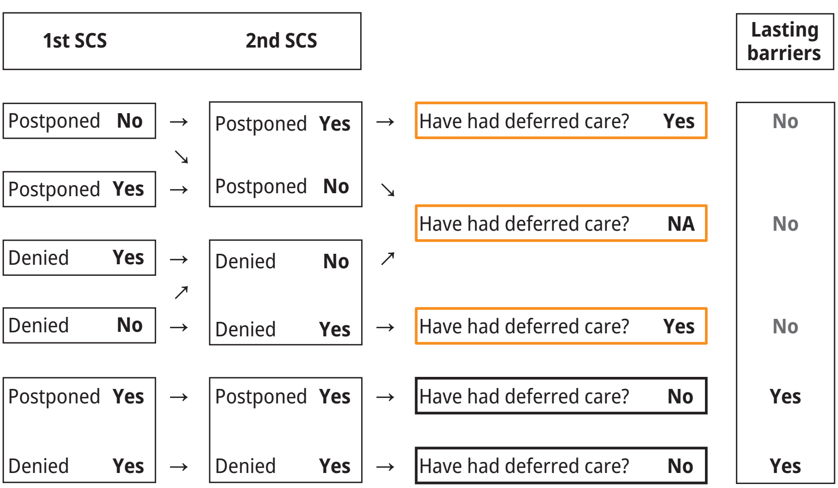

Figure 1: Defining the outcome variable.
Notes: NA – not asked in the SCS2.

1 For example, it was coded 1 if answer = 'Yes' to caq010_ or caq015_ in SCS1 and to caq110_ or caq115_ in SCS2 (see http://www.share-project.org/data-documentation/questionnaires/corona-questionnaire-2.html for more details).
2 Developed by the Gateway to Global Aging Data, for more details see https://g2aging.org/.

ularly takes prescription drugs (yes vs no). All health-related variables are taken from the SCS2, except for the SAH before the outbreak, which is taken from the SCS1.

Our analytic sample includes 44,758 respondents aged 50 or older in 27 European countries and Israel. Nearly 55% were women, 52% were aged 50–64, 34% were aged 65–79, and 14% were aged 80 or older. Almost one in four respondents were living alone, and most were living in an urban area (64%). Around half of respondents were retired, one in three was employed, and close to 30% had difficulties in making ends meet with their monthly household income. In terms of health status, over one in three older adults was in poor or fair health, 36% reported having two or more chronic conditions, and close to 70% were taking prescription drugs regularly. In addition, only 17% of the older adults in the sample were not vaccinated against COVID-19, and only a small proportion (6%) experienced COVID-19 symptoms (6%). Slightly over 7% of the SHARE respondents aged 50 or older experienced lasting barriers to accessing health care during the pandemic. Finally, Figure 2 shows the prevalence of lasting barriers to health care ac-

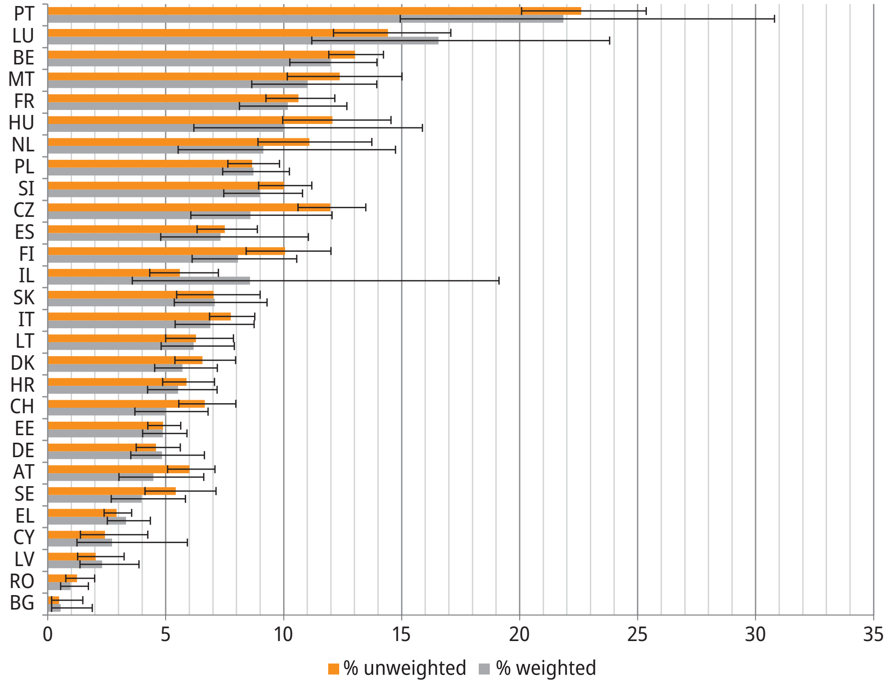

Figure 2: Prevalence (%) of lasting barriers to health care access across SHARE countries.
Note: N = 44,758. Error bars represent 95% confidence intervals.
Source: SHARE Wave 8 and SHARE Corona (W1 & W2), release 8.0.0.

cess across SHARE countries. There were substantial differences across countries, with lasting barriers to accessing health care being the most common in Portugal and Luxembourg, and the least common in Romania and Bulgaria[3].

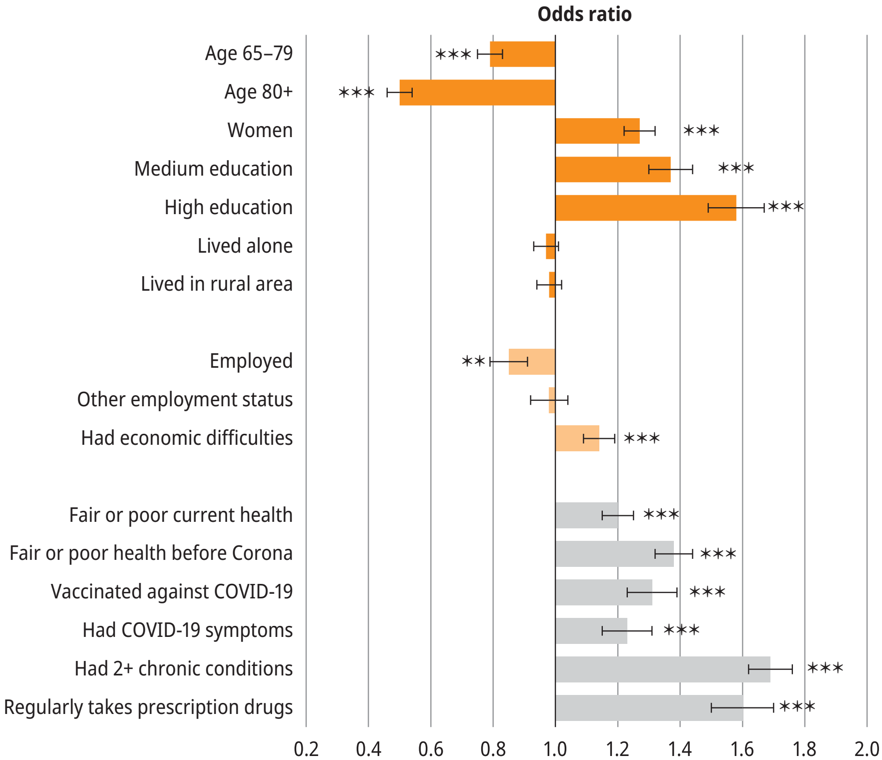

Figure 3: Results of logistic regression model for lasting barriers to health care access.
Note: We use robust standard errors. Country controls are included but not shown. Reference categories have been omitted as they have been indicated in the previous section ** $p<0.05$; *** $p<0.01$.
Source: SHARE Wave 8 and SHARE Corona (W1 & W2), release 8.0.0.

3 Empirical analysis and results

To explore the predictors of having lasting barriers to health care access, we estimate a binary logistic regression model. Figure 3 summarises the estimates from

3 Percentages are weighted.

the logistic regression model with three groups of predictors. We conclude that the odds of having health care postponed or denied steadily declined with age, and were lower for occupationally active older adults. Women, respondents with higher education levels, and respondents who reported having difficulties making ends meet were significantly more likely to report having long-lasting unmet health care needs during the COVID-19 pandemic. We consider it important to reflect on the association between individuals' education levels and their likelihood of having persistent unmet health care needs during the COVID-19 pandemic. On the one hand, it is possible that better educated older adults were more likely to report having long-lasting unmet health care needs because they were paying closer attention to preventive care, access to which was reduced substantially after the outbreak. On the other hand, as better educated individuals were likely accustomed to having more stable and continuous health care access before the outbreak, they might have been more exposed than others to disruptions in health care provision.

We find that health-related variables had significant effects on the odds of having persistent unmet health care needs. For example, respondents who had poor overall health, were vaccinated against COVID-19, or had experienced COVID-19-related symptoms were more likely to report having ongoing limited access to health care. In addition, older adults who had two or more chronic conditions were, on average, 70% more likely to report having ongoing limited access to health care. By contrast, healthier older adults were less likely to be vaccinated, and were less likely to report having long-lasting unmet health care needs.

Our results suggest that the socio-demographic and health-related characteristics of the respondents aged 50 or older in our sample were strong predictors of their long-lasting barriers to health care access in the pandemic. It is important to stress that many of our findings are consistent with those of previous studies of unmet health care needs in the COVID-19 pandemic that employed the SCS datasets, including studies that considered socio-demographic variables (see Smolić, Čipin and Međimurec, 2022) or variables that explain previous health care use (see Arnault, Jusot and Renaud, 2022).

4 Conclusions

The preliminary results of this study confirm that there have been significant differences in the lasting barriers to health care access experienced by older adults in European countries and Israel since the outbreak. We found that the countries with the highest proportions of older adults with persistent unmet health care needs were Portugal, Luxembourg, and Belgium; while the countries with the lowest proportions were Latvia, Romania, and Bulgaria. We also observed that younger older adults (aged 50–64), women, and adults with a higher level of education or economic hardship had greater odds of having long-lasting unmet health care needs. Regarding the health-related variables, we found that older adults who reported having poorer SAH (either at the moment of the interview or before the outbreak), two or more chronic conditions, or regular medication use were more likely to have persistent unmet health care needs. In addition, we found that older adults who were vaccinated against COVID-19 and those who experienced COVID-19 symptoms were more likely to have lasting barriers to health care access.

Our findings regarding long-lasting health care access limitations during the COVID-19 pandemic have several policy implications. First, access to health care should be improved for vulnerable populations, such as for women, people in poorer health, and people who are economically deprived. Likewise, economic strain was the main reason why one in eight individuals aged 65+ in the EU reported having unmet health care needs even before the outbreak. At the same time, women were more likely to report having unmet health care needs than men (for reasons including financial costs, distance to health care facilities, lack of transportation, and being placed on a waiting list). Second, policymakers should encourage health care providers to provide targeted assistance to individuals with ongoing unmet health care needs by, for example, defining which health care services and which vulnerable groups should be prioritised. Such strategies are critically important for reducing the costs of health care treatments, decreasing health inequalities, and improving the quality of life of older adults.

Finally, we should not overlook the possibility that older adults may face barriers to health care access for reasons other than those examined in the present study, and that identifying these reasons might be equally important for improving our understanding of older adults' long-lasting unmet health care needs that are not related to COVID-19. However, the progress of the pandemic in 2021 and the elevated risk of a relatively slow recovery from the pandemic could negatively affect existing efforts to improve access to health care for older adults.

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Julien Bergeot and Florence Jusot

3 The impact of unmet health care needs on self-assessed health and functional limitations during the first wave of the Covid-19 pandemic

Key points

- Of Europeans aged 50+, 35% reported having unmet health care needs during the pandemic.
- Unmet care needs contributed to lower self-rated health status (self-assessed health status) and an increase in the severity of functional limitations.
- The detrimental effects of having unmet care needs on the health status of older adults may persist over the long term.

1 Research questions

The first wave of the COVID-19 pandemic led to a substantial reduction in health care utilisation due to, on the one hand, a reduction in health care demand resulting from fears of contamination or mobility restrictions; and, on the other hand, restrictions on health care provision, and especially on health care services not related to treating COVID-19 (Arnault et al., 2022; Smolić et al., 2022). Forgoing care can have detrimental health effects in the medium to long term (Chen and McGeorge, 2020; De Jong et al., 2020), especially for older individuals suffering from chronic diseases and limitations in activities of daily living. Therefore, it is important to assess how the effects of the pandemic itself, and of the policies implemented to fight the spread of the virus, affected individuals' health care access and health outcomes.

In this chapter, we assess the effects of having unmet health care needs during the first wave of the COVID-19 pandemic on the general health indicators of European older adults in summer 2021. Our results suggest that there was a deterioration in their health, as measured by their self-assessed health and functional limitations in activities of daily living.

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2 Data

This chapter examines the effects of having unmet health care needs on the health outcomes of older adults in the context of the COVID-19 pandemic. To identify whether these individuals had unmet needs during the first wave of the pandemic – i.e., between March and June/ August 2020 – we use data from the first wave of the SHARE Corona survey. This survey gathered information about the respondents' experiences of having unmet needs and the reasons for their unmet needs; that is, whether an individual had an unmet need because a care appointment/ treatment was postponed or denied, or because the person was afraid of being infected. For each reason, we can identify the type of care it involved: i.e., general practitioner (GP), specialist, planned care, or physiotherapist/ psychotherapist/ rehabilitation care.

To study whether having experienced unmet health care needs affected the respondents' health outcomes one year later, we combine the regular SHARE Wave 8 (collected from November 2019 to March 2020) and the second wave of the SHARE Corona survey (collected in June/ July 2021). Both surveys provide information on self-assessed health (SAH) and the general activity limitation indicator (GALI). The SAH is measured with the following question: "Would you say your health is excellent, very good, good, fair, or poor?" The general activity limitation indicator is measured with the following question: "For the past six months at least, to what extent have you been limited because of a health problem in activities people usually do?" The surveyed individuals were asked to choose one of three potential responses: i) "not limited", ii) "limited but not severely", and iii) "severely limited".

Based on those health indicators measured in 2021 and just before the start of the COVID-19 pandemic, we constructed two ordered categorical outcome variables, with the lowest values reflecting better health status (i.e., "excellent" for SAH and "not limited" for the GALI), and the highest value reflecting the worst health status (i.e., "poor" for SAH and "severely limited" for the GALI).

Our sample comprises 36,447 observations of respondents who participated in Wave 8 of SHARE and the first and second waves of the SHARE Corona survey.

3 Empirical approach

We use an ordered probit regression to study how the respondents' health outcomes collected in 2021 were affected by their unmet care needs in 2020. Using an ordered probit modelling approach, we regress health outcomes during the second wave of the SHARE Corona survey on a dummy variable indicating whether each individual had unmet care needs, after adjustment for the person's health in Wave 8 (self-assessed health, general activity limitation indicator, body mass index, and self-reported chronic conditions) and socio-demographic characteristics (age, gender, education, economic vulnerability). The respondents' previous health care habits largely determined their unmet needs, since more intensive users of health care had a greater likelihood of experiencing postponed or denied health care, and to have decided to refrain from using health care due to a fear of infection. Therefore, the analysis is also adjusted for health care use in Wave 8. This regression analysis explores whether the individuals who had unmet needs had poorer health or more limitations one year after, after controlling for other factors likely to affect health dynamics.

This analysis is conducted first by considering any unmet care need, regardless of the reason why the care need had been unmet and the type of care that was forgone; second by examining each reason for forgoing care; and third by examining each type of forgone care.

4 Results

4.1 Descriptive statistics

Table 1 reports the proportion of individuals who had unmet care needs in 2020 by the type of care and the reason for forgoing care. The results are in line with Arnault et al. (2022) and Smolić et al. (2022), who studied the distribution of unmet care needs in the population with the same data. More than one-third of our study sample had unmet needs between March and August 2020. This large proportion reflects the sharp drop in the provision of care in most countries due to the pandemic itself, and to the policies implemented to reduce the spread of the virus and to preserve health care resources for patients with severe COVID-19 infections.

The main reason for having forgone health care was the postponement by the health system of a care appointment or a previously planned treatment: 27% of our study sample experienced care postponement. In addition, 12% of respondents decided to forgo health care due to the fear of being infected. Just 5% of respondents were completely unable to get a new appointment or a new treatment.

Table 1: Descriptive statistics – Unmet health care needs by types of care and reasons for having forgone care.

	Percentage
At least one unmet need (%)	34.98
Unmet needs by reason	
Because afraid (%)	12.25
Postponed care (%)	26.99
Denied care (%)	5.28
Unmet needs by type of care	
GP care (%)	9.92
Specialist care(%)	26.16
Planned care (%)	4.24
Physiotherapy / rehabilitation / psychologist care (%)	3.67
Other types of care	4.56

Note: This table reports the proportion of individuals who reported having unmet needs by types and reason. N = 36,447.
Source: SHARE Wave 8 and SHARE Corona (W1 & W2), release 8.0.0.

Table 1 also shows that the type of care for which an unmet need was most likely to be reported was specialist care: 26.16% of the sample were denied access to at least one specialist visit between March and July 2020. Another 10% of respondents reported forgoing at least one GP care visit, while 4% of respondents reported forgoing at least one planned physiotherapist/ psychologist/ rehabilitation care visit.

In Figure 1, we show the proportions of individuals who reported having unmet care needs. We observe some differences across countries, with 60% of respondents in Luxembourg having unmet needs, compared to only 11% of respondents in Romania. We note that most of the countries for which the proportion of individuals with unmet needs was high also had high levels of health care consumption before the pandemic. Finally, we observe that the proportion of individuals with unmet needs was close to the average across countries.

We also display descriptive statistics by reasons for unmet needs in Figure 1. There were considerable cross-country differences in the proportion of individuals who experienced care postponement, ranging from 2% in Bulgaria to 55% in Portugal. While these shares might reflect different levels of care consumption before the pandemic, they could also reflect differences in how countries responded to the pandemic, and in the extent of the decline in health care use in each country. We observe less heterogeneity in the proportion of individuals who had unmet needs because they were afraid, although there were still large differences between countries. We also see that the main reason for unmet needs was

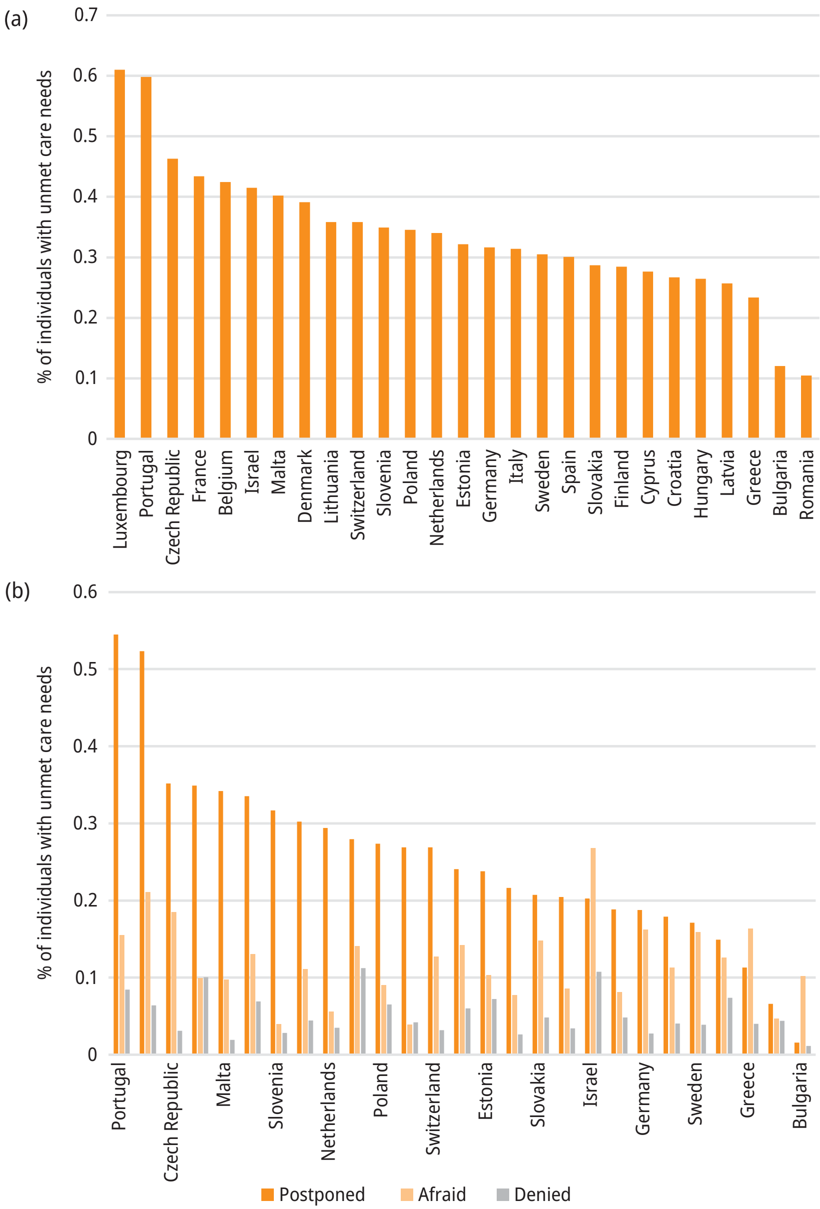

Figure 1: Percentage of individuals with unmet needs.
Note: Proportion of individuals with unmet care needs by countries. We differentiate by the types of care and the reasons for the unmet needs. Sample weights are used to make the descriptive statistics representative at the county level.
Source: SHARE Wave 8 and SHARE Corona (W1 & W2), release 8.0.0.

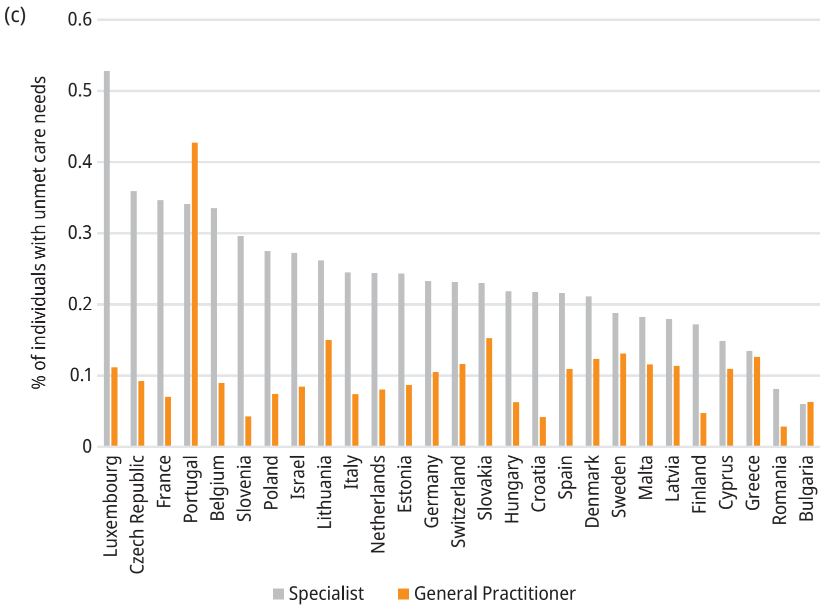

Figure 1 (continued)

care postponement in most countries, except in Israel, Greece, and Bulgaria. Finally, we find that the denial of care was the least common reason for unmet needs in all countries.

If we zoom in on the types of care needs that were unmet, we observe that in many countries, including in Bulgaria and Portugal, unmet GP care needs were more prevalent than unmet specialist care needs. There was considerable heterogeneity in the prevalence of unmet specialist care needs and GP care needs, which might reflect differences in the role of specialist care in the continuity of care, as well as its accessibility or availability.

Table 2 reports the distribution of the values for self-assessed health and the general activity limitation indicator in 2021 according to whether individuals had any unmet care needs in 2020. Although the differences in self-assessed health were rather small in magnitude, it seems that individuals who had unmet care needs were in poorer health in 2021 than those who did not. A similar result is found for the reported activity limitations, although the gap appears to be much larger: there was a difference of about 10 percentage points in the prevalence of activity limitations in 2021 between those who had unmet needs and those who did not. These descriptive statistics tend to show a deterioration in health, but because this pattern could largely reflect differences in baseline health (i.e., those who had unmet care needs already had worse health before the start of the

COVID-19 pandemic), we now turn to regression analyses, in which we control for socio-economic and baseline health differences.

Table 2: Descriptive statistics – Health status and limitations according to unmet needs.

	All	Any unmet needs	No unmet needs	Difference (p-value)
	(1)	(2)	(3)	(4)
Self-assessed health				
Poor	9.92	11.40	8.98	0.00
Fair	30.57	34.67	28.27	0.00
Good	40.13	37.91	41.45	0.00
Very good	15.13	13.10	16.28	0.00
Excellent	4.25	2.92	5.02	0.00
General activity limitations				
No limitations	55.01	48.74	58.58	0.00
Not severely limited	31.15	35.35	28.80	0.00
Severely limited	13.84	15.91	12.62	0.00

Note: This table reports the proportion of individuals who reported a given health status or level of limitations in June/July 2021, according to whether the individuals did or did not have any unmet care needs during the first wave of pandemic. N = 36,447.
Source: SHARE Wave 8 and SHARE Corona (W1 & W2), release 8.0.0.

4.2 Regression analysis

Our main results are summarised in Figures 2 and 3, where we display the marginal effects of the coefficients of interest by the reasons for the unmet care needs and the types of unmet care needs. Our results show that individuals who had unmet care needs during the first wave of the pandemic tended to have poorer self-assessed health and more functional limitations in summer 2021. These results are robust for all reasons for the unmet needs (Figure 2), for all types of unmet needs (Figure 3), and for both health indicators.

In Figure 2, we mainly observe a larger effect on the subsequent health status of individuals who were denied care during the first wave of the pandemic. This finding might reflect the fact that individuals who tried to obtain an appointment during the first wave of the pandemic had urgent care needs that were unmet, which caused their health to deteriorate. The association was large: having been denied care during the first wave of the pandemic was associated with a 7-percentage-point decrease in the probability of having no limitations rather than having moderate or severe limitations, and with a 4-percentage-point increase in

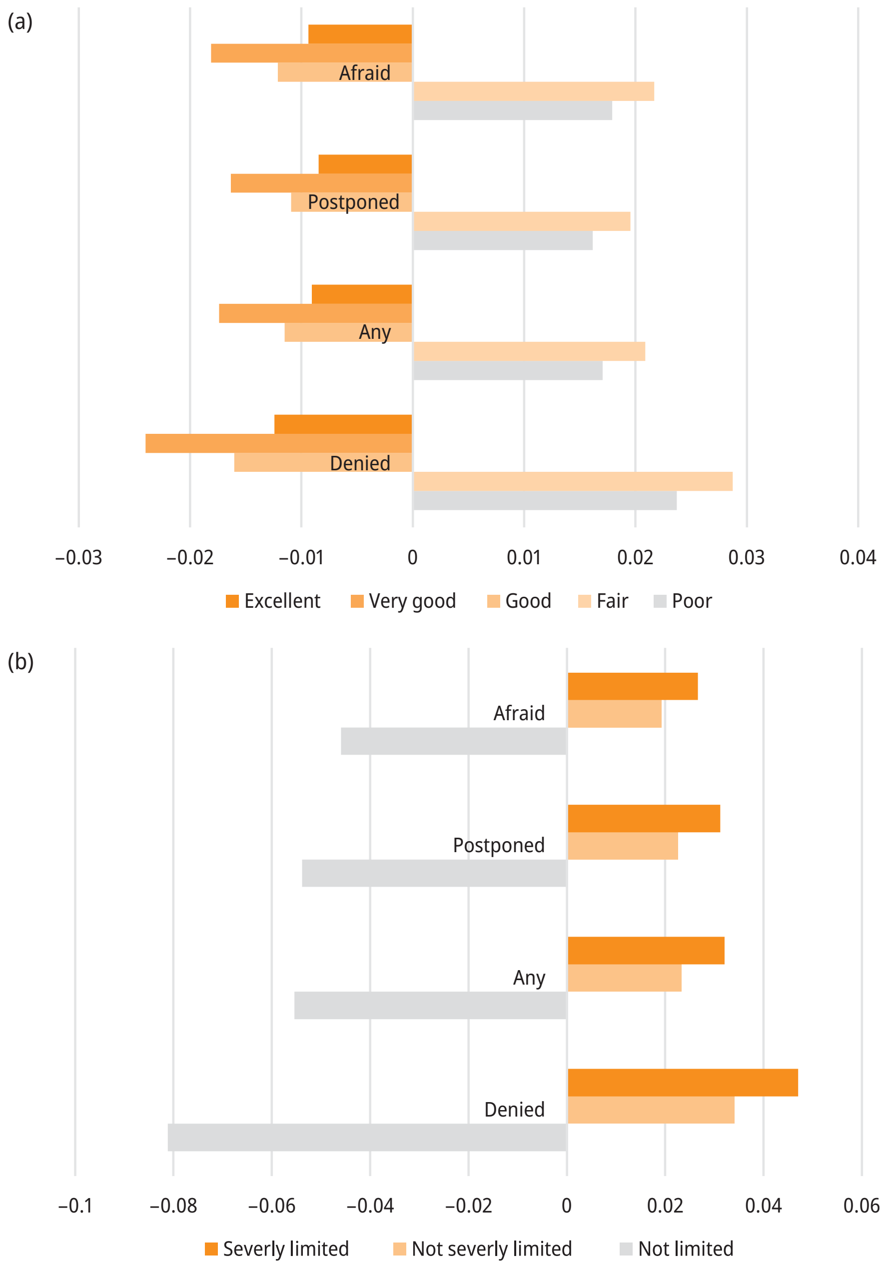

Figure 2: Marginal effects of having unmet care needs by reasons.
Note: This figure displays the marginal effects of having unmet care needs i) for any reason, ii) because the individual was afraid, iii) because care was postponed, and iv) because care was denied.

the probability of having severe limitations. For self-assessed health, the main decrease was in the probability of having very good health, of about 2.5 percentage points. We also observe an increase in the probability of having a poor health status of about 2.3 percentage points.

Figure 3 displays the marginal effects of having unmet care needs by the types of foregone care. Again, the associations were significant for all types of care. The findings were especially strong for individuals who had foregone physiotherapy care, which suggests that it is crucial for individuals to maintain this type of care to avoid accelerating their functional limitations. Indeed, not having access to physiotherapy decreased the probability of having no limitations by 12 percentage points. Given a baseline probability of not having limitations of 55%, this represents an average increase in the prevalence of limitations (i.e., the probability of having limitations, severe or not) of about 21%.

5 Conclusion

In this chapter, we have explored the association between individuals having unmet health care needs during the first wave of the pandemic and their health one year later. The results show that individuals with unmet care needs had poorer self-assessed health and were more likely to have severe limitations one year later. The findings for denied health care were particularly important, with the correlation between unmet physiotherapist care needs and activity limitations being the largest in magnitude. All in all, these results indicate that even in the context of a pandemic, continuity of care is important to avoid the potentially long-lasting negative health effects of not having access to care, especially for older individuals like those in our sample.

Figure 2 (continued)

The results are obtained with an ordered probit model, while controlling for sex, age, self-assessed health status in Wave 8; limitations in Wave 8; care consumption in Wave 8; having at least one chronic disease; body mass index; economic vulnerability; and country.

Source: SHARE Wave 8 and SHARE Corona (W1 & W2), release 8.0.0.

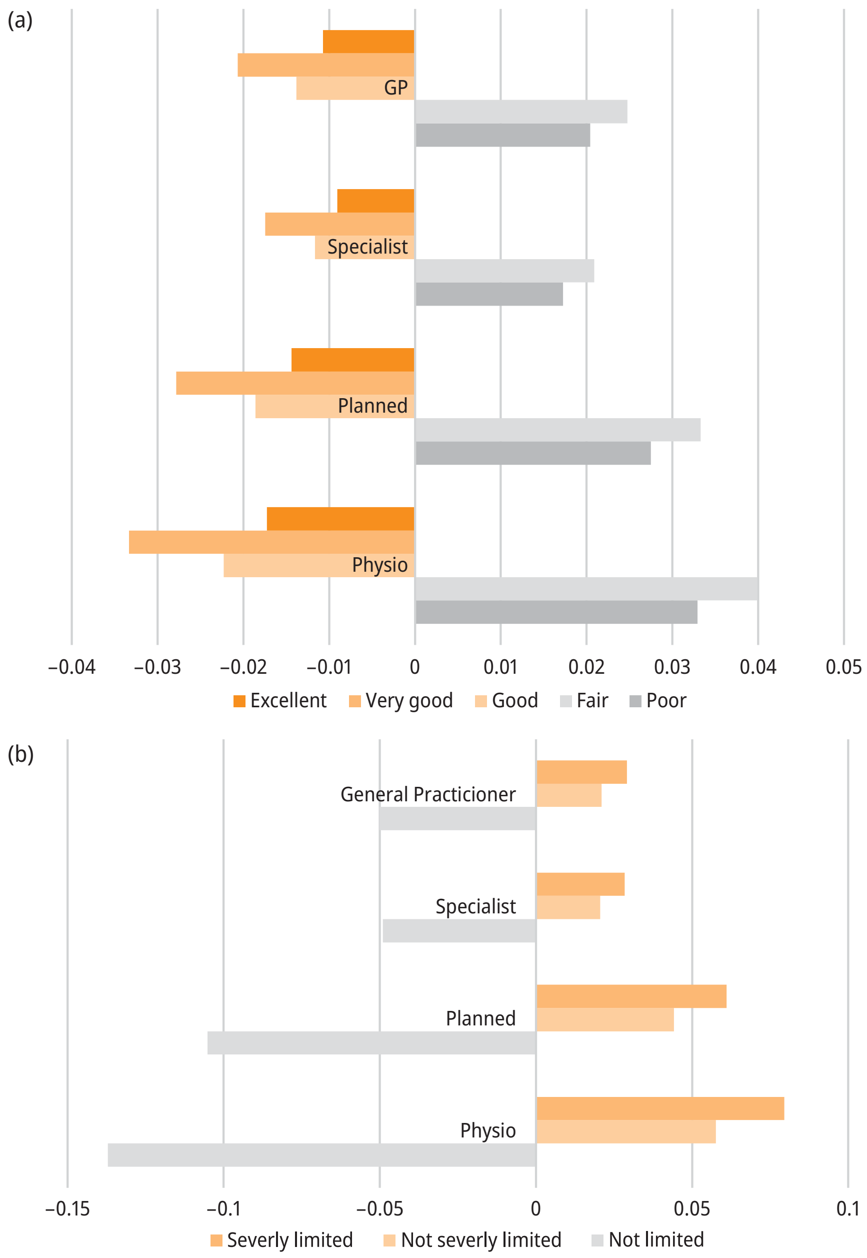

Figure 3: Marginal effects of having unmet care needs by types of care.
Note: This figure displays the marginal effects of having unmet i) GP care, ii) specialist care, iii) planned care, and iv) other types of care. The results are obtained with an ordered probit model,

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Figure 3 (continued)
controlling for sex, age, self-assessed health status in Wave 8; limitations in Wave 8; care consumption in Wave 8; having at least one chronic disease; body mass index; economic vulnerability; and country.
Source: SHARE Wave 8 and SHARE Corona (W1 & W2), release 8.0.0.

Louis Arnault and Florence Jusot

4 Inequality of opportunity in the risk of suffering from persistent symptoms of COVID-19

Key points

– Both the social background and the current "circumstances" of individuals have a significant impact on inequalities in the likelihood of reporting persistent symptoms of COVID-19.
– These results support the need for efficient public policies – despite their potential costs or collateral effects – to protect the individuals facing the highest risk.
– The contribution of legitimate sources of inequalities is estimated at least 23%, which suggests that some of the public policies that are implemented should also be based on individual responsibility.

1 Introduction and research question

Following the call for health equity by the World Health Organisation (Commission on Social Determinants of Health, 2008), improving health equity has become one of the main objectives of public health policies in Europe, in addition to promoting the health of the whole population. In the context of the COVID-19 pandemic, it is particularly important to understand the pandemic's effects on health equity, and more specifically, on the equity in the distribution of COVID-19 infections and COVID-19 symptoms in the population. Suppose, for example, that persistent symptoms of COVID-19 mostly affected those who did not comply with barrier gestures. In that case, it could be more relevant for policymakers to call for prioritising recommendations that demand individual responsibility (wearing a mask, social distancing, hand hygiene, etc.) over the imposition of coercive restrictions. Conversely, if most of the sources of infections and symptoms are largely not under the control of individuals, then the need to protect the most vulnerable people and to restore fairness could justify the imposition of universal restrictions, despite their deleterious consequences for the health, finances, or well-being of some individuals.

Analysing the equity of the effects of the COVID-19 pandemic in terms of COVID-19 infection patterns requires the adoption of a normative definition of fairness recognised in the field of health. Some recent developments in the theoretical and empirical literature on equity in health advocate the use of the philo-

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sophical concept of equality of opportunity (Fleurbaey, 2008; Roemer and Trannoy, 2014; Jusot and Tubeuf, 2019). According to this concept, the fairness of the distribution of health outcomes has to be assessed based on its determinants. Some sources of inequality are considered more objectionable than others, and could be prioritised in policies aiming to improve health equity. The concept of equality of opportunity distinguishes between legitimate and illegitimate sources of differences in health disparities. While legitimate differences can be attributed to individual efforts (i.e., determinants within people's control), illegitimate differences are related to circumstances (i.e., determinants beyond people's control). The latter are recognised as forms of inequality of opportunity, and justify the implementation of public policies that seek to compensate individuals for their unlucky circumstances.

The aim of this article is to quantify and compare inequality of opportunity and legitimate inequality among individuals suffering from persistent symptoms of COVID-19 across European countries.

2 Conceptual framework

In the related empirical literature, people's circumstances are often analysed by considering the characteristics that are not under their individual control, and that could induce unfair differences in health within the population. For example, since individuals do not choose their parents, their educational or social background, their genetic inheritance, or their parents' health-related behaviours, they are generally not held responsible for their social or family background. Thus, in studies of COVID-19 infection patterns, the differences in the probability of reporting persistent symptoms observed between individuals from different backgrounds could be recognised as forms of inequality of opportunity.

Conversely, this literature has also tended to argue that individual health-related behaviours may reveal certain preferences that should be respected, and should thus be considered as belonging to the sphere of individual responsibility. Tobacco smoking, excessive alcohol consumption, having an unbalanced diet, and failure to exercise are typically used as effort variables. When examining COVID-19 infections, whether individuals adopt protective behaviours to avoid infection, and, conversely, whether they resist preventive measures and engage in risky behaviours, could also be considered relevant for explaining modest differences in the probability of suffering from persistent symptoms.

2.1 Methodology

For each individual, the risk of suffering from persistent symptoms of COVID-19 is assumed to be explained by his/her circumstances, his/her effort variables, his/her demographics, and his/her country of residence. Here, we estimate a Probit model as a statistical model, and use the variance as a measure of inequality, as this approach will enable us to easily decompose the total inequality across sources (Shorrocks, 1982). Thus, we are able to quantify the relative contribution of each source to the total inequality in COVID-19 symptoms by its covariance with the health outcome. We pay special attention to the contributions of efforts and circumstances, which, respectively, reflect fair and unfair sources of inequality in the probability of having COVID-19 symptoms, independent of the country of residence and the demographic-related sources. Indeed, the normative status of health inequalities related to the latter sources remains unclear.

With regard to circumstances, two different sets of variables are considered. In a first model (model 1), we only introduce variables related to the individual's family and social environment or health(care) behaviour during childhood, as these variables are clearly not under the individual's control. In a second model (model 2), we also account for other variables, such as the person's current socio-economic status, which may be partially driven by individual behaviour or choices, but are nevertheless reasonable to consider as being beyond the sphere of individual responsibility, at least in the short run.

Both models are also estimated by subgroups of "homogeneous" countries according to the average proportion of respondents who reported suffering from persistent COVID-19 symptoms. Our aim is to reduce the contribution to inequality of the country variables, which is difficult to interpret as being fair or unfair.

2.2 Data

For this analysis, we use a sample of 23,899 individuals who responded to several waves of SHARE: the retrospective survey of SHARELIFE (collected in 2008/2009 or in 2017/2018), Wave 8 of the regular SHARE survey (collected from November 2019 to March 2020), the first wave of the SHARE Corona survey (collected from June to September 2020), and the second wave of the SHARE Corona survey (collected in June / July 2021).

We build a binary indicator to assess inequality of opportunity in the risk of experiencing persistent symptoms of COVID-19 using the two variables measuring whether the respondents had been infected with COVID-19, and, if so, whether they were experiencing any persistent symptoms in the second wave of the

SHARE Corona survey. To measure effort, we use information about the respondents' COVID-19-related protective behaviours in the first wave of SHARE Corona survey: e.g., meeting more than 5 people, visiting family, keeping distance from others when outside, wearing a mask, washing their hands more regularly, and covering their coughs. We include information the respondents' vaccination or vaccination intentions from the second wave of SHARE Corona survey. We also consider proxies of the respondents' preferences regarding risk, time, altruism, social participation, religious practices, prevention care, and lifestyles, as measured in SHARE Wave 8.

In Model 1, individuals' circumstances are measured exclusively using retrospective information from the SHARELIFE survey on their social and family backgrounds, and on their parents' health-related behaviours and health habits. Five groups of additional variables measuring individuals' current "circumstances" are introduced into model 2: their pre-epidemic health status, which may have a direct impact on the severity of their COVID-19 symptoms (score of their pre-epidemic needs based on a dozen health indicators measured in SHARE Wave 8); their socio-economic status (education and income variables measured in SHARE Wave 8); their living conditions (housing characteristics and household size from SHARE Wave 8); their working conditions during the pandemic (measured in the first wave of the SHARE Corona survey); and their access to information regarding health care and COVID-19 (health literacy, searches for health information on the internet, use of treatments aimed at preventing COVID-19 infection).

3 Results

Figure 1 shows the proportion of individuals who reported suffering from persistent symptoms of COVID-19 by country. The proportion varied from 1% of the respondents in Finland to 12% of the respondents in Poland. The countries are classified into four "homogeneous" groups, with group 1 consisting of the countries with the lowest proportions and group 4 consisting of the countries with the highest proportions.

Total inequality in COVID-19 symptoms is then decomposed into the relative contributions of the different groups of explanatory variables (Table 1). In model 1, which includes the whole sample, 65% of the inequalities in the probability of having persistent symptoms of COVID-19 are explained by country differences, which are difficult to interpret as being either legitimate or illegitimate from a normative point of view (column 1). Although the small proportions of individuals affected by

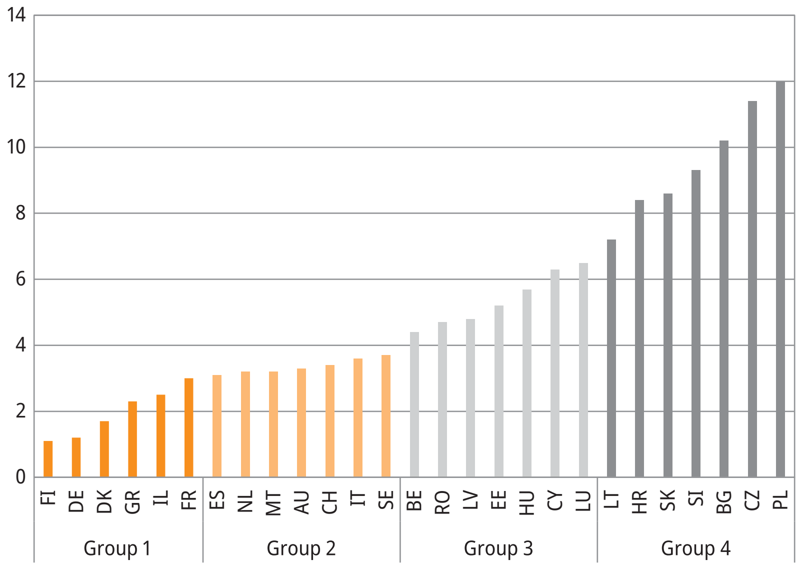

Figure 1: Proportion of individuals who suffer from persistent symptoms of COVID-19, by country.
Notes: Unweighted sample, N = 23,988 observations.
Source: SHARE Corona (W2), release 8.0.0.

persistent COVID-19 symptoms prevent us from estimating country-by-country models, breaking down the sample into the four subgroups of "homogeneous" countries makes it possible to reduce to 12% or less the proportion of inequalities attributable to international differences (columns 2 to 4). In all subgroups of homogeneous countries, the contribution of efforts to inequalities in the likelihood of having persistent symptoms of COVID-19 is greater than the contribution of early-life circumstances. The former contribution varies from 35% to 46% – meaning that 35% to 46% of the inequalities in the probability of having persistent symptoms of COVID-19 can be considered legitimate – whereas the latter contribution is between 19% and 36%. With regard to effort, differences in pure preferences, such as preferences for engaging in risk aversion or social participation, or in lifestyles or behaviours aimed at preventing COVID-19 infections, are the most closely correlated with inequalities in the likelihood of having COVID-19 symptoms. The contribution of circumstances is mainly attributable to differences in educational skills during childhood and parental longevity. Thus, according to model 1, the inequality of opportunity in the risk of reporting persistent symptoms of COVID-19 is small (Figure 2).

Table 1: Relative contributions to inequalities in persistent symptoms of COVID-19.

	Model 1: without current "circumstances"					**Model 2: including current "circumstances"**				
	All countries	**Group 1**	**Group 2**	**Group 3**	**Group 4**	**All countries**	**Group 1**	**Group 2**	**Group 3**	**Group 4**
N	**23 988**	**6 215**	**5 362**	**5 613**	**6 798**	**23 988**	**6 215**	**5 362**	**5 613**	**6 798**
Total inequality (variance)	0.154	0.167	0.135	0.120	0.092	0.197	0.240	0.193	0.222	0.146
Country (%)	**65**	**12**	**1**	**2**	**11**	**50**	**11**	**1**	**1**	**5**
Demographics: age (%)	12	5	15	34	16	7	3	8	16	5
Demographics: sex, nb of child (%)	2	1	16	1	3	1	1	11	1	1
Total: Demographics (%)	**14**	**6**	**31**	**36**	**19**	**8**	**3**	**19**	**16**	**6**
Effort: pure preferences (%)	3	8	14	10	4	2	5	9	6	2
Effort: altruism (%)	0	1	2	0	8	0	1	1	0	5
Effort: preferences about health(care) (%)	1	1	0	10	3	1	1	0	6	2
Effort: preferences about COVID-19 (%)	6	31	8	15	13	4	22	6	7	8
Effort: lifestyles (%)	7	5	10	7	19	5	3	9	4	11
Total: Efforts (%)	**16**	**46**	**35**	**43**	**46**	**12**	**33**	**26**	**23**	**28**
Early-life circumstances: social background (%)	3	34	24	14	18	3	26	18	7	12
Early-life circumstances: health (%)	2	1	3	2	7	1	0	2	2	4
Early-life circumstances: health care (%)	0	1	5	3	−1	0	0	4	1	−1
Total: Early-life circumstances (%)	**5**	**36**	**32**	**19**	**24**	**4**	**26**	**23**	**10**	**15**

Current “circumstances”: Living conditions (%)	7	2	12	17	12
Current “circumstances”: Information (%)	9	14	11	22	13
Current “circumstances”: Work (%)	3	1	2	2	7
Current “circumstances”: Socio-econ. status (%)	3	7	3	8	11
Current “circumstances”: Pre-epidemic needs (%)	3	2	3	0	3
Total: Current “circumstances” (%)	**26**	**26**	**31**	**50**	**45**

Source: SHARE Wave 8 and SHARE Corona (W1 & W2), release 8.0.0.

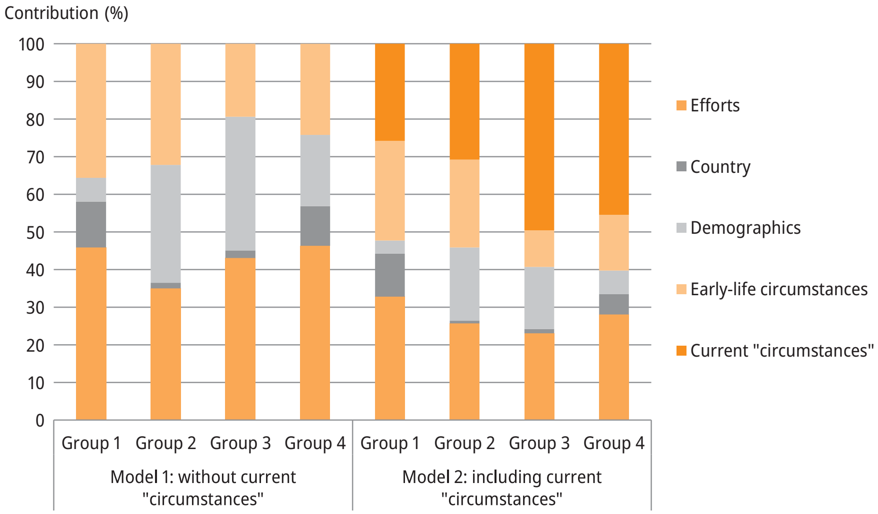

Figure 2: Relative contributions to inequalities in the likelihood of reporting persistent symptoms of COVID-19 by country group.
Source: SHARE Wave 8 and SHARE Corona (W1 & W2), release 8.0.0.

Nevertheless, these preliminary results become more nuanced following the introduction of variables measuring individuals' current "circumstances" (Table 1, model 2): in model 2, they contribute to around one-quarter of the inequalities in the probability of reporting persistent symptoms of COVID-19 in the whole sample (Table 1, column 6), and from 26% to 50% of total inequality when applied to subgroups of "homogeneous" countries (Table 1, columns 7 to 10). In particular, the risk of having persistent symptoms of COVID-19 increases significantly with household size or having continued to work at the usual workplace during the epidemic, and it also seems to be correlated with having had access to reliable information about health in general, and about COVID-19 in particular. The relative contribution of efforts to inequalities in the likelihood of having persistent symptoms of COVID-19 decreases, and now varies between 23% and 33%, which suggests that there is a correlation between the effort variables and current circumstances. The contribution of efforts becomes lower than the sum of the contributions of early-life and current circumstances: in model 2, the global share of unfair inequalities in the likelihood of having persistent symptoms of COVID-19 dominates that of legitimate inequalities. Interestingly, the share of unfair inequalities explained by current "circumstances" is higher in the country groups 3 and 4, where the prevalence of persistent symptoms is highest (Figure 2). This shows that the greater the spread of the epidemic, the greater the risk of being infected by working outside or living in crowded accommodations.

4 Conclusion

These initial results underline the observation that both the social backgrounds and the current "circumstances" of individuals have significant effects on inequalities in the likelihood of reporting persistent symptoms of COVID-19. Even if individuals' current "circumstances" also reflect the choices they made all over their life course and partly depend on their efforts, it would be difficult to hold people responsible for these sources of inequality, and to consider them legitimate. Therefore, these results support the need for efficient public policies – such as compulsory mask-wearing, activity restrictions, travel limitations, or the requirement to show proof of COVID-19 vaccination to access some public places – to protect the individuals facing the highest risk of suffering from persistent symptoms of COVID-19, despite their potential costs or collateral effects.

Nevertheless, as the findings of our analysis also show that the contribution of legitimate sources of inequalities to the probability of reporting persistent symptoms of COVID-19 is at least 23%, a non–negligible share of these inequalities could be considered fair. These results suggest that some of the public policies that are implemented should also be based on individual responsibility, such as "charging for testing".

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Alice Delerue Matos, Gina Voss and Paulo Silva

5 Economic and health system policies during the pandemic and the mental health of older adults

Key points

- The shares of individuals aged 65+ who reported experiencing depression/sadness during the COVID-19 pandemic varied between countries (from 18.3% in Denmark to 59.7% in Portugal).
- Economic support policies, such as those mandating debt/contract relief and financial support from the government, were associated with lower chances of reporting feelings of depression/sadness.
- The restrictive measures aimed at controlling the spread of COVID-19 and the preventive health measures implemented by governments during the pandemic did not affect the mental health of the older population.

1 Introduction

Mental health problems compromise the well-being of individuals, and have very high costs for European societies, whether in the form of health care and welfare spending or productivity losses (Wykes et al., 2015).

A review of 150 studies on mental health conducted between 2004 and 2014 showed that there is a range of factors associated with poor mental health, including higher age, female gender, marital status/not living with a partner, low level of education, low income, financial strain, unemployment, lack of emotional/social support, loneliness, and adverse subjective health (Silva et al., 2016).

The pandemic introduced significant changes to people's lives, and the policies implemented to control the spread of the virus had repercussions for their mental health. Indeed, increases in reports of feelings of depression/sadness have been linked to the severe restrictions implemented by many countries (Voss, Paiva and Delerue Matos, 2021). The imposition of social distancing measures may have intensified people's feelings of isolation and loneliness. These phenomena and living alone have been shown to be associated with a higher risk of worsened mental well-being after the first COVID-19 wave (Atzendorf and Gruber, 2021). Because of the pandemic, many medical appointments, including for psychological consultations, were postponed or cancelled (Arnault et al., 2022). In addition,

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some people experienced a decrease in income or became unemployed. It is likely that these factors also had a significant impact on mental health.

Policies have been implemented to alleviate some of these problems. In terms of health policies, several countries have taken steps to ensure that remote consultations are available. Economic policies that provide individual financial support, debt relief, and contractual payments have also been introduced by some governments.

This study aims to assess the role of health policies and the response capacity of health systems during the pandemic, and how economic policies affected the mental health of people aged 65+ during this period. More precisely, it examines whether these types of policies protected the mental health of older individuals during the pandemic.

2 Study methods

This study uses data from SHARE Corona Survey 2, release 8.0.0. Our sample includes older adults aged 65 years or older from 26 European countries and Israel. The Netherlands was removed from the sample due to insufficient observations. The final sample size is 35,218 individuals.

Our dependent variable is self-reported depression/sadness. Interest variables are the economic support index, the containment index, and the health system policies index from the Oxford Coronavirus Government Response Tracker (OxCGRT). The financial support index is a construct that uses two indicators (income support from the government and debt/contract relief). The containment index is related to restriction measures to control the pandemic (such as school and workplace closures, cancellations of public events, etc.). The health system policies index is a construct that uses six policy indicators (general information campaigns, testing policy, the extent of contact tracing, requirements to wear face coverings, guidelines for vaccine delivery for different groups, and procedures for protecting older adults). These last two indexes are the result of disaggregating the original Oxford “containment and health” index. We distinguish health-related indicators from containment-related indicators. We calculate the mean score for the previous OxCGRT variables for each country from 31 July 2020 to 31 July 2021.

As control variables we include the following: age at the time of the interview (65 to 79 and 80+); gender; educational level imputed from Waves 6, 7, and 8 (primary or less, secondary and post-secondary); living alone; financial distress (made ends meet with great difficulty or with some difficulty); self-reported physical health (1-excellent; 5-poor); feeling sad or depressed before the pandemic imputed from waves 6, 7, and 8; face-to-face contact with social network members (at least one weekly personal contact with two or more types of family/friendship relations, including children, parents, grandchildren, other relatives, and friends, in the last three months); and closeness of contact with COVID-19 (had symptoms or had contact with someone with symptoms, tested positive, was hospitalized, or died from COVID-19). We also control for the financial support received from the government, and, with regard to health, the postponement or denial of health appointments (health system responsiveness).

Multilevel logistic regression is used to account for the hierarchical structure of the SHARE data, in which individuals are separated by country. Statistical analyses are conducted using SPSS 27 and R 4.0.2 software.

3 Results of the study

Figure 1 shows the proportion of individuals with depression/sadness in the month before the SHARE Corona Survey 1 and 2 interviews in each country (June-September 2020 and June-August 2021, respectively). During the pandemic period defined for this study (SHARE Corona Survey 2), Portugal and Hungary had the highest proportions of individuals with depression/sadness (59.7% and 44.6%, respectively) whereas during the SHARE Corona Survey 1 period, Portugal and Poland had the highest percentages of individuals with depression/sadness (49.0% and 39.8% respectively). Figure 1 further shows that between the SHARE Corona Survey 1 and 2, the mental health of older adults worsened, particularly in Portugal, Bulgaria, and Latvia.

According to the SHARE Corona Survey 2 data, 70.7% of the individuals in our study population were aged 65 to 79, 29.3% were aged 80 or older, 57.2% were women, and 34.5% were living alone. In addition, 27.2% of these individuals reported experiencing financial distress, and 40.0% indicated that they did not have face-to-face contact with members of their social network. Moreover, 43.3% of these individuals said they had depression symptoms before the pandemic, 40.9% reported having close contact with COVID-19, 4.8% said they received financial support from the government, and 15.2% reported experiencing a postponement or denial of a health appointment.

After controlling for variables usually associated with depression (Table 1), we find that having experienced a postponement or denial of a health appointment (i.e., encountering the unresponsiveness of the health system during the pandemic) was associated with 34.9% higher chances of experiencing depression/

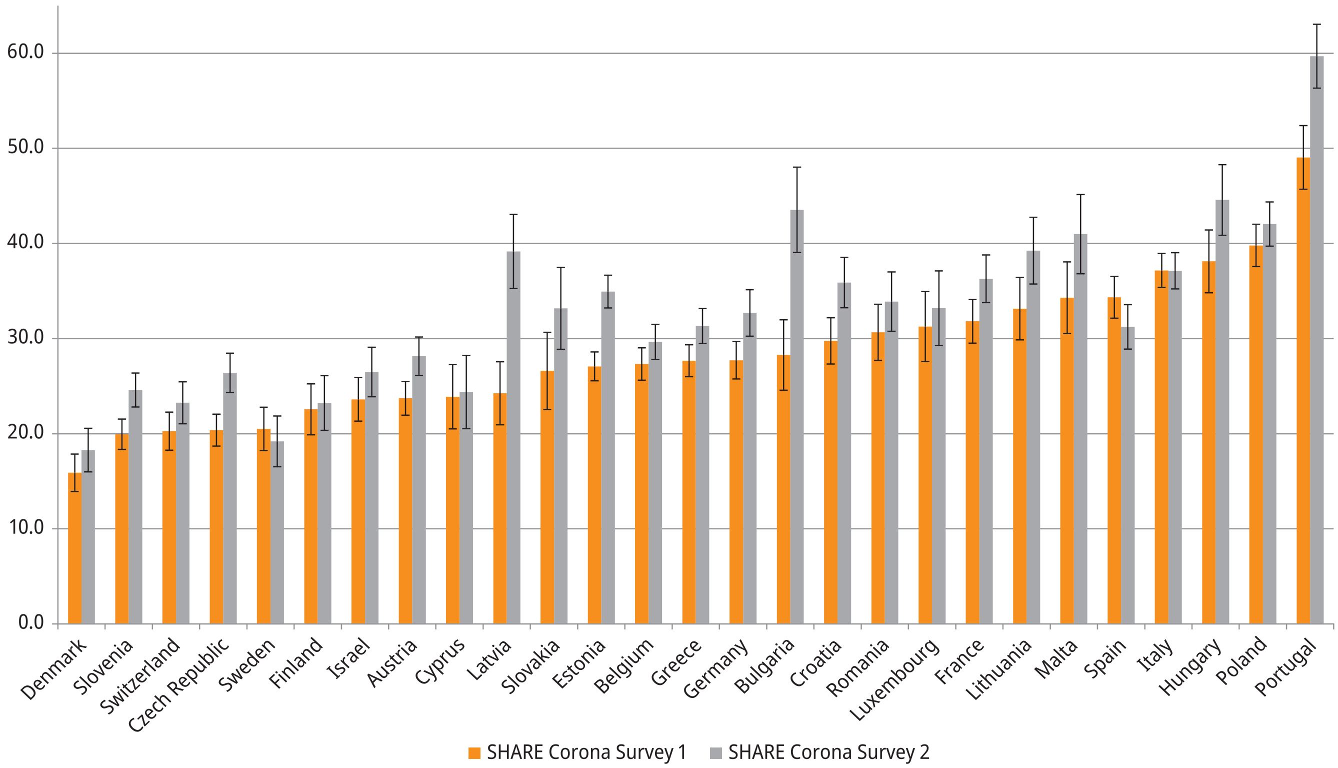

Figure 1: Individuals with depression/sadness in the month before the interview (%).
Note: The bars represent the confidence intervals. The sample is limited to individuals aged 65+.
Source: SHARE Corona (W1), release 8.0.0., N = 40,173 and SHARE Corona (W2), release 8.0.0., N = 34,987. Weighted data.

Table 1: Multilevel logistic regression for depression/sadness.

Multilevel logistic regression for depressed_camh002			
	Model 1 (N=29899)		
	OR	CI (95%)	*p*
Fixed parts			
(Intercept)	0.124	0.109 - 0.140	**< 0.001**
Age			
65 - 79 years (ref.)			
80 + years	1.185	1.111 - 1.265	**< 0.001**
Gender (female)	1.591	1.499 - 1.689	**< 0.001**
Education			
Low (ref.)			
Medium	0.971	0.906 - 1.041	0.411
High	1.019	0.944 - 1.099	0.634
Living alone (yes)	1.335	1.254 - 1.420	**< 0.001**
Financial distress (yes)	1.556	1.454 - 1.666	**< 0.001**
Self-reported physical health	1.963	1.899 - 2.030	**< 0.001**
Depression before pandemic (yes)	2.783	2.631 - 2.943	**< 0.001**
Face to face social network contacts (no)	1.182	1.117 - 1.251	**< 0.001**
Closeness contact with covid (yes)	1.208	1.141 - 1.278	**< 0.001**
Received government financial support (yes)	1.012	0.912 - 1.123	0.819
Postponed or denied health appointments (yes)	1.349	1.252 - 1.453	**< 0.001**
Oxford containment index	1.012	0.898 - 1.140	0.848
Oxford health index	1.087	0.972 - 1.216	0.142
Oxford support economic index	0.899	0.811 - 0.995	**0.040**
Random parts			
ICCcountry		0.016	
Between-country variation		0.0542	
Deviance		30925.2	
N countries		27	

Note: *Ref* reference group, *OR* odds ratio, *CI* confidence interval; *p* p-value. The sample is limited to individuals aged 65+. Significance levels are in bold ($p < 0.05$).
Source: SHARE Corona (W2), release 8.0.0. Unweighted data.

sadness. As individuals who had depressive symptoms before the pandemic may have had more difficulties getting health appointments, our model controls for the presence of depressive symptoms in the period before the pandemic. In contrast, our findings show that health policies that did not strengthen the health system’s responsiveness (notably, policies related to COVID-19 testing and contact tracing, the use of face coverings outside the home, vaccination, and protections for older people) were not associated with individuals’ mental health.

We also observe no link between having received financial support from the government during the pandemic and individuals' mental health. However, debt/ contract relief policies are shown to protect mental health. Specifically, we find that individuals' chances of having experienced depression/sadness decreased by 0.10% for every extra value on a country's economic indicator.

The regression results also show that people in the older age group (80+) had higher chances of reporting feelings of depression/sadness (18.5%), and that women were more prone than men to have such feelings (women had 59.1% higher chances of reporting depression/sadness). Living alone also increased individuals' chances of experiencing depression/sadness by 33.5%. In addition, individuals who were experiencing financial distress were 55.6% more likely to have depression/sadness than individuals who were not. The worse an individual's self-reported physical health, the higher his/her chances were of having depression/sadness (for every extra value in worsening physical health, the chances increased by 96.3%). Individuals who had depression before the pandemic were almost two times more likely to have depression/sadness (OR = 2.783) during the pandemic than those who had no depression before the COVID-19 pandemic. In addition, individuals who reported having low levels of face-to-face contact with social network members were 18.2% more likely to experience depression/sadness than individuals who reported having frequent and diverse social connections. Meanwhile, people who had close contact with COVID-19 had 20.8% higher chances of experiencing depression/sadness than individuals who had no contact with the virus.

Furthermore, the pandemic restriction measures considered in a country's containment index are not found to be associated with the mental health of individuals. In addition, health policies that helped to protect people from being infected with the COVID-19 virus were not associated with older adults' mental health. Conversely, economic policies, such as those providing contract/debt relief and financial help from the government (Oxford economic index), were associated with mental health. Indeed, for each higher value in the economic index, the chances of individuals experiencing depression/sadness decreased by 10.1%.

4 Conclusion

Our results show that there were significant differences across countries in levels of depression/sadness during the pandemic. Portugal, a country that usually has high values for depression, was found to have the highest share of older adults with mental health problems during the pandemic (59.7%), while Denmark was shown to have the lowest share (18.3%). We also observed that having worse physical health and experiencing the postponement or denial of appointments was associated with higher chances of having mental health problems. In economic terms, having financial distress was associated with a higher likelihood of experiencing depression/sadness. Conversely, we found that debt and contract relief policies and financial support from the government (considered in the Oxford support economic index) protected older adults' mental health.

These findings have implications for health and economic policies in Europe and Israel. Having personal experience of the unresponsiveness of the health system through the postponement or denial of medical appointments was linked to a greater likelihood of having depression/sadness. Preventive public health measures, such as those related to the availability of virus detection tests, vaccinations, contact tracing, mandatory mask use, and protections for older adults, did not appear to protect mental health. We also found that measures aimed at containing the spread of the virus (such as closing schools and workplaces, cancelling public events, etc.) had no impact on the mental health of older individuals. We therefore conclude that these preventive public health measures and containment measures should be accompanied by policies aimed at strengthening the response capacity of the health system to ensure that the health problems of each individual are not neglected.

It should also be stressed that no relationship was found between the financial support received by some individuals to mitigate the economic impact of the pandemic and the mental health of older people. However, public debt/contract relief policies were found to have a positive impact on the mental health of the 65+ population. In sum, policies that provided people with economic/financial protections during the pandemic, such as those that froze household financial obligations, positively affected the mental health of older individuals.

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Part II Health and health behaviours in the pandemic

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6 Personal contact with other people and mental well-being during the COVID-19 pandemic

Key points

- Having less frequent contact with children (at most once a week) was negatively related to mental health among people aged 50+ compared to having more frequent contact.
- Respondents aged 50+ who reported never contacting their friends had worse mental health than those who did so more frequently.
- Other negative experiences (deterioration of one's financial situation, experiencing a death due to COVID-19 or a COVID-19 infection) also had a negative impact on the mental well-being of adults aged 50+.

1 Introduction

Direct contact with other people (especially children, relatives, or friends) may be a source of emotional support that contributes to individuals' subjective assessments of their quality of life. The COVID-19 pandemic shed new light on the previous research on this issue. Social distancing recommendations, as well as the imposition of quarantines, changed people's everyday behaviour and limited in-person contact. Preliminary analyses of the effects of these shifts in behaviour have not provided clear evidence, because they focused primarily on the short-term implications of the pandemic, and were based on cross-sectional data. On the one hand, Chen et al.'s (2021) review of the pandemic's consequences for mental health found that the prevalence of reported symptoms of psychological distress (such as anxiety, depression, loneliness, or sleep disorders) was higher during the pandemic than in the pre-pandemic period. On the other hand, according to Shevlin and others (2021), the overall prevalence of anxiety-depression remained stable during the pandemic, with a noticeable reduction occurring between Waves 2 and 3. Similar findings were provided by Wester et al. (2022), who showed that adults aged 50+ had a lower

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risk of feeling depressed or sad and experiencing sleep problems during the pandemic, although they were more prone to feeling lonely. Moreover, the authors demonstrated that the findings on the mental health consequences of the COVID-19 pandemic are mixed depending on the measures employed in the analyses and on how they are estimated (using cross-sectional vs. longitudinal data). Thus, the impact of the pandemic on people's well-being remains ambiguous and needs further investigation, especially while taking into account the different aspects that influenced it, and its long-lasting effects.

The restrictions introduced during the COVID-19 pandemic led to a significant reduction in the frequency of social contact, especially among people aged 50+, which may have had a negative impact on their mental health (Chen et al., 2021, Litwin and Levinsky, 2022). Moreover, the differences in family ties observed in different European countries may be reflected in cross-country disparities in social contact frequency (including during the COVID-19 outbreak), which may, in turn, have varying effects on people's psychological well-being. Previous analyses on the impact of the COVID-19 pandemic on mental health were based on separate single variables describing different aspects of mental health (nervousness, feeling depressed or sad, trouble sleeping, loneliness, etc.), and compared respondents' feelings during the pandemic with their feelings in the pre-pandemic period (Litwin and Levinsky, 2022). In our view, this approach is not comprehensive, as the investigated phenomenon is multifaceted, and should not be analysed with the use of single outcome measure. Thus, our approach accounts for the multifaceted nature of the phenomenon under study by creating a composite variable describing mental health that is based on several measures.

Thus, the aim of this chapter is to present the results of analyses of the relationship between the frequency of contact with other people and mental well-being among people aged 50+ during the COVID-19 pandemic. To this end, we used data from two waves of the SHARE Corona survey. Our research extends work on mental health and social network contact among older adults after the COVID-19 outbreak by Litwin and Levinsky (2022). We used a composite measure of mental well-being based on four questions as our dependent variable, and we accounted for the within-person longitudinal dimension of the studied phenomenon. Moreover, we considered other issues (such as the respondents' financial situation or experiences of death or hospitalisation due to COVID–19) that could have impacted both the social contact and the mental health of the respondents in the years 2020–2021.

2 Data and analytical approach

We used data from two rounds of the Survey of Health, Ageing and Retirement in Europe carried out during the pandemic (in 2020 and 2021) (SHARE Corona Survey). The sample was limited to respondents aged 50+ at Wave 2 with non-missing data in 27 European countries and Israel. The final sample contained information on 44,113 respondents. The characteristics of our sample (by variables in our models) are presented in Table A1 (in the appendix).

We estimated structural equation models (SEM) with fixed effects (FE-SEM), as proposed by Allison (2009), in which the dependent variable is a composite measure of different mental health measures regressed against variables describing social contact during the pandemic and other variables that could simultaneously influence mental health and social contact. Estimating the model within an SEM context offers several advantages, including allowing for the inclusion of latent variables and measurement errors, which facilitates the measurement of difficult-to-measure concepts, such as mental health status, whose multi-faceted nature is difficult to capture with a single variable.

Our dependent composite variable describing mental health combines information from two sets of variables, with the first assessing whether the respondents experienced any of the respective symptoms (i.e., feeling depressed or sad, nervousness, trouble sleeping, and loneliness), and the second asking the respondents to report the frequency of these symptoms (i.e., more, less, or about the same as before the pandemic[1]/ than during the first wave of the pandemic[2]) if they had them. These variables were recoded so that the final dependent latent variable ranges from 0 to 3, with higher values representing a better mental health status. The composite variable is based on confirmatory factor analysis estimated simultaneously with a structural equation model that also estimates coefficients of the determinants of mental health.

Variables describing personal contact with other people were based on questions about how frequently the respondents had in-person contact with children, relatives, and friends, with the following possible responses: “Daily”, “Several times a week”, “About once a week”, “Less often”, “Never”, and “Not applicable” (i.e., did not have children, relatives, or friends; or lived far away, making in-person contact impossible). In our approach, we reduced the number of categories in these variables by combining them into the following groups: 1. Daily or several times a week, 2. About once a week or less often, 3. Never, and 4. Not applicable.

