

Results of the 1st SHARE Corona Survey Project

SHARE-COVID19

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Part A: Introduction and executive summary of results

I. Introduction

This is the first report on the **SHARE-COVID19 project**, which started in November 2020. The project is supported by the European Commission with funds provided by Horizon 2020 and the Coronavirus Global Response. The report contains the essence of our approach and summarizes our first and preliminary findings.

The COVID-19 virus has been affecting our health, economy, politics, and social life. It has been especially disrupting for the target group of the individuals who are observed in the Survey of Health, Ageing and Retirement in Europe (SHARE), namely the 50+ population, including people in retirement or nursing homes who have the greatest risk on their health from being infected.

SHARE has been studying the life of the 50+ population across Europe for many years, accumulating a wealth of longitudinal data for research and strongly contributing to the understanding of the ageing process and its life-course determinants in Europe and Israel. The outbreak of the COVID-19 virus hit SHARE in the middle of its Wave 8 data collection. In October 2019, the data collection for SHARE Wave 8 had started off. All 28 countries, which had participated in Wave 7, were included again. However, at the beginning of February 2020, the virus was spreading quickly across Europe, leading to a gradual suspension, country by country, of all the SHARE fieldwork between March 10 and March 23. Nevertheless, about 70% of all planned longitudinal interviews and 50% percent of all refreshment interviews across countries had been finished by then, thus providing an ideal reference point against which the effects of the pandemic and the epidemic control decisions can be measured.

Against this background, all stakeholders involved – SHARE users, researchers and funders – shared the opinion that SHARE data about the health and living situation of the 50+ population in Europe were now needed more than ever to shed light on the short and long-term implications of the pandemic. They also agreed that this should be done in two ways. First, SHARE as a longitudinal survey provides *as it is* an ideal infrastructure to put the implications of the pandemic in its proper context. The investment in 8 waves of data collection now pays off in many ways. SHARE's strength is to determine the impact of the pandemic on living conditions that we have routinely recorded: labor market status, income, family and social contacts, inter- and intra-generational help, differentiated by living conditions, by the three age groups in SHARE (still working, young retirees, oldest old), by income situation and by their health history. This data has been available since 2004. This enables us for instance to compare the effects of the economic crisis precipitated by COVID-19 with those of the financial crisis in 2008, and to trace whether the negative economic, social and health effects of the pandemic are hitting those who were anyway disadvantaged.

Second, the stakeholders involved in SHARE decided that this wealth of life-course data should be complemented by measurements of the situation during and immediately after the first lockdown. This is the “SHARE Corona Survey” on which this report is based. Since it became

clear that a quick return to the normal face-to-face Computer Assisted Personal Interview (CAPI) was unlikely, it was decided that SHARE would resume interviewing with a Computer Assisted Telephone Interview (CATI) with a focus on the living situation under the pandemic and the epidemic control decisions.

Hence, as a reaction to the seriousness of the COVID-19 outbreak and the prolonged lockdowns, a special COVID-19 questionnaire was developed. Whenever possible, questions from the regular SHARE questionnaire have been used to improve comparability. This questionnaire covers the most important life domains for the target population and asks specific questions about infections and life during the lockdown:

- **Health and health behavior:** General health before and after the COVID-19 outbreak, health conditions that may impact the pathway of COVID-19, safety measures taken (e.g. social distancing, wearing a mask, using disinfection fluids)
- **Mental health:** Anxiety, depression, sleeping problems and loneliness before and after the COVID-19 outbreak
- **Infections and healthcare:** COVID-19 related symptoms, COVID-19 testing and hospitalization of the respondent and of family and friends, forgone medical treatment, satisfaction with treatments
- **Changes in work and economic situation:** Unemployment, business closures, working from home, safety measures at the workplace, changes in working hours and income, financial support, financial hardship
- **Social networks:** Changes in personal contacts with family and friends, help given and received, personal care given and received, and volunteering.

The key advantage of these new data are their link to the SHARE base panel study with its life-course information on previous health conditions and economic and social living conditions. Since the incidence of the COVID-19 illness as well as the economic and social implications of the epidemic-control decisions vary dramatically by these health, economic and social preconditions, understanding this linkage is essential in order to optimally target public policy.

Based on these data, the SHARE-COVID19 project has the overarching objective to understand the non-intended consequences of the epidemic control decisions and to devise improved health, economic and social policies. This report summarizes the very first findings of this project, which started in November 2020, hence only about 3 months after its beginning. It should therefore be stressed that all findings in this report are preliminary and require further data and research before firm policy conclusions can be drawn.

The report is structured by the seven specific aims of the SHARE-COVID19 project:

1. To identify **healthcare** inequalities before, during and after the pandemic and their effects across all EU Member States
2. To understand the lockdown effects on **health** and **health behaviours**
3. To analyse **labour market** implications of the lockdown

4. To assess the impacts of pandemic and lockdown on **financial hardship** and **inequality**
5. To mitigate the effects of epidemic control decisions on **social relationships**
6. To optimise future epidemic control measures by taking the **geographical patterns** of the disease and their relationship with social patterns into account
7. To better manage **housing and living arrangement** choices between independence, co-residence or institutionalisation

Finally, we added a short section on the data generation by this project, which is central to perform the international comparisons and their causal links to the severity of the pandemic and the stringency of the epidemic control decisions.

II. Executive summary of the main conclusions

This section summarizes our main findings. They relate to the “first wave” of the pandemic, i.e., between March and June 2020. The data were collected mainly in June and July 2020. We stress again that all findings are preliminary, based on a first data release, and require further data analyses before firm policy conclusions can be drawn. We also remind the reader that SHARE studies the 50+ population, including people in retirement or nursing homes who have the greatest risk on their health from being infected. Conclusions to the general population should not be drawn from the SHARE data as younger people may have behaved quite differently.

Healthcare

The pandemic has precipitated widespread postponements and cancellations of healthcare unrelated to Covid19. This did not happen at random but with a distinct social gradient. A bad economic situation, poor overall health and higher healthcare utilisation contributed to unmet healthcare. People aged 50+ in countries of “Old Europe”, countries with higher universal health coverage and stricter containment and closure policies were more likely to have medical services postponed.

We detected quite large cross-country differences when it comes to initial pandemic wave effects on unmet health care of the population aged 50+. The proportions of those who avoided medical care due to fear of the Coronavirus ranged from 4% in Slovenia to almost 23% in Israel, and approximately 5% of persons aged 50+ were denied medical treatment in spite of explicitly asking for it. Specialist and primary healthcare services were disrupted the most. The odds of having medical care forgone were generally lower for those in “New Europe” (post-socialist countries) compared to countries in “Old Europe”.

Health and health behaviours

SHARE respondents in all countries self-reported a high extent of adhering to recommendations for reducing virus spread during the initial wave of the pandemic in the first half of 2020. The mean of all countries is 95.6% for always keeping distance in the public, 82.4% for using hand sanitizer, and 87.5% for washing hands more frequently than usual. Smokers and those with high alcohol consumption engaged less in preventive measures.

Compared to results from SHARE Wave 8 that was collected before the onset of the Covid-19 pandemic, the proportions of respondents reporting being in very good, good or fair self-reported health (SRH) did not change. It actually even improved in some countries. Only about 10% stated a worse health status.

Contrary to what might be expected, this also holds for mental health (e.g., symptoms of depression). Most country-specific shares of individuals reporting depressive symptoms were similar or even lower as compared to Wave 8. About one third of European citizens felt nervous or anxious in the last month before being interviewed in June and July 2020. European countries that were hit hard by the pandemic dominated the top-ranking countries in terms of nervousness or anxiety. Similar findings apply to loneliness or sleep problems.

Female, living alone, taking ≥ 5 different medicines per day (polypharmacy, an indicator of multimorbidity) or with a chronic medical condition had a higher risk for worsened mental well-being.

Work and labour markets

Our findings reveal important differences in the impact of the various job categories both on the probability of experiencing work interruptions and of switching to teleworking. In addition, the results highlight that women, self-employed workers and less educated workers have been more often affected by work interruptions and longer spells of absence from work.

Middle-income groups are more likely to reduce hours or become unemployed compared to low - and high-income groups. Self-employed workers are also more likely to work less or not work at all in comparison to private sector employees.

Short time work seems related to the lockdown measures more than to the epidemic itself, but the type of earnings support adopted in the different countries for different jobs also play a role: In countries where short-time employment aid is more generous, respondents are more likely to be covered.

Earnings support is received mostly by respondents who live in countries where the lockdown measures were strict and the pandemic more severe. In general, it appears that short-time employment aid is regressive in the sense that more high-income and middle-income workers received such aid compared to low-income workers, even after controlling for sector composition and occupation.

Controlling for occupational characteristics, IT-skills appears a crucial determinant of performing a job at home. Preliminary results show that working from home mildly impaired the mental health of older workers.

Financial hardship and inequality

The economic downturn predominantly causes financial hardship through a reduction or the loss of labor income. Having a job interruption during the pandemic significantly increases the risk of financial distress. This holds even after controlling for socio-economic indicators and past values of the indicator. Households who could not make ends meet coped with the negative shock by receiving (mostly public) financial help, by postponing bill payments and by running down savings.

Country policies and responses to the implications of the COVID-19 pandemic had a significant impact on the economic situation and the ability to cope with economic risks.

Social relationships

Social relationships strongly focused on the nuclear family. Children reported having more frequent contact with, and giving more help to, their parents. This is reported by both sides: Parents reported having received more help from their children, and children reported having given more help to their parents than before the pandemic, while the other direction (parents helping children) was less frequent than before. Help to others also declined.

The study findings point to the role of the social network, even if indirect, in promoting self-protective behaviors among the oldest cohort. Around 15 percent of all respondents stayed home completely during the initial phase of the COVID-19 crisis – mainly the elderly aged and those with prior health risk conditions. On average, older Europeans responded strongly to the recommended protective behavior measures (6 out of 7 measures adopted). Feeling more anxious than before Corona and especially fear of infection are the main motivators for protective behavior. Women, the partnered, and those with higher education engaged in more, while respondents from Sweden, Latvia, Finland and Denmark engaged in fewer self-protective behaviors.

We found that 75 percent of the sample were not exposed to the virus. We predicted poorer well-being for all those who were exposed (e.g., by mentioning someone in their network who was tested positive) compared to those who were not.

Additionally, results on the influence of social networks on selected aspects of mental health indicate that more face-to-face contacts significantly reduced negative mental health consequences while this is not the case for electronic contacts. Splitting the sample into age groups reveals that within the 50+ population no age group benefitted from electronic contact, while all ages benefitted from the effect of face-to-face contact.

Geographical patterns

Older people in the SHARE countries reduced activities that could have increased the spread of the virus quite drastically from the onset of the pandemic until the summer of 2020. We observe the largest reductions in activities related to social relations, like visiting other family members or meeting more than 5 people outside the household. A majority of older people in Europe also report a decline in shopping which may not necessarily be a social activity in-itself but may nevertheless involve various forms of social interactions.

Women and older people reduced their activities to a slightly larger extent than men and younger people. Both stringency of epidemic restrictions and severity of the pandemic were positively associated with a reduction in social activities. However, restrictions and infections only displayed a weak association with a reduction in shopping. Furthermore, our results display a strong relationship between reduced walking and restrictions, but not between walking and infections.

