

**MENTAL HEALTH RISK ALERTS AND LONELINESS DURING THE PANDEMIC:  
A COMPARATIVE INSIGHT FROM THREE BALKAN COUNTRIES**

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**Abstract**

The aim of this paper is to explore the country-specific causes of mental health risk alerts (MHRA) and loneliness during the pandemic among populations aged 60+ in three Balkan countries: Bulgaria, Romania and Greece. Persons 60+ years of age are a high-risk group from a health (infection severity) and social (physical distance, self-isolation) perspective due to Covid-19. The lockdown measures in force differ between countries and have highlighted the importance of intensive social contacts and family support. Lack of social contact, anxiety and loneliness increase the risks for mental health, and analysis reveals interesting comparative insights. Restriction of physical contact and fear of infection intensify feelings of anxiety and loneliness, but there is insufficient empirical evidence on how these factors affect the 60+ age group in the three Balkan countries. The analysis is based on the SHARE Corona survey, with pre-selection of panel members 60+ years of age. Anxiety, depression, and loneliness also depend on social networks. In addition, low socioeconomic status is associated with a higher risk of mental disorders, especially during the outbreak, due to general economic uncertainty. There are peculiarities across the countries in terms of socio-demographic characteristics of the 60+ population, as well as self-assessment of household economic status since the beginning of the pandemic. The degree of MHRA and loneliness varies between countries and corresponds to the severity of the anti-epidemic measures introduced. Participation in social networks during the pandemic also varies between countries and various socio-demographic groups. The results of the logistics models support the hypothesis that factors influencing the increased MHRA and loneliness are country-specific. The outbreak and its influence on the population must be analysed within a specific national context. Anti-epidemic measures and the severity of the pandemic differ between countries, and MHRA and loneliness depend on national and cultural specifics.

**Keywords**

SHARE Corona survey – Mental health risk alerts – Loneliness – Covid-19 – Bulgaria  
Romania – Greece

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## Introduction

The Coronavirus<sup>1</sup> pandemic has placed the whole world in an unprecedented situation and since December 2019 is changing politics, economy, social sphere, healthcare, culture, and everyday life. One of the greatest challenges facing sociology in studying the effects of the pandemic and managing its crisis, in addition to the temporal variability of the pathogen outbreak, is the strong differences between countries. Not only do the occurrence and severity of Covid-19 waves vary, but also the individual reaction to the responses introduced by governments. Objective macro indicators, such as birth rate, mortality, case fatality rates should be taken into account carefully in line with nationally specific contextual data. The aim of this research is to use the comparative analysis of three neighbouring Member States of the European Union to shed light on some of the reasons for such differences, confirming the necessity to include cross-country context in every comparative analysis related to the pandemic.

The main objective of this article is to explore the country-specific causes of mental health risks (anxiety, depression) and loneliness during the pandemic among populations aged 60+ in three Balkan countries: Bulgaria, Romania and Greece, because of the following considerations: 1) All three countries are EU member states, neighbouring countries, situated in one European region; 2) The pandemic crisis management differs significantly among the countries compared, as well as factors that increase the anxiety and loneliness for elderly. 3) The selected countries were not seriously affected by the Covid-19 pandemic at the time of the empirical observation, compared to other EU countries. For example registered positive cases were 11 000 in Bulgaria, 50 000 in Romania, and 4500 in Greece (30 July 2020)<sup>2</sup>.

The main research questions of interest are:

1. What is the share of elderly living alone, with and without support, during the Covid-19 outbreak? What are the country similarities and differences, if any?
2. Who are the people who experience increased anxiety and loneliness? How are these feelings related to the severity of the lockdown measures in each country?
3. What factors influence the increase in anxiety and loneliness at an individual level? What could explain the country variations observed, if any?

Lockdown measures are a great challenge for different social groups: children, parents<sup>3</sup>, and teachers, the employed and unemployed, the elderly, for those living alone, persons with multiple morbidity, etc. The target group of this research is people aged 60+, who are considered a vulnerable group in health and social terms due to Covid-19 and self-reported feelings of anxiety and loneliness caused by the pandemic.