1 At the first wave of the SHARE Corona survey.

2 At the second wave of the SHARE Corona survey.

Moreover, we introduced a set of covariates that may have influenced both the mental health and the social contact levels of the respondents during the COVID-19 pandemic. In particular, these covariates were: experiencing someone's death due to COVID-19 (yes/no(ref.)),[3] experiencing COVID-19 symptoms (of someone else or personally) (yes/ no (ref.)), or hospitalisation due to COVID-19 (yes/no (ref.)). The measure of the respondent's economic activity at the moment of the survey (based on two variables: 1. Economic activity when COVID-19 broke out and 2. Change in economic status due the COVID-19 pandemic) had two categories (yes/ no (ref.)). The respondent's financial situation was approximated by the household's ability to make ends meet since the outbreak (1. With great difficulty, 2. With some difficulty, 3. Fairly easily, 4. Easily (ref.)). The respondent's subjective health status was assessed by the question: "Before the outbreak of the coronavirus, would you say your health was excellent, very good, good, fair, or poor?" (excellent (ref.)).[4]

3 Results

3.1 Contact with other people and mental health variables

The frequency of personal contact with children during the COVID-19 pandemic among people aged 50+ differed significantly across the analysed countries (Figure 1). In 2020, the countries with the highest proportions of people aged 50+ who had daily direct contact with children were in Southern and Central Europe (such as Croatia – 41.6%, Bulgaria – 34.3%, Italy – 30.6%, Hungary – 30.5%,), while the countries with the lowest proportions were in Northern and Western Europe (the Netherlands – 2.6%, Denmark – 7.9% Finland – 8%, and Switzerland – 10.2%). A similar pattern, with a few exceptions, was observed in 2021. Respondents aged 50+ met other relatives very rarely: in 2020, the share of older people who had daily contact with other relatives ranged from 0.6% in Austria and Israel to 15.0% in Portugal and 10.6% in Bulgaria; while in 2021, this share ranged from 0.4% in Luxembourg to 11% in Portugal (Figure 2). Personal contact with friends, neighbours, and colleagues was more frequent: in 2020, the proportion of respondents aged 50+ who had daily contact with

3 A relative could be a partner/ spouse, a child, other household member, etc.

4 Note that in Wave 1, the question referred to self-rated health status before the outbreak; and in Wave 2, the question referred to the rating of subjective health. There are variables describing changes in health status compared to the pre – pandemic period (Wave 1) or changes in health in the last 3 months (Wave 2), but in our opinion, these variables do not reflect the health status of respondents appropriately.

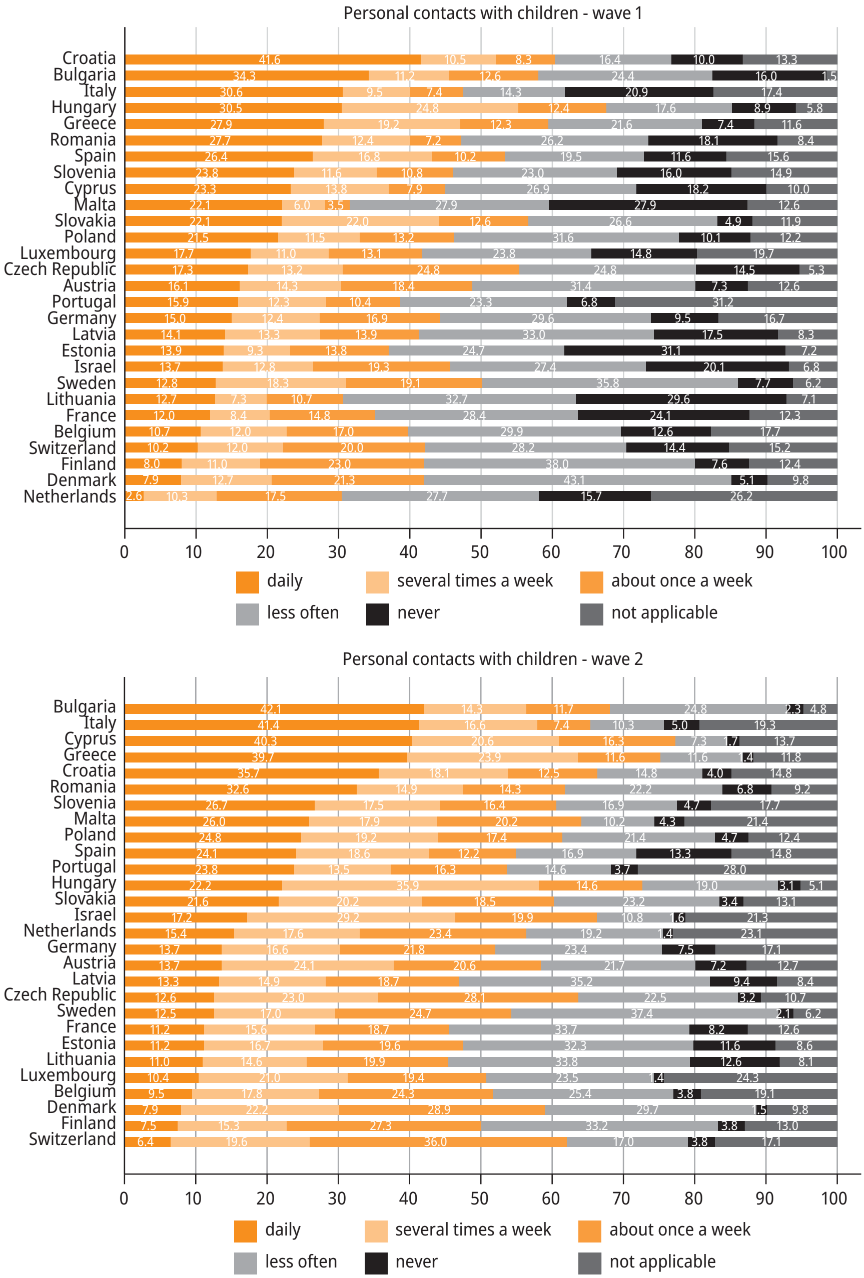

Figure 1: Frequency of personal contact with children during the COVID-19 pandemic.
Source: SHARE Corona (W1 & W2), release 8.0.0.

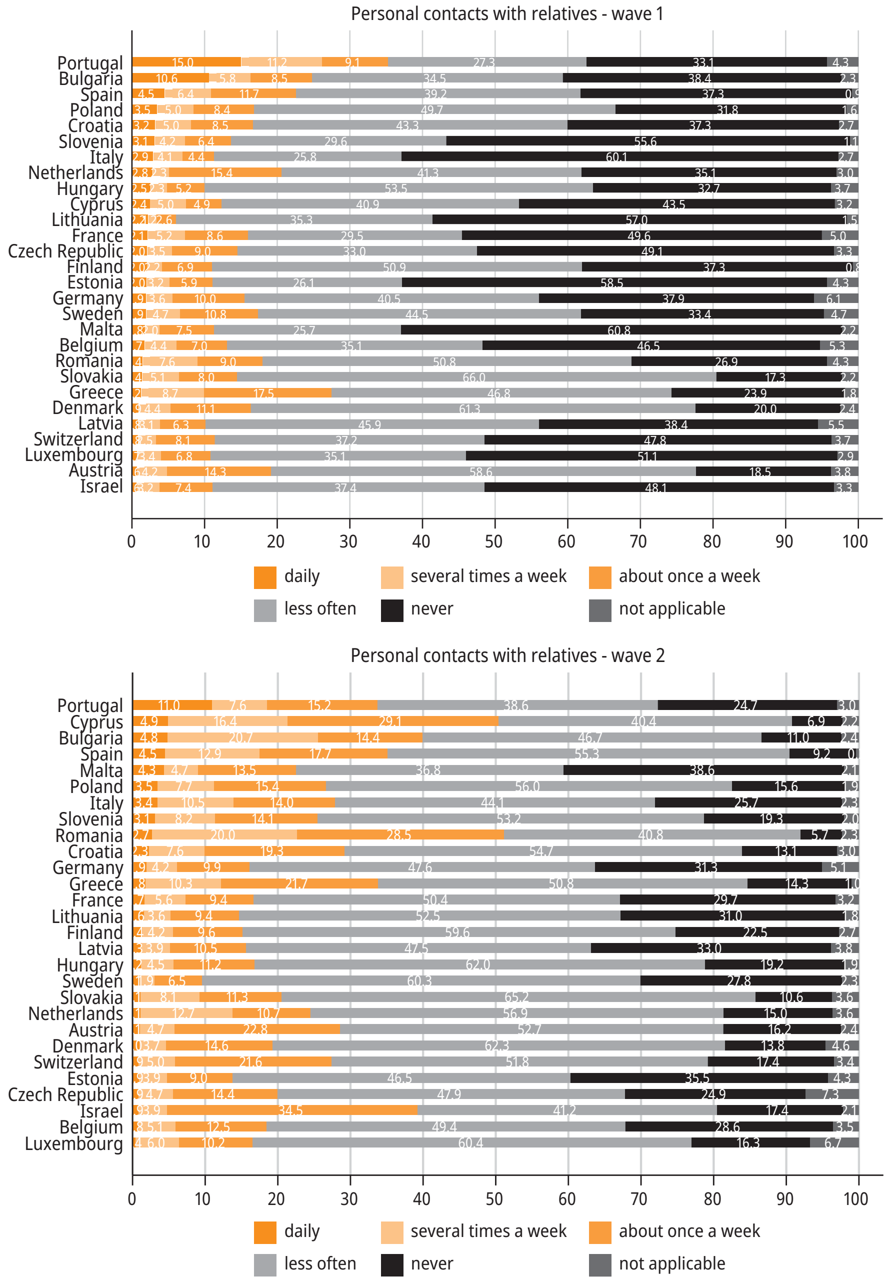

Figure 2: Frequency of personal contact with relatives during the COVID-19 pandemic.
Source: SHARE Corona (W1 & W2), release 8.0.0.

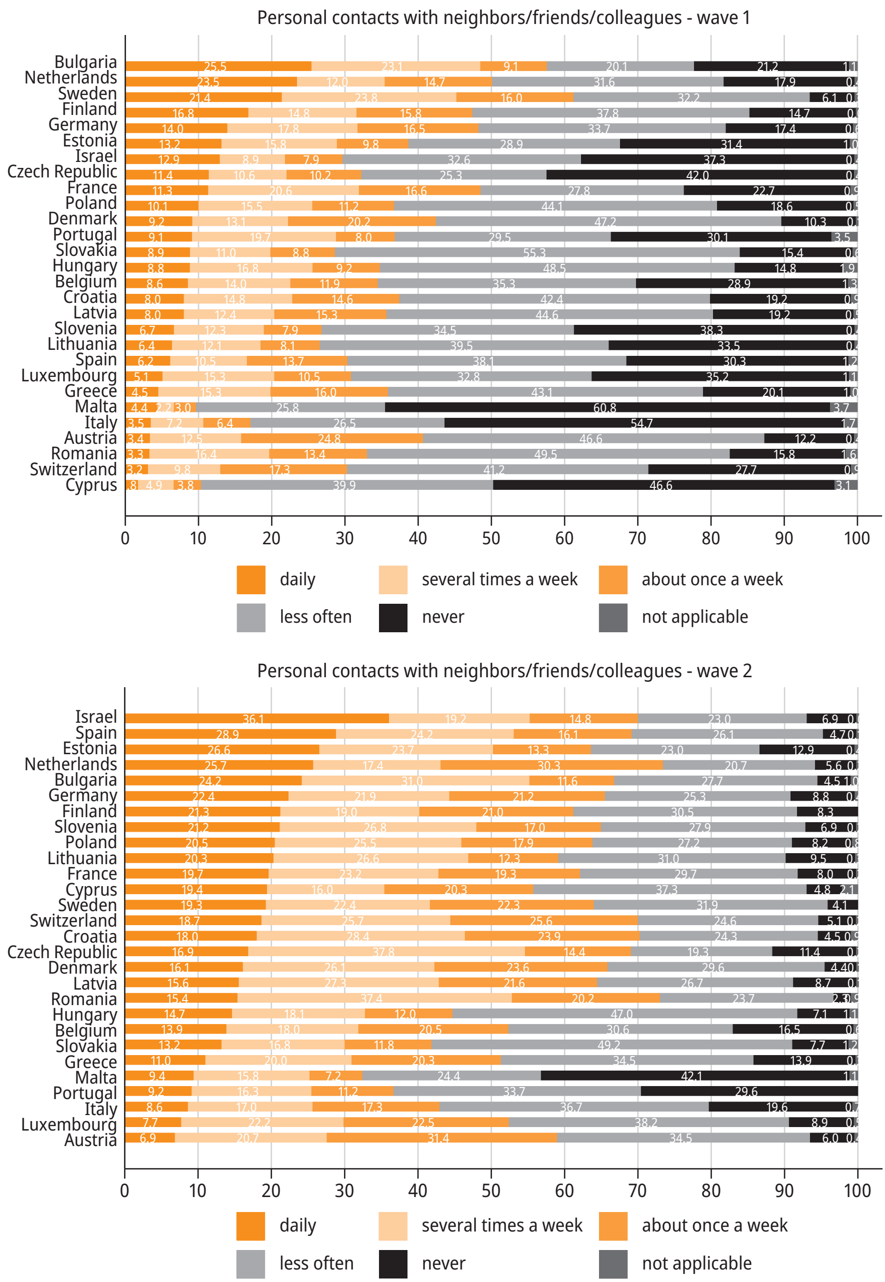

Figure 3: Frequency of personal contact with neighbours/friends/colleagues during the COVID-19 pandemic.
Source: SHARE Corona (W1 & W2), release 8.0.0.

these people was 1.8% in Cyprus and 25.5% in Bulgaria; while in 2021, this share increased in all countries, ranging from 6.9% in Austria to 36.1% in Israel (Figure 3). It should be noted that contact frequency with other people was higher 2021 than in 2020, which may reflect both having less fear of infection due to vaccination and becoming accustomed to the pandemic. In general, these findings seem to reflect the well-known division of European countries according to weak-strong family ties, differences in the frequency of the co-residence of older people with adult children, and differences in the importance of non-kin relationships in people's lives. Moreover, these findings may mirror respondents' attitudes towards the pandemic and the COVID-19 vaccine in the analysed countries.

Mental health status, measured by the proportion of respondents aged 50+ experiencing different mental conditions (nervousness, feelings of depression or sadness, trouble sleeping, feelings of loneliness), worsened slightly (Figure 4).

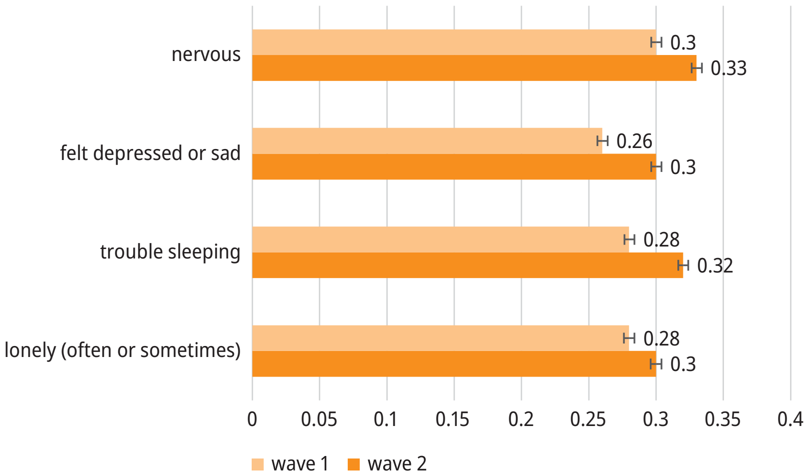

Figure 4: Proportion of people aged 50+ experiencing mental disorders (with 95% CI).
Source: SHARE Corona (W1 & W2), release 8.0.0.

3.2 Results of SEM modelling

Our results for the SEM fixed–effects models of mental health regressed against measures of frequency of contact with children, relatives, and friends are presented in Figure 5. As a sensitivity analysis, we estimated separate models for several subsamples, including for those aged 50 or older (with separate models for men and women), as well as for those aged 50–64 and 65 or older.

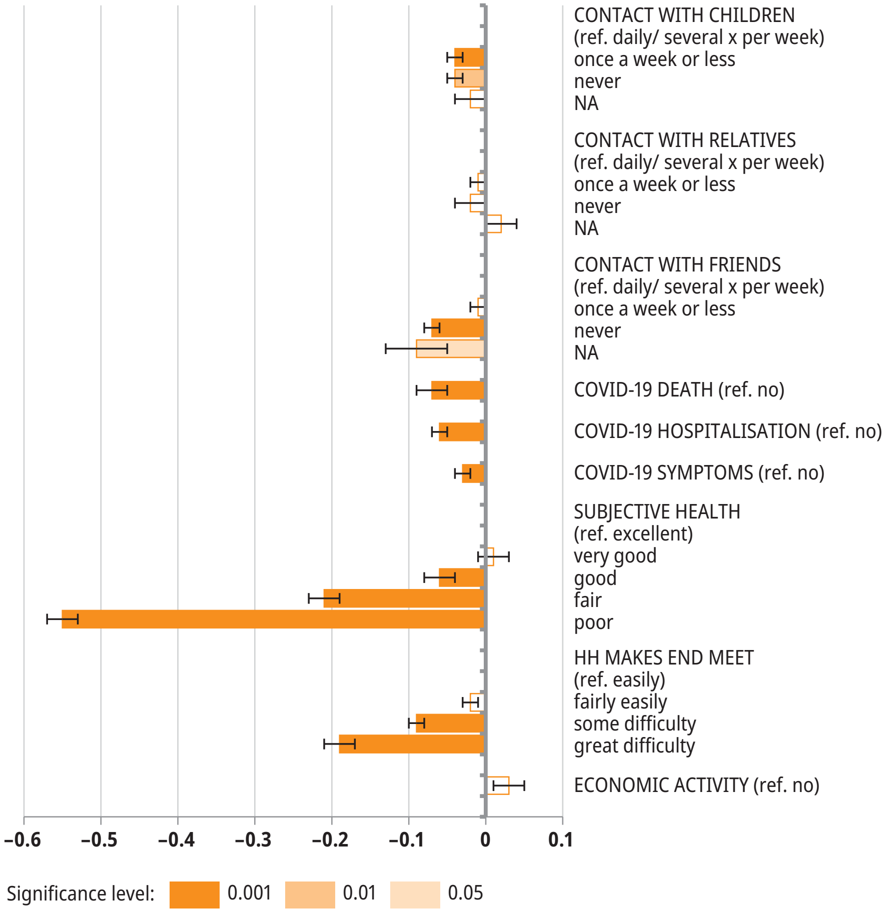

Figure 5: Estimates of structural equation fixed-effects models among people aged 50+ (with SE).
Source: SHARE Corona (W1 & W2), release 8.0.0.

The results show that having contact with children and to some extent with friends was crucial for the mental health of people aged 50+ in the analysed countries. Generally, having less frequent contact with children (once a week or less or never) was negatively related to mental health among people aged 50+, compared to having contact that was daily or several times per week. Similarly, respondents who never contacted their friends had worse mental health than those who did so more frequently. It is worth mentioning that the results for contact with relatives were not significant, which may signify that this kind of contact was less important for the mental well-being of people 50+ during the COVID-19 pandemic.

In terms of control variables, with the exception economic activity, all other measures (death of someone close due to the COVID-19, COVID-19 symptoms, hospitalisation due to COVID-19, financial situation, and subjective health) nearly always showed statistically significant effects on changes in mental health. Moreover, these effects were in the expected direction. For example, experiencing the death of someone close, having COVID-19 symptoms, or being hospitalised due to COVID-19 were all related to having worse mental health. Reporting that one's household had more difficulties making ends meet contributed to lower mental health, while having worse self-rated health (compared to having "excellent" health) was associated with worsening mental health. These results were similar across all the analysed subpopulations, with a few notable exceptions. For example, having COVID-19 symptoms was non-significant for men aged 50 or older, while experiencing the death of someone close was non–significant for those aged 50–64.

4 Summary and conclusions

In summary, we examined the association between the frequency of personal contact with children, relatives, and friends and mental health among people aged 50+ living in various European countries (and Israel) during the COVID-19 pandemic. Our results demonstrated that having personal contact with other people is an important predictor of mental well-being. Specifically, we found that having personal contact with children, and to a lesser extent with friends, was related to the mental well-being of people aged 50+ in the analysed countries. The effect of having personal contact on mental health was stable for the analysed age groups, as well as for men and women. Moreover, our results confirmed that other events experienced during the COVID-19 pandemic, such as the deterioration of one's financial situation, or suffering from a COVID-19 infection, had negative effects on the mental well-being of people aged 50+. It should also be noted that similar analyses were carried out for electronic contacts with other people, but the results were not significant. Thus, we can confirm the findings of Litwin and Levinsky (2022), who showed that electronic contact was not beneficial for the mental well-being of people aged 50+.

People aged 50+, and especially those aged 65+, are considered the most vulnerable age group for many reasons. As well as being the age group most susceptible to infection, the effects of social distancing on their mental well-being may be the most serious. Moreover, adults aged 50+ are a very heterogenous group, not only with respect to their socio-demographic situations, but also with respect to the gravity of their mental conditions in response to the COVID-19 pandemic. These differences can be explained to some extent by the characteristics of the countries where they live. Policymakers and health care providers should pay special attention to the needs of this group, as mental health is strongly related to physical health and mortality. Different policy measures aimed at reducing the social isolation of older people should be introduced in order to counteract the negative effects of the COVID-19 restrictions at both the macro and the micro levels. This is very important, especially given that the long-term consequences of social isolation, quarantines, and lockdowns are not yet well studied.

Appendix

Table 1A: Descriptive statistics for variables in SEM models.

	Age 50+		Age 65+		Age 50-65		Men, Age 50+		Women, Age 50+	
	Wave 1	Wave 2	Wave 1	Wave 2	Wave 1	Wave 2	Wave 1	Wave 2	Wave 1	Wave 2
Nervous										
More	0.21	0.12	0.21	0.13	0.22	0.12	0.16	0.10	0.25	0.14
Same	0.08	0.17	0.08	0.17	0.07	0.16	0.06	0.14	0.09	0.18
Less	0.01	0.03	0.01	0.03	0.01	0.04	0.00	0.02	0.01	0.04
None	0.71	0.68	0.71	0.67	0.70	0.69	0.77	0.74	0.66	0.63
Depression										
More	0.16	0.12	0.17	0.13	0.15	0.11	0.11	0.09	0.20	0.14
Same	0.08	0.15	0.09	0.16	0.07	0.12	0.06	0.11	0.10	0.18
Less	0.01	0.02	0.01	0.02	0.01	0.02	0.00	0.01	0.01	0.03
None	0.75	0.71	0.74	0.69	0.77	0.75	0.82	0.79	0.69	0.65
Trouble Sleeping										
More	0.08	0.09	0.08	0.09	0.09	0.09	0.06	0.07	0.09	0.10
Same	0.19	0.22	0.20	0.23	0.15	0.19	0.15	0.17	0.22	0.25
Less	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.01	0.01	0.01
None	0.73	0.68	0.71	0.67	0.76	0.72	0.79	0.75	0.68	0.64
Loneliness										
More	0.11	0.07	0.12	0.08	0.09	0.06	0.08	0.05	0.14	0.09
Same	0.15	0.21	0.16	0.22	0.13	0.17	0.11	0.16	0.18	0.24
Less	0.01	0.02	0.01	0.02	0.01	0.02	0.01	0.01	0.01	0.03
None	0.73	0.70	0.71	0.68	0.78	0.75	0.80	0.78	0.68	0.65
Contact with Children										
Daily, Several × per Week	0.31	0.42	0.31	0.43	0.33	0.41	0.30	0.40	0.32	0.43
Once a Week or Less	0.44	0.43	0.45	0.44	0.39	0.41	0.45	0.44	0.43	0.43
Never	0.16	0.05	0.16	0.05	0.15	0.05	0.15	0.05	0.16	0.05

Table 1A (continued)

	Age 50+		Age 65+		Age 50-65		Men, Age 50+		Women, Age 50+	
	Wave 1	Wave 2	Wave 1	Wave 2	Wave 1	Wave 2	Wave 1	Wave 2	Wave 1	Wave 2
Not Applicable	0.09	0.10	0.08	0.08	0.13	0.13	0.10	0.10	0.09	0.09
Contact with Relatives										
Daily, Several × per Week	0.07	0.09	0.07	0.08	0.07	0.10	0.06	0.09	0.07	0.09
Once a Week or Less	0.47	0.64	0.45	0.61	0.52	0.68	0.50	0.66	0.45	0.62
Never	0.43	0.24	0.45	0.26	0.39	0.19	0.40	0.23	0.45	0.25
Not Applicable	0.03	0.03	0.04	0.04	0.02	0.02	0.03	0.03	0.04	0.04
Contact with Friends										
Daily, Several × per Week	0.20	0.36	0.17	0.32	0.26	0.45	0.21	0.37	0.19	0.35
Once a Week or Less	0.49	0.51	0.49	0.53	0.50	0.46	0.52	0.51	0.48	0.51
Never	0.30	0.13	0.32	0.15	0.24	0.09	0.26	0.12	0.32	0.14
Not Applicable	0.01	0.01	0.01	0.01	0.01	0.00	0.01	0.00	0.01	0.01
Control Variables										
Covid-19 Hospitalization	0.04	0.12	0.04	0.12	0.04	0.13	0.04	0.13	0.04	0.12
Covid-19 Death	0.03	0.08	0.03	0.08	0.02	0.08	0.03	0.09	0.03	0.08
Covid-19 Symptoms	0.12	0.39	0.11	0.37	0.14	0.45	0.12	0.39	0.12	0.40
Subjective Health										
Excellent	0.07	0.04	0.06	0.03	0.10	0.07	0.07	0.05	0.07	0.04
Very Good	0.17	0.16	0.14	0.13	0.23	0.22	0.17	0.16	0.17	0.15
Good	0.45	0.41	0.45	0.39	0.46	0.43	0.46	0.42	0.45	0.40
Fair	0.25	0.30	0.29	0.33	0.17	0.22	0.24	0.29	0.26	0.31
Poor	0.06	0.09	0.07	0.11	0.03	0.05	0.05	0.08	0.06	0.10
HH Makes Ends Meet										
Great Difficulty	0.09	0.07	0.08	0.07	0.11	0.09	0.08	0.06	0.10	0.08
Some Difficulty	0.25	0.25	0.25	0.24	0.28	0.27	0.24	0.23	0.26	0.26
Fairly Easily	0.36	0.38	0.36	0.38	0.35	0.38	0.35	0.38	0.36	0.38
Easily	0.30	0.30	0.31	0.32	0.27	0.27	0.32	0.33	0.28	0.29
Economic Activity	0.17	0.17	0.05	0.03	0.47	0.52	0.19	0.18	0.16	0.16
N	44113	44113	30349	30349	12053	12053	18417	18417	25696	25696

Source: SHARE Corona (W1 & W2), release 8.0.0.

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Stefan Gruber and Josefine Atzendorf

7 Developments in feelings of loneliness and depression among older adults in Europe and Israel during the pandemic

Key points

- The share of retired respondents aged 60+ years who reported feelings of loneliness did not increase significantly between summer 2020 and summer 2021. However, the share of these respondents who reported feelings of sadness/depression increased significantly over the same period.
- Multi-level regression models based on data from the second round of the SHARE Corona Survey reveal that women, the oldest-old, people with financial distress, people with worsened health status, and people living alone were at highest risk of reporting feelings of loneliness and depression.
- On the macro level, living in a country where the number of COVID-19-related deaths per 1000 inhabitants was higher was associated with a significant increase in the probability of reporting feelings of loneliness.
- To attenuate the negative effects of the pandemic on the well-being of older adults, improving the supply of and access to age-attuned mental health care should be on the political agenda.

1 Introduction

While social distancing measures turned out to be effective in limiting the spread of COVID-19, the effects of such measures on people's mental well-being turned out to be negative. On a hypothetical level, the older population may be particularly affected by the negative consequences of social distancing measures because the level of social contact in old age tends to be low. While the study by Wester et al. (2022) found that Europeans aged 50+ had fewer depressive symptoms but felt lonelier in the summer of 2020 than in the pre-pandemic period, most studies that compared the mental well-being of this population in the initial phase of the pandemic with that in the pre-pandemic period found that there were significant increases in the burden of depressive symptoms among older people (e.g., Briggs et al., 2021). Results based on the first SHARE Corona Survey (SCS) showed that within the group of older adults, the oldest-old and those living alone had the highest risk of reporting an increase in loneliness and depression (Atzendorf and Gruber, 2022). However, the results of research that compared the mental health of older adults with that of

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younger cohorts suggested that older people were more resilient, and that having a higher age might have buffered the impact of the pandemic and the pandemic control measures on the mental well-being of older adults (Parlapani et al., 2021).

While a large number of studies focused on the initial phase of the pandemic, the question of how the mental well-being of older adults evolved over the course of the pandemic merits more attention. In addition, the issue of how the factors that contributed to the well-being of older adults changed between summer 2020 and 2021 has yet to be fully addressed. These are the central research questions of this study. For our analysis, we use data from the second SHARE Corona Survey, which was conducted from June to August 2021 in 27 European countries and Israel. Combining data from the second SCS with macro data from the Oxford COVID-19 Government Response Tracker (OxCGRT) allows us to include macro indicators at the country level in addition to individual characteristics: namely, the mortality rate due to COVID-19 infection and the number of days with stringent epidemic control measures. Comparing our results to previous findings based on the first SCS (Atzendorf and Gruber, 2022) enables us to reach conclusions about how the determinants of feelings of loneliness and depression developed over the pandemic.

2 Changes in feelings of loneliness and depression between summer 2020 and summer 2021

Feelings of loneliness are measured with the following question: "*How much of the time do you feel lonely?* The answer options are: *(1)* "*often*", *(2) "some of the time"*, or *(3) "hardly ever or never*". We generate a dummy variable that equals 0 for *hardly ever or never* and 1 for both *often* and *some of the time*. Information on feelings of sadness/depression is collected with the question: *"In the last month, have you been sad or depressed?"* The resulting dummy variable equals 0 for respondents who answered "*no*" and 1 for those who answered "*yes*".

The consequences of the pandemic for peoples' mental well-being likely differed fundamentally, not only between older and younger cohorts, but also within older cohorts, and particularly between individuals who were still working and those who were retired. The pandemic had an extensive impact on working conditions not only in terms of working from home, but also in terms of reductions in working hours or even job losses, and, strongly connected to these developments, losses of income. To reduce heterogeneity within the sample, we focus on the latter group, and restrict our sample to retired respondents aged 60 or older.

A comparison of the number of social contacts older adults had in summer 2020 and in summer 2021 shows that their behaviour changed considerably between the initial phase of the pandemic and one year later. In the first SCS, less than one-third of respondents reported that they had personal contact with members of their close social network at least once a week; while one year later, the share of respondents who reported having frequent contact with family or friends had increased to 54 percent. Nevertheless, the prevalence of feelings of loneliness and depression did not change for the better over this period. Our descriptive analyses reveal that across all countries, there was a slight increase from SCS1 to SCS2 in the share of respondents who reported feelings of loneliness. Figure 1 shows that the share of respondents who reported feelings of loneliness was relatively constant in most countries between summer 2020 and summer 2021. The exceptions to this pattern are Greece, Croatia, and Bulgaria, where the share of respondents who reported feeling lonely was significantly higher in summer 2021 than in summer 2020. The picture is different for feelings of sadness/depression in the last month, as the share of respondents who reported such feelings rose significantly over the period. As displayed in

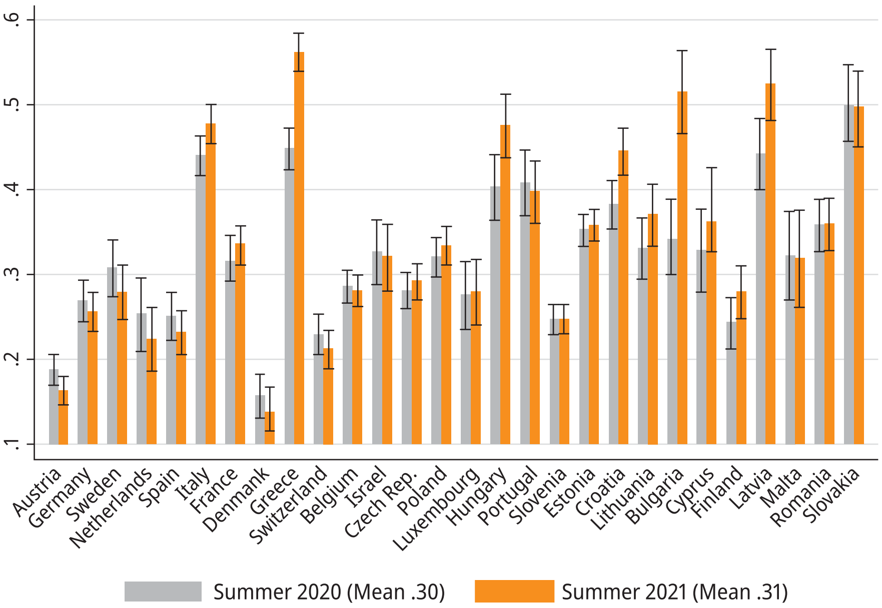

Figure 1: Share of respondents reporting feelings of loneliness per country in summer 2020 and in summer 2021.

Source: SHARE Corona (W1) release 8.0.0 (n = 35,792) and SHARE Corona (W2) release 8.0.0 (n = 32,016).

Figure 2, across all countries, 30 percent of respondents reported feelings of sadness/depression in 2021 (CI: .2973; .3074), up from 26 percent in summer 2020 (CI: .2592; .2683). The exception here is Spain, where the share of respondents who reported feelings of sadness/depression was significantly higher in the initial phase of the pandemic. The fact that Spain was among the countries that were hit particularly hard by the first wave of the pandemic might partially explain this descriptive finding.

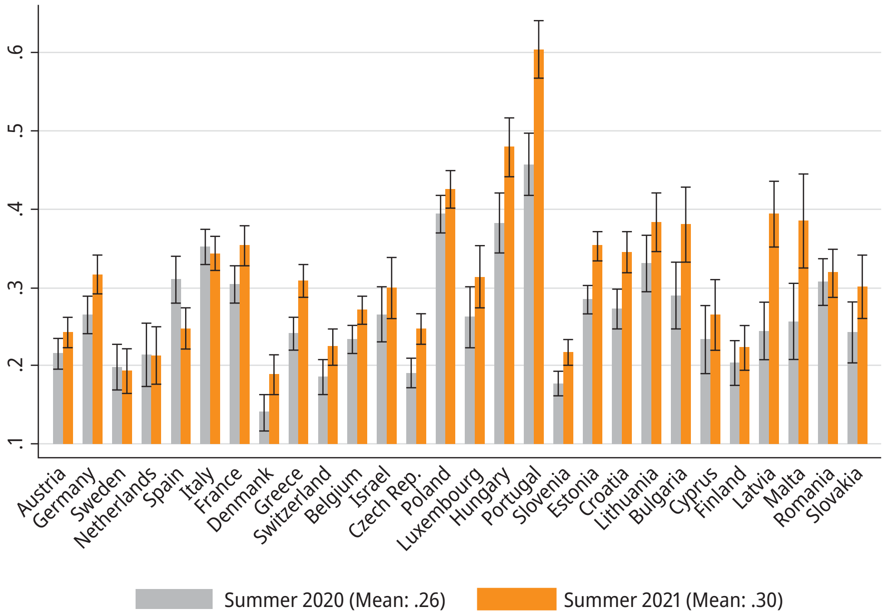

Figure 2: Share of respondents reporting feelings of sadness/depression in the last month per country in summer 2020 and in summer 2021.
Source: SHARE Corona (W1) release 8.0.0 (n = 35,792) and SHARE Corona (W2) release 8.0.0 (n = 32,016).

3 Determinants of feelings of loneliness and depression in summer 2021

We apply multilevel binary logistic regression models in the second analytical step. The analyses focus on participants of the second SCS, which was collected in summer 2021. The analytical sample of retired respondents aged 60 or older from

28 participating countries comprises 32,016 respondents, 55.7 percent of whom were female. The average age of the respondents in the sample was 74.3 years.

The models include the same predictors as in our previous paper that analysed the risk factors for increased feelings of loneliness and depression based on the first SCS (Atzendorf and Gruber, 2022). At the micro level, we include gender, age, educational level (measured via the ISCED coding scheme, which allows for international comparisons, and distinguishes between high, medium, and low educational levels), marital status, a dummy variable that equals 1 for having some or great difficulties making ends meet; deterioration of individual health status; knowing anyone who tested positive for COVID-19 or was hospitalised or died as a consequence of a COVID-19 infection; living alone; and the frequency of face-to-face contact and electronic contact via phone, email, or other electronic means. At the country level, we include the number of deaths due to COVID-19 per 1000 inhabitants and the number of days with stringent epidemic control measures. Measures are defined as stringent if the stringency index provided by OxCGRT exceeds the value of 60.

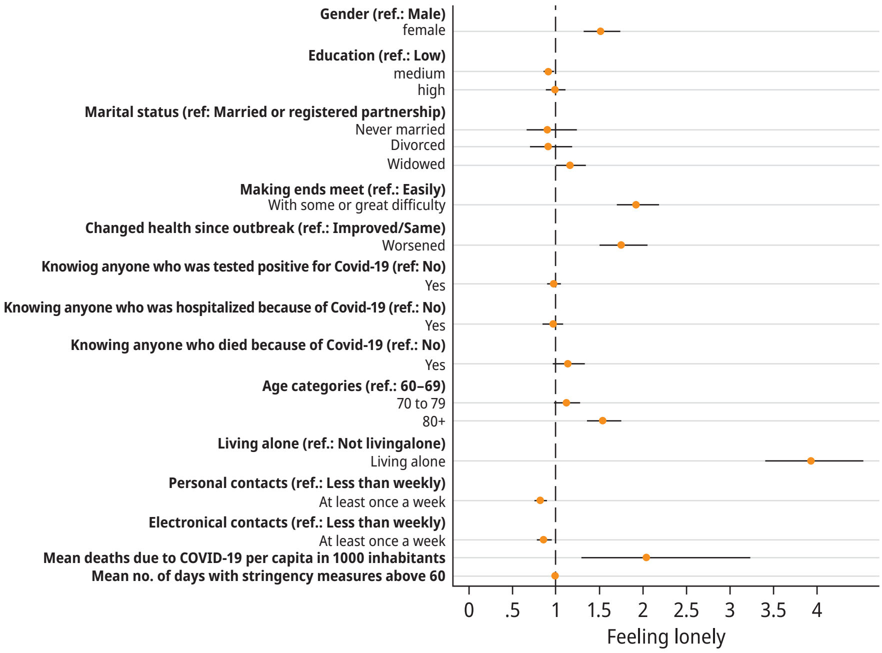

Figure 3: Multilevel binary logistic regression on feeling lonely.

Note: Displayed are odds ratios from a multilevel logistic regression model, incl. random intercepts for countries with 95%-confidence intervals.

Source: SHARE Corona (W2), release 8.0.0 (n = 32,016).

The multilevel models show that the likelihood of reporting feelings of loneliness varied significantly between countries. Individuals in countries with a high mortality rate due to a COVID-19 infection reported more feelings of loneliness (Figure 3). However, individual factors, like gender, age, living alone, experiencing financial distress, and having a deteriorating health status were the major factors that drove the probability of reporting both feelings of loneliness and feelings of sadness/depression in the last month (Figure 4). Women reported more feelings of loneliness and depression than men. In addition, the oldest-old respondents aged 80 or older had a higher risk of reporting feelings of loneliness and feelings of sadness/depression than the younger respondents aged 60–69. Having personal contact at least once a week turned out to be a stabilising factor, as it was associated with a decrease in both feelings of loneliness and feelings of sadness/depression. Having contact via telephone or electronic means also reduced feelings of loneliness, but had no significant influence on feelings of sadness/depression.

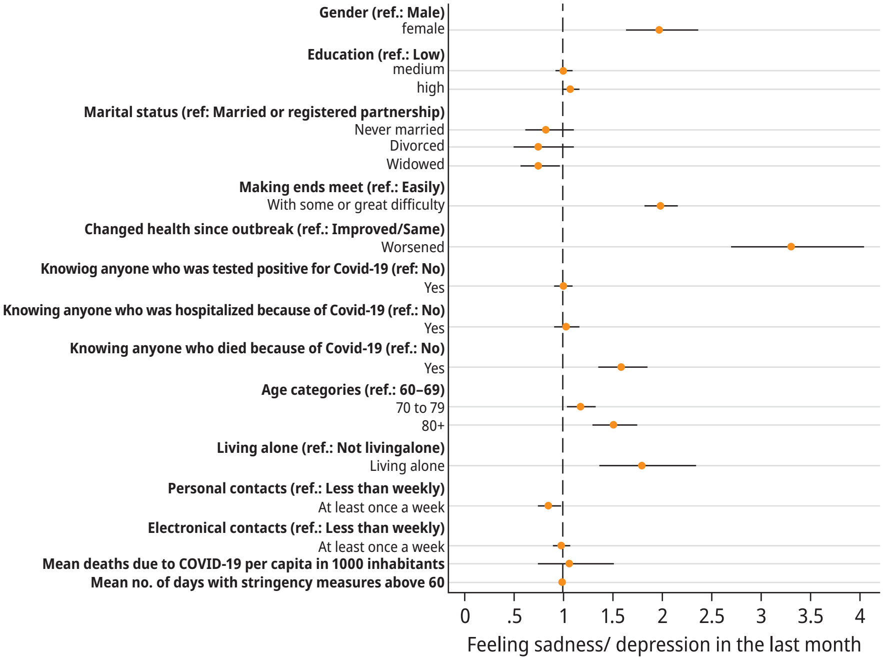

Figure 4: Multilevel binary logistic regression on feeling sadness/depression in the last month.
Note: Displayed are odds ratios from a multilevel logistic regression model, incl. random intercepts for countries with 95%-confidence intervals.
Source: SHARE Corona (W2), release 8.0.0 (n = 32,016).

4 Conclusion

The models based on the second SCS used the same predictors (age, gender, education, marital status, health status, making ends meet, living alone, contact frequency, pandemic situation) as the models in a previous paper that used data from the first SCS to analyse determinants of increases in feelings of loneliness and depression directly after the outbreak of the pandemic (see Atzendorf and Gruber, 2022). This approach allowed us to compare the factors that influenced the mental well-being of older adults in the summer of 2021 with findings on these factors one year earlier. Our comparison showed that the share of respondents who reported feelings of depression was significantly higher than the share in the summer of 2021, while the share of respondents who reported feeling lonely did not differ significantly from the share one year earlier. The multilevel logistic regression models showed differences mainly for the macro indicators. In the summer of 2021, the influence of macro indicators on depressive feelings was insignificant, whereas the mortality rate per 1000 inhabitants was associated with increased feelings of loneliness. In the summer of 2020, both macro factors, the mortality rate per 1000 inhabitants and the number of days with stringent epidemic control measures, had a significant influence on increases in feelings of sadness/depression, but their effects on increases in feelings of loneliness were insignificant. Future studies could focus on whether other factors at the macro level could help to explain country-level differences in the effects of the pandemic on people's well-being.

The models showed that the individual factors that influenced the mental well-being of older adults did not change considerably between summer 2020 and one year later. Gender, living alone, experiencing financial distress, and having a deteriorating health status were found to be the major factors driving feelings of loneliness and feelings of sadness/depression. In addition, the results showed that while having weekly personal contact significantly decreased the risk of reporting feelings of loneliness and depression, having contact via electronic means was not significantly associated with the probability of reporting feelings of sadness/depression. However, having contact by telephone or electronic was found to significantly decrease the risk of reporting feelings of loneliness.

Furthermore, being aged 80 or older was significantly associated with a higher risk of reporting feelings of loneliness and of being sad or depressed in the last month. Since mental health problems are often stigmatised, and older people are less likely than younger people to seek help, the older population in particular should be offered assistance in reaching out for help or in seeking mental health treatment if needed. Increasing the awareness of mental health risks among the older population, and improving access to age-attuned mental health care, should be on the political agenda in future pandemic waves.

Other studies have reported that while mental health problems increased at the beginning of the pandemic, they later declined to levels comparable to those before the outbreak of the pandemic (Robinson et al., 2022). These results are only partially in accordance with our findings, which revealed that the share of retired Europeans and Israelis aged 60 or older who reported feelings of sadness/depression increased from summer 2020 to summer 2021. Female respondents, the oldest-old, and people living alone were shown to have the highest risk of reporting feelings of loneliness and depression during the pandemic. A limitation of our study is its cross-sectional design. To assess real changes in mental well-being over time, longitudinal analyses are needed. However, this study offers insights into which groups were at risk of experiencing worse mental health outcomes during the pandemic. Future studies are needed to gain more knowledge about the factors that could help to strengthen the resilience of those vulnerable groups in our society.

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8 Longitudinal changes in mental health following the first COVID-19 lockdown in Europe

Key points

– People aged 50+ reported having fewer depressive symptoms and sleeping problems, but also feeling lonelier, during the COVID-19 pandemic than they did before the pandemic.
– Stricter policy measures attenuated the overall positive impact on mental health of the first COVID-19 lockdown.
– The first COVID-19 lockdown did not have a detrimental effect on the mental health of the European population aged 50+.

1 Introduction

To limit the spread of the deadly 2019 coronavirus disease (COVID-19) in the early phases of the pandemic, governments implemented a range of measures, including social distancing and isolation orders, restrictions on gatherings through closures of workplaces and institutions, and even national curfews. Middle–aged (aged 50–64) and older (aged 65+) people were the most vulnerable to the virus. Thus, the highest priority in terms of protecting the population from the disease was to protect people aged 50+, even though it is well known that social activity restrictions and social isolation can have a detrimental impact on people's mental health (Leigh-Hunt et al., 2017).

Generally, for older people, having no or few close social contacts is associated with an increased risk of experiencing depressive symptoms, and those who report being less satisfied with their social relationships are more prone to feeling lonely. Likewise, as older, and retired people often use physical leisure and recreational activities to stay socially connected, they may be more susceptible to a decline in mental health when social isolation measures are imposed.

Governmental responses to the pandemic differed across countries. Cross-sectional studies have shown that people aged 60+ who were living alone in a country with a high number of COVID-19 related deaths per 100,000 residents and strict lockdown measures had an increased risk of feeling depressed or lonely (Atzendorf and Gruber, 2022). In addition, longitudinal studies have found that being

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subject to stricter COVID-19 lockdown measures predicted an increase in loneliness in middle-aged and older people (Daly, Sutin, and Robinson, 2022). Nonetheless, there is a lack of research on the effects on people's mental health of limiting their movements and social interactions, which is crucial for understanding the mental health consequences of the COVID-19 pandemic. Thus, in this chapter, we will investigate the changes in mental health (depressive symptoms, sleeping problems, and loneliness) between the pre-pandemic period and the first phase of the COVID-19 pandemic (June-August 2020) among people aged 50+ across Europe. Furthermore, we will examine the effects of different national lockdown strategies to determine whether the imposition of tighter national restrictions had a negative impact on older adults' mental health during the pandemic. We hypothesise that among older adults, mental health problems increased from the period before the lockdown to the period during the first wave of the COVID-19 pandemic, with significant differences depending on socio-demographic factors; and that the imposition of tighter restrictions during the pandemic led to a decline in mental health.

2 Analytical approach

We utilised data from the SHARE Wave 8 Survey (SW8) (interviews from October 2019 to March 2020) and the first SHARE Corona Survey (SCS1) (interviews from June to August 2020) to explore the changes in older adults' mental health from the last survey wave before the pandemic to the first survey wave during the pandemic. Participants were included if they responded to three specific questions regarding mental health (depressive symptoms, sleeping problems, and loneliness) in both the SW8 and the SCS1, and if they were 50 years of age or older by the time of the SW8.

Both survey waves measured mental health as 1) feeling sad or depressed, 2) having sleeping problems, and 3) feeling lonely. Participants were asked the following three questions: 1) "In the last month, have you been sad or depressed?" (with the response options "yes" or "no"); 2) "Have you had trouble sleeping recently?" (with the response options "Trouble with sleep or recent change in pattern" ("yes") or "No trouble sleeping" ("no"); and 3) "How much of the time do you feel lonely?" (with the response options "often", "some of the time", and "hardly ever or never", dichotomised in this study to "often/some of the time" ("yes") and "hardly ever or never" ("no").

Moreover, to assess the influence on mental health of country-specific COVID-19-related restrictions, we used the Oxford Stringency Index (Hale, 2020), which measured policy responses to the COVID-19 pandemic, e.g., travel restrictions and school and workplace closures. The Stringency Index was scored on a 0 (no restrictions) to 100 (complete lockdown), scale and was dichotomised to a "low stringency" (score <46.1) category and a "high stringency" (score ≥46.1) category, based on the median value of the Stringency Index mean scores from the 27 countries (Table 3).

The socio–demographic variables included in the analyses were sex (male, female), age (aged 50–64, aged 65–79, aged 80+), educational level based on the International Standard Classification of Education (ISCED–97) (lower (0–2), medium (3–4), higher (5–6)), employment status (employed, retired, not working (e.g., unemployed, disabled, homemaker)), and number of close social relations ("0–1" and "2 or more") defined by the number of people the respondent discusses important things with. Moreover, we included household size ("living alone", "living with 1 person", "living with 2 or more persons"), limitations in daily activities due to a health problem (severely limited or limited as "yes" and not limited as "no"), and whether the respondent or a near contact of the respondent had been infected or hospitalised due to COVID-19 ("yes" and "no"). Data on age and infection/hospitalisation were retrieved from the SCS1, and the other variables were retrieved from the SHARE Wave 8.

Multilevel logistic regression models were used for the analyses to investigate mental health in a longitudinal setting, and the main model was adjusted for the Stringency Index, age, sex, educational level, household size, close social relations, working situation, infection/hospitalisation due to COVID-19, and limitations in activities due to health. To ease the interpretation of the odds ratios, we computed the marginal effects to estimate the percentage–point (pp) changes. Moreover, to examine the mental health changes associated with different levels of national lockdown and the other mentioned covariates, we included interactions between the time variable (the time of the SW8 and the SCS1) and each of the mentioned covariates. We then ran a similar model to analyse the mental health changes in each of the 27 SHARE countries between the SW8 and the SCS1.

The final sample comprised 36,478 individuals with a mean age of 70.1. Of the sample, 58.1% were women and 53.6% were aged 65–80 (Table 1). The descriptive analysis demonstrated the following changes in mental health from the SW8 to the SCS1: a decline in feeling sad or depressed (39.7% to 25.4%) and a decline in having sleeping problems (36.5% to 27.2%), but an increase in loneliness (27.3% to 28.9%).

The analytical sample comprised 35,734 individuals for *feeling sad or depressed*, 35,826 individuals for *having sleeping problems,* and 35,734 for *loneliness,* respectively.

Table 1: Study population characteristics (N = 36,478).

Variable	N (%)
Age groups	
50–64 years	9,669 (26.5)
65–79 years	19,552 (53.6)
80+ years	7,257 (19.9)
Mean age, years (SD)	70.1 (9.2)
Sex	
Male	15,276 (41.9)
Female	21,202 (58.1)
Educational level	
Low	11,818 (32.4)
Medium	16,040 (44.0)
High	8,446 (23.2)
Close social relations	
0–1 persons	10,136 (27.8)
2 persons or more	26,310 (72.1)
Employment status	
Employed	6,524 (17.9)
Retired	24,884 (68.2)
Not working	4,726 (13.0)
Infection/hospitalisation COVID-19[1]	2,891 (7.9)
Sad/depressed*	
SHARE Wave 8 Survey	14,207 (39.7)
First SHARE Corona Survey[1]	9,242 (25.4)
Sleeping problems*	
SHARE Wave 8 Survey	13,301 (36.5)
First SHARE Corona Survey[1]	9,930 (27.2)
Lonely*	
SHARE Wave 8 Survey	9,942 (27.3)
First SHARE Corona Survey[1]	10,549 (28.9)

Source: SHARE Wave 8 (SW8) and SHARE Corona (W1) (SW8 Survey if not mentioned otherwise) Chi-square test conducted comparing time (SW8 to SCS1) and mental health.
Significance: * = 1%

3 Mental health changes from the pre-pandemic period to the pandemic period

The multilevel logistic regression models showed that, overall, respondents had a lower risk of feeling sad or depressed (−14.3 pp) and a lower probability of having sleeping problems (−9.9 pp), but a higher risk of loneliness (+1.18 pp), during the COVID-19 pandemic than they did before the pandemic (Table 2).

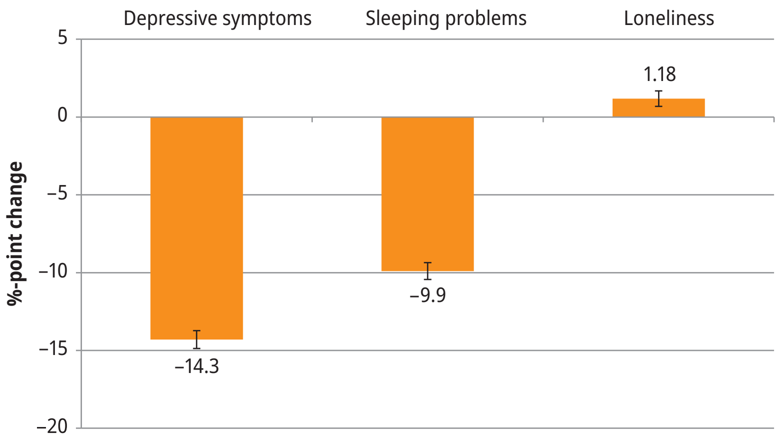

Figure 1: Mental health from before to during COVID-19.
Note: Reference: Wave 8 (pre-pandemic). 95% confidence interval.
Source: SHARE Wave 8 and SHARE Corona (W1).

The respondents who experienced smaller declines in the risk of feeling sad or depressed during the pandemic were those who, prior to the pandemic, had a lower rather than a medium or higher educational level (−12.0 pp), and 0 or 1 close social relations rather than 2 or more close social relations (−12.3 pp). Furthermore, the respondents who had the smallest declines in the probability of having sleeping problems were men (−7.4 pp) and those who had 0 or 1 close social relations (−8.0 pp). Regarding loneliness, women were at greater risk (+2.30 pp) than men, and the respondents with 2 or more close social relations (+2.33 pp) before the pandemic were more prone to feeling lonely than those who had fewer close social relations.

The mean Stringency Index was 46.9 (range 29.7–67.3) across all 27 SHARE countries. The longitudinal analyses for each country demonstrated that the respondents living in a country with a high Stringency Index had a higher probability of feeling sad or depressed (+12.1 pp) than those living in a country with a low

Table 2: Multilevel logistic models estimating percentage-point (pp) changes and ORs for mental health from the SHARE Wave 8 to the first SHARE Corona Survey.

	Sad/depressed² (n = 35,734)		Sleeping problems² (n = 35,826)		Loneliness² (n = 35,734)	
	pp (95% CI)	p^a	**pp (95% CI)**	p^a	**pp (95% CI)**	p^a
Wave time (adjusted)	−14.3 (−14.9 to −13.7)**	–	−9.9 (−10.4 to −9.3)**	–	1.18 (0.7 to 1.7)**	–
Stringency index[b]		0.000		0.465		0.001
Low	−16.4 (−17.2 to −15.6)**		−10.4 (−11.2 to −9.6)**		0.32 (−0.4 to 1.0)	
High	−12.1 (−13 to −11.3)**		−9.3 (−10.1 to −8.6)**		2.08 (1.4 to 2.8)**	
Age groups		0.001		0.101		0.123
50–64 years	−14.6 (−15.7 to −13.6)**		−10.1 (−11.1 to −9.1)**		0.83 (−0.1 to 1.8)	
65–79 years	−14.5 (−15.3 to −13.8)**		−9.9 (−10.6 to −9.1)**		1.61 (0.9 to 2.3)**	
80+ years	−13.3 (−14.6 to −11.9)**		−9.6 (−10.9 to −8.3)**		0.44 (−0.8 to 1.7)	
Sex		0.186		0.000		0.000
Male	−12.1 (−12.9 to −11.2)**		−7.4 (−8.2 to −6.7)**		−0.42 (−1.2 to 0.3)	
Female	−15.9 (−16.7 to −15.2)**		−11.6 (−12.3 to −10.9)**		2.30 (1.6 to 3.0)**	
Education		0.000		0.000		0.508
Low	−12.0 (−13.0 to −11.0)**		−8.9 (−9.9 to −7.9)**		1.00 (0.1 to 1.9)*	
Medium	−15.0 (−15.8 to −14.1)**		−10.0 (−10.8 – to −9.2)**		1.11 (0.4–1.8)**	
High	−16.2 (−17.4 to −15.1)**		−11.0 (−12.1 to −9.9)**		1.54 (0.6 to 2.5)**	

Close social relations		0.000		0.000		0.000
0–1 persons	−12.3 (−13.4 to −11.2)**		−8.0 (−9.1 to −7.0)**		−1.90 (−2.9 to −0.9)**	
2 persons or more	−15.1 (−15.9 to −14.4)**		−10.6 (−11.2 to −9.9)**		2.33 (1.8 to 2.9)	
Employment status		0.000		0.017		0.167
Employed	−14.5 (−15.8 to −13.3)**		−9.4 (−10.6 to −8.2)**		0.05 (−1.0 to 1.1)	
Retired	−14.5 (−15.2 to −13.9)**		−10.3 (−10.9 to −9.6)**		1.43 (0.8 to 2.0)**	
Not working	−12.8 (−14.5 to −11.1)**		−8.4 (−10 to −6.9)**		1.41 (−0.1 to 2.9)	
Infected/hospitalised COVID-19[1]		0.851		0.094		0.015
No	−14.3 (−14.9 to −13.7)**		−9.7 (−10.3 to −9.2)**		1.01 (0.5 to 1.5)**	
Yes	−15.0 (−17 to −12.9)**		−11.4 (−13.3 to −9.5)**		3.08 (1.4 to 4.8)**	

Significance: ** = 1%; * = 5%

Notes: Controlled for all characteristics presented.

[a]Tested for interaction using Wald tests. [b]High stringency index = > 46.1 (median score).

Source: [1]SHARE Corona (W1), [2]SW8 and SHARE Corona (W1), [3]Oxford Stringency Index (SW8 Survey if not mentioned otherwise).

Stringency Index (−16.4 pp). Similarly, the respondents living in a country with a high Stringency Index reported feeling lonelier (+2.1 pp) than those living in a country with a low Stringency Index. (Figure 2 and Table 2). Moreover, in each country, the respondents had a lower risk of feeling sad or depressed and having sleeping problems in the SCS1 than in the SW8. In contrast, the respondents in five countries had a lower risk of feeling lonely, while the respondents in nine countries had a higher risk of feeling lonely, during the pandemic than they did before the pandemic.

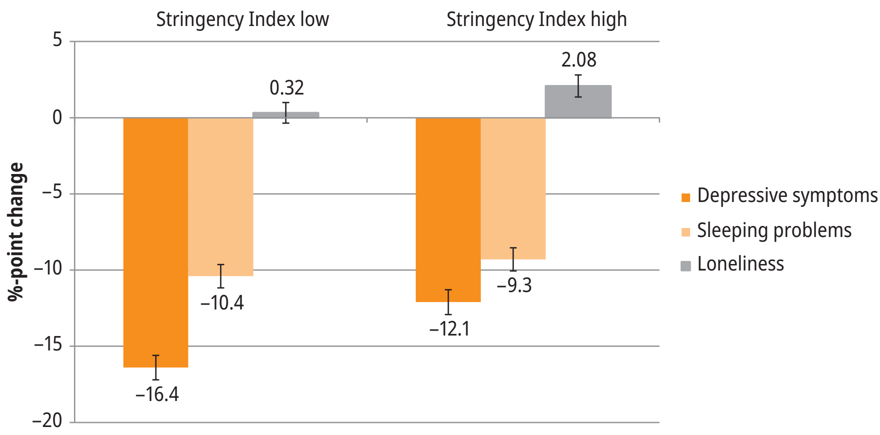

Figure 2: Mental health change and restriction level from before to during COVID-19.
Note: Reference: Wave 8 (pre-pandemic). 95% confidence interval.
Source: SHARE Wave 8 and SHARE Corona (W1).

4 Discussion and policy implications

Our results show that the respondents in our sample had a lower risk of feeling sad or depressed or having sleeping problems, but a higher risk of feeling lonely, during the first phase of the COVID-19 pandemic than they did before the pandemic. Most of the respondents who felt lonelier during the pandemic reported having a larger number of close social relations before the pandemic. Furthermore, the respondents living in a country with a high rather than a low Stringency Index had a higher probability of feeling sad or depressed and a higher risk of feeling lonely. These results suggest that people living in countries where the COVID-19-related restrictions were especially tight experienced more adverse mental health effects, as has been shown by others (Atzendorf and Gruber, 2022).

Our finding that mental health improved during the pandemic is in contrast with the results of previous population-based observational (Atzendorf and Gruber, 2022) and longitudinal (Daly et al., 2022) studies, which found a higher prevalence of and an increase in depressive symptoms during the COVID-19 pandemic among middle–aged (aged 50–64) and older (aged 65+) people. However, several studies have shown that cohorts younger than the SHARE population experienced much larger increases in mental health problems (Daly et al., 2022) during the COVID-19 pandemic, whereas many 70–90-year-olds were more resilient during the most restrictive lockdown, likely coping with the situation by, for example, adapting to a slower pace of life and enjoying the reduced social and economic pressures.

In addition, we should note that the average Stringency Index score of 46 when the SCS1 data were collected in June-August 2020 was lower than it was in the period from March to June (Hale, 2020). The SCS1 interviews were conducted several months after the primary outbreak in Europe. Thus, the absence of any immediate signs of another major COVID-19 outbreak at that time could explain the decrease in feelings of sadness or depression. Moreover, several longitudinal studies showed that during the pandemic, mental health problems first increased (March to April/May 2020) and then decreased (April/May 2020 and onwards) (e.g., Daly et al., 2022), which suggests that there was an adaptation period as well as a period of rapid recovery, as the governments in several countries started to lift restrictions around May.

Another possible explanation for the improvements in depressive symptoms and sleeping problems is an increase in social cohesion during the pandemic, as there is evidence that in societies that experience collective adversities, suicide rates tend to decrease, as was the case in the US during the Spanish flu (Bastiampillai, 2021). In contrast, it has also been shown that during periods of lower social cohesion, depressive symptoms tend to increase among the older population in Europe.

Our findings regarding increased loneliness are compatible with the results of other studies. Generally, loneliness is more common in populations at risk of isolation and separation, such as older individuals, who are more likely to live alone and tend to be more isolated from their friends and families. To cope with loneliness, especially emotional loneliness, it is essential to have a significant other (e.g., a close friend or family member) who can provide emotional support. This may have been especially important during the COVID–19 pandemic. Nonetheless, the lockdown measures restricted such contacts, which likely explains our finding that the risk of loneliness increased among the respondents who had two or more close social relations, as their contacts may have been suddenly reduced. Meanwhile, the respondents who had 0–1 close relationships did not experience a similar reduction in the number of near social contacts, which may explain why their pre-pandemic level of loneliness did not change during the COVID-19 pandemic.

Our findings demonstrate that the middle-aged (aged 50–64) and older (aged 65+) populations in Europe felt slightly lonelier, but they also felt less depressed and had fewer sleeping problems during the pandemic. These results indicate that middle-aged and older Europeans quickly adapted to and recovered from the first lockdown and were thus more resilient than might otherwise be assumed. However, it is important to note that the respondents were surveyed in a period when restriction levels were lower due to improvements in COVID-19 infection rates (summer 2020), and there were no signs of another pandemic wave, which may have led the majority of people to experience feelings of relief. Moreover, we found that the risk of loneliness did increase during the pandemic, and that stricter policy measures attenuated the otherwise positive impact on depressive symptoms. Thus, as mental health problems can have substantial societal and economic consequences, it is crucial for future studies to examine the long-term impact of pandemic events on mental health in order to develop preventive initiatives, such as clinical guidelines on how to help people cope with the challenges of a lockdown, and to ensure that support is provided during and after disease outbreaks to those most at risk of developing mental health problems.

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9 Precautionary behaviour and behavioural risk factors during the COVID-19 pandemic: Evidence from the second SHARE Corona survey

Key points

- Precautionary behaviour is important to avoid infections (with COVID-19) for the high-risk group of older adults who engage in behavioural risk factors.
- A year following a similar study on SHARE respondents, behavioural risk factors were found to be associated with less engagement in behaviours involving other people that increase the risk of infection, but they were not shown to be associated with taking preventive measures.
- The results point to a change in precautionary behaviour over time during a global pandemic, which is a period of heightened risk, and of awareness of such risks.

1 Introduction

Smoking, episodic heavy drinking, physical inactivity, obesity, and unhealthy food intake are considered behavioural risk factors (BRF) that can increase the risk of having severe outcomes following a COVID-19 infection (see Mendoza-Jiménez, Hannemann and Atzendorf, 2021 for overview). Therefore, preventive measures to avoid infection are particularly important for individuals who engage in BRFs. In a previous study, using data from the first SHARE Corona survey, we found that BRF engagement was indicative of less adherence to recommended hygienic measures, such as hand washing and sanitising; however, for other preventive measures, such as wearing masks and social distancing, we found no association. Moreover, the level of adherence to preventive measures was shown to decline further in the presence of clusters of BRFs (Mendoza-Jiménez, Hannemann and Atzendorf, 2021). The second SHARE Corona survey offers us the opportunity to reexamine the association between BRFs and precautionary behaviour, as well as between BRFs and social behaviour that increased exposure among an at-risk population after the second wave of the pandemic (summer 2021). As of 2021, COVID-19 vaccines were readily available throughout Europe. As such, we are now also able to examine the association between engagement in BRFs and intent to be vac-

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cinated. Previous studies have found that substance use disorders, which are included in some of the above-mentioned behavioural risk factors, are associated with a reduced likelihood of COVID-19 vaccine hesitancy (Eyllon et al., 2022). We can therefore assume that BRFs are also likely to be associated with lower vaccine hesitancy.

In this chapter, we seek to answer the question of whether behavioural risk factors play a role in the decision to engage in precautionary behaviours, or in social behaviours that may increase the risk of infection, during the second year of the COVID-19 pandemic.

2 Data and method

The SHARE data from SHARE Wave 8 (October 2019 – April 2020) and the second SHARE Corona Survey (June-August 2021) were used in the analyses. Data from 27 participating countries were included. Data from Portugal were excluded from the analysis, as no information on the explanatory variables in Wave 8 was available. Most of these precautionary behaviours are related to potential interactions with others (e.g., washing hands after being outside, meeting with others). Only respondents who reported leaving the house within the past three months were included, as not doing so would negate the need for increased precautionary behaviour (*cah110_*). This resulted in an analytical sample of n = 25,071.

Precautionary behaviours to protect oneself from an infection were used as our first set of outcome variables, including keeping distance in public, covering coughs and sneezes, intent to be vaccinated, as well as using preventive medicine (not further specified). All four variables were dichotomised. Keeping distance from others in public (cah113_) was originally coded into four categories. If the respondents stated they had *always* kept their distance in public, as opposed to *often*, *sometimes*, or *never kept distance*, the behaviour was considered carried out. Furthermore, respondents were asked about covering their coughs and sneezes (cah116_). The respondents were considered to have engaged in this precautionary behaviour if they stated that they had covered their coughs and sneezes *more frequently* in the past three months than they did early in the pandemic. Finally, the respondents were considered to have vaccination intent if they had already received a vaccination (cahc117_) or were planning to be vaccinated (cahc118_). Furthermore, we investigated risky social behaviours that increase the likelihood of infection, including meeting with five or more people outside of one's household, shopping, going to the post office/bank or public office, using public transportation, or going to pubs or restaurants within the past three months (cah111_*).

SHARE Wave 8 main data were used to assess the BRFs of smoking (br002_); episodic heavy drinking, i.e., 6+ units of alcohol in one sitting weekly in the past three months (br623_); physical inactivity, i.e., less than weekly vigorous physical activity, such as sports, heavy housework, or a job that involves physical labour (br015_); unhealthy diet, i.e., less than daily consumption of fresh fruits and vegetables (br029_); as well as a body mass index (BMI) considered overweight or obese based on height (ph0012_) and weight (ph0013_). All BRFs were coded dichotomously, as described above, and were combined in an aggregate BRF index, which categorised respondents engaging in 0, 1, 2, or 3+ BRFs.

Potential associations were controlled for socio-demographic information such as gender (dn042_), age (dn003_), employment (ep005_), education (isced1997_r), and cohabitation (dn014_). Furthermore, we included information on health using the variables on the number of chronic diseases (ph006*), subjective health (ph013_), and the 12-item EURO-D scale for assessing depression (mh002_ – mh017_). Using the EURO-D scale, a binary variable was created for subsequent analyses, with a cut-off at four or more depressive symptoms endorsed. As the behaviour investigated relates to social distancing, the size of the respondent's social network was also considered (sn_size_w8, found in *gv_networks*). Information on the control variables was taken from the SHARE Wave 8 main data, as well as from baseline data of previous waves. An additional variable that was taken into account was affectedness by COVID-19. This three-point variable coded whether the respondent had been mildly affected by COVID-19 (knew someone with symptoms or a positive test, or had experienced symptoms or a positive test him/herself), had been severely affected (knew someone who had been hospitalised or had been hospitalised him/herself due to COVID-19, or knew someone who had died from a COVID-19 infection), or had not been affected at all (had experienced none of the aforementioned COVID-19-related situations). The variable was based on information gathered in the second SHARE Corona survey (cac102_-cac105_1 & cac110_-cac111_ & cac113_).

Furthermore, we included national-level data describing the severity of the pandemic and its communal consequences using the Oxford COVID-19 Government Response Tracker (Hale et al. 2020). The number of confirmed cases of COVID-19 was rescaled to the number of cases per 1000 capita. We calculated the days spent with "stay at home" policies in place (variable *C6_Stay at home requirements* was two or above), and divided it by seven to represent the number of weeks a country spent in lockdown. We limited the number of new cases, as well as the weeks spent in lockdown measures, to the three months prior to the start of the fieldwork to match the timeframe of the predictor questions. Two–level binary logistic regression models were conducted. The following section will focus on the results of the full model, including the control variables and context factors.

3 Results

Table 1 describes the sample composition in terms of the precautionary behaviour as well as the social behaviour, while Table 2 reports the engagement in BRFs. More than 80% of the analytical sample engaged in at least one BRF, while around 15% engaged in more than three BRFs. Being sedentary was the most prevalent BRF in our sample.

Table 3 reports the model estimates per preventive outcome, listing BRFs as predictors, as well as the individual control variables and the pandemic context variables. The only statistically significant associations observed between BRFs and preventive behaviour were that respondents engaged in 3+ BRFs had a decreased likelihood of keeping their distance from others (OR: 0.84 [CI: 0.79–0.96]), and that respondents engaged in two BRFs had a decreased likelihood of using preventive medicines (OR: 0.87 [CI: 0.77–1.00]). However, the qualitative results hold across all four preventive behaviours, with ORs decreasing with increased engagement in BRFs. This may point to a trend of these respondents being less likely to take measures to prevent infection.