These findings will become ingredients of richer models for the spread of SARS-CoV2 and similar viruses. Since the "geoSHARE" database is still under construction, findings for

geographically optimal lockdown measures are very preliminary. Three scenarios were studied: (a) a baseline scenario, which lifts the national lockdown and all NPIs in January 2021, (b) a “semi-lockdown” scenario with school opening, partial retail sector operation, universal mask wearing and social distancing/teleworking in January 2021 and (c) a “rolling lockdown” scenario combining a partial lifting of measures in January 2021 followed by a third nationwide lockdown in February 2021. The results regarding the first phase indicate that the “semi-lockdown” scenario clearly outperforms the third lockdown scenario (5.7% less expected fatalities); the second phase is very sensitive to the availability of sufficient vaccine supplies and relevant vaccination rates.

Housing and living arrangements

People were less depressed and had less trouble sleeping if they lived outside big cities and their suburbs and large towns, especially for those who do not live in a single house. Having just one or two rooms also increased the frequency by which symptoms of depression were measured. In turn, frequency of loneliness were observed more often when living in a single house. Living alone rather than with a spouse or in a multigenerational household was detrimental for self-reported mental and physical health. Having no child living very close, co-residing or in the same building, increased the probability of self-reported depressive symptoms or loneliness for parents.

Part B: Findings by research area and policy field

Part B presents more details on the findings summarized above. All sections are structured by first delineating the research aims, listing the (working) papers produced by the SHARE-COVID19 projects in this research area, presenting the first and preliminary results and which conclusions might be drawn if these results hold after additional data analyses, and finally further steps planned by the project participants.

III. Healthcare

1. Research aims

The main objective in this part of the project phase was an in-depth analysis of the determinants of unmet healthcare for people aged 50 and older after the outbreak of COVID-19. Our research strategy relies on a micro-macro approach by combining available SHARE survey data—the 1st SHARE Corona Survey and data from previous SHARE waves—with a set of macro determinants that capture health system differences, the COVID-19 pandemic effects (for example country specific morbidity and mortality), and country specific epidemic containment strategies. Another important branch of our investigation focused on social inequalities in access to health care during the first epidemic wave in Europe, also by combining data from the regular SHARE survey (preliminary wave 8 data) and the SHARE Corona Survey. Furthermore, the aim of our research was to provide extensive descriptive healthcare analysis of unmet healthcare needs due to Corona in 26 European countries and Israel—this has been performed by using the data from the SHARE Corona Survey and data from the SHARE wave 7.

2. List of papers that have been written in this first reporting period

Research papers that have been prepared and submitted for peer review in the European Journal of Ageing, before the 1st reporting period:

- Š. Smolić*, I. Čipin*, P. Međimurec* (*Faculty of Economics & Business, University of Zagreb, Croatia). *'Access to healthcare for people aged 50+ in Europe during the COVID-19 outbreak'*
- L. Arnault*, F. Jusot*, T. Renaud* (*Université Paris Dauphine, PSL, Paris, France), IRDES (Institut de Recherche et Documentation en Economie de la Santé, Paris, France). *'Social inequalities in access to healthcare among the population aged 50+ years during the COVID-19 pandemic in Europe'*

A working paper-style report, with detailed descriptive analyses of unmet healthcare due to the COVID-19 pandemic across European countries and Israel.

- Š. Smolić*, N. Blaževski* (*Faculty of Economics & Business, University of Zagreb, Croatia): *'Descriptive analyses of unmet healthcare based on 1st round of SCS'*

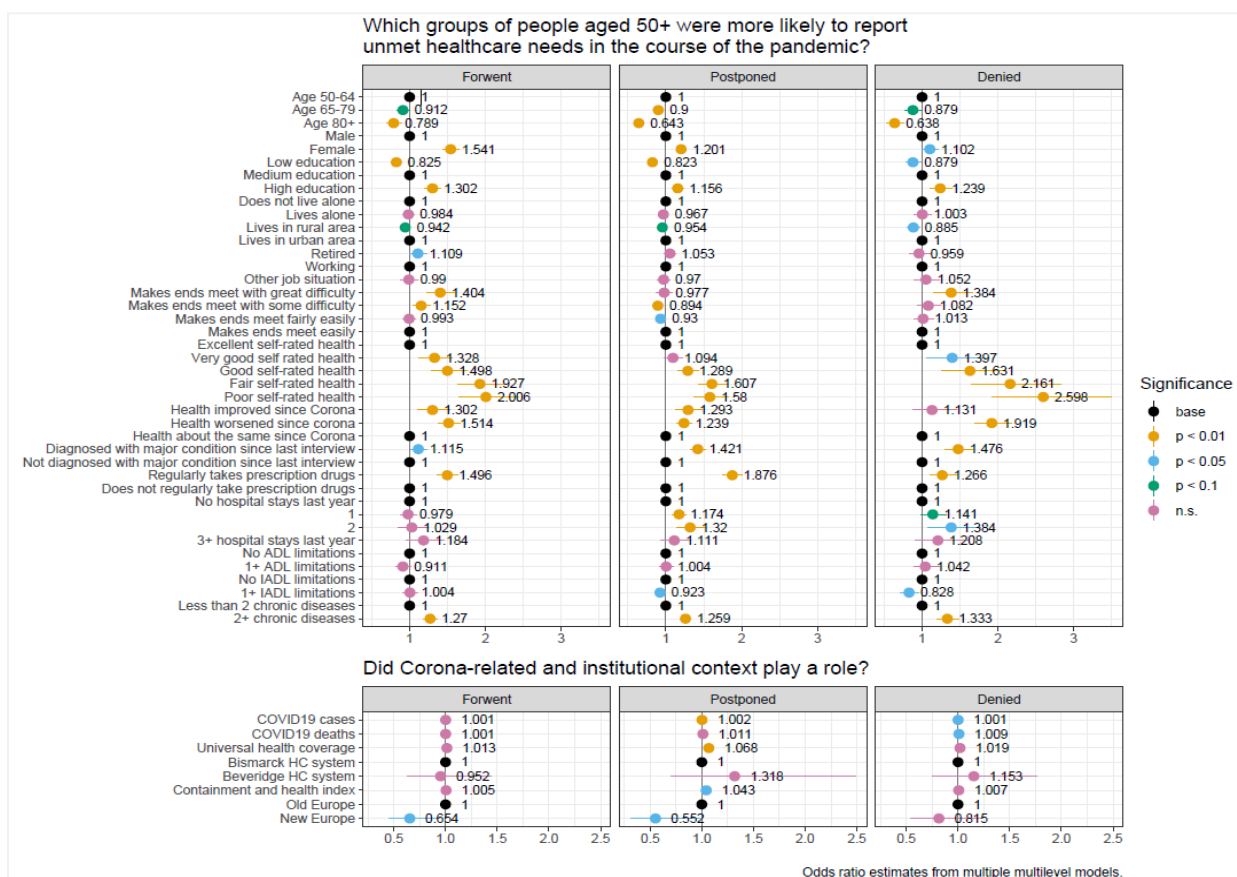
3. Description of results

In the following part, we present abstracts for the above-mentioned papers.

Paper 1 (UniZg-FEB). In their paper **'Access to healthcare for people aged 50+ in Europe during the COVID-19 outbreak'**, the team from the Faculty of Economics and business—Zagreb combines SHARE-COVID19 and SHARE Wave 7 data for 25 European countries and Israel (N = 40,919) with institutional and epidemic-related country characteristics to investigate healthcare access for Europeans aged 50

and over during the outbreak of COVID-19. We use a micro–macro approach to examine whether and to what extent barriers to accessing healthcare measured by reported unmet healthcare needs vary within and between countries. We consider various aspects of barriers and distinguish among: 1) respondents who forewent medical treatment because they were afraid of becoming infected with the Coronavirus; 2) respondents who had pre-scheduled medical appointments postponed by health providers due to the outbreak; and 3) respondents who tried to arrange a medical appointment but were denied one. Limited access to healthcare during the initial outbreak was more common for the occupationally active, women, the more educated and those living in urban areas. A bad economic situation, poor overall health and higher healthcare utilisation were robust predictors of unmet healthcare. People aged 50+ in countries of Old Europe, countries with higher universal health coverage and stricter containment and closure policies were more likely to have medical services postponed (Figure 1). Policymakers should address the healthcare needs of older people with chronic health conditions and a poor socioeconomic status who were made more vulnerable by this pandemic. In the aftermath of the health crisis, public health systems might experience a great revival in healthcare demand, a challenge that should be mitigated by careful planning and provision of healthcare services.

Figure 1. The determinants of unmet health care due to the outbreak



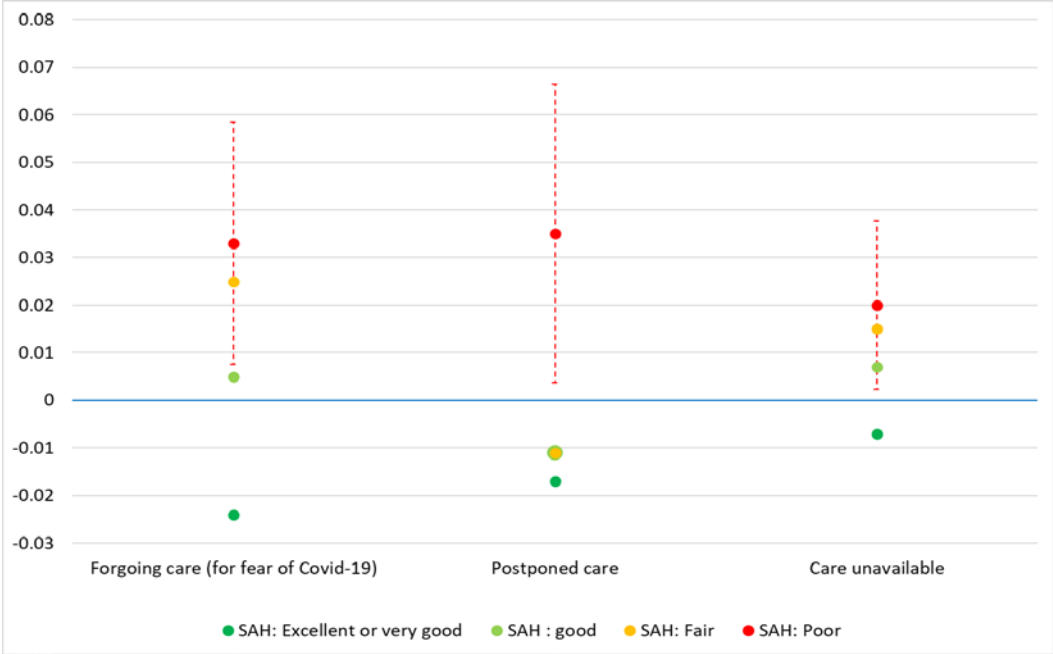
Sample: N = 40,919 in 26 countries.

Paper 2 (Dauphine). In their paper ‘Social inequalities in access to healthcare among the population aged 50+ years during the COVID-19 pandemic in Europe’, a research team from Université Paris Dauphine investigated social inequalities in access to healthcare during the first wave of the coronavirus disease 2019 (COVID-19) epidemic in Europe among adults aged 50 years and older, using data from the regular administration of the Survey of Health, Ageing and Retirement in Europe (SHARE)

and the specific telephone survey administered regarding COVID-19 (SHARE-COVID19). It addressed three main research questions: Did people who were in difficult economic situations before the epidemic face more barriers to access healthcare than others? If so, to what extent can these discrepancies be attributed to initial differences in health status and the use of care between social groups or to differential effects of the pandemic on these groups? Did social inequalities with regard to unmet needs during the pandemic differ across countries? Unmet healthcare needs are characterised by three types of behaviours likely to be induced by the pandemic: forgoing care for fear of contracting COVID-19, having pre-scheduled care postponed, and being unable to obtain medical appointments or treatments when needed.