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<sup>1</sup> World Health Organization (WHO), Covid-19 – China (Geneva: WHO, 12.01.2020), <https://www.who.int/emergencies/disease-outbreak-news/item/2020-DON233> (05.08.2021).

<sup>2</sup> Dynamic COVID-19 live statistics is available at Worldometer. <https://www.worldometers.info/coronavirus/>.

<sup>3</sup> G.Yordanova, "Analiz na balansa rabota-semeystvo v usloviyata na pandemia", Nauka: 2 (2021): 21. <http://spisanie-nauka.bg/arhiv/2-2021.pdf>.

The analysis contributes to the scientific debate on policy measures, and Covid-19 effects on the personal well-being of the elderly. The paper also contributes to the discussion about country variations in personal and national pandemic response<sup>4</sup>.

The analysis, conclusions and discussion refer to the first wave of the Covid-19 pandemic when lockdown measures were introduced, and whose effects have been measured by SHARE Corona survey<sup>5</sup> on the psychological well-being of 60+ populations in Bulgaria, Romania and Greece.

The article is organized as follows: it begins with a presentation of the country-sensitive context and theoretical considerations, as well as country specifics of the SARS-CoV-2 outbreak and government responses. The article continues with the data, variables and methods used and the analysed results in a comparative perspective between the three observed countries. The article ends with conclusions and discussion.

## COUNTRY SENSITIVE CONTEXT

In line with health, demographic and economic challenges, Covid-19 induces a massive collective trauma<sup>6</sup> caused by fear, fatigue, traumatic grief, depression and traumatic conditions where Covid-19 causes personal loss. Despite the heterogeneity of experience and individual reactions to the pandemic, it is important to identify regional variations in general psychological reactions. Possible sources of collective trauma during the Covid-19 pandemic could also be decision-making fatigue, diffusion or loss of social roles and social identity, the emergence of social, health and economic inequalities.

It is very important from a sociological perspective to observe the fact that anti-epidemic measures distinguish various health and socially 'vulnerable' groups who are at increased risk of infection and death due to Coronavirus infection, including persons 60+ years of age<sup>7</sup>. The 60+ age cohort is at high-risk from a health (infection severity) and social perspective (physical distance, self-isolation) due to Covid-19<sup>8</sup>.

The study of the effects of targeted actions toward Covid-19 vulnerable groups should be a priority for future research. However, we place special emphasis on vulnerability, because the 60+ population studied is precisely an example of a complex vulnerable group created by the pandemic.

The personal life of the elderly has been under pressure, for instance various factors (health status, socio-economic status, place of residence, etc.) have caused the delay and

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<sup>4</sup> H. Litwin and M. Levinsky, "Social networks and mental health change in older adults after the Covid-19 outbreak", *Aging & Mental Health* (2021): 1. <https://doi.org/10.1080/13607863.2021.1902468>.

<sup>5</sup> A. Börsch-Supan, Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 8. Covid-19 Survey 1. Release version: 1.0.0. Data set (Munich: SHARE-ERIC, 2020). <https://doi.org/10.6103/SHARE.w8ca.100>, <http://www.share-project.org/special-data-sets/share-corona-survey.html>.

<sup>6</sup> M. Masiero; K. Mazzocco; C. Harnois; M. Cropley and G. Pravettoni, "From individual to social trauma: sources of everyday trauma in Italy, the US and UK during the Covid-19 pandemic", *Journal of Trauma & Dissociation*: num 21 (2020): 513.

<sup>7</sup> European Centre for Disease Prevention and Control (ECDC) definition for high-risk groups, available at: <https://www.ecdc.europa.eu/en/covid-19/high-risk-groups>.

<sup>8</sup> European Centre for Disease Prevention and Control (ECDC), Covid-19 data (Solna: ECDC, 2020). <https://www.ecdc.europa.eu/en/covid-19/data> (27.07.2021).

denial of medical care<sup>9</sup>. The vulnerability of the elderly varies between countries and different socio-demographic profiles, also regarding the type of social support networks, which can be helpful, deficient, or even harmful<sup>10</sup>. The lockdown measures in force have highlighted the importance of intensive social contacts and family support.