Table 4 depicts the association between BRFs and engagement in social behaviours that can increase the risk of infection. Interestingly, the likelihood of engaging in such behaviours was lower in respondents who engaged in BRFs. The only behaviour that was not associated with the number of BRFs the respondents engaged in was going to pubs and restaurants.

4 Discussion

Our first set of results seemed to indicate that preventive measures, such as keeping distance, covering coughs and sneezes, or using preventive medicines, were used less often by respondents who engaged in BRFs; however, the differences were not statistically significant. Interestingly, the analyses of our second set of outcomes revealed that respondents who engaged in BRFs participated significantly less in social activities that could have increased the risk of infection than respondents who did not engage in BRFs. We were unable to determine whether the level of exposure had increased, decreased, or remained unchanged compared to periods before (Wave 8) or during the early stages of the pandemic (first SHARE Corona survey), as these items were not collected then. Nevertheless, taken together, our results suggest that there can be multiple mechanisms underlying differences in preventive behaviours in the context of a pandemic caused by an infectious disease. Although engagement in BRFs helped explain preventive

Table 1: Overview of sample size and prevalence (%) of use of preventive measures/ social behaviours in the past 3 months across countries (n = 25,071).

		Kept distance	Covered coughs/ sneezes	Vaccination intent	Used preventative meds	Met with 5+ people	Went shopping	Visited post office/bank	Visited pubs/ restaurants	Used public transportation
	n	%	%	%	%	%	%	%	%	%
Austria	1033	68.73	94.77	90.42	6.00	65.83	93.42	81.41	70.47	39.98
Belgium	1327	72.27	93.97	97.29	3.24	42.95	91.56	48.91	45.89	20.35
Bulgaria	483	54.87	94.41	29.40	12.01	79.71	92.13	63.56	28.78	25.67
Croatia	749	73.43	98.93	74.63	2.94	61.42	91.86	74.50	32.04	12.42
Cyprus	232	78.02	96.98	88.79	8.62	85.78	91.38	65.09	36.21	7.76
Czech Republic	1347	55.90	96.96	88.34	14.48	62.73	91.76	63.77	26.50	49.59
Denmark	1021	74.83	93.73	98.82	1.76	89.42	95.59	29.68	57.30	31.73
Estonia	1849	51.43	98.11	81.72	24.12	73.55	92.70	24.66	18.88	42.02
Finland	826	67.19	93.83	95.88	3.39	70.46	97.70	47.58	33.78	24.82
France	1371	67.54	95.99	91.54	2.92	64.11	93.14	67.69	35.67	16.56
Germany	1496	77.81	96.59	94.39	2.54	57.29	94.05	72.66	39.51	20.92
Greece	1786	71.16	98.15	85.16	6.27	59.13	94.74	66.46	37.29	21.78
Hungary	294	63.27	98.30	89.12	14.97	82.31	93.20	76.87	15.65	50.68
Israel	395	25.06	91.39	96.46	3.54	89.11	87.59	58.48	49.62	37.22
Italy	1196	83.70	97.49	94.23	2.93	55.77	90.89	70.15	38.13	9.03
Latvia	548	46.17	98.54	56.39	3.10	55.29	94.89	37.59	3.47	30.29
Lithuania	894	62.86	92.95	72.93	8.72	66.89	91.16	42.28	6.04	33.89
Luxembourg	566	84.10	96.11	94.88	1.77	48.76	93.64	50.53	61.48	41.70
Malta	530	91.70	98.30	98.49	6.79	43.40	91.32	48.87	50.94	25.85
Netherlands	388	62.89	93.56	96.39	2.06	44.85	91.75	33.76	41.49	23.97
Poland	1348	53.41	92.88	80.49	4.60	65.36	90.73	64.02	12.61	29.75
Romania	617	60.94	88.49	37.12	5.19	73.58	92.06	53.97	13.61	32.09

(continued)

Table 1 (continued)

		Kept distance	Covered coughs/ sneezes	Vaccination intent	Used preventative meds	Met with 5+ people	Went shopping	Visited post office/bank	Visited pubs/ restaurants	Used public transportation
	n	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
Slovakia	521	37.81	96.55	75.43	23.42	83.30	96.35	88.29	40.50	45.11
Slovenia	1609	79.49	97.45	77.50	6.34	51.90	90.37	68.30	27.97	11.00
Spain	719	87.34	96.24	98.47	4.45	58.28	87.34	66.62	57.16	29.90
Sweden	702	64.81	88.18	98.43	1.57	82.91	91.60	39.60	51.71	24.07
Switzerland	1224	65.85	92.57	84.89	4.41	66.67	94.36	79.66	62.91	53.02
Total	25,071	67.08	95.50	85.27	6.94	64.01	92.61	58.88	36.40	39.98

Notes: For each precautionary measure, country-level unweighted prevalence rates are presented.
Source: SHARE Wave 9 COVID-19 survey, Release version: 8.0.0.

Table 2: Overview of sample size and prevalence (%) of behavioural risk factors across countries (n = 25,071).

		0 BRFs	1 BRF	2 BRFs	3+ BRFs	Overweight	Smoking	Unhealthy diet	Physical Inactivity	Episodic heavy drinking
	n	%	%	%	%	%	%	%	%	%
Austria	1033	20.72	39.11	25.94	14.23	20.04	14.62	27.49	47.34	6.39
Belgium	1327	17.48	36.85	31.05	14.62	20.65	12.06	13.26	57.35	10.17
Bulgaria	483	7.45	25.05	38.30	29.19	25.05	18.43	66.67	55.69	17.60
Croatia	749	14.02	36.58	33.78	15.62	28.30	23.50	24.70	50.07	7.48
Cyprus	232	12.50	35.78	30.17	21.55	24.57	15.52	24.57	66.38	20.26
Czech Republic	1347	15.81	33.26	31.77	19.15	31.48	14.85	27.02	58.43	5.57
Denmark	1021	20.57	38.49	26.64	14.30	17.14	14.01	27.13	32.42	3.72
Estonia	1849	14.28	38.56	31.69	15.47	32.40	15.52	19.31	57.11	5.08
Finland	826	24.21	39.23	23.37	13.20	23.00	10.53	22.03	34.26	6.42
France	1371	17.72	41.65	29.91	10.72	19.77	11.16	11.09	58.57	2.70
Germany	1496	19.32	35.09	28.88	16.71	21.99	15.78	27.74	43.92	9.89
Greece	1786	13.94	32.75	36.00	17.30	20.44	23.24	35.89	56.38	7.56
Hungary	294	4.76	26.87	41.16	27.21	30.61	20.41	54.08	66.33	11.22
Israel	395	22.03	42.28	27.34	8.35	20.51	8.10	20.76	50.38	0.76
Italy	1196	19.65	43.81	27.84	8.70	15.05	12.37	14.21	61.29	5.94
Latvia	548	21.90	36.31	33.39	8.39	34.49	12.77	30.11	37.77	5.47
Lithuania	894	17.00	33.11	34.34	15.55	33.00	16.22	28.64	53.47	4.25
Luxembourg	566	25.09	36.75	25.27	12.90	22.61	12.72	13.60	44.35	9.36
Malta	530	15.28	34.91	29.81	20.00	39.43	11.32	26.79	57.55	10.94
Netherlands	388	23.97	39.18	27.84	9.02	18.30	7.73	10.82	32.73	4.90
Poland	1348	8.38	29.23	38.20	24.18	30.04	22.63	33.53	63.35	2.67
Romania	617	8.43	28.69	41.33	21.56	30.15	15.4	58.35	45.22	11.35
Slovakia	521	8.25	33.59	36.47	21.69	24.76	15.74	63.34	47.60	18.23

(continued)

Table 2 (continued)

		0 BRFs	1 BRF	2 BRFs	3+ BRFs	Overweight	Smoking	Unhealthy diet	Physical Inactivity	Episodic heavy drinking
	n	%	%	%	%	%	%	%	%	%
Slovenia	1609	26.23	37.60	26.48	9.70	26.35	12.55	13.61	42.45	4.10
Spain	719	14.19	40.61	31.15	14.05	26.84	9.87	16.27	66.20	3.48
Sweden	702	23.08	35.19	29.34	12.39	16.24	6.55	19.94	42.88	4.70
Switzerland	1224	25.82	39.54	23.53	11.11	14.05	13.15	17.08	39.79	13.64
Total	25,071	17.62	36.35	30.78	15.24	24.29	14.81	25.26	51.04	7.04

Notes: For each behavioural risk factor, unweighted prevalence rates are presented. Prevalence of overweight and obese BMIs, compared to normal weight and underweight. Unhealthy diet is defined as no daily intake of fruits and vegetables. Physical inactivity is defined as less than weekly physical activity. Episodic heavy drinking is defined as drinking 6+ units of alcohol on one occasion at least weekly in the last three months.
Source: SHARE Wave 8, Release version: 8.0.

Table 3: Multilevel analyses predicting the use of preventive measures (n = 25,071).

	Keeping distance		**Covered coughs/ sneezes**		**Vaccination Intent**		**Used preventative meds**	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
BRFs								
0 BRF (*Ref.*)								
1 BRF	1.01	[0.92; 1.11]	1.03	[0.90; 1.18]	1.05	[0.94; 1.18]	0.91	[0.81; 1.02]
2 BRFs	0.94	[0.86; 1.03]	0.94	[0.83; 1.06]	0.92	[0.81; 1.04]	0.87*	[0.77; 1.00]
3+ BRFs	0.84*	[0.73; 0.96]	0.93	[0.77; 1.13]	0.91	[0.79; 1.05]	0.88	[0.76; 1.02]
Sex								
male (*Ref.*)								
female	1.36***	[1.30; 1.43]	1.21*	[1.04; 1.42]	1.02	[0.93; 1.13]	1.26***	[1.12; 1.41]
Age								
50–64 y/o (*Ref.*)								
64–79 y/o	1.08	[0.98; 1.20]	1.17	[0.95; 1.44]	1.57***	[1.34; 1.83]	1.01	[0.87; 1.16]
80+ y/o	1.09*	[1.00; 1.20]	1.09	[0.83; 1.43]	1.91***	[1.45; 2.52]	0.84	[0.66; 1.05]
Living situation								
Living alone (*Ref.*)								
Spouse/partner in HH	1.05	[0.97; 1.15]	0.95	[0.84; 1.07]	1.45***	[1.26; 1.67]	1.14*	[1.01; 1.28]

(continued)

Table 3 (continued)

	Keeping distance		Covered coughs/ sneezes		Vaccination Intent		Used preventative meds	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Education								
Primary (*Ref.*)								
Secondary	1.15**	[1.06; 1.25]	1.12	[0.90; 1.40]	1.30*	[1.00; 1.69]	1.03	[0.84; 1.25]
Tertiary or above	1.13	[0.99; 1.30]	0.97	[0.78; 1.21]	1.99***	[1.42; 2.78]	1.26	[0.99; 1.61]
Employment								
Retired (*Ref.*)								
Employed/Self-employed	0.86***	[0.79; 0.94]	1.20	[0.91; 1.58]	0.98	[0.83; 1.16]	1.01	[0.87; 1.18]
Other	1.01	[0.91; 1.11]	1.16	[0.89; 1.50]	0.68***	[0.57; 0.82]	0.90	[0.72; 1.12]
No. of chronic diseases	1.08***	[1.04; 1.11]	1.02	[0.97; 1.08]	1.16***	[1.10; 1.21]	1.00	[0.95; 1.05]
Subjective health								
Fair/poor (*Ref.*)								
Excellent/Very Good	0.96	[0.88; 1.05]	0.96	[0.77; 1.20]	1.11	[0.98; 1.26]	0.91	[0.78; 1.06]
4+ symptoms of depression (EURO-D)	0.99	[0.92; 1.06]	1.06	[0.93; 1.19]	0.82**	[0.71; 0.94]	1.25**	[1.07; 1.47]
Affectedness of COVID-19								
Not at all (*Ref.*)								
Mildly	0.94	[0.83; 1.06]	0.77***	[0.68; 0.88]	1.15**	[1.05; 1.25]	1.19*	[1.02; 1.38]
Severely	1.05	[0.95; 1.15]	0.83	[0.69; 1.01]	1.59***	[1.43; 1.76]	1.32***	[1.15; 1.51]

Size of social network (no. of people)	1.03	[1.00; 1.06]	0.99	[0.95; 1.04]	1.05**	[1.02; 1.09]	1.02	[0.99; 1.06]
Pandemic context								
Confirmed cases (p. 10^6 inhabitants, past 3 months)	0.99	[0.99; 1.00]	1.00	[0.99; 1.00]	1.00	[0.98; 1.01]	1.01	[1.00; 1.02]
Time in lockdown (weeks in the past 3 months)	1.19	[0.87; 1.63]	1.10	[0.82; 1.47]	1.03	[0.55; 1.91]	0.88	[0.67; 1.15]

Note: OR = Odds ratios, CI (95%) = confidence interval 95%,, *** p<0.001, ** p<0.01, * p<0.05.

Source: SHARE Wave 9 COVID-19 survey, Release version: 8.0.0.; SHARE Wave 8, Release version: 8.0.

Table 4: Multilevel analyses predicting the engagement in social activities in the previous 3 months (n = 25,071).

	Met with 5+ people		**Went shopping**		**Visited post office/ bank**		**Visited pubs/ restaurants**		**Used public transportation**	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
BRFs										
0 BRF (*Ref.*)										
1 BRF	0.87**	[0.80; 0.95]	0.73***	[0.62; 0.85]	0.93	[0.85; 1.02]	0.97	[0.89; 1.06]	0.86**	[0.78; 0.94]
2 BRFs	0.88*	[0.79; 0.97]	0.65***	[0.54; 0.77]	0.87***	[0.81; 0.93]	0.93	[0.85; 1.02]	0.85*	[0.75; 0.97]
3+ BRFs	0.81*	[0.68; 0.97]	0.61***	[0.50; 0.75]	0.87*	[0.76; 1.00]	1.01	[0.89; 1.14]	0.82*	[0.69; 0.97]
Sex										
male (*Ref.*)										
female	0.79***	[0.72; 0.86]	1.42***	[1.23; 1.64]	0.79***	[0.71; 0.88]	0.72***	[0.64; 0.82]	1.34***	[1.23; 1.46]
Age										
50–64 y/o (*Ref.*)										
64–79 y/o	0.84***	[0.76; 0.92]	0.65***	[0.52; 0.82]	0.86*	[0.74; 0.99]	0.83*	[0.71; 0.96]	0.98	[0.88; 1.09]
80+ y/o	0.57***	[0.49; 0.65]	0.21***	[0.16; 0.27]	0.60***	[0.47; 0.76]	0.49***	[0.39; 0.62]	0.77**	[0.64; 0.93]
Living situation										
Living alone (*Ref.*)										
Spouse/partner in HH	1.18***	[1.10; 1.27]	0.94	[0.82; 1.09]	0.75***	[0.67; 0.84]	0.98	[0.89; 1.08]	0.6***	[0.55; 0.66]

Education										
Primary (*Ref.*)										
Secondary	0.98	[0.86; 1.12]	1.42***	[1.21; 1.67]	1.21***	[1.09; 1.34]	1.52***	[1.39; 1.67]	1.43***	[1.19; 1.71]
Tertiary or above	1.06	[0.88; 1.27]	1.88***	[1.62; 2.17]	1.48***	[1.36; 1.61]	2.38***	[2.04; 2.77]	2.07***	[1.65; 2.60]
Employment										
Retired (*Ref.*)										
Employed/Self-employed	1.96***	[1.71; 2.24]	1.06	[0.79; 1.41]	1.06	[0.94; 1.20]	1.40***	[1.22; 1.61]	0.98	[0.89; 1.08]
Other	0.99	[0.88; 1.11]	0.84	[0.66; 1.08]	0.83*	[0.71; 0.96]	0.87	[0.76; 1.00]	0.98	[0.91; 1.05]
No. of chronic diseases	0.93***	[0.90; 0.97]	0.92***	[0.88; 0.96]	0.97	[0.94; 1.00]	0.94***	[0.91; 0.97]	0.98	[0.94; 1.01]
Subjective health										
Fair/poor (*Ref.*)										
Excellent/Very Good	1.25***	[1.15; 1.37]	2.18***	[1.92; 2.47]	1.47***	[1.33; 1.62]	1.52***	[1.40; 1.66]	1.21***	[1.13; 1.28]
4+ symptoms of depression (EURO-D)	0.89***	[0.83; 0.95]	0.81***	[0.73; 0.90]	0.93	[0.85; 1.02]	0.92*	[0.84; 1.00]	1.10*	[1.01; 1.20]
Affectedness of COVID-19										
Not at all (*Ref.*)										
Mildly	1.26***	[1.15; 1.38]	1.08	[0.99; 1.19]	1.06*	[1.00; 1.13]	1.33***	[1.22; 1.44]	1.08*	[1.01; 1.16]
Severely	1.19**	[1.06; 1.33]	1.15	[0.98; 1.34]	1.07	[0.99; 1.16]	1.33***	[1.17; 1.50]	1.20**	[1.08; 1.33]
Size of social network (no. of people)	1.05***	[1.02; 1.08]	1.05**	[1.02; 1.09]	1.02	[1.00; 1.04]	1.04**	[1.02; 1.07]	1.04***	[1.02; 1.06]

(continued)

Table 4 (continued)

	Met with 5+ people		Went shopping		Visited post office/ bank		Visited pubs/ restaurants		Used public transportation	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
Pandemic context										
Confirmed cases (p. 10^6 inhabitants, past 3 months)	1.00	[1.00; 1.00]	1.00*	[0.99; 1.00]	1.00	[1.00; 1.01]	1.00	[0.99; 1.01]	1.00	[1.00; 1.01]
Time in lockdown (weeks in the past 3 months)	0.76*	[0.89; 1.02]	0.91	[0.78; 1.07]	1.63**	[1.16; 2.29]	1.40	[0.78; 2.55]	0.79	[0.55; 1.15]

Note: OR = Odds ratios, CI (95%) = confidence interval 95%, *** $p<0.001$, ** $p<0.01$, * $p<0.05$.
Source: SHARE Wave 9 COVID-19 survey, Release version: 8.0.0.; SHARE Wave 8, Release version: 8.0.

behaviours during the initial stage of the emergency (Mendoza-Jiménez et al, 2021), our present findings show that its role diminished with time. The reason for this reduction warrants further investigation. Particular attention needs to be paid to monitoring exposure via certain public activities, such as going to the post office (or bank or public office), using public transportation, or going shopping, as avoiding these activities is often not a feasible precautionary measure for people who are dependent on these institutions.

When we looked specifically at vaccination intent, we found that it was not significantly associated with engagement in BRFs among older adults in Europe. Despite previous evidence of vaccine hesitancy in contexts of other infectious diseases, we observed no systematic differences in vaccination intent between respondents engaging in different numbers of BRFs. One explanation for this finding could be that we did not assess the effects of substance use disorders, as previous studies did (Eyllon et al., 2022), but instead looked only at behaviours related to these disorders. Overall, vaccination intent was high in our sample. A previous study identified several indicators related to personal vaccination intent in the SHARE population (Bergmann, Hannemann, Bethmann & Schumacher, 2021). Health concerns, as well as indicators related to socio-economic status, predicted vaccination intent most reliably. Therefore, any effects that BRFs had on vaccination intent seemed to be negligible after taking other factors into account.

When interpreting our findings, there are at least three considerations to keep in mind. The studied BRFs were collected in Wave 8, and may have changed in the interim, which should be assessed using Wave 9 data. To correctly scale the effect of the pandemic as an external shock on behavioural risk factors, the change in these behaviours between SHARE Wave 8 and the data collections during the pandemic should be considered. The present study can, however, be considered together with our previous study, which looked at variables similar to our first set of outcomes and the same predictors. Nonetheless, comparisons between these studies should be made with caution, as the items in the first iteration of the SHARE Corona survey explicitly asked respondents to take the pre-pandemic context into account, whereas such a reference point was no longer adequate during the second wave. Additionally, relevant factors shaping preventive behaviour continued to evolve throughout the pandemic, such as local circumstances related to regulations and variant severity and outbreaks, as well as individual factors, such as beliefs about treatment effectiveness and even time preferences. Therefore, we attempted to control for relevant proxies using contextual national measures from the three months before the interviews and relevant socio-demographic individual measures. However, these controls may have captured only a portion of the unobserved variation, and not the variation that evolved as the pandemic unfolded.

This study documented two patterns among elderly adults in Europe based on their reported behaviour during the summer of 2021, more than a year into the COVID-19 pandemic. First, it found a trend of respondents who engaged in BRFs exhibiting lower levels of preventive behaviour than respondents who did not; however, the differences were not statistically significant. Second, our estimates also indicated that respondents who engaged in BRFs reported having lower levels of risky social activity, i.e., behaviour that could have increased the risk of infection. When the present results are considered together with those of similar studies conducted in the early stages of the pandemic, it appears that there was an evolution of protective behaviour over time. The question of which factors induced these changes remains open.

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10 Risk factors of post COVID-19 condition attributed to COVID-19 disease in people aged 50+ in Europe and Israel

Key points

– Higher age, low or medium educational level, and prior COVID-19-related hospitalisation are risk factors for developing post COVID-19 condition.
– This study recommends that policymakers devote more attention to educational interventions aimed at increasing health literacy.

1 Introduction

By spring 2022, the COVID-19 pandemic had lasted for about two years, and the repercussions of COVID-19 could be observed. Although COVID-19 strikes people at all ages, particular groups of people are at higher risk of experiencing a more acute form of the disease than others, e.g., people with comorbidities and older people. Following a COVID-19 infection, many people experience lingering symptoms lasting from weeks to months. This phenomenon was recently called "*post COVID-19 condition*" by WHO, and is defined as "*a condition that occurs in individuals with a history of probable or confirmed SARS-CoV-2 infection, usually 3 months from the onset of COVID-19 with symptoms that last for at least 2 months and cannot be explained by an alternative diagnosis*".

Only a limited number of studies have described the risk factors of post COVID-19 health condition, and their results have been conflicting. However, a recent review of this research found that increasing age, female gender, multimorbidity, high BMI, having multiple symptoms during COVID-19 infection, and having a more severe acute phase of COVID-19 disease are all associated with post COVID-19 condition (Crook et al., 2021).

Full recovery from COVID-19 disease may take several months, and having post COVID-19 condition may affect people's ability to return to everyday activities. Furthermore, cases of post COVID-19 condition may lead to an increased burden on a health care system that is already under pressure from the ongoing COVID-19 pandemic, and from the burden of a growing number of older people

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with chronic diseases. Understanding post COVID-19 condition is important for mapping the full effect of COVID-19 disease. To our knowledge, no previous studies have explored the possible risk factors of post COVID-19 condition in a large population-based sample of middle-aged and older adults across several countries. Thus, the aim of the study was to investigate risk factors of post COVID-19 condition among people aged 50+ in 27 European countries and Israel.

2 Methods

We used data from the second wave of the Survey of Health, Ageing and Retirement in Europe (SHARE) COVID-19 survey (SCS2), conducted in June-August 2021. Participants in the SCS2 who had previously tested positive for COVID-19 were asked "*Have you experienced any long-term or lingering effects that you attribute to your Covid Illness*?"; with the following answer options: "Fatigue", "cough, congestion, or shortness of breath", "loss of taste or smell", "headache", "body aches or joint pain", "chest or abdominal pain", "diarrhoea or nausea", "confusion", and "other". Based on this question, a dichotomous outcome variable was created indicating whether the respondents had "no symptoms" or "one symptom or more". Based on the existing literature and biological or clinical plausibility, the following explanatory variables were selected as primary potential risk factors for developing post COVID–19 condition: age (50–69 and 70+ years), sex (male, female), and educational level (higher, medium, lower). Having any disease besides the COVID-19 disease was seen as a comorbidity, and the following diseases or conditions were included to assess comorbidity: "hip fracture", "diabetes or high blood sugar", "high blood pressure or hypertension", "heart attack or other heart problem", "chronic lung disease", "cancer or malignant tumour", and "other disease or health condition". Comorbidity was divided into three categories: "no diseases", "one or two diseases", and "three or more diseases (multimorbidity)". Smoking was categorised as "not smoking", "smoking now" or "previously smoked". BMI was computed and classified into "normal weight" (BMI ≥ 18.5 and <25 kg/m2), "underweight" (BMI < 18.5 kg/m2), "overweight" (BMI ≥ 25 and <30 kg/m2), and "obese" (BMI ≥ 30 kg/m2). Moreover, the variable "country" representing the 28 SHARE countries was included, as was a variable describing whether respondents have been hospitalised due to COVID-19 ("yes" or "no"). The age, sex, diseases, and COVID-19 hospitalisation variables were drawn from the SCS2, and all other variables were drawn from SHARE Wave 8 (2020) or the latest wave possible.

Multiple logistic regression models were used to study the risk factors for developing post COVID-19 condition, and the analyses were performed in three steps. First, we included age, gender, education, comorbidity, smoking, and BMI (model 1). Second, we added a "country" variable (model 2). Third, we included the "COVID-19-hospitalisation" variable (model 3). Additionally, to explore the risk factors for the most common post COVID-19 conditions (namely, "fatigue", "cough, congestion, shortness of breath", and "body aches or joint pain"), we repeated model two for each condition, respectively. In all analyses, the cross-sectional individual weights supplied by SHARE were applied to yield a representative sample.

3 Results

Of all SCS2 participants (n = 49,044), 6.5% (n = 3,156) reported having tested positive for COVID-19 and were thus included in the final analysis. Of the respondents in the final sample, 42.4% were aged 70 or older, and 61.6% were females. Broken down by educational level, 19.2% of the respondents had a high level, 45.1% had a medium level, and 30.4% had a lower level (10% were missing). Of the respondents, 19.4% had three or more comorbidities while 24.1% had none, and 39.1% were overweight while 28.4% had a normal BMI. Only 7.9% of the respondents were smokers, and 16.4% were hospitalised due to COVID-19 disease (data not shown).

At least one post COVID-19 condition was reported by 21.8% of the respondents (weighted data), and the most commonly cited conditions were "fatigue", followed by "cough, congestion, or shortness of breath" and "body aches or joint pain" (Figure 1). In the crude analysis, the respondents with higher age (aged 70+), medium or low education, multimorbidity, and obesity were at higher risk of developing post COVID-19 condition. However, in the adjusted model (model 1), only the older participants (aged 70+) (OR 1.58) and those with a medium (OR = 2.46) or lower educational level (OR 2.42) had a higher risk of developing post COVID-19 condition (Table 1). When the country variable was added to the model (model 2), the risk persisted for respondents aged 70+ (OR 1.61) and for those with a medium (OR 2.38) or lower (OR 2.14) educational level, but the effect was attenuated. We also considered the variables "marital status", "wealth" (the sum of household net financial and real assets), and "income", but did not find any associations. Additionally, when "COVID-19 hospitalisation" was added to the model (model 3), respondents who were hospitalised due to COVID-19 had a risk of devel-

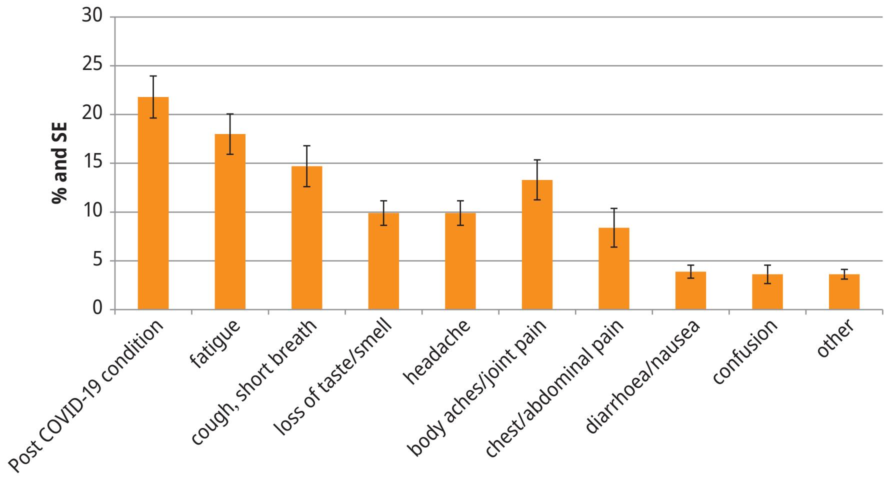

Figure 1: Distribution of post COVID-19 condition(s) among individuals who tested positive for COVID-19.
Note: Weighted data.
Source: SHARE Wave 8 and SHARE Corona (W2).

oping post COVID-19 condition (OR 25.9) that was 26 times higher than that of respondents who were not hospitalised. Sex, comorbidity, BMI, and smoking were not found to be associated with post COVID-19 conditions (Table 1).

Additionally, in the investigation of the risk factors for developing the individual lingering symptoms, the risk factors for experiencing the condition "fatigue" were identified as being aged 70+ – (OR 1.81), having a medium educational level (OR 1.96), having obesity (OR 1.75), and being a smoker (OR 2.44). Similarly, the main risk factors for "cough, congestion, shortness of breath" were having a medium (OR 2.56) or a lower (OR 2.67) educational level and being a smoker (OR 3.16); while the main risk factor for "body aches or joint pain" was having obesity (OR 2.41). People who were hospitalised due to COVID-19 were more likely than people who had been treated for COVID-19 as out-patients to have any post COVID-19 condition (data not shown).

Table 1: The risk of having at least one post COVID–19 condition.

Variables	Crude		Model 1[b]		Model 2[a+b]		Model 3[a+b+c]	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Age								
50–69	–		–		–		–	
70+	1.57*	1.05–2.35	1.58*	1.06–2.34	1.61*	1.08–2.41	1.07	0.64–1.80
Sex								
Male	–		–		–		–	
Female	0.98	0.58–1.64	1.14	0.76–1.72	1.18	0.79–1.76	1.31	0.81–2.13
Education								
High	–		–		–		–	
Medium	3.13***	1.77–5.56	2.46***	1.46–4.16	2.38**	1.39–4.09	2.69***	1.48–4.89
Low	3.43***	1.96–6.01	2.42**	1.37–4.25	2.14*	1.18–3.86	2.30**	1.22–4.35
Comorbidity								
0	–		–		–		–	
1–2	1.68	0.93–3.01	1.28	0.73–2.25	1.23	0.71–2.12	0.99	0.58–1.70
3 +	3.40**	1.43–8.08	1.75	0.89–3.46	1.76	0.92–3.37	1.74	0.82–3.67
Smoking								
Not smoking	–		–		–		–	
Previous smoker	1.16	0.75–1.81	1.11	0.74–1.66	1.11	0.74–1.67	1.07	0.64–1.78
Smoker	2.10	0.92–4.77	2.20	0.97–4.98	2.25	0.97–5.18	1.68	0.72–3.94

(continued)

Table 1 (continued)

Variables	Crude		Model 1[b]		Model 2[a+b]		Model 3[a+b+c]	
	OR	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**	**OR**	**95% CI**
BMI								
Normal	–		–		–		–	
Underweight	0.28	0.04–1.88	0.27	0.04–1.76	0.23	0.03–1.67	0.35	0.05–2.64
Overweight	1.15	0.68–1.93	1.18	0.76–1.83	1.22	0.78–1.91	1.14	0.69–1.88
Obese	1.86**	1.17–2.94	1.59	0.98–2.59	1.61	0.98–2.67	1.31	0.69–2.46
COVID–19 hospitalisation								
No							ref	
Yes							25.9***	15.64–42.79
Pseudo R^2			0.059		0.081		0.274	
Observations			2,817		2,817		2,817	

Notes: [a]adjusted for age, sex, education, comorbidity, smoking and bmi; [b]adjusted for country (reference: Germany); [c]adjusted for COVID-19 hospitalisation.
Significance: *** = 1%; ** = 5%; ** = 10%
Source: SHARE Wave 8 and SHARE Corona (W2).

4 Discussion and policy implications

About one-quarter (23.5%) of COVID-19-infected people aged 50+ living in the 28 SHARE countries reported having at least one post COVID-19 condition. The individuals who were most affected were older and had a lower educational level.

Our finding that individuals with a lower educational level had an increased risk of developing post COVID-19 condition has not previously been observed in a European population. However, educational attainment is known to be a social determinant of health, as well as a predictor of the severity of COVID-19 disease (Jian et al., 2021), which may explain our findings. Having a lower educational level is also associated with having low health literacy (Van der Heide et al., 2013); i.e., a low level of ability to reflect upon one's illness and to understand how to distinguish between symptoms of chronic disease and symptoms related to COVID-19. Poorer health literacy among respondents with a lower or a medium educational level may also help to explain the over-reporting of symptoms.

Increasing age has been found to be associated not only with the severity of COVID-19 disease, but also with a higher risk of having post COVID-19 conditions (Crook et al., 2021). These results are in line with our findings indicating that people aged 70+ were at higher risk of developing post COVID-19 condition.

The most salient predictor of developing post COVID-19 condition identified in our study was hospitalisation due to COVID-19-, which may indicate the severity of the COVID-19 disease, and is in line with the findings of other studies (Crook et al., 2021). However, as undergoing intensive treatment during a hospital stay can cause similar symptoms (Vrettou et al., 2022), it may be difficult to determine whether the symptoms can be attributed to the in-hospital treatment, the COVID-19 disease, or a combination of the two.

When looked at the risk factors for the most common conditions, we found that individually, smoking was a risk factor for “fatigue” and “cough, congestion, shortness of breath”. Smoking was also found to affect the immune system and its response to infection, making smokers more vulnerable to infectious diseases. Furthermore, the recurrence rate and the uncured rate of infection were higher in smokers than in non-smokers. Smoking can also interfere with the structure and function of the respiratory tract (Jiang et al., 2020), which may explain our finding that smokers had a higher risk of experiencing “cough, congestion, shortness of breath” than non-smokers.

Our results further indicate that having a lower educational level, a higher age, or a prior hospitalisation for COVID-19 disease increased the risk of developing post COVID-19 conditions; while smoking increased the risk of experiencing post-COVID “fatigue” and “cough, congestion, shortness of breath”. Similarly, obesity was found to be a risk factor for experiencing “fatigue” and “body aches or joint pain". While biological mechanisms may explain the adverse effects of higher age, smoking, obesity, and disease severity, the effect of having a lower educational level on the risk of developing post COVID-19 conditions is more likely explained by lower health literacy. In conclusion, these findings have implications for public policies in Europe and Israel, as they shed light on the social inequalities in health in these countries, which continue to be large. To reduce these inequalities in health, we encourage policymakers devote more attention to educational interventions, and to implement programmes and policies aimed at increasing health literacy.

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Lasse Lybecker Scheel-Hincke, Linda Juel Ahrenfeldt
and Karen Andersen-Ranberg

11 Sex differences in activity and mental health changes following the onset of the COVID-19 pandemic in Europe

Key points

- Following the start of the COVID-19 pandemic, women experienced larger negative changes than men in their social activities and mental health.
- Sex differences were observed for all items across the European regions, with a few exceptions.
- Knowledge of health discrepancies between men and women is crucial for achieving the important public health goal of gender equality.

1 Introduction

The Coronavirus Disease 2019 (COVID-19) outbreak has had severe economic and health consequences throughout the world. Public health initiatives designed to reduce social contacts – e.g., closure of schools and workplaces, restrictions on gatherings, and even curfews – have been shown to mitigate transmission of the virus. However, there is also evidence that social isolation and loneliness had negative effects on both physical and mental health. While engagement in daily and social activities decreased significantly during lockdown periods, studies have reported conflicting results regarding the development in mental health following the start of the pandemic. While the negative mental health effects of COVID-19 restrictions have been reported in many studies and have garnered considerable media attention, a recent study utilising longitudinal SHARE data has suggested that following the first COVID-19 wave in Europe, there were only minor negative changes in mental health, and there were even some positive changes in certain aspects of mental health (Wester et al., 2022).

The contradictory phenomenon whereby women report poorer health but live longer than men has been called the male-female health-survival paradox (Oksuzyan, Juel, Vaupel, and Christensen, 2008). Previous SHARE studies have shown that sex differences in health vary by age, over time, and across European regions. The general findings of these SHARE studies are that compared to men, women report worse mental health, have worse physical functioning, and have

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more limitations in activities of daily living (ADL); and that these sex differences tend to be most pronounced in Southern and Eastern Europe. Regarding COVID-19, a female advantage in overall survival has been demonstrated (Ahrenfeldt, Otavova, Christensen, and Lindahl-Jacobsen, 2020), but potential sex differences in health and activity changes in response to the COVID-19 pandemic have not been thoroughly studied.

While sex is one of the most important determinants of health, it is often neglected in health research, and is instead treated as a confounder rather than as an independent determinant, leaving gaps in our ability to detect and understand health deficits between men and women. This paper aims to examine the direction and the magnitude of the sex differences in changes in social activities, self-rated health, and mental health following the start of the COVID-19 pandemic. For our analyses, we used data from the first SHARE COVID-19 survey that took place in June and July 2020 in 26 European countries. The study population included 23,571 men and 32,036 women aged 50 or older who had answered the questions on mental health and daily activities. In line with previous SHARE papers on sex differences, we grouped the countries into four regions (Northern, Western, Southern, and Eastern Europe, see Figure 1). Among the respondents, more men than women had a high level of education (24.4% vs 21.5%), whereas a larger proportion of the women than of the men were widowed (23.9% vs 7.0%) or were living alone (29.6% vs 14.4%). Men and women did not differ in terms of age (overall mean age 70.7 years). The results in this chapter have been published in the *European Journal of Public Health*. While this article provides updated analyses using the newest version of the SHARE data and further model adjustments, these updates do not significantly change the original results or conclusions.

2 Overall changes in daily activities and mental health following the start of the COVID-19 pandemic

The changes in mental health and daily activities were measured retrospectively: i.e., respondents were asked to compare their situation during the pandemic to their situation before the outbreak. If the respondents had ever left their home or experienced any mental health issues since the outbreak, they were subsequently asked about this subjective change. We compared respondents who reported a negative change to those who reported having unchanged or improved health.

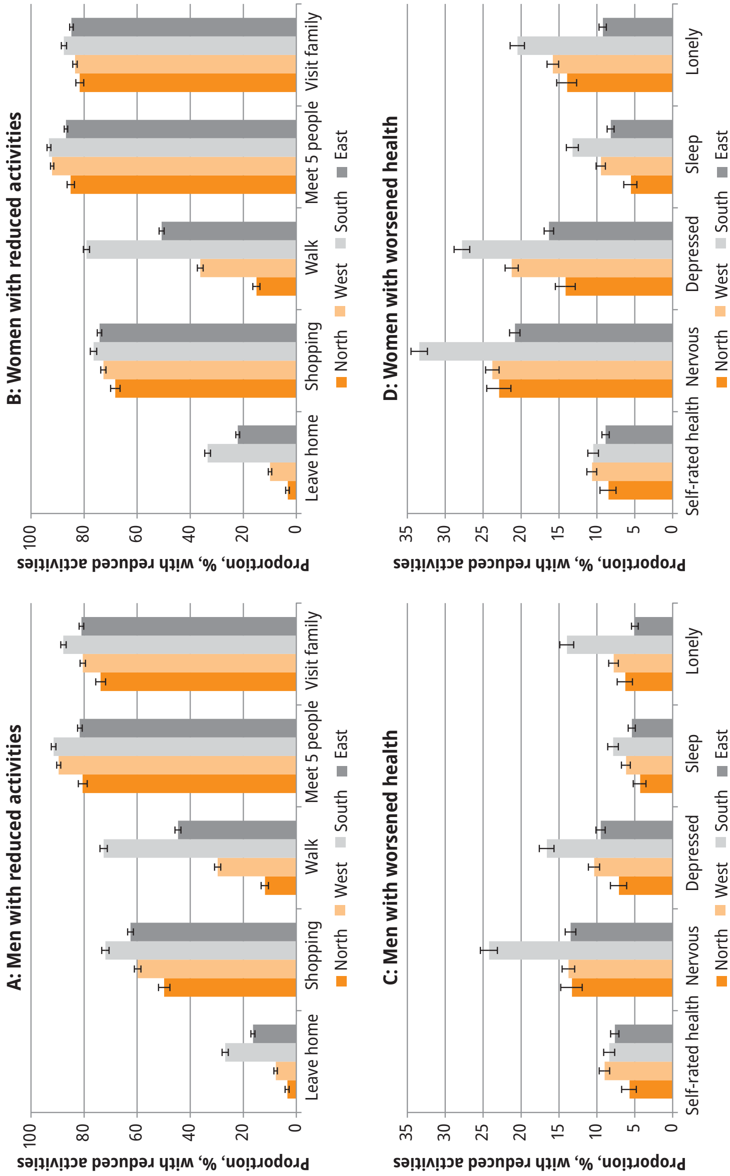

Figure 1: Proportion of European men and women with reduced social activities and worsened health in the first SHARE COVID-19 survey.

Note: Northern EU: Denmark and Sweden. Western EU: Austria, Germany, France, the Netherlands, Switzerland, Belgium, Ireland, and Luxembourg. Southern EU: Spain Italy, Greece, and Portugal. Eastern EU: the Czech Republic, Poland, Hungary, Slovenia, Estonia, and Croatia.

Source: SHARE Corona (W1), release 8.0.0. Weighted data.

Descriptive analyses revealed that 10.8% of men and 16.0% of women had never left their homes since the start of the pandemic. An even larger proportion of the Europeans surveyed had reduced their daily activities, with most having refrained from meeting with five people or more at the same time (85.7% of men and 90.4% of women). However, considerable regional differences in the reported social activities were found. Only 3.4% of men and 3.3% of women in Northern Europe had never left their homes since the outbreak, compared to 26.8% of men and 33.4% of women in Southern Europe. Similar results were observed for the other social activities, with respondents from Southern Europe reporting the largest reduction in all activities after the outbreak (Figure 1A, B).

In response to questions about their health, a total of 7.9% of men and 10.1% of women rated their health as worse since the outbreak. When asked about their mental health, 16.4% of men and 25.5% of women said they felt more nervous, while a smaller proportion reported feeling more depressed, having more sleep problems, and feeling more lonely. For all four mental health items, the largest decline was found in Southern Europe (Figure 1C, D).

3 Sex differences in daily activities and mental health changes

To study the sex differences in changes in daily activities and mental health, we applied logistic regression models estimating odds ratios (ORs) for the differences between men and women in changes from before the pandemic to summer 2020. We adjusted the analyses for age at interview, educational level, marital status, household wealth (the sum of household net financial and real assets), and household composition (number of persons in household), and investigated these characteristics separately by European region. In all of the analyses, the cross–sectional individual weights supplied by SHARE were applied.

The results showed that women had a higher risk than men of reducing their social activities across all measures. The largest sex difference was found in relation to reduced shopping activities (OR = 1.77, 95% CI 1.60–1.96), while the smallest sex difference was found for the reduction in the probability of going for a walk (OR = 1.35, 95% CI 1.22–1.50). A similar pattern was found for the change in self–rated health (OR = 1.24, 95% CI 1.09–1.42), and for the four mental health outcomes, including feeling more nervous (OR = 1.91, 95% CI 1.70–2.14), feeling more depressed (OR = 2.10, 95% CI 1.86–2.38), having more sleep problems (OR = 1.65, 95% CI 1.40–1.94), and feeling more lonely (OR = 1.88, 95% CI 1.65–2.14); with women having higher odds than men of reporting worsened mental health.

Table 1: Sex differences in the changes in social activities and worsened health since the outbreak of COVID–19 in Europe (Summer 2020).

Outcome	All countries	Northern EU[a]	Western EU[b]	Southern EU[c]	Eastern EU[d]
	OR (95% CI)	**OR (95% CI)**	**OR (95% CI)**	**OR (95% CI)**	**OR (95% CI)**
Social activities (Reduced since outbreak)					
Never left home	1.36 (1.21–1.54)*	1.32 (0.77–2.27)	1.16 (0.92–1.46)	1.45 (1.19–1.76)*	1.29 (1.09–1.51)*
Shopping	1.77 (1.60–1.96)*	2.58 (2.09–3.19)*	1.87 (1.61–2.17)*	1.55 (1.18–2.03)*	1.64 (1.44–1.87)*
Went for a walk	1.35 (1.22–1.50)*	1.37 (1.03–1.82)*	1.25 (1.07–1.45)*	1.60 (1.21–2.12)*	1.40 (1.24–1.59)*
Met 5 people	1.68 (1.45–1.95)*	1.46 (1.10–1.93)*	2.02 (1.56–2.61)*	1.25 (0.84–1.87)	1.50 (1.27–1.76)*
Visited family	1.40 (1.25–1.58)*	1.63 (1.28–2.08)*	1.53 (1.30–1.82)*	1.00 (0.71–1.39)	1.42 (1.21–1.65)*
Health variables (Worsened since outbreak)					
Self–rated health	1.24 (1.09–1.42)*	1.24 (0.83–1.85)	1.26 (1.03–1.56)*	1.29 (0.97–1.71)	1.18 (0.95–1.47)
Nervous	1.91 (1.70–2.14)*	1.70 (1.30–2.22)*	2.16 (1.79–2.61)*	1.88 (1.53–2.30)*	1.65 (1.40–1.94)*
Sad/depressed	2.10 (1.86–2.38)*	1.37 (0.98–1.91)	2.16 (1.77–2.63)*	2.33 (1.87–2.90)*	1.77 (1.48–2.12)*
Sleep problems	1.65 (1.40–1.94)*	0.99 (0.60–1.65)	1.33 (1.02–1.73)*	2.36 (1.77–3.13)*	1.69 (1.35–2.13)*
Loneliness	1.88 (1.65–2.14)*	1.96 (1.43–2.67)*	2.05 (1.64–2.56)*	1.82 (1.47–2.26)*	1.55 (1.22–1.95)*

Significance: * = 5%

Notes: Results are based on SHARE Corona (W1), release 8.0.0. Logistic regression models are adjusted for age at interview, education, marital status, household wealth, and household composition. The combined model is further adjusted for European region. Weighted data.

[a]Northern EU: Denmark and Sweden.

[b]Western EU: Austria, Germany, France, the Netherlands, Switzerland, Belgium, Ireland, and Luxembourg.

[c]Southern EU: Spain Italy, Greece, and Portugal.

[d]Eastern EU: the Czech Republic, Poland, Hungary, Slovenia, Estonia, and Croatia.

While sex differences in the activities and health measures were observed in all regions, we found only a few significant sex-by-region interactions; i.e., for most of the activities and health measures, the differences between men and women did not vary by European region (Table 1). To investigate whether self-rated health at baseline was mediating the differences between men and women, we ran a model that further adjusted for self-rated health before the outbreak, but found that this did not change the results. Furthermore, while respondents reporting COVID-19 infections in close proximity might have influenced the state of their mental health and their activity levels, it did not appear to affect the sex differences in these associations (results not shown).

4 Discussion and conclusion

The present study based on SHARE COVID-19 survey data demonstrated that there were sex differences in the changes in self-reported health and social activities after the start of the COVID-19 pandemic. Women experienced larger negative changes than men across all social activities and health measures, which supports the male-female health survival paradox concept (Oksuzyan et al., 2008). Interestingly, it appears that the paradox can also be observed in relation to COVID-19. Evidence from Europe has shown that mortality from COVID-19 is higher among men than among women in almost all age groups across all European regions (Ahrenfeldt et al., 2020). This study found that women reported larger negative changes in their health than men following the onset of the COVID-19 pandemic, which may support findings indicating that for women, their level of social connectedness is most strongly associated with their health status (Caetano, Silva, and Vettore, 2013); whereas for men, it is most strongly associated with mortality (Shye, Mullooly, Freeborn, and Pope, 1995). Thus, a lack of social connectedness may be among the mechanisms that underlie the male-female health survival paradox.

While this study found large overall regional differences in the health and activity changes people reported following the start of the COVID-19 pandemic, it also demonstrated that the sex differences in these changes were similar across the European regions. These findings conflict with the results of previous SHARE studies, which found varying sex differences in health across the European regions. Thus, it appears that the COVID-19 lockdowns had the same negative effects, mainly on the mental health of women, across the European regions.

Notably, this cross-sectional study reported overall negative changes across all mental health measures, whereas another study on the same SHARE population utilising longitudinal data found a small increase in loneliness, but a decline in sleep problems and in feelings of sadness or depressive symptoms (Wester et al., 2022). The study by Wester et al. compared the prevalence of mental health symptoms in the SHARE COVID-19 survey to that in SHARE Wave 8 (conducted just before the pandemic). The present study used another question in the SHARE COVID-19 survey in which respondents were asked to retrospectively compare their current situation with their situation before the pandemic. Thus, the temporality and the timing of the measurements seem to have greatly influenced how the respondents perceived their situation. Because of the cross-sectional design of this study, the results may be affected by recall bias influenced by, for instance, the widespread media attention on the negative consequences of the pandemic.

In conclusion, the current study provided evidence of sex-based disparities in the impact of the COVID-19 pandemic on social activities, self-rated health, and mental health across European regions. Women experienced more significant negative changes compared to men, affecting all aspects of social activities and health measures. These results show that while lockdowns and social distancing are effective in the fight against COVID-19, such measures should be followed by initiatives aimed at reducing loneliness and promoting mental health and well-being, particularly among women.

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Part III Employment and labour market during the pandemic

Edited by Agar Brugiavini, Anita Abramowska-Kmon and Agnieszka Chłoń-Domińczak

Elena Bassoli, Michele Belloni, Agar Brugiavini and Ya Gao

12 Did the pandemic change retirement trends?

Key points

– The average retirement age increased during the pandemic. Only a few individuals reported retiring earlier than planned due to the pandemic.
– Mental health issues led to earlier retirement. Working from home and receiving financial support from the government were associated with later retirement.
– Giving older workers the chance to work remotely may provide a bridge to retirement, as eliminating commuting time and allowing employees to work in a familiar environment may induce them to prolong their working life.

1 Introduction

The situation created by the measures aimed at mitigating the spread of COVID-19 (lockdowns, restrictions on movements, school closures, limitations on social contact) led to major disruptions in economic activity, and, relatedly, in the labour market (ILO, 2021, Cribb et al., 2021).

Many studies have focused specifically on the labour force participation of youth and middle-aged people. However, less attention has been paid to older individuals nearing retirement age. On the one hand, due to age discrimination in the labour market (Carlsson and Eriksson, 2019), older people faced more challenges than younger cohorts in remaining in the labour market after experiencing unemployment or job interruptions during the pandemic. Moreover, the closure of workplaces, the significant changes in working arrangements, the increased need for informal care or support within family networks, and, last but not least, the fear of contagion may have led some older individuals to change their retirement plans. On the other hand, older workers may have been disinclined to retire early because they did not want their benefits to be reduced. When we consider these factors together, it is difficult to predict the retirement responses of older workers during the pandemic. Therefore, we aim to investigate the retirement behaviour of people aged 50 or older during the pandemic.

Using data from the first and second waves of the SHARE Corona survey and additional information elicited from the regular SHARE waves, we first explore the changes in the retirement trends of individuals aged 50 or older. We then pro-

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vide evidence on whether men and/or women retired earlier than planned due to the pandemic. Finally, in an econometric framework, we try to identify the main determinants of retirement during the pandemic period.

2 Method and data

In the first step of our analysis, we seek to identify the retirement patterns a few years before the pandemic and during the pandemic. For the pre-pandemic period, we exploit information about the respondents' employment status based on their answers to two questions included in Waves 6 (2015) to 8 (2019/2020). The first question asked the respondents about their current job situation ("In general, which of the following best describes your current employment situation? 1. Retired 2. Employed or self-employed (including working for family business), 3. Unemployed, 4. Permanently sick or disabled, 5. Homemaker, 97. Other (Rentier, Living off own property, Student, Doing voluntary work")). We select individuals who reported that they were employed or self-employed in the initial wave, such as Wave 6 or 7, and look at whether they reported being retired in the subsequent wave (Wave 7 or 8, respectively). The second question asked the respondents in what year they retired. To investigate the age of retirement prior to the pandemic, we restrict the sample to individuals who retired from 2016 to 2018. For the pandemic period, we exploit data from Wave 8 and the Corona survey 2 (June-August 2021): among individuals who reported that they were employed or self-employed in Wave 8, we select those who declared that they had retired after the outbreak of COVID-19 (the precise question was: "Did you retire after the outbreak of the Corona?").

Table 1 illustrates the wave-by-wave transitions from the respondents' initial job situation of "employed or self-employed (i.e., working)" to their final job situation of "retired". About 13% of individuals who were working in Wave 6 indicated that they had retired in Wave 7 (2,014), while about 22.6% reported that they had retired from Wave 7 to Wave 8. Finally, about 18.3% indicated that they had retired during the COVID-19 pandemic (i.e., from Wave 8 to the Corona survey 2).

To identify the main determinants of retirement during the pandemic, we estimate a set of linear probability models: i.e., standard OLS regressions in which the dependent variable is binary. We consider two dependent variables. We first consider the decision to retire during the pandemic. Therefore, the dependent variable equals one if the respondent retired during the pandemic, and equals zero if the individual was employed in Wave 8 but did not retire during the pandemic. We then consider the decision to leave employment during the pandemic (i.e., respondents who reported in the Corona survey 2 that they were retired, unemployed, sick

Table 1: Transitions from one wave to the following wave for individuals who were working in the initial wave.

Working	Retired		Total
	No	**Yes**	
From W6 to W7			
Yes	12,647	2,014	14,661
	86.26	13.74	100.00
From W7 to W8			
Yes	7,470	2,177	9,647
	77.43	22.57	100.00
From W8 to Corona survey 2			
Yes	4,701	1,054	5,755
	81.69	18.31	100.00

Note: The first row reports frequencies and the second row reports percentages.
Source: SHARE Waves 6–8, SHARE Corona (W1 & W2), release 8.0.0.

or disabled, a homemaker, or other, such as a rentier, living off their own property, a student, or doing voluntary work). In this case, the dependent variable equals one if the respondents reported not being employed during the pandemic after indicating in Wave 8 that they were employed, and equals zero if they reported being employed in the Corona survey 2.

Note that among the individuals who were identified above as retired or not in employment, we excluded those who left employment before the Corona survey 1 (May-August 2020), as in order to assess whether the explanatory variables affected the retirement decision, they had to be measured before retirement. Thus, the respondents either retired or left employment between the interview dates of the Corona surveys 1 and 2, while the explanatory variables are drawn from the Corona survey 1.

The explanatory variables include standard demographic characteristics, such as age and gender. We then construct three sets of key explanatory variables. Most of these variables are specific to the analysis of retirement in the pandemic period. The first set comprises the respondents' mental health conditions. We use three dummy variables to measure mental health, including *depression* (equals one if the respondents had been depressed in the last month), *sleeping trouble* (equals one if the respondents had trouble sleeping), and *felt lonely* (equals one of the respondents had felt lonely at some point in time or often). Alternatively, we construct a mental health index based on the three measures of mental health mentioned above using the principal component analysis method.[1] The second set of key variables captures whether the respondents had provided care to others or had received care from others. We classify respondents as *caregivers* if they had provided personal care to others outside their home, or had helped others outside their home (e.g., parents, kids, friends, or colleagues) obtain necessities since the start of the pandemic. We define *care recipients* as individuals who had received help from others outside their household in obtaining necessities since the start of the pandemic. The third set of variables concerns working conditions and financial support, and specifically dummy variables reflecting whether the respondents a) experienced any work interruptions during the pandemic, b) worked from home, c) felt safe at their usual workplace, and d) received any additional financial support due to the COVID-19 crisis. All models include country-fixed effects and information on country-specific lockdown policies drawn from the Oxford COVID-19 Government Response Tracker data, as used by Bassoli, Brugiavini, and Ferrari (2021).

3 Results

Table 2 shows that there was an increase of about 0.77 years in the average retirement age from the pre-pandemic to the pandemic period.

Table 2: Average retirement age before and during the pandemic period.

	Mean retirement age	Sd(retirement age)	N
Pre-pandemic	63.338	3.422	4,110
Pandemic	64.100	3.745	1,106

Source: SHARE Waves 6–8, SHARE Corona (W1 & W2), release 8.0.0.

Figure 1 complements this information with data on the distribution of the retirement age before (Figure 1(a)) and during (Figure 1(b)) the pandemic period. While the differences between these two periods are not straightforward, it appears that the distribution of the retirement age during the pandemic was slightly more skewed to the right (with peaks at ages 62 to 66) than the pre-pandemic distribution was.

1 Using a similar approach, we also tried to construct variables measuring whether the respondents' mental health problems worsened during the pandemic. These results align with the baseline results, and are available upon request.

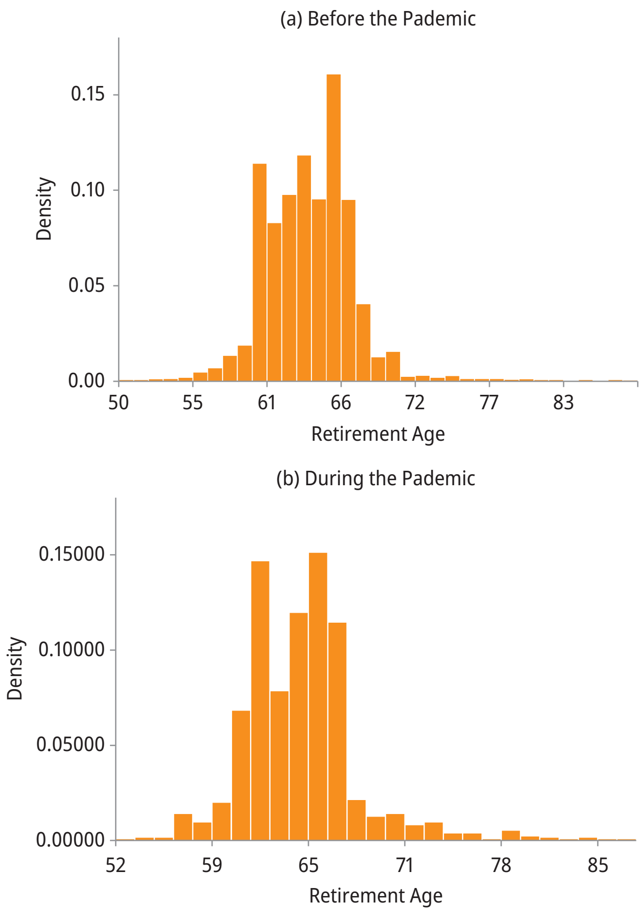

Figure 1: Distribution of the retirement age before and during the pandemic.
Source: SHARE Waves 6–8, SHARE Corona (W1 & W2), release 8.0.0.

Before the pandemic, the retirement age for men had two peaks, at age 63 and age 65; while the corresponding peaks for women were at age 60 and age 65. Figure 2 shows the distribution of the retirement age during the pandemic by gender, with a peak at around age 65 for males and a peak at age 61 for females.

Figure 3 displays the average retirement age by country, and compares the pre-pandemic and the pandemic period, as was done above. The graph shows that the average retirement age during the pandemic period increased in almost every country except for Cyprus, Italy, Malta, and Poland.

Finally, we focus on the group of retirees who retired after the start of the COVID-19 pandemic. We look at their retirement planning process: namely,

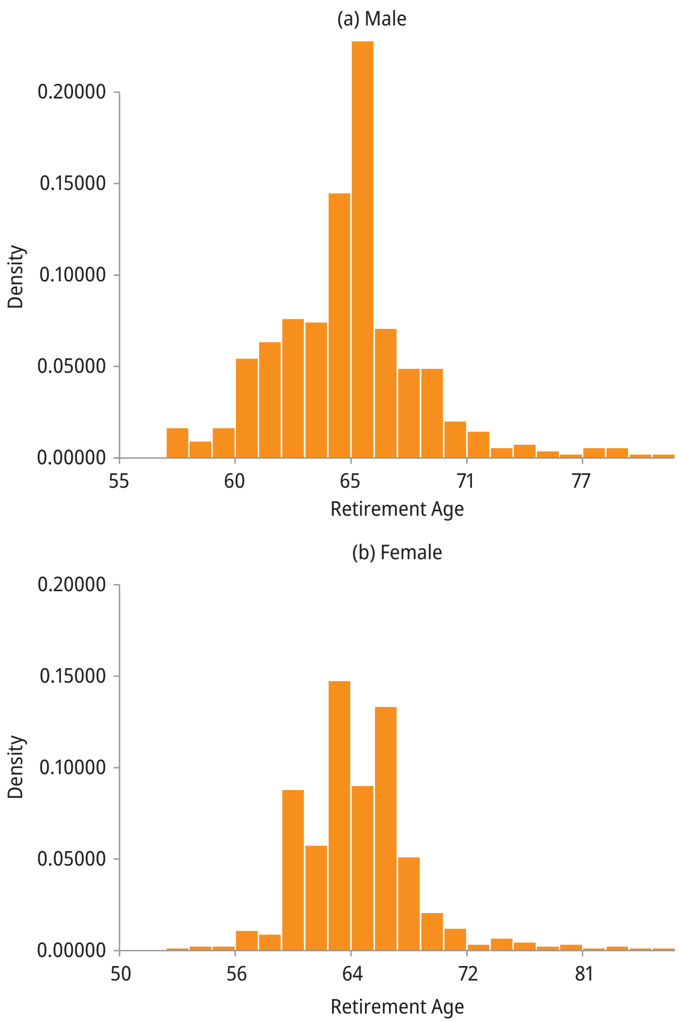

Figure 2: Distribution of the retirement age during the pandemic by gender.
Source: SHARE Waves 6–8, SHARE Corona (W1 & W2), release 8.0.0.

whether they reported that they retired earlier or later than planned, or as planned. We find that a non-negligible percentage of retirees (about 18%, or 178) reported that they retired earlier than planned. However, of these individuals, only 42% (i.e., 75 retirees) indicated that they chose to retire early because of the pandemic.

Table 3 shows results for the probability of retiring after the start of the COVID-19 pandemic. The average sample probability of retiring was equal to

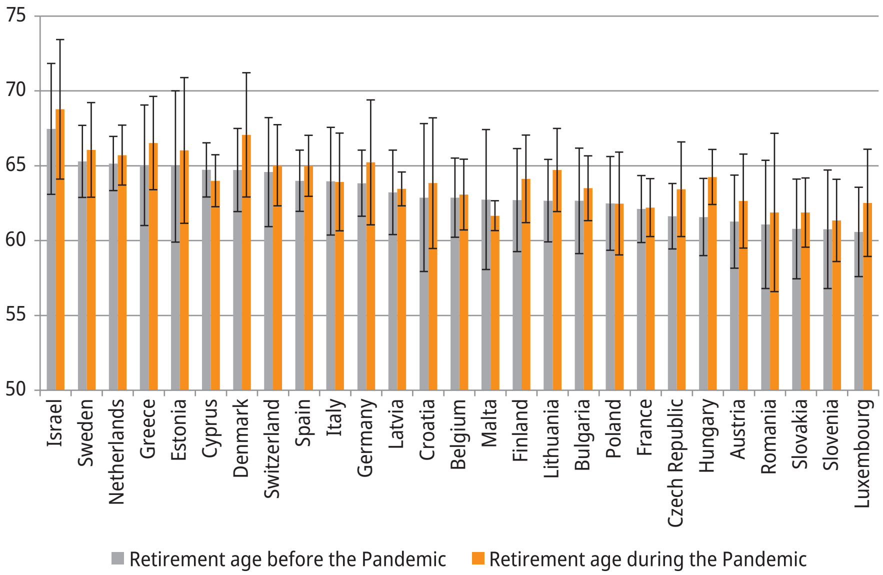

Figure 3: Average retirement age before and during the pandemic by country.
Source: SHARE Waves 6–8, SHARE Corona (W1 & W2), release 8.0.0.

14.35%. We present seven specifications, each of which includes a set of explanatory variables (roughly the three groups of key variables explained above). The last column includes all but one explanatory variable. As expected, we find that being older or female was associated with a higher probability of retiring. Column 1 and especially column 2 suggest that having been in worse mental health before the pandemic was also positively related to retirement. The working conditions and financial support variables – shown in columns 4 to 6 – provide the most interesting findings: working from home (instead of at the workplace) reduced the probability of retiring by two percentage points; while receiving financial support (mainly from the government, as only a few individuals reported receiving support from relatives or friends) reduced the probability of retiring by more than three percentage points. Being a caregiver/recipient is not shown to be related to the decision to retire early; see column 3. The results are unchanged when we pool all the explanatory variables together, except for the financial support variable, which is no longer statistically significant; see column 7.

Table 4 shows the results for the probability of leaving employment – i.e., by retiring, becoming unemployed, becoming permanently sick or disabled, becoming a homemaker, or other conditions – after the start of the COVID-19 pandemic. The average sample probability of leaving employment was equal to 21.15%. The results are qualitatively similar to – although stronger than – the results displayed in Table 3 regarding age, gender, and mental health. However, it appears that the probability of leaving employment was more affected by the working conditions and financial support variables than by the probability of retiring, as reported in Table 3. Having experienced work interruptions during the pandemic was associated with an increase in the probability of leaving the labour force (and especially of becoming unemployed) of more than five percentage points (this estimate was significant at the 1% significance level). Working from home instead of at the workplace reduced the probability of leaving employment by about four percentage points; a figure that was more than double that found in Table 3. Feeling safe in the workplace during the pandemic was a critical determinant of the decision to remain in employment; whereas this result was not significant in Table 3. Finally, the importance of receiving financial support from the government during the pandemic in the decision to keep working was confirmed.

Table 3: Factors associated with the probability of retiring after the outbreak of COVID-19.

VARIABLES	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**
Age	0.023*** (0.001)	0.023*** (0.001)	0.023*** (0.001)	0.020*** (0.001)	0.021*** (0.001)	0.023*** (0.001)	0.020*** (0.001)
Female	0.029*** (0.009)	0.029*** (0.009)	0.032*** (0.009)	0.019** (0.009)	0.020* (0.011)	0.032*** (0.009)	0.018** (0.009)
Mental health conditions							
Depression	−0.003 (0.012)						−0.003 (0.013)
Sleeping trouble	0.026** (0.012)						0.026** (0.012)
Felt lonely	0.009 (0.012)						−0.011 (0.012)
Mental health index		0.008* (0.004)					
Whether provide/receive care							
Caregiver			−0.011 (0.010)				−0.007 (0.010)

Table 3 (continued)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Care recipient			0.029 (0.019)				0.018 (0.021)
Working conditions and financial support							
Interruptions				0.004 (0.012)			0.008 (0.013)
Working from home				−0.019* (0.010)			−0.020** (0.010)
Felt safe at workplace					−0.008 (0.017)		
Financial support						−0.032** (0.013)	−0.021 (0.014)
Country fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lockdown policies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,169	6,169	6,172	5,175	3,497	6,177	5,168
R-squared	0.155	0.155	0.155	0.121	0.136	0.154	0.123

Significance: *** p < 1%; ** p < 5%; * p < 10%
Notes: The dependent variable is a dummy variable that equals one if the respondent retired during the pandemic, and that equals zero if the respondent was employed in Wave 8 and did not retire during the pandemic. Lockdown policies: country-specific lockdown policies using the Oxford COVID-19 Government Response Tracker data (Bassoli, Brugiavini, and Ferrari, 2021).
Source: SHARE Wave 8, SHARE Corona (W1 & W2), release 8.0.0.

Table 4: Factors associated with the probability of being out of the labour force after the outbreak of COVID-19.

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Age	0.029*** (0.001)	0.029*** (0.001)	0.029*** (0.001)	0.024*** (0.001)	0.025*** (0.002)	0.029*** (0.001)	0.024*** (0.001)
Female	0.024** (0.011)	0.024** (0.011)	0.032*** (0.011)	0.027** (0.011)	0.024* (0.013)	0.032*** (0.011)	0.020* (0.011)

Table 4 (continued)

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Mental health conditions							
Depression	0.015 (0.016)						0.018 (0.016)
Sleeping trouble	0.060*** (0.015)						0.067*** (0.015)
Felt lonely	0.015 (0.015)						0.015 (0.015)
Mental health index		0.023*** (0.005)					
Whether provide/receive care							
Caregiver			−0.023* (0.012)				−0.010 (0.012)
Care recipient			0.027 (0.024)				−0.013 (0.024)
Working conditions and financial support							
Interruptions				0.054*** (0.016)			0.058*** (0.016)
Working from home				−0.037*** (0.012)			−0.037*** (0.011)
Felt safe at workplace					−0.047** (0.022)		
Financial support						−0.056*** (0.017)	−0.035** (0.017)
Country fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Lockdown policies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,597	5,597	5,600	4,913	3,331	5,605	4,906
R-squared	0.130	0.129	0.127	0.096	0.102	0.128	0.104

Significance: *** = 1%; ** = 5%; * = 10%
Notes: The dependent variable is a dummy that equals one if the respondent reported not being employed (retired, unemployed, sick or disabled, homemaker, or other) in the Corona survey 2 but being employed in Wave 8, and that equals zero if the respondent reported being employed. We control for country-specific lockdown policies. Lockdown policies: country-specific lockdown policies using the Oxford COVID-19 Government Response Tracker data (Bassoli, Brugiavini, and Ferrari, 2021).
Source: SHARE Wave 8, SHARE Corona (W1 & W2), release 8.0.0.

4 Conclusions

We found that the average retirement age increased during the pandemic, with similar trends for men and women. However, given that many countries have been subject to pension system reforms, it is difficult to argue that the increase in the retirement age was due to the pandemic. This increase is in line with a long-term increase in the average retirement age, as documented by Eurostat. Although we cannot say for certain whether the increase would have been higher (or lower) in the absence of the COVID-19 outbreak, we found that only a few respondents retired earlier than planned due to the pandemic.

This preliminary evidence might suggest that during the pandemic, individuals did not retire or leave employment more frequently than they did in the pre-pandemic period. There are several potential explanations for this pattern. First, after the pandemic started, governments implemented strict lockdown policies that primarily affected labour arrangements. Some individuals working in specific sectors and occupations were required to work from home, which facilitated the reorganisation of personnel. At the same time, individuals who held so-called "essential jobs" (such as nurses or doctors) were allowed to go to work without restrictions, and may have faced difficult work situations and a shortage of personnel. These circumstances may have prevented some of the respondents from retiring early or when planned, and may have even led them to postpone their retirement. Furthermore, since governments provided financial support to workers, these benefits may have protected employees and encouraged them to stay in the labour market.

In conclusion, our analysis is the first to show that the early retirement patterns documented in other countries during the pandemic did not occur in Europe, and that the financial support governments provided to workers might have incentivised them to stay in the labour market. Given that the ageing population will put pressure on the sustainability of the pension systems in Europe in the coming decades, policymakers should be aware that providing financial support during challenging periods is a concrete tool that can be used to encourage individuals to stay in the labour market. In non-pandemic periods, giving older workers (in specific sectors or occupations) the chance to work remotely may provide a bridge to retirement: i.e., eliminating commuting time and allowing older employees to work in a familiar environment may induce them to keep working longer.