Our results substantiate the existence of social inequalities in accessing healthcare during the pandemic and of cumulative effects of economic and medical vulnerabilities: the impact of economic vulnerability is notably stronger among those who were in poor health before the outbreak and thus are potentially the oldest individuals (Figure 2). The cross-country comparison highlighted heterogeneous effects of economic vulnerability on forgoing care and having care postponed among countries, which are not comparable to the initial cross-country differences in social inequalities in access to healthcare.

Figure 2. Effects of economic vulnerability on unmet healthcare needs according to baseline self-assessed health (SAH) in all SHARE countries



How to read: The results are expressed as average marginal effects, which can be understood as percentage points of increase/decrease in the probability of the outcome; *Data:* Preliminary SHARE wave 8 release 0. *Conclusions are preliminary;* *Sample:* N = 31,928 respondents in 26 countries.

Notes: Full models including all countries and adjusted for differences in unmet needs due to age, sex, relationship status (living alone or not), country of residence and for baseline differences in health care needs and utilisation; the error bars represent 95% confidence intervals.

Working paper/Report (UniZg-FEB). ‘Descriptive healthcare analyses based on 1st round of SHARE Corona Survey’. This paper focuses on unmet health care during the initial wave of pandemic and explores both, the micro (social, economic and health status) and the macro determinants (health system characteristics, the COVID-19 effects, epidemic-control measures) of barriers to healthcare

access. A motivation for our analyses is grounded on sizeable reduction and discontinuity in medical care provision for conditions non-related to COVID-19, and its effects on the most vulnerable populations. We detect quite large cross-country differences when it comes to initial pandemic wave effects on unmet health care of populations aged 50+. The proportions of those who avoided medical care due to fear of the Coronavirus ranged from 4% in Slovenia to almost 23% in Israel, and approximately 5% of persons aged 50+ were denied medical treatment after explicitly asking for it. The great heterogeneity among European countries is observed for the type of medical services postponed, with specialist and primary healthcare services being disrupted the most. These findings might be a good guide to policymakers in the resilience of healthcare provision. Furthermore, our study revealed populations that had a higher likelihood to have unmet healthcare—women, individuals in poor economic situation, persons in poor overall health and with underlying health conditions. On the other hand, we observe that those with higher education were more likely to report unmet healthcare, and that there was a protective age effect.

From the macro perspective, epidemic-control measures had different success in the virus spread prevention, and most post-socialist countries were more successful in controlling the pandemic. Our analysis identified two clusters of post-socialist countries, along with Cyprus, Finland, Greece and Malta, that were similar in terms of unmet healthcare reported by persons aged 50+ and indicators of health systems and pandemic effects (morbidity and mortality). We showed that the odds of having medical care forgone is lower for those in New Europe (post-socialist countries). Also, persons aged 50+ in New Europe were less likely to have had medical treatment postponed compared to countries in the Old Europe. Finally, the higher the number of COVID-19 cases in countries in Old Europe was, the higher were the proportions of people aged 50+ who had their medical treatment postponed from health providers. Policymakers should address the healthcare needs of economically deprived older people and with underlying health conditions who were made more vulnerable by this pandemic. Following this health crisis, public health systems might experience a great upraise in healthcare demand, a challenge that should be mitigated by careful planning and provision of healthcare services.

4. Future research aims

- a) Extend the current paper on social inequalities in accessing healthcare i.e. going further by refining our understanding of unmet healthcare according to types of care, for example primary or specialist healthcare.
- b) Increase our limited knowledge of the European older adults (65+) who lived alone during the pandemic—almost 30 percent of persons aged 65 and older who participated in the 1st SHARE Corona Survey—and combining it with SHARE waves 7 & 8 data. It is widely known that living alone is often associated with greater risk of financial hardship, and that people who live alone are substantially more vulnerable than older persons who live with someone. Our goal is to explore whether and how epidemic-control measures reshaped the access to health care for older adults who live alone, and how should policymakers address immediate and long-run health issues of this growing population group. We thus raise several research questions: Were those living alone more likely to have unmet healthcare in the pandemic? If yes, are there any differences in barriers to healthcare access for those living alone for example in urban vs. rural settlements? Are there any variations between European countries that could be attributed to the level of public health care, the extent of epidemic containment measures etc.?

- c) Improve SHARE-based typology—currently based on cluster analysis of unmet healthcare, health system coverage and the COVID-19 mortality and morbidity—concerning the effects of epidemic controls on healthcare quality and provision in the EU MS.
- d) Predict which individuals are most likely to forgo or be denied essential care services due to the pandemic. We aim to do this by building machine-learning classification models to predict displaced essential care. We will use two complementary approaches to select predictor variables: 1) Theory-driven: Include predictors known from prior literature to be associated with healthcare access and seeking, 2) Data-driven: Apply feature selection algorithms to identify meaningful predictors. In addition to predicting which individuals are most likely to experience healthcare crowd out, we will characterize types of services for those with highest risk of crowd out.
- e) Establish the causal effect of COVID-19 transmission on use of healthcare services. The main challenge will be to control for the common causes of the intensity of transmission/mortality and health-service use that confound the main effect. We will explore two identification strategies to attempt to correct for this source of confounding: 1) differential timing of holidays and 2) interrupted time series/regression discontinuity using surveying variation.

IV. Health and health behaviours

1. Research aims

The outbreak of the coronavirus and the measures implemented to limit the spread has brought fundamental changes to the way people live and interact all over the world. During the first waves of the outbreak, good hygiene and social isolation were the only methods to effectively limit the spread of the virus. However, both the fear of being infected by the potentially deadly virus and the measures implemented to combat this risk might have affected both individual and public health negatively.

The research for the 1st deliverable focuses on the short-term consequences of the recommendations and restrictions enforced nationally on general and mental health. The analyses are based on the 1st round of the SHARE Corona Survey and are primarily descriptive analyses of country differences adjusted by sex and age groups. Furthermore, the first multivariate analyses have been conducted with adjustment for confounding factors.

This deliverable has three main themes:

1. Adherence to protective measures against COVID-19 during the lockdown; Contributors: *University of Southern Denmark (SDU) & Munich Center for the Economics of Aging (MEA/MPG)*
2. Self-rated health before and after the outbreak of COVID-19; Contributors: *SDU*
3. Mental health changes following the outbreak; Contributors: *SDU & MPG*

2. List of papers

SDU

- L.L. Scheel-Hincke, L.I. Ahrenfeldt, K. Andersen-Ranberg. *Health changes following the outbreak of COVID-19 across sex and European regions*. Results from the 2020 SHARE Corona survey. Submitted to *European Journal of Public Health*

MPG

- S. Gruber, J. Atzendorf. *The mental well-being of older adults after the first lockdown*. Submitted to the SHARE COVID-19 Special Section in the European Journal of Ageing
- M. J. Mendoza Jimenez, T.-V. Hannemann, J. Atzendorf. *Behavioural risks factors and preventative COVID-19 measures amongst a high-risk population* (Planned submission to Frontiers in Public Health's special issue "COVID-19, Aging, and Public Health" on 28.02.2021)

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- M. Bertoni, C. Dal Bianco, N. Zambon, D. Cavapozzi. *COVID-19, mental health, and internet use*. (Paper under preparation).

3. Description of results

Adherence to protective measures during the lockdown

SHARE respondents in all countries adhere well to recommendations for reducing virus spread. The mean of all countries is 95.6% for always keeping distance in the public, 82.4% for using hand sanitizer, and 87.5% for washing hands more frequently than usual. Jimenez et al. show that smokers and those drinking high levels of alcohol engage less in preventive measures.

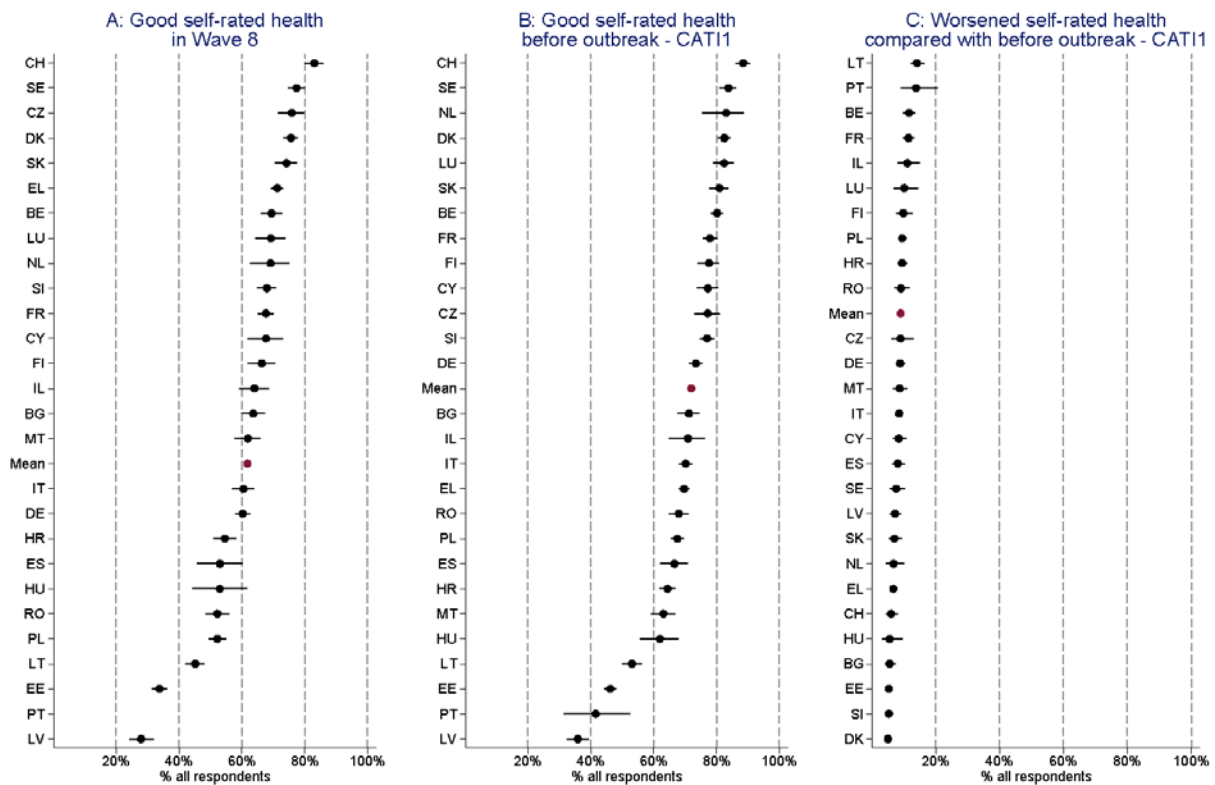
Self-rated health (SRH) before and after the outbreak

Compared to results from the SHARE Wave 8 (pre-Covid-19) the proportions of respondents reporting being in very good, good or fair SRH did not change or even improved in some countries. But when asked about changes in SRH in the SHARE Corona Survey 10% stated worsening SRH (Figure 3).

Mental health changes following the outbreak

About 1/3 (30.4%; range: 19.6%-61.2%) of SHARE Corona Survey participants felt nervous or anxious in the last month. European countries that were hit hard by the pandemic dominated the top-ranking countries. Similar proportions of participants felt sad or depressed in the last month (28.5%; range 13.8% – 39%), 29.4% (range 15.3-45.2%) had felt lonely, and 27.4% (range 16.1-37.6%) had sleeping problems the last month. Contrary to what could be expected, the country-specific proportions were similar or even lower, when compared to Wave 8 and suggest that retrospective views on mental problems are relative to the situation at the time of the interview. Older adults seem to be more resilient than expected. Moreover, this finding pertains to individuals aged 50 and older, while younger individuals are reported by other studies as suffering more from loneliness and depressive symptoms. However, more in-depth longitudinal analyses are needed to substantiate this finding.