## COUNTRY SPECIFICS OF THE SARS-COV-2 OUTBREAK AND GOVERNMENT RESPONSES

The outbreak severity, as well as the stringency of anti-epidemic policy response varies across countries<sup>11</sup>. The contextual demographic and Covid-19 related health information<sup>12</sup> for Bulgaria, Romania and Greece reveals national variations, from lockdown measures to mortality rate and Covid-19 morbidity. This contextual information plays an important role in helping us gain a better understanding of the circumstances that affect the personal mental state of people in the three countries being compared.

In terms of demographic structure, Greece has the second oldest population of all European Union countries (Table 1)<sup>13</sup>, although Bulgaria has a strong demographic disbalance and decreasing life expectancy.

Bulgaria and Romania have lower life expectancy at birth for both genders compared to Greece, but despite that the share of the population aged 60+ in these two countries is higher than in Greece by 3 percentage points (pp). It is notable that the Healthy Life Years Index (HLY)<sup>14</sup> at birth for Romania is considerably lower (Table 1). HLY at age 65 differs among the three countries – the highest is in Bulgaria (9.9 years), the lowest is in Romania (6.6)<sup>15</sup>.

<sup>9</sup> Š. Smolić; I. Čipin and P. Međimurec, "Access to healthcare for people aged 50+ in Europe during the Covid-19 outbreak", *European Journal of Ageing* (2021): 1. <https://doi.org/10.1007/s10433-021-00631-9>

<sup>10</sup> M. Cugmas; A. Ferligoj; T. Kogovšek and Z. Batagelj, "The social support networks of elderly people in Slovenia during the Covid-19 pandemic", *PLoS ONE*: num 16 (2021): 1. <https://doi.org/10.1371/journal.pone.0247993>.

<sup>11</sup> T. Hale; N. Angrist; R. Goldszmidt, et al., "A global panel database of pandemic policies (Oxford COVID-19 Government Response Tracker)", *Nature Human Behaviour*: 5 (2021): 529. <https://doi.org/10.1038/s41562-021-01079-8>.

<sup>12</sup> H. Ritchie; E. Ortiz-Ospina; D. Beltekian, et al., *Coronavirus Pandemic (COVID-19)* (Oxford: OurWorldInData.org, 2020). <https://ourworldindata.org/coronavirus-source-data>

<sup>13</sup> Eurostat, *Population structure and ageing* (Luxembourg: Eurostat, 06. 2021). [https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Population\\_structure\\_and\\_ageing#The\\_share\\_of\\_elderly\\_people\\_continues\\_to\\_increase](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Population_structure_and_ageing#The_share_of_elderly_people_continues_to_increase) (30.07.2021).

<sup>14</sup> The indicator Healthy Life Years (HLY) at birth measures the number of years that a person at birth is still expected to live in a healthy condition, combining mortality and morbidity. The indicator is also known as disability-free life expectancy (DFLE).

<sup>15</sup> Eurostat, *Healthy life years at age 65 by sex* (Luxembourg: Eurostat, 12.03.2021). [https://ec.europa.eu/eurostat/databrowser/view/tepsr\\_sp320/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/tepsr_sp320/default/table?lang=en) (30.07.2021).

Country	Population (1 January 2021) <sup>16</sup>	Life expectancy at birth (2019) <sup>17</sup>		Age dependency ratio (2020) <sup>18</sup>	% of population on 60+ (2020) <sup>19</sup>	Survival to age 65+, female, % of cohort (2019) <sup>20</sup>	Healthy Life Index at birth (2019) <sup>21</sup>
		Female	Male				
<b>Bulgaria</b>	6,916,548	78.8	71.6	56.61	28.2	86.842	66.3
<b>Romania</b>	19,186,201	79.5	71.9	53.26	25.9	87.876	60.2
<b>Greece</b>	10,682,547	84.2	79.5	56.10	28.8	93.464	66.0

Table 1

Contextual demographic data: Bulgaria, Romania and Greece

Source: Eurostat, World Bank, Authors' calculations

The severity of the pandemic seems to be sharpest in Romania with its high cumulative number of Covid-19 cases (Table 2). Greece<sup>22</sup> is one of the countries with the lowest case fatality rates among nations of the European Union (EU), following two consecutive waves of the COVID-19 pandemic and the lowest actual number of deaths during the first wave.