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Axel Börsch-Supan, Vesile Kutlu-Koç and Diana López-Falcón

13 Short-time employment aid during the COVID-19 lockdown: Short- and long-run effectiveness

Key points

– The use of short-time employment aid became more intense during the COVID-19 pandemic: the share of respondents who benefited from it increased from 17% in 2020 to 25% in 2021 in most SHARE countries. The exceptions were Italy, France, the Czech Republic, and Slovenia.
– Evidence suggests that vulnerable individuals (i.e., those who were less educated, previously unemployed, or in the lowest income tercile) still experienced a decrease in their working hours in the second phase of the pandemic, despite the relaxation of containment measures.
– In the longer run, STEA may have extended the life of unproductive companies, and thereby created unemployment in the longer run.

1 Introduction

The COVID-19 pandemic, and the epidemiological containment measures governments introduced in response to it, caused one of the largest economic downturns since the financial crisis in 2009. Many people were affected by a reduction in working hours, also known as short-time work (STW). To minimise the negative effects of STW on workers' incomes, many governments compensated workers for their earnings losses through short-time employment aid schemes (STEA). Although the coverage and the generosity of these schemes differed widely across countries (EU COM 2010, ETUC 2020, OECD 2020), the STEA guaranteed workers a minimum income, regardless of the hours they worked.

This study examines whether the working population was actually helped by STEA. A comparative view of SHARE countries is taken, and the differences in policy outcomes are analysed cross-nationally. The research objectives are based on the following questions:

– Who was affected by shorter working hours during the COVID-19 pandemic? Specifically, were these workers among the most vulnerable because, for example, they had a previous history of unemployment or had a low income?
– Did the workers affected by STW receive support? Specifically, did they receive short-time employment aid from their governments? Did this support help them to maintain their living standards?

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While most economists agree that STEA is helpful in the short run, some have warned that it may have a negative impact in the longer run, because STEA could prohibit the natural fluctuation of jobs, whereby companies that are no longer profitable, regardless of the economic downturn, terminate jobs. Therefore, in effect, subsidising workers at such companies (in the extreme: “zombie companies”) temporarily prolongs employment, but the companies eventually have to lay off employees after STEA ends. Taking this into consideration, a second set of questions evaluates the potential negative side effects of STEA:

- Do we observe negative side effects of STEA? Specifically, do we see higher unemployment in the longer run among workers who received STEA?
- If we observe such negative long-run outcomes, can we attribute them to STEA, or can they be explained by the jobs and the workers eligible for STEA having been less productive in the first place?

To distinguish between short- and longer-run effects, the paper takes advantage of the cross-national and longitudinal data from the Survey of Health Ageing and Retirement in Europe (SHARE). The data comprise two waves of the SHARE Corona Survey conducted during the COVID-19 lockdown in spring 2020 and spring 2021. Shifts in individuals’ working hours, income situations, and STEA receipts can be compared between the two periods.

It also uses data from previous waves of SHARE, including SHARELIFE, to identify respondents who were considered vulnerable prior to the pandemic. In addition, the study distinguishes between the direct effects of the pandemic, measured by the country-specific death rate due to COVID-19; and the indirect effects of the pandemic, derived from the governments’ containment responses, as represented by the Stringency Index of the Oxford COVID-19 Government Response Tracker (OxCGRT).

2 Who was affected by shorter work hours?

The sample comprises 5662 panel respondents from the SHARE Corona survey 2 (CATI2) who also participated in the SHARE Corona survey 1 (CATI1) and answered all relevant questions in both surveys. As part of the research, all respondents included were working or were self-employed at the time of the interview. Figure 1 shows that between 2020 and 2021, the share of respondents across all countries who reduced their working hours declined, on average, from 27.94% to about a third (10.86%). This finding is in line with the OECD (2021) evidence.

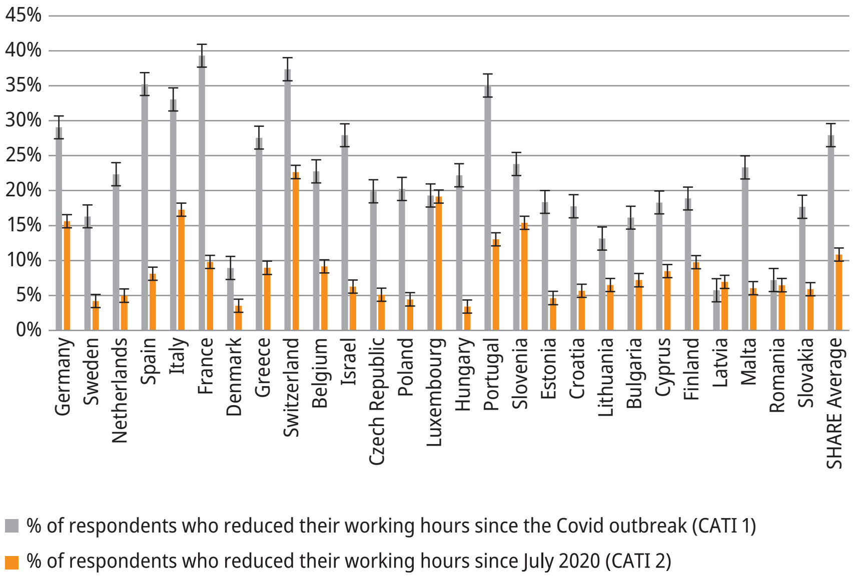

Figure 1: Reduction in short-time work between CATI1 and CATI2.
Source: SHARE Corona (W1 & W2), release 8.0.0, N = 5662, weighted.

In addition to the decline in the prevalence of STW from 2020 to 2021, the distribution of individuals affected by STW also shifted during this period. While in the beginning of the pandemic, middle-income groups were more likely than low- and high-income groups to have their hours reduced or to become unemployed (see Börsch-Supan, Kutlu-Koç and López-Falcón (2021)), Table 1 shows that the majority of the recipients are concentrated in the lower tercile of the income distribution. There is still an age effect, but it is no longer significant. While our analysis of the 2020 data suggests that the risk of being affected by short-time work was more attributable to the lockdown measures, and not to the epidemic itself, the opposite pattern is shown in Table 1: the stringency of the (relatively fewer) lockdown measures reduced the probability of being affected by STW, whereas the high mortality associated with the pandemic increased it. Some effects were the same for 2020 and 2021. Relative to other workers, the self-employed were more likely to work less or not at all. Women were more affected by STW than men. Well-educated individuals, as well as respondents without a history of unemployment, were less affected by STW. Overall, the evidence suggests that vulnerable individuals (i.e., those who were less educated, previously unemployed, or in the lowest income tercile) were still more likely than others to experience a decrease in their working hours in the second phase of the pandemic, and that these disparities had worsened since the outbreak.

Table 1: Who is affected by short-time work?

Dependent variable: STW	Coef.	Std. Err.	t	P > t
Age	0.00175	0.0013	1.38	0.169
Female	0.0254	0.012	2.12	0.034
Self-employed	0.122	0.018	6.81	0
Education level	−0.00643	0.0025	−2.55	0.011
Ever unemployed	0.0431	0.017	2.52	0.012
First income tercile	0.0255	0.013	1.90	0.057
Third income tercile	−0.00254	0.013	−0.20	0.844
Stringency Index	−0.151	0.074	−2.04	0.042
Cumulative deaths/100000	0.0689	0.031	2.20	0.028

Note: Regression analysis. N = 3,273, R-squared = 5.6%, country and industry dummies included.
Source: SHARE Corona (W2), release 8.0.0.

3 Who received short-time employment aid?

As reported by the OECD (2021), the relaxation of containment measures and the subsequent increase in working hours resulted in a decline in job retention measures in most countries (Figure 1). However, the use of STEA became more intense in the sense that the share of respondents who received compensation for STW increased from 17% in 2020 to 25% in 2021 in most of the countries that still had a sizeable number of STEA recipients. The exceptions were Italy, France, the Czech Republic, and Slovenia. These results are shown in Figure 2.

The results also indicate that the likelihood of vulnerable populations receiving STEA increased from 2020 to 2021. Further regression results (not shown) suggest that STEA became not only more intense, but also better targeted. Börsch-Supan, Kutlu-Koç, and López-Falcón (2021) found that STEA worked regressively in the sense that low-income groups did not benefit from STEA at all, while higher-income groups profited more than the middle-income tercile. By contrast, a year later, the probability of receiving STEA was about 6% higher if an individual was in the lowest income tercile, and was about 5% lower if the person was in the highest income tercile. However, due to the small sample size, most effects are only weakly significant or not significant at all.

Regarding the effectiveness of STEA, the evaluation is less straightforward, since we do not observe a convincing counterfactual that clearly shows that all

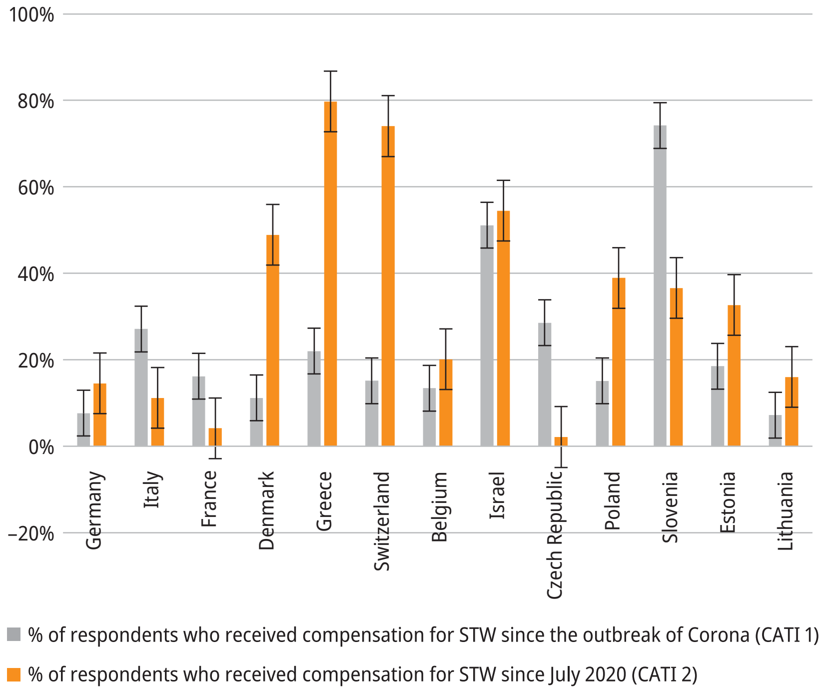

Figure 2: Prevalence of short-time employment aid in CATI1 and CATI2.
Note: The countries with less than 30 observations are excluded from the graph.
Source: SHARE Corona (W1), release 8.0.0, N = 1319, weighted; SHARE Corona (W2), release 8.0.0, N = 1263, weighted.

individuals eligible for this type of aid effectively received it. Still, the respondents' answers to the survey provide some feedback about its effectiveness, as reflected in the financial wellbeing of STEA recipients. Table 2 cross-tabulates the share of individuals with shorter work hours and a subjective measure of economic stress ("Thinking of your household's total monthly income, would you say that your household has been able to make ends meet with great difficulty, with some difficulty, fairly easily, or easily?") by receipt of STEA. Overall, individuals who did not receive STEA reported lower rates of financial distress than STEA recipients. Nonetheless, only 15% of STEA recipients reported having serious financial stress, and 57% reported having none at all.

Table 2: Financial stress and receipt of short-time employment aid.

Make ends meet	**STEA receipt**		***N***
	no	**yes**	
With great difficulty	4.4%	14.6%	*62*
With some difficulty	19.4%	27.9%	*192*
Fairly easily	40.1%	30.1%	*337*
Easily	36.1%	27.4%	*304*
Total	**100.0%**	**100.0%**	*895*

Source: SHARE Corona (W2), release 8.0.0.

4 Did STEA create unemployment in the longer run?

STEA may have extended the life of unproductive companies, and thereby created unemployment in the longer run. A superficial look at the data may suggest that this was not the case (Table 3).

Table 3: Unemployment and receipt of short-time employment aid.

In 2020 (in CATI1)	**In 2021 (in CATI 2): Became unemployed**	**Not unemployed**
Received STEA	11.7%	88.3%
Did not receive STEA	7.3%	92.7%

Source: SHARE Corona (W2), release 8.0.0, N = 912.

Of the respondents who did not receive STEA from the outbreak of the pandemic until July 2020, 92.7% stayed employed since July 2020. Of those who received the allowance, 88.3% stayed employed. While this difference is rather small, it suggests that STEA measures prevented unemployment not only in 2020, but also in the longer run, i.e., in 2021.

However, this interpretation does not take into consideration that the about 25% of individuals who received STEA are not a random selection, but were already vulnerable before the pandemic (e.g., were less educated, had a lower income, and/or had experienced unemployment), as noted earlier. To account for these selection effects, we use three different methods: we condition on a broad array of personal characteristics; we match individuals and only compare individuals who are alike; and instead of comparing employment levels, we measure the relations between the differences in STEA receipt and unemployment outcomes. While each of these methods has its own advantages and disadvantages, a challenge common to all of them is that the sample size for these comparisons becomes relatively small.

The results displayed in Table 4 suggest that there is a positive correlation between receiving STEA in 2020 and being unemployed in 2021, even after correcting for the selectivity of individuals receiving STEA. On the other hand, receiving STEA in 2020 increases the probability of being unemployed in 2021 by about 10 to 12 percentage points.

Table 4: Longer-run effect of short-time employment aid on unemployment.

Method	Coef.	Std. Err.	t	P > t	R^2	N
Regression with conditioning variables	0.098	0.045	2.20	0.028	0.71	421
Propensity score matching (ATT)	0.100	0.068	1.48	0.138	0.32	372
Regression in first differences	0.121	0.037	3.31	0.001	0.49	420

Note: Regression analysis. Covariates, industry and country dummies included in all specifications.
Source: SHARE Corona (W1 & W2), release 8.0.0.

5 Conclusions

The results show that the share of respondents who experienced reduced working hours significantly declined from 2020 to 2021. On average across all countries, this share declined from 27.9% to about a third (10.9%). Nevertheless, it was not only the prevalence of short-time work that changed between 2020 and 2021, but also the selection of individuals who were affected by it. Vulnerable individuals (i.e., those who were less educated, had a previous history of unemployment, or were in the lowest income tercile) were affected by short-time work relatively more in 2021 than they were in 2020.

The use of short-time employment aid (STEA) became more intense in the sense that the share of respondents who benefited from it increased from 17% in 2020 to 25% in 2021 in most SHARE countries. The exceptions were Italy, France, the Czech Republic, and Slovenia.

Even though the recipients of short-time employment aid were found to have relatively low incomes, only 15% reported having serious financial stress, and 57% reported having no financial stress. Receiving short-time employment aid in 2020 increased the probability of being unemployed in 2021 by about 10 to 12 percentage points, once the selectivity of individuals receiving such aid was considered.

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14 Work interruptions and medium-term labour market outcomes of older workers during the COVID-19 pandemic

Key points

- Experiencing work interruptions in the first wave of the COVID-19 pandemic was associated with a higher probability of entering unemployment or exiting the labour market for older workers, and might jeopardise their chances of returning to work.
- Women and less educated workers represent more vulnerable categories.
- Well-designed and well-targeted policy measures are required to protect workers in at-risk occupations, to reduce job losses, and to support the training and/or re-employment of older workers.

1 Introduction

Recent studies in various fields, from labour economics to psychology, have found an *age bias* in the process for recruiting new employees that is particularly relevant for older women (Neumark et al., 2019). Given the goal of lengthening working lives that is central to the pension system reforms that have been enacted in most European countries in recent years, this age discrimination represents a problem for older individuals and a challenge for welfare systems. Losing a job at an older age may lead to long unemployment spells, and could jeopardise the chances of returning to the labour market for individuals aged 50+.

Researchers are investigating the reasons for such discrimination. It appears that the difficulties older individuals face in finding a new job are partially related to the labour demand side. Indeed, a large share of older workers may lack the skills required by some types of job vacancies, including computer, creative, and training skills (Turek and Henkens, 2020). Moreover, economic downturns often lead to sizeable job losses, which tend to affect specific occupations more strongly (Jaimovich and Siu, 2020), mainly occupations that "age" (Autor and Dorn, 2009). Therefore, older workers in general (and older women in particular) represent more vulnerable categories of workers, especially during and following recessions.

Given the difficult situation created by the ongoing COVID-19 pandemic, it is particularly relevant to understand the implications of the containment measures (ex-

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tended lockdowns, restrictions on movements, increased need for informal care of old/fragile individuals and/or grandchildren) for the labour market outcomes of older people in both the short and the medium run. In their analysis of the role of occupational features in relation to the probability and the length of work interruptions during the first wave of the COVID-19 pandemic, Brugiavini et al. (2022) found that individuals working in non-essential jobs that were characterised by a low feasibility of remote work and/or high levels of social interaction faced a higher probability of undergoing work breaks. Moreover, their analysis showed that women and less educated individuals were particularly exposed to the risk of experiencing such events.

Using data from the second SHARE Corona Survey, we aim to investigate the medium-term impact of having experienced work interruptions during the first wave of the pandemic on various labour market outcomes (employment/ unemployment/ retirement/ homemaking) for individuals aged 50 or older. Were individuals who experienced work interruptions in the first wave of the pandemic more likely to become unemployed or to exit the labour market in 2021? Which individual and job characteristics significantly affected individuals' labour market decisions during the pandemic?

2 Data and method

2.1 Data

We take advantage of the data collected through the SHARE Corona survey Waves 1 and 2, linking them with additional information from the regular pre-pandemic waves. We keep in the sample those individuals who took part in both waves of the SHARE Corona survey, and who reported that they were working at the start of the pandemic. We exclude respondents for whom we could not retrieve the ISCO-08 one-digit occupation from pre-pandemic waves; respondents answering "other" or "permanently sick or disabled" to the question about their current employment situation in Wave 2 of the Corona survey; as well as respondents belonging to major 0 ("Armed forces occupations"), which contained few observations. In addition, we drop individuals from Hungary, as the Hungarian sample satisfying our requirements was very small. Our final sample includes 7056 individuals. Note that there are significant differences in the number of observations by country (the sample size by country ranges from 61 observations in the Netherlands to 931 observations in Estonia).

From Wave 1 of the SHARE Corona Survey, we exploit the battery of questions related to work interruptions: namely, questions about whether respondents had experienced work interruptions since the start of the pandemic, and the length of such spells (i.e., the number of weeks). From Wave 2, we use the information on current employment status, as well as the information on work discontinuities between the first and the second wave of the Corona survey. In addition, we link the most recent information available from the pre-pandemic SHARE waves regarding respondents' occupation, education, and IT skills. Table 1 briefly describes the main features of our sample.

Table 1: Sample description.

Variable	Mean/%
Age	61.5
Women	55.9
Work interruptions between the start of the COVID-19 pandemic and Wave 1	18.43
Weeks of work interruption between the start of the COVID-19 pandemic and Wave 1 (if experienced)	9.01
Work interruptions between Wave 1 and Wave 2	8.92
Weeks of work interruption between Waves 1 and 2 (if experienced)	17.1
Job Title (ISCO-08 1 digit):	
Managers	7.58
Professionals	25.30
Technicians	14.00
Clerical support workers	9.68
Service and sales workers	13.89
Skilled agricultural, forest and fish workers	3.30
Craft and related trades workers	10.76
Plant and machine operators, and assemblers	6.75
Elementary occupations	8.74
Labour Market Outcomes (Wave2):	
Retired	16.9
Employed	80.4
Unemployed	2.00
Homemaker	0.67
N. of observations	7056

Source: SHARE Waves 1 to 8, release 8.0.0; SHARE Corona (W1 & W2), release 8.0.0.

Overall, women represent about 56% of the sample, and the mean age of respondents at the time of the second interview was 61.5. There is, however, variation across countries, with Slovenia and Lithuania having the largest shares of female respondents (64% and 63%, respectively); and Malta, Greece, and Italy having the lowest percentages of female respondents (41%, 47%, and 49%, respectively). The countries with the youngest samples were Slovakia and Romania (with a mean age of 58 and 59, respectively), while the countries with the oldest samples were Israel and Sweden (with a mean age of 67 and 64, respectively). Of the participants in the second SHARE Corona Survey, about 17% of those who had been working during the pandemic retired before the interview, 80.4% were currently employed, while the rest were unemployed or out of the labour force (homemaker). Finally, it is important to observe that 18.43% of the respondents in our sample experienced work interruptions during the first wave of the pandemic, while 8.92% experienced work breaks between the first and the second SHARE Corona interviews.

In the present study, we analyse the relationship between respondents having experienced work interruptions between the start of the pandemic and the first SHARE Corona survey (June-August 2020) and their working status in Wave 2 of the survey (June-August 2021). In particular, we aim to understand whether and to what extent having experienced work breaks during the first wave of the

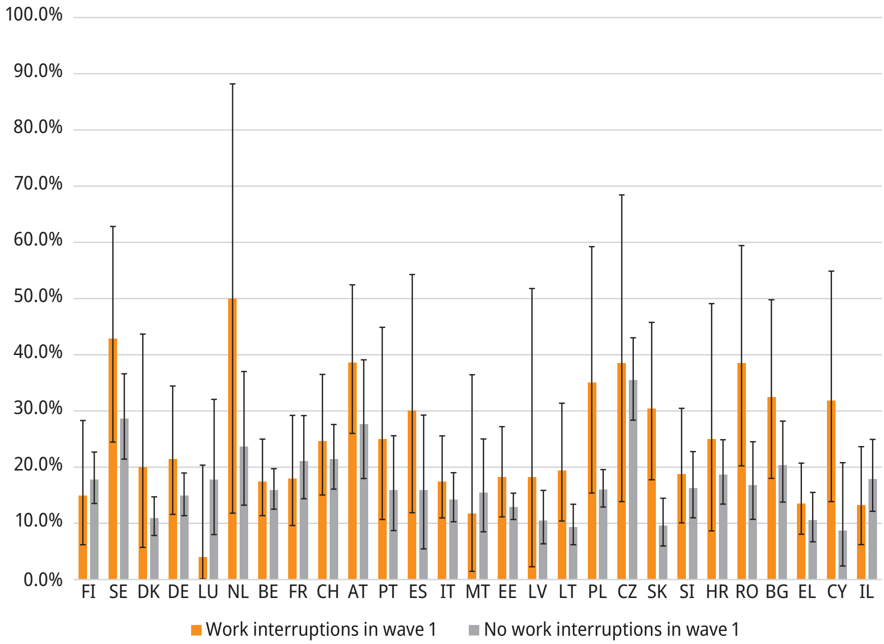

Figure 1a: Transitions from work to retirement between Wave 1 and Wave 2 of the SHARE Corona survey, with and without work interruptions.
Note: Due to small sample sizes the confidence interval is very large in some countries and therefore our descriptive evidence lacks statistical significance.
Source: SHARE Waves 1 to 8, release 8.0.0; SHARE Corona (W1 & W2), release 8.0.0.

pandemic was associated with the probability of retiring, becoming unemployed or exiting the labour force to become a homemaker.

Figures 1a and 1b describe the transitions from work to retirement and from work to unemployment, separately for respondents who did and did not experience work interruptions during the first wave of the pandemic. Overall, the pictures show that having experienced work interruptions was associated with a higher probability of retiring between the first and the second SHARE Corona survey, or being unemployed in the second wave of the SHARE Corona survey.

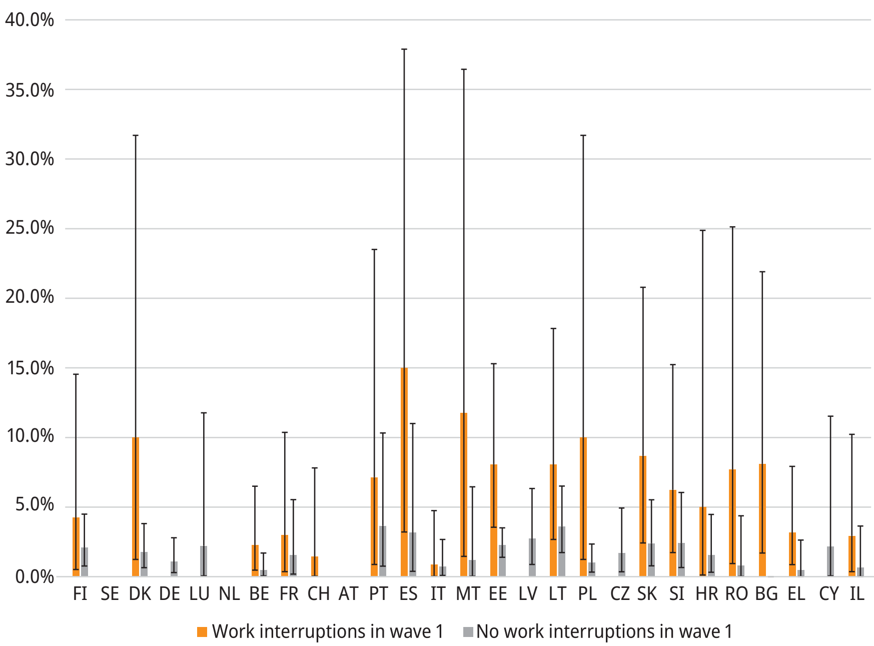

Figure 1b: Transitions from work to unemployment between Wave 1 and Wave 2 of the SHARE Corona survey, with and without work interruptions.
Note: Due to small sample sizes the confidence interval is very large in some countries and therefore our descriptive evidence lacks statistical significance.
Source: SHARE Waves 1 to 8, release 8.0.0; SHARE Corona (W1 & W2), release 8.0.0.

Figures 2a and 2b show the flows from work to retirement and unemployment for respondents who had and those who had not experienced work interruptions, by occupation major. It is worth noting that in all of the majors considered, the share of individuals who were unemployed during Wave 2 of the SHARE Corona survey was significantly larger among the respondents who had undergone work interruptions in Wave 1 of the pandemic. Such interruptions seemed to be particularly rele-

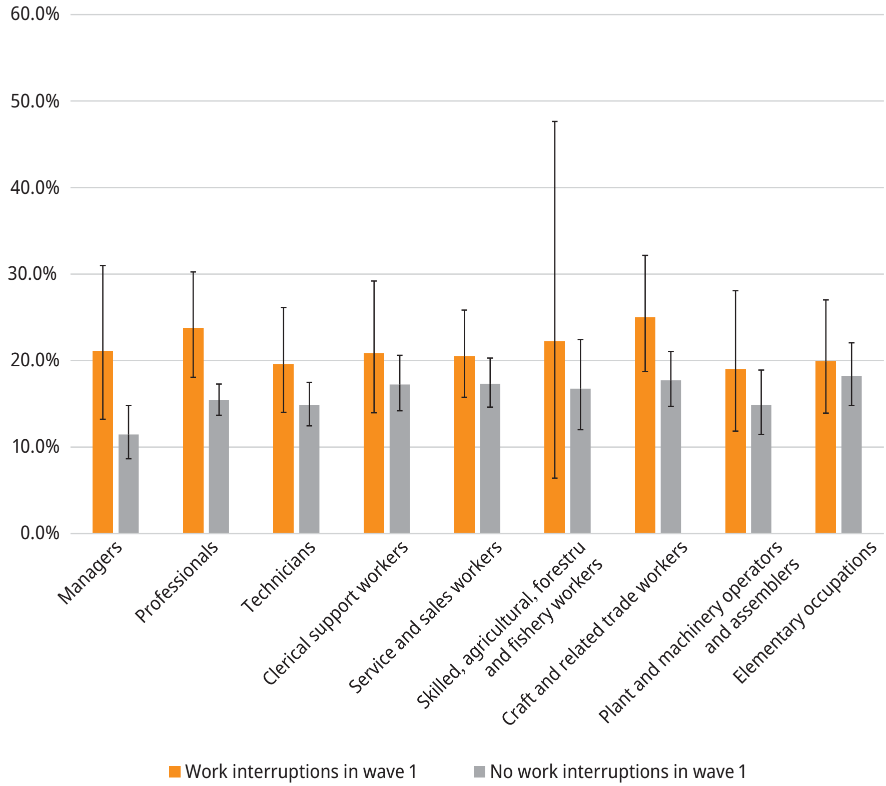

Figure 2a: Transitions from work to retirement between Wave 1 and Wave 2 of the SHARE Corona survey, with and without work interruptions, by occupation major.
Note: Due to small sample sizes the confidence interval is very large in some occupation majors and therefore our descriptive evidence lacks statistical significance.
Source: SHARE Waves 1 to 8, release 8.0.0; SHARE Corona (W1 & W2), release 8.0.0.

vant for respondents in certain middle-skilled blue-collar occupations, including "skilled agricultural, forestry and fishery workers" (major 6) and "craft and related trade workers" (major 7).

When we compare the employment situation of people who experienced work suspensions during the first wave of the pandemic with that of people who did not, we observe that the share of respondents out of the labour market or unemployed in Wave 2 was slightly larger among those who underwent work breaks. Moreover, while the data show a similar picture for both genders in case of work continuity, they also document some differences between men and women who experienced work discontinuities. In particular, they show that among the respondents who had experienced work interruptions, larger percentages of men retired, while larger

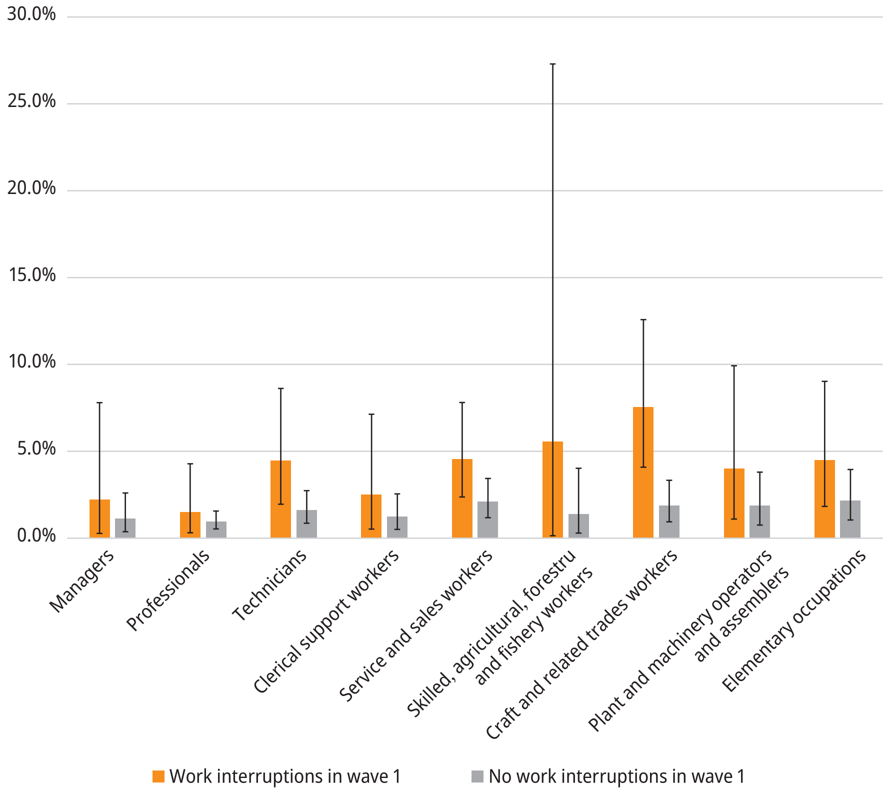

Figure 2b: Transitions from work to unemployment with and without work interruptions, by occupation major.
Note: Due to small sample sizes the confidence interval is very large in some occupation majors and therefore our descriptive evidence lacks statistical significance.
Source: SHARE Waves 1 to 8, release 8.0.0; SHARE Corona (W1 & W2), release 8.0.0.

shares of women became unemployed or homemakers. This evidence raises concerns, as these two last categories generally have less social protection (with some variation from country to country, depending on the welfare system), which suggests that women may represent a more vulnerable category.

2.2 Method

In order to refine our analysis, we perform two sets of regressions. First, we estimate the correlation between work interruptions in the first wave of the pandemic and the employment situation in the second wave of the SHARE Corona survey by means of a multinomial logit. For this specification, we refer to work breaks up to the first Corona survey, because this information is not available for the period between the first and the second waves for either the retirees or the homemakers.

Second, we analyse the probability of ending up in unemployment by also taking advantage of the available information on the presence and the length of work interruptions between the first and the second Corona survey interview. To do this, we run two additional logit regressions.

The empirical specification for the first part of the analysis is the following:

$$\Pr(Y_i = j) = \frac{\exp\left(\alpha_j + \beta_j w_i + X'_i \gamma_j\right)}{\sum_{k=1}^{J} \exp\left(\alpha_k + \beta_k w_i + X'_i \gamma_k\right)}$$

The key dependent variable is a categorical variable representing the working situation of the respondent (retired/ employed/ unemployed/ homemaker), with the baseline comparison group being employed individuals. The main explanatory variable, w_i, is, alternatively, (i) a binary indicator that takes the value of one if the individual experienced work breaks during the first wave of the pandemic, and the value of zero otherwise; (ii) a categorical variable that takes the value of zero if the respondent experienced no interruptions, the value of one if the respondent experienced work interruptions lasting one to eight weeks, and the value of two if the respondent experienced work breaks longer than eight weeks. The threshold of eight weeks represents the median number of weeks of work interruptions for those who underwent such episodes before the first wave of the SHARE Corona survey. This threshold changes to eighteen in the logit specification, where we consider the experience/ length of work discontinuities throughout the whole period, from the start of the pandemic to the second Corona survey interview.

Additional controls include gender, the nine ISCO-08 occupation majors (one-digit categories), the self-reported pre-pandemic IT skills, five-year age groups, whether the individuals used to work in the public or private sector or were self-employed, and four country clusters based on their geographical location (Nordic, Western, Southern, East European countries and, separately, Israel).

3 Results

Table 2 reports the results of our multinomial logit specifications for three working statuses: retirement, unemployment, and homemaker, while employment represents the reference outcome. At first glance, it is clear that there is a positive

Table 2: Multinomial logit estimations results.

Variable	Retired		Unemployed		Homemaker		Retired		Unemployed		Homemaker	
	Relative risk ratios	**Standard error**	**Relative risk Ratios**	**Standard error**	**Relative risk ratios**	**Standard error**	**Relative risk ratios**	**Standard error**	**Relative Risk Ratios**	**Standard error**	**Relative risk ratios**	**Standard error**
Work interruptions in w1	1.520***	(0.148)	3.498***	(0.694)	2.233*	(0.792)						
Weeks work interruption:												
No interruptions (0 weeks)									ref			
Between 1–8 weeks							1.214	(0.155)	2.789***	(0.689)	1.447	(0.705)
More than 8 weeks							2.137***	(0.284)	4.308***	(1.097)	3.602**	(1.486)
Female	1.014	(0.086)	1.164	(0.236)	10.529***	(5.910)	1.008	(0.086)	1.174	(0.240)	10.369***	(5.825)
IT skills:												
Never used computer			ref						ref			
Poor or fair	0.754	(0.112)	0.637	(0.185)	0.909	(0.503)	0.774	(0.116)	0.63	(0.184)	0.925	(0.514)

(continued)

Table 2 (continued)

Variable	Retired		Unemployed		Homemaker		Retired		Unemployed		Homemaker	
	Relative risk ratios	Standard error	Relative risk Ratios	Standard error	Relative risk ratios	Standard error	Relative risk ratios	Standard error	Relative Risk Ratios	Standard error	Relative risk ratios	Standard error
Good	0.983	(0.152)	0.368**	(0.121)	0.896	(0.558)	0.993	(0.154)	0.368**	(0.122)	0.903	(0.565)
Very good-excellent	0.761	(0.125)	0.445*	(0.156)	1.106	(0.708)	0.773	(0.128)	0.445*	(0.156)	1.121	(0.723)
Type of occupation:												
Private employee			ref						ref			
Public employee	1.185	(0.107)	0.914	(0.197)	0.270*	(0.142)	1.186	(0.107)	0.881	(0.191)	0.278*	(0.146)
Self-employed	0.745*	(0.091)	0.572	(0.188)	1.465	(0.607)	0.746*	(0.090)	0.573	(0.189)	1.457	(0.612)
Age groups	√		√		√		√		√		√	
ISCO08 majors (1 digit)	√		√		√		√		√		√	
Country cluster	√		√		√		√		√		√	
Constant	0.002***	(0.002)	0.013***	(0.012)	0	(0.000)	0.002***	(0.002)	0.014***	(0.013)	0	(0.000)

Significance: *** = 1%; ** = 5%; * = 10%

Source: SHARE Waves 1 to 8, release 8.0.0; SHARE Corona (W1 & W2), release 8.0.0.

relationship between having undergone work interruptions during the first wave of the pandemic and the risk of falling into each of the three abovementioned categories, relative to being employed.

More specifically, having experienced work discontinuities is associated with an increase by a factor of 1.52 in the risk of being retired, by 3.49 in the risk of being unemployed, and by 2.23 in the risk of becoming a homemaker, relative to being employed, at the time of the second Corona survey. Furthermore, our analysis shows that also the length of such episodes was significantly and positively related to the probability of not being employed. The respondents who experienced work gaps of one to eight weeks had a relative risk of ending up unemployed that was 2.78 times higher than that of the respondents who had worked continuously since the start of the pandemic. Finally, individuals with work interruptions longer than eight weeks were significantly more likely to be retired, unemployed, or a homemaker at the time of the second interview (the relative risk was, respectively, 2.14, 4.3, and 3.6 times higher).

As for the other variables, we believe that gender and IT skills deserve particular attention. Being a woman was associated with a significantly higher probability of becoming a homemaker with respect to men. Indeed, for females, the risk of becoming a homemaker relative to being employed at the time of the second interview increased by a factor of about 10.36 compared to that for males.

IT capabilities proved to be an important determinant of unemployment status, while there was no significant relationship between IT capabilities and moving to retirement or becoming a homemaker. Having good or very good computer skills decreased the relative risk of becoming unemployed by a factor of 0.37 and 0.44, respectively.

As a robustness check, we run two additional logit regressions in which we estimate the probability of becoming unemployed by complementing the information on work discontinuities with the work interruptions between the two waves of the SHARE Corona survey. This provides us with a more complete picture of the respondents' working experiences since the start of the pandemic. The results, reported in Table 3, support all of our main findings from the multinomial logit, but the magnitude of the effects related to the experience and the length of work interruptions are considerably larger.

Table 3: Logit estimation results.

Variables	Logit (1)		Logit (2)	
	Odds ratio	**Standard error**	**Odds ratio**	**Standard error**
Work interruptions	**14.163*** **	(3.086)		
Weeks work interruption:				
No interruptions (0 weeks)				
Between 1–18 weeks			**8.870*** **	(2.281)
More than 18 weeks			**44.410*** **	(11.749)
Female	1.126	(0.239)	1.182	(0.266)
IT skills:				
Never used computer	ref			
Poor or fair	0.565	(0.174)	0.541	(0.179)
Good	**0.308*** **	(0.107)	**0.287*** **	(0.108)
Very good-excellent	**0.382* **	(0.142)	**0.402* **	(0.159)
Type of occupation:				
Private employee	ref			
Public employee	1.159	(0.260)	1.302	(0.311)
Self-employed	**0.511* **	(0.169)	**0.439* **	(0.154)
Age groups	√		√	
ISCO-08 majors (1 digit)	√		√	
Country cluster	√		√	
Constant	**0.007*** **	(0.006)	**0.006*** **	(0.006)

Significance: *** = 1%; * = 5%; * = 10%

Source: SHARE Waves 1 to 8, release 8.0.0; SHARE Corona (W1 & W2), release 8.0.0.

4 Conclusions

We study the impact of experiencing work interruptions in the first wave of the COVID-19 pandemic on the employment situation of older people in the second wave of the SHARE Corona survey (June-August 2021). We focus on individuals who reported working at the start of the pandemic, and who participated in both waves of the Corona survey. The analysis shows that discontinuities in the respondents' working activity are associated with a significant increase in their probability of being retired, unemployed, or a homemaker at a later point in time.

In addition, our results confirm and support the argument that women and less educated people represent more vulnerable categories. In particular, individuals with poor or no computer skills are found to be more likely to end up in unemployment, while women are shown to be more likely to become homemakers. Given the evidence from numerous studies that there is age discrimination in the recruitment process, our results raise concerns about the working lives of older workers. Indeed, these individuals might exit the labour market completely before they are eligible for retirement, and thus enter long-term unemployment while being excluded from other welfare support schemes (for example, as homemakers). Therefore, well-designed and well-targeted policy measures are needed to protect workers in at-risk occupations, reduce job losses, and support the training and/or re-employment of older workers.

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15 What is the future of (remote) work?

Key points

- Among the individuals who worked continuously since the start of the COVID-19 pandemic, around 22% of men and 30% of women were working remotely in both waves of the SHARE Corona survey.
- Only 10% of the workers in our sample were initially working remotely, and then moved back to their usual workplace.
- Remote work adoption varied depending on the technical feasibility of performing a job remotely.

1 Introduction

In this paper, we describe the evolution of remote working ("working from home") after the start of the COVID-19 pandemic by exploiting the panel dimension of the SHARE Corona survey. The first wave of this survey was mainly collected between June and the beginning of August 2020, whereas the second round was conducted in the same period in 2021. Combining the data drawn from the two waves, we can observe the remote working experiences of the respondents from the start of the pandemic until the interview in the second wave. The aim of our analysis is to understand whether the adoption of remote working among older workers was a short-term reaction to the start of the pandemic, or whether it continued over a longer time horizon, suggesting a persistent change in the organisation of work.

"Working from home" has been an important solution for mitigating the dramatic economic impact of the sanitary emergency created by the COVID-19 pandemic. Countries rapidly adopted measures to enable and/or facilitate this type of working arrangement, which allowed for the continuation of economic activity while reducing social contact, and, in turn, the risk of contagion. Once the shortage of personal protective equipment (PPE) had been overcome and the lockdown measures had been replaced by physical distancing measures more compatible with in-place work activities, remote work could be used as an option available to workers and firms to replace standard workplace organisation. Recently, an increasing number of studies have analysed various aspects of telework. On the

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one hand, remote working allows workers to eliminate commuting times as well as transportation costs, and to have more flexibility in the organisation of their activities within and outside the labour market. Firms that allow their employees to work remotely can reduce costs related to the maintenance and the utilisation of plants, buildings, and offices. On the other hand, individuals who work from home might be more exposed to stress and mental health problems (Bertoni et al., 2021, Sandoval-Reyes et al., 2021). Moreover, this working modality may be characterised by a lack of communication and of social interaction, which could lead to increased difficulties and lower efficiency in occupations for which teamwork is important (Sostero et al, 2020). Furthermore, firms that allow remote work face agency problems generated by the difficulties in supervising the efforts of employees who are not under the direct control of their supervisors. This may be why some companies, such as Goldman Sachs or Apple, have stepped back from full remote work, and have opted for hybrid models in which employees are required to spend some days working in the office.

2 Data

In our empirical analysis, we focus on individuals aged between 50 and 70 who worked continuously throughout the pandemic. We do this by selecting respondents who participated in both waves of the Corona survey, were employed or self-employed when the COVID-19 crisis started, and did not experience any interruption of their employment activity up to the time of the second wave. Our sample consists of 3940 individuals, 57% of whom were women. Their average age in 2021 was 61 for men and 59.8 for women.

This sample is clearly selected, as the COVID-19 crisis had a massive impact on the labour market and employment stability. Indeed, among the respondents aged 50–70 who were working at the start of the pandemic and were interviewed in both Wave 1 and Wave 2 of the survey, 17.73% reported in the first wave that they had become unemployed, been laid off, or had been forced to close their business at least temporarily due to the COVID-19 crisis. In the same sample, 10.67% of the respondents reported that they had experienced work interruptions between Wave 1 and Wave 2. Notably, 5.99% of respondents reported experiencing job interruptions both between the start of the pandemic and Wave 1 and between Wave 1 and Wave 2. As a result, the sample that will be used in our main analysis is likely not representative of the overall population of workers at the start of the pandemic. However, focusing on the respondents who were working continuously is necessary to analyse the evolution over time of the utilisation of telework, as it enables us to rule out the effects of the pandemic on job interruptions and job changes, which were potentially related to the feasibility of performing the job remotely and to the individuals' skills in coping with remote work.

The information collected in the two waves of the SHARE Corona survey allows us to monitor the dynamics of respondents' remote work patterns since the beginning of the pandemic. The main outcome of our analysis is a variable identifying four alternative patterns of remote work adoption: (i) working only at the usual workplace in both Wave 1 and Wave 2; (ii) working only at the usual workplace in Wave 1 and working remotely in Wave 2; (iii) working remotely in Wave 1 and working only at the usual workplace in Wave 2; and (iv) working remotely in both Wave 1 and Wave 2. For the sake of simplicity, in our analysis, the utilisation of remote work in a given wave indicates that individuals were either working from home only or were combining teleworking and working at the usual workplace.

3 Results

Overall, 41% of the individuals in our sample were working remotely since the beginning of the pandemic (conversely, 59% of workers were continuously performing their job at the usual workplace). However, we notice substantial heterogeneity in the timing of teleworking adoption and across countries. About 26% of respondents were working remotely in both waves. As shown in Figure 1, this percentage was higher in the Netherlands, Luxembourg, Belgium, and France; and was lower in Bulgaria, Cyprus, Latvia, and Spain. Around 10% of the respondents were working from home between the outbreak of the pandemic and the Wave 1 of the survey, but were working at the usual workplace between Wave 1 and Wave 2. This implies that for about one-fourth (10% over the sum of 26% and 10%) of the individuals who were teleworking at the beginning of the pandemic, this work arrangement was temporary, and was later discontinued. The share of respondents who switched from working remotely to working at the usual workplace might represent cases in which remote working was not found to be a successful work arrangement from the individuals' or the firms' perspective. Workers might prefer to work at the usual workplace in order to have a clearer distinction between their labour and non-labour market activities, or to enjoy social interactions with colleagues. Firms might prefer to have workers coming to the usual workplace in order to have direct control over their efforts. Finally, 5% of workers in the sample carried out their job at the usual workplace between the outbreak of the pandemic and Wave 1, but were teleworking between Wave 1 and Wave 2. Jobs that were performed at the usual workplace between the outbreak of the pandemic and Wave 1 were typically jobs in sectors deemed "essential" for economic activity, and were allowed by governments to keep their production process at the workplace. Alternatively, these jobs may not have been immediately convertible to a remote work setting due to their content and their degree of teleworkability (Sostero et al., 2020). However, it is worth noting that the time period between the two waves of the Corona surveys is about one year. The finding that around 8% (5% over the sum of 59% and 5%) of the individuals who continued to work in person at the start of the pandemic were able to switch to teleworking in such a limited time span is encouraging, as it demonstrates the potential solutions that future ICT (Information and Communications Technology) infrastructures can provide for the online organisation of work.

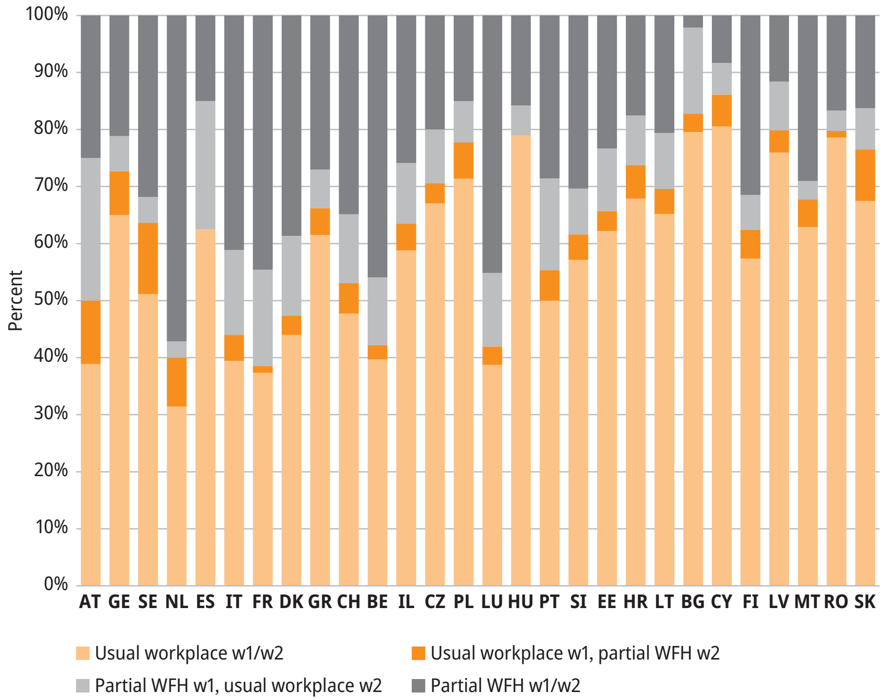

Figure 1: The dynamics of remote work utilisation among older workers.
Source: SHARE Corona (W1& W2), release 8.0.0.

It might be argued that gender-related differences were driving the dynamics of the adoption of teleworking, as women might have had a higher propensity to work from home than men in response to the need to reconcile their labour market activities and family responsibilities. For instance, teleworking may have helped women meet the need or the demand to provide informal care to older parents/relatives or to (grand)children at home due to school closures and quarantine restrictions. However, while the percentage of female workers who engaged in teleworking was large (45%), a sizeable share men worked remotely as well (36%). This cross-gender difference was largely explained by the differential in the probability of having worked remotely continuously since the beginning of the pandemic, which was 30% for women and 22% for men. Note that around one-fourth of women and one-third of men who were teleworking at the outbreak of the pandemic later transitioned back to the usual workplace. Finally, the percentage of individuals who switched to remote working between Wave 1 and Wave 2 was around 5% for both men and women.

As we argued above, we expect that the adoption of remote working also depends on job characteristics. If a job requires physical manipulations or in-person interactions among individuals, the probability of performing it remotely is clearly lower. Following Brugiavini et al. (2022), we exploit the ISCO-08 three-digit classification of occupations available in SHARE to describe job contents according to their level of teleworkability and required social interactions. The ISCO-08 classification allows us to match the jobs carried out by SHARE respondents with the detailed job descriptions collected by the Bureau of Labour Statistics O*NET survey data 2018. The first index we consider ranks jobs according to the technical feasibility of performing them remotely (teleworkability), and it reflects the importance of computer-based tasks in the job. This index ranges between zero and one, representing the lowest and the highest levels of teleworkability, respectively. The second index reflects the extent to which social interaction and physical contact are usually needed to carry out the job. This index captures heterogeneity across jobs related to the physical proximity and the intensity of interactions with other persons, such as colleagues and/or the public. We expect this dimension to be extremely relevant for explaining the adoption of remote working during the pandemic, as social interaction and in-person contact were risk factors driving the contagion (Lewandowski, 2020), particularly when vaccines were not available. However, even in "normal times", the greater the need for social interaction between individuals that characterises the job content, the lower the probability is that the job can be done remotely, or the more the quality of the output is affected when the job performed "at a distance". This index is defined to vary between zero and one, indicating the lowest and the highest levels of interactions required by the job, respectively. Brugiavini et al. (2022) described the construction of both indicators in detail.

Figure 2 reports the median levels of these two indicators in the nine job categories defined by the ISCO-08 majors (one-digit classification). The orange bars refer to teleworkability. Managers and clerical support workers carry out the jobs with the highest level of teleworkability. In these two groups, the median of the index is, respectively, equal to 0.97 and one. The degree of teleworkability of the job performed by professionals and technicians is lower, but is still substantial. In the remaining job categories, the median of the index is equal to zero. In all these occupations (for instance, plant and machine operators), the adoption of remote working clashes with job characteristics that prevent the job from being done online. When we look at the grey bars, we can see the heterogeneity across job categories in the level of social interaction required. The level is higher for service

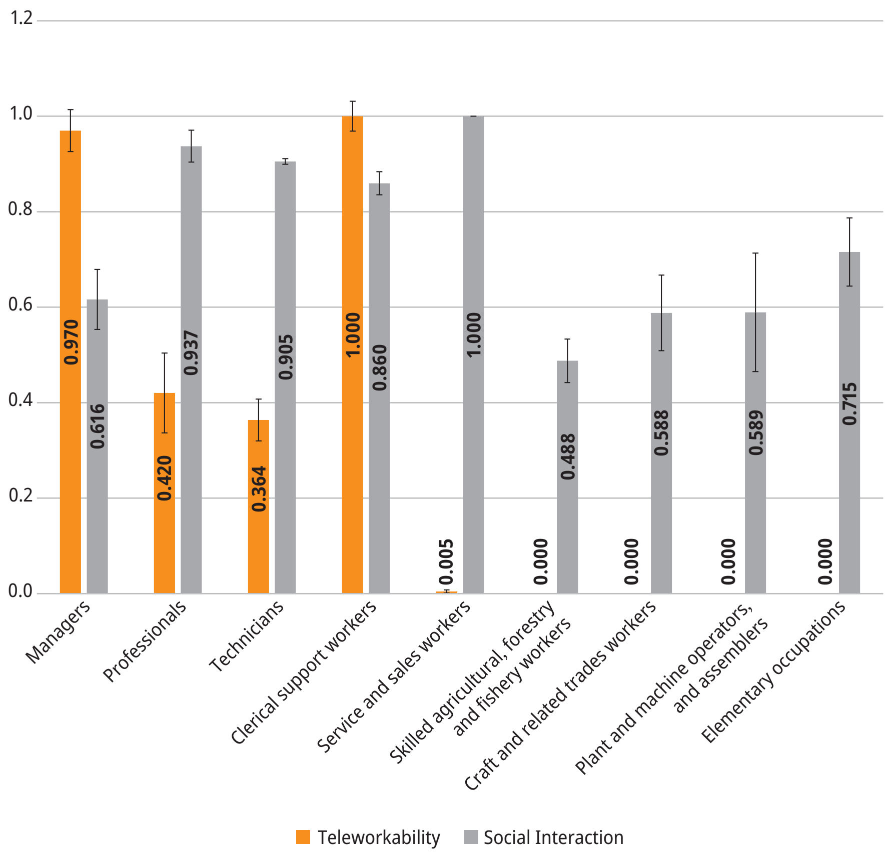

Figure 2: Remote work feasibility and social interaction at work indexes (median values) by occupation.
Note: Confidence intervals (95% level) in the graph are computed by running quantile regressions. Whenever confidence intervals are not shown, they turn out to collapse on the median point estimate due to limited sample variability.
Source: SHARE Waves 1 to 8, release 8.0.0; SHARE Corona (W1 & W2), release 8.0.0.

and sales workers, professionals, technicians, and clerical support workers; while it is lower for agricultural workers. Finally, it is worth noting that the differences in these two indicators across and within job groups clearly show that they are not redundant and capture different job dimensions. As an example, managers perform a job that is almost fully teleworkable, but the level of social interaction required is among the lowest, and is comparable to that for craftsmen and plant operators, whose jobs are difficult to perform online due to technical barriers. Moreover, within the category of clerical workers, there are jobs with a high level of both teleworkability and social interaction. The above considerations may help to partially explain the cross-gender differences in the adoption of remote working discussed above. A large share of women are involved in occupations in the public sector (clerks), which managed to quickly adapt to the pandemic conditions by adopting telework, in part because in most European countries these occupations were subject to some forms of remote work regulation even before the start of the pandemic. By contrast, jobs belonging to major 7-"Craft and related trade workers" or 8-"Plant and machine operators . . .", which have low levels of telework suitability and medium levels of social interaction, tend to be more male-dominated.

Figure 3 shows how the actual adoption of remote working in our sample varied across job groups identified by the ISC0-08 one-digit classification of occupations. If we look at professionals, we note that 33% of them continuously carried out their job at the usual workplace (this percentage was 59% in the overall sample), and 48% of them (versus 26% in the overall sample) continuously worked remotely since the beginning of the pandemic. Analogous patterns are found for managers, technicians, and clerical support workers. As shown in Figure 2, in all of these job categories, the technical feasibility of performing the work remotely is high, and, with the exception of managers, the level of social interaction required is also high. Finally, it should be noted that for these workers, the probability of working remotely at the start of the pandemic and then "coming back" to the usual workplace was always higher than the probability of experiencing the opposite pathway. This suggests some inertia in work organisation, and a preference of firms to restore the usual "in place" work arrangements. If we look at the other job categories (majors 5 to 9), we see that all are characterised by a very low suitability for teleworking, and that the great majority of individuals in these groups were continuously working at the usual workplace since the start of the pandemic. In particular, conditional on keeping on working, more than 89% of the craftsmen, plant, and machine operators, as well as the workers employed in elementary occupations, were always working at the usual workplace. When interpreting these results, it is important to keep in mind the nature of our selected sample. We are considering a sample of workers who did not experience any job interruptions, and the probability of stopping working at least temporarily since the start of the pandemic was relatively high for these job categories. For example, for majors 5 and 7 to 9, the percentage of individuals who experienced work interruptions up to the Corona Wave 1 interview was between 20–25%, compared to 10–17% for individuals in the first four one-digit ISCO-08 categories. This pattern is clearly attributable to these jobs lacking the conditions that would make it technically feasible to perform them remotely (Brugiavini et al., 2022). According to this descriptive evidence, the technical remote feasibility index is a strong predictor of the diffusion of remote working. Regardless of the level of social interaction a job requires, if the technical feasibility of performing the job online is negligible, the workers who do the job will not be able to telework.

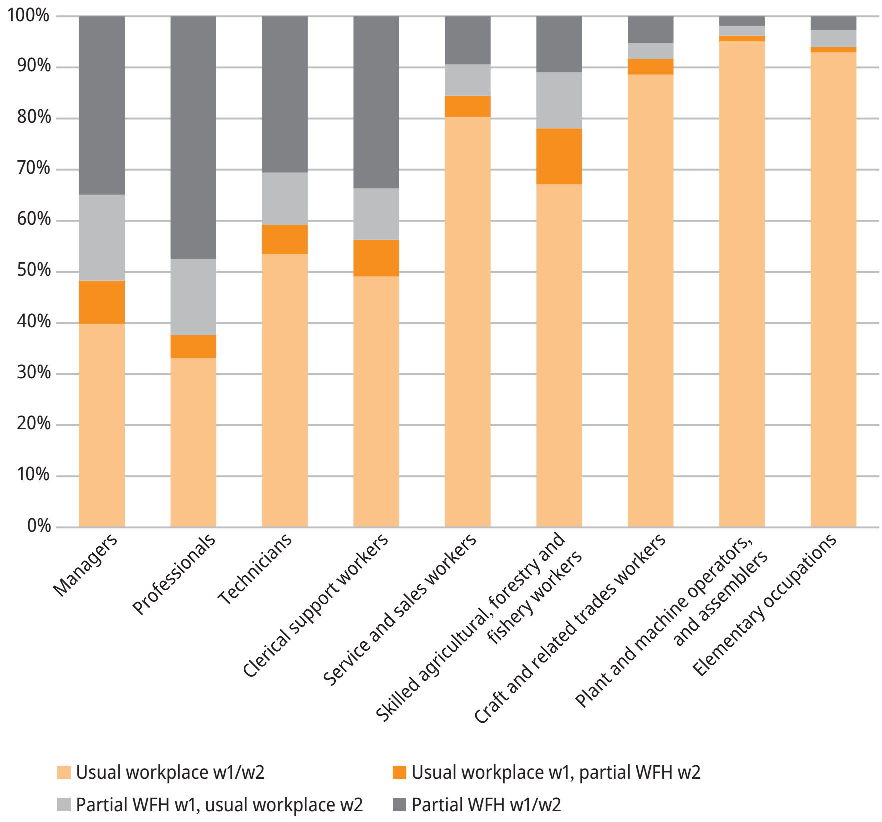

Figure 3: The dynamics of remote work utilisation among older workers by occupation.
Source: SHARE Waves 1 to 8, release 8.0.0; SHARE Corona (W1 & W2) release 8.0.0.

4 Conclusions

We combined data from the first two waves of the SHARE Corona Survey to analyse the dynamics of the diffusion of remote working arrangements among older workers. Around one-fourth of the workers in our sample worked remotely continuously since the beginning of the pandemic. This percentage varied somewhat by gender (30% for women and 22% for men). Moreover, this share hid the heterogeneity across occupations depending on the technical feasibility of performing the job remotely. Whereas the percentage of workers who were steadily adopting teleworking was found to be about 40% among managers, professionals, technicians, and clerical support workers; this share was at most 11% for less skilled occupations that are very difficult to perform remotely. Finally, it is worth noting that only 10% of workers in our sample were initially working remotely and then returned to the usual workplace. Our findings suggest that in occupations in which remote working was technically feasible, it was still being practiced by a sizeable share of workers more than one year after the start of the pandemic. Thus, it is difficult to classify remote working as a short-term arrangement dictated by the pandemic emergency. On the one hand, this calls for further research investigating the effects of the protracted utilisation of remote work on the labour and non-labour market outcomes of older workers. On the other hand, policy actions are needed to provide older workers with the necessary knowledge to deal successfully with this increasingly common working arrangement.

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16 Changes in work performance and work losses during the COVID-19 pandemic

Key points

- During the COVID-19 pandemic, the majority of people aged 50 years or older worked more or less “as usual”, despite the social distancing requirements.
- Among the people who experienced job modifications during the pandemic, the largest share experienced job vulnerability, including having shorter working hours and an increased risk of job loss; while a much smaller share lost their job at the beginning of the pandemic.
- Both individual and country characteristics were associated with different types of job modifications, including educational attainment, age, and household composition.
- People who experienced job modifications were more likely to receive financial support, while people who experienced job vulnerability or a job loss were at increased risk of reporting financial stress.

1 Introduction

The COVID-19 pandemic forced employers to engage in different labour practices. While organisational work practices were most affected by government policies and actions, including by recommendations that some types of workplaces close, they were also affected by access to and the promotion of vaccinations. In some occupations (i.e., the health care sector), working hours became longer, whereas in other occupations, shorter working hours were introduced. Some people also experienced work losses because they were furloughed, laid off, or faced a business closure (Alam, 2020; Brugiavini, Buia, and Simonetti, 2022). Over the course of the COVID-19 pandemic, employers’ labour practices often changed. For example, some people experienced a shortening of their working hours followed by a job loss, while others experienced a temporary job loss followed by a return to employment.

In this chapter, we aim to contribute to the understanding of the interplay of government policies and people’s employment paths and transitions to inactivity, while considering various types of job modifications and disruptions during the pandemic. Moreover, we seek to broaden the understanding of the labour supply of older workers during the COVID-19 pandemic (Dang and Viet Nguyen, 2021).

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Using data from the two waves of the SHARE Corona survey, we analysed the employment and labour market activity paths of Europeans aged 50 or older, and how these paths were affected by government policies related to workplace closures, but also by vaccination outcomes.

The analysis presented in the chapter was based on two analytical methods. First, we applied a two-step cluster analysis to identify groups of people with similar employment patterns in terms of the job modifications or disruptions they experienced during the COVID-19 pandemic. To the set of variables related to job changes, we applied principal component analysis in order to reduce the number of dimensions in the analysis. Then, using the predicted component variance, we performed a cluster analysis that allowed us to identify distinct groups of workers aged 50+ based on their labour market experiences during the COVID-19 pandemic. Second, we used multinominal logistic regression to identify the individual and the country characteristics that were associated with being assigned to each of the selected groups.

2 How did the employment and work patterns of people 50+ change during the COVID-19 pandemic?

Using the results from the SHARE Corona survey 2, we performed a cluster analysis to group SHARE respondents according to their employment patterns during the pandemic.

For the principal component analysis, we used the following job-related experiences during the pandemic:[1]

- Unemployed, laid off, or experienced a business closure since the last interview in July 2020;
- Weeks of being unemployed, laid off, or without work due to a business closure;
- Worked from home since the last interview;
- Worked at the usual workplace since the last interview;
- Worked elsewhere, at a different workplace since the last interview;
- Worked shorter hours since the last interview;
- Worked longer hours since the last interview.

1 These variables were selected following the Kaiser-Meyer-Olkin measure of sampling adequacy.

The analysis led to the selection of the first five components, which explained almost 97% of the observed variance. Using the predicted component values, we performed a cluster analysis that identified four clusters, as shown in Table 1. As we can see, around 30% of respondents experienced various types of job modifications or job losses during the COVID-19 pandemic.

Table 1: Clusters of people working before the pandemic, according to their employment experiences during the pandemic.

Cluster	Description	Share of respondents
Cluster 1	People who continued their employment as usual, mainly working at their usual workplace with unchanged working hours.	70.1%
Cluster 2	People whose employment was at risk during the pandemic, as they worked shorter hours with a high risk of job loss.	17.3%
Cluster 3	People who worked mainly from home, and frequently worked longer working hours.	8.1%
Cluster 5	People who lost their job during the pandemic, with some of them retiring.	3.4%

Source: SHARE Corona (W2), release 8.0.0.

The distribution of job-related experiences according to the identified clusters is presented in Table 2. We can observe that in all clusters, a majority of people reported that they were working at the usual workplace. The share of respondents who indicated that they were working from home was smaller, but was still large in all of the clusters. Working from home more frequently was associated with having longer working hours. Working shorter hours was linked to a higher risk of job loss, as cluster 2 shows.

The composition of the clusters varied across countries, as shown in Figure 1. In all countries, cluster 1 was the largest, with the share of respondents belonging to this cluster ranging from 49% in Portugal to 88% in Romania. In general, we observed that it was by far the largest cluster in many of the Central and Eastern European countries. The share of respondents belonging to the vulnerable cluster 2 was largest in Portugal and Austria (31% and 30%, respectively). The share of respondents belonging to cluster 3 was largest in the Netherlands (22%).

Table 2: Job-related experiences by identified clusters.

	unemployed, laid off, or business closed	retired after the COVID-19 outbreak	worked from home	worked at the usual workplace	worked elsewhere, at a different workplace	worked shorter hours	worked longer hours
Cluster 1: worked mainly at the usual workplace and with unchanged working hours	10.1	0.0	27.2	85.0	2.4	0.0	0.0
Cluster 2: vulnerable job with a risk of job loss, shorter working hours	37.3	0.0	29.8	69.8	5.5	65.5	9.0
Cluster 3: worked longer and frequently from home	8.1	0.0	38.5	80.3	4.1	0.0	99.1
Cluster 4: lost job after the COVID-19 outbreak, with some transitioning to retirement	29.6	15.4	0.0	0.0	0.0	0.0	0.0

Source: SHARE Corona (W2), release 8.0.0.

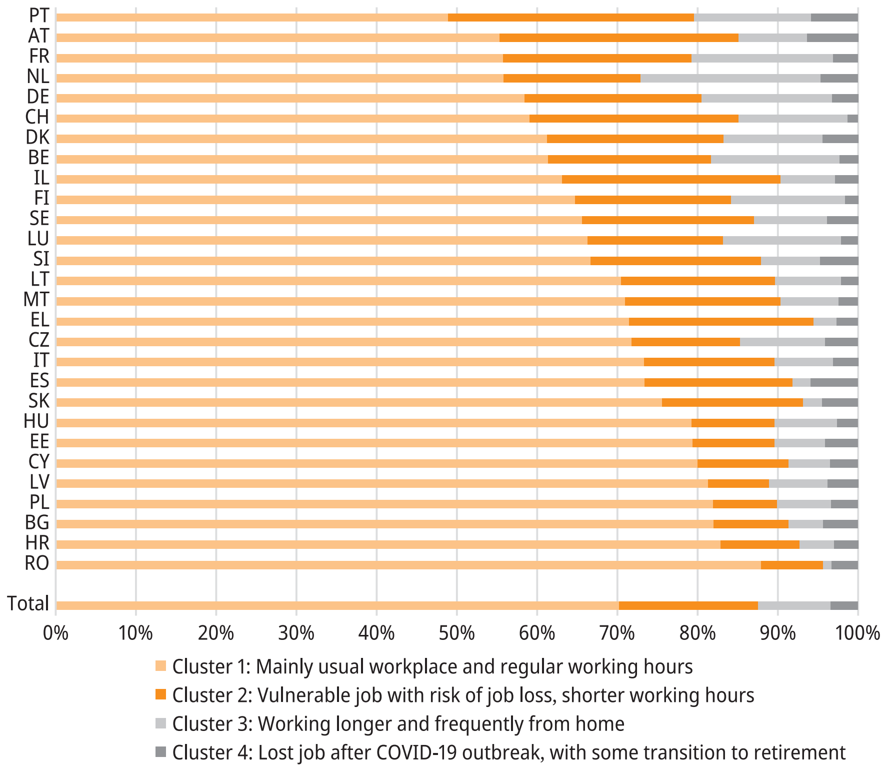

Figure 1: Composition of clusters by country.
Source: SHARE Corona (W2), release 8.0.0.

3 How different job experiences were associated with individual or country characteristics

To determine which individual and country characteristics were associated with the identified clusters, we performed a series of multinominal logit models. In the models, we used individual and household characteristics as explanatory variables, including sex, educational attainment, age group, household size, being vaccinated, facing difficulties making ends meet, and receiving financial support; and, in a separate model, we included variables related to employment histories collected in the SHARE-LIFE questionnaire that measured intensity of employment until age 50 based on sequence analysis (Chłoń-Domińczak and Strzelecki, 2022).

In the second set of models, we added country characteristics, including the mean stringency index; the mean number of infections; the change in the employment rate from the first quarter of 2020 to the second quarter of 2020 and 2021, respectively; the change in GDP over the same periods; and the Human Development Index (HDI) in 2019, used as a proxy for the socio-economic development of the country (Chłoń-Domińczak and Holzer-Żelażewska, 2022).

The results of the models indicate which variables were statistically significant in explaining the assignment to the selected clusters, with cluster 1 (worked as usual) used as a reference.

4 How were individual and country characteristics associated with the identified types of work patterns during the pandemic?

The models uncovered statistically significant associations between selected individual characteristics and specific types of job disruptions. The results of the model are presented in Table 3 at the end of the chapter. People with tertiary education were more likely to be in cluster 3, which means that they were more likely to be in a job that required longer working hours and could be performed remotely. They were also less likely to be in clusters 2 and 4, which included people who experienced job vulnerability or who lost work during the pandemic. These results suggest that having higher skills, as reflected by educational attainment, protected people against employment vulnerability during the pandemic, but it also increased their risk of working longer hours.

The likelihood of being assigned to a given cluster also varied significantly by age. Compared to respondents aged 65–69, workers aged 55–59 were less likely to be in cluster 2 and workers aged 50–59 were less likely to be in cluster 4, while people aged 70–74 were more likely to be in cluster 2. Thus, the results of the estimated models showed that workers in the older age groups (aged 65 or older) were more vulnerable, as they were at higher risk of losing a job or transitioning to retirement.

Respondents who were single were more likely (albeit not in all models) to be in either cluster 3 (working longer hours and working from home) or cluster 4 (job loss). People who were living in a larger household (but only in the model with individual characteristics, including labour market history) were less likely to be in clusters 2 and 3, which may indicate that they were trying to work “as usual”.

Finally, compared to respondents who worked mainly at their usual workplace, people who were vaccinated were less likely to be in clusters 2 or 3. This may indicate that working at the usual workplace was an incentive to be vaccinated during the pandemic.