Figure 3. Self-rated health by country



Note: Proportion (%) of participants in good self-rated health (SRH) in SHARE Wave 8 (A). In the SHARE Corona Survey, participants were asked about the SRH before the outbreak (B) and the change in SRH following the outbreak (C). In A and B, SRH was dichotomized to “Good” (Excellent/very good/good) vs. “Poor” (Fair/poor). The change in SRH was dichotomized into “Worsened” vs. “Improved/about the same”. Portugal had no data for wave 8. Source: SHARE Wave 8 and SHARE Corona Survey (June/July 2020). Weighted data.

Combining SHARE data with macro data from the Oxford COVID-19 Government Response Tracker, Gruber and Atzendorf (MPG) include macro indicators at country level, namely deaths per capita and the number of days with stringent epidemic control measures, in addition to individual characteristics. The macro indicators show negative well-being consequences, particularly for the oldest survey participants. Additionally, the results reveal that those living alone had a higher risk for worsened mental well-being in the time after the first COVID-19 wave.

Chronic medical conditions and mental health

Having any of the chronic medical conditions was associated with significantly increased risk (OR) of feeling nervous or anxious. Also, being female, taking ≥ 5 different medicine per day (polypharmacy, an indicator of multimorbidity), and being limited in at least one activity of daily living (1+ADL) increased the risk for being nervous or anxious, while high age alone did not. Further analyses show that in respondents suffering from cancer, Parkinson’s disease, Alzheimer’s disease, dementia, ‘other affective disorders’, ADL limitations, and polypharmacy, the symptom of nervousness was not driven by the outbreak of COVID-19.

Behavioural risks factors and preventative COVID-19 measures

Jimenez, Hannemann and Atzendorf (MPG) are looking at behavioural risk factors and preventative COVID-19 measures amongst a high-risk population. Preliminary results show that smokers engage less in preventative measures and that those with high levels of alcohol consumption engage in less social

distancing; and low levels of physical activity are likewise associated with lower engagement in preventative behaviours.

4. Future research aims

Future research within WP3 will build on the first deliverable and extend it with analyses adjustment for potential confounding factors such as SES-factors, physical health, and ADL limitations. The analyses will be refined by adding a multilevel dimension with the possibility of considering both macro (e.g. the Oxford Stringency Index) and micro level factors. Future research will be carried out in close collaboration with all work package participants.

In particular,

- a) The group of Anna Rieckmann, Umeå University (UmU), will extend the work from SDU's research on "who is most affected by the lockdown?". The work by SDU focuses on pre-existing medical conditions, whereas UmU will look at cognitive status and other markers of mental well-being as risk factors for the non-intended negative effects of the pandemic restrictions on mental health. The aim is that these analyses can identify the most vulnerable individuals in the society and develop recommendations on how these individuals can be protected.
- b) The Warsaw School of Economics (SGH) group will contribute with further analyses on relationships between activities, health, protective behaviours, and contacts with other people since the outbreak of Covid-19.

V. Work and labour markets

1. Research aims

The research aims of this Work Package were to analyse labour market implications of the lockdown; document heterogeneity across gender, occupations and socioeconomic status; study the switch to teleworking arrangements and IT skills; document the balance of the distribution of family and home care duties within couples; evaluate mitigation policies.

In collaboration with **MPG, UNIPD, HUJI, SGH, UPRC, NHU AV CR, UNIZG-FEB** the researchers involved in WP4 have focused on several topics/tasks during the first months:

- The impact of occupation characteristics on working outcomes during pandemics (tasks 1 + 2).
- The determinants of job losses and work reduction, with particular focus on short-time employment aid (task3)
- Impact of job losses or income reduction on the economic situation of the 50 plus individuals
- The consequences of smart working on mental health during the COVID-19 pandemic (task 2)

2. List of papers

- A. Brugiavini, R.E. Buia, I. Simonetti. *Occupation and working Outcomes during the Coronavirus Pandemic*
- A. Börsch-Supan, V. Kutlu Koc, D. López-Falcón. *Short-Time Employment Aid during the Corona Lockdown: Evidence from the SHARE Countries*
- A. Chłoń-Domińczak, D. Holzer-Żelaźewska. *Economic situation of older workers and pensioners in European countries – role of country policies* (joint work with WP5)

- M. Bertoni, D. Cavapozzi, G. Pasini, C. Pavese. *The consequences of smart working on mental health during the COVID-19 pandemic*

3. Description of results

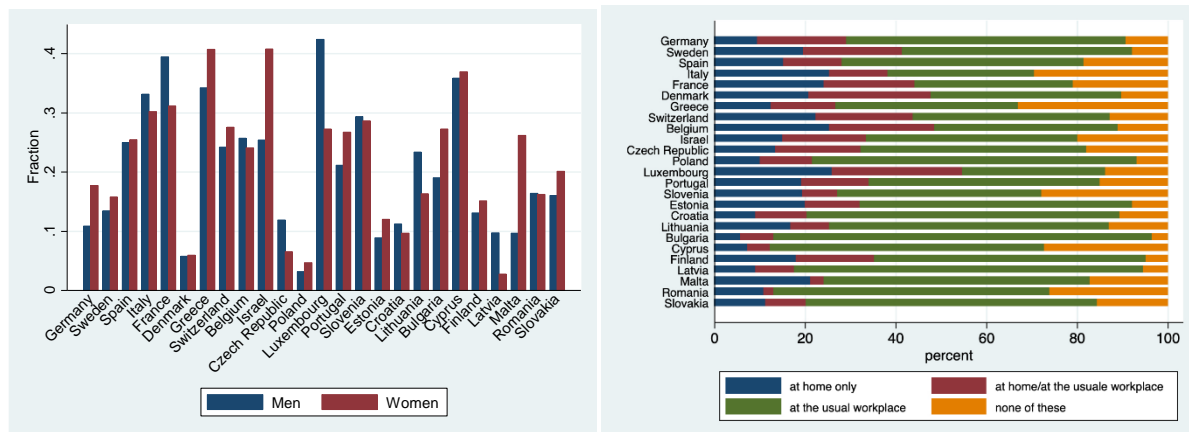
Occupation and working Outcomes during the Coronavirus Pandemic

Using data from the recent SHARE Corona survey and additional respondents' information collected in the previous waves of SHARE, we explore the effects of occupations characteristics on two outcomes: (i) the probability of work interruptions during the pandemic, coupled with the length of such interruptions and (ii) the probability of switching to home working during the lockdown period (see fractions in Figure 4).

The novelty rests on the richness of the SHARE data, which allows the authors to retrieve information on panel respondents before the COVID-19 outbreak and to relate such information to the reported level of activity during the lockdowns. The most salient feature of this work is the use of the newly coded occupations reported in SHARE and classified according to their 4-digit ISCO08 code. The level of detail provided by the occupational coding allows their classification into several categories based on two dimensions: the degree of safety in terms of exposure to the Coronavirus and the essential (or unessential) nature of the job. For example, medical doctors, personal care workers in health service and food processing activities are classified as essential and unsafe jobs, while sport and fitness workers are unessential and unsafe. Our findings reveal important differences in the impact of the various job categories both on the probability of experiencing work interruptions and of switching to teleworking. In addition, the results highlight that women, self-employed workers and less educated workers have been more affected by the pandemic from a labour market perspective. They all display significantly higher likelihood of work interruptions and longer spells of absence from work. Key findings:

- (a) The COVID-19 shock has made clear that employers and institutions have to plan a rearrangement of the work force according to the nature of the tasks performed.
- (b) Once controlling for the occupational characteristics, the IT-skills appears a crucial determinant of performing a job at home. This finding calls for more investment in IT infrastructure as well as for training of adult workers.
- (c) Women aged 50 and over have been more heavily affected by the pandemic because they are more likely to experience job interruptions and for longer periods.
- (d) Occupations which are unsafe and unessential are characterized by longer job interruptions and lower propensity for teleworking.

Figure 4. Fractions of work interruptions (left panel) and work arrangements (right panel) after the pandemic outbreak, by country



Short-Time Employment Aid during the Corona Lockdown: Evidence from the SHARE Countries

This paper looks at the determinants of job losses and work reduction in relation to the timing of lockdown measures and to direct impact of the Covid-19 pandemic, measured in terms of number of deaths, in Europe for workers aged 50 and over. At a second stage job losses are associated to the type of income-support available for the various labour market position in each SHARE country. An important distinction is made in the paper on the various labour market interventions during the pandemic and how these have been adapted: (a) Job Retention Schemes, which preserve jobs at firms by alleviating firms' labour costs, through supporting the incomes of workers whose hours are reduced. Employees keep their contracts with the employer even if their work is suspended. But also (2) Short-time work (STW) schemes which directly subsidise hours not worked but do not change the cost of hours worked. Finally (3) Wage subsidy (WS) schemes also subsidise hours worked in a sort of "bridging income provision". A possible explanation for the different patterns of job losses is that workers may have a specific previous unemployment history (precarious jobs) or be vulnerable in the sense of belonging to low income groups. The challenge is to understand if STW is caused directly by the epidemic or indirectly by the lockdown measures.

Key findings:

- a) Middle-income groups are more likely to reduce hours or become unemployed compared to low - and high-income groups. Self-employed workers are also more likely to work less or not work at all in comparison to private sector employees. Short time work seems related to the lockdown measures more than to the epidemic itself, but the type of earnings support adopted in the different countries for different jobs also play a role: in countries where Short-Time-Employment Aid is more generous, respondents are more likely to be covered.
- b) Earnings support is received mostly by the respondents who live in countries where the lockdown measures were strict and the pandemic more severe.

Economic situation of older workers and pensioners in European countries – role of country policies

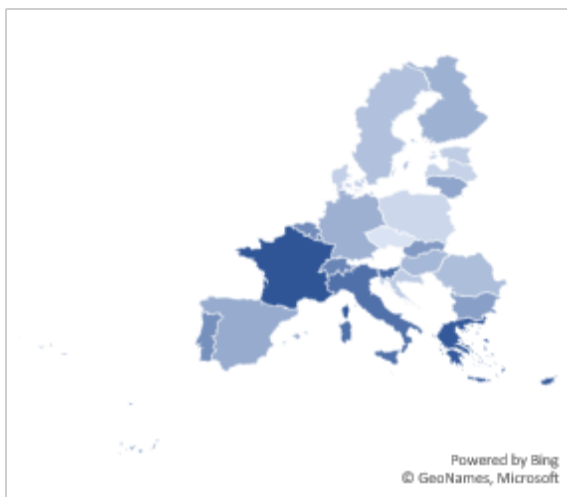
The COVID-19 pandemic caused lockdown of economies, which in turn led to the worsening of the economic situation of many households. During the first wave of the COVID-19 pandemic governments undertook various measures in order to support economies and societies, including jobs protection along with financial support provision to people who suffered financial loss during the economic crisis. The authors analyse the economic situation of older Europeans, depending on their socio-economic

characteristics and country of residence type. The article focuses in particular on the differences in the economic situation of respondents depending on their socio-economic characteristics as well as country of residence. Results show that country policies and responses to the implications of the COVID-19 pandemic have a significant impact on the economic situation and ability to cope with economic risks.

One in five workers aged 50 and over in the analysed countries lost their job (even if temporarily). The incidence of job loss was highest in France, Greece, Slovenia, Cyprus and Italy. People living in the “old” European Member States faced a higher risk of job loss (see Figure 5) and used their savings more often, compared to the “new” countries. Besides the direct effects of lockdown measures, older workers may face a higher risk of job loss.