The government response to the spread of SARS-Cov-2 includes limitation of social contacts. Lockdown measures introduced during the first wave of Covid-19 vary between Bulgaria, Romania and Greece. In Bulgaria, the first registered Covid-19 positive is on March 8, 2020, followed by a State of emergency on March 13, 2020 with closure of schools and shopping malls, stay-at-home orders only for persons subject to mandatory isolation or quarantine<sup>23</sup>, travel bans, a recommendation to work from home, certain local public transport restrictions. In Greece, control measures started with the cancelation of public festivities, the closure of educational institutions, shopping centres and restaurants, and travel restrictions<sup>24</sup>.

<sup>16</sup> Eurostat, Population on 1 January by age and sex (Luxembourg: Eurostat, 06.07.2021). [https://ec.europa.eu/eurostat/databrowser/view/demo\\_pjan/default/table?lang=en](https://ec.europa.eu/eurostat/databrowser/view/demo_pjan/default/table?lang=en) (30.07.2021).

<sup>17</sup> Eurostat, Life expectancy at birth by sex (Luxembourg: Eurostat, 12.03.2021). <https://ec.europa.eu/eurostat/databrowser/view/tps00208/default/table?lang=en> (30.07.2021).

<sup>18</sup> World Bank, Age dependency ratio (% of working-age population) – Bulgaria, Greece, Romania (Washington: World Bank, 2019). <https://data.worldbank.org/indicator/SP.POP.DPND?locations=BG-GR-RO> (30.07.2021).

<sup>19</sup> World Bank, Population ages 60 and above (% of total population) – Bulgaria, Greece, Romania, Data from database: Health Nutrition and Population Statistics (Washington: World Bank, 2019). <https://data.worldbank.org/indicator/SP.POP.65UP.TO.ZS?locations=BG-GR-RO> (30.07.2021).

<sup>20</sup> World Bank, Survival to age 65, female (% of cohort) – Bulgaria, Greece, Romania (Washington: World Bank, 2019). <https://databank.worldbank.org/source/health-nutrition-and-population-statistics> (30.07.2021).

<sup>21</sup> Eurostat, Healthy life years at birth by sex (Luxembourg: Eurostat, 12.03.2021). <https://ec.europa.eu/eurostat/databrowser/view/tps00150/default/table?lang=en> (30.07.2021).

<sup>22</sup> G.J. Delinasios; P.C. Fragkou; A.M. Gkirmipa AM et al., "The Experience of Greece as a Model to Contain COVID-19 Infection Spread", *In Vivo*: 35 (2021): 1285, <https://doi.org/10.21873/invivo.12380>.

<sup>23</sup> European Union Agency for Fundamental Rights (FRA), Coronavirus pandemic in the EU - Fundamental Rights Implications (Vienna: FRA, 08.04.2020). <https://fra.europa.eu/en/publication/2020/covid19-rights-impact-april-1>.

<sup>24</sup> G.J. Delinasios; P.C. Fragkou; A.M. Gkirmipa AM et al., "The Experience of Greece .... 1285-1294.

Greece declared a national lockdown when the number of active COVID-19 cases was as low as 695 patients across the country. The Romanian authorities<sup>25</sup> announced a national lockdown (March 25, 2020) with ‘stay at home’ restrictions, closure of schools and shopping centres, a travel ban. The elderly above age 65 were restricted from leaving their homes, except between 11:00 to 13:00 (local time) and only for essential reasons.

In order to be able to compare the dynamics of the pandemic outbreak, especially in order to avoid subjectivity and to take into account regional specifics, we try to control the occurrence of pandemic waves. The reference period for the contextual data is 13.04.-13.05.2020, during the first wave. The case fatality rates are indicative of infection control in Greece, in contrast to the alarming situation in Bulgaria and Romania. For example, on September 1, 2020 the case fatality rate for Bulgaria was 8.77, compared to 3.84 in Romania and 1.84 in Greece (Table 2). The highest Government Stringency Index for the period 13 Apr-13 May 2020 is in Romania (Table 2).