As we would expect, people who were assigned to cluster 2 (vulnerable job) or cluster 4 (job loss) were more likely to receive financial support than people who were working as usual. Respondents who were assigned to cluster 3 had a higher probability of receiving such support. This means that experiencing modifications to the way work was performed, not only a job loss, led to workers receiving some form of financial support during the pandemic. At the same time, only respondents in cluster 2 and cluster 4 were more likely to report having difficulties making ends meet.

Contrary to expectations, previous job intensity did not have a significant impact on the risk of experiencing job modifications. Only the respondents with the shortest working lives were more likely to be in cluster 3.

Interestingly, the chances of being assigned to a given cluster did not vary significantly by sex in most cases. Women were more likely to be represented in cluster 2 in only one model (with individual and country characteristics as explanatory variables).

5 How were work patterns during the pandemic related to the stringency of government policies, economic and social development levels, labour market conditions, and economic changes during the pandemic?

In our models, we also considered country characteristics, such as medium-term economic changes (GDP, employment rate), as well as country development levels based on the Human Development Index. We also controlled for COVID-19 severity (mean number of infections, mean number of COVID-19 deaths), as well as for the stringency of government policies, as measured by the mean stringency index.

The higher a country's Human Development Index was, the more likely the people in that country were to experience different types of job modifications (compared to working as usual). However, after controlling for the employment histories, the assignment to the job loss cluster 4 was not statistically dependent on the HDI.

In countries with a higher mean number of infections, people were more likely to be assigned to the vulnerable cluster 3 (however, the estimated regression coefficients were small). In countries with more stringent policies, people were more likely to be assigned to cluster 2 (vulnerable job), but also to cluster 3 (working from home and longer hours).

Last but not least, we also included variables related to labour market and GDP developments in the second quarter of 2020 (after the COVID-19 outbreak) and in the second quarter of 2021 (when the SHARE Corona survey 2 was conducted). The initial drop in the employment rate was associated with a higher risk of job loss (which is intuitive). However, later in the pandemic, the sign of this relationship changed, while remaining statistically significant.

The results of the regressions for GDP development were also interesting. An initial decline in GDP, after controlling for other individual and country characteristics, was not significantly associated with different types of job modifications. A further decline in GDP (that is, from the COVID-19 outbreak until the time of the survey) was associated with higher chances of belonging to cluster 2 and cluster 4.

6 Conclusions

Multi-dimensional analysis of job modifications during the COVID-19 pandemic indicated that despite the restrictions that were imposed, the majority of workers aged 50 years or older remained at their usual workplace, and their working hours were unchanged. In the Central and Eastern European countries, the share of workers in this group was particularly large; while in Portugal and the Continental European countries, the share of workers whose job pattern was modified was larger.

The results of the cluster analysis showed that an eventual job loss was often preceded by a shortening of working hours, while more frequent remote work was often coupled with having longer working hours. In addition, we observed that having higher education and higher skills made workers less vulnerable to COVID-19-related labour market disruptions.

It appears that the COVID-19 pandemic made prolonging working life more difficult, as workers in the older age groups (aged 65 or older) were more likely to experience job vulnerability or to lose their job.

In addition, we found that country characteristics mattered during the COVID-19 pandemic. People living in less developed countries, as measured by Human Development Index, tended to experience fewer job modifications. Thus, the shares of people in these countries who continued to work in their usual workplace with un-

Table 3: Multinominal logistic regressions results – selection to identified clusters (ref: cluster 1).

VARIABLES	Model 1: Individual characteristics			Model 2: Individual characteristics + employment history			Model 3: Individual characteristics + country characteristics			Model 4: Individual characteristics + employment history + country characteristics		
	Cluster 2	Cluster 3	Cluster 4	Cluster 2	Cluster 3	Cluster 4	Cluster 2	Cluster 3	Cluster 4	Cluster 2	Cluster 3	Cluster 4
Sex (ref. male) female	0.0911	0.0889	0.0804	0.0229	−0.0202	0.227	0.134*	0.137	−0.0375	0.101	0.0651	0.0891
Education (ref. secondary)												
primary	0.143	−0.120	0.00733	0.0982	−0.188	−0.186	0.0910	−0.118	0.148	0.0859	−0.139	−0.0952
tertiary	−0.122	0.435***	−0.395**	−0.203**	0.352***	−0.464**	−0.144*	0.421***	−0.370**	−0.201**	0.356***	−0.495**
Age group (ref. 65–69)												
50–54	−0.333	0.182	−1.088**	−0.238	0.202	−1.015**	−0.268	0.210	−1.127**	−0.133	0.246	−1.047**
55–59	−0.264**	0.212	−0.887***	−0.141	0.278	−0.935***	−0.256*	0.132	−0.905***	−0.116	0.195	−0.923***
60–64	−0.0860	0.282	−0.244	0.0527	0.280	−0.188	−0.150	0.172	−0.313	0.00300	0.161	−0.194
70–74	0.350*	0.226	0.335	0.460**	0.212	0.199	0.460**	0.398	0.144	0.509**	0.294	−0.0450
75 and over	0.644**	−1.693*	−0.361	0.555*	−1.594	−0.234	0.503	−1.621	−0.461	0.456	−1.541	−0.282
Marital status (ref. couple)												
Single	0.0118	0.162	0.291*	0.0918	0.221*	0.304	−0.00219	0.189	0.323*	0.0764	0.239*	0.368*

(continued)

Table 3 (continued)

VARIABLES	Model 1: Individual characteristics			Model 2: Individual characteristics + employment history			Model 3: Individual characteristics + country characteristics			Model 4: Individual characteristics + employment history + country characteristics		
	Cluster 2	Cluster 3	Cluster 4	Cluster 2	Cluster 3	Cluster 4	Cluster 2	Cluster 3	Cluster 4	Cluster 2	Cluster 3	Cluster 4
Medical condition (3 or more)	−0.135	−0.184	−0.271	−0.201**	−0.230*	−0.132	−0.0523	−0.104	−0.198	−0.118	−0.139	−0.0754
Difficulties making ends meet	0.513***	−0.235*	1.522***	0.523***	−0.0734	1.615***	0.710***	−0.0286	1.750***	0.722***	0.110	1.761***
Financial support	1.360***	0.682***	0.838***	1.267***	0.808***	0.704***	1.311***	0.657***	0.935***	1.193***	0.778***	0.799***
Vaccination	−0.0778***	−0.152***	0.000620	−0.0903***	−0.178***	−0.0380	−0.0412	−0.101***	0.0132	−0.0502*	−0.126***	−0.0233
Employment (ref. cluster 1)												
cluster 2				0.242	−0.0223	−0.934**				0.135	−0.0628	−0.995**
cluster 3				0.313*	−0.0825	−0.523				0.271	−0.0956	−0.519
cluster 4				−0.138	−0.220	0.471				−0.118	−0.278	0.632
cluster 5				−0.0493	0.283**	0.258				−0.0637	0.286**	0.195
HDI							8.947***	11.00***	5.371*	8.323***	11.30***	0.756

Mean stringency							0.0125**	0.0269***	−0.0105	0.0170**	0.0231**	0.00856
Mean number of infections							4.03e-05**	5.17e-05**	3.97e-05	6.81e-05**	4.87e-05	7.74e-05
Employment rate change 2020:Q2							−0.0767	0.110	−0.174*	−0.0855	0.153*	−0.252**
Employment rate change 2021:Q2							0.0593	0.0513	0.152**	0.0458	−0.00102	0.181**
GDP change 2020:Q2							−0.0142	0.0304	0.0275	−0.0127	0.0216	0.0552
GDP change 2021:Q2							−0.0670***	0.00873	−0.0624*	−0.0562***	0.0277	−0.00971
Mean number of COVID deaths										−0.00143	−0.00158	−0.00336
Constant	−1.496***	−2.260***	−3.170***	−1.996***	−2.293***	−2.591***	−9.896***	−13.74***	−7.122**	−10.02***	−13.68***	−3.865
Observations	5,304	5,304	5,304	4,510	4,510	4,510	5,136	5,136	5,136	4,378	4,378	4,378

Standard errors in parentheses
***p < 0.01, **p < 0.05, *p<0.1
Source: SHARE Corona (W2), release 8.0.0.

changed hours were large. In the more developed countries, by contrast, the shares of people who had a vulnerable job (shorter hours, risk of job loss), or who were working from home and working longer hours during the pandemic, were larger.

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Nikolaos Theodoropoulos and Georgios Voucharas

17 Containment measures and job loss: Evidence from SHARE CORONA surveys

Key points

- We investigate the short- and medium-term effects on the job loss rate of COVID-19 containment measures imposed by governments during the pandemic.
- The impact of containment measures on the job loss rate was significant at the beginning of the pandemic, but later disappeared.
- There was significant cross-country heterogeneity in the job loss rate and in the severity of the containment measures that were imposed.
- Vulnerable people, such as those who were lower educated, were older, or had health problems, were more likely to have lost their job during the pandemic.

1 Introduction

After the start of the COVID-19 pandemic, governments imposed various measures intended to mitigate and control the spread of the virus. Lockdown and quarantine measures, such as school and workplace closures, travel bans, social distancing mandates, and movement restrictions, had one main objective: "flattening the curve". However, the imposition of these measures had severe socio-economic implications, including for the labour market, as these policies led to extensive job losses.

How did the imposition of COVID-19 containment measures affect employment? The existing literature has suggested that stricter government policies were associated with higher rates of job loss. For instance, Ang and Dong (2022) showed that the imposition by governments of containment interventions during the pandemic led to higher unemployment rates in a sample of 59 countries. Similarly, Jiskrova et al. (2021) using the first wave of the SHARE Corona data, found evidence of a positive relationship between job loss rates and stringent government policies.

The previous literature that focused on the first wave of the pandemic captured short-term labour market shocks. However, as more recent COVID data has become available, it is crucial to explore how containment measures shaped the labour market over time. As the pandemic continues to evolve globally, analysing any potential differences between the short-term and the medium-term impact of

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containment policies on the labour market could improve our understanding of the current employment situation, and lead to more effective decision-making. This chapter addresses this research gap.

2 Data

We utilise two SHARE Corona survey datasets, and focus on 27 European countries and Israel. Part of the analysis is based on preliminary SHARE Wave 9 COVID-19 Survey release 0. Thus, the results and conclusions of the analysis are preliminary. We restrict our study sample to individuals who were actively engaged in the labour market and were 65 years old or younger at the time of the survey. Specifically, our sample is comprised of all adult respondents who stated that they were "employed or self-employed when COVID-19 broke out" in the first Corona survey.

The dependent variable *Jobloss* is equal to one if the respondent answered that s/he was unemployed, s/he was laid off, or her/his business was closed due to the pandemic; and is equal to zero otherwise. Our main control variable is the strictness of containment measures, as captured by the *stringency index,* a well-established measure based on information collected by the Oxford Coronavirus Government Response Tracker (OxCGRT) project (see Hale et al., 2021). Higher values of the index correspond to stricter policies. The index is calculated daily by aggregating governments' responses to the pandemic, including school and workplace closures, cancellations of and restrictions on public events and gatherings, stay-at-home requirements, closures of public transport, travel and movement restrictions, and public information campaigns. We follow Bassoli et al. (2021), and construct a country-specific and an individual-specific cumulative measure of the stringency index. Thus, for every single country and individual in our sample, we sum up the daily index from 1 January 2020 until each interview date. Then, we divide this index by the total number of days elapsed between the start of the pandemic and the corresponding interview date.

The other control variables we use include two dummies capturing individual age (56–60, 61–65, omitted category: 49–55), a female dummy, a partner dummy (irrespective of marital status), two dummy variables capturing educational level (secondary, tertiary education, omitted category: primary education), four dummy variables capturing the subjective assessment of the individual's health condition (poor, fair, good, very good, omitted category: excellent), a dummy for low household income (low income is equal to one if the respondent's household income is below his/her country-specific median household income, is equal to zero otherwise). The variables are drawn from the SHARE Corona surveys, as well as from the main SHARE Waves 7 and 8.

We report descriptive statistics for the variables of interest in Table 1. We show that 15% of the respondents reported losing their job during the two SHARE Corona waves. The country with the highest job loss rate was Spain (26.6%), while the country with the lowest job loss rate was the Netherlands (2.1%). The mean value of the stringency index was 53.92. The country with highest stringency index was Italy (64.92), and the country with the lowest stringency index was Estonia (38.06). These differences suggest that there was considerable cross-country variation in both the labour market outcomes and the COVID-19 containment measures that governments imposed. The sample was split equally by gender. Most of the respondents in our sample were in the 55 to 60 age group, 76% were living with a partner, 46% were living in a low-income household, 12% had tertiary education, and 70% reported being in very good or good health.

Table 1: Descriptive statistics.

Variable	Mean	SD	Min	Max
Job loss	0.15	0.36	0	1
Stringency index	53.92	8.07	35.37	69.07
Female	0.49	0.50	0	1
Age 55–60	0.68	0.47	0	1
Age 60–65	0.21	0.40	0	1
Partner	0.76	0.42	0	1
Low income	0.46	0.50	0	1
Secondary	0.19	0.40	0	1
Tertiary	0.12	0.33	0	1
Health (very good)	0.18	0.38	0	1
Health (good)	0.52	0.50	0	1
Health (fair)	0.22	0.41	0	1
Health (poor)	0.04	0.21	0	1

Notes: Means are weighted using individual-level weights.
Source: SHARE Wave 7, release 7.1.1, SHARE Wave 8 and SHARE Corona (W1 & W2), release 8.0.0.

Panels A and B of Figure 1 provide two scatterplots with the average rate of job loss on the vertical axis, and with the average stringency index on the horizontal axis. Panel A shows that there was a strong and positive correlation in the first Corona wave, suggesting that stricter government policies were associated with higher job losses. However, Panel B shows that in the second Corona wave, the relationship between the job loss rate and the stringency index was flat.

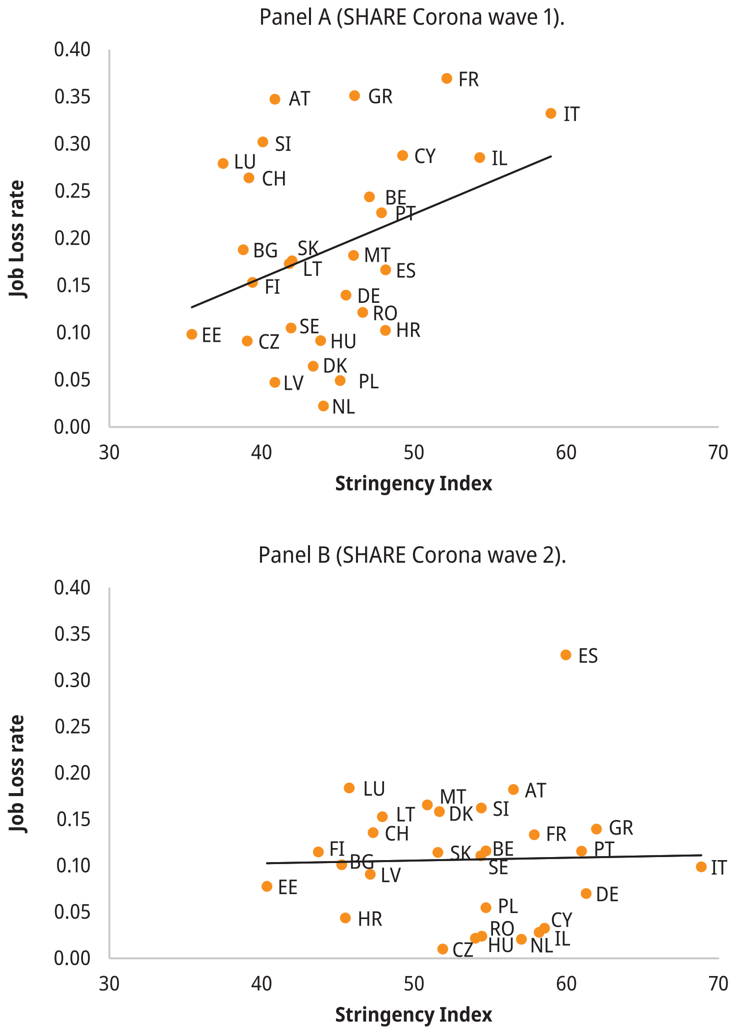

Figure 1: Job loss and stringency index (weighted data).
Source: SHARE Corona (W1 & W2), release 8.0.0 and Oxford Coronavirus Government Response Tracker (OxCGRT) data.

3 Results

Table 2 reports the average marginal effects obtained from probit models. It shows that stricter stringency measures were positively associated with the job loss rate. For instance, in column one, we can see that a one-percentage-point increase in the stringency index significantly increased the probability of experiencing a job loss, by 1.21 percentage points. However, the coefficient of the stringency index in column 3 (pooled waves) was 51.2% lower than that in column 1 (first wave). This is because the coefficient of the stringency index in column 2 (second wave) was positive but statistically insignificant, which suggests that the stringency index had a short-run effect on the job loss rate. The coefficient of the stringency index on the job loss rate persisted even after the inclusion of country fixed effects (column 4), despite potential multicollinearity issues between the stringency index and some of the country dummies. When we look at the rest of the explanatory variables while focusing on both waves, we find that older people, people with lower education, and people with health difficulties were more likely to have lost their job. The latter finding was mainly driven by data from Wave 2, which indicated that the job loss rate was associated with all categories capturing individuals' health conditions. Hence, even individuals with very good health were more likely than to those with excellent health to have reported losing their job. In contrast to the rest of the literature, we do not find that women were more likely than men to have experienced a job loss.

Table 2: Average marginal effects.

Dep. Var: Job loss	(1) Wave 1	(2) Wave 2	(3) Pooled	(4) Pooled + Country dummies
Stringency index	0.0121*** (0.0016)	0.0008 (0.0018)	0.0059*** (0.0014)	0.0064* (0.0033)
Age 55–60	0.0461 (0.0335)	0.0432 (0.0417)	0.0462 (0.0305)	0.0315 (0.0255)
Age 61–65	0.0754** (0.0344)	0.0427 (0.0365)	0.0524** (0.0263)	0.0361 (0.0237)
Female	0.0060 (0.0185)	−0.0259 (0.0244)	−0.0161 (0.0182)	−0.0199 (0.0168)
Partner	−0.0390* (0.0227)	0.0170 (0.0205)	−0.0083 (0.0152)	−0.0096 (0.0145)

Table 2 (continued)

Dep. Var: Job loss	**(1) Wave 1**	**(2) Wave 2**	**(3) Pooled**	**(4) Pooled + Country dummies**
Low-income	0.0581*** (0.0197)	0.0156 (0.0283)	0.0353 (0.0217)	0.0286 (0.0175)
Secondary	−0.0064 (0.0214)	−0.0509*** (0.0187)	−0.0258* (0.0144)	−0.0054 (0.0179)
Tertiary	−0.0717** (0.0280)	0.0993 (0.0751)	0.0509 (0.0664)	0.0387 (0.0535)
Health – very good	0.0050 (0.0428)	0.1110*** (0.0405)	0.0408 (0.0298)	0.0466* (0.0278)
Health – good	0.0026 (0.0402)	0.1014** (0.0465)	0.0360 (0.0310)	0.0457* (0.0270)
Health – fair	0.0178 (0.0423)	0.1269*** (0.0419)	0.0543* (0.0301)	0.0776*** (0.0285)
Health – poor	−0.0477 (0.0578)	0.1499*** (0.0537)	0.0497 (0.0429)	0.0714* (0.0414)
Wave 2			−0.1633*** (0.0200)	−0.1697*** (0.0388)
Country fixed effects	No	No	No	Yes
Observations	8,683	7,778	16,461	16,461

Notes: The estimation method is a probit model. Entries in cells are average marginal effects, while entries in parentheses are the associated robust standard errors. Estimates are weighted using individual-level weights. The omitted country in column (4) is Austria. Robust standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.1.
Source: SHARE Corona (W1 & W2), release 8.0.0.

4 Conclusions

In this chapter, we examined the effects on the job loss rate of the stringency of the measures countries imposed to fight the spread of COVID-19. We updated the literature by using two waves of the SHARE Corona surveys. We found that stricter government policies were associated with a higher job loss rate. However, it appears that this association was only temporary, as it was observed in the first SHARE Corona survey only. Our finding that the effect of containment measures on the job loss rate was short-lived suggests that the labour market adjusted after the first wave of the pandemic. This may have occurred because governments were providing financial support to businesses; vaccines were becoming widely available; and the adoption of various alternative working arrangements, such as working from home, were making it easier for people to remain employed.

We also found significant cross-country heterogeneity in these patterns, which suggests that different countries imposed different policies to limit the spread of the virus, and that this variation had implications for which workers were the most likely to be affected. People who generally faced disadvantages in the labour market, such as those who were older, were lower educated, or had health difficulties, were more likely than others to have lost their job during the pandemic. This result can be seen as problematic, as the individuals in these groups who lost their employment during the pandemic may be less likely to find a new job over the medium term.

In future work, we aim to model possible non-linear effects of the stringency index on the job loss rate. We also intend to examine how containment measures have affected the intensive margin of the labour supply (working hours), as well as how containment measures have affected different working arrangements, such as remote work.

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Francesco Principe and Guglielmo Weber

18 Internet use during the pandemic

Key points
- We analyse whether and, if so, how the COVID-19 pandemic affected the digital activities of Europeans aged 65+.
- The frequency of individuals' online activities increased during the pandemic.
- The use of the internet to search for health-related information and to purchase goods and services increased more than other types of online activities.

1 Introduction

The COVID-19 outbreak changed several aspects of our everyday lives. During the widespread lockdowns, the internet came to play a crucial role, as many activities that used to be carried out in person had to be moved online, including working, shopping, accessing services, and talking to family and friends.

While information technology helped to mitigate the negative consequences of the outbreak for the general population; for the elderly population, the use of the internet represented a challenge. According to data from Eurostat (2021), internet use is less popular among the older than the younger generations: before the COVID-19 outbreak, 98% of individuals aged 16–24 used the internet, compared to 61% of individuals aged 65–74. However, this figure varied across the EU member states. The countries with the highest shares of individuals aged 65–74 using the internet were Denmark (94%), followed by Luxemburg and Sweden (91%); while the countries with the lowest shares of individuals aged 65–74 using the internet were Bulgaria (25%) and Croatia (28%).

There are at least two main reasons for these geographical and generational disparities in internet use. First, there are important differences in the main types of production across European regions. The North-South digital divide in Europe is partly due to the greater weight of personal and leisure services in the Mediterranean economies, compared to the more technologically oriented industrial activities of, for example, the Nordic countries. Second, the level of IT training of the older workforce depends on the institutional setting in terms of the retirement age. The existence of financially advantageous early retirement schemes in countries like Italy and France has reduced the incentives for employers to train older work-

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ers (Hairault et al. 2010). The IT skills of older individuals reflect both their computer use prior to retirement and the geographical digital divide (Friemel 2016, Berkowsky et al. 2018). A comprehensive review of this literature is provided in Hunsaker and Hargitta (2018).

In this chapter, we analyse whether and, if so, how the COVID-19 pandemic affected the digital activities of Europeans aged 65+, who are arguably the demographic group least familiar with the internet.

2 Data and variables of interest

We use data on individuals aged 65+ who took part in both SHARE COVID-19 surveys in June–July 2020 and May-July 2021. We combine data from these COVID-specific waves with information from previous SHARE waves on the respondents' socio-demographic characteristics, health-related information, and employment histories. Our main variables of interest are the frequency of internet use since the start of the pandemic for the following online activities: (i) finding information on health-related issues; (ii) getting information about government services, (iii) managing finances, and (iv) buying/selling goods and/or services.

Figure 1 shows the frequency of responses for the four abovementioned categories. The omitted category is "never used". For instance, around 75% of respondents reported that they used the internet to gather health information, while the remaining 25% said that they never used the internet for this purpose. Among the respondents who indicated that they used the internet, roughly 25% said they used it more often, 10% said they used it less often, and the remaining share said they used it about as often as they did before the outbreak. Larger shares of respondents reported using the internet for health information and for home banking than for government services and the purchase/sale of goods and services.

When we look at changes in internet use, we see that the use of the internet to search for health information and to purchase goods and services increased more than it did for other types of online activities. These results might be attributable to the pandemic itself, or to the implementation of lockdowns and other measures to reduce personal contacts that induced people to stay home more. Note that the data we use refer to a period well before the availability of COVID-19 vaccines.

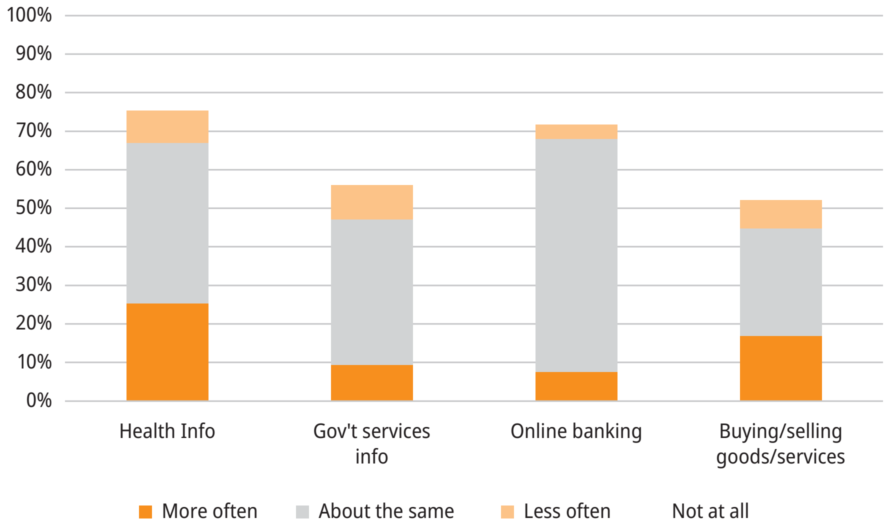

Figure 1: Frequency of internet use by task.
Source: SHARE Corona (W1), release 8.0.0.

3 Empirical specification and results

We use a linear probability model to estimate the association between the use of the internet since the start of the pandemic and a number of individual and household characteristics. In doing so, we distinguish between four groups of covariates: socio-economic characteristics; employment status; health and personality traits; and dummies to proxy the subjective COVID-19 experiences of the respondents: namely, whether someone in the respondents' social network died or was hospitalised due to a COVID-19 infection.

Figure 2 shows the estimates (and their 95% confidence intervals). The dependent variable takes a value of one if the respondent had used the internet since the outbreak, and a value of zero otherwise. The top of the panel shows that women were less likely than men to use the internet. While income and education were among the most important variables explaining online behaviours, individuals living in larger households were less likely to use the internet, possibly because of information sharing among household members. To examine the role of employment status, we use dummy variables for the respondents' type of occupation based on their current job or the last job they held before retirement.[1] Individuals who had worked in high-skilled white-collar jobs were more likely to use the internet. Notably, having held a job requiring PC skills before the outbreak was the largest predictor in terms of magnitude. Concerning health status and personality traits, Figure 2 shows that there was a negative association between self-reported health status (SRHS, with a value of one denoting excellent health, and a value of five denoting poor health) and internet use; while among the Big 5 personality traits, agreeableness and openness had a statistically significant association with the outcome.

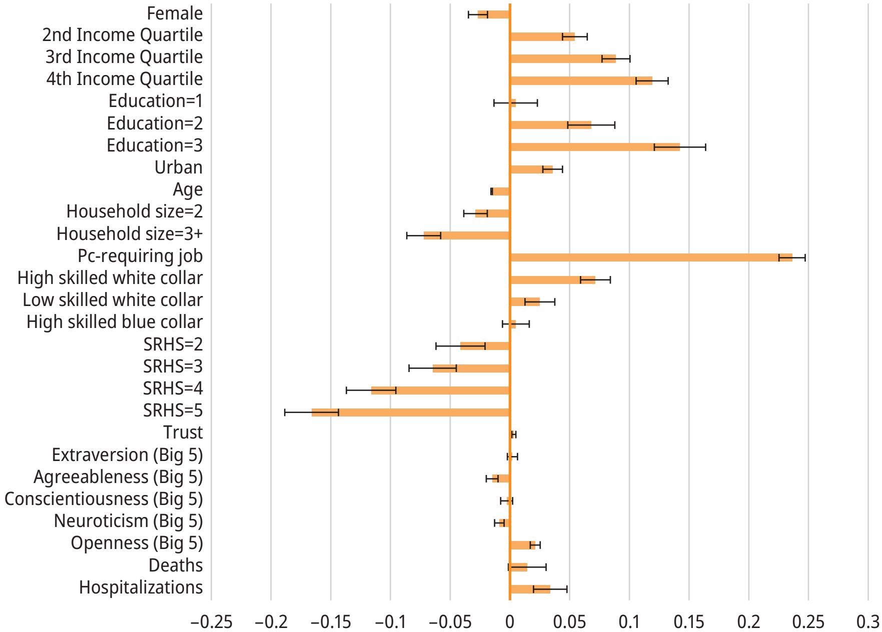

Figure 2: Linear probability model for internet use.
Source: SHARE Corona (W1), release 8.0.0 and SHARE Waves 4-7, releases 8.0.0.

We now focus on the geographic association between the incidence of COVID-19 cases and the increase in internet use among Europeans aged 65+. We provide graphical evidence at the national level in Figure 3.

1 The type of occupation is defined according to the International Standard Classification of Occupations (ISCO): high-skilled white-collar (ISCO codes 1,2, and 3); low-skilled white-collar (ISCO codes 4 and 5); high-skilled blue-collar (ISCO codes 6 and 7); low-skilled blue-collar (ISCO codes 8 and 9).

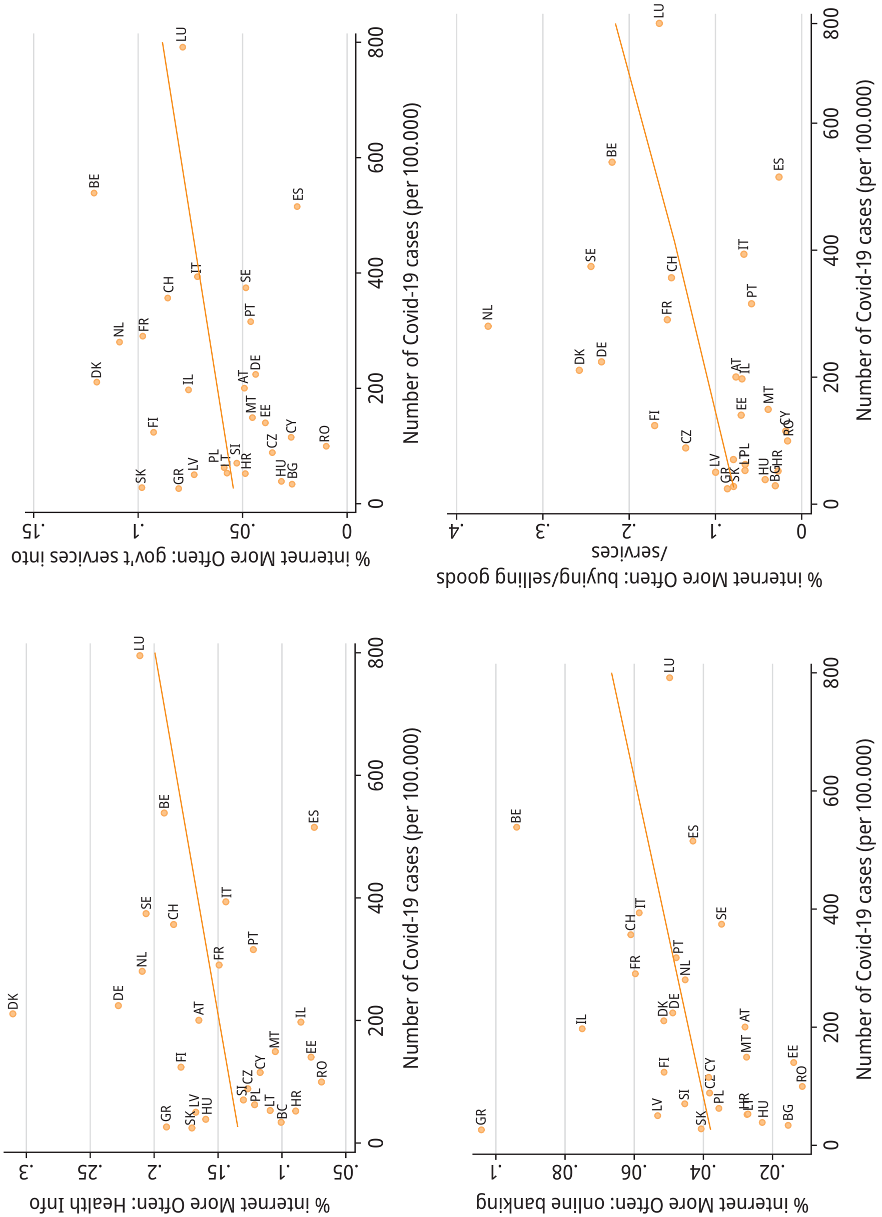

Figure 3: Internet use and the number of COVID-19 cases by country.
Source: SHARE Corona (W1), release 8.0.0 and European Centre for Disease Prevention and Control data.

In the figure, we plot the country-specific intensity of the COVID-19 outbreak, expressed as the number of confirmed cases (per 100,000 inhabitants) on 30 May 2020, against the increase in the four uses of the internet analysed in this chapter. Overall, the results show that the increase in online activities was positively related to the number of infections. This positive association was found consistently across all outcomes.

4 Conclusions

This chapter provided the first empirical evidence on whether and, if so, how the COVID-19 outbreak changed the digital habits of Europeans aged 65+. Overall, we showed that the frequency of individuals' online activities increased in all European countries during the pandemic, irrespective of the large cross-country differences in the prevalence of internet use before the pandemic. The use of the internet to search for health-related information and to purchase goods and services were identified as the online activities that increased the most.

We can tentatively conclude that in addition to having obvious negative effects, the pandemic had positive indirect effects on the use of the internet by a demographic group who would have otherwise remained less familiar with this technology.

Our results also highlight the importance of policies to improve the digital skills of the population. While the digital divide in the elderly population is undoubtedly a long-standing issue, the COVID-19 outbreak caused the role of new technologies in everyday life to increase, and thus underlined the need to take action to promote their use.

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Part IV Income and economic situation

Edited by Guglielmo Weber

Agnieszka Chłoń-Domińczak, Dorota Holzer-Żelażewska and Michał Taracha

19 Persistence of economic stress during the COVID-19 pandemic

Key points

- The stringency of the emergency containment measures introduced during the COVID-19 pandemic were expected to increase poverty and inequality, particularly in Eastern and Southern Europe where indeed a higher risk of economic stress was observed. Simultaneously, in many regions of Central and Northern Europe, the subjective perception of economic vulnerability among older people declined.
- At the regional level, the implementation of more stringent policies was associated with older people having fewer challenges making ends meet, which might be related to lower household expenditures due to social distancing. The rise in inequality was also associated with higher poverty.
- People who did not have a job or who were retired, as well as individuals who had lower educational attainment or were living in a single household, were more likely to face economic risks.
- Countries that are more developed, as measured by the Human Development Index, protected their citizens more from economic stress than less developed countries. In the event of economic stress, people living in the more developed countries could more easily dip into their savings to cope with economic stress.

1 Introduction

The COVID-19 pandemic affected the economic well-being of people in Europe, including that of people aged 50+. The stringency of the emergency containment measures was expected to have an impact on the increases in poverty and inequality in Europe. An initial assessment by (Palomino et al., 2020) indicated that during the pandemic, both poverty and inequality were increasing more in Eastern and Southern Europe than in Northern and Central Europe.

During the first wave of the pandemic, the various symptoms of economic stress people experienced differed depending on their individual socio-economic characteristics, and on the short-term economic developments and the overall development level in their country (Chłoń-Domińczak and Holzer-Żelażewska, 2022). It has also been shown that the risk of experiencing economic stress was highest in the Southern and Eastern European countries.

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In vulnerable Eastern European countries, the risk of job loss during the pandemic was higher for younger and older workers than for prime-age workers (Narayan et al., 2022). Moreover, older workers found returning to employment especially challenging, and thus faced an increased risk of long-term poverty and economic stress. One of the factors underlying older workers' slower recovery from the effects of pandemic were their lower ICT skills, which are increasingly in demand due to rapid technological changes and the expansion of remote work during the pandemic.

In this chapter, we analyse the economic stress faced by people aged 50 or older in European countries, and how it has changed since 2019. We also investigate the factors that are associated with greater economic stress at the regional and the individual level, while taking into account individual, regional, and country characteristics.

2 How did economic stress among older people in Europe change, and how was it distributed?

In the second SHARE Corona survey, one out of five respondents aged 50 or older reported experiencing economic stress, understood as facing difficulties making ends meet. Among the respondents who faced such stress, around 10% reported postponing bill payments, while around 18% said they dipped into their savings to finance current consumption, and 36% indicated that they had no savings they could use in case of economic difficulties.

The results from Wave 7 of SHARE and the SHARE Corona 1 and 2 surveys revealed that economic stress among people aged 50+ evolved differently across European countries and regions between 2017 and 2021. In many regions, we observe a decline in the percentage of people who were facing difficulties making ends meet, as presented in Figure 1.

The percentage of respondents having difficulties making ends meet increased in those regions where the initial share of people facing economic stress was high (Northern Greece, Wallachia, Dobruja, Western Moldova, Western and Central Slovakia). Meanwhile, in the regions where the risk of experiencing economic stress was lower, the share of respondents who reported having difficulties making ends meet declined over the analysed period. In some countries, a declining trend in the share of people facing economic difficulties between 2017 and 2019 stopped after the start of the pandemic (i.e., Hungary, Spain, Eastern Germany).

The observed decline in the share of older people having difficulties making ends meet might be attributable not only to their relatively smaller income losses,

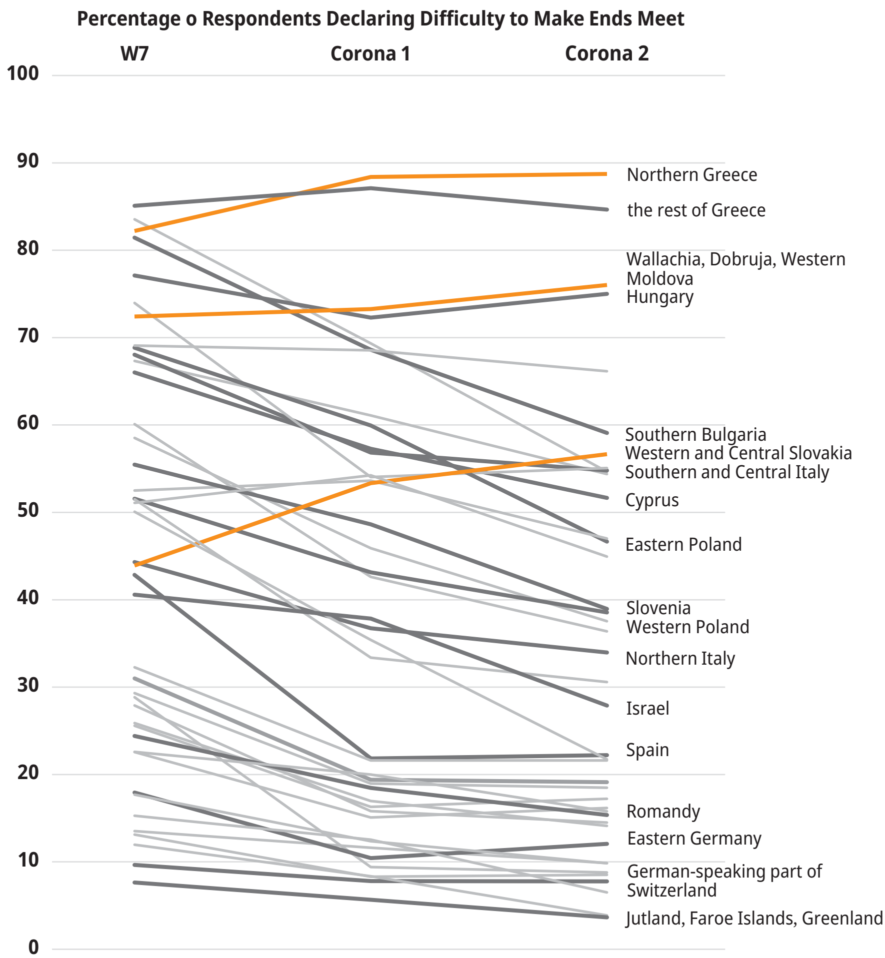
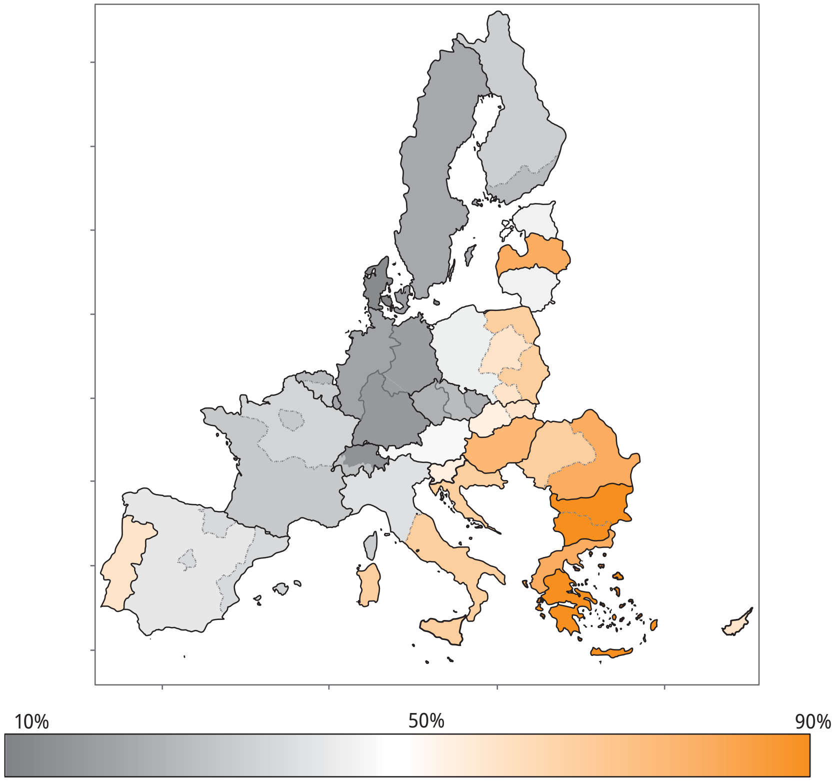


Figure 1: Percentage of respondents declaring difficulty to make ends meet: 2017, 2019 and 2021.
Source: SHARE Wave 7 and SHARE Corona (W1 & W2), release 8.0.0.

but also to their reduced expenditures. The social distancing measures, such as the shift to remote work and the closure of restaurants or cultural institutions, also led to reduced expenditures related to transportation, participation in cultural events, and eating out. For example, in the SHARE Corona 2 survey, almost 60% of respondents aged 50 or older (and almost 75% of those in poor health) stated that they had not visited a restaurant during the three months before the time of the survey.

The evolution of economic stress levels at the regional level reflects the increasing economic inequalities between the European countries and regions, with an increased gradient towards Southern and Eastern Europe. The regional distribution of the economic stress levels faced by the SHARE respondents is presented in Map 1.



Map 1: Regional distribution of difficulties making ends meet in the SHARE countries (2021).
Source: SHARE Corona (W2), release 8.0.0.

Persistence of economic stress in European regions – results of panel analysis

We examined the persistence of economic stress at the regional level using the GLS random-effects panel models. The model covers 41 regions and countries of Europe and Israel. The dependent variable reflects the subjectively assessed difficulties respondents faced making ends meet. In terms of time, the panel models cover three periods of different SHARE surveys: the pre-pandemic Wave 7 and the two SHARE Corona surveys.

The model has four independent variables differentiated at the national or the regional level: the government response stringency index, excess mortality, GDP per capita, and the Gini coefficient. The stringency index is a composite measure of nine policy response indicators, including school closures, workplace closures, travel bans, and restrictions on public transports (Hale et al., 2021). Excess mortality reflects the average weekly number of excess deaths per 10,000 inhabitants of the analysed 41 regions compared with the average level from 2014–2019 (averaged in the three periods covered by the SHARE questionnaire). In the panel analysis, the values of this variable for the period of Wave 7 were set to zero (in order to measure new fatal infections of COVID-19). This predictor represents the degree of the severity of the pandemic. GDP per capita is measured in thousands of purchasing power standard units from 2020 in each region. Excess mortality and GDP per capita variables were constructed based on the Eurostat data. The data for Switzerland were obtained from the Swiss Federal Statistical Office.

The last variable differentiated at the regional level is the Gini index, which reflects income inequality. The Gini index values at the country level were obtained from the World Bank database (the latest available data), while the Gini index values at the regional level were calculated using data from the national papers on income disparities in Europe.[1] The Gini index values were used to construct the weights through which the national Gini index values from the World Bank were broken down to the regional level. The values of the Gini index variable for the regions of Bulgaria, Belgium, Denmark, Finland, Slovakia, and Switzerland were not differentiated at the regional level. The results of two panel models are presented in Table 1.

All variables, except from excess mortality, were significantly associated with changes in the risk of experiencing economic stress. In the regions with more stringent containment measures, and higher GDP per capita, the risk of facing difficulties making ends meet was lower. This indicates that people who were living in more developed regions were less exposed to economic stress. Moreover, the imposition of more strict containment measures likely led to lower household expenditures, as discussed earlier, which also reduced the risk of having difficulties making ends meet. Finally, as expected, a higher Gini coefficient was associated with an increased risk of experiencing economic stress.

Extensive European welfare states may have guaranteed effective help for the people who would be most affected by new restrictions. Indeed, procedures aimed at counteracting the negative effects of lockdowns, and especially of social

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1 List of the national sources available at the request from the authors.

exclusion, seem to be an important factor that was not included in the analysis. The variable reflecting the stringency index could catch its variability, indicating that more responsive governments were also those that could afford to implement wide-ranging aid policies, whether for political or economic reasons. The results could also suggest that even though lockdowns had a negative impact on economic activity and added to the long-term risk of increasing poverty, they led households to reduce their expenditures, and made it easier for individuals making ends meet during the pandemic.

When interpreting the insignificant relationship between excess mortality and difficulties making ends meet found by the panel models, it is important to take into account that the negative impact of mortality on the ability of people to cope financially became noticeable at the multi-national level became visible only at the end of 2021. By contrast, the generally positive impact of more stringent lockdowns on the ability of people to make ends meet persisted throughout the pandemic.

The panel regression also shows that the increase in inequality was accompanied by higher levels of economic vulnerability among the older population.

Table 1: Results of two panel regressions explaining difficulties making ends meet at the regional and the country level.

Variable	**RE panel model**	**SDM RE panel model**
Stringency Index	−0.00116*** (0.000285)	0.00098** (0.00048)
Excess mortality	−525.7 (946.9)	
GDP per capita	−6.56e-06*** (1.36e-06)	−3.59e-06*** (1.24e-06)
Gini coefficient	0.0184*** (0.00675)	0.0102** (0.00530)
Constant	0.0461 (0.221)	0.5418** (0.284)
Excess mortality (spatially lagged)		−4112.176** (1813.093)

Table 1 (continued)

Variable	RE panel model	SDM RE panel model
GDP per capita (spatially lagged)		−0.00002*** (4.98e-06)
Observations	123	123
Number of regions	41	41

Standard errors in parentheses.
*** p<0.01, ** p<0.05, * p<0.1
Source: SHARE Wave 7 and SHARE Corona (W1 & W2), release 8.0.0.

3 The COVID-19 pandemic and economic stress in the SHARE Corona 2 survey at individual level

To investigate whether economic stress persisted during the pandemic, we used the data collected during the second SHARE Corona 2 Survey in 2021 to assess the association between individual- and country-level characteristics, and economic stress. We estimated the generalised ordered probit model that covers four ordered answers to the question on making ends meet, that is: "with great difficulty", "with some difficulty", "fairly easily", or "easily".

The independent variables include the respondents' socio-economic characteristics, such as their sex, age group, household composition, educational attainment, and current economic status, but also their type of employment history until age 50 (using data from the SHARE Life questionnaire). People were divided according to their employment history into five clusters, from the most job-rich to job-poor groups. In the model we also control, whether the respondents were experiencing economic difficulties before the COVID-19 outbreak (in 2017, during Wave 7 of the SHARE).[2] Country-level characteristics include changes in the employment rate and GDP growth between Q2 of 2021 (the time of the SHARE Corona 2 survey) and Q1 2020 (the start of the pandemic); the Human Development Index (HDI), which reflects the country's level of development; the mean stringency index; as well as the mean number of COVID-19 deaths and cases in the country.

2 For more information on the approach to clustering based on the employment histories, please see Chłoń-Domińczak and Strzelecki (2022).

The obtained results indicate that both individual- and country-level variables were associated with higher levels of economic vulnerability, as presented in Table 2.

For individual characteristics, we observe that people aged 75 years or older had higher chances making ends meet fairly easily compared to with great difficulty, which confirms that receiving pension transfers reduces the risk of financial difficulties. Women aged 70–74 are more vulnerable, which might be attributable to the transition to widowhood and the resulting loss of income. Living in single household, rather than living in a couple household, also increased the risk of facing economic difficulties.

People with higher education attainment were more likely to report making ends meet easily or fairly easily than having great difficulties. At the same time, people with below secondary education were less likely to report making ends meet fairly easily.

People who were inactive or unemployed (but not pensioners) would less likely say that they were making ends meet easily or fairly easily. Moreover, people who had some employment breaks in their employment history (compared to those with a full employment history) were also less likely to report making ends meet fairly easily.

Finally, having previous exposure to economic stress (in 2017) was a strong predictor of having a higher risk of economic vulnerability in 2021. A similar pattern was also observed during the first wave of pandemic. These findings indicate that economic vulnerability tends to persist among people aged 50 years or older in Europe.

Moving to the country characteristics associated with higher economic vulnerability among people aged 50+, we observe a strong association with the Human Development Index. In the more developed countries, the chances of experiencing economic stress were lower, which is consistent with the results obtained in the SHARE Corona 1 survey in 2020. Results indicate that the stringency index was only associated with higher chances of making ends meet easily. We also investigated the association between COVID-19 deaths and levels of economic vulnerability. There was an association between mean COVID-19 deaths and mean COVID-19 infections and economic stress. Interestingly, the mean number of COVID-19 infections was associated with a higher probability of reporting making ends meet fairly easily or with some difficulties, compared to having great difficulties making ends meet. By contrast, the mean number of COVID-19 deaths was associated with a lower probability of reporting making ends meet fairly easily, compared to having great difficulties. This suggests that the severity of the COVID-19 outcomes in the country had a more negative influence on people's levels of economic stress than the incidence of COVID-19 infections.

Table 2: Results of the ordered probit model explaining difficulties to make ends meet at individual level.

Independent variables:	**(1) With great difficulty/ With some difficulty**	**(2) With great difficulty/ Fairly easily**	**(3) With great difficulty/Easily**
Sex (ref. male)			
female	0.163	0.171	−0.0802
Age group (ref. 65–69)			
50–54	−0.0918	0.297	−0.187
55–59	−0.636*	−0.0154	−0.224
60–64	−0.449	0.136	−0.0250
70–74	0.191	0.291	0.152
75 and over	0.0334	0.400**	0.130
female#50–54	−0.345	−0.359	0.538
female#55–59	−0.381	−0.314	−0.0809
female#60–64	0.0378	−0.0637	−0.232
female#70–74	−0.352	−0.370*	−0.161
female#75+	−0.124	−0.103	−0.0249
Household composition (ref. couple)			
single household	−0.697***	−0.628***	−0.398***
3 or more HH members	−0.247	−0.0280	−0.296
Educational status (ref. secondary)			
below secondary	−0.258	−0.232**	−0.0436
higher	0.581	0.601***	0.508***
Employment status (ref. retired)			
employed	0.301	−0.0447	0.0794
inactive or unemployed	−0.189	−0.275***	−0.334***
Difficulty to make ends meet in W7 (2017)	−2.518***	−1.713***	−1.531***

Table 2 (continued)

Independent variables:	**(1) With great difficulty/ With some difficulty**	**(2) With great difficulty/ Fairly easily**	**(3) With great difficulty/Easily**
Employment history:			
Few employment breaks	−0.00273	−0.659**	0.00432
Some employment breaks	−0.347	−0.162	−0.0831
Shorter working lives	0.313	0.234	0.136
Job poor employment history	−0.156	−0.0270	−0.0957
Country level characteristics:			
Employment rate change (2021Q2/2020Q2)	−0.0776*	0.0236	0.0103
GDP change (2021Q2/ 2020Q2)	−0.0306	0.0293	−0.0335
HDI	13.66***	20.65***	21.18***
Mean Stringency Index	−0.00133	0.00211	−0.0154***
Mean COVID deaths	0.00300	−0.00262*	−0.000509
Mean COVID infections	0.000144***	0.000136***	2.95e-05
Constant	−7.725***	−17.04***	−18.06***
Observations	18,435	18,435	18,435

Source: SHARE Wave 7 and SHARE Corona (W1 & W2), release 8.0.0.

4 What kinds of strategies did people adopt to cope with economic stress?

The data from the SHARE Corona 2 survey allowed us to assess propensity to postponing bill payments and/or dipping into savings when facing economic stress. To investigate which individual and country characteristics were associated with such behaviours, we performed logistic regression models on individual data of respondents who indicated that they faced difficulties making ends meet (Table 3).

The results showed that people aged 50–54 were more likely to dip into their savings, in line with the results of the SHARE Corona 1 survey. As was highlighted by (Chłoń-Domińczak and Holzer-Żelażewska, 2022), this could increase their risk of having lower income after retirement. The interaction effect also indicated that women in this age group were less likely than men to dip into their savings.

People with lower educational attainment were less likely than people with secondary educational attainment to dip into their savings, but they could have less savings to use in such case.

In general, people who were employed were more likely to postpone paying bills. The association between people's work histories and their strategies for coping with economic stress reveals that people who had job poor employment histories were less likely to adopt any of the two strategies. Those who had relatively few employment breaks were less likely than people with job rich histories to dip into their savings. Respondents who had some (but not long) breaks in employment were more likely to postpone bill payments. Those who had shorter employment breaks were more likely to dip into their savings. This indicates a "U-shaped" pattern of strategies for coping with economic stress depending on people's employment histories. While people with job-rich histories might have been generally less likely to adopt such strategies, those with job-poor histories probably did not have the resources to adopt such strategies.

The country-level coefficients indicate that a decline in the employment rate was associated with a lower probability of dipping into savings. People living in countries with higher HDI were more likely to adopt this strategy, which confirms the results obtained in 2020. As Chłoń-Domińczak and Holzer-Żelażewska (2022) concluded, people living in countries with higher HDI were more likely to have savings they could use in periods of economic stress. However, a decline in GDP per capita was associated with a higher probability of postponing bill payments.

Table 3: Results of the logit model explaining strategies to deal with the economic stress.

Strategies:	**Postponing bills payments**	**Dipping into savings**
Sex (ref. male)		
female	−0.399	−0.000145
Age group (ref. 65–69)		
50–54	−0.817	1.881*
55–59	0.212	0.756
60–64	0.242	0.263

Table 3 (continued)

Strategies:	**Postponing bills payments**	**Dipping into savings**
70–74	0.0691	−0.384
75+	−0.589	−0.0928
female#50–54	0.764	3.605***
female#55–59	0.683	−0.508
female#60–64	0.201	−0.225
female#70–74	0.179	0.230
female#75+	0.176	−0.301
Household composition (ref. couple)		
Single household	0.199	0.123
3 or more HH members	0.210	−0.0519
Educational status (ref. secondary)		
below secondary	0.114	−0.414**
higher	−0.294	0.438
Employment status (ref. retired)		
employed	0.568*	0.191
inactive or unemployed	−0.0196	0.0268
Employment history:		
Few employment breaks	−0.0972	−1.071**
Some employment breaks	0.960*	0.273
Shorter working lives	0.324	0.817**
Job poor employment history	−0.645**	−0.480*
Country level statistics:		
Employment rate change (2021Q2/2020Q2)	0.0711	0.235***
GDP change (2021Q2/2020Q2)	−0.0700**	−0.00244
HDI	−4.075	11.78***
Mean Stringency Index	−0.000942	0.00720
Mean COVID-19 deaths	0.00433	−0.00323

Table 3 (continued)

Strategies:	Postponing bills payments	Dipping into savings
Mean COVID-19 infections	−0.000182***	0.000122**
Constant	0.827	−11.54***
Observations	6,062	3,890

Source: SHARE Wave 7 and SHARE Corona (W2), release 8.0.0.

5 Conclusions

Economic vulnerability increases during times of crisis. The COVID-19 pandemic was no exception to this rule. Older people tended to be more exposed to the negative consequences of strict containment policies, particularly if they had fewer resources and had experienced economic difficulties in the past. The rise in economic inequality was accompanied by increasing levels of poverty and economic stress.

Older people's economic vulnerabilities tend to persist, particularly in the Eastern and the Southern Europe. Continuous efforts and policies aimed at improving the overall socio-economic situations of these regions are needed. In particular, efforts to stimulate economic development and to reduce income inequality, as well as investments in skills development, can help to build resilience in these regions in the future. The policy responses should also address groups who are particularly vulnerable, including those with lower human capital, or those who live in a single household, and who thus have fewer resources for coping with adverse economic conditions.

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20 Effects of COVID-19-related economic support on household financial distress

Key points

- The COVID-19 restrictions affected households differently depending on the employment status of their members.
- Governments implemented a variety of financial support measures to alleviate the economic impact of COVID-19 restrictions.
- We show that financial support measures were effective in reducing the financial distress of households hit by job interruptions during the first wave of the pandemic.

1 Introduction

The COVID-19 pandemic had a major impact on people's lives, changing the social behaviours and the economic conditions of most individuals. These changes were mainly due to the pandemic-related restrictions implemented by governments to limit the spread of the virus, such as social distancing requirements, mask mandates, mobility restrictions, and even lockdowns.

The effects of these COVID-19-related measures had heterogeneous economic effects on the population, depending on people's job type and job sector, their education, and other factors. Using data from the first SHARE Corona survey, Bertoni et al. (2021) showed that these effects varied with the age and the employment status of individuals, with large differences being found between older and younger people.

Given the exceptional nature of the measures used to limit the spread of the virus, and the large social and economic effects of these policies, most governments implemented extraordinary financial support programs to compensate both households and businesses for their losses. While the support programs different countries introduced varied, most included measures such as the postponement of taxes, tax cuts, and income subsidies. Simulations by Almeida (2021) showed that these economic support policies reduced the average drop in household income from 9.3% to 4.3%.

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Recent papers on the pandemic, like Bonfatti et al. (2021), concluded that age played a protective role in household financial distress, because older individuals across Europe could rely on public pensions. Households whose members were still in the workforce were more likely to face economic difficulties, especially if they experienced job interruptions or reductions in their weekly working hours.

This chapter investigates the effectiveness of these financial support policies in reducing the financial distress of Europeans aged 50 or older during the pandemic. It contributes to the existing literature in two different ways: it presents cross-country evidence on the variation in household financial distress across Europe (plus Israel), and on the effects of government support policies on the finances of a cross-section of households over a reasonably long period of the pandemic.

The main results show that the households who experienced job interruptions during the first wave of the pandemic were more likely to benefit from financial support received between August 2020 and August 2021. Moreover, the results of the econometric analyses indicate that the financial distress of these households was significantly alleviated by financial support policies. These findings suggest that the governments' plans were well-targeted and effective.

2 Data

We use data from Waves 7 and 8 of SHARE, and from the first and the second SHARE Corona survey (from now on: SCS1 and SCS2), which were conducted in June-August 2020 and June-August 2021, respectively. We focus on the subsample of individuals who participated in both waves of the SHARE Corona survey, and do not present missing values for any of the variables involved in our econometric study. Our final sample is composed of 26,836 households.

Household financial distress during the pandemic

Our analyses focus on the effect of government financial support reported in the SCS2 on the change in the financial distress of households between the two waves of the SCS.

We construct the financial distress index (FDI) of Bonfatti et al. (2021) for each SCS, and then take its difference (ΔFDI) across waves. FDI is the sum of three dummy variables: one variable indicating whether the household reported having difficulties making ends meet; a second variable indicating whether the household experienced a reduction in income during the pandemic (defined as in

Bethmann and Schumacher – this book); and a third variable indicating whether the household postponed regular payments during the pandemic. Thus, the FDI can take values between zero and three, with a higher value representing a higher level of financial difficulty. In measuring the change in financial distress, ΔFDI takes values between −3 and +3, with a positive value denoting a worsening of the household's situation.

We also construct a financial support indicator. In the SCS2, individuals reported whether they had benefited from COVID-19-related financial support programs since the SCS1. We define a household-level binary variable that takes the value of one if at least one household member received any such support from the government.

Finally, we focus on the work-related conditions of households, using information on any job interruptions the household members experienced during the pandemic. In the SCS1, individuals who were employed at the outbreak of the pandemic reported whether they became unemployed, were laid off, or had to close their business due to the COVID-19 crisis. We construct a household-level binary indicator that identifies whether at least one household member had experienced a job interruption (or job loss) at the time of the SCS1.

Government financial support and household financial distress across Europe

Figure 1 shows the share of households who reported benefitting from financial support policies related to the COVID-19 pandemic in the SCS2, by country and number of job interruption episodes reported in the SCS1. With some notable exceptions (Latvia, Israel, Croatia, Bulgaria, and Slovenia) households who did not experience a job interruption did not receive financial support. However, Figure 1 shows that households who reported having lost a job in the SCS1 were more likely to receive financial support in the period covered by the SCS2. These results highlight that these policies were mainly targeted to the working-age population (an exception was Hungary, where very few respondents reported receiving financial support).

Figure 2 compares the percentages of households who experienced a deterioration (dark orange bars) or an improvement (light orange bars) in their financial situation, by country. These shares are based on the sign taken by the ΔFDI variable described above (dark orange refers to ΔFDI > 0; light orange refers to ΔFDI < 0).

Overall, the share of households whose financial situation improved was higher across all of Europe, with some exceptions in Mediterranean and Eastern European countries (e.g., Italy, Malta, Cyprus, Bulgaria, and Slovenia). These dif-

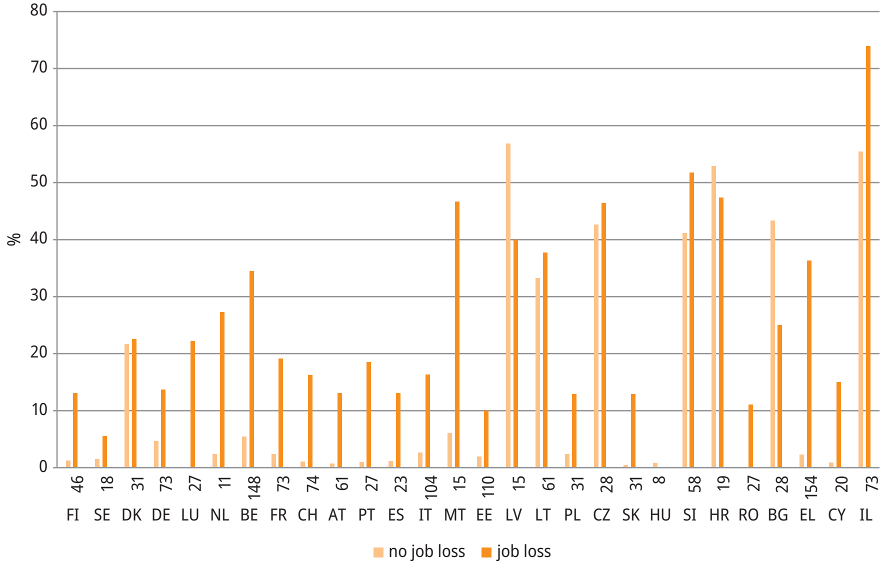

Figure 1: Percentage of households receiving financial support, by country and work-related conditions.
Source: SHARE Corona (W1 & W2), release 8.0.0.

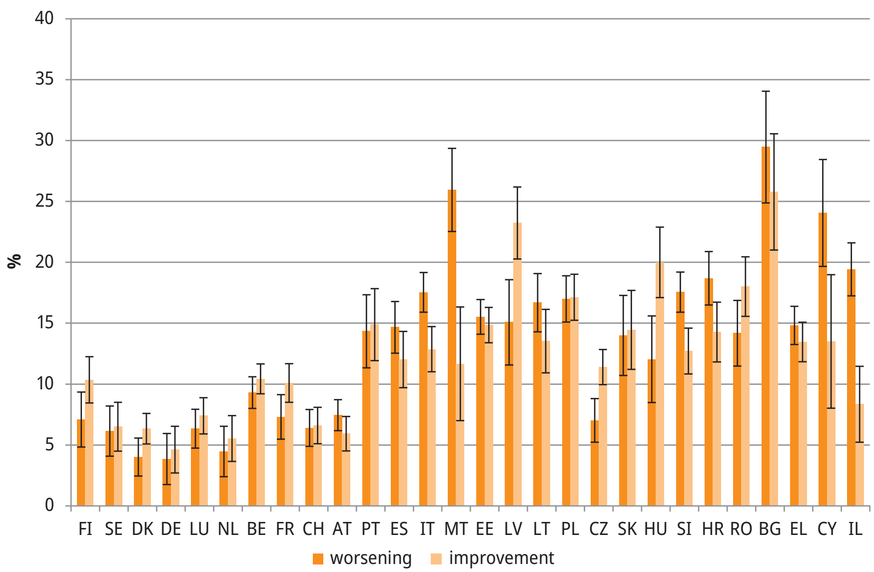

Figure 2: FDI variation between SCS1 and SCS2, by country.
Source: SHARE Corona (W1 & W2), release 8.0.0.

ferences may be attributable in part to the differences in the pandemic conditions and the containment policies implemented in these countries.

3 Results

This section investigates the effects of financial support policies on household FDI. We focus on the variation in FDI (ΔFDI) among those households who reported having job loss episodes in the SCS1 and receiving financial support from COVID-19-related policies in the SCS2.

Figure 3 gives an overview of the households' FDI distribution in the SCS2 by work status in the SCS1 across groups of countries (Nordic: Finland, Sweden, Denmark; Central: Belgium, Netherlands, Germany, Austria, Switzerland, Luxemburg, France; Mediterranean: Portugal, Spain, Italy, Malta, Greece, Cyprus, Israel; Eastern: Slovenia, Croatia, Hungary, Slovakia, Czech Republic, Romania, Bulgaria, Po-

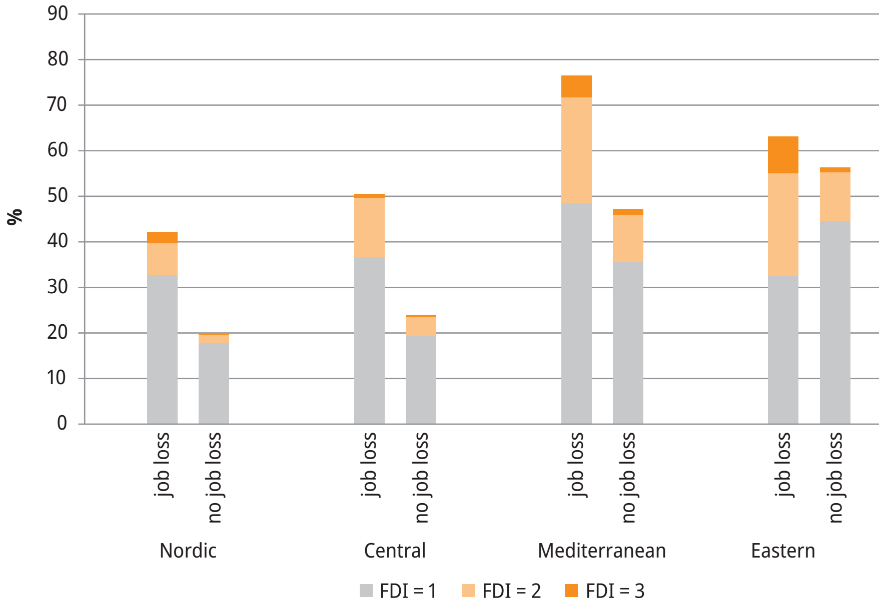

Figure 3: Distribution of household FDI by country location and job interruption status in SCS1.
Notes: *Nordic*: Finland, Sweden, Denmark; *Central*: Belgium, Netherlands, Germany, Austria, Switzerland, Luxemburg, France; *Mediterranean*: Portugal, Spain, Italy, Malta, Greece, Cyprus, Israel; *East*: Slovenia, Croatia, Hungary, Slovakia, Czech Republic, Romania, Bulgaria, Poland, Estonia, Latvia, Lithuania.
Source: SHARE Corona (W1 & W2), release 8.0.0.

land, Estonia, Latvia, Lithuania). There are two columns for each group: the first represents the FDI distribution among households who reported experiencing a job loss in the SCS1, while the second represents the FDI of the rest of the population. Figure 3 shows that those households who reported having a job loss in the SCS1 were more likely to experience financial difficulties, and that their financial difficulties were more severe. There was some regional variability. We see, for example, that non-negligible shares of households with job losses in the Mediterranean and Eastern European countries had an FDI index equal to three.

However, the main result of the analysis is that households' employment conditions played a crucial role in determining their FDI across all countries. Therefore, to better understand the effects of financial support policies on the ΔFDI, we focus on the question of whether households had a job interruption episode.

Table 1 shows the share of the population across Europe who reported receiving financial support in the SCS2 by their work-related status in the SCS1. For households who had experienced a job interruption, their probability of receiving financial support from the government was 24.4%, or about double that for households who did not have a job interruption episode. Hence, we conclude that the work-related conditions of households played a crucial role in the assignment of economic subsidies.

Table 1: Share of households who reported receiving government financial support in the SCS2 by whether they reported experiencing a job interruption in the SCS1.

Job interruption in SCS1	
Yes	No
24.4%	12.89%

Source: SHARE Corona (W1 & W2), release 8.0.0.

To better understand the efficacy of government financial support policies, we compare the average ΔFDI by whether the household reported receiving economic support in the SCS2, and conditioning on the household's work-related conditions in the SCS1.

First, we regress ΔFDI on a set of controls – namely, country, age, pre-pandemic income, and education – to filter out the effects of these variables. We then conduct the analysis using the residual of that regression. Table 2 shows the average of the residual ΔFDI for four groups identified as having

Table 2: Average residual ΔFDI by whether households reported receiving government financial support in the SCS2 and experiencing a job interruption in the SCS1.

ΔFDI		**Financial Support SCS2**	
		No	**Yes**
Job LossSCS1	No	−0.138	−0.159
	Yes	−0.175	−0.216

Source: SHARE Corona (W1 & W2), release 8.0.0.

experienced a job loss in the SCS1, and as having received government financial support in the SCS2.

Table 2 shows that those households who received financial support experienced an improvement in their financial conditions that was greater than those who did not receive it. The differences between the average ΔFDI of the households who did or did not receive financial support were 0.041 and 0.021, respectively, for households who did or did not report experiencing a job loss episode in the SCS1. These differences were both statistically significant (p-value = 0.00) and larger among those who reported experiencing a job interruption in the SCS1. Therefore, it appears that government financial support policies reduced household financial distress and were more effective among those households who reported experiencing a job interruption in the SCS1.