Key findings: There are differences in the risks faced by older individuals in Europe in relation to individual characteristics and to the country of residence. The latter points to the labour market arrangements but also the welfare state, besides the stringency of the lockdown measures.

Figure 5. Job losses among 50+ in SHARE countries



Note: Percentage of job losses ranges between 3 percent (light blue) and 39 percent (dark blue)

The consequences of smart working on mental health during the COVID-19 pandemic

We use longitudinal data from SHARE to estimate the effect of working from home on the mental health of European older workers during the pandemic. We consider individuals who were at work when the pandemic broke out and assess the consequences of working from home on the following measures of mental health: (i) feeling nervous, anxious, or on edge, (ii) being sad or depressed, (iii) having trouble sleeping, (iv) feeling lonely. Working arrangements and mental health may influence each other in both directions. We try to identify the causal direction from working conditions to mental health by leveraging plausibly exogenous variation in the likelihood of working from home within households as well as across occupations and countries. Preliminary results show that working from home mildly impaired the mental health of older workers.

4. Future research aims

- a) We will complete the investigation into the role of the different determinants of job losses.
- b) We will study the switch to teleworking arrangements and IT skills.

- c) We will do further work into the mitigating role of income provisions.
- d) We will address the division of labour within the household during the pandemic by stressing differences between genders.

VI. Financial hardship and inequality

1. Research aims

The units involved in Work Package 5 have analyzed data on household income and indicators of financial distress collected in SHARE by telephone during the first wave of COVID-19 (“SHARE Corona Survey”) but also in standard, pre-pandemic waves. The analysis conducted so far aims at identifying the characteristics of individuals who have faced the most severe economic consequences, with potentially long-term implications, including the increased risk of poverty and social exclusion. Specific attention has been devoted to the role of lockdown actions and changes in employment as drivers of financial difficulties and financial support received.

Understanding the economic and social costs of the pandemic is of critical importance to develop effective and sustainable policies and to evaluate the current epidemic governmental responses. The data analysis should inform policies aimed at overcoming financial difficulties and income losses associated to the pandemic.

2. List of papers

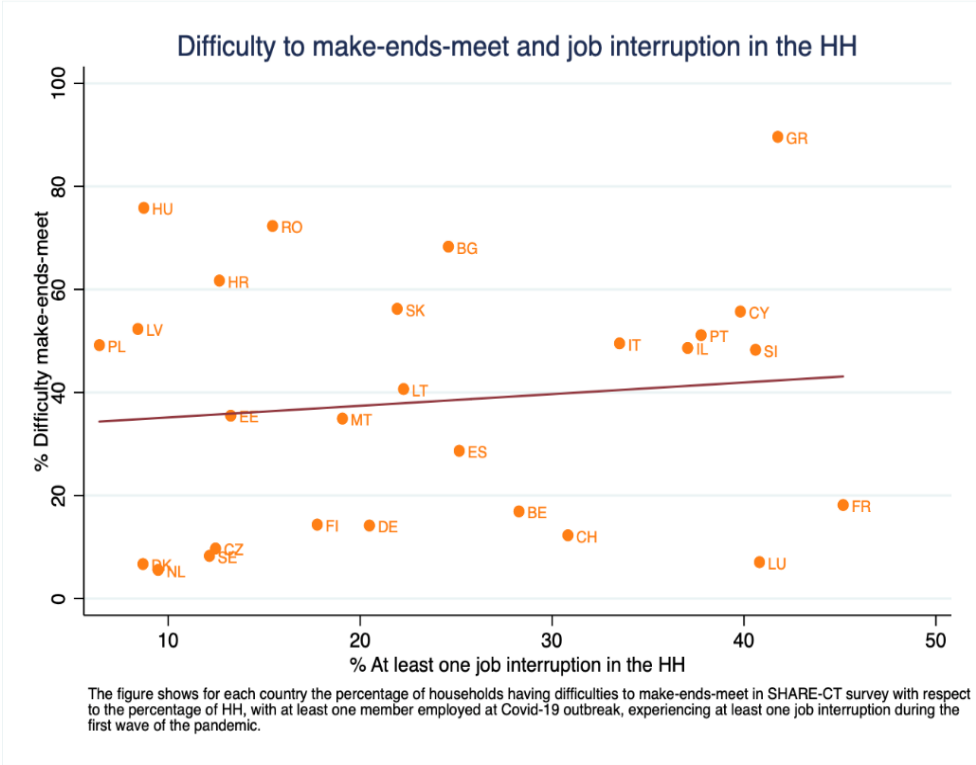
- A. Bonfatti, G. Weber, N. Zambon (Department of Economics and Management – University of Padua, Padua, Italy). *Economic distress among the 50+ Europeans during the first wave of the pandemic*
- A. Chłoń-Domińczak, D. Holzer-Żelaźewska (SGH Warsaw School of Economics, Warsaw, Poland). *Economic situation of older workers and pensioners in European countries – role of country policies* (joint work with WP4; stage: submitted EJOA)
- A. Schumacher, A. Bethmann (MPG). *Financial Hardship during the Corona Pandemic*

3. Description of results

Economic distress among the 50+ Europeans during the first wave of the pandemic

We define a financial distress indicator based on the answer to a question about “difficulties in making ends meet” that has been regularly asked in SHARE. We show that having a job interruption during the pandemic increases the risk of financial distress, after controlling for socio-economic indicators and past value of the indicator (see also country breakdown in Figure 6). We then investigate how households who could not make ends meet coped with the negative shock. We find that (mostly public) financial help provided (partial) relief, but also that postponing bill payments and running down savings were commonly reported over the time period we consider (first wave of the pandemic).

Figure 6. Financial hardship and job interruption



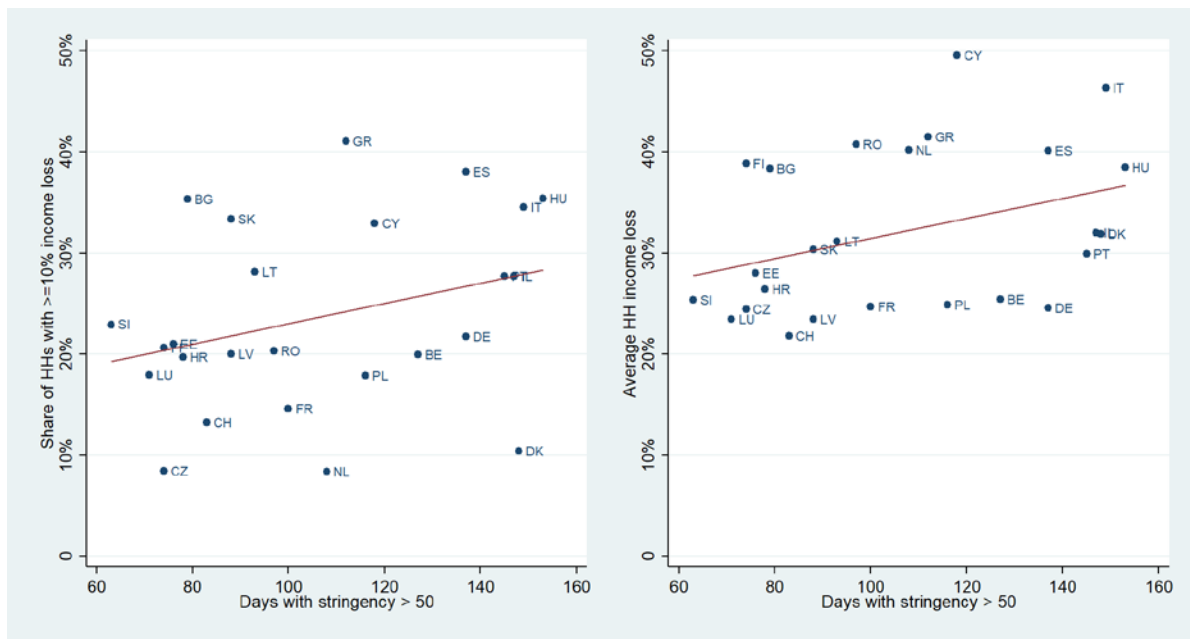
Economic situation of older workers and pensioners in European countries – role of country policies

This is joint work with Work Package 4. Please see p. 17/18 for further details on this project.

Financial Hardship during the Corona Pandemic

We identify risk groups for financial hardship during the 2020 Covid lockdown measures among the European 50+ population, using “making ends meet” variables and loss of income (see also country breakdown in Figure 7). Since we find that the economic downturn predominantly causes financial hardship through reduction or loss of labor income, our descriptive analysis focuses mainly on previously employed respondents. The project will describe the economic situation of households during the pandemic along variables such as country of residence, previous income, age, education, household composition and employment sector. In a second step, an analysis of interaction effects between data on the stringency of lockdown measures and household characteristics will help shed some light on the mechanisms that lead to financial hardship in the corona crisis.

Figure 7. Income loss and days with stringent epidemic control measures



4. Future research aims

The units involved in the Work package 5 will develop the analysis along the following lines of research:

- Exploiting the variability in policy interventions, in terms of lockdown actions, to better characterize vulnerable individuals and households who experienced the most severe economic consequences, including also data from the second SHARE Corona Survey that will go into the field in the spring of 2021.
- Enriching the descriptive analysis on the factors associated to an increased risk of financial distress, considering not only more detailed employment history information, but also other factors such as education or economic conditions before the pandemic.
- Investigate the differential role of governmental financial support as opposed to support from other (informal) sources among different countries.
- We shall also use data from both SHARE Corona Surveys to assess the consequences for income inequality and financial distress of the new ways of working (“working from home”) that have been made available to some, but not all, workers in our sample.

VII. Social relationships

1. Research aims

The aim of WP6 is to describe the effects of epidemic control decisions on social relationships and related outcomes. The first task was to provide descriptive analyses of the data obtained from the first round of the survey.

2. List of papers

- H. Litwin, M. Levinsky (HUJI). *Social networks and mental health change in older adults after the Covid-19 outbreak*

- H. Litwin, M. Levinsky (HUJI). *Network-exposure severity and self-protective behaviors: The case of Covid-19*
- G. Sand, J. Bristle (MPG). *The relationship of threat perceptions and optimistic outlook with protective behavior in the COVID-19 crisis*
- H. Litwin, M. Levinsky (HUJI). *Exposure-network type and post-outbreak well-being: Analysis of data from the SHARE Corona Survey*
- M. Wagner, M. Bergmann (MPG). *Consequences of the COVID-19 pandemic on informal carers and care recipients in Europe*