Country (13.04-13.05.2020)	Case rate fatality	Stringency Index	Cumulative Number of Covid-19 cases up to 28 July 2021	Workplace closure	Stay at home
Bulgaria	3.93%	71,3	424,079	Recommended	Recommended
Romania	3.97%	87.04	1,08 million	Require closing some sectors	Required with exceptions
Greece	0.24%	84,26	485,015	Require closing some sectors	Required with exceptions

Table 2  
SARS-Cov-2 related data

Source: \* T. Hale; N. Angrist; R. Goldszmidt, et al. (2021); H. Ritchie; E. Ortiz-Ospina; D. Beltekian, et al. (2020)

## THEORETICAL CONSIDERATIONS

The psychosocial effects of the pandemic are of significant societal concern<sup>26</sup>. Psychological well-being during large-scale social crises, such as that caused by Covid-19, is crucial for at least two merits: psychological factors are key in the implementation of anti-epidemic measures, incl. vaccination<sup>27</sup>, because people who suffer from psychological issues are particularly vulnerable in general<sup>28</sup>. More importantly, the presence of mental disorder (illness) or low levels of psychological well-being are associated with a higher risk of general health problems, and thus with an increased risk of infection with Covid-19<sup>29</sup>.

<sup>25</sup> GardaWorld, Romania: Government announces lockdown measures on March 25 /update 2 (Montréal: GardaWorld, 26.03.2020), <https://www.garda.com/fr/crisis24/alertes-de-securite/326626/romania-government-announces-lockdown-measures-on-march-25-update-2> (05.08.2021).

<sup>26</sup> C. Armour; E. McGlinchey; S. Butter; K. McAloney-Kocaman and K.E. McPherson, “The COVID-19 Psychological Wellbeing Study: Understanding the Longitudinal Psychosocial Impact of the COVID-19 Pandemic in the UK; a Methodological Overview Paper”, *Journal of Psychopathology and Behavioral Assessment*: 43 (2021): 174. <https://doi.org/10.1007/s10862-020-09841-4>.

<sup>27</sup> W. Cullen; G.Gulati and B.D. Kelly, “Mental health in the COVID-19 pandemic”, *QJM: An International Journal of Medicine*: 113 (2020): 311. <https://doi.org/10.1093/qjmed/hcaa110>.

<sup>28</sup> S. Taylor, *The Psychology of Pandemics: Preparing for the Next Global Outbreak of Infectious Disease*. (Newcastle upon Tyne: Cambridge Scholars Publishing, 2019), 45.

<sup>29</sup> W. Cullen; G.Gulati and B.D. Kelly, “Mental health in the COVID-19... 311-312.

Research confirms<sup>30</sup> an increase in anxiety and depression caused by the Covid-19 pandemic in China. Surveys of psychological reactions during the pandemic have been conducted in various European countries<sup>31</sup>, online survey results of healthcare professionals<sup>32</sup>, or continuous online survey of the Romanian population<sup>33</sup>. Current research on the impact of the first lockdown (March–July 2020) in Western and Northern Europe is present<sup>34</sup> and the main outcomes from the pandemic were loneliness, anxiety, and COVID-19-related worries and precautionary behaviour.

The importance of regional comparative research on factors that affect psychological well-being is widespread among scholars, but according to the public policies and anti-epidemic measures, resources for supporting individual psychological comfort are not envisaged enough. Huge differences between countries regarding the increased feelings of sadness/depression and loneliness are reported by the SHARE Corona survey<sup>35</sup>. Lockdown measures in Bulgaria, Romania and Greece include social distancing, and the limitation of social contacts. Loneliness is associated with anxiety and depression among numerous other conditions<sup>36</sup>, but also with higher mortality and morbidity risk<sup>37</sup>. Social loneliness, as an objective condition, involves lack of contacts, social networks and the sense of belonging to a smaller or wider circle of people which in the elderly is related to depression, anxiety, an increased risk of further social disconnectivity<sup>38</sup>. The lack of social contacts, and respective anxiety and loneliness in later life increase the risk of mental health in relation to depression<sup>39</sup>. Meta-analysis<sup>40</sup>, conducted long before the pandemic, reveals that socio-