4 Conclusions

We presented an overview of the relationship between financial support policies and the financial conditions of Europeans aged 50 or older. We defined a financial distress indicator based on the ability of households to make ends meet, whether they experienced an income reduction during the first wave of the pandemic, and their need to postpone payments. Then, we studied the determinants of the variation in this indicator between SHARE Corona survey waves.

Our analysis of the effects of financial support policies on households' employment status and financial distress produced two main results. First, the financial support programs implemented by European governments were well-targeted, as the households who experienced a job interruption were more likely to receive subsidies. Second, the financial support provided by governments was effective in reducing household financial distress, especially among those households who reported experiencing a job interruption in the SCS1.

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21 How the first wave of the pandemic affected household finances

Key points

- During the first wave of the COVID-19 pandemic, individuals past retirement age were less likely than working-age individuals to be in financial distress, which suggests that the European public pension systems successfully protected older individuals.
- Households who were experiencing difficulties before the pandemic were more likely to be in financial distress during the first wave of the pandemic, which highlights persistency of having difficulties making ends meet.
- The ability to make ends meet of households who suffered income losses during the pandemic worsened more than the ability to make ends meet of households who suffered income losses in the two year-period before the pandemic.

1 Introduction

The outbreak of COVID-19 was a dramatic shock that affected the lives and the health of most individuals, and the economy in general. Lockdowns and other restrictions were imposed in many countries with the aim of reducing the spread of the virus. These measures successfully controlled the spread of the virus during the first wave of the pandemic, but they also had important economic consequences that were unevenly distributed across the population.

In this chapter, we examine the impact of the first wave of the pandemic on the finances of European and Israeli households, investigating which factors increased their levels of financial hardship, and which factors had protective effects. To answer our research question, we constructed a financial distress indicator that captures income losses, difficulties making ends meet, and the postponement of payments. We then investigated the relationship of this indicator with various socio-demographic, economic, and employment indicators.

We find that the pandemic exacerbated economic inequalities in all of the analysed countries. This result is not surprising, because less educated and lower paid workers were more vulnerable to income losses and layoffs (ILO, 2020; Stiglitz, 2020), while the option of working from home was mainly available to better paid and better educated workers (Deaton, 2021). The impact of the COVID-19 pandemic also depended on country characteristics (Fana, Torrejón Pérez and Fernández-

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Macías, 2020), as countries that relied on service activities, such as Mediterranean countries, were more likely to suffer. It is of critical importance to understand the economic and social costs of the COVID-19 pandemic in order to better target ad hoc policies and to prepare for future pandemics.

One of our most relevant results is that individuals past retirement age were less likely to be in financial distress or to face increased financial difficulties. This finding confirms that the European public pension systems successfully protected older individuals during the pandemic.

The next section describes the data used in the empirical analysis. The following section illustrates the empirical specification and the main results. The last section concludes.

2 Data and variables

We use data on 30,069 households who participated in the first wave of the SHARE Corona survey. The sample includes respondents who provided valid information on the variables we use in our analysis, as well as respondents who failed to report their income. For the missing income variables, we use the average of five multiple imputations. Of the households in our sample, 38.74% were single households and 61.26% were couple households. The average household size was 2.15 (standard deviation 1.07), and the majority of the respondents had a medium-low level of education.

We construct a comprehensive indicator, the Financial Distress Indicator (FDI), to measure the severity of the impact of the first wave of the pandemic on households. The FDI score ranges from zero to three, and is the sum of the following three dummy variables:

– difficulties making ends meet, which takes the value of one if the household reported being able to make ends meet with some or great difficulties;
– postponed regular payments, which takes the value of one if the household reported the need to postpone regular payments, such as rent, mortgage, loan, or utility payments (conditional on experiencing difficulties making ends meet); and
– income losses during the pandemic, which takes the value of one if the household's lowest level of monthly income was lower during the first wave of the pandemic than it was before the pandemic (by 5% or more).

Table 1 reports the descriptive statistics of the three variables that compose the FDI. In our sample, 30.40% of households reported having difficulties making ends meet, and, among those, 10.24% reported having to postpone regular payments. On average, 15% of households experienced an income loss during the first wave of the pandemic. However, the results clearly show that working-age households were more likely to have incurred income losses, as the share of households in which at least one member was younger than age 65 who experienced income losses was almost three times larger than the share of households in which both members were older than age 65.

Table 1: Descriptive statistics (%).

Variables	Mean	SD	N
Difficulties making ends meet	30.40	46.00	30,069
Postponed payments	10.24	30.32	10,272
Income loss	15.00	35.70	30,069
At least one HH member under age 65	21.93	41.38	8,858
All HH members aged 65+	8.99	28.60	21,211

Notes: The table shows household descriptive statistics (mean, standard deviation, and number of observations), weighted using calibrated cross-sectional household weights, of the economic outcomes of interest in the first wave of the SHARE Corona survey.
Source: SHARE Corona (W1), release 8.0.0.

Figure 1 presents the distribution of FDI across the 28 countries in our sample. The figure highlights different patterns. Households in the Nordic countries, and in the Czech Republic, Germany, and Luxembourg, appeared to be in less financial distress. At the other extreme, households in Hungary, Bulgaria, Greece, and Cyprus were more likely to report experiencing some or high levels of financial distress. These differences may be due to the timing of the first wave of the pandemic across countries, since the interviews were (mostly) conducted in June-August 2020, when some countries had not yet been hit by the first wave of the COVID-19 pandemic, or had not yet implemented mobility restrictions.

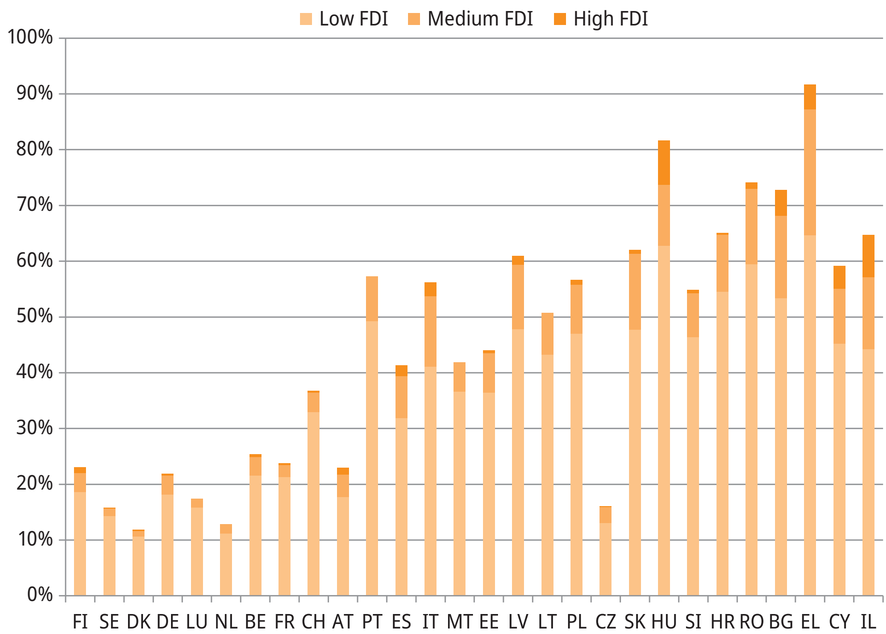

Figure 1: Financial distress indicator (FDI) by country.
Note: N = 30,069, weighted data.
Source: SHARE Corona (W1), release 8.0.0.

Figure 2 groups households according to their composition and age, and presents the respective distribution of FDI. The “couples<65 y.o.” group includes couples in which at least one respondent was under age 65. The “couples≥65 y.o.” group includes households in which both members were aged 65 or older. The figure highlights the protective role of age, as the households in which both members were above the pension eligibility age reported having less financial distress than the households in which at least one member was potentially in the labour market. Similar conclusions can be reached for the impact of living as a couple, as the results show that single households reported higher levels of financial distress than couple households.

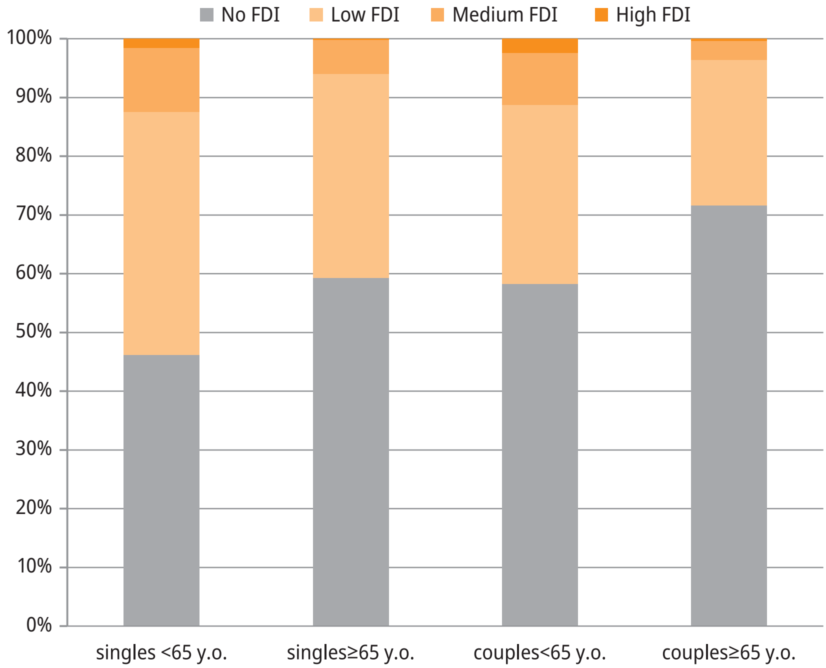

Figure 2: Financial distress indicator (FDI) by household composition and age.
Note: N = 30,069, weighted data. "y.o." stands for "years old".
Source: SHARE Corona (W1), release 8.0.0.

3 Determinants of financial distress and of a deterioration in the ability to make ends meet

To assess which factors most affected household finances during the first wave of the pandemic, we conduct an OLS regression in which the dependent variable is the FDI. We control for the following household-level variables: country dummies, age, gender, household size and type (i.e., single vs. couple household), education, employment-related variables (e.g., whether the household members experienced job interruptions or reductions in working hours), other sources of income (e.g., income from other household members and businesses), being a housing tenant/subtenant, income before the COVID-19 crisis, and the length and the intensity of restrictions derived from the OxCGRT Stringency Index. Statistically significant estimates (and their 95% confidence intervals) are presented in Figure 3.

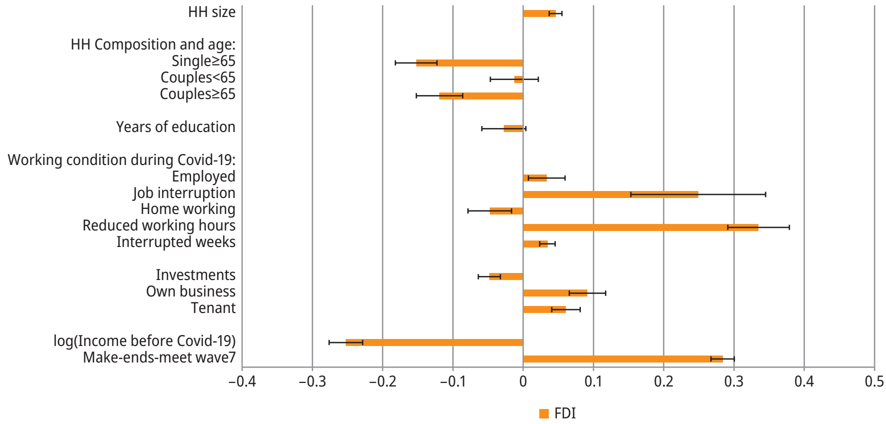

Figure 3: OLS regression results for FDI.
Note: N = 30,069; only significant results ($p < 0.05$) are displayed. Female, receiving income from other household members, ownership of a second home, the average intensity of restrictions, and the length of restrictions had no significant association with the outcome measure. The model includes country dummies; $R^2 = 0.316$.
Source: SHARE Corona (W1), release 8.0.0 and SHARE Waves 1-2 and 4-7, releases 8.0.0.

Figure 3 confirms the protective role of age, as "Singles≥65" and "Couples≥65" have negative coefficients. This is evidence that the pension systems successfully insured retirement-eligible households against the shock of the pandemic. By contrast, among working-age households, the pandemic hit their finances harder, as employed households whose members experienced job interruptions or reductions in working hours were more likely to experience financial distress. At the same time, households whose members had jobs that allowed them to work remotely were less likely to suffer financial hardship. Moreover, having higher education and a higher pre-pandemic income helped to counteract the negative effects of the pandemic. The results also indicated that certain households experienced persistent difficulties, as those households who reported having difficulties making ends meet in Wave 7 (collected in 2017–2018) were much more likely to report having financial difficulties during the pandemic.

In the second part of our analysis, we investigate which determinants affected the probability of the ability of households to make ends meet worsening over a two-year period (between SHARE Wave 7 and the first wave of the SHARE Corona survey). To do so, we restrict our sample to those households who did not report having financial difficulties in Wave 7. Therefore, we keep only households who did not report in Wave 7 having difficulties making ends meet, and end up with 17,417 households. We run an OLS regression in which the dependent variable is the dummy for a worsening of the ability to make ends meet, and we control for country, age, gender, household size (level and changes) and type, employment-related variables (in both Wave 7 and the SHARE Corona survey), education, dummies for income losses/gains between waves (typical income before the pandemic – typical income in Wave 7) and during the pandemic (lowest income during the pandemic – typical income before the pandemic), income before the COVID-19 crisis, other sources of income (e.g., income from other household members and businesses), being a tenant/subtenant, and the length and the intensity of the restrictions.

Figure 4 confirms the protective effects of age, education, and the pre-pandemic level of income. It also highlights that income losses during the pandemic were more important than income losses between the surveys, as the coefficient was about three times bigger. A potential explanation for these findings is that households who were hit by a pandemic–related income shock had no time to adjust their spending patterns, whereas households whose incomes had declined over the two years prior to the pandemic could smooth and adapt their consumption levels.

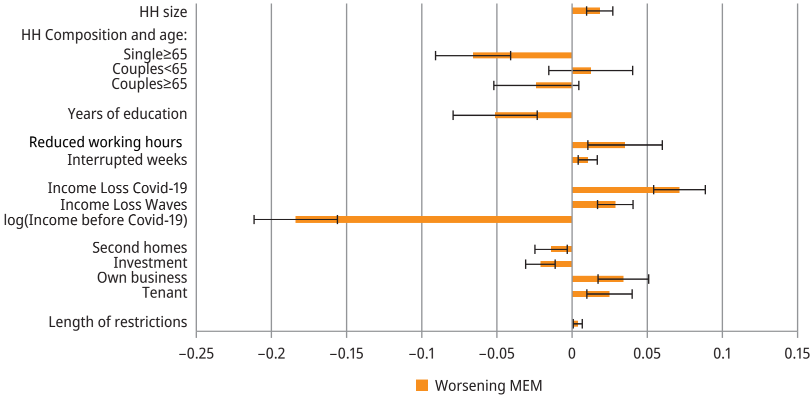

Figure 4: OLS regression results for a worsening of the ability to make ends meet.
Note: N = 17,417; only significant results ($p < 0.05$) are displayed. The variables of female, changes in household size, employment except for reduced working hours and interrupted weeks, receiving income from others, and the average intensity of the restrictions had no significant association with the outcome measure. The model includes country dummies; $R^2 = 0.197$.
Source: SHARE Corona (W1), release 8.0.0 and SHARE Waves 1-2 and 4-7, releases 8.0.0.

4 Conclusions

We investigated the effects of the COVID-19 crisis on the finances of Europeans using the first wave of the SHARE Corona survey. We constructed a financial distress indicator that captured whether households experienced income losses, had difficulties making ends meet, or needed to postpone payments. We found that the education and income levels of households before the pandemic played a protective role, as did being past retirement age, which suggests that the welfare state effectively protected older people. By contrast, for households in which the members were employed, experiencing job interruptions or reductions in their working hours increased their probability of facing economic difficulties, while having the option to work from home reduced their likelihood of experiencing financial distress. We also found that having difficulties making ends meet had a persistent effect, as those households who were having difficulties before the pandemic were more likely to be in financial distress during the first wave of the pandemic as well. In addition, we investigated how experiencing an income decline affected the ability of households to make ends meet. Our results showed that the ability of households to make ends meet worsened more if they had experienced income losses during the pandemic than if they had experienced income losses in the two-year period before the pandemic.

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Alexander Schumacher and Arne Bethmann

22 Financial hardship during the COVID-19 pandemic

Key points

- There were clear differences in income losses across European regions, with losses being lower among households in Northern Europe and higher among households in Southern Europe.
- Income losses reflected existing patterns of educational inequality.
- The poorest households were less likely to report a recovery of their subjective financial situation over the course of the pandemic.

1 Introduction

The COVID-19 pandemic, and the containment measures that were imposed in response to the pandemic, have had substantial effects on the economies in the EU member states, as well as on Europeans' financial well-being. In the following analysis, we provide some initial insights into the financial situations of the population aged 50+ across Europe during the COVID-19 pandemic.

We look at two distinct, but interrelated aspects of financial hardship. First, we investigate the respondents' income situation, and, more specifically, whether the respondents experienced income losses in the time between the start of the pandemic and the interview. Second, we look at the respondents' subjective assessment of whether it was easy or hard to "make ends meet"; i.e., whether their disposable income was sufficient to cover their living expenses. The analyses are divided into a spatial overview of average income losses across SHARE countries and European regions; the relationship between education, age, and household size on the one hand and income losses on the other; and the average ability to make ends meet during the COVID-19 pandemic within each country-specific income tercile prior to the pandemic.

Using data from both SHARE Corona surveys enables us to compare two snapshots in time for each analysis. This gives us an impression of how financial hardship developed under prolonged pandemic conditions within each country, sub-group, and income percentile.

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2 Data

In our analyses, we use data from the first and second SHARE Corona surveys (SCS1 and SCS2), which were conducted in all 28 participating countries during the summer of 2020 and 2021, respectively. In addition, we merge information on the respondents' education from previous SHARE waves, as it was not collected during the Corona surveys.

The analysis sample is limited to individuals living in households with at least one employed member at the start of the pandemic. This seems sensible, since the threat to individuals' financial well-being can mainly be attributed to the dire situations of the employing companies, and to the risks associated with being physically present in a workplace during a pandemic. SHARE includes a large proportion of individuals who were not employed (anymore), but who instead received some form of (state) pension that was likely to be far less threatened by the pandemic.

This pattern can also be shown empirically when looking at the proportion of individuals living in households with a relative loss of total household income of more than 10%. This proportion was only 4.9 percent for households with no employed respondents, compared to 20.9 percent and 28.4 percent for households with one and two employed members, respectively, at the time of the first COVID-19 outbreak. Our actual analyses are therefore based on data from a little under 10,000 respondents for each SCS1 and SCS2. In addition, respondents without income data for their household are excluded from the analysis in the respective wave. The share of respondents with missing data in the outcome variable was around 25.2 percent in the first wave, and 25.1 percent in the second wave.

We use the individual-level survey weights for each wave provided in the data release. All reported proportions should therefore be interpreted as the share of individuals living in a household with at least one employed member at the start of the COVID-19 pandemic.

While all SHARE panel respondents were eligible to participate in both SCS, the actual sample composition for both surveys varied to some degree due to (temporary) non-response. This is accounted for, to the extent possible, in the estimates using the wave-specific calibrated cross-sectional weights for the population projections (De Luca, Li Donni and Rashidi, 2021).

3 Results

3.1 Income losses from a European perspective

The questions about income were phrased differently in the two waves of the SCS. Two data points were collected in the first wave: the “typical” household income before the outbreak of the pandemic, and the lowest monthly income since the outbreak. In the second wave, a filter question assessed whether the respondent’s household income had changed since the last wave. If so, the respondents were asked to give their highest and lowest monthly income.

As a consequence, for the cases without an income change after the first interview, we could not tell whether their income had recovered before the first interview. However, we are able to assess the size of the biggest loss they experienced since the outbreak of the pandemic for both waves. If this loss was greater than 10 percent, we consider the respondent to have lost a significant share of his/her income.

Due to this construction of the income loss variable, cases could not exit the state of having experienced income loss in the second wave once they entered it in the first wave. With this in mind, it is important to understand that some of the increase between waves was a purely stochastic effect. As the probability of households losing income was non-zero even without the economic effects of the pandemic, some increase of losses would have occurred naturally.

Furthermore, date and duration are not known for the income losses before the first interview. Therefore, we are not able to infer from the data when exactly and for how long the income losses occurred, and whether the households were able to recover from them. Consequently, our analysis will focus mainly on the differences in income losses by our independent variables at the two observation points, rather than on the differences between waves.

Across all countries participating in the SCS, the average share of individuals who had experienced a loss of household income was 24 percent (see Figure 1) in the summer of 2020. By the summer of 2021, this share had increased to about 30 percent, meaning an additional six percent had lost household income since the start of the pandemic.

It is remarkable that the number of individuals with income losses in the few months between the start of the pandemic in March 2020 and our first Corona survey in June and July 2020 was far larger than the number of individuals with additional losses in the much longer period between July 2020 and the second Corona survey in June 2021. This suggests that economic stress was particularly high in the first months of the pandemic.

Regional differences

For our first look at the data, we divide our sample into four European macro regions: Northern Europe (Denmark, Finland, Sweden), Eastern Europe (Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia), Southern Europe (Cyprus, Italy, Greece, Malta, Portugal, Spain), and Western Europe (Austria, Belgium, France, Germany, Luxembourg, the Netherlands, Switzerland).

Looking at these regions, we find that the region with the largest share of respondents with a financial loss of over 10 percent was Southern Europe. As Figure 2 shows, within this group of countries, Spain had the largest share of respondents with income losses in both waves, at 43 percent in 2020 and at 46 percent from the start of the pandemic until 2021. Spain was closely followed by Greece, and by Italy and Portugal, where about 35 percent of respondents had income losses. These four Southern European countries were the most affected in 2020, and were surpassed only by Hungary in 2021.

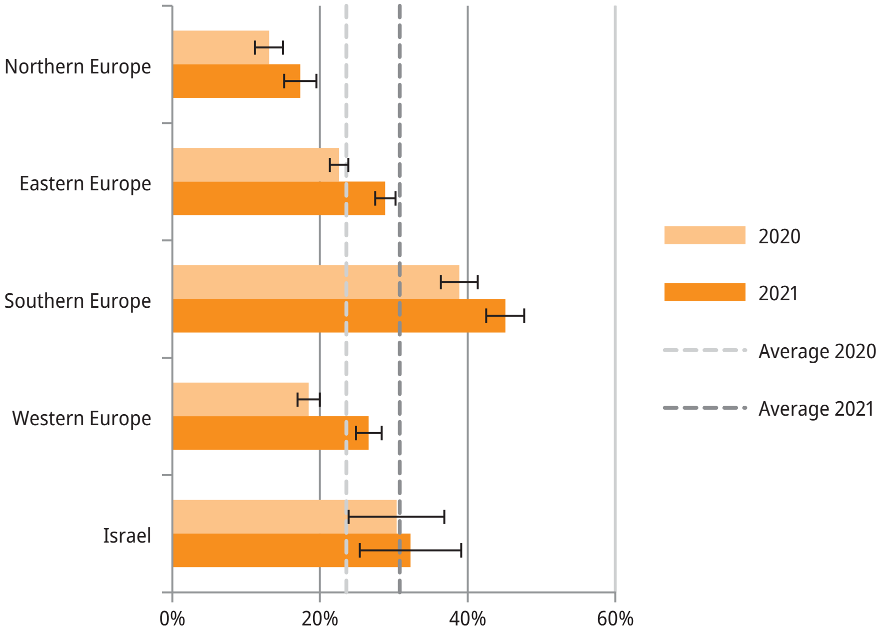

Figure 1: Share of individuals in households with income losses across European regions.
Source: SHARE Corona (W1 & W2), release 8.0.0, weighted, N_{SCS1} = 9,721, N_{SCS2} = 9,733.

On the other end of the distribution, the countries of Northern Europe had the smallest shares of respondents with losses of income, at about 13 percent in 2020 and 17 percent until 2021. Sweden and Denmark ranked among the countries with the fewest respondents who experienced income losses in both waves, while Finland ranked closer to the European average.

Less homogeneity could be found among the large group of Eastern European countries. While Czechia ranked second-lowest in 2020 and lowest in 2021 (at seven and 16 percent, respectively), Slovakia and Bulgaria had shares of respondents with income losses that were nearly as large as those in Southern Europe. However, most Eastern European countries were in the middle of the distribution.

The group of Western European countries had a below-average share of respondents with income losses, putting it between the Northern and Eastern regions. Of all SHARE countries, the Netherlands had the smallest share of respondents with income losses in 2020 (about five percent), and the fourth-lowest share until 2021 (at about 18 percent). Switzerland and France ranked fifth and sixth in both waves. In Germany, the share of affected individuals was close to average in both waves. In Austria, the share was in the lower midfield in 2020, but was below average by 2021. Israel is excluded from our depiction of European macro-regions. However, it had an above-average share of respondents with income losses in 2020 and an average share in 2021.

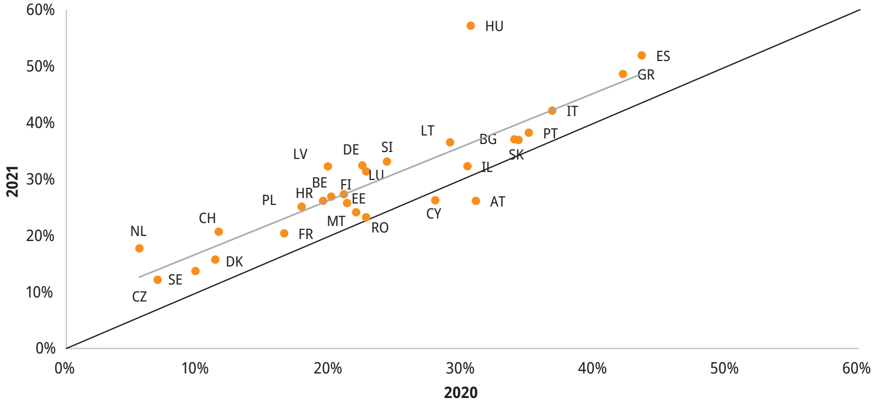

Figure 2: Share of individuals in households with income losses in each SHARE country.
Source: SHARE Corona (W1 & W2) release 8.0.0, weighted, N_{SCS1} = 9,919, N_{SCS2} = 9,931.

Changes over the waves can only be described in approximate terms. A staggering increase can be found in Hungary, which almost doubled its share of respondents with losses from 30 percent to just below 60 percent. Looking at country groups, the increase appeared to be largest in Western Europe and smallest in Northern Europe. Cyprus and Austria even experienced decreases, which must be attributed to weighting and to differences in the sample composition between the two waves.

3.2 The risk of income loss by individual and household characteristics

Education

Education might be an important determinant of how individuals compete on the labour market. As an additional benefit, individuals in white-collar jobs are more likely to be able to work remotely. Thus, they should be less likely to lose employment as a direct consequence of contact restrictions. We would therefore expect income losses to be larger among respondents with a lower level of education.

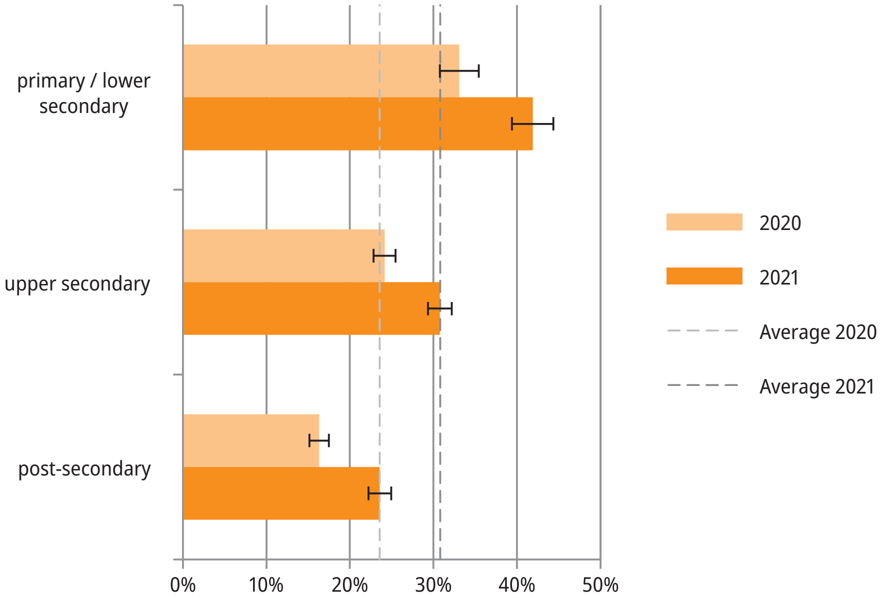

Figure 3: Share of individuals in households with income losses by education level.
Source: SHARE Corona (W1 & W2), release 8.0.0, weighted, N_{SCS1} = 9,504, N_{SCS2} = 9,263.

We construct education as a variable divided into three groups. At the lowest level, we group respondents with highest reported education at the primary or lower-secondary level. This corresponds to ISCED 1997 (UNESCO, 2006) levels zero to two, with level two corresponding to passing ninth or 10th grade. The medium level includes respondents with an education at the upper-secondary level, which corresponds to ISCED level 3. This level is often associated with earning a university entrance certificate. Finally, the group with the highest level of education is composed of respondents with a post-secondary education, such as a university degree (ISCED 1997 levels 4 and above).

Indeed, our data live up to our expectations, showing very clear differences by education. In both waves, income losses were lowest among respondents with a post-secondary education, and were highest among respondents with a lower secondary or primary education. The income losses in the group of respondents educated at the upper secondary level were close to average in both waves. To make matters worse, the development over the course of the pandemic was not friendly to the most affected group. The respondents with lower education levels experienced the biggest increase between waves, with about 40% of them being affected in the second wave.

Age group

Age could also be related to the respondents' position in the labour market. Part-time and irregular employment was more common among older workers, and they were less likely to find employment after losing their job.

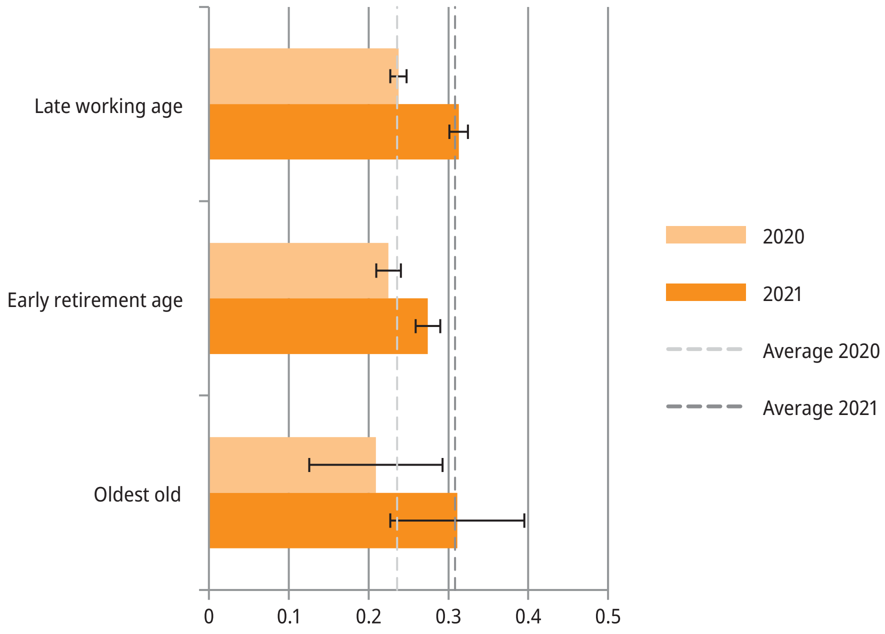

Figure 4: Share of individuals in households with income losses by age group.
Source: SHARE Corona (W1 & W2), release 8.0.0, weighted, N_{SCS1} = 9,919, N_{SCS2} = 9,931.

We construct three age groups. The youngest respondents of "late working age" were aged 50 to 65. The group of respondents of "early retirement age" were aged 66 to 80. It is important to keep in mind that the cases in our analysis were not necessarily retired, since our sample only contains individuals in households in which at least one respondent had been working before the pandemic. This means that all cases shown here were either working past the age of 65 or were living with a partner who was still working. Finally, the third group of respondents were the "oldest old" aged 80 years or older. Due to the sample restrictions mentioned above, this group was too small to make adequate claims about them, since only a very few respondents over age 80 were living in a household in which at least one person was working.

The income losses by age group are shown in Figure 4. We see almost no differences between age groups after the first months of the pandemic. However, a significant difference by age becomes apparent in the 2021 data. By 2021, more respondents in the youngest group had experienced a loss of income since the start of the pandemic. Thus, the share of affected respondents of late working age seems to have increased more strongly than the share among respondents of early retirement age.

Household size

In our last description of the covariates of income losses, we look at how household size affected the risk of suffering financial losses. Differences between household composition types could point to distinct vulnerabilities due to, for example, higher shares of labour income in the overall income, care responsibilities, or options for mutual financial support. We divided our respondents into groups according to household size: the first group consists of respondents living in single households, the second group is made up of individuals living in two-person households, and the third group includes all respondents living in households with three or more inhabitants.

However, household size did not make an observable difference in the income loss patterns. In both waves, the share of respondents with income losses was indistinguishable from the mean for all groups. This means that we did not see significant differences in the shares of respondents with income losses based on household size in either of the two waves.

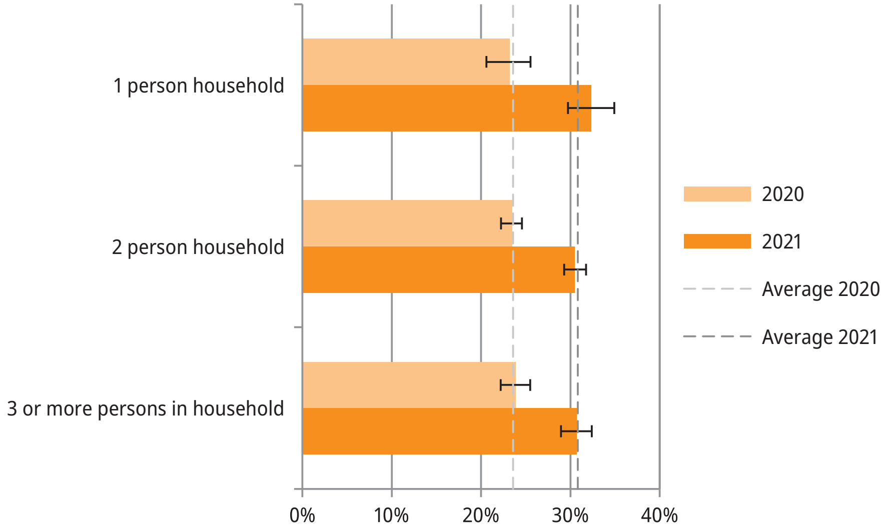

Figure 5: Share of individuals in households with income losses by household size.
Source: SHARE Corona (W1 & W2), release 8.0.0, weighted, N_{SCS1} = 9,919, N_{SCS2} = 9,931.

3.3 “Making ends meet” – a struggle for lower income households

Finally, we look at inequalities in the financial impact of the pandemic. For that purpose, we compare the ability to make ends meet by income tercile. The household’s ability to make ends meet is a subjective, but straightforward way to inquire about the respondents’ financial situation. It reflects not only their income, but also their spending patterns and the pressures they face. It also captures irregular sources of income, like support received from family and friends, without having to ask about it directly.

In order to position the households in the income distribution, we calculate the equivalised net household income using the OECD-modified scale (OECD, 2013), and then estimate income terciles within each participating country. The dependent variable is a question asking the respondents how they were able to make ends meet in the time period before the interview. We construct a binary variable in which we denote as struggling to make ends meet those respondents who indicated they had some or considerable difficulties making ends meet.

Overall, we see a slight reduction in the share of individuals struggling to make ends meet, from about 28 percent to 26 percent. This result is consistent with our previous finding that the number of individuals added to the cumulative

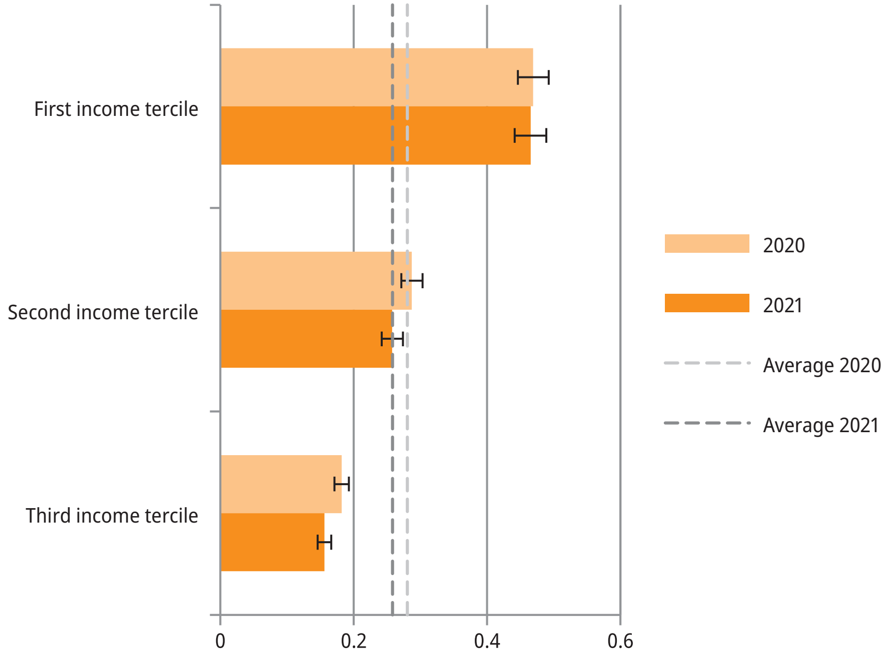

Figure 6: Share of individuals in households struggling to make ends meet by income tercile.
Source: SHARE Corona (W1 & W2) release 8.0.0, weighted, N_{SCS1} = 9,854, N_{SCS2} = 9,726.

count of respondents with income losses was smaller in the second wave than in the first wave.

It is very clear that income tercile was a strong predictor of financial difficulties. Almost half of the respondents in the lowest tercile had difficulties making ends meet in both 2020 and 2021, compared to well below 20 percent in the highest tercile. Moreover, the share of individuals struggling to make ends meet in the lowest income tercile seems to have remained constant over both years. Meanwhile, respondents in both the middle and the highest tercile had improved their situation by 2021.

It therefore appears that respondents in the lowest tercile were not able to recover their losses during the pandemic to the same extent as respondents in the upper terciles. Individuals in the middle and top terciles seem to have been able to compensate for at least some of their losses, whether by regaining employment or by changing their consumption patterns. However, it appears that individuals in the lowest tercile did not have these options available to the same extent.

4 Conclusions

Our analyses gave a bird's eye overview of a few landmarks indicating the financial struggles individual households in the SHARE countries faced during the COVID-19 pandemic. On the regional level, we see clear differences between the European macro-regions. Comparatively few individuals in the Northern European countries faced income losses, whereas individuals in Western Europe and Eastern Europe were more likely to have experienced income losses, and individuals in Southern European countries were the worst off. When we took a more detailed view, we observed considerable heterogeneity within the groups, especially in the large group of countries we classified as Eastern European. Czechia fared relatively well, but Slovakia, Bulgaria, and Hungary had rather high shares of individuals with income losses. This was surprising given that Czechia had many more COVID-19 cases much earlier than the other three countries (see, e.g., Dong et al., 2020).

Regarding the individual characteristics, we observed that during the COVID-19 pandemic, well-known patterns of inequality were replicated. On an objective level, we could show that income losses were closely related to educational attainment, i.e., that individuals with lower levels of education faced higher risks of experiencing a loss of household income during the pandemic. More subjectively, the analyses pointed out that making ends meet was particularly hard for households in the lowest income percentile, and that this problem was more persistent for them as the pandemic dragged on than it was for households with a more favourable initial economic situation.

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Ivo Bakota

23 Pandemic lockdowns: The role of economic and demographic structures

Key points

- During lockdown episodes, governments had to balance the benefits of slowing the spread of COVID-19 with the risks of hurting the economy. However, the slowdown of the spread of the virus and the slowdown of the economy affected different population subgroups differently.
- The SHARE Corona surveys showed that people with relatively high salaries before the COVID-19 epidemic were more likely than people with lower-wage jobs to continue working from home. This pattern is observed across European countries. The likelihood of continuing to work during the pandemic differed across sectors as well.
- These heterogeneities among social groups are quantitatively important. When they are accounted for in a hybrid epidemiological/economic model, they lead to a change in the optimal government-imposed lockdown policies.

1 Introduction

When formulating lockdown policies in the middle of the COVID-19 pandemic, governments were faced with a complex choice. In a sense, they needed to weigh the health of the population, which would be protected by lockdowns that slowed the spread of the virus, against the economic damage that such lockdowns could cause. To add to this complexity, governments had to consider the different preferences regarding lockdowns that various groups in society would have. For example, people who were in frail health and whose income did not depend on non-essential businesses would arguably view lockdown policies much more favourably than people who were in good health and whose income depended on non-essential businesses. People's preferences would likely also depend on the reimbursement schemes that the government provided for the closed-down companies, or on their ability to perform work from home.

These starkly heterogeneous preferences for or against the imposition of lockdowns warrant detailed investigation. This study is also motivated by the increased political tensions and protests caused by the lockdown policies, the burdens and the benefits of which were unequally distributed in the population. To improve our understanding of these motives, I studied them in a framework of a model that consists of an economic part and epidemiological part. Studying these questions through the lens of a model has the advantage of enabling scientists to

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construct hypothetical scenarios (counterfactuals), and to evaluate how favourable they would be for different agents in the economy. This is a useful approach, given that experiments conducted at the level of society are either impractical or inhumane. Furthermore, the outcomes in different countries that pursued different policies cannot simply be compared, since the differences in outcomes would be caused not only by the differences in policies, but also by all the other differences in the characteristics of the countries.

The model aims to explore what the preferences regarding lockdown policies were among different groups in society before the vaccines became widely available. Furthermore, it seeks to analyse how the composition of the economy influenced the overall optimal lockdown policies by the social planner. To do so, I extend the model by Glover et al. (2020) to include household heterogeneity in income, differences in the sector-specific risk of infection, and differences in the ability to work from home. I use data from the second wave of the SHARE Corona survey to calculate several parameters in the model.

2 SHARE Corona Wave 2 and heterogeneity

I use SHARE data to explore whether there are some important heterogeneities that the model by Glover et al. (2020) did not capture. The data from the second Corona survey were merged with the data from the SHARE Wave 8, which was collected just before the pandemic started. This is a useful feature of the SHARE data, as it enables me to control for the heterogeneity that was present before the pandemic. The data are eventually used to pin down several parameters in the model. I find several potentially important heterogeneities in the data.

First, I document the correlation between individuals' income and their ability to work from home. On average, 21.4% of the workers in the sample worked primarily from home. When split into three different income groups (in their respective countries), the differences were vast. I find that individuals with higher incomes were more likely to have the opportunity to work from home. On average, 16% of respondents who were in the lowest income tercile in their respective countries had worked primarily from home since the start of the pandemic until the interview. The share of individuals in the middle tercile of the income distribution who were working from home was only slightly higher, at 16.3%. However, on average, 32% of respondents in the top income tercile were primarily working from home during this period. This finding is potentially important for the model, since the individuals who could continue their work from home might have viewed the lockdown policies more favourably. It is interesting to note that individuals in the top earning terciles made the substantive difference. Therefore, the distribution was skewed. Furthermore, it is important to keep in mind that the income data date from the end of 2019 and the beginning of 2020 (SHARE Wave 8, i.e., before the start of pandemic). Consequently, the correlation was driven not only by the individuals who were able to work from home, and were therefore able to earn higher incomes; but also by those individuals who had higher incomes before the pandemic and the lockdowns started.

Second, of the sample of respondents who were working in service sectors (excluding healthcare), and had not been primarily working from home, 12.11% had tested positive for COVID-19, compared to 10.93% of individuals who had not been working in service sectors. When interpreting this difference, it is important to keep in mind that not all infections happen at the workplace. It is easy to imagine that the non-workplace infection rates of individuals employed in service sectors and of individuals employed in non-service sectors were more similar than their workplace infection rates. Therefore, the differences in the *workplace* infection risk that service sector and non-service sector workers faced might have been substantially larger than the overall infection rate differences reported above.

Finally, 21.5% of respondents who were not working in service sectors were primarily working from home, compared to only 15% of respondents in service sectors (excluding the healthcare sector).

Figure 1 shows the ratio of wages earned by agents primarily working from home and the average wages in the sample. We can see that the ratio was higher than one in most of the countries. Some countries are not shown due to small sample size.

The descriptive statistics are potentially important by themselves. Nonetheless, I also use the information on the heterogeneity obtained from the SHARE data to inform an economic-epidemiological model; i.e., to pin down different parameters of the model. I then analyse how the introduction of these heterogeneities would change the optimal policy of the government in the given model. Furthermore, I compute the different preferences of these heterogeneous groups regarding lockdown policies.

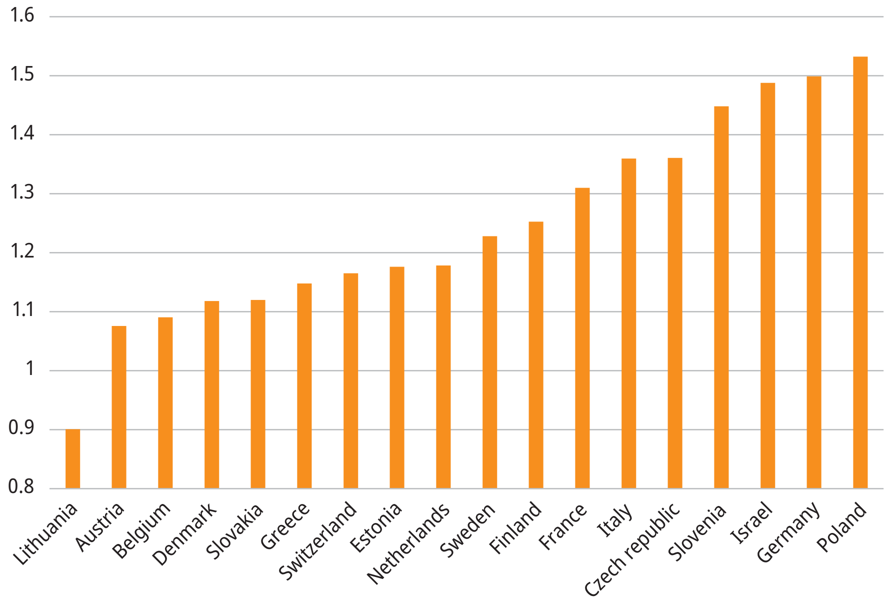

Figure 1: Ratio of wages earned by respondents working primarily from home and average wages in 2019.
Source: own calculations based on SHARE Wave 8 and SHARE Corona (W2) (release 8.0.0).

3 Model

This model consists of two interconnected parts: an economic part and an epidemiological part. The epidemiological part of the model is an augmented SIR (susceptible, infected, recovered) type. The infection stage is broken down into multiple stages: asymptomatic, feverish, and requiring hospitalisation (emergency). Together, this creates the abbreviation SAFER. The model is based on and augments the model from Glover et al. (2020) to include different types of non-essential sectors (service sectors and non-service sectors), income inequality, and ability to work from home. Only a sketch of the model is provided here; a more detailed model specification should be available in the online working version of the paper.

3.1 Economic part of the model

I model a society populated by individuals who maximise their utility, which is increasing their income (consumption); but which decreases if they become sick, are hospitalised, or eventually pass away.

The model distinguishes between young people who work and old people who are retired and receive pensions. Young people can work in essential sectors (which are assumed to never close down) and in non-essential sectors. If they are working in non-essential sectors, they can be employed in the service sector or the non-service sector, and they might have the ability to work from home. In addition, all workers are divided into three income groups: low, middle, and high earners. Thus, the individuals in the model have a high degree of heterogeneity.

The government (social planner) in this model has two decisions to make in each period: first, the government decides how much of the non-essential sector will be locked down; and, second, it decides how many resources will be redistributed from working to non-working agents.

During a lockdown, a certain share of workers in the non-essential sector are not working, and the production in that sector declines proportionally. A certain share of workers can continue to work from home, but are potentially less productive. Closing down part of the non-essential sector will slow the spread of the virus, but at a cost of decreased output and consumption.

3.2 Epidemiological part of the model

The epidemiological part of the model is based on the SAFER model from Glover et al. (2020). SAFER is an abbreviation for different health states that the agents may find themselves in: susceptible, asymptomatic, feverish, emergency (hospitalised), and recovered (similar to vaccinated). It is useful to explicitly model different infection states, since asymptomatic people go to work and can infect others, while hospitalised people require additional resources from society to take care of them.

The transitions between these states are probabilistic. The probability of moving from one state to another depends on the age of the person, the sector the person works in, whether the person goes to a workplace, the number of infected people in the society, the mitigation policies of the government, etc. The probability that a hospitalised person will die additionally depends on the overcrowdedness of the hospitals.

The epidemiological part is connected to the economic part of the model in the following ways. First, if sick and deceased people cannot go to work, the production of the economy will be lower. Second, the government can slow down the transition of susceptible individuals to the asymptomatic and feverish state by making the lockdown more strict (closing down a larger share of the non-essential sector), but this will also lead to reduced production in that period. This is the main trade-off in this model.

3.3 Calibration and epidemiological assumptions in the simulations

Most of the parameters are taken from Glover et al. (2020). As I described earlier, I use SHARE data to inform the additional parameters. The starting date of the model is 22 March 2020. Therefore, the reported optimal policies are computed based on the assumption that vaccines were not widely available at that time. However, the social planner assumes that vaccines will be available at a future date. Exogenous jumps in the rates of infection on 22 March and on 20 September are calibrated to match the peak infection rates in Germany in early 2021 and the number of deaths in Germany by June 2021. Additional waves after winter 2020/2021 are not modelled and considered. Transitions from the recovered to the susceptible state are calibrated so that after six months, half of the originally immune individuals have lost their immunity. The social planner's (government's) mitigation policy is restricted to a certain parametric function of time, while the redistribution policies are (linearly) fully optimal.

4 Model results

I simulate the model with several specifications, and find that different groups have starkly different preferences regarding lockdown policies. Only a subset of the results is reported; a more detailed exposition is available in the online working version of the paper. I calculate the optimal lockdown stringency (the share of non-essential sectors that are closed down over a certain period of time) when the government seeks to maximise the welfare of all individuals equally. I also calculate the optimal lockdown stringency for a certain group: i.e., when the government seeks to maximise the welfare of a certain group in the society, while ignoring other groups. If the optimal lockdown policy calculated in the way described above is stricter (closes down a larger share of the non-essential sector and for a longer time) for group A than for the group B, I conclude that group A prefers stricter lockdowns.

An obvious finding is that retired (older) agents prefer the stricter lockdown (mitigation) policy. This is because older people are more likely to become sick and hospitalised if they get infected with COVID-19. Additionally, older people do not work, so they feel the economic burden of lockdowns only indirectly.

When workers in service and non-service sectors are observed, interesting trade-offs emerge. As individuals working in service sectors face a higher infection risk at work, lockdowns would benefit their health more. However, as these individuals are less able to work from home, the economic damage of lockdowns is greater for them. Overall, for service sector workers, lockdowns are more beneficial, but they are also more costly.

High-income individuals prefer stricter lockdowns than average earners, since they are, on average, more able to continue working from home. Additionally, they are better positioned to handle a decrease in income due to the disruption of businesses during lockdowns. However, this result holds only if we assume that the government's reimbursement plans ensure that lost income is reimbursed proportional to the income earned prior to the lockdowns. If the reimbursement scheme involves subsidies to the unemployed that do not depend on the individual's previous income, the existing result may even be overturned! This means that the support for lockdowns among different groups may depend heavily on the accompanying government scheme for compensating individuals for their lost income. If the reimbursement for non-working agents is same for everyone, irrespective of the person's previous (lost) income, it is the poorer agents who prefer stricter lockdowns. This is the case despite their lower ability to work from home.

Failing to include these important heterogeneities in the model can significantly influence the results. This means that in the absence of these heterogeneities, the model would identify different optimal policies for the utilitarian government (taking everybody into account equally).

5 Conclusions

In this chapter, I documented the correlation between people's income prior to the pandemic and their ability to work from home during the pandemic, and the correlation between working in the service sector and infection incidence. These data were used to inform a hybrid epidemiological and economic model. When these differences were introduced into the model, the results showed that these different subgroups of society tend to have starkly different preferences regarding lockdown policies. However, the model also indicated that the preferences of various groups for different lockdown policies can heavily depend on the government's reimbursement strategy for the closed-down sectors. Thus, ignoring such documented heterogeneities might result in the formulation of suboptimal lockdown policies.

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Part V Social and geographical patterns

Edited by Howard Litwin

Michael Bergmann and Melanie Wagner

24 Receiving care at home during the COVID-19 pandemic: Revisiting the situations of care recipients 18 months after the outbreak of SARS-CoV-2

Key points

- Care services for older adults were more widely available in 2021 than one year previously.
- Unmet care needs also declined considerably over this period.
- Nevertheless, the physical and mental health of care recipients were strongly affected by the pandemic.
- Policymakers and health care institutions should actively support older adults in need of care in order to prevent a further deterioration of their health.

1 Background

In the first phase of the COVID-19 pandemic, in 2020, several health-related issues arose among older Europeans in need of care. Beyond their regular care needs, the chronic health conditions of this population made them more pre-disposed to severe COVID-19 infections. Moreover, epidemiological control measures, such as physical distancing and stay-at-home requirements, which were imposed at least temporarily in almost all European countries, also affected the situations of care-dependent older adults.

Studies from the first phase of the pandemic revealed that many care recipients had discontinued paid home services because of a fear of infection, or because they were advised to do so (Evandrou et al., 2020; Giebel et al., 2021); and that care recipients often chose to forego medical treatments (Smolić et al., 2021), and experienced greater physical and mental health problems (Bergmann and Wagner, 2021). Correspondingly, help from family and friends was found to have increased during this phase (Evandrou et al., 2020).

In this chapter, we revisit the situations of care recipients using data from the second SHARE Corona Survey (SCS2), which was fielded in 2021; and compare them to the situations of care recipients immediately after the start of the pandemic based on data from the first SHARE Corona Survey (SCS1), which was conducted in 2020. We consider how the care older people received and their unmet

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care needs developed over the course of the pandemic, and look at the variation in these trends across Europe. We also compare the evolution of the physical and mental health of care recipients and of non-care recipients. We conclude with a discussion of the lessons learned, and ask whether we are better prepared to protect this high-risk group should incidence rates rise again in the future.

2 Data and Methods

The following analyses use data from the first and second SHARE Corona Surveys, which were fielded in the summers of 2020 and 2021, respectively, in 27 European countries and Israel (see Scherpenzeel et al., 2020 for further information on the SHARE Corona Survey). As the second survey re-interviewed respondents from the first survey, we are able to examine changes in individuals from the start of the pandemic until about one year later. Moreover, we draw on data from the regular SHARE panel study to provide additional information on different respondent characteristics. Overall, our analyses are based on data from 57,190 respondents who were interviewed in summer 2020, 49,063 of whom were re-interviewed in summer 2021.

First, we compare the regional differences in the weighted prevalence of receiving home care in summer 2021 with those in the first phase of the pandemic one year previously. Then, we analyse whether the share of respondents who reported having difficulties in accessing care changed during the pandemic. Finally, we investigate the differences in the physical and mental health of care recipients and of non-care recipients over time, controlling for individual respondent characteristics using adjusted predictions. To measure the use of home care services, we draw on responses to the following question in the first SHARE Corona Survey: "Did you regularly receive home care before the outbreak of Corona?" In the second SHARE Corona Survey, the time frame of the question was slightly adapted to avoid country differences in the development of the pandemic: "During the last three months, did you regularly receive home care, provided by someone not living in your household?" This question was followed by a request to indicate the frequency of the care and the provider of the care (if applicable): "Compared to the first wave of the pandemic, how often did you receive home care from [care provider] in the last three months? Less often, about the same, or more often?" The list of potential care providers included the respondent's children, parents, other relatives, other non-relatives, and professional care providers. All analyses are run using Stata 14.2, with weights provided by the SHARE coordination team.

3 Results

3.1 Changes in the care received over the course of the pandemic

While the 2020 survey found that 5.8% (n = 3,629) of respondents were receiving regular home care before the start of the pandemic, in the 2021 survey, some 7.1% (n = 3,497) of respondents reported receiving regular home care in the preceding three months. In terms of regional variation, the largest increase was observed in the Baltic States (Estonia, Latvia, Lithuania) and Western Europe (Austria, Belgium, France, Germany, Luxembourg, the Netherlands, Switzerland), followed by Southern Europe (Croatia, Cyprus, Greece, Israel, Italy, Malta, Portugal, Slovenia, Spain). In contrast, there was almost no change in the share of respondents who were receiving regular home care in Eastern Europe (Bulgaria, the Czech Republic, Hungary, Poland, Romania, Slovakia), and there was a decrease in Northern Europe (Denmark, Finland, Sweden; see Figure 1).

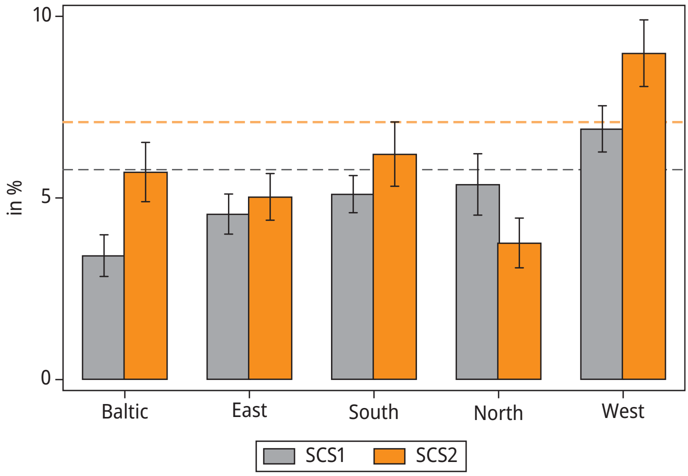

Figure 1: Percent of Respondents Receiving Home Care from Outside their Own Household (before the COVID-19 Outbreak (first SHARE Corona Survey) and during the Previous Three Months (second SHARE Corona Survey)).
Source: SHARE Corona (W1), release 8.0.0 (SCS1: n = 57,190; weighted) and SHARE Corona (W2), release 8.0.0 (SCS2: n = 49,063; weighted) with 95% confidence intervals.

In 2021, home care was mainly provided by professional care providers (69%) and by children (36%), while relatives and non-relatives (11% each) provided care to a lesser extent. In addition, there were large regional differences. Professional care providers accounted for the bulk of care provision in Western (85%), Northern (78%), and Southern Europe (58%), while children played a much more prominent role in care provision in Eastern Europe (64%) and the Baltic States (61%).

3.2 Unmet care needs throughout the COVID-19 pandemic

During the first phase of the pandemic, about every fifth (n = 759) care recipient reported having difficulties accessing home care. Around one year later, the share of care recipients who reported having difficulties had declined considerably, to about 5% (n = 195). The largest decreases in this share were in Western and Southern Europe, which were the hardest hit countries in the first phase of the pandemic. In contrast, the differences were not significant in the Eastern, the Baltic, and the Northern states (see Figure 2).

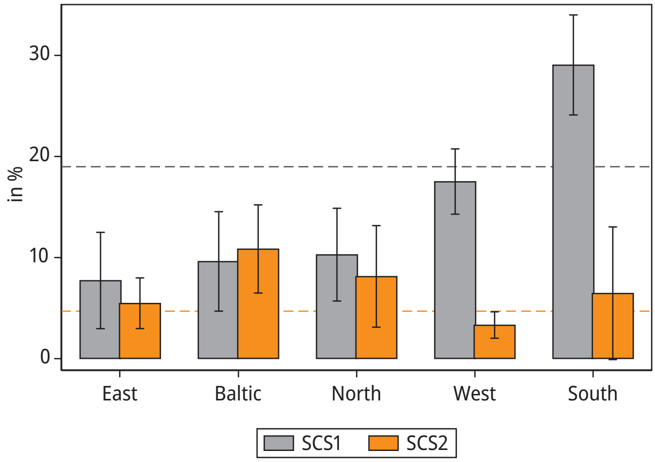

Figure 2: Percent of Care Recipients Reporting Difficulties Accessing Home Care since the COVID-19 Outbreak (first SHARE Corona Survey) and during the Preceding Three Months (second SHARE Corona Survey).
Source: SHARE Corona (W1), release 8.0.0 (SCS1: n = 3,609; weighted) and SHARE Corona (W2), release 8.0.0 (SCS2: n = 3,481; weighted) with 95% confidence intervals.

When the respondents who reported having difficulties accessing care in 2021 were asked about the specific reasons why, 32% said that they could not get to the place where they typically received care (such as day care centres); another 27% said that caregivers came to their home, but less often; 21% reported that caregivers could not come to their home at all; around 16% reported having financial difficulties; and 21% cited “other difficulties” not specified.

3.3 Physical and mental health effects of the COVID-19 pandemic

Finally, we analysed whether and, if so, how the respondents’ physical and mental health were affected by the pandemic. The results indicated that there were considerable changes in various aspects of the respondents’ health between the first and the second SHARE Corona Surveys in 2020 and 2021 (see Table 1). For example, while 35% of the care recipients said in the first survey that their physical health was poor or fair before the pandemic, this share increased significantly, to 50%, in the second survey. For the non-care recipients, this share also increased significantly, from 27% in 2020 to 35% in 2021. However, the relative increase in poor health was larger among the care recipients than among the non-care recipients. These findings suggest that the health of the care recipients was more negatively affected by the pandemic than the health of the non-care recipients.

In addition, the results indicated that more care recipients than non-care recipients were personally affected by COVID-19, meaning that they had symptoms, tested positive for the virus, or were hospitalised because of a COVID-19 infection. While in the first SHARE Corona Survey, 3% of both care and non-care recipients had been affected, in the second survey, this share had risen significantly, to 12% among care recipients and to 7% among non-care recipients. Thus, while the two groups were equally affected by COVID-19 in the first phase of the pandemic, there was a five-percentage-point difference in how they were affected in the second phase of the pandemic. That is, the increase in exposure to COVID-19, and to the potentially negative health effects of the virus, was significantly larger among care recipients than among non-care recipients.

To measure the mental health of older adults, the respondents were asked in the second SHARE Corona Survey whether they had felt sad or depressed in the last month, and how these feelings had changed since the first survey. Among the non-care recipients, the share of those who reported feeling sad or depressed rose only slightly (28% vs. 30%). Among the care recipients, this share increased significantly, by nine percentage points, from 34% to 43%. Thus, the increase in this share between 2020 and 2021 was much larger for the care recipients than for the non-care recipients, which indicates that there was a worsening of mental health among people in need of care in particular.

Feelings of nervousness or anxiety were also found to have increased over the course of the pandemic. In the second SHARE Corona Survey, 39% of the care recipients reported feeling nervous or anxious, an increase of five percentage points. For the larger number of non-care recipients, this share rose by around two percentage points, from 30% to 32%. Moreover, the two groups differed significantly in their probability of reporting feelings of nervousness or anxiety in the first SHARE Corona Survey (by four percentage points), as well as in the second survey (by seven percentage points), which indicates that there was a growing gap between care recipients and non-care recipients in the likelihood of reporting these feelings.

A similar picture emerged with regard to sleeping problems. In the second survey, 31% of the non-care recipients (+3 percentage points) and 41% of the care recipients (+14 percentage points) reported having sleeping problems. Thus, the increase was significantly larger among care recipients than among non-care recipients. We also note that while the proportion of respondents who reported having sleeping problems hardly differed between the two groups in the first SHARE Corona Survey (27% for care recipients vs. 28% for non-care recipients), the care recipients reported having significantly more sleeping problems in the second survey (41% vs. 31%).

Finally, a large proportion of respondents reported having feelings of loneliness in both surveys. However, the gap in the share of care recipients and of non-care recipients who reported feeling lonely was significant in both the first (four percentage points) and the second SHARE Corona Survey (eight percentage points). In addition, the increase in the likelihood of reporting feelings of loneliness between the first and the second survey was only significant for the care recipients (four percentage points).

Table 1: Physical and Mental Health Outcomes of Care and Non-Care Recipients in the First and the Second SHARE Corona Survey.

		1st SHARE Corona Survey		2nd SHARE Corona Survey		Change over Time by Care Status
		Share (%)	Difference by Care Status	Share (%)	Difference by Care Status	
Physical Health						
Poor/fair self-rated health	Care Recipient	35%	***	50%	***	***
	Non-Care Recipient	27%		35%		***

Table 1 (continued)

		1st SHARE Corona Survey		2nd SHARE Corona Survey		Change over Time by Care Status
		Share (%)	Difference by Care Status	Share (%)	Difference by Care Status	
Affected by COVID-19	Care Recipient	3%	n.s.	12%	***	***
	Non-Care Recipient	3%		7%		***
Mental Health						
Sad/ depressed	Care Recipient	34%	***	43%	***	***
	Non-Care Recipient	28%		30%		*
Nervous/ anxious	Care Recipient	34%	**	39%	***	*
	Non-Care Recipient	30%		32%		**
Sleeping problems	Care Recipient	27%	n.s.	41%	***	***
	Non-Care Recipient	28%		31%		***
Lonely	Care Recipient	33%	***	37%	***	*
	Non-Care Recipient	29%		29%		n.s.

Significance: *** = 1%, ** = 5%, * = 10% (significances based on average marginal effects (AMEs)).
Notes: Entries are adjusted predictions, controlled for sex, age, level of education, household composition, area of residence, economic status; as well as for self-rated health, ADL, IADL, and GALI before the pandemic; and country of residence.
Source: SHARE Wave 8, release 8.0.0 and SHARE Corona (W1 & W2), release 8.0.0 (weighted).

4 Conclusion

In sum, between summer 2020 and summer 2021, the situations of care recipients improved in the sense that care from outside the household had become more widely available, and they were less likely to report having difficulties accessing home care. This was particularly the case for care recipients living in countries that were hit the hardest by the first phase of the pandemic. Many of these countries implemented more stringent epidemiological control measures, which may, in turn, have increased the need for informal care. Nevertheless, care recipients were still much more likely than non-care recipients to report that they had physical and mental health issues. Indeed, the differences in physical health, depressive symptoms, and sleeping problems between the two groups widened.

In light of these results, policymakers and health care institutions should pay special attention to older adults in need of care to prevent their health from further deteriorating. Moreover, formal care services should remain open in future lockdowns so that people who need care can continue to receive it. Policymakers have an obligation to ensure the safety of care-dependent older people. Thus, any epidemiological control measures need to be balanced against the possible physical and mental health effects that may result from the closure of therapeutic facilities, the postponement of medical treatments, and/or the implementation of stay-at-home orders. We showed in our study that care recipients had more serious health issues during the pandemic than their non-care-dependent counterparts. Therefore, policies should be designed to limit the health risks of the most vulnerable group of older adults during major health crises.

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Andrej Srakar

25 Effects of lockdown measures on receiving home care during the COVID-19 pandemic: A subgroup analysis

Key points

- Government-imposed lockdown and containment measures had varying effects on home care provision in different countries during the COVID-19 pandemic.
- This association was not always related to the welfare regime of the country.
- We propose a new typology of countries based on the relationship between lockdowns and home care provision.

1 Introduction

During the COVID-19 pandemic, the rapid spread of the coronavirus initially led many governments to implement severe lockdown measures that drastically affected the daily lives of the population, and required citizens to remain isolated for extended periods of time. For those older adults with higher health risks, the effects of the pandemic and the quarantine were particularly notable. Specifically, their ability to access needed home care services and other essential life supports was negatively affected. In addition, a disproportionately high rate of COVID-19-related mortality was observed among this group (Pereiro et al., 2021; Dichter et al., 2020).

In the present study, my aim is to analyse the effects of the lockdowns on home care provision in different countries. To this end, I use datasets from the first and second SHARE Corona surveys to address several questions. First, did the lockdowns indeed affect home care provision? Second, if such effects can be observed, did they vary significantly across European countries and Israel? Third, were these effects conditional on key socio-economic indicators? To address the third question, I consider the variables of gender, age, education, income, health and labour status, and household and family characteristics.

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2 Variables

In the analysis, I used the following five dependent variables from the second SHARE Corona survey as proxies for home care provision during the COVID-19 epidemic (each variable was analysed individually, and was of a binary nature):

- CAS020_: Since the outbreak of Corona, were you helped by others from outside of home to obtain necessities, e.g. food, medications or emergency household repairs? 0. No; 1. Yes (Helped);
- CAS026_: Since the outbreak of Corona, did you face more difficulties in getting the amount of home care that you need? 0. No; 1. Yes (Difficulties);
- CAS027_: Which difficulties were they?
  1. I had to pay more to get the help I need (Pay More)
  2. People who cared for me could not come to my home (Not Come)
  3. Other difficulties (Other)

The socio-economic variables mentioned above were drawn from the first SHARE Corona survey dataset. Moreover, I considered two additional variables that are available from the Our World in Data (OWID) dataset on COVID-19, which includes extensive time series information on around 100 variables for all countries around the world. I looked specifically at stringency (the average value of the stringency index for each country in the study over the entire period of the pandemic), and the number of infections (the average total number of COVID-19 infections per million citizens for each included country). The stringency index is a composite measure based on nine response indicators, including school closures, workplace closures, and travel bans, rescaled to a value from zero to 100 (100 = most stringent). The stringency variable served as the variable of interest: that is, as the main factor that explains having had problems receiving home care during the COVID-19 epidemic. The number of infections indicator served as a control variable that took into account the severity of the epidemic in each country.

I expected to find an adverse effect of the stringency of containment measures on the provision of home care. Hence, I formulated the following main hypothesis: the more severe the government's epidemiological control measures were, the more negative their effect on the amount of home care provided was.

3 Analysis

I used general regression specifications, but adopted a Bayesian approach due to expected heterogeneity in estimated regression effects. Thus, instead of multilevel regressions, I used a nonparametric Bayesian causal inference approach: namely, Bayesian additive regression trees (BART), developed by Chipman et al. (2010) and later extended in several papers. The model allowed for an overview of the heterogeneity of regression coefficients across both countries and subgroups of selected indicators (gender, age, education, income, health and labour status, and household and family characteristics). This approach provided a detailed and rich assessment of the effects of lockdowns on home care provision. It was implemented in the R package dbarts.