3. Description of results

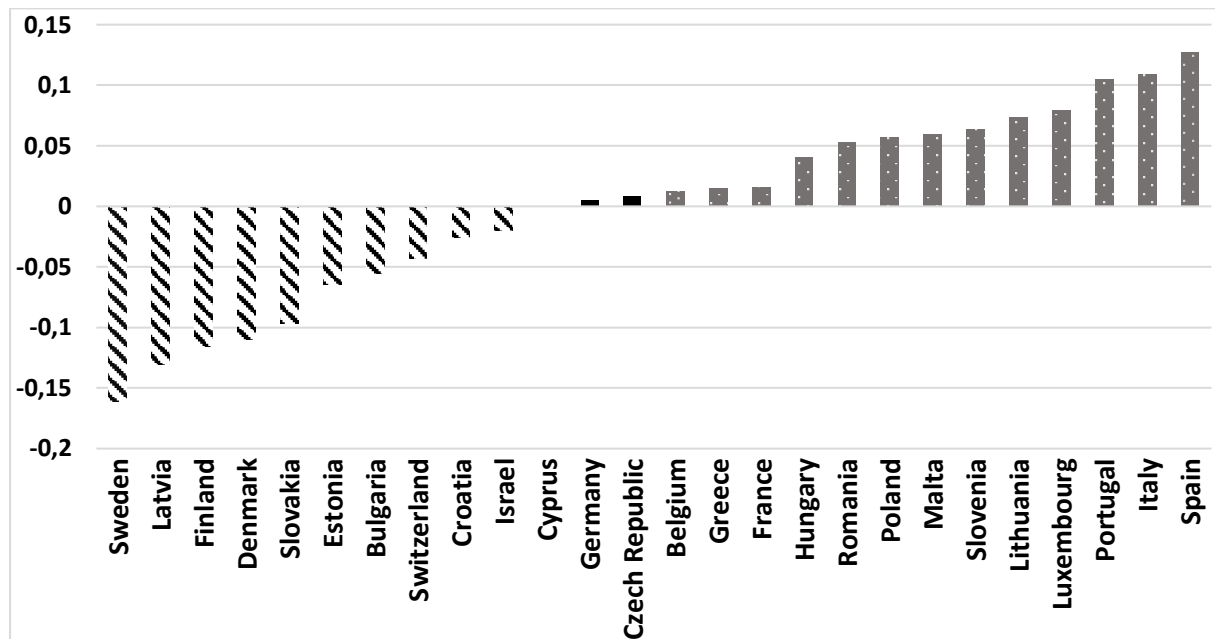
Social networks and mental health change in older adults after the Covid-19 outbreak

This paper examines the influence of social networks on selected aspects of mental health (i.e., depression and anxiety) following the outbreak of the coronavirus. We analyze contact frequency on the basis of two modes of social contact that are particularly relevant in the COVID-19 era: face-to-face contact and electronic contact (e.g., cell phones, video chats, and so on). We linked data from the SHARE Corona Survey with baseline data from SHARE Wave 6 (2016) (n=33,485). The results of our analysis revealed that greater face-to-face network contact significantly reduced negative mental health changes while more electronic contacts significantly increased them. In sum, no one in the sample, regardless of age, benefitted from electronic contact, while all ages benefitted from the effect of face-to-face contact. Therefore, face-to-face social networks can moderate the negative impact of the COVID-19 pandemic on important aspects of mental health.

Network-exposure severity and self-protective behaviors: The case of Covid-19

This paper seeks to clarify whether the extent and severity of exposure to the COVID-19 virus among the members of the social networks of older adults is related to the engagement by the latter in self-protective behaviors. The inquiry is guided partly by the Health Belief Model and by concepts from the domain of social networks. Data from two waves of the Survey of Health, Ageing and Retirement in Europe were used: Wave 7 (2018) and the SHARE Corona Survey. The study sample numbered 33,005 persons aged 50 and older in 25 countries. The results showed that network-exposure severity (i.e., who and how many people in one's network had COVID-19-related symptoms, was tested positive or negative, was hospitalized due to infection, or died due to the virus) was positively associated with the extent of engagement in self-protective behaviors among older adults, but only among the oldest group, aged 70 and older. Conscientious individuals as well as neurotic persons engaged more frequently in self-protective behaviors, as did women, the partnered, and those with higher education. Respondents from Sweden, Latvia, Finland and Denmark engaged in fewer self-protective behaviors, while those from Spain, Italy and Portugal self-protected to a greater degree (Figure 8). In conclusion, the study findings point to the role of the social network, even if indirect, in promoting self-protective behaviors among the oldest cohort.

Figure 8. Country deviation from the all-country mean of self-protective behaviors, after controlling for the study variables



The relationship of threat perceptions and optimistic outlook with protective behavior in the COVID-19 crisis

Based on Protection Motivation Theory and using data from the first SHARE Corona Survey, we investigate how threat perceptions and optimistic attitudes are associated with motivation to engage in protective behavior in the population 50+. A binary measure of staying at home and an additive index for adherence to protective behavior were regressed upon a range of possible predictors. First results show that around 15 percent of all respondents stayed home completely during the initial phase of the COVID-19 crisis—mainly the elderly aged, those with prior health risk conditions. On average, older Europeans responded strongly to the recommended protective behavior measures (6 out of 7 measures adopted). Feeling more anxious than before Corona and especially fear of infection are the main motivators for protective behavior. The fear-protection link is especially large in countries with low death rates. An optimistic attitude shows an equally strong association with protective behavior. Optimistic attitudes are even a stronger predictor than fear in Sweden, France, and the Czech Republic—all countries with high levels of trust in their health care systems. The results stress the importance of finding a balance between instrumenting fear as motivational factor and hope as healthy long-term motivator for protective behavior.

Exposure-network type and post-outbreak well-being: Analysis of data from the SHARE Corona Survey

We examine whether awareness of exposure to COVID-19 in different types of networks in which an exposure to the virus occurred (“exposure network types”, i.e., who in the network was exposed to the virus: spouse, children, relatives, friends, other and none) is related to post-outbreak well-being among older adults. Data were drawn from Wave 8 and the telephone-based SHARE Corona Survey (n=31,249). We regressed measures of post-outbreak self-rated health and depressed status on exposure-network type, controlling for self-exposure severity, socioeconomic background, health and country. We found that from the six exposure-network types, the group with no COVID-19 exposure was the largest (75% of the sample). It did not matter who from the network got exposed. We predicted poorer well-being for all those who were exposed compared to those who were not.

Policymakers and practitioners should be aware of this association when devising interventions aimed at minimizing the ill effects of the pandemic.

Consequences of the COVID-19 pandemic on informal carers and care recipients in Europe

The first wave of the COVID-19 pandemic hit the European countries at the beginning of 2020. This has become particularly problematic for those in need for personal care as related epidemiological control measures (physical distancing, stay at home requirements etc.) installed in almost all European countries strongly affected the possibility to provide care to others as well as to receive care from people outside the own household. Against this background, this paper focus on how caregivers and care recipients living at home (the non-institutionalized) dealt with the situation using preliminary data from the 8th wave of the Survey of Health, Ageing and Retirement in Europe (SHARE) until its suspension in March 2020 and the SHARE COVID-19 Survey fielded from June to August 2020. Concretely, we analyzed the direct effects of the pandemic as well as accompanying epidemiological control measures on those giving as well as receiving personal care by exploring country differences on COVID-19-related changes. Our results show that giving personal care to parents has increased, while care to children, in turn, has decreased. Further, about one out of five care recipients had difficulties in obtaining personal care during the pandemic, which was mainly because carers could not come to the home of the care recipients. In addition, country differences played an important role in explaining perceived difficulties in receiving home care and hence are an important starting point for policy makers and social organizations.

4. Future research aims

The next research tasks include refinement of the analyses that were already begun as well as expansion of the database to include more variables from previous waves of SHARE. In addition, the analyses will incorporate relevant regional indicators that will be developed by the WP6 partners from Umeå (UmU). Initial discussion has begun toward this end.

VIII. Geographical patterns

1. Research aims

The main objective of the WP7 is to measure the geographically different effects of Covid-19 epidemic on activities and behavior of respondents and therefore the risk of exposure to an infection. The goal is to analyze how changes in activity patterns have affected well-being and health in different countries and regions. The SEIR model will be the main tool for analyzing the consequences of epidemic control policies and for producing policy recommendations in order to minimize negative effects of the COVID-19 pandemic. Several country-specific papers will test hypotheses why some countries proved more resilient to the crisis than other countries, drawing policy conclusions about resilience and vulnerability.

The first set of deliverables for Tasks 2-5 in WP7 (and also some deliverable in WP2 and WP8) depend on the availability of, first, existing geographic data from all waves 1-8, and second, on current geographic data from the SHARE Corona Survey collected in 2020 and the follow-up survey in spring 2021. Unfortunately, geographic data across waves and for wave 8 are available only at the country level (NUTS level 0). Some NUTS levels 1-3 are available for baseline interviews and in life history data in wave 3 and 7. These data are not sufficient for geographic analysis anticipated by the Horizon Covid-

19 project. For the successful completion of WP7, consistent data on at least NUTS 2 is needed for all waves up to the SHARE Corona Survey interviews.

The availability of geographic data depends on SHARE-ERIC strategic decisions on geographic data collection, coding, availability, release mode, and all related methodological and technological issues. Without these decisions and their implementation the WP7 will not be able to deliver tasks 2-5. So far, WP7 researchers have not received any requested information about the content, timing, or mode of geographic data for Horizon project. This lack of information represents a major obstacle not only for the actual deliverables but also for several activities related to future work. The absence of information on expected technological solution and the content of geographic data was a major problem for the public tender needed to subcontract programmers for the software solution needed for Tasks 2-5.

2. List of papers

CERGE-EI and Ca' Foscari Venice

- R. Bohacek, G. Pasini, C. Pavese. *geoSHARE: Geographic Information in SHARE Data*

University of Piraeus (UPRC), Piraeus, Greece

- N.P. Rachaniotis, T.K. Dasaklis, F. Fotopoulos, P. Tinios. *Using SHARE-Covid to orient a national pandemic pathway: Operationalising a two-phase stochastic dynamic model for Greece*

Umea University, Sweden

- F. Fors, J. Olofsson, G. Malmberg, M. Stattin. *Adjustment of daily activities to restrictions and reported spread of the corona pandemic across Europe*

Additional working papers in collaboration with Work Package 2 (details see sections II.2 and II.3):

- *Access to healthcare for older Europeans in the outbreak of COVID-19* (joint work with Smolić, Čipin, Međimurec; under review for a special issue of European Journal of Ageing)
- *Descriptive analysis on macro perspectives* (health resources and financing, universal health coverage, healthcare system organization, epidemic-control measures and consequences of the COVID-19 disease) combined with SHARE data.

3. Description of results

geoSHARE: Geographic Information in SHARE Data

The lack of geographic data postponed research on Tasks 2-5 to later stages of the project. Meanwhile, major effort had to be directed at the analysis of the current state of the geographic data in SHARE and at their coding. The working paper "geoSHARE: Geographic Information in SHARE Data" summarizes the progress. In cooperation with the SHARE team in Ca' Foscari University in Venice, the Czech team assembled the existing geographic variables in wave 1 to wave 8 and coded the missing longitudinal geographic information that could be retrieved from the SHARE public Release 7.1.0. These variables include each respondent's retrospective life-history data from wave 3 or wave 7, all geographic data from all baseline interviews in wave 1-7, and all additional data that can be used for identifying moving respondents (distance to children, distance to parents, or residential characteristics). The goal of the coding is to provide researchers in WP7 with a preliminary internal working database of available NUTS classification levels 1-3 (see Figure for NUTS 2016 level 1). This internal database is expected to be delivered to WP7 researchers before March 31, 2021, together with a working paper. This timing will coincide with the evaluation of the public tender for the software

programming for Tasks 2-5. Provided that the Covid-19 crisis does not become substantially worse, future deliverables will be delivered according to the planned schedule in month 12, 21, and 36.

The Working Paper "geoSHARE: Geographic Information in SHARE Data" suggests all important steps for creating geoSHARE database. First, geographic information at NUTS levels 1-3 should be collected regardless of their future utilization or release mode. Second, assembled geographic information should be coded into a consistent official NUTS classification. Third, technological and methodological solutions to providing geographic data to users that conform to the requirements of the GDPR should be developed. Finally, SHARE-ERIC should develop a strategy and methodology for collecting geographic information in all future waves in SHARE depending on the fieldwork mode. This methodology could be based on GPS location of CAPI notebooks, tablets, or any electronic tools operated by an interviewer or a respondent. In CATI surveys (already in spring 2021), geographic information questions about the name of municipality or county should be inserted into the interview. While the necessary precautions have to be taken in order to protect the anonymity of the respondents, absence of this information will preclude the delivery of research on optimal clustering and affect all other Tasks in WP7. The Working paper also lists other tasks that are less urgent but important for future quality and use of geoSHARE.