<sup>30</sup> C. Wang; R. Pan; X. Wan, et al., “Immediate psychological responses and associated factors during the initial stage of the 2019 coronavirus disease (COVID-19) epidemic among the general population in China”, *International Journal of Environmental Research and Public Health*: num 17 (2020): 1729. <https://doi.org/10.3390/ijerph17051729>.

<sup>31</sup> K. Sønderskov; P. Dinesen; H. Vistisen and S. Østergaard, “Variation in psychological well-being and symptoms of anxiety and depression during the COVID-19 pandemic: Results from a three-wave panel survey”, *Acta Neuropsychiatrica*: 33 (2021): 156. <https://doi.org/10.1017/neu.2020.47>.

<sup>32</sup> S. Weibelzahl; J. Reiter and G. Duden, “Depression and anxiety in healthcare professionals during the COVID-19 pandemic”, *Epidemiology and Infection*: num 149 (2021): 1. <https://doi.org/10.1017/S0950268821000303>.

<sup>33</sup> F. Vancea and M-Ş. Apostol, “Changes in mental health during the COVID-19 crisis in Romania: A repeated cross-section study based on the measurement of subjective perceptions and experiences”, *Science Progress*: num 140 (2021):1. <https://doi.org/10.1177/00368504211025873>.

<sup>34</sup> T. Varga; F. Bub; A. Dissinga et.al., “Loneliness, worries, anxiety, and precautionary behaviours in response to the COVID-19 pandemic: A longitudinal analysis of 200,000 Western and Northern Europeans”, *The Lancet Regional Health – Europe*: num 2 (2021):1. <https://doi.org/10.1016/j.lanepe.2020.100020>

<sup>35</sup> J. Atzendorf and S. Gruber, “The mental well-being of older adults after the first wave of COVID-19”, *Max Planck Institute for Social Law and Social Policy, Munich Center for the Economics of Aging (MEA)*: (2021): 1. [https://www.mpisoc.mpg.de/fileadmin/user\\_upload/MEA\\_DP\\_04-2021.pdf](https://www.mpisoc.mpg.de/fileadmin/user_upload/MEA_DP_04-2021.pdf).

<sup>36</sup> R. Narchal and S.A. McDavitt, “Loneliness and Anxiety Sensitivity: Understanding Behavioural Avoidance in the Lonely”, *Acta Psychopathol*: 3 (2017): 1. <https://doi.org/10.4172/2469-6676.100130>

<sup>37</sup> M.H. Lim; T.L. Rodebaugh; M.J. Zyphur and J.F. Gleeson, “Loneliness over time: The crucial role of social anxiety”, *Journal of Abnormal Psychology*: num 125 (2016): 620. <https://doi.org/10.1037/abn0000162>.

<sup>38</sup> J. Domènech-Abella; J. Mundó; J.M.Haro and M. Rubio-Valera, “Anxiety, Depression, Loneliness and Social Network in the Elderly: Longitudinal Associations from The Irish Longitudinal Study on Ageing (TILDA)”, *Journal of Affective Disorders*: num 246 (2019): 82. <https://doi.org/10.1016/j.jad.2018.12.043>.

<sup>39</sup> H. Litwin and M. Levinsky, “Social networks and mental health...1-25.

<sup>40</sup> M. Pinquart and S. Sörensen, “Influences on Loneliness in Older Adults: A Meta-Analysis”, *Basic and applied social psychology*: num 23 (2001): 245.



economic and demographic factors such as age, gender, socio-economic status influence loneliness among the elderly.