4 Results

Table 1 shows the descriptive statistics for the five dependent variables (the analysis was repeated separately for each of them). The highest percentage of respondents receiving help from others (Helped), was observed in Israel, Cyprus, France, Greece, and Belgium. These five countries also reported having experienced the greatest difficulties in home care provision (Difficulties). A similar pattern could be observed for all three of the separate categories of the difficulties experienced in receiving home care, with a few additional countries reporting high numbers as well, such as Slovakia for problems with payments for home care (Pay More), and Italy for problems with access to the home (Not Come).

Figure 1 shows the average values for the key explanatory variable: the stringency of the epidemiological control measures imposed by governments. The most severe measures were observed in Italy, Greece, Cyprus, France, Germany, Portugal, and Israel. The least severe measures were found in Estonia, Finland, Latvia, Lithuania, and Luxembourg.

To assess the basic relationships between the main variables, a multilevel regression specification was used in which country served as the second-level variable. The results of this analysis confirmed the hypothesis in relation to three of the five outcome measures: general problems with receiving home care (Difficulties), problems with accessing the home (Not Come), and other difficulties with receiving home care (Other). These results show that the severity of the control measures had an enhancing (adverse) effect. However, the effect was not always statistically significant, which raises the question of whether the relationship was linear.

As I explained above, I modelled the heterogeneity in the effects using a Bayesian additive regression trees model. In this analysis, the results confirmed that the relationship between the severity of the government measures and the outcomes (having problems in receiving home care) was indeed far from linear.

Table 1: Sample description for receiving home care.

Country	Helped (%)	Difficulties (%)	Pay More (%)	Not Come (%)	Other (%)	D (N)
Belgium	7.27	1.47	0.00	1.21	0.39	5,922
Bulgaria	6.13	0.45	0.00	0.45	0.15	1,525
Croatia	3.50	0.58	0.13	0.52	0.19	3,462
Cyprus	10.99	1.70	0.62	0.46	1.08	1,354
Czechia	2.36	0.05	0.00	0.05	0.00	4,552
Denmark	2.99	0.43	0.05	0.27	0.22	3,674
Estonia	3.03	0.36	0.06	0.25	0.22	6,739
Finland	4.01	0.17	0.00	0.09	0.17	1,977
France	8.28	2.53	0.00	2.30	0.23	3,704
Germany	5.58	0.42	0.05	0.19	0.19	4,203
Greece	7.96	4.57	0.10	4.31	0.95	5,720
Hungary	4.28	0.66	0.00	0.16	0.49	2,054
Israel	17.11	5.27	0.15	3.97	1.76	2,531
Italy	3.80	0.69	0.00	0.60	0.13	5,863
Latvia	3.51	0.11	0.00	0.11	0.00	1,485
Lithuania	6.01	0.74	0.32	0.32	0.63	2,318
Luxembourg	4.93	1.15	0.00	1.15	0.00	1,798
Malta	3.38	0.62	0.00	0.46	0.31	1,443
Netherlands	3.51	0.42	0.00	0.28	0.14	2,814
Poland	4.31	0.12	0.04	0.08	0.08	5,876
Portugal	1.90	0.32	0.00	0.11	0.21	1,822
Romania	1.07	0.08	0.08	0.00	0.00	2,745
Slovakia	4.73	0.90	0.26	0.64	0.13	1,468
Slovenia	2.96	0.32	0.04	0.24	0.08	5,398
Spain	7.11	1.47	0.12	0.94	0.53	4,810
Sweden	6.94	0.43	0.00	0.21	0.32	3,407
Switzerland	6.19	0.51	0.00	0.34	0.25	2,878

Source: SHARE Corona (W1), release 8.0.0.

Figures 1 and 2 display partial dependence plots that show the marginal effects that one or two features had on the predicted outcomes in a model. For the observed statistically significant effects in Table 2 (variables Difficulties, Not Come, and Other) we can observe the following:

– For Difficulties – i.e., general problems with receiving home care – most problems were experienced in countries with less (i.e., below 50) or with more (i.e., above 60) severe COVID-19 containment measures. The relationship in the middle of the distribution (values between 50 and 60) was lower, and countries with government containment measures with an average level of severity (for example, Belgium, Hungary, the Netherlands, Poland, Spain) seem to have experienced the fewest difficulties.

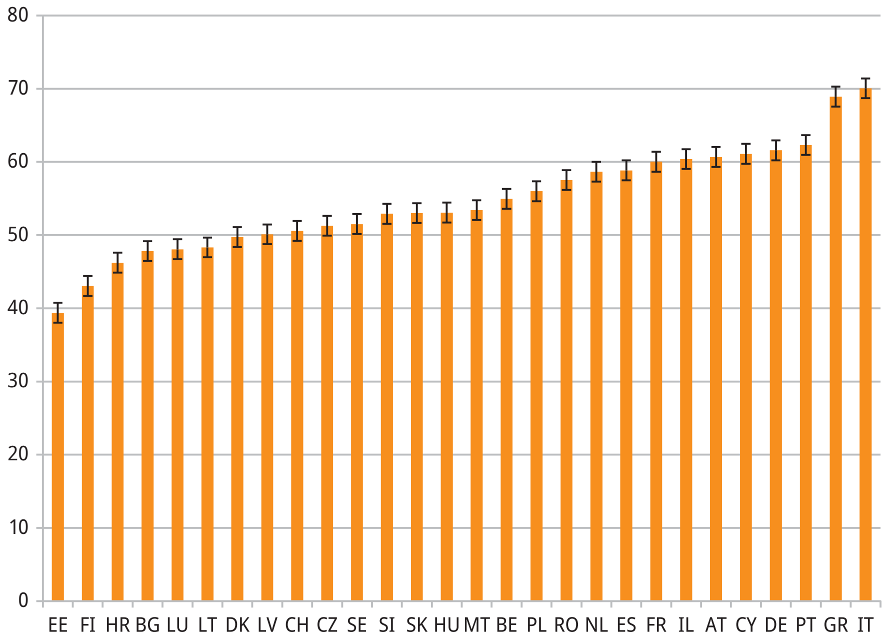

Figure 1: Average values of the severity of governmental measures.
Source: Own analysis based on Our World in Data dataset.

– For Not Come, the dynamics were even more pronounced. Countries with a stringency score in the low middle range (50–55) (e.g., the Czech Republic, Hungary, Malta, Slovakia, Slovenia) seem to have experienced the most difficulties in ensuring access for home carers, while countries with values in the range of 55–60 (e.g., the Netherlands, Poland, Romania, Spain) were on the other end in this spectrum, with significantly fewer problems.
– For Other – i.e., other difficulties – the situation reversed again, with countries with values in the range of 55–60 (as mentioned before: the Netherlands, Poland, Romania, Spain) having the most difficulties.

The above analysis provides the basis for the following classification of the countries based on their stringency index scores:

– For the countries with low index values (lower than 50), i.e., Bulgaria, Croatia, Estonia, Finland, Lithuania, and Luxembourg; and for the countries with high values (higher than 60), i.e., Cyprus, Greece, Germany, Israel, and Italy; the problems with home care provision seemed to be minor compared to those in other countries. For the countries with the least severe measures, the relationship was easily explained, and was in accordance with my main

Table 2: Results of linear mixed logit regressions.

Variables	Linear mixed logit		Linear mixed logit		Linear mixed logit		Linear mixed logit		Linear mixed logit	
	Helped		Difficulties		Pay More		Not Come		Other	
	Coefficients	Standard error	Coefficients	Standard error	Coefficients	Standard error	Coefficients	Standard error	Coefficients	Standard error
Stringency	−0.0091	0.0115	0.0565**	0.0230	0.0105	0.0418	0.0515*	0.0294	0.0442**	0.0201
Average number of infections	0.0578	0.1953	0.0636	0.4311	1.2522	0.9379	0.1202	0.5538	−0.4367	0.3883

Significance: *** = 1%; ** = 5%; * = 10%

Notes: Controlled for gender, age, education, income, household size, number of chronic diseases, and weekly working hours.

Source: SHARE Corona (W1), release 8.0.0.

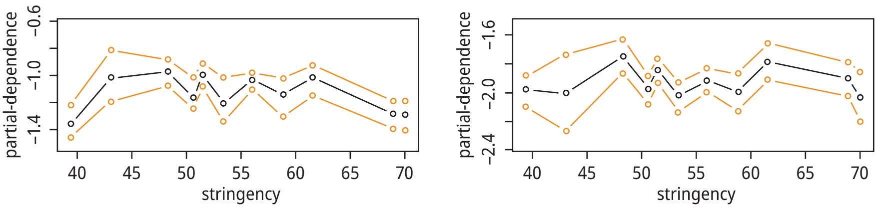

Figure 2: Partial dependence plots from BART regression for variables Helped (left) and Difficulties (right).
Source: SHARE Corona (W1), release 8.0.0.

hypothesis. However, for the countries with the most severe measures, the explanation could lie in their geographic distribution (most of them can be classified as belonging to the Mediterranean region and as having mixed welfare systems). In that specific context, the provision of home care is more frequently provided by families; that is, by relatives living close to home. As it may expected that stringent pandemic measures reduced the mobility of people, this finding seems logical.

– For the countries with stringency index values in the range of 50–55, the situation was more complicated, as those countries (e.g. the Czech Republic, Hungary, Malta, Slovakia, Slovenia) had large problems in ensuring access for home carers (variable Not Come), but fewer additional problems that could not be accounted for by financial and access troubles (variable Other). Most of these countries belong to the Eastern European welfare regime, and thus have lower average incomes than other welfare regimes and a higher demand for services (Kotschy and Bloom, 2022), which may explain the observed relationship. This group also included Sweden and Switzerland, but they were located at the very margins of the distribution.
– Finally, for the countries with stringency scores in the range of 55–60 (e.g., the Netherlands, Poland, Romania, Spain), most of the problems in home care provision during the COVID-19 epidemic seem to have been unrelated to finances (Pay More) or access (Not Come). Nevertheless, they experienced severe problems (Other), and thus confirmed our main hypothesis in the top part of the stringency index distribution. As observed in a recent article by Bergmann and Wagner (2022), the shares of care recipients who had a medical appointment cancelled by their doctor or medical facility were highest in Western European countries. Our findings confirmed that problems with long-term care provision were widely distributed among European countries, with some Western European countries experiencing difficulties as well.

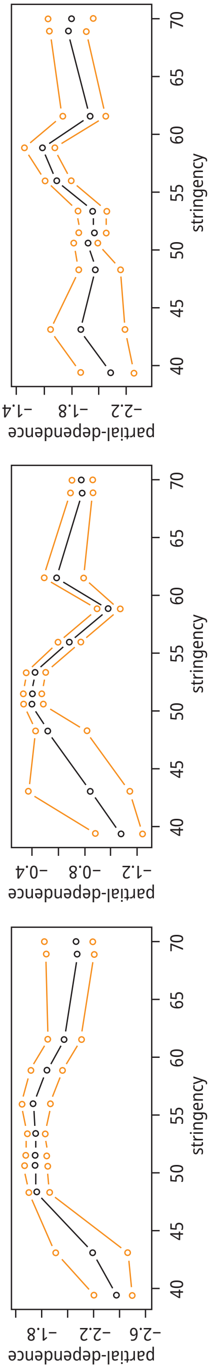

Figure 3: Partial dependence plots from BART regression for variables Pay More (left), Not Come (middle), and Other (right).
Source: SHARE Corona (W1), release 8.0.0.

5 Conclusion

In this chapter, I analysed the relationship between the severity of government containment measures during the COVID-19 epidemic and the provision of home care. The main hypothesis was that more severe government measures had a negative effect on the amount of home care that was provided for older people in need.

The hypothesis was only partially confirmed, as the effects found were heterogenous and nonlinear. However, using a Bayesian approach, I was able to explain the differences in the effects, and propose a typology of countries to explain this relationship.

The countries in my typology, with labels for the groups, are as follows:

- Group 1 – Fewer problems in home care provision during the pandemic: Bulgaria, Croatia, Cyprus, Denmark, Estonia, Finland, France, Germany, Greece, Israel, Italy, Lithuania, Luxembourg, Portugal
- Group 2 – Problems in home care provision related to having to pay more: the Czech Republic, Hungary, Latvia, Malta, Slovakia, Slovenia, Sweden, Switzerland
- Group 3 – Problems in home care provision not related to finances or access, but to other factors, such as health status or socio-demographic characteristics: Belgium, the Netherlands, Poland, Romania, Spain

In sum, it appears that national responses to the pandemic and their effects on home care provision have been very diverse. Moreover, these responses were conditioned not only by the welfare regime, but also by the long-term care system and the pandemic response characteristics of each country. The typology presented in this chapter provides grounds for further research on the effects of the pandemic, and for the verification of welfare regime and other typologies in this context.

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Christian Tolstrup Wester, Tine Bovil, Lasse Lybecker Scheel-Hincke, Karen Andersen-Ranberg, Linda Juel Ahrenfeldt and Niels Christian Hvidt

26 Prayer frequency and COVID-19 vaccine hesitancy among people aged 50+: A comparison of European regions

Key points

- High prayer frequency is found to be positively associated with vaccine hesitancy in 27 European countries.
- Frequent praying is shown to be associated with increased vaccine hesitancy in Northern, Western, and Eastern Europe, but not in Southern Europe.
- The motives for vaccine hesitancy among different religious groups should be explored, and the relationships between national health authorities and religious communities should be improved.

1 Introduction

As of spring 2022, the COVID-19 infection rate in many European countries has dwindled, a trend that has likely been driven by the distribution of COVID-19 vaccines. In response to this development, European governments have been lifting the restrictions that have limited gatherings and social contacts over the past two years. Although the protection rates of the different vaccines appear to vary, studies have demonstrated that the vaccinations do reduce the risk of severe illness, hospitalisation, and death (Johnson et al., 2022). However, vaccination uptake differs greatly across Europe, and vaccine hesitancy may explain a large part of these differences.

A SHARE report showed vaccine-hesitant Europeans are, on average, more likely to be aged 50–65, less educated, and from Central and Eastern Europe (Bergmann et al., 2021). The low vaccine rate in some Central and Eastern European countries may be attributed to people in this region having less trust in national governments and health authorities. Despite the fact that even the Pope, as a major religious leader, has proclaimed that vaccination is a moral and charitable obligation, studies have shown that some fundamentalist religious groups are

Note: The authors Linda Juel Ahrenfeldt and Niels Christian Hvidt contributed equally to this work.

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still vaccine-hesitant (Corcoran, Scheitle, and DiGregorio, 2021). This may be explained by these groups having low trust in science; a strong tendency to believe that God will protect them from illness and crisis; and conservative political values, such as the belief that people should be free to choose whether or not they get vaccinated.

Although religiosity and spirituality are complex concepts to measure, prayer frequency has been found to be a robust indicator of religious involvement in several studies (e.g., Jors et al., 2015). However, there are different motivations for prayer. For example, general prayers thanking God for health and well-being (*restful religiosity*) differ markedly from supplication to God for help in an illness (*crisis religiosity*). In this chapter, we examine possible associations between religiosity, measured by prayer frequency, and vaccine hesitancy across Europe, and we investigate whether this association is modified by European region. We examine the following two questions: Is prayer frequency associated with vaccine hesitancy among middle-aged (aged 50–64) and older (aged 65+) Europeans? And, is the association between prayer frequency and vaccine hesitancy modified by European region?

2 Data and methods

Sample: The study sample included SHARE participants aged 50 or older who answered the question related to prayer frequency (SHARE Wave 5, 6, 7, or 8) and questions on the COVID-19 vaccinations (the second SHARE Corona survey). The sample encompassed 27 of the 28 SHARE countries. We excluded Israel, as it does not belong to any of the European regions covered in this analysis.

Explanatory variable: Data on the prayer frequency variable were obtained from the latest wave possible, i.e., between Wave 5 and Wave 8. The information was based on the following question in the computer-assisted personal interview: “Thinking about the present, how often do you pray?” The answer categories were: “Never”, “Less than once a week”, “Once a week”, “A couple of times a week”, “Once daily”, and “More than once a day”. For our analyses, we grouped the answer categories as “Never”, “Weekly or less”, and “Daily”.

Outcome variable: Information on the vaccine hecitancy outcome variable was retrieved from the second SHARE Corona survey, and was based on the following question: 1) “Have you been vaccinated against COVID-19?” (“yes” or “no”). If the respondents replied “no”, they were also asked the question: 2) “Do you want to get vaccinated against COVID-19?”; with the following possible answer categories:

"Yes, I already have a vaccination scheduled", "Yes, I want to get vaccinated", "No, I do not want to get vaccinated", and "I'm still undecided". We dichotomised the vaccine hesitancy variable, which indicates whether respondents were hesitant to take the vaccine, into "Yes" ("not vaccinated", "still undecided", "does not want vaccination") and "No" ("vaccinated", "vaccination scheduled, "not vaccinated but wants vaccination").

Confounding variables: The possible confounders considered in the analyses were age (aged 50–64, aged 65+), sex (male, female), educational level (higher, medium, lower), partner in household ("yes" or "no"), and whether the respondent had any chronic diseases (0, 1, 2–3, 4 or more), such as hypertension, diabetes, or hip fracture. Moreover, the household's net worth (wealth), which measures the sum of the household's net financial assets and real assets, was included as a variable indicating socio–economic status. Information on the covariates was retrieved from the same waves as information on the prayer frequency variable (Waves 5–8).

In line with the classification approaches used in previous SHARE studies, we grouped the 27 European countries into four regions based on their geographical locations, as well as on their historical, cultural, and political differences: 1) Western Europe: Germany, the Netherlands, Belgium, Luxembourg, Switzerland, and Austria; 2) Southern Europe: France, Spain, Portugal, Malta, Italy, Greece, and Cyprus; 3) Eastern Europe: Estonia, Latvia, Lithuania, Poland, the Czech Republic, Slovakia, Slovenia, Hungary, Croatia, Romania, and Bulgaria; and 4) Northern Europe: Denmark, Sweden, and Finland.

Analyses: For the descriptive analyses, a chi-squared test was used to test differences in the vaccine hesitancy-prayer frequency association by region, age, sex, and educational level. We investigated the association between prayer frequency and COVID-19 vaccine hesitancy using multiple logistic regression models. First, we ran a crude model with prayer frequency as the independent variable and vaccine hesitancy as the dependent variable. In the second model, we controlled for age, sex, educational level, partner in household, number of chronic illnesses, and European region. Third, we carried out analyses divided by European region, because a significant interaction was found for prayer frequency by region. These analyses were adjusted for the same variables as in the second model. As the interactions for prayer frequency by age, sex, and educational level were not found to be significant, we did not conduct stratified analyses on these variables.

3 Results

Descriptive results

The final study population comprised 37,304 individuals, with a average age of 71. Women (58%) and people aged 65+ (73%) made up a majority of the study sample (Table 1). In the univariate analyses, people who prayed daily were significantly more likely to be vaccine-hesitant, female, older (aged 65+), and less educated. Broken down by region, a significantly larger proportion of people reported praying daily in Southern Europe than in Western, Eastern, or Northern Europe.

Table 1: Study population characteristics, overall & by prayer frequency (N = 37,304).

Variable	Total (%)	Praying Frequency		
		Never (%)	Weekly (%)	Daily (%)
Sex				
Male	15,673 (42.0)**	7,534 (48.1)	5,060 (32.3)	3,079 (19.7)
Female	21,631 (58.0)**	6,577 (30.4)	6,833 (31.6)	8,221 (38.0)
Age–groups[a]				
50–64 years	10,013 (26.8)**	3,826 (38.2)	3,573 (35.7)	2,614 (26.1)
65+ years	27,291 (73.2)**	10,285 (37.7)	8,320 (30.5)	8,686 (31.8)
Mean age, years (SD)	71.00 (8.9)	70.50 (8.4)	70.16 (8.7)	72.5 (9.4)
Educational level[a]				
Higher	8,879 (23.8)**	4,097 (46.1)	2,850 (32.1)	1,932 (21.8)
Medium	16,198 (43.4)**	6,392 (39.5)	5,351 (33.0)	4,455 (27.5)
Lower	12,058 (32.3)**	3,555 (29.5)	3,647 (30.3)	4,856 (40.3)
European regions				
Western Europe	10,101 (27.1)**	4,165 (41.2)	3,412 (33.8)	2,524 (25.0)
Southern Europe	8,830 (23.7)**	2,208 (25.0)	2,828 (32.0)	3,794 (43.0)
Eastern Europe	15,047 (40.3)**	6,035 (40.1)	4,623 (30.7)	4,389 (29.2)
Northern Europe	3,326 (8.9)**	1,703 (51.2)	1,030 (31.0)	593 (17.8)
Vaccine hesitancy[a]				
Yes	5,675 (15.2)**	1,704 (30.0)	1,775 (31.3)	2,196 (38.7)
No	31,629 (84.8)**	12,407 (39.2)	10,118 (32.0)	9,104 (28.8)

Table 1 (continued)

Variable	Total (%)	Praying Frequency		
		Never (%)	Weekly (%)	Daily (%)
Religiousness[a]				
Prayer frequency	37,304 (100)	14,111 (37.8)	11,893 (31.9)	11,300 (30.3)

Significance level: ** = 1%, * = 5%
Note: Demographic characteristics based on data from SHARE Waves 5, 6, 7, and 8 and the second SHARE COVID-19 survey.
Source: [a]SHARE Corona (W2), release 8.0.0. Other variables are from the time of the latest prayer frequency observation (between SHARE Waves 5 and 8, release 8.0.0).

Main results: Prayer frequency and vaccine hesitancy

The crude results of the logistic regression models showed that weekly (OR 1.50 95% CI 1.16–1.93) and daily (OR 2.14 95% CI 1.72–2.66) praying were significantly associated with a higher level of vaccine hesitancy, compared to never praying (Figure 1, Table 2). However, in the adjusted model, only praying daily (OR 1.56, 95% CI 1.22–2.01) remained significantly associated with COVID-19 vaccine hesi-

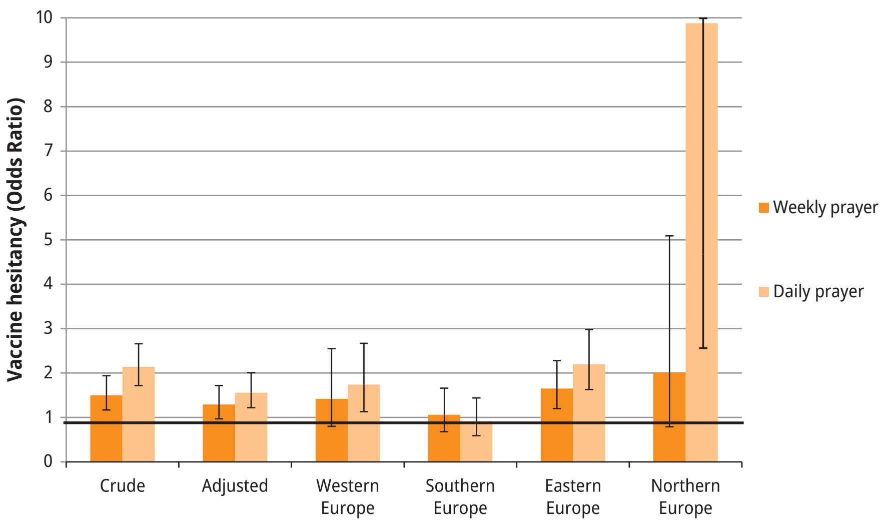

Figure 1: Prayer frequency and vaccine hesitancy, overall and by European regions.
Note: *Reference: 'Never'. Weighted data. 95% confidence interval.
Source: SHARE Wave 5, 6, 7 and 8 and SHARE Corona (W2), release 8.0.0.

Table 2: Association between frequency of praying and vaccine hesitancy, overall and stratified by European region.

Variable	p	Prayer frequency*	
		Weekly	Daily
		OR (95% CI)	OR (95% CI)
Crude (n = 37,301)		1.50 (1.16–1.93)**	2.14 (1.72–2.66)**
Adjusted[a] (n = 37,132)		1.29 (0.97–1.73)	1.56 (1.22–2.01)**
Region[b]	**		
Western Europe (n = 10,024)		1.42 (0.80–2.55)	1.74 (1.13–2.67)*
Southern Europe (n = 8,766)		1.06 (0.68–1.66)	0.92 (0.59–1.44)
Eastern Europe (n = 15,027)		1.65 (1.20–2.28)**	2.20 (1.63–2.98)**
Northern Europe (n = 3,315)		2.01 (0.79–5.09)	9.88 (2.65–36.86)**

Significance: ** = 1%; * = 5%
*Reference = "Never".
Notes: [a]Adjusted for age, sex, educational level, partner in household, wealth, number of chronic diseases, and European region.
[b]Adjusted for age, sex, educational level, partner in household, wealth, and number of chronic diseases.
p = Tested for interaction.
Source: SHARE Waves 5-8 and SHARE Corona survey (W2), release 8.0.0.

tancy. The region-stratified results showed that in Northern (OR 9.88, 95% CI 2.65–36.86) and Western Europe (OR 1.74 95% CI 1.13–2.67), respondents who prayed daily were more likely to be vaccine-hesitant; while in Eastern Europe, respondents who prayed either weekly (OR 1.65 95% CI 1.20–2.28) or daily (OR 2.20 1.63–2.98) were more likely to be vaccine-hesitant. No association between praying and vaccine hesitancy was found in Southern Europe.

4 Discussion and implications

The findings of our study indicated that, overall, people who reported praying daily were more likely to be vaccine-hesitant than people who did not engage in daily prayer. Moreover, among the people who reported praying daily, those who were living in Western, Northern, or Eastern Europe were more likely to be vaccine-hesitant. By contrast, we did not see any significant association between prayer frequency and vaccine hesitancy in Southern Europe.

Previous research has found that certain fundamentalist religious groups are more vaccine-hesitant (Corcoran et al., 2021) than groups who are less religiously observant. Efforts to explain COVID-19 vaccine-hesitancy among people with a high prayer frequency often refer to their tendency towards restful or crisis religiousness. Thus, these individuals may be vaccine-hesitant because they believe that God will protect them (*restful religious*), or because they fear both the COVID-19 disease and the vaccine (*crisis religious)*.

Studies have suggested that restful religiousness is more common in Southern Europe, which includes societies that have a stronger connection to religion than countries in other regions. Crisis religiousness is, in turn, more common in secular regions such as Northern Europe (Hvidt et al., 2017). There may be a stronger connection in Southern Europe between religious communities and national governments and health authorities.

Furthermore, as we noted earlier, Pope Francis referred to the COVID-19 vaccination as “a moral obligation because of one’s own health and the lives of others”. He also called the refusal to be vaccinated “suicidal denialism”. While these statements may have been noted in Catholic communities, whether they had a direct impact on Catholics’ decisions to accept vaccination remains unclear.

The results showing that vaccine hesitancy was higher among more religious people in Eastern Europe may be explained by the greater variety of religions in those countries. Some Eastern European countries are mainly Eastern Orthodox Catholic, whereas in other Eastern European countries, there are also smaller Catholic communities, or a mix of groups.

In conclusion, our study found that people who prayed frequently in Northern, Western, and Eastern Europe were more hesitant to accept COVID-19 vaccination.

These findings have important implications for policy and practice in Europe. Since religiosity may be related to vaccine scepticism and refusal, European countries should explore the specific motives for this vaccine hesitancy. Moreover, they should implement strategies that focus on improving the relationships between the health authorities and religious communities. Such initiatives could involve an expanded outreach to faith-based communities through publicity campaigns featuring religious leaders. The outreach programs should focus on providing specific information about the vaccines – in several languages if necessary – and on making it easier to access the vaccines. In addition, future research should investigate which religious groups are more COVID-19 vaccine-hesitant than others.

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Lasse L. Scheel-Hincke, Filip Fors Connolly, Jenny Olofsson and Karen Andersen-Ranberg

27 Two Nordic countries with different approaches to handling the COVID-19 pandemic: A comparison of Sweden and Denmark

Key points

- We analyse Denmark and Sweden, two countries that are comparable in many ways, but that implemented lockdown measures that differed in their level of strictness during the COVID-19 pandemic.
- We found only minor differences in the health outcomes and the reductions in daily activities during the pandemic between Sweden and Denmark. Compared to Sweden, Denmark had a larger short-term decline in depressive symptoms, but also a larger medium-term increase in depressive symptoms.
- Although Sweden had high infection and mortality rates, while Denmark imposed strict epidemiological control measures during the pandemic, both countries have proven very resilient in terms of their health and daily activity levels.

1 Introduction

Although Denmark and Sweden share many cultural and societal traits, such as universal healthcare systems with free access, the two countries reacted quite differently to the COVID-19 outbreak in 2020. Denmark followed the majority of the European countries in introducing strict, mandatory epidemiological control measures. By contrast, Sweden favoured less strict, voluntary measures that were introduced days or even weeks later than those in Denmark. The Swedish approach has been widely debated. It has, for example, been argued that Swedish health authorities may have initially underreacted, or, conversely, intentionally sought to achieve herd immunity through natural infection (Claeson and Hanson, 2021); or that they made a different trade-off between preventing deaths from COVID-19 and other health costs associated with a lockdown.

A potential consequence of these two different approaches is that Sweden experienced substantial excess mortality during the pandemic, while normal mortality rates were reported in Denmark (Rizzi et al., 2022). Excess mortality is often

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regarded as a reliable measure of the overall effect of the pandemic, since it not only captures the direct deaths from COVID-19, but also the otherwise unmeasured effects of lockdowns and neglected or postponed medical treatment. As Sweden had low old-age mortality in the pre-pandemic months, it may have entered the pandemic with more fragile elderly people; however, this would explain only a fraction of the country's excess mortality (Rizzi et al., 2022). Instead, it appears likely that a failure to shield the oldest old and nursing home residents from COVID-19, coupled with the inefficient and delayed introduction of social distancing measures in the general population, led to the excessive deaths in Sweden (Mishra et al., 2021, Yarmol-Matusiak et al., 2021).

While the societies of Sweden and Denmark are similar in many ways, the countries differed in their reactions to the pandemic, with Denmark going into strict lockdown early on, and Sweden enacting only minor societal restrictions. This difference in approaches enables us to study the impact of lockdowns on health. For example, did the stricter lockdown in Denmark during the first wave of COVID-19 lead to increased physical inactivity and worsened mental health? Alternatively, did the higher infection and mortality rates in Sweden result in more fear and more mental health problems?

The study reported in this chapter looks at the short- and the medium-term differences in mental health, daily activities, and medical care in Sweden and Denmark after the COVID-19 outbreak. We used data from SHARE Wave 8 (2019/2020) and the two special SHARE COVID-19 surveys that were conducted in summer 2020 and summer 2021, respectively. The study population in SHARE Wave 8 comprised 4,515 Swedish and Danish SHARE respondents aged 50 or older. The short-term consequenses of the pandemic were examined by looking at those respondents who also participated in the first SHARE COVID-19 survey (n = 2,646; 58.6 %), while the medium-term consequences were examined by focusing on those respondents who took part in the second SHARE COVID-19 survey (n = 1,961; 43.4%). The final study sample comprised 1,961 respondents who participated in all three waves. As may be seen in Table 1, the Swedish participants were older than their Danish counterparts (average age of 72.2 vs 68.8), and a larger proportion of the Danish respondents had a high level of education (49.9 % vs 40.5 %). The samples for the two countries were similar in terms of their proportions of men and women, marital status distributions, and shares of persons with limitations in activities of daily living (ADL).

Table 1: Baseline characteristics of the study population.

	Sweden	Denmark
Age groups, n (%)		
50–64 years	138 (16.9)	378 (33.0)
65–79 years	532 (65.1)	630 (55.1)
80+ years	147 (18.0)	136 (11.9)
Mean age (SD)	72.2 (8.0)	68.8 (8.3)
Gender, n (%)		
Men	361 (44.2)	501 (43.8)
Women	456 (55.8)	643 (56.2)
Education level, n (%)		
Lower	225 (27.8)	138 (12.1)
Medium	257 (31.7)	434 (38.0)
Higher	328 (40.5)	570 (49.9)
Missing	7 (1.0)	2 (0.2)
Marital status, n (%)		
Married/registered partnership	577 (70.7)	788 (68.9)
Unmarried/divorced	141 (17.3)	208 (18.2)
Widowed	98 (12.0)	148 (12.9)
Missing	1 (0.1)	0 (0)
ADL limitations, n (%)		
0	748 (91.6)	1,056 (92.5)
1+	69 (8.4)	86 (7.5)
Missing	0 (0)	2 (0.2)
N	817	1144

Source: SHARE Wave 8 release 8.0.0

2 Overall health and activity changes in Sweden and Denmark

Just before the outbreak of COVID-19, participants in SHARE Wave 8 were asked about their mental health symptoms (feeling sad or depressed, sleep problems, and feeling lonely), and about their self-rated health (SRH). We divided their responses into two levels: bad (fair or poor) and good (excellent, very good, or good). In the first SHARE COVID-19 survey (SCS1), the following outcome variables were included: mental health, self-reported changes in daily activities (going shopping, going out for a walk, meeting with more than five people from outside the household, and visiting other family members), and postponement of medical appointments. In the second SHARE COVID-19 survey (SCS2), all the above items were included except the questions on daily activities.

The findings indicate that Sweden and Denmark had similar prevalences of depressive symptoms and sleep problems just before the pandemic. In both countries, sleep problems declined in the first SHARE COVID-19 survey, and while the decline attenuated in the second SHARE COVID-19 survey, it was still lower than it was before the outbreak. Although a higher proportion of Swedish than of Danish respondents reported feeling lonely at all three data collection points, respondents in both countries indicated that they had experienced an increase in loneliness in the first SHARE COVID-19 survey. Interestingly, in the second SHARE COVID-19 survey, loneliness had decreased to the same level as before the pandemic (Figure 1). For daily activities, a large overall reduction was observed in both countries in the first SHARE COVID-19 survey. However, the Swedish participants reported reducing their actitivies more overall than the Danish respondents did. In contrast, the Danish participants reported postponing their medical appointment more often than the Swedish respondents did (Figure 2).

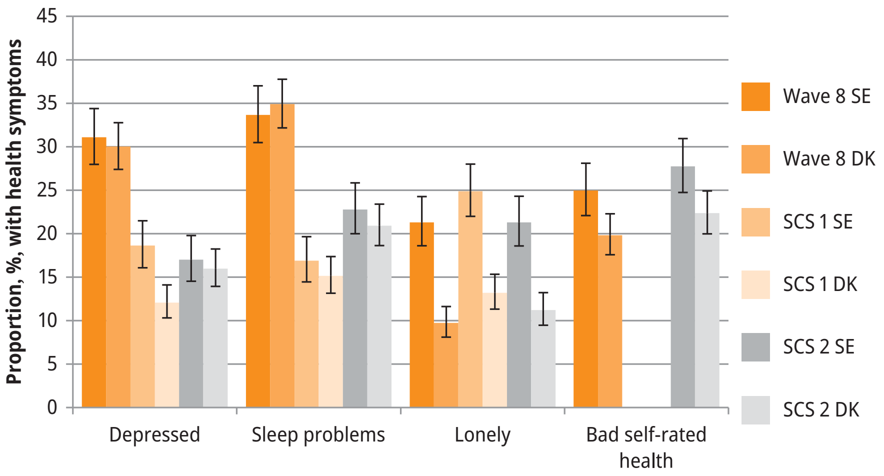

Figure 1: Prevalence of mental health symptoms and bad self-rated health in Wave 8, SCS1, and SCS2.
Source: SHARE Wave 8 and SHARE Corona (W1 & W2), release 8.0.0.

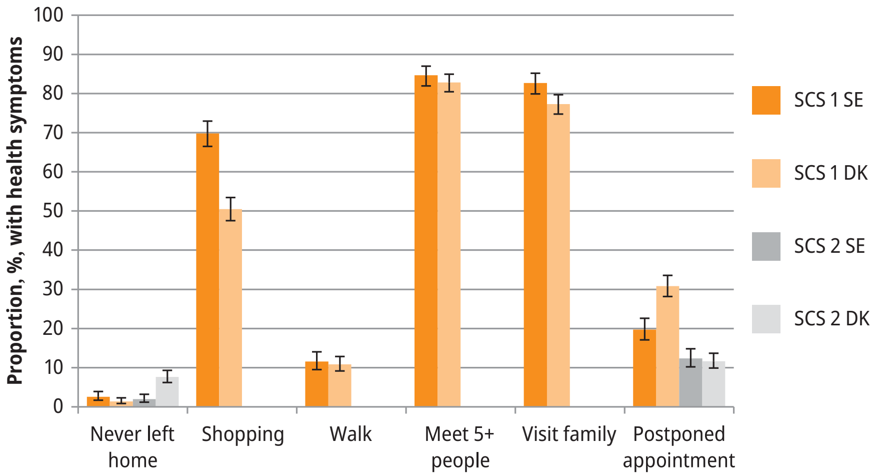

Figure 2: Proportion of participants with reduced activities and postponed medical appointments in SCS1 and SCS2.
Source: SHARE Wave 8 and SHARE Corona (W1 & W2), release 8.0.0.

3 Short-term differences between Sweden and Denmark

Having three data collection points for mental health enabled us to compare prevalences in the two countries at different time points: before the pandemic, a few months after it began, and a year later. Changes over time were investigated using multilevel logistic regression models with an individual-specific random intercept. To investigate the country differences, we tested for interactions between the country and the time variables. The marginal changes were calculated to present the results as percentage-point (pp) changes. The questions on daily activities and postponement of medical care were phrased to prompt participants to compare their current situation to their situation before the pandemic. This allowed for cross-sectional comparisons through logistic regression models estimating odds ratios (ORs). All of the regression analyses were adjusted for age, gender, education, marital status, and ADL limitations at baseline.

The adjusted results are shown in Table 2. They indicate that there was a short-term decline in the proportion of participants feeling sad or depressed (12.8 pp in Sweden and 18.1 pp in Denmark). A similar decline was observed for sleep problems (Sweden: 16.7 pp; Denmark: 19.9 pp). However, the decline in depressive symptoms was significantly larger in Denmark ($p = 0.019$) than in Sweden. Both countries experienced small but equal increases in loneliness. In terms of daily activities, Danes were less likely than Swedes to have reduced their shopping habits (OR = 0.45, 95% CI 0.37–0.55) or limited their family visits (OR = 0.75, 95% CI 0.59–0.96). In contrast, Danes were more likely than Swedes to have had a medical appointment postponed during the first wave of the pandemic (OR = 1.80, 95% CI 1.44–2.25).

Table 2: Short- and medium-term changes in health and daily activities after the start of the COVID-19 pandemic. Differences between Sweden and Denmark.

Short-term changes[a]					
Longitudinal analyses	**Sweden**		**Denmark**		**SE vs DK**
	%-point change	**95 % CI**	**%-point change**	**95 % CI**	**P for interaction**
Mental health					
Sad or depressed	−12.5*	−15.9 to −9.1	−17.9*	−20.7 to −15.1	0.016
Sleep problems	−16.8*	−20.3 to −13.4	−19.7*	−22.6 to −16.8	0.209
Feeling lonely	3.7*	0.7 to 6.6	3.5*	1.5 to 5.4	0.920
Cross-sectional analyses	**OR**	**95 % CI**	**OR**	**95 % CI**	**P DK vs SE**
Daily activities					
Never left home	Ref.	–	0.56	0.28 to 1.11	0.097
Going shopping, less or never	Ref.	–	0.44*	0.36 to 0.55	<0.001
Going for a walk, less or never	Ref.	–	1.11	0.81 to 1.51	0.523
Meet 5+ people, less or never	Ref.	–	1.02	0.79 to 1.32	0.874
Visit family, less or never	Ref.	–	0.75*	0.59 to 0.96	0.021
Postponed medical appointment	Ref.	–	1.84*	1.47 to 2.30	<0.001

Table 2 (continued)

	Medium-term changes[b]				
Longitudinal analyses	**Sweden**		**Denmark**		**SE vs DK**
	%-point change	**95 % CI**	**%-point change**	**95 % CI**	**P for interaction**
Mental health					
Sad or depressed	−1.4	−4.3 to 1.6	3.9*	1.6 to 6.2	0.006
Sleep problems	6.0*	2.9 to 9.0	5.8*	3.3 to 8.4	0.952
Feeling lonely	−3.2*	−5.9 to −0.5	−2.1*	−4.0 to −0.2	0.526
Self-rated health	2.6	0 to 5.2	2.3*	0.1 to 4.5	0.885
Cross-sectional analyses	**OR**	**95 % CI**	**OR**	**95 % CI**	**P DK vs SE**
Daily activities					
Never left home	Ref.	–	4.20*	2.41 to 7.31	<0.001
Postponed medical appointment	Ref.	–	0.93	0.70 to 1.24	0.622

[a]Data from SCS1. Longitudinal changes are compared to Wave 8. Cross-sectional analyses are self-reported changes since before the outbreak.
[b]Data from SCS2. Longitudinal changes are compared to SCS1, except for SRH, which is compared to Wave 8. Cross-sectional analyses are self-reported changes since SCS1.
Significance: * = 5%
Notes: All models are controlled for age, gender, education, marital status, and ADL limitations.
Source: SHARE Wave 8 and SHARE Corona (W1 & W2), release 8.0.0.

4 Medium-term differences between Sweden and Denmark

The medium-term changes are defined as the changes between the summer of 2020 and the summer of 2021; except for self-rated health, for which the medium-term changes indicate the changes since before the outbreak. In this period, the share of Danish respondents who reported depressive symptoms was 4 pp higher (95% CI 1.7–6.3), whereas no change was found for the Swedish participants. Both the Swedish and Danish participants reported having more sleep problems, while smaller shares reported being lonely, but the changes did not differ between the countries. In contrast to the results for the short-term changes, Danes were found to be more likely than Swedes to report that they never left their home (OR = 4.06, 95% CI 2.32–7.10). The comparison of self-rated health prior to the outbreak and in the second SHARE COVID-19 survey indicated that there was a small increase in bad self-rated health in both Sweden and Denmark. Unlike in the first SHARE COVID-19 survey, no differences in the postponement of medical appointments were found in the second SHARE COVID-19 survey (Table 2).

5 Discussion and conclusion

The short-term improvements in mental health reported in this study correspond with the results of a recent study showing a similar trend across all 28 SHARE countries (Wester et al., 2022). However, the present study shows that the short-term improvements in depressive symptoms were smaller for the Swedish participants than for their Danish counterparts. This may be explained by the fear or anxiety caused by the higher Swedish infection and mortality rates in spring 2020. One year later, when the differences in the restrictions and the mortality levels in Sweden and Denmark had narrowed, the two countries had a similar prevalence of depressive symptoms.

This study found a small but similar short-term increase in loneliness in both countries, which is a plausible consequence of the stay-at-home recommendations in both countries. However the observed reduction in depressive symptoms and sleep problems contradicts the general contention that lockdowns harm mental health. As loneliness is usually positively correlated with depressive symptoms and sleeping problems, our results are puzzling. While increased loneliness but concurrent improvements in depressive symptoms and sleeping problems were observed in the short term, the changes were reversed a year later. This indicates that the expected increase in mental health problems may have been delayed due to increased social cohesion during the pandemic.

A possible consequence of the harsher restrictions in Denmark could have been a proportionally larger reduction in daily activities among older people. This was not found to be the case. As we showed, the Swedes had reduced their shopping habits and family visits more than the Danes. Similar tendencies have been detected using Google mobility data. While there was a larger intitial reduction in Denmark (because their lockdown came first), the mobility data show that activity levels were lower in Sweden around the time of the first SHARE COVID-19 survey (Yarmol-Matusiak et al., 2021).

We tested whether the country differences varied across age groups by means of a sensitivity analysis. The results indicated that the short-term country differences in activities were driven primarily by a reduction in activities among the oldest age group (aged 80+) in Sweden (results not shown). It is striking that the largest reduction in daily activities was among the oldest Swedes; the very same group who experienced the highest excess mortality. This indicates that there may have been self-imposed restrictions in Sweden.

Very early in the pandemic, Danish authorities decided to postpone a large number of non-acute hospital treatments out of concern that hospitalisation rates might exceed capacity. In our study, we found that 31% of Danes reported that their medical appointments had been postponed. It might be expected this level of undertreatment would lead to more deaths. However, although mortality rates were initially higher in Sweden, two years into the pandemic, the cumulative excess mortality in Sweden remains similar to that in Denmark (https://ourworldindata.org/excess-mortality-covid). Several studies have tried to explain the high number of COVID-19-related deaths in the early phase of the pandemic in Sweden. Whatever the ultimate explanation, it is posible that a more prompt implementation of effective interventions may have saved many lives (Mishra et al., 2021).

In conclusion, our study found that during the pandemic, there were only minor differences in the health and daily activity levels in Sweden and Denmark, even though the authorities in the two countries took very different initial approaches to managing the risk of contagion. Compared to Sweden, Denmark had a larger short-term decline in depressive symptoms, but it also had a larger medium-term increase. Therefore, while the timing and the choice of lockdown measures may have had an influence on mortality in the two countries, they might have led to only minor changes in perceived health and daily activities. Thus, middle-aged and older Scandinavians have been shown to be quite resilient, despite the major upheaval in their daily lives.

Our study provides several potential insights for policymakers. First, our results show (surprisingly) that policies aimed at reducing the spread of the virus by reducing social activities, either through government-imposed restrictions or voluntary measures, did not seem to lead to reduced mental health among older adults. Second, stronger government-imposed restrictions (Denmark) did not necessarily lead to worse well-being outcomes for older people than more voluntary approaches (Sweden). Third, among the older population, governmental recommendations seemed to be at least as effective as restrictions when it came to reducing social activities in the two neighbouring countries of Denmark and Sweden.

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Sharon Shiovitz-Ezra, Michal Levinsky, Bracha Erlich and Liat Ayalon

28 Epidemiological control measures and subjective age among people aged 50 or older

Key points

- Strict epidemiological control measures at the country level are associated with older subjective age, but moderate control measures are not.
- Having higher education and having a better financial situation are related to having a younger subjective age, but being married may be associated with having an older perceived age during a pandemic.
- The aim of slowing the spread of disease should be balanced against the risks associated with narrowing the social environment.

1 Introduction

Subjective age is defined as how old a person perceives him/herself to be; that is, how old they feel. There is cumulative evidence in the literature that an individual's subjective age has consequences for several domains of health: physical, mental, and cognitive. Subjective age affects health directly, and indirectly through interactions with other variables. That is, a person's subjective age can alleviate or exacerbate a range of stressors that subsequently affect various health outcomes. Specifically, a younger subjective age is believed to be a protective factor, while an older subjective age is seen as a risk factor. Research conducted during the COVID-19 pandemic has largely supported the hypothesis that a younger subjective age serves as a protective factor. For example, one study found that the relationship between loneliness during the pandemic and psychiatric symptoms was weaker among individuals who reported a younger subjective age (Shrira et al., 2020).

It is, therefore, important to explore the antecedents of subjective age in order to improve our understanding of the factors that contribute to the formation of a younger (or an older) subjective age in different individuals during a pandemic. Previous research has mainly focused on the factors at the micro level, such as perceived mastery and personality traits. In this chapter, we examine for the first time the contributions of epidemiological control measures to the subjective age of Europeans aged 50 or older. To this end, we use the COVID-19 Stringency Index as a proxy for epidemiological control measures at the country level. According to the

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Stringency Index (see Figure 1), the strictness of COVID-19 policies varied across SHARE countries. Thus, these data provide us with the opportunity to examine the relationship between macro-level variability and micro-level variability, and, more specifically, to test whether the severity of COVID-19-related restrictions was indeed associated with subjective age.

2 Age, subjective age, and the COVID-19 pandemic

The notion of age has received considerable attention during the COVID-19 pandemic for several reasons, including because of the association between older chronological age and the risk of severe morbidity and mortality due to COVID-19. Older people have been identified as an at-risk population, while heterogeneity among older people has been largely disregarded.

Moreover, during the pandemic, there has been an increase in the prevalence of ageist stereotypes and behaviours at both the individual and the institutional level. Worldwide, old age is commonly associated with an increased risk of morbidity and mortality. Thus, many policy measures have relied on chronological age as the criterion for restricting the autonomy of people and for limiting their care. Across the globe, lockdown, exit, triage, and vaccine strategies have been operationalised based on age. In many cases, these policy measures have used age as a criterion that explicitly identified older people as a vulnerable group, and as a burden on overstretched healthcare systems (Ayalon et al, 2021).

In response to these developments, subjective age, in addition to chronological age, has recently attracted the interest of researchers. Subjective age is largely context – dependent (Hughes and Touron, 2021). Certain life events, such as death, sickness, an early transition to grandparenthood, or even nearing one's birthday are associated with an older subjective age. The priming of ageist stereotypes can also affect a person's subjective age. In the context of the pandemic, age, death, and disease have all served as constant reminders of the risks associated with getting older.

A three-wave study that followed 3,738 adults found that the belief that "the pandemic is only a threat to older adults" was the only consistent predictor of change in subjective age (Terracciano et al., 2021). Studies have also found a positive association between exposure to stressful conditions and accelerated subjective ageing (Wettstein, Wahl, and Kornadt, 2021). Pandemic conditions that reminded older people in particular of their potential exposure to a life-threatening illness, and the imposition of strict epidemiological control measures, placed considerable stress on the older population.

Given the well-established role of subjective age in physical health, mental health, and well-being, it is important to further assess the variability of this important phenomenon. Specifically, is subjective age associated with the strictness of the containment measures that were imposed during the pandemic? Examining the relationship between lockdowns and social distancing, which considerably narrowed the social sphere of older people, can provide us with a better understanding of the contextual nature of subjective age.

3 Methods

This analysis uses data from the second SHARE Corona survey collected in 27 European countries and Israel via telephone interviews during July–August 2021. Our analytical sample consists of 41,947 individuals aged 50 or older.

Variables

The outcome variable for subjective age was derived from the following survey question: “Many people feel older or younger than they actually are. What age do you currently feel?” Responses ranging from 0–120 years old were considered acceptable, and a small number of responses above this range were recoded to the maximum value of 120. We then subtracted the respondents’ chronological age from their subjective age score. A negative value on the resultant subjective age variable in our analysis indicates that the respondent reported feeling younger than his/her chronological age, while a positive value indicates that the respondent reported feeling older than his/her actual age.

A measure of the strictness of epidemiological controls was our main independent variable. For our analysis, we used the COVID-19 Stringency Index (Oxford COVID-19 Government Response Tracker). The index is based on nine response indicators (e.g., school closures, workplace closures, and travel bans). It is scaled from zero to 100; the higher the score, the stricter the measures adopted. Using the scores from 1 July 2021 (the midpoint of the two-month data collection period), we created an ordinal stringency index by assigning a stringency score to every country, and dividing the index into tertiaries. This resulted in three values: low, medium, and high stringency.

We also controlled for background socio-demographic variables in our analysis. These variables included gender (male = 0, female = 1), partner status (no live-in partner = 0, live–in partner = 1), education (ranked on the ISCED scale of 0–6;

the higher the score, the higher the education), and subjective financial capacity (a four-point scale indicating the level of difficulty in making ends meet, with a higher score indicating a lower level of difficulty).

Analysis

First, we examined the associations between the respective variables. Then, in the main part of the analysis, we regressed the subjective age gap on the stringency score and the background variables using an OLS regression. The need for multilevel analysis was tested by calculating the Intraclass Correlation Coefficient (ICC) to determine the extent to which the variance in the subjective age gap was explained by country differences. In this case, the ICC was 3.1%, which is lower than the recommended cut-point of 5%. For this reason, we considered it unnecessary to apply multilevel modelling in our analysis.

4 Results

As noted, the analytical sample was comprised of adults aged 50 or older in 28 SHARE countries. It included more women (58.4%, N = 24,510) than men. A majority of the adults in the sample had a live-in partner (68.9%, N = 28,905). The respondents' mean education level was upper secondary education (M = 3.04, SD = 1.73), and a majority of the respondents had a good financial capacity (M = 2.92, SD = .91).

The stringency scores varied across the analysed countries, which indicates that there was considerable variability in the severity of the COVID-19-related restrictions imposed in different national settings (see Figure 1). The graph shows that Germany and Portugal had more COVID-19-related restrictions, as reflected in their scores (67.6 and 63.9, respectively), whereas Hungary (27.8), Israel, and Lithuania (both 29.6) had far fewer restrictions, on 1 July 2021.

The results of a bivariate analysis showed that education was negatively related to subjective age (r = −.06, p < .001). Financial capacity (making ends meet) was also negatively related to the subjective age outcome (r = −.10, p < .001). That is, having a higher level of education and a better perceived financial capacity were related to reporting a younger subjective age. On the other hand, gender and partner status were not related to subjective age. The Pearson test also found a weak but significant correlation between a high level of stringency and

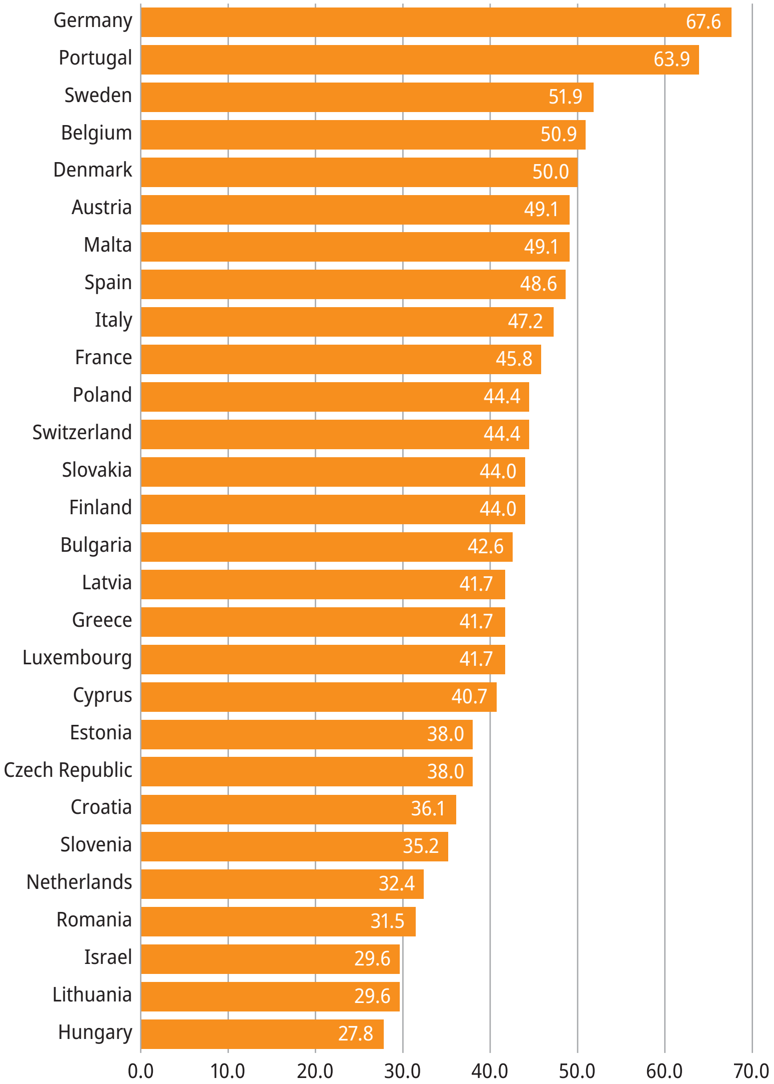

Figure 1: COVID-19 stringency index, 1 July 2021, across SHARE countries.
Source: Oxford COVID-19 Government Response Tracker.

subjective age. A high stringency score was related to an older subjective age (r = .01, p <.05), but the other two categories were not.

The adjusted multivariate model, which included the background characteristics gender, partner status, education, and subjective financial capacity, found that a high stringency score was indeed associated with an older subjective age.

That is, older adults who were living in a country that imposed COVID-19-related restrictions with the highest level of stringency reported having an older subjective age than older adults who were living in a country that imposed COVID-19-related restrictions with the lowest level of stringency ($\beta = .03$, $p < .001$). However, the association between subjective age and living in a country that imposed restrictions with a medium level of stringency was not significant compared to living in a country that imposed restrictions with a low level of stringency. Having a live-in partner was associated with an older subjective age, while having a higher education and having a better subjective financial capacity were associated with a younger subjective age (see Figure 2).

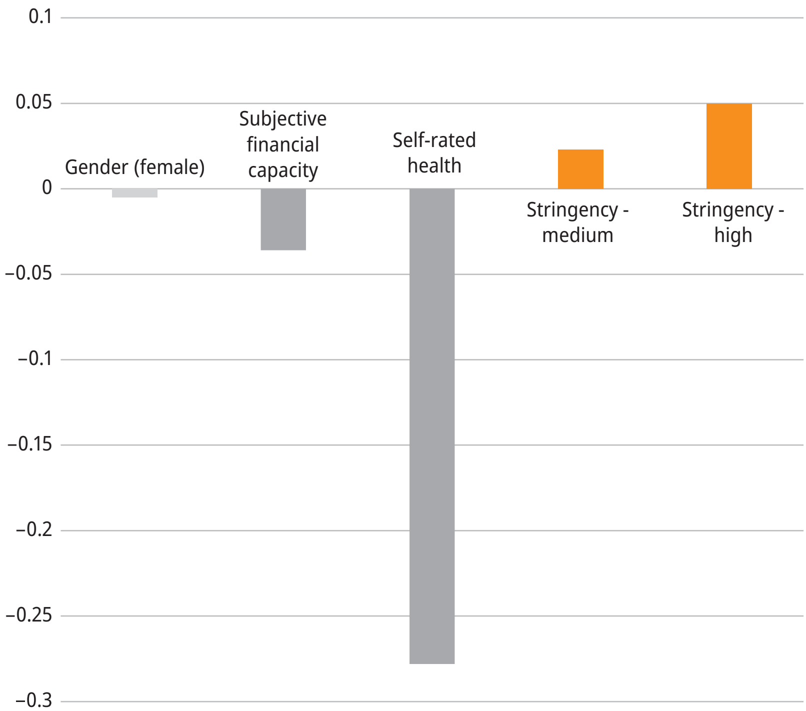

Figure 2: Associations between the stringency of COVID-19 epidemiological control measures and reporting an older subjective age.
Source: SHARE Corona (W2), release 8.0.0.

5 Conclusions

The results of our study indicated that the implementation of strict epidemiological control measures at the country level was associated with an older subjective age. In other words, people aged 50 or older who were living in a country that adopted more stringent restrictions in response to the pandemic tended to report an older perceived age than their counterparts who were living in a country that imposed restrictions and limitations with a low level of stringency. Given that an older subjective age is an established risk factor for poor health, the implementation of stringent containment measures could endanger the health of older adults via its effect on their subjective age.

Previous research has found that a younger subjective age is associated with better health. While these studies were undertaken before the COVID-19 pandemic, studies that were conducted during the pandemic have also emphasised the protective role of a younger perceived age. Much less attention has been paid in the literature to the predictors of subjective age, and, in particular, to the contextual factors associated with such age perceptions. In our study, we extended the investigation of subjective age predictors by looking at individual characteristics, such as partnership status, gender, education, and subjective financial capacity, as well as COVID-19-related restrictions at the country level.

Our findings underscore that having a higher level of education and a better perceived ability to make ends meet are associated with a lower probability of reporting an older subjective age. However, our observation that having a partner was a risk factor for having an older perceived age was more surprising. A potential explanation for this result is that during the pandemic, many older adults were worried about their own health and the health of their partner. Thus, our findings unexpectedly suggest that being married might actually be a risk factor for poor health (via its effect on subjective age) during a pandemic.

On the macro level, we found that the imposition of more severe COVID-19-related restrictions was a risk factor for reporting an older subjective age, after controlling for individual factors. However, the imposition of medium-level COVID-19-related restrictions was not shown to have an effect on subjective age. Given the known negative health consequences of an older subjective age, policymakers should consider the potentially harmful effects of imposing severe restrictions and limitations. While epidemiological control measures may slow the spread of COVID-19, their long-term emotional and health consequences have yet to be acknowledged. It is also important for policymakers to acknowledge the psychosocial effects of these supposedly protective measures on the population. The consequences of such policy measures need be weighed not only in relation to

COVID-19 infection rates and morbidity, but also in relation to their effects on the well-being of older adults.

In sum, our research found that while the imposition of stringent epidemiological control measures affected subjective age, the implementation of medium-level restrictions did not. This finding implies that when policymakers are formulating pandemic-related restrictions (if needed), they should carefully consider the severity of the measures. Thus, the aim of slowing the spread of the virus should be balanced against the effects of narrowing the social environment. Future research should examine additional contextual factors that may affect subjective age perceptions, as well as the effects of contextual factors on changes in subjective age over time.

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Part VI Housing and living arrangements

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29 Do intergenerational co-residence and multigenerational housing arrangements increase the risk of COVID-19 morbidity? Findings from SHARE

Key points

- Intergenerational co-residence and multigenerational housing arrangements affected the likelihood of testing positive for COVID-19 among Europeans aged 50+.
- The risk of testing positive for COVID-19 was highest in three-generation households in which respondents co-resided with their children and grandchildren.
- The effect of household composition on COVID-19 morbidity was different in the "old" than in the "new" European countries.
- Policymakers should be aware of housing arrangements as a potential mechanism of COVID-19 transmission.

1 Introduction

It is common knowledge among demographers and other social scientists that the size and the diversity of households change during processes of industrialisation and urbanisation. Nowadays, the majority of older adults in developed countries co-reside with their partner in two-person households or live alone. While generally relatively rare in Europe, multigenerational households are more common in post-socialist European countries. Many recent studies have shown that demographic factors, such as the age structure or the density of a population, play a key role in explaining the adverse impact of COVID-19. Because close social contacts drive the transmission of infectious respiratory diseases, yet another demographic variable may catalyse the spread of the disease. There is early evidence that living arrangements – namely, household size and composition – and cross-generational contacts shape the risk of infection (Bayer and Kuhn, 2020). Epidemiological studies have found that households are the primary setting for the transmission of new coronavirus infections (Bi et al., 2021). Older people are at notably higher risk of having severe symptoms or dying from COVID-19, but they are also less socially mobile, which can tend to reduce their risk of infection. Older people who are living with

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younger and more mobile family members may face a greater risk of contracting COVID-19 than their peers who are living alone or with a partner. Thus, higher rates of cross-infection may be expected among older adults who co-reside with their (grand)children in multigenerational arrangements. Recent scholarship on this topic is scarce, and most of the existing studies were limited to the first wave of the pandemic. Moreover, these studies tended to focus on the aggregate-level association between COVID-19 cases and household composition, while failing to provide robust evidence of higher COVID-19 prevalence in multigenerational households (Arpino, Bordone and Pasqualini, 2020). Single-country studies using individual-level data (e.g., Brandén et al., 2020; Nafilyan et al., 2021) have suggested that intergenerational co-residence is associated with increased risks of COVID-19 morbidity and mortality. Our paper contributes to the existing literature on the differences in the rates of COVID-19 infection by household type by looking beyond the first wave of the pandemic in a pan-European setting.

Research questions

In this study, we investigate whether and, if so, to what extent household composition influences the risk of COVID-19 morbidity among Europeans aged 50+. The following research questions guide the analysis:

1. How does the risk of testing positive for COVID-19 differ by household composition? Do intergenerational co-residence and multigenerational housing arrangements increase the risk of infection?
2. Does the effect of household composition on COVID-19 morbidity vary between “old” and “new” European countries, and what are the patterns therein?

2 Data and methods

The main data source used in the analysis is the second round of the SHARE Corona survey (SCS2). We restrict the analysis to respondents aged 50+ at the time of the interview who were not living in nursing homes. The sample covers 28 countries. To keep the multivariate analysis as simple as possible, we classify countries in two blocks: the “old” (Austria, Belgium, Cyprus, Denmark, Finland, France, Germany, Greece, Israel, Italy, Luxembourg, Malta, the Netherlands, Portugal, Spain, Sweden, Switzerland) and the “new” (Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, Slovenia) European bloc. We include Israel in the capitalist “old” European bloc, while the “new” European bloc is comprised of former socialist countries.

The dependent variable is a dichotomous indicator of whether the respondent tested positive for COVID-19. The main independent variable is household composition: we distinguish between single-person households, two-person couple households, two-generation households in which respondents co-reside with at least one child (2G: R + C), two-generation households in which respondents co-reside with at least one parent (2G: R + P), three-generation households in which respondents have at least one co-resident child and at least one co-resident grandchild (3G: R + C + GC), three-generation households in which respondents have at least one co-resident child and at least one co-resident parent (3G: R + C + P), and

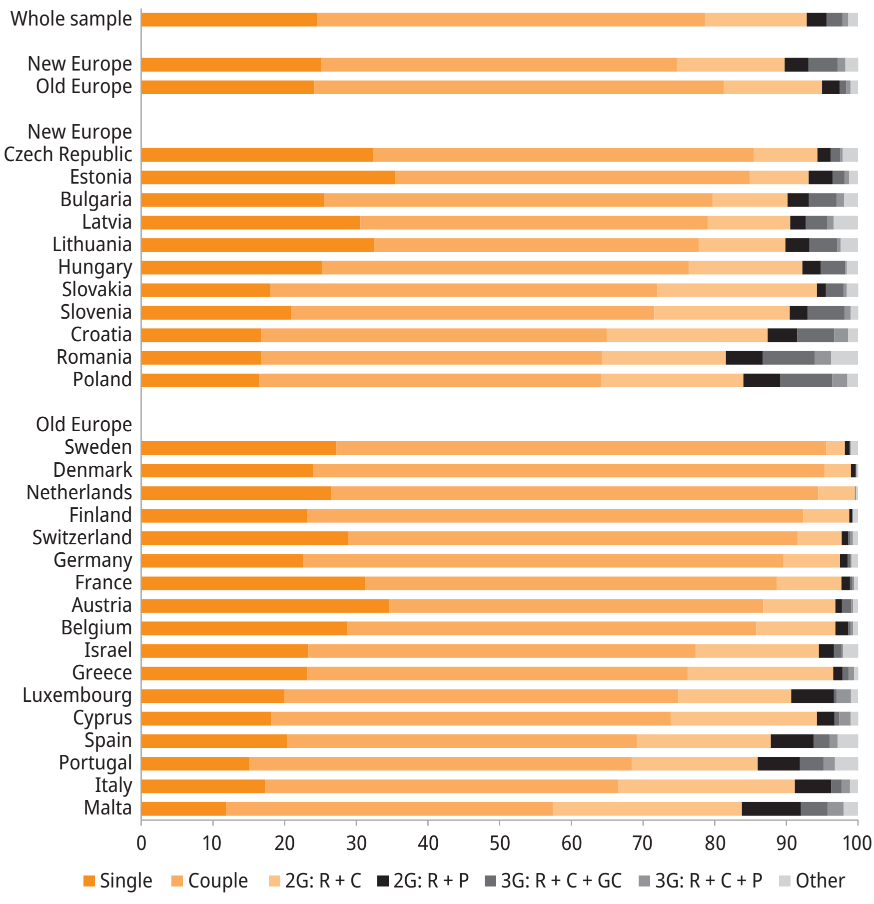

Figure 1: Household composition in comparison across SHARE countries.
Note: Unweighted.
Source: SHARE Corona (W2), release 8.0.0.

other household types. Note that two-generation households (2G) are comprised of two or more people (i.e., household size ≥ 2), and that three-generation households (3G) are comprised of three or more people (i.e., household size ≥ 3). Housing arrangements differ considerably across the countries in our sample, as shown in Figure 1. Approximately 17% and 3% of the SHARE respondents in our sample live in two- and three-generation households, respectively. The percentages are highest in Poland, Romania, and Croatia; and are lowest in the Nordic countries and the Netherlands.

In our analysis, we control for age, gender, area of residence (urban vs rural, based on the interviewer's observation of where the respondent lives: "a big city", "the suburbs or outskirts of a big city", "a large town", or "a small town" were coded as urban, while "a rural area or village" was coded as rural), education level (based on ISCED 1997 classification of country-specific educational categories collected by SHARE: ISCED 0, 1, 2 were coded as low education; ISCED 3, 4 were coded as medium education; and ISCED 5, 6 were coded as high education), employment status (retired, working, or other), having been vaccinated against COVID-19, and chronic health conditions (less than two vs two or more). Because area of residence and education are not available in the SCS2, we obtained these variables from earlier SHARE waves (regular SHARE Wave 8, and the Harmonized SHARE dataset, which was developed by the Gateway to Global Aging Data, and contains data from all earlier waves).

After removing observations with missing values (4.64% of the total), we were left with a workable sample of 46,374 observations. Table 1 provides descriptive statistics (percentages for categorical variables, means and standard deviations in parentheses for numerical variables).

Table 1: Descriptive statistics by outcome category.

	Tested positive for COVID-19		
	No	**Yes**	**Total**
Housing arrangements			
Single	24.9%	19.3%	24.5%
Couple	54.1%	53.9%	54.1%
2G: R + C	14.0%	17.5%	14.2%
2G: R + P	2.7%	3.5%	2.8%
3G: R + C + GC	2.1%	3.5%	2.2%
3G: R + C + P	0.8%	0.9%	0.8%
Other	1.3%	1.4%	1.3%

Table 1 (continued)

	Tested positive for COVID-19		
	No	**Yes**	**Total**
Age	70.9 (8.9)	68.0 (8.5)	70.7 (8.9)
Sex			
Male	41.7%	41.4%	41.7%
Female	58.3%	58.6%	58.3%
Area of residence			
Urban	64.8%	64.6%	64.8%
Rural	35.2%	35.4%	35.2%
Education ISCED 1997			
Low	34.1%	31.6%	34.0%
Medium	42.4%	47.8%	42.7%
High	23.5%	20.5%	23.3%
Employment situation			
Retired	73.0%	63.2%	72.4%
Employed	16.0%	26.8%	16.7%
Other	11.0%	10.0%	10.9%
Vaccinated against COVID-19			
No	17.9%	35.4%	19.0%
Yes	82.1%	64.6%	81.0%
Chronic conditions			
Less than 2	58.3%	55.3%	58.1%
2 or more	41.7%	44.7%	41.9%

Note: Unweighted.
Source: SHARE Waves 1–8 and SHARE Corona (W1 & W2), release 8.0.0.

To examine how the risk of testing positive for COVID-19 differs by household composition, we estimate a series of binary logistic regression models, as presented in Table 2. Model 1 includes the household composition variable, and distinguishes between "old" and "new" European countries. Model 2 extends Model 1 by adding a set of controls, as described above. Model 3 is an interaction model, allowing the effect of household composition on the risk of testing positive for COVID-19 to vary between "old" and "new" European countries.

3 Results

The odds of testing positive for COVID-19 are highest in three-generation households in which respondents co-reside with their children and grandchildren (Model 1 in Table 2). The heightened risk persists after controlling for a set of demographic, socio-economic, and health-related factors (Model 2 in Table 2). However, the effect of household composition on COVID-19 morbidity varies between the "old" and the "new" European countries (we find a significant interaction, with p = 0.0184, between the household composition variable and the "old" vs "new" Europe variable in Model 3).

To facilitate the interpretation of the results, we supplement the odds ratio estimates from our final model (Model 3 in Table 2) with margins. In Figure 2, we show contrasts of predictive margins, comparing every household type to single-person households. Co-residing with children and grandchildren increases the probability of testing positive for COVID-19 more than any other living arrangement, by 0.0444 on average; i.e., by 4.44 percentage points (95% confidence interval: 2.11, 6.77).