A recursive SEIR – SVEIR epidemic model calibrated and applied to Greece

The introduction of vaccination creates a complex immediate decision problem of how to combine vaccination with continued use of Non-Pharmaceutical Interventions (NPIs) to contain the current COVID-19 outbreak. This conundrum is explored in the case of Greece and is presented in a separate Discussion Paper. A two-phase stochastic dynamic network compartmental model (a pre-vaccination SEIR until February 15th, 2021 followed by a post-vaccination SVEIR from February 15th, 2021 to June 30th, 2021) is used to simulate COVID-19 propagation in Greece. Three scenarios are computed and assessed for the first phase, where only NPIs are available: (a) a baseline scenario, which lifts the national lockdown and all NPIs in January 2021, (b) a “semi-lockdown” scenario with school opening, partial retail sector operation, universal mask wearing and social distancing/teleworking in January 2021 and (c) a “rolling lockdown” scenario combining a partial lifting of measures in January 2021 followed by a third nationwide lockdown in February 2021. In the second phase we assess three scenarios with different vaccination rates. Publicly available data along with some first results of the SHARE Corona survey conducted in Greece are used as input. The results regarding the first phase indicate that the “semi-lockdown” scenario clearly outperforms the third lockdown scenario (5.7% less expected fatalities); the second phase is extremely sensitive to the availability of sufficient vaccine supplies and relevant vaccination rates.

The two-phase model above was used to derive a complete pathway towards the ultimate medium-term goal – the achievement of herd immunity. The model is fully operational and can be used to simulate many of the policy issues faced by public authorities in the first half of 2021; with suitable changes in parameters it can be used for all countries participating in the SHARE Corona Survey. In the case of Greece, the model is used to investigate the relative impact on COVID-19 pandemic of a set of major NPIs, specified on a targeted individual basis, alongside voluntary mass vaccination. It thus enables rigorous analysis of transmission patterns and realistic interventions based on the properties of networks. It is the first time that such a model is applied to yield a mid-term forecast in Greece, where hitherto only deterministic models have been used. It thus represents a step improvement compared to the infrastructure currently available. The use of well-defined behavioral parameters holds the hope that the model will be enriched with more intensive use of SHARE. It is also available for policy use in Greece, while it can be easily adapted for use in other countries.

Adjustment of daily activities to restrictions and reported spread of the Corona pandemic across Europe

Background: In the wake of the corona pandemic, governments in Europe and throughout the world have induced restrictions to limit daily activities and social contacts aiming to curb the spread of the corona virus. Previous research on daily activities based on mobility data for whole populations has shown a substantial reduction of daily activities across European countries, but also large variations across countries. Previous studies have further shown that this variation across countries can partly be explained by both governmental restrictions and the overall spread of the pandemic (infections). However, no studies have analyzed adjustment of daily activities for older people across European countries and to what extent older people's activity adjustment can be explained by restrictions and infections. Thus, the aim of this paper is to describe adjustment of daily activities among people over the age of 50 in Europe and investigate to what extent such adjustment are associated with stringency and infections.

Data and Methods: To investigate this topical issue, we use data from the Survey of Health Ageing and Retirement in Europe (SHARE). More specifically, the analyses are based on data from the SHARE COVID-19 dataset collected through individual computer-assisted telephone interviews (CATI) during June and August 2020 in 27 European countries and Israel. The SHARE Corona Survey data include a total of 52,310 respondents and among them, 42,296 respondents met our inclusion criteria: 1) aged 50 years and older and 2) ever left home since COVID-19 break out. Data from the Oxford COVID-19 OxCGR was used when measuring government response (restrictions) across all countries included. Data on confirmed COVID-19 cases and deaths for all countries were retrieved from the COVID-19 Data Repository by the CSSE at Johns Hopkins University. Descriptive analyses and regressions were used to investigate the variation in activity adjustment and the associations between on one hand adjustment of daily activities and on the other the stringency in country-specific restrictions and the reported spread of the virus and mortality on country level.

Results: Results from our descriptive analyses suggest that older people in all countries who participated in the SHARE Corona Survey reduced their activities quite drastically from onset of the pandemic until the summer of 2020. We observe the largest reductions in activities related to social relations, like visiting other family members or meeting more than 5 people outside the household. A majority of older people in Europe also report a decline in shopping which may not necessarily be a social activity in-itself but may nevertheless involve various forms of social interactions. The reported frequency of walking among the respondents also declined in most countries, however, the rate of this decline was weaker in general and much more heterogeneously spread across countries. In the sample as a whole, women and older people reduced their activities to a slightly larger extent than men and younger people. These differences in relation to age and gender were also observed in most individual countries but not all of them. When it comes to relationships with stringency and infections on the one hand, and activity adjustment on the other, both levels of restrictions and infections were positively associated with a reduction in social activities. However, restrictions and infections only displayed a weak association with a reduction in shopping. Furthermore, result displayed a strong relationship between reduced walking and restrictions, but not between walking and infections.

Conclusions: Our analysis show that older Europeans across the continent have reduced their daily activities quite substantially during the pandemic. This reduction is evident in all 27 countries analyzed. However, we still observe variation across countries and demographic groups. which may be important to highlight for policy makers. Our explanatory analysis replicates previous studies using mobility data showing that both restrictions and infections predict a reduction in mobility. Thus, policy makers could

potentially rely on both restrictions and voluntary adjustments in order to decrease the spread of the virus. However, it is noteworthy that we find relatively weaker associations with restrictions compared to previous studies using mobility data. One explanation for this discrepancy could be that our study focuses on older people which face a higher risk of getting severely ill and therefore have stronger incentives to adjust their behaviors independent of governmental regulations.

It is also crucial to underline that we have not investigated to what extent different policy-induced restrictions have influenced the spread of the virus and the disease. We also want to stress that these are first results from the project, that no causal interpretations can be made and that further research on these issues will be carried out within the project.

4. Future research aims

- a) Once the strategic decisions on geographic data availability and their format is reached, the WP7 team at SHARE-CZ is ready to code and make data available for protected releases in accordance with the GDPR. Subsequently, the SEIR epidemiological model described in Tasks 2, 3, and 4 will be programmed and made available as an API (Application Programming Interface) first for internal and later for all users. If the geographic data are not available by month 12 of the Horizon Covid-19 project, the WP7 members will not be able to guarantee the completion of tasks in WP7 and the delivery of deliverables. For future deliverables D7.2 in month 12, the cooperation between SHARE-IT and SHARE-CZ will also result in a Housing History Panel data coded from the life history questionnaires in wave 3 and wave 7. This Housing History Panel will have the same structure as the Job Episode Panel for working histories of all respondents in SHARE.
- b) Additionally, the UPRC Team is conducting a literature survey (inter alia in Economic Geography) on concepts of resilience and how these can be translated to the individual household level. We are also conducting a detailed comparison of pre- and post- financial crisis SHARE descriptives (w2 and w6), placing emphasis on Greece and countries of Southern Europe especially affected by the financial crisis (ES, IT). This will be expanded to bring in subsequent waves (w7 and w8) and will be related to SHARE-Covid. The analysis over the coming months will discuss notions of resilience capable of relating experience in the financial crisis to that during the pandemic.

IX. Housing and living arrangements

1. Research aims

The research aims were the preparation of a database with key measures of housing conditions from previous waves of SHARE and the collection of context data to be fed into SPLASH (done by WP9).

2. List of papers

- María Inés Berniell, Anne Laferrère, Pedro Mira, Elizaveta Pronkina. *Robinson Crusoe: Protected but depressed? Where to live in an epidemic? Living arrangements and the virus in the 1st wave of 2020.*
- María Inés Berniell, Anne Laferrère, Pedro Mira, Elizaveta Pronkina. *Measuring the environment in SHARE: from homes and family to neighbourhood and region. Assessing the first SHARE Corona Survey sample quality.*

- María Inés Berniell, Anne Laferrère, Pedro Mira, Elizaveta Pronkina. *Descriptive analyses based on the SHARE Corona Survey sample. Living arrangements, the virus and the anti-virus measures in 2020.*

3. Description of results

Depression: Increased for those living alone (Fig. 9.a). Increased compared to pre-COVID times for those not living in multigenerational households, particularly for couples (Fig. 9.b).

Figure 9.a

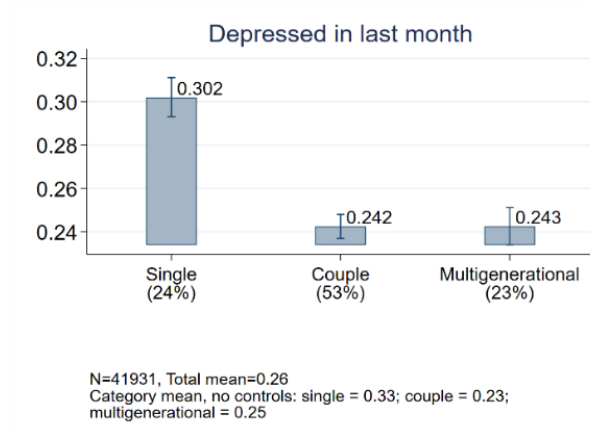
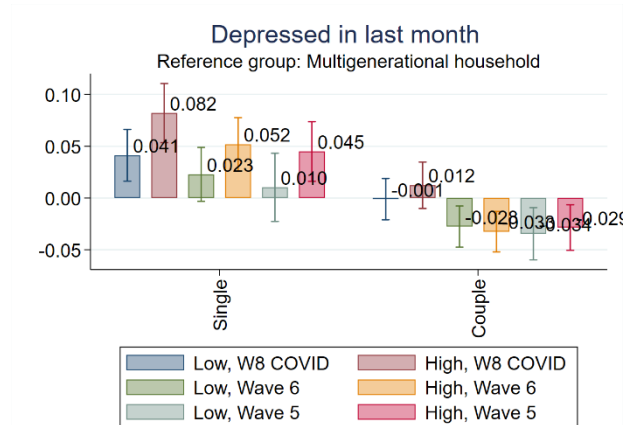


Figure 9.b



Loneliness: Increased for parents without a child co-residing or in the same building (Fig. 10.a), and increased compared to pre-COVID times - particularly in high mortality countries (Fig. 10.b). Increased for people living in denser areas compared to pre-COVID times in badly hit countries (Fig. 10.c).