As Model 3 includes an interaction, we proceed to estimate predictive margins for each level of the interaction between household composition and "old" vs "new" Europe, as presented in Figure 3. In the "new" European countries, the probability of testing positive is generally higher. However, in the "old" European countries, the effect of co-residence with children and grandchildren is especially pronounced: it increases from 4.68% among SHARE respondents who live alone (95% confidence interval: 4.13%, 5.23%) to 10.38% among SHARE respondents with co-resident children and grandchildren (95% confidence interval: 6.55%, 14.20%).

Table 2: Odds ratio estimates from three binary logistic regression models.

	Model 1		**Model 2**		**Model 3**	
Housing arrangements						
Single	Ref.		Ref.		Ref.	
Couple	1.331	***	1.249	***	1.082	
2G: R + C	1.606	***	1.262	***	1.153	
2G: R + P	1.595	***	1.306	**	1.282	
3G: R + C + GC	1.688	***	1.578	***	2.393	***
3G: R + C + P	1.266		0.901		0.980	
Other	1.267		1.105		1.250	
Age			0.973	***	0.973	***

Table 2 (continued)

	Model 1		Model 2		Model 3	
Sex						
Male			Ref.		Ref.	
Female			1.009		1.014	
Area of residence						
Urban			Ref.		Ref.	
Rural			0.854	***	0.858	***
Education ISCED 1997						
Low			Ref.		Ref.	
Medium			0.913	**	0.912	**
High			0.829	***	0.831	***
Employment situation						
Retired			Ref.		Ref.	
Employed			1.448	***	1.445	***
Other			0.836	**	0.830	***
Vaccinated against COVID-19						
No			Ref.		Ref.	
Yes			0.493	***	0.492	***
Chronic conditions						
Less than 2			Ref.		Ref.	
2 or more			1.296	***	1.296	***
European countries						
Old Europe	Ref.		Ref.		Ref.	
New Europe	2.096	***	1.664	***	1.413	***
New Europe ×						
Couple					1.301	***
2G: R + C					1.179	
2G: R + P					1.051	
3G: R + C + GC					0.632	*
3G: R + C + P					0.906	
Other					0.857	
Number of observations	46,374		46,374		46,374	
Pseudo R-squared	0.02		0.05		0.05	

Note: *** p<0.01, ** p<0.05, * p<0.10.
Source: SHARE Waves 1–8 and SHARE Corona (W1 & W2), release 8.0.0.

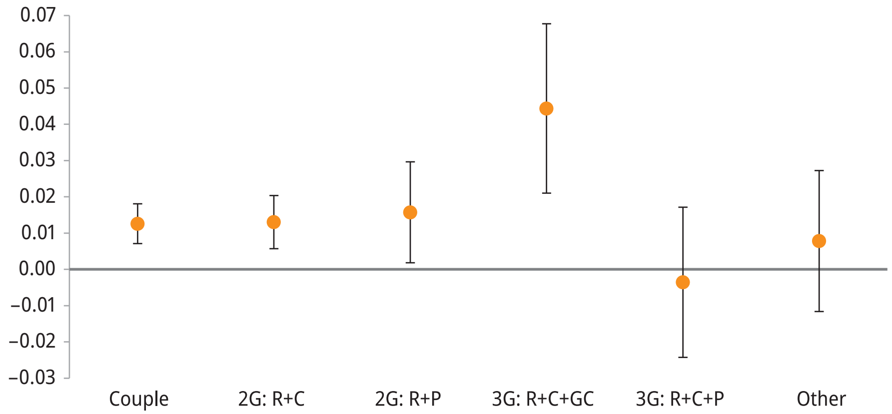

Figure 2: Contrasts of predictive margins of household composition (each level vs single) with 95% confidence intervals.
Note: Estimates based on Model 3.
Source: SHARE Waves 1–8 and SHARE Corona (W1 & W2), release 8.0.0.

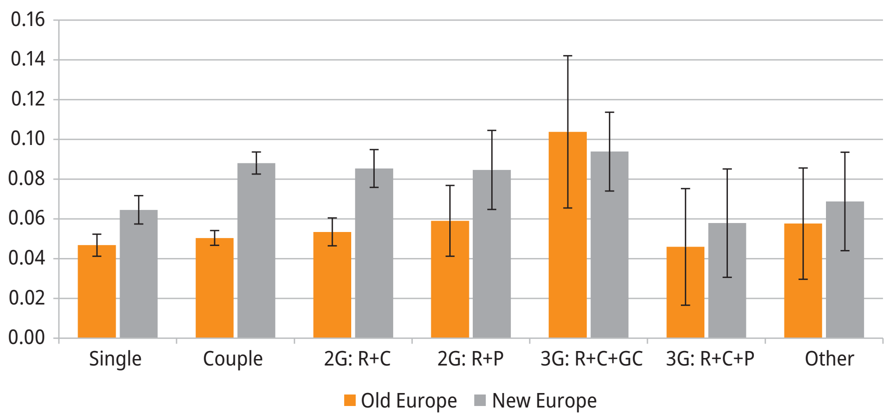

Figure 3: Predictive margins for levels of the interaction of household composition and "old" vs "new" Europe with 95% confidence intervals.
Note: Estimates based on Model 3.
Source: SHARE Waves 1–8 and SHARE Corona (W1 & W2), release 8.0.0.

As a robustness check, we considered the "old" and the "new" European countries separately by estimating two additional models: one for "old" Europe and one for "new" Europe, with each model including country dummies. The results were substantively robust to this change: the effect of housing arrangements on the risk of testing positive for COVID-19 was similar to the effect shown in Figure 3; i.e., the risk of testing positive for COVID-19 was generally higher in “new” Europe, but the effect of co-residing with children and grandchildren was particularly notable in “old” Europe.

4 Conclusions

This study examined the role of housing arrangements in older Europeans’ exposure to COVID-19. While the effects of household composition on COVID-19 morbidity were not found to be as strong as those of factors such as age, sex, or population density, they should not be overlooked. COVID-19 mitigation measures across Europe were designed to minimise close social contacts with non-household members, while potentially increasing the risk of infection among people who live in the same household. We found the highest risk of testing positive for COVID-19 among Europeans 50+ who are living with their children and grandchildren, especially in “old” Europe, where multigenerational housing arrangements are, on average, rarer. As some studies have shown (e.g., Nafilyan et al., 2021), in Western Europe, COVID-19 has disproportionately affected certain ethnic minorities who are more likely to live in multigenerational households. Testing this explanation using SHARE data requires a separate analysis.

One limitation of this study is that the available data did not allow us to consider the age of the co-resident grandchildren. Future research should address this issue using other data sources. Moreover, future research should investigate differences in COVID-19 morbidity among older adults who co-reside with their employed children, and especially with children working in sectors more vulnerable to COVID-19.

Despite these limitations, our results have important practical implications. Policymakers should consider the housing arrangements of older adults, given their role in COVID-19 transmission. When designing epidemic control measures and recommendations, policymakers should pay particular attention to regions with higher rates of intergenerational co-residence and multigenerational households, in light of this study’s finding that such living arrangements may increase COVID-19 morbidity.

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Inés Berniell, Anne Laferrère, Pedro Mira and Elizaveta Pronkina

30 Housing conditions, living arrangements, and mental well-being of Europeans aged 50+: How the COVID-19 pandemic made a difference

Key points

- In summer 2020, after the first wave of the COVID-19 pandemic, loneliness had increased, but feelings of sadness and depression and sleep problems were at historic lows among people aged 50+.
- While living in an apartment in a city was previously linked to feeling less lonely, in summer 2020, it was associated with increased feelings of loneliness and depression, especially among women. Closeness to children became a more important factor in all three dimensions: depression, loneliness, and trouble sleeping. Relative to that of the general population, the mental well-being of couples declined, particularly if they were not living with other family members.
- In summer 2021, after the pandemic had lasted more than a year, the mental well-being of people aged 50+, and its associations with living arrangements and housing conditions, were reverting back to "normal" pre-pandemic patterns.

1 General motivation

The lockdown policies implemented in spring 2020 made home the centre of the life for many Europeans. Even after strict lockdowns were lifted, the pandemic, and the associated disruptions and fear of contagion, persisted. For this reason, researchers may be interested in how people's "housing conditions" during the pandemic affected them in a broader sense. Whether people were living in a multigenerational household, in a city, or in a crowded apartment may have influenced their risk of infection and their likelihood of working from home, which, in turn, may have affected their mental well-being. Similarly, whether people were living alone during lockdowns may have influenced their feelings of loneliness. Hence, we ask the following questions: During the pandemic, was it better for people aged 50 or older to have been living alone or away from dense cities, and thus with greater protection from the virus; or with others, which may have helped them from feeling depressed or lonely? And, was having children living close by of any help to older people during the pandemic?

Density can be a blessing and a curse. Externalities of agglomeration can be positive for people if, for instance, living in a city increases contacts and exchanges

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of ideas, reduces commuting costs, and boosts networking and productivity; and thus improves well-being. On the other hand, during pandemics and lockdowns, these benefits can be reduced or become disadvantages if density increases exposure to contamination or stress (see Duranton and Puga, 2020 for a recent survey). It has been shown that at the household level, life satisfaction is related to living arrangements. Hamermesh (2020) found that the well-being of married couples increases with additional time spent together. Hence, our conjecture is that the COVID-19 containment measures and lockdown policies changed the associations between living arrangements (LA), housing conditions (HO), and well-being, compared to the associations that were observed in the past.

2 Method

We use data from the two SHARE Corona telephone interviews, and, as a point of comparison, data from two pre-pandemic waves of the Survey of Health Ageing and Retirement in Europe (SHARE), which provide a representative sample (Waves 5 and 6) of Europeans aged 50 or older. We drop respondents who were living in nursing homes. We include in our sample respondents from 12 countries that participated in all of those survey waves (Sweden, Denmark, Germany, Belgium, France, Switzerland, Austria, Spain, Italy, the Czech Republic, Slovenia, and Estonia), and consider separately three mental well-being outcomes: depression, loneliness, and sleep problems. The outcomes are based on the participants' answers to three questions that were asked at each wave of SHARE: "In the last month, have you been sad or depressed, felt lonely, had trouble sleeping?". We use six dimensions of LA and HO. First, we analyse the following LA variables: household composition (of the respondents aged 50+, 27% were living alone, 46% were living as a couple, 20% were living as a couple and with adult children or others, and 7% were living as a single person with adult children or others) and the distance to the nearest child. Then, we examine the following HO variables: location (big city or rural area), type of building (single house or multiple unit), number of rooms, and second home ownership.

The other controls we use in our analysis include age, gender, number of children, education level, the ability to make ends meet, self-reported health as it was reported before the current interview, marital state, and country.

Our strategy is to use multivariate linear probability regressions, interacting wave indicators with LA and HO variables, to compare the associations of LA/HO variables with the three mental health outcomes during the pandemic (Corona survey in summer 2020 or in summer 2021) with the corresponding associations before the pandemic (pooled Waves 5 and 6). Our preferred fixed-effect models control for unobserved heterogeneity by exploiting the longitudinal aspect of the data (for more details, see Berniell et al., 2023).

3 Overall mental well-being levels over time

First, we look at the evolution of our three mental health indicators over time since 2012 (Figure 1). Overall, after the first COVID-19 wave in June–July 2020, the respondents were less likely than in the past to say that they had been feeling sad or depressed in the last month: only around a quarter of the respondents indicated they felt this way, compared to a consistent rate of around 43% before the pandemic. Moreover, the share of respondents who reported having trouble sleeping was smaller in summer 2020 (27%) than it was before the pandemic (36%). However, the respondents indicated that were feeling as lonely in summer 2020 as they were before the pandemic (28%). In the summer of 2021, the same questions were asked. The results showed that the rates of depression and sleep problems were higher than in 2020, but still below their historic levels, while the rate of loneliness stayed the same.

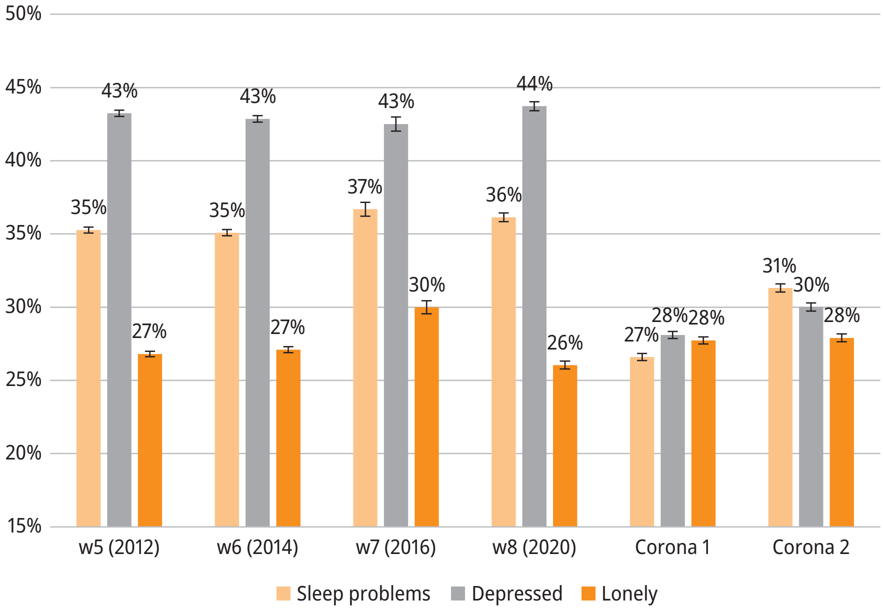

Figure 1: Rates of trouble sleeping, depression, and loneliness among people aged 50+ over time.
Note: Bars stand for standard errors.
Source: SHARE Waves 5–8 and SHARE Corona (W1 & W2), release 8.0.0. Weighted data.

Next, we ran models controlling for all of the factors mentioned above: HO and LA, as well as demographic characteristics, economic conditions, health status, country, and the month of interview (to control for potential seasonal effects). We still found lower rates of depression (−9 to −17 percentage points, depending on the specification) and sleep problems (−3 to −6 pp), and a higher rate loneliness (+ 5 pp) in summer 2020. In June-July 2021, we observed that, *ceteris paribus*, the respondents were still less depressed and had less trouble sleeping than they did before the pandemic, but the reductions were smaller; and they were no longer feeling more lonely.

4 Modelling associations between mental well-being and living conditions

Lockdown policies created differences between respondents depending on with whom and where they were living that might be associated with their mental well-being. The SHARE data allow to look at whether those differences existed before (some did), and at whether they were different after the first wave of the pandemic in summer 2020, and one year later in summer 2021. Each of the following figures presents the results of three models, one for each type of well-being outcome. We comment first on the pre-pandemic situation, as observed in Waves 5 and 6 of SHARE; then on the situation in summer 2020 (Corona 1 survey); and, finally, on the situation in summer 2021 (Corona 2 survey).

4.1 Before COVID-19: in Wave 5 and Wave 6

Before the pandemic, respondents who were living with a spouse, or with a spouse and adult children, were less likely to feel sad or depressed or to have sleep problems, and were much less likely to feel lonely, than respondents who were living alone (Figure 2, pre-COVID). This finding is in line with Hamermesh (2020). The area where respondents were living – regardless of whether it was a big city, a large town, a village, or a rural area – had almost no significant associations with any of our three mental-well-being outcomes. In a model in which we interacted location and type of home, living in an apartment in a city was associated with feeling less lonely compared to living in a house in a village, while it did not affect sleep or sadness (Figure 3, pre-pandemic).

4.2 In summer 2020, after the first COVID-19 wave

In summer 2020, after the first wave of the pandemic, and the stay-at-home policies implemented in many countries, those associations changed: rates of loneliness and of sleep problems became higher for people who were living alone than for singles living with others, while the mental health of people who were living as a couple became much less favourable. The order of magnitude of these differences was around 4 pp (Figure 2, Corona 1).

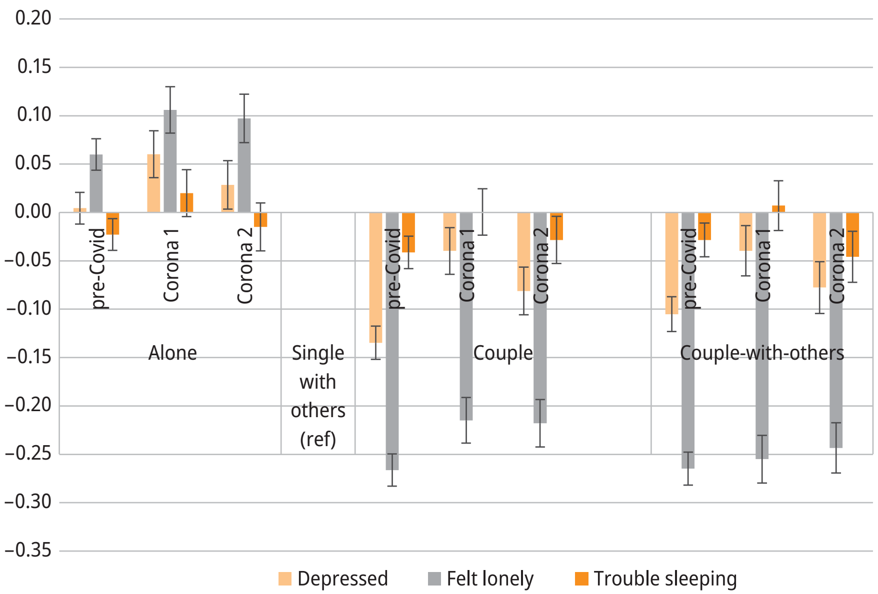

Figure 2: Changes in the associations between LA and the three mental well–being outcomes.
Source: SHARE Waves 5–6, Corona 1 and Corona 2.
NB. Computed from three fixed-effects models for depression (pale orange; 48,861 observations), loneliness (grey, 48,844 observations) and sleep problems (bright orange, 48,881 observations). Bars stand for standard errors. Before the pandemic, living alone was not linked to depression; in summer 2020, it was associated with an increased frequency of depression (+6 pp), relative to living as a single person with others. Before the pandemic, living with a spouse was linked to feeling less lonely; while this association was significantly reduced in summer 2020, and still reduced in summer 2021 (−5 pp).

Another important reversal occurred in the associations with living in a city compared to living in a village or a rural area. This is clear from the three models presented in Figure 3, in which the place and the type of home (single house or multiple units) were interacted. In summer 2020, living in an apartment in a city became positively associated with having feelings of sadness or depression. When we further interacted the city indicator with gender, we found that the effect was driven by women (not shown). The observation that women suffered more than men during the pandemic is in line with the findings of others (Croda and Grossbard, 2021). Another striking result was that during the COVID-19 pandemic, living in a house rather than an apartment stopped being associated with more loneliness.

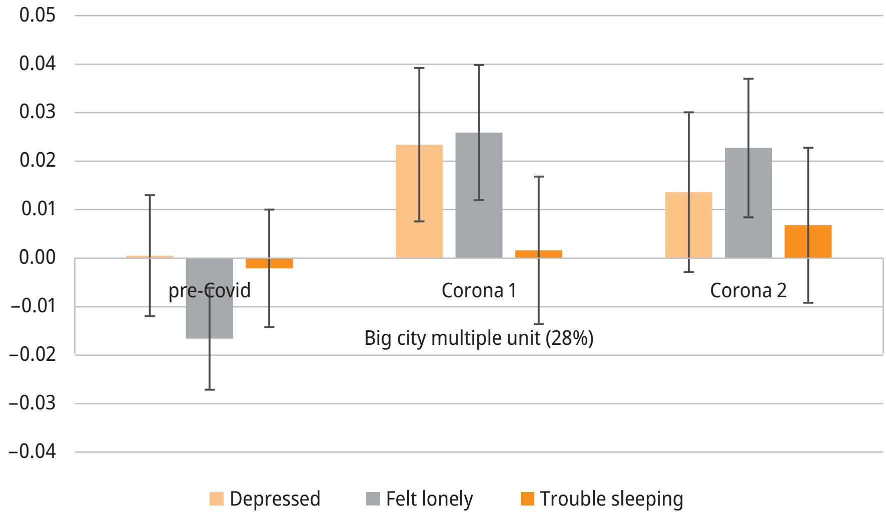

Figure 3: Changes in the associations between housing conditions and the three mental well-being outcomes.
Computed from three fixed-effects models for depression, loneliness, and sleep problems. Bars stand for standard errors. Before the COVID–19 pandemic, living in an apartment in a city rather than in a house in a small town or a village (the reference category) reduced loneliness by 1.7 pp; in 2020, it increased loneliness by 2.6 pp; and in 2021, it still increased loneliness by 2.3 pp.
Source: SHARE waves 5–8 and SHARE Corona (W1 & W2), release 8.0.0.

Focusing on parents, we found that before the COVID-19 pandemic, the distance to the nearest child did not have a large or a significant impact on the mental well-being of parents (Figure 4, pre-pandemic). After the first wave of the pandemic in 2020, as soon as the nearest child was not in the same building as the parent, the parent felt worse off, on all three dimensions: depression, loneliness and trouble sleeping (Figure 4, Corona 1). Thus, being unable to see their children, even if the children lived quite close by, was clearly detrimental for the mental well-being of parents.

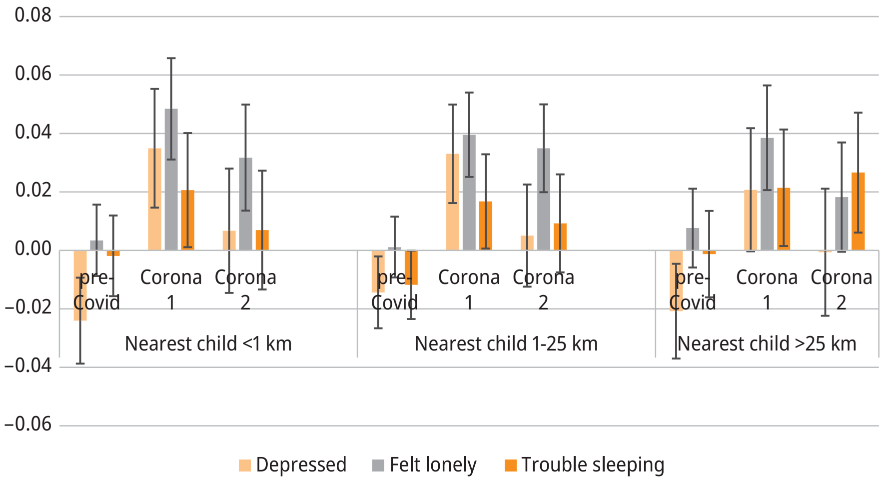

Figure 4: Changes in the association between a parent's distance to the nearest child and the three mental well-being outcomes.
Note: Sample of parents.
NB. Computed from three fixed-effects models for depression (pale orange; 40,480 observations), loneliness (grey, 40,451 observations) and sleep problems (bright orange, 40,497 observations). Bars stand for standard errors. The reference category is "the nearest child co-resides or lives in the same building". Before the COVID–19 pandemic, having a child living close by reduced depression and was not associated with loneliness or sleep problems. In summer 2020, it was associated with an increased frequency of depression (+ 0.3 pp, which disappeared in 2021) and of loneliness (+0.05 pp, which was reduced to +0.03 pp, but was still higher in 2021).
Source: SHARE waves 5–6 and SHARE Corona (W1 & W2), release 8.0.0.

4.3 In summer 2021: back to normal?

In summer 2021, the associations between housing conditions and mental well-being had become more similar to those observed before the pandemic. However, the detrimental impact of living in an apartment in a city, rather in a single house in a smaller town, remained, and this association was observed for the first time during the pandemic (Figure 3, Corona 2). For parents, the distance to the nearest child remained an important factor in their level of loneliness, which may be explained by the persistent mobility restrictions.

5 Conclusion

The outbreak of a new virus, and the public policies that were imposed to reduce the contagion, changed the lives of Europeans, and affected their mental well-being. Even if people aged 50+ had an overall sense of relief in summer 2020, and reported having less depression or having less trouble sleeping than ever before, the associations between people's feelings and their living arrangements or housing conditions took a new turn. Living only with a spouse, in a big city, or with no children living very close by became less beneficial or more detrimental for older adults. These changes can probably be attributed less to the direct effects of the virus itself, and more to the impact of lockdown policies. In summer 2021, when it had become clear that the virus was here to stay, the paradoxical improvement in mental well-being had subsided, and the associations between people's mental well-being and their living arrangements and housing conditions looked more like those that were observed before the start of the pandemic. Nonetheless, some of the effects of the pandemic could be longer-lasting. In some countries, the relative prices of houses in small towns or on the outskirts of cities have been rising faster than those of apartments in cities centres. It is intriguing to note that the change in the association between the mental well-being of the older population and their housing conditions, as measured by SHARE, could be useful in interpreting such movements in the housing market.

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Yarine Fawaz, Anne Laferrère, Pedro Mira and Elizaveta Pronkina

31 Housing, living arrangements, and contagion among Europeans aged 50+

Key points

- In 2020–2021, nursing home residents in the western part of Europe were more likely to develop COVID-19 symptoms or to test positive for the virus than older people living in private homes with a similar observed health status before the pandemic.
- Living in a larger household, in an apartment rather than a house, being active in the labour market, or having an active spouse, especially if the partner did not work remotely, increased the likelihood of contracting COVID-19.
- Adult children were a source of contagion for older parents, regardless of whether they shared their home.

1 Introduction

The risk of viral infection is affected by the people with whom one is in contact, and COVID-19 is no exception. The virus has been particularly deadly for older adults, regardless of whether they had more comorbidities (see, e.g., Dessie et al. 2021). Thus, older people's living arrangements and housing conditions might have been even more important in the COVID-19 pandemic than usual in a time of pandemic.

Since the beginning of the pandemic, the media has reported high COVID-19 contamination and death rates in nursing homes. However, it is hard to draw conclusions about the causes of these high rates. Alacewich et al. (2021) showed that the presence of a care home in a municipality is associated with excess mortality in the population aged 70 or older. Aalto et al. (2022) reported that the 2020 COVID-19 death rates in nursing homes and in the total population were correlated at the country level, but also that the mortality rates in nursing homes were higher in countries with a larger number of beds per nursing home, which suggests that practices may differ between countries. More generally, people's living arrangements – i.e. whether they live alone, with a spouse or with children, and in a spacious house or in a flat – play an important role in COVID-19 mortality. Aparicio and Grossbard (2020), using US state-level data, found that more people died of COVID-19 in states with higher rates of intergenerational co-residence.

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The frequency of contact individuals have with people outside of their home, and their housing conditions, such as whether they live in a city or a rural area, might also play a role in COVID-19 mortality. Along the same lines, the possibility to work remotely is likely to reduce the risk of contagion from commuting by public transportation or from in-person contacts with co-workers. The size of the household and the distance to other family members might also affect the risk of contracting COVID-19. Hence, this chapter studies how the living arrangements (LA) and housing conditions (HO) of people aged 50 or older in Europe and Israel were linked to COVID-19 contagion.

2 Data and methods

We use the rich SHARE data, mainly from the two Corona surveys conducted by telephone in June-July 2020 and 2021, to assess the associations between contagion and various aspects of LA and HO. Contagion is measured through the respondents' answers to the questions on having symptoms, testing positive, or being hospitalised; and to the follow-up questions that ask respondents to name who was involved in case of a positive answer: the respondent, a spouse or a partner, and/or other household or non-household members.

More precisely, the following questions were asked: *"Since the outbreak of Corona (Since your last interview (or Since July 2020) for the 2021 interview), did you or anyone close to you experience symptoms that you would attribute to the Covid illness, e.g. cough, fever, or difficulty breathing, or (this symptom was added in 2021) loss of sense of taste or smell?"* Similarly, for testing: *"Have you or anyone close to you been tested for the Corona virus and the result was positive?"* And for hospitalisation: "*Have you or anyone close to you been hospitalised due to an infection from the Corona virus?"*

We focus on whether the respondents reported having symptoms, testing positive, or being hospitalised for COVID-19, and restrict the analysis to respondents aged 50 or older. Moreover, we exploit previous SHARE waves collected before the COVID-19 outbreak to complement our controls for a set of demographic and economic variables (age, gender, education, ability to make ends meet, number of children), and predetermined health (self-rated health, number of chronic diseases, the Euro-D depression scale).

LA are measured by household composition. For parents, we also consider the distance to the nearest child (co-residence, less than 1 km, from 1 to 25 km, and more than 25 km). Whether the children came to help the parent or the parent visited them might be important for the risk of infection. The detailed household composition takes into account household size: single, with only a partner, with a partner and one other person, with a partner and more than one other person, single with one other person, single with more than one person. Those "other persons" were mainly adult children. Home characteristics include density (number of persons per room) and living in a single house, an apartment, or a nursing home (with the latter including residences with services for older people). Area characteristics are measured by a city size proxy (rural, small town, and big city). Finally, we also study the impact of meeting colleagues or commuting to a workplace, as measured by whether the respondent and his/her spouse were able to work remotely.

We run three multivariate models, one for each – increasing in intensity – type of "contagion" (symptoms, positive testing, and hospitalisation). The outcomes are three dichotomous variables that are equal to one if the respondent had symptoms, tested positive, or was hospitalised; and that are equal to zero otherwise. We run linear probability models on all survey participants from 27 European countries and Israel, and then separately for couples and for parents. Logit or probit models give similar qualitative results. Keeping respondents aged 50 or older in the sample provides us with around 41,000 observations (43,000 when nursing home residents are included).

3 Descriptive statistics

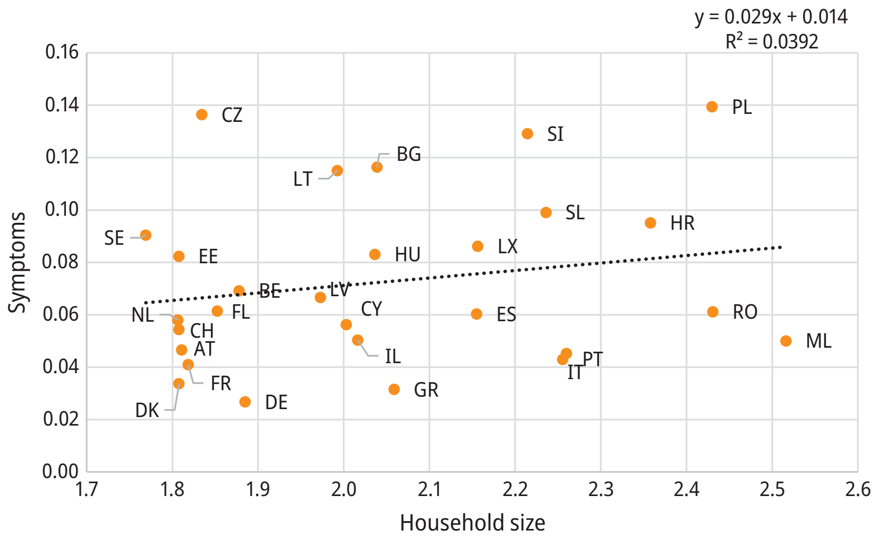
The rate of symptoms reported by the respondents was 2% in the 2020 survey, and was 7% in the 2021 survey. Because of the lower rate in 2020, we focus on the results for 2021. The findings for 2020 are qualitatively similar. Among parents, the probability of having symptoms increased by 2 pp if they were co-residing with a child. As for other measures of contagion, 6.5% of respondents tested positive and 1.2% had been hospitalised in 2021.

The average household size varied significantly across European countries, from 1.8 in Estonia, Denmark, and Sweden; to 2.4 in Romania and Poland; to 2.5 in Malta. On average, a quarter of the adults aged 50+ were living alone. Across European countries, the share of respondents who were living alone ranged from more than a third in Estonia, to less than 20% in Spain, and 12% in Portugal.

There was a positive and significant correlation (0.20, t-score 5.35) between the country rate of COVID-19 contagion and the average household size (Figure 1).

The correlation (0.30, t-score 8.64) was slightly larger for testing positive than for having symptoms, and it became insignificant for the hospitalisation rate. More people in a household may have even been linked to more positive tests than symptoms if information about testing availability was shared between the household members.

1A Symptoms



1B Positive testing

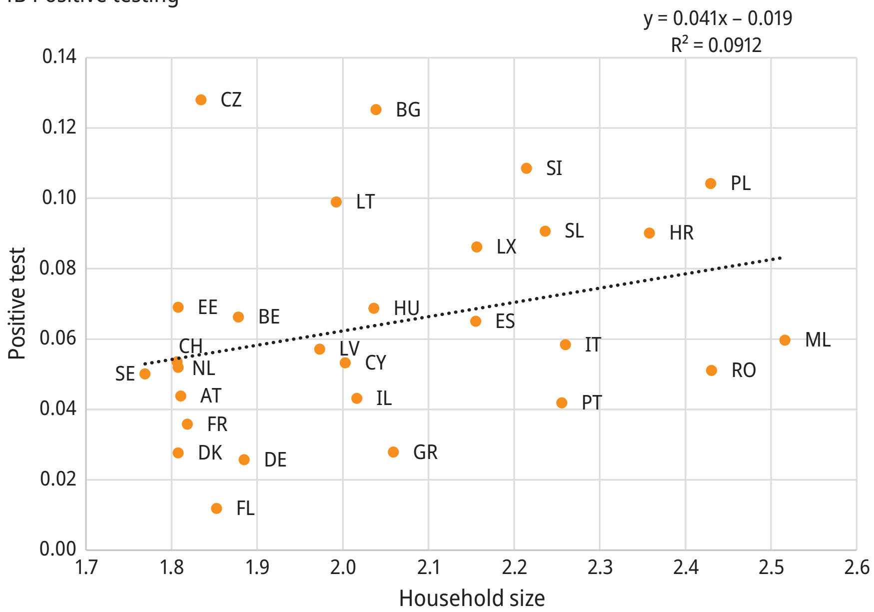


Figure 1: Correlation between having symptoms or testing positive for COVID-19 and household size.
Note: Each dot represents a country. Respondents in nursing homes are excluded. Number of observations: 43,415.
Source: SHARE Corona (W2), release 8.0.0. Unweighted data.

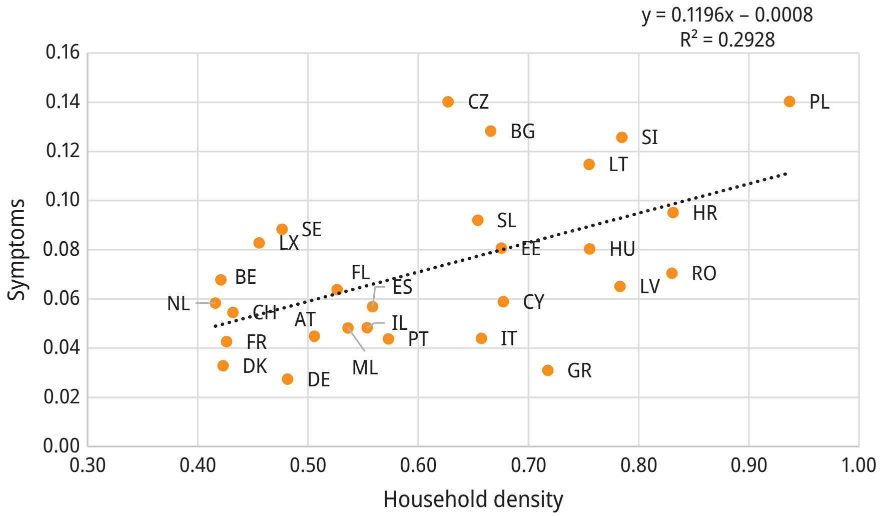


Figure 2: Correlation between having symptoms and household density.
Note: Each dot represents a country. Number of observations: 43,415.
Source: SHARE Corona (W2), release 8.0.0. Unweighted data.

It was not only the number of people in the household that mattered, but also the space in the home. Indeed, contagion increased with housing density (Figure 2; correlation 0.53, t-score 19.08).

4 The drivers of contagion: Results of models

To gain more insight into the potential drivers of contagion, we run multivariate models that allow to control for predetermined observed characteristics. The aim is to disentangle, the effects of housing conditions (HO), say, living in a house rather than an apartment, for people of similar household composition (LA). Introducing health, education, and economic conditions allows us to control for potential confounders.

First we concentrate on the type of home. The majority of the respondents were living in a house (66%), a third were living in an apartment, and less than 1% were living in a nursing or a care home. The respondents who were living in a nursing home were more likely to have had COVID-19 symptoms or to have tested positive. The effects were large: +3.8 pp for symptoms and +7.2 pp for testing positive. The sharing of common space and staff in nursing homes likely explains the increased risk of contagion. We do not document a large statistically significant difference in hospitalisation rates between nursing home residents and individuals living in the community after controlling for observed characteristics. It is likely that some nursing home residents died in their nursing homes without being hospitalised. Moreover, compared to in the pre-pandemic face-to-face surveys, nursing home residents were underrepresented in the SHARE Corona survey because it was conducted by phone. Accordingly, more data are needed to document the effect of living in a nursing home on COVID-19 mortality. Interestingly living in a house, as opposed to living in either a nursing home or an apartment, was protective (Figure 3).

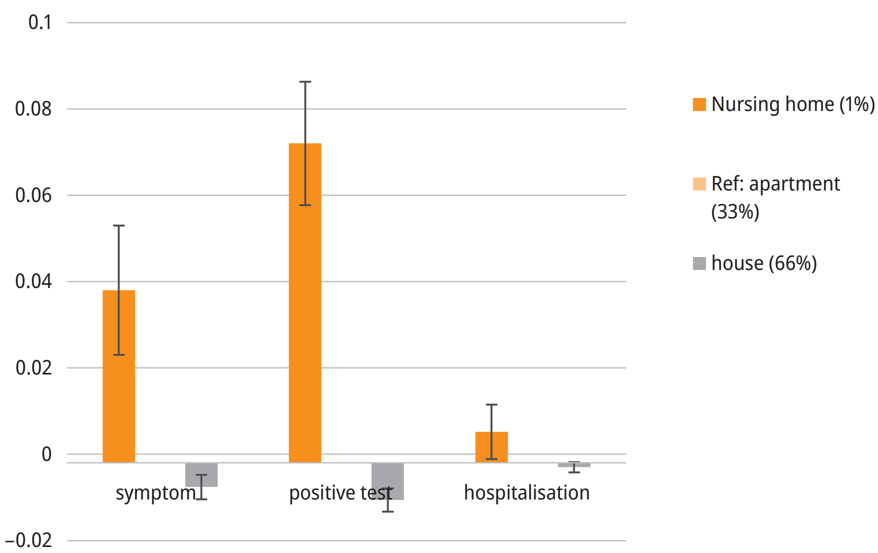


Figure 3: Effect of type of home on the risk of contagion.
Note: Linear probability models (controls are the same as those of Table 1). The reference category is living in an apartment. Number of observations: 41,814 (symptoms), 41,758 (testing), and 42,046 (hospitalisation). Bars represent standard errors.
Source: SHARE Corona (W2), release 8.0.0.

In the rest of this chapter, we drop the 1% of respondents living in nursing homes, and we focus on the associations between contagion and LA and HO for respondents living in the community. Figure 4 extracts the effect of detailed household composition from the model of Table 1.

We find that the incidence of symptoms was 1 pp (1.4 pp) higher for the 55% (resp. 10%) of respondents who were living with a spouse (resp. with a spouse and one child), and was 2.3 pp higher for the 6% of respondents who were living

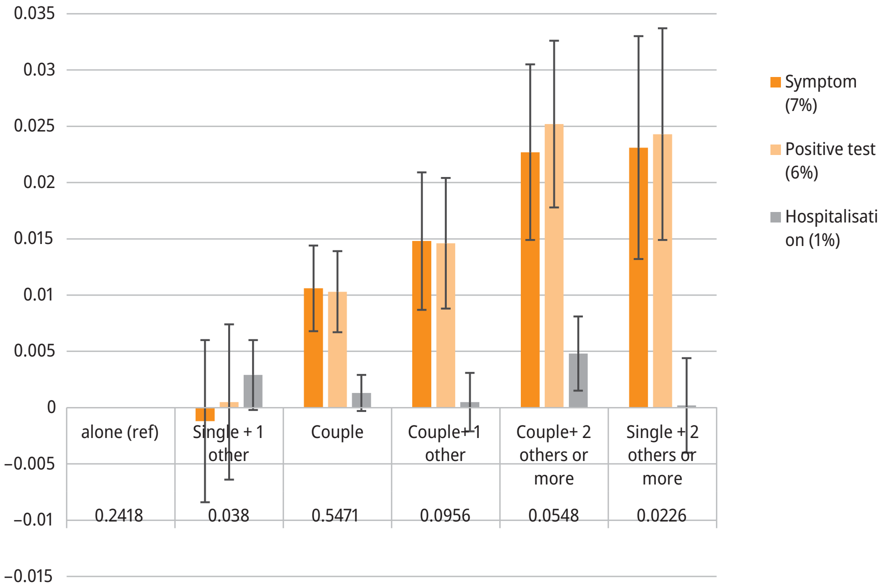


Figure 4: Effect of detailed household composition on respondents' probability of having symptoms, testing positive, and being hospitalised for COVID-19.
Note: Linear probability models (controls are those of Table 1). The reference category is living alone. Number of observations: 40,752 (symptoms), 40,696 (positive test), and 40,965 (hospitalisation). Bars represent standard errors.
Source: SHARE Corona (W2), release 8.0.0.

with a spouse and children and for the 2% of respondents who were single but living with more than one person, than it was for the 28% of respondents who were living alone or with just one person. Thus, sharing a home with more people was associated with having more contacts, and potentially more exposure. However, the respondents' living arrangements had no significant effect on their risk of hospitalisation.

The results also show that the more children, the higher the risk of contagion (as indicated by the incidence of symptoms, positive tests, or hospitalisation). The effects of the number of children are found to be statistically and quantitatively large (Table 1). It therefore appears that children were vectors of infection, either at home or through family interactions.

We also observe that the respondents were less likely to have had symptoms if they were living in a house, rather than in an apartment. This finding is likely attributable to people who are living in houses having fewer shared non-private spaces than people who are living in apartment buildings. It may also be explained by other non-observed factors, such as better housing quality in houses. We lack more detailed data on housing quality. The association between contagion and the quartiles of housing density is found to be weak, and there is no evidence of a pattern with a clear interpretation.

Note that having a university education is shown to have been protective, reducing the likelihood of having a positive test by 0.8 pp, and even the probability of being hospitalised by 0.3 pp. This finding may be explained by higher educated individuals having better unobserved health or more access to care.

Table 1: Linear probability models of respondents having symptoms, testing positive, and being hospitalised.

Single	**(1) symptoms ref**	**(2) positive test ref**	**(3) hospitalisation ref**
Couple	0.0106***	0.0103***	0.0013
Couple + 1 other	0.0148**	0.0146**	0.0005
Couple + others	0.0227***	0.0252***	0.0048
Single + 1 other	−0.0012	0.0005	0.0029
Single + others	0.0231**	0.0243***	0.0002
Rural	ref	ref	ref
Small town	−0.002	0.0012	−0.0016
Big city	−0.0024	0.0028	0.0007
Apartment	ref	ref	ref
House	−0.0103***	−0.0117***	−0.0025*
Household density			
q1	ref	ref	ref
q2	−0.0029	−0.0027	−0.0001
q3	−0.0026	−0.0036	0.0006
q4	−0.0089*	−0.0107**	−0.0003
50–64	ref	ref	ref
65–79	−0.0215***	−0.0171***	−0.0016
80+	−0.0468***	−0.0389***	0.0004
Female	0	0.0008	−0.0050***
Primary education	ref	ref	ref
Secondary	0.0013	−0.0013	−0.0008
University	−0.002	−0.0083**	−0.0030*
Makes ends meet			
With difficulty	ref	ref	ref
Some difficulty	0.0056	0.0057	0.0019
Fairly easily	0.0011	0.0073	0.0011
Easily	−0.0014	0.0071	0.0014

Table 1 (continued)

Single	**(1) symptoms ref**	**(2) positive test ref**	**(3) hospitalisation ref**
Working remotely			
Inactive	ref	ref	ref
Work at home	0.0184**	0.0269***	−0.0001
At home or as usual	0.0382***	0.0425***	0.0013
Self-perceived health			
Very good	ref	ref	ref
Good	0.0159***	0.0118***	0.0042***
Fair	0.0221***	0.0231***	0.0099***
Poor	0.0261***	0.0339***	0.0256***
Depression (Eurod)	0.0025***	0.0009	0.0005*
Nb chronic diseases	0.0015*	−0.0003	0.0002
Having children			
Childless	ref	ref	ref
One child	0.0017	0.0019	0.0019
2 children	0.0196***	0.0166***	0.0050**
3+ children	0.0253***	0.0248***	0.0051**
Constant	0.0750***	0.0341***	0.0017
Observations	40,752	40,696	40,965
R-squared	0.0296	0.0265	0.0091

Note: ***p<0.01, **p<0.05, *p<0.1. Non-nursing home respondents. Linear probability model. Other controls are 28 country dummies.
Source: SHARE Corona (W2), release 8.0.0.

Women were less likely than men to be hospitalised. This finding is in line with previous research showing that the virus is more lethal for men. There was a higher frequency of contagion (but not of hospitalisation) for younger respondents, and for those who were employed, even if they were working from home. The effect was larger, up to 4 pp, if the respondents had to commute and did not always work remotely from home, which may be explained by these individuals having a higher contact frequency, either at their workplace or during their commute.

Focusing on couples, we add controls for the partner's activity. These controls have an additional effect on the respondents' risk of infection only if the partner was working outside the home, and not if s/he was working remotely from home (Figure 5).

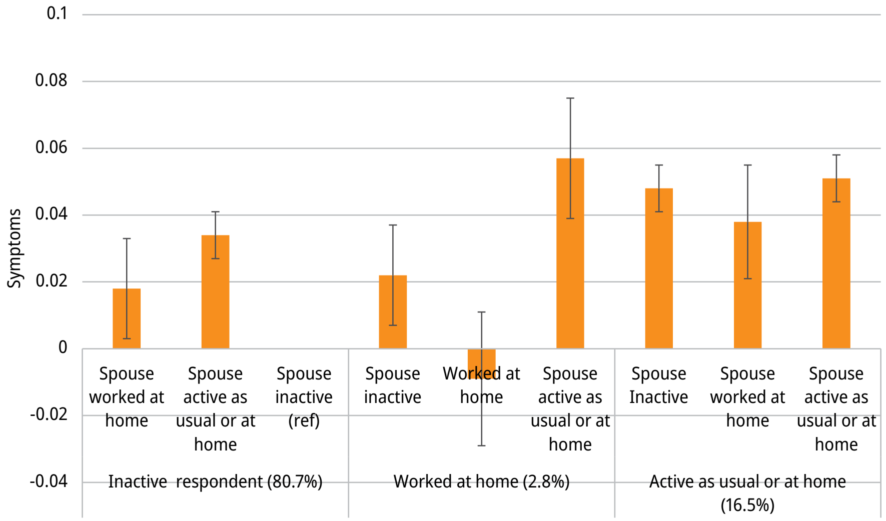


Figure 5: Symptoms of respondents living with a spouse.
NB. Linear probability model. Other controls are those of Table 1, col. 1. Bars represent standard errors. Number of observations: 26,617.
Source: SHARE Corona (W2), release 8.0.0. Unweighted data.

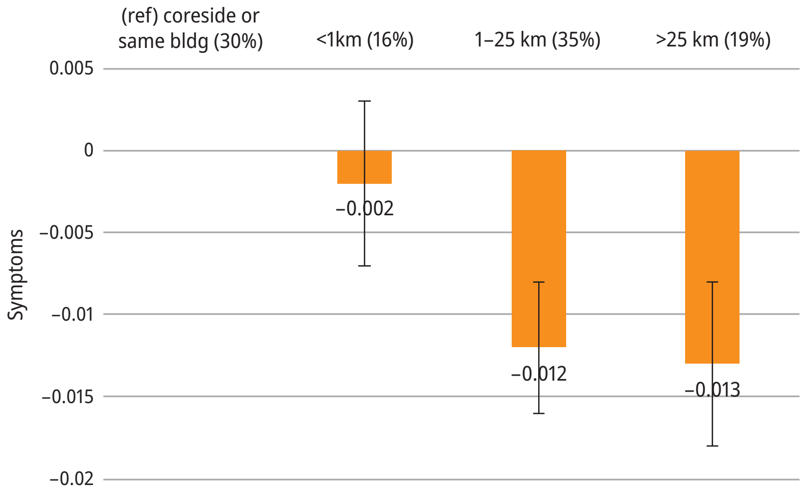


Figure 6: Effect of distance to the nearest child on a parent's probability of having symptoms.
Note: Linear probability model. Other controls are age, gender, number of children, education, ability to make ends meet, area, number of chronic diseases, Euro-D depression scale, and country. Bars represent standard errors. Number of observations: 29,555.
Source: SHARE Corona (W2), release 8.0.0. Unweighted data.

When we examine the effect of the distance of a parent to the nearest child, we find that a parent was 1 pp less likely to be infected if all of his/her children were living more than 1 km away (Figure 6).

5 Conclusions

Public policy should take into account housing conditions in a pandemic. Housing plays a role in the risk of infection when people are sharing living space, or when household members are working remotely during strict lockdown periods. During the COVID-19 pandemic, working remotely from home rather than commuting reduced the risk of contagion. The need to adapt homes to meet the desire of older people to age "in place" has been widely acknowledged, and the additional risk of infection in nursing homes observed during the pandemic may further strengthen this demand. These developments may have consequences for long-term care policies (Achou et al., 2022). In addition, the new trend towards adapting home space to allow employees to work remotely at least part of the time could gradually become more important.

Our finding that living in a house rather than an apartment had a small but robust and significant beneficial effect on the risk of contagion is also challenging at a time when there are environmental concerns about urban sprawl in some densely populated European countries.

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Šime Smolić, Stipica Mudražija, Nikola Blaževski
and Margareta Fabijančić

32 Health status of older Europeans living alone: The role of living arrangements, healthcare, and social supports in the COVID-19 pandemic

Key points

- During the COVID-19 pandemic, older adults who were living alone were more likely to report a health decline than their counterparts who were living with others.
- People aged 60 or older who had limited access to healthcare during the COVID-19 pandemic were more likely to report worsened health.
- A more generous “welfare state”, better coverage of health services, and higher per capita health and social protection expenditures were associated with a more moderate decline in health among older Europeans.

1 Introduction

A growing number of older Europeans are living alone. In the European Union (EU) in 2020, nearly 28 million, or almost 31% of the adult population aged 65 or older, were living alone (Eurostat, 2022). These older adults face many challenges, including an increased risk of social isolation, poorer health status, financial strain, and a greater need for social support (Esteve et al., 2020). Living alone has been associated with a higher risk of loneliness and depression and of nursing home admission, and with more intensive use of health-related public supports (Mudrazija et al., 2020). In addition, studies conducted during the COVID-19 pandemic have confirmed that older adults living alone faced an elevated risk of loneliness (Atzendorf and Gruber, 2022) and of an overall deterioration in mental health. The COVID-19 health crisis has greatly exacerbated older people’s health vulnerabilities, impeding their access to healthcare services due to either their own or their healthcare providers’ decisions. Therefore, it is critically important to understand how the resiliency of older adults during the COVID-19 pandemic differed depending on their living arrangements. People who live alone have generally relied more on the public health system to meet their health and long-term care needs than people who live with others.

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Recent studies have called for the health needs of older adults in poorer health who are living alone in a crisis, such as the ongoing pandemic, to be identified and addressed. To this end, we use data from the SHARE Corona Survey (SCS) to examine the changes in older Europeans' health status during the pandemic, and the role of different policy settings. We explore systemic differences in the health status of older adults depending on their living arrangements, and investigate how their socio-demographic and health-related characteristics may moderate the link between their living arrangements and their health. Furthermore, we focus on variables indicating that these older adults had unmet healthcare needs, and the importance of these variables in shaping their health status. Another goal of this chapter is to examine whether different institutional contexts – i.e., differences between welfare regimes more broadly and the characteristics of health systems more specifically – can be related to the health status of older Europeans who were living alone during the COVID-19 crisis. Finally, we discuss our findings on the health of older Europeans living alone during the COVID-19 pandemic in the context of public healthcare policies designed to address their needs.

2 Data and methods

We use the SCS datasets, and supplement them with data collected in previous ("regular") SHARE waves, as well as data from the official releases of Eurostat, the Organisation for Economic Co-operation and Development (OECD), and the World Health Organization (WHO). The outcome variable was obtained by asking respondents whether their health had improved, stayed about the same, or worsened compared to three months before the interview. These three categories were transformed into a binary variable that equals one if the respondent's health had declined, and that equals zero otherwise. The respondent's living arrangements – that is, whether the respondent was living alone or with others (e.g., in a couple, with others) – is the key explanatory variable of interest. Three dummy variables that reflect limited access to healthcare in the second SCS (healthcare forgone, postponed, or denied) are also predictors of particular interest. Our socio-demographic controls include gender, age (in years), education (in years), and area of residence (rural or urban). Our health-related controls include the number of current chronic conditions (≤ 1 and 2+), self-reported health status (SRH) before the pandemic (poor/fair and good or better), whether the respondent has limitations due to health problems, and whether the respondent has been vaccinated against COVID-19 or had symptoms of COVID-19.

The full sample includes 49,253 respondents aged 50 or older from 27 European countries and Israel. Our analytic sample includes 40,491 respondents aged 60 or older.[1] Women comprised 56% of the working sample, while the average age of the respondents was 71.6 years (SD = 8.5 years). Men had, on average, one year of education more than women (11.6 vs 10.7), and almost one in three respondents were living alone. The countries with the highest proportions of respondents aged 60+ living in single households were Estonia (47%) and the Netherlands (41%), while the countries with the lowest proportions were Portugal (18%) and Romania (19%). Nearly 13.9% of respondents reported a decline in health, and 29% said they had poor or fair SRH before the pandemic. Close to 15% indicated that they were not vaccinated against COVID-19, and 5.5% reported experiencing COVID-19 symptoms.

Figure 1 shows the shares of older adults who reported worsening health by living arrangements. On average, older adults who were living alone were significantly more likely to report a decline in health than those who were living with others (16% vs 12.9%). If we assume that close to 122 million people in the EU were aged 60 or older in 2021, our findings suggest that at least six million people who were living alone experienced a health decline. The share of older adults living alone who reported a decline in health varied considerably across countries: the proportions were largest in Bulgaria and Lithuania, and were smallest in Denmark and the Netherlands.

Our macro-level explanatory variables include a dummy variable describing welfare regimes as more or less generous (more details on its construction are available in Mudrazija et al., 2020). Other variables we use are the 2019 Universal Health Coverage (UHC) score (Lozano et al., 2020) related to essential health services (low for values < 80, high for values 80 and above) and health system type (Bismarck or Beveridge). Finally, we include dummy variables indicating whether health or social protection expenditures per capita are high or low, and indicators of health system resources based on the number of practising doctors and nurses. These macro-level variables capture the state of health systems in 2019, and thus in the period preceding the pandemic. Before dichotomising them into “high” and “low”, we compare country-specific values to the average figures for all countries in the sample, or the EU-27 average.

Figure 2 shows the correlations of the macro-level variables and the percentages of older Europeans living alone whose SRH had recently worsened. Al-

1 In addition to those younger than age 60 (N = 4,540), we exclude respondents from Israel (N = 1,203) (to limit the analysis to European countries only), interviews with proxy respondent only (N = 1,269), and respondents in nursing homes (N = 385). Another 862 cases were excluded due to missing information on SRH before the pandemic, and 503 cases were excluded due to missing information on all other variables (1.2%).

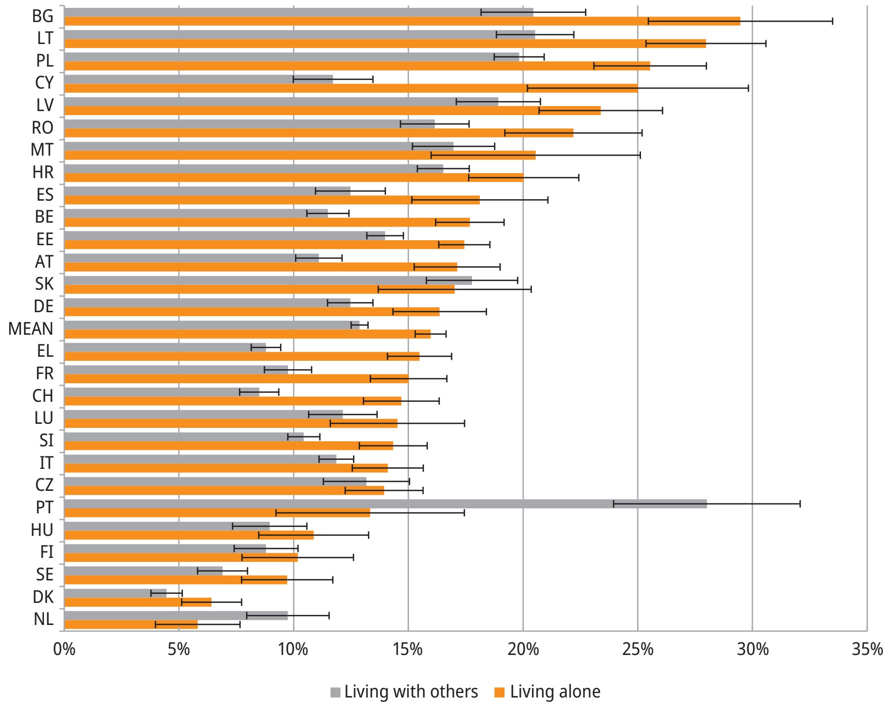

Figure 1: Percentages of older adults aged 60+ whose health worsened by living arrangements.
Note: N = 40,491 (Living with others = 29,758; Living alone = 10,733).
Error bars represent 95% CI. Subsample mean of worsened health: Living with others = 12.9%; Living alone = 16.0%. Older adults living with others in NL, PT, and SK were more likely to report worsened health than those living alone. One reason for this might be relatively small sample sizes, but this issue should be investigated more thoroughly.
Source: SHARE Corona (W2), release 8.0.0. Weighted data.

though the associations were generally weak to moderate, the proportion of older adults living alone who reported a health decline was lower in countries with higher health and total social protection expenditures. Moreover, the same pattern is visible for countries with more comprehensive essential health care coverage and a higher density of health personnel.

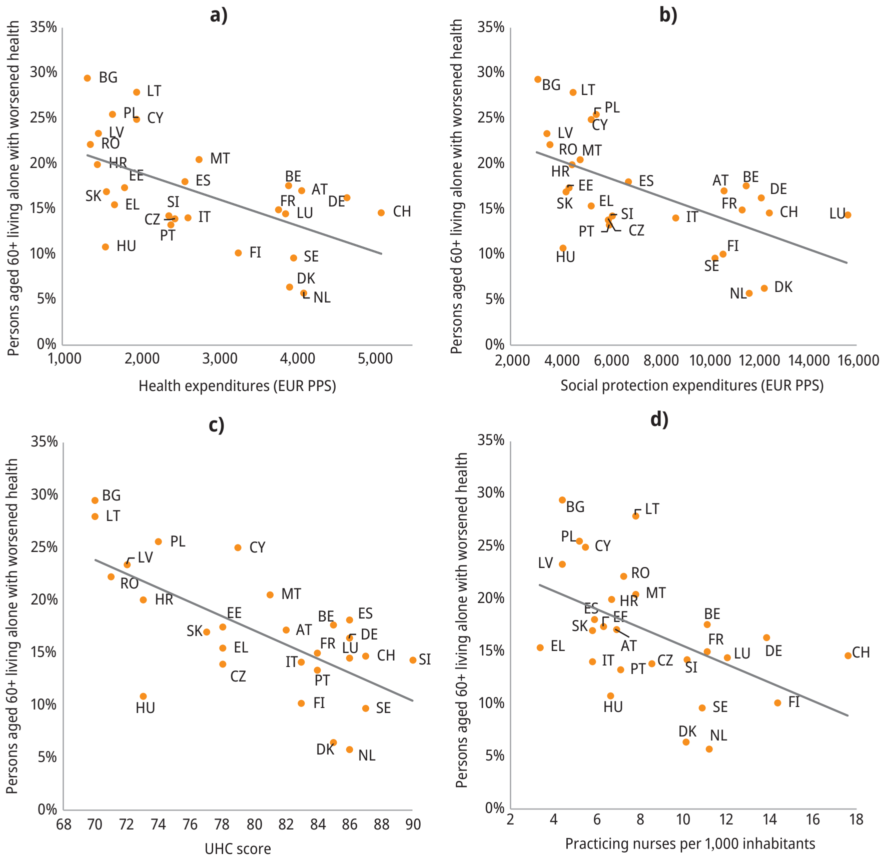

Figure 2: Correlations between macro-level variables and shares of older adults who were living alone and reported worsened health in the pandemic.
Note: N = 40,491. PPS – purchasing power standard.
Data for the macro-level variables are for 2019, or for the latest available year in the Eurostat, WHO, or OECD databases.
Source: SHARE Corona (W2), release 8.0.0. Weighted data.

In addition, Figure 3 shows the differences in the proportions of older Europeans who reported a health decline during the COVID-19 pandemic by welfare state generosity. Regardless of their living arrangements, older adults in countries with a more generous welfare state were less likely to report a health decline during the pandemic.

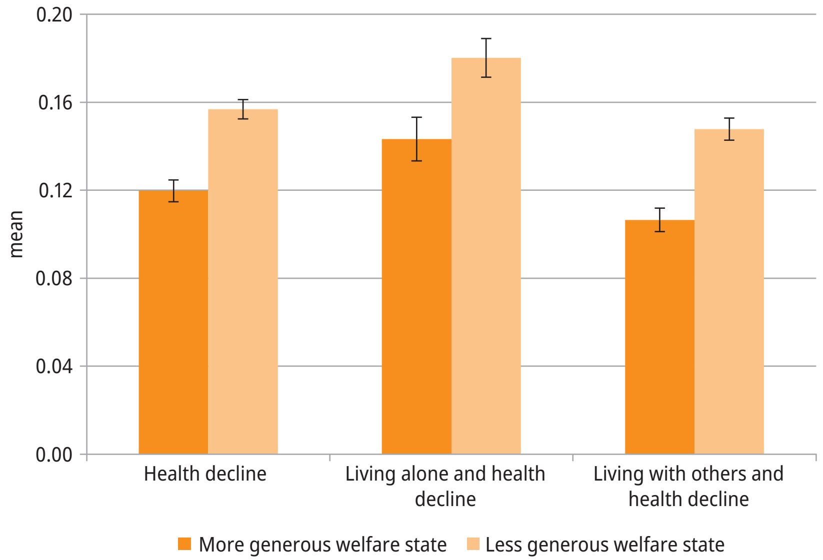

Figure 3: Health decline among older adults by living arrangements and welfare state generosity.
Note: N = 40,491. Countries in the "more generous welfare state" group: AT, BE, CH, DE, DK, FI, FR, LU, NL, SE; others in the "less generous welfare state" group.
Source: SHARE Corona (W2), release 8.0.0. Weighted data.

3 Empirical analyses and results

To explore the determinants of health decline among Europeans aged 60 or older, we estimated logistic regression models. In the first step, we identified the characteristics of older adults who were more likely to report a health decline during the COVID-19 pandemic. In the second step, we added the macro-level variables to the models to estimate the effects on the odds of reporting worsened health status. In the univariate analyses (based on the *chi-square* test), previous health status was associated with health decline (in all *p*-value < 0.001). In addition, the respondents who reported having unmet healthcare needs in the pandemic were more likely to report a health decline than those who did not. Furthermore, the respondents who were not vaccinated against COVID-19 and who had COVID-19-related health symptoms were significantly more likely to report a health decline. Finally, macro-level variables, such as higher UHC and health and social protection expenditures, were associated with a lower likelihood of reporting a health decline (based on the *t-test* results).

Figure 4 summarises the estimates from the logistic regression model with micro-level variables. We conclude that the odds of older adults reporting a health decline were significantly higher if, holding other things equal, they were living alone. Health-related variables had a significant effect on the likelihood of reporting a health decline. For example, individuals who had two or more chronic conditions had, on average, 80% higher odds of reporting an adverse change in health. Moreover, the odds of reporting worsened health status were around 25% higher for respondents who had forgone healthcare due to fear of contagion, and were 70% higher for those who were denied a medical appointment.

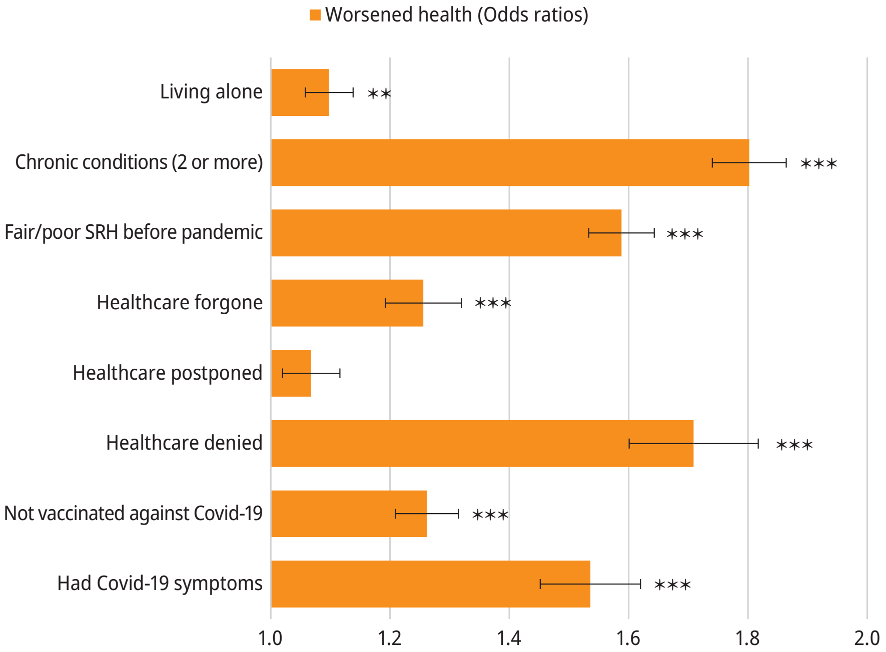

Figure 4: Estimated results for health decline among older Europeans (micro–level variables).
Note: *** $p < 0.01$, ** $p < 0.05$, N = 40,491. We control for age, gender, years of education, area of residence, and limitations due to health. Country controls = yes.
Source: SHARE Waves 1–8 and SHARE Corona (W2), release 8.0.0.

Figure 5 shows estimates of the logistic regression models with macro-level variables added stepwise. A more generous welfare state, more substantial coverage of health services, and higher health and social protection expenditures were associated with lower odds of older Europeans experiencing a health decline during the pandemic. Health personnel stock had mixed effects on the outcome. While above-average density of nursing staff was associated with lower odds of reporting a health decline, the density of practising doctors was not significantly related to better health.

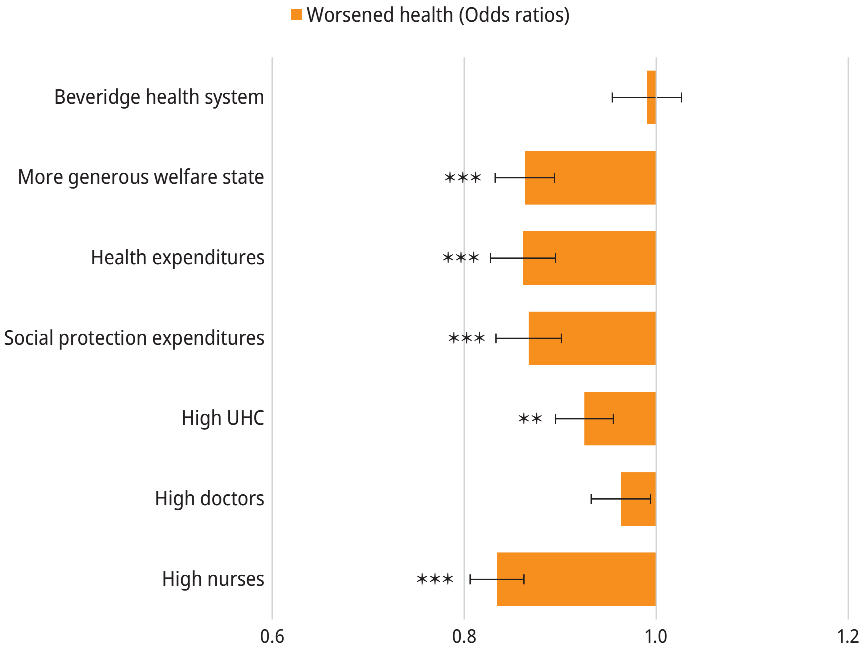

Figure 5: Estimated results for health decline among older Europeans (macro–level variables).
Note: *** p < 0.01, ** p < 0.05, N = 40,491. Individual controls = yes.
Source: SHARE Waves 1–8 and SHARE Corona (W2), release 8.0.0. Eurostat, WHO and OECD databases.

4 Conclusion

A significant increase in single-person households among the elderly population is a well-known phenomenon in the developed world, especially in the last few decades. As more older people are living alone, the demand for public healthcare services is likely to increase, given that living alone has been linked to adverse health consequences. Coping with health issues or impairments may be particularly difficult for older individuals who are living alone, and who do not receive adequate help from their family members or others.

The COVID-19 health crisis affected older people who were living alone in many ways. On the one hand, people's living arrangements became an essential factor in the risk of contracting COVID-19, and those who were living alone were less exposed to the disease. On the other hand, due to the COVID-19 pandemic, barriers to accessing healthcare increased, and the supply of formal and informal care decreased for non-pandemic-specific health needs.

The preliminary results presented in this chapter suggest that socio-demographic factors were significant predictors of reporting a health decline in the pandemic. In particular, we conclude that the odds of reporting a health decline during the pandemic were higher for older adults who were living alone than for those in other living arrangements. Further evaluations showed that having unmet healthcare needs due to COVID-19 – and particularly if healthcare was forgone or denied – negatively affected the health status of older adults, especially if they were living alone. Therefore, vulnerable population groups, including those living alone, should be targeted by health interventions aimed at reducing barriers to healthcare access and maintaining continuity in the provision of health and social services. These interventions could slow down health decline among older adults, and improve their quality of life.

Closer examination of our macro-level variables suggests that countries with more developed health and social protection systems had significantly smaller shares of older adults who were living alone and reported a health decline during the pandemic. In addition, we showed that older adults in more generous welfare states had lower odds of experiencing a health decline. We found similar effects for the coverage of essential health services (UHC) and health and total social protection expenditures. While there is a clear need to increase health and social protection spending, this is likely to be a challenging proposition for policymakers in the context of post-pandemic economic conditions, limited fiscal capacity, and competing social demands. Another growing challenge is the shortage (and ageing) of health workers, even as our results show that having sufficient nursing staff plays a vital role in the health status of older adults. As more information becomes available, future analyses and data evaluations will be able to build on our insights, and further improve our understanding of the interplay between the living arrangements and health of older adults and institutional contexts in Europe.

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