Figure 10.a

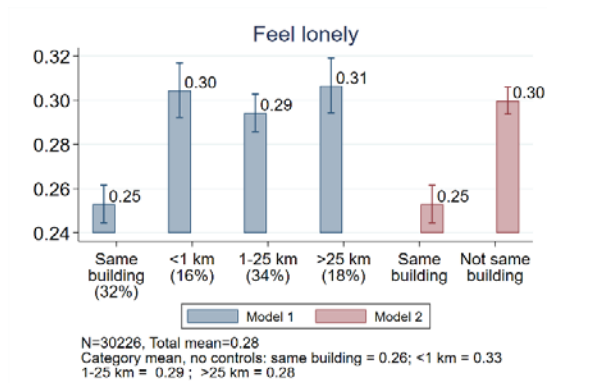


Figure 10.b

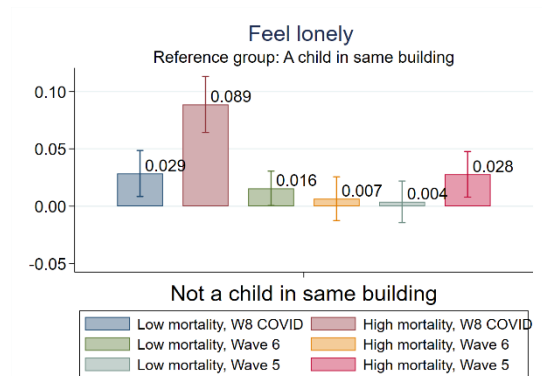
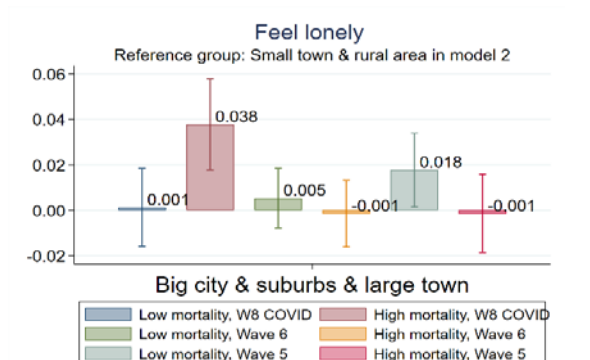


Figure 10.c



Assessment of data coverage / availability of the CATI-1 sample: coverage is 93% for type of building, 85% only for number of rooms, close to 100% for household size (if we abstract from movements between regular Wave 8 and Wave 8 COVID). More mobile, younger, males, are more likely to have missing HO, so are those living in countries that entered SHARE in w7.

Where to live in an epidemic? Robinson Crusoe: Protected but depressed?

Controlling for age, sex, country, education level, number of surviving children, and self-rated health before the pandemic, being depressed or sad, feeling lonely or having trouble sleeping during the 1st wave of the epidemic were significantly correlated with where one lived, whether in densely populated area or in rural area, in a single house or an apartment, and with whom one lived. People were less depressed and had less trouble sleeping if they lived outside big cities and their suburbs and large towns, especially for those who do not live in a single house. Having just one or two rooms also influenced depression. But one felt more lonely living in a single house. Living alone rather than with a spouse or in a multigenerational household was detrimental for all three ailments. Having no child living very close, co-residing or in the same building, increased also the probability of depression or loneliness for parents.

Moreover some of these effects had changed compared to before the pandemic, especially in countries that were more hit by its first wave (Belgium, Italy, Spain, France, the Netherlands and Sweden). Some of what is called the “positive externalities of agglomeration”, such as living in a city turned negative, while other, such as living in an apartment building rather than in a house became relatively more favourable. As if one could not benefit anymore of what a city usually offers, but turned more to immediate neighbourhood. Also interesting is the fact that while living with a spouse was better than living alone, it became less so than in the pre-Covid era relatively to living in an intergenerational household. Also children had to live very close to reduce depression or loneliness in a time where mobility was reduced by anti-Covid policy. Perhaps containment measures could take this into account and be more fine-tuned for particular groups and places.

Details can be found in Berniell, María Inés (CEDLAS-Universidad Nacional de La Plata, Argentina), Laferrère, Anne (Université Paris-Dauphine-PSL, and CREST), Mira, Pedro (CEMFI, Madrid) & Pronkina, Elizaveta (Universidad Carlos III, Madrid) (2021). *Robinson Crusoe: Protected but depressed? Where to live in an epidemic? Living arrangements and the virus in the 1st wave of 2020*. WP.

Comparing differential mortality in nursing homes and in the community

The current health crisis has particularly affected the elderly population. Nursing homes have unfortunately experienced a relatively large number of deaths. On the basis of this observation and working with European data (from SHARE), we check whether nursing home were lending themselves to excess mortality even before the pandemic. Controlling for a number of characteristics of the elderly population in and outside nursing homes, we conjecture that the difference in mortality between those two samples is to be attributed to the way the nursing homes are designed and organised. Using matching methods, we observe excess mortality in Belgium, France, Germany or Switzerland, and no statistically significant excess mortality in Austria, Denmark, Italy, Spain or Sweden. This raises the question of the organisation and management of these nursing homes, but also of their financing.

Details can be found in Flawinne, Xavier, Lefebvre, M., Perelman, Sergio, Pestieau, Pierre & Schoenmaeckers, Jérôme (2021). *Nursing Homes and Mortality in Europe: Uncertain Causality*. WP, Université de Liège.

4. Future research aims

- a) We already started going beyond correlation in descriptive analysis of housing conditions and living arrangements and the effect of the pandemic by using all SHARE waves. This could be improved by adding more about personal context data (using life histories to analyse the determinants of HO and LA) and replacing country dummies by interaction between more refines contextual variables on various health and COVID policies (but also housing policies) and the regional level.
- b) Nursing home choice: further analysis needed to test the robustness of increased mortality in NH. Nursing home coverage and mortality assessment: how to make both better in SHARE
- c) Description of multigenerational living: go more deeply into various intergenerational arrangements: living with adult children, permanently, temporarily during various lockdowns, living with very old parents, moving out of nursing home during the pandemic, use of second home, etc.

X. Data generation

1. Aims

Realising the objectives of this project relies on combining existing and new data:

- the wealth of data from the previous 8 waves of SHARE, including the SHARELIFE histories of childhood and life-course health, economic and social experiences
- two waves of the new SHARE Corona Survey, of which one was in place before this project and the other is part of this project, and
- the SPLASH database of contextual data.

The first SHARE Corona Survey, on which this report is based, interviewed 58,571 individuals between mid June and early August 2021 with the bulk of interviews in July. Sample sizes in the respective countries were: Belgium: 3957, Bulgaria: 914, Switzerland: 1995, Cyprus: 867, Czech Republic: 2782, Germany: 2855, Denmark: 2083, Estonia: 4738, Spain: 2251, Finland: 1509, France: 2187, Greece: 3901, Croatia: 2188, Hungary: 1099, Israel: 1626, Italy: 4003, Lithuania: 1349, Luxembourg: 982, Latvia: 1079, Malta: 920, Netherlands: 813, Poland: 3128, Portugal: 1180, Romania: 1620, Sweden: 1414, Slovenia: 3271, and Slovakia: 1087. The data in AT were collected substantially later and are therefore not included. The differences in sample sizes are due to the sample sizes of previous waves and available funding.

In order to measure the longer-run consequences of the pandemic and its accompanying epidemic control decisions, we aim to collect further data in a second SHARE Corona Survey planned for May and June 2022.

To analyze the linkage between the Covid-19 measures on the living conditions of the individuals, it is important to integrate information about the environment. As such, we developed a contextual data collection that addresses cross-national differences related to the Covid-19 pandemic, the severity and stringency of the epidemic control actions and the employment-related measures implemented as a response. The data will be integrated into the Social PoLicy Archive for SHARE (www.splash-db.eu), the contextual data portal of SHARE. All data has been collected and processed at the Research Data Center of the Munich Center for the Economics of Aging.

2. State of January 2021

The questionnaire for the second SHARE Corona Survey has been designed and will be pre-tested in the 28 participating countries during the first week of March 2021. The main areas are the same as in the first survey (see Section I). Many questions will be the same to monitor the changes between the first wave of the pandemic and the statuses in early summer 2021 about a year later. New questions about longer-term developments (such as job changes, retirement decisions and geographical moves) have been added.

In order to link individual events with the country-specific health, economic and social environment, we mapped international and national Covid-19 resources to review containment measures implemented in SHARE countries. These include policy databases and datasets from international organizations (ECDC, OECD, ILO, IMF, IOM) and research infrastructures, as well as reports and policy documents from the European Commission and stakeholder organizations. During this process, we revised contents and metadata of the sources, identifying those suitable for research at national and subnational level. Based upon this in-depth audit, we were able to identify instruments that merited further investigation as they might have played a role in employment/labor market outcomes during the pandemic. Some of the instruments of interest include restrictions to social contacts and curfews. The results were collected using SPLASH's standardized format for external databases that contains a basic description of each indicator, keywords, the countries and years covered, as well as the hyperlink to the provider's website. Among others, these include sources such as the OECD Country Policy Tracker¹, the Oxford Covid-19 Government Response Tracker (OxCGRT)², the John Hopkins Coronavirus Resource Center³, the Human Mortality Database⁴, and the ACAPS Covid-19 Government Measures Dataset⁵ that provides sub-national measures.

Data from the resources listed above were used to code and estimate basic Covid-19-related indicators for gauging the severity of the pandemic in the respective SHARE countries. These include daily measures such as new cases, cumulative cases, registered deaths and cumulative deaths, as well as information about the evolution of the containment measures. The inclusion of these variables responds to the need for reflecting the national context in the models, as well as the impact that the evolution of the pandemic per se might have had at individual level.

For the contextual overview of employment and working conditions of the respondents, various institutional and agency reports, as well as policy databases were consulted. The main point of interest was job retention measures, namely short-time employment and wage subsidy programs given their relevance as instruments to combat unemployment and loss of income during the current crisis. The content was revised to extract the following policy details: whether the measures existed prior to the pandemic, the requirements for accessing the benefit, as well as its duration and the amount offered. Once the information was compiled into a standardized format, the various policies were organized into main categories to help with cross-country comparisons.

The sources revised include the OECD Job Retention Measures report (OECD 2020), the European Commission Reports on policy measures against the spread of Covid-19 (European Commission 2020a,b,c), the European Trade Union Confederation (ETUC) Briefing Notes on alternatives to

¹ Available at: <https://www.oecd.org/coronavirus/country-policy-tracker/> (last access 10.01.2020)

² Available at: <https://www.bsg.ox.ac.uk/research/research-projects/coronavirus-government-response-tracker> (last access 10.01.2020)

³ Available at: <https://coronavirus.jhu.edu/map.html> (last access 10.01.2020)

⁴ Available at: <https://www.mortality.org/> (last access 10.01.2020)

⁵ Available at: <https://www.acaps.org/projects/covid19/data> (last access 10.01.2020).

redundancy (ETUC 2020a,b), and the ILO Country Policy Responses. The ACAPS Covid-19 Government Measures Dataset and national ministries websites were also identified as sources of sub-national information. In total, almost 400 employment-related measures have been identified for the SHARE countries until December 2020.

Furthermore, we retrieved contextual employment indicators for a better understanding of the labor market conditions existing prior and –whenever possible– during the pandemic in the SHARE countries. These include data from the OECD Employment Outlook 2020 such as average hours worked, participation in short-time work programs for a selection of countries and unemployment rates. The data however cover mostly the period until 2019.

There are several challenges, however, in locating indicators that support cross-national analyses. The first being, it appears the events are too recent for international organizations and statistical offices to offer harmonized cross-country data on short-time work beneficiaries. Despite its availability at the national level, the methodological disparities and language prevail as main barriers for constructing a cross-national dataset. For instance, even when some countries report the number of short-time work applicants received and approved, the variable (applicant) has not been classified as the employer or the employee which impedes analysis. Still, we were able to locate participation rates in short-time work and wage subsidy programs during the Covid-19 pandemic for a selection of SHARE countries from OECD (2020a) and Müller and Schulten (2020).

3. Future aims

The qualitative information about short-time work and wage subsidy policies in the SHARE countries will be further revised and processed. The data will be coded into proxy and scale variables for their inclusion in composite indicators and econometric models. In addition, we will continue monitoring and collecting complementary quantitative indicators for 2020. We expect that more employment-related data will become available during the next months, consistent with the release calendar of national and international offices.

We will actively collaborate with SHARE Country Team Leaders and project partners to validate our findings on national policies and the evaluation of high-quality sources of information at national and sub-national level.

The external sources covering national and cross-national data, as well as the quantitative indicators for the SHARE countries will be openly available in the SPLASH website. All the resources collected in the framework of the project will be identified with the “SHARE-Covid19” keyword to facilitate their identification and access.

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