The restriction of physical contact due to lockdown measures and fear of infection intensify the feelings of anxiety and loneliness, but there is insufficient empirical evidence on how these factors affect the 60+ population in the three Balkan countries. Anxiety, depression and loneliness also depend on social networks. In addition, low socioeconomic status is associated with a higher risk of mental disorders<sup>41</sup>, so we presume it will be valid especially during the outbreak due to general economic uncertainty. The decline in income could also contribute to anxiety disorders<sup>42</sup>. The lack of social support is perceived as a 'potential fundamental cause of disease'<sup>43</sup>.

## DATA, VARIABLES AND METHODS

The data analysis is based on the SHARE Wave 8 COVID-19 Survey 1<sup>44</sup>, with pre-selection of panel members 60+ years of age in three countries: Bulgaria, Romania and Greece. The object of the observations in all SHARE waves, as well as in the SHARE Corona survey, are samples from the population aged 50+ and their partners. The sample sizes for the countries of interest in the SHARE Corona survey are respectively 3636 for Greece, 819 for Bulgaria and 1486 for Romania. The panel members who reported age equal to or more than 60 years are selected from the original country samples. The subsamples of interest include Bulgaria (n=674), Romania (n=1209) and Greece (n=3135). Descriptive statistics are presented in table 3.

The data is analysed with SPSS - version 26.0 (IBM, 2019).

The data analysis is constructed in the following logic:

Outcome variables of interest are: self-reported feelings of mental health risk alerts (MHRA) and loneliness. A composite (integrated) variable is constructed in order to measure the MHRA during the pandemic among the target population.

MHRA measure is based on a combination of three variables, formed from the following questions<sup>45</sup>:

- "In the last month, have you felt nervous, anxious, or on edge?" And if the answer is positive, then the respondent is asked "Has that been more so, less so, or about the same as before the outbreak of Corona?"

<sup>41</sup> Y-M. Kim and S-i. Cho, "Socioeconomic status, work-life conflict, and mental health". *American Journal of Industrial Medicine*: num 63 (2020) 703. <https://doi.org/10.1002/ajim.23118>.

<sup>42</sup> R. de Graaf; M. ten Have; M. Tuithof and S. van Dorsselaer, "First-incidence of DSM-IV mood, anxiety and substance use disorders and its determinants: results from the Netherlands Mental Health Survey and Incidence Study-2", *Journal of Affective Disorders*: num 149 (2013): 100-107. <https://doi.org/10.1016/j.jad.2013.01.009>.

<sup>43</sup> L. Song; J. Son and N. Lin, "Social Support", in *The Sage Handbook of Social Network Analysis*, eds. J. Scott and P. J. Carrington (London: SAGE, 2011), 116-128.

<sup>44</sup> A. Börsch-Supan, *Survey of Health, Ageing and Retirement in Europe...*

<sup>45</sup> SHARE Corona Questionnaire 1 is available at <http://www.share-project.org/data-documentation/questionnaires/corona-questionnaire-1.html>.

- “In the last month, have you been sad or depressed?” (the meaning of depressed is miserable, in low spirits, or blue) And if the answer is positive, then the respondent is asked “Has that been more so, less so, or about the same as before the outbreak of Corona?”
- “Have you had trouble sleeping recently?” And if the answer is positive, then the respondent is asked “Has that been more so, less so or about the same as before the outbreak of Corona?”

If the respondent answered “more so” in at least one of these three questions, then the integrated variable becomes a positive value – “yes”. Otherwise the integrated variable has a negative value – “no”.

For the measure of loneliness the answers to the original variable “more or less lonely since outbreak” are used – if the answer is “more lonely since outbreak” then the lonely variable has a positive answer.

The micro-level factor variables that could trigger MHRA and loneliness are grouped into three dimensions: socio-demographic factors (gender, age and household composition); self-evaluation of household economic situation since the outbreak; social networks and support.

The target population 60+ is further distributed by: three age cohorts (aged 60-69, 70-79 and 80 and more); gender; living with a partner in the household or not, and living alone or not. The household economic situation, i.e. ‘Is the household able to make ends meet’, is constructed in two categories - with difficulty and easily. Social networks and support is formed by the frequency of the respondents’ physical contacts with three different groups – own children; relatives; neighbours, friends or colleagues.

Descriptive analyses, Chi square-method and logistic regression model are used for examination of the influence of determinants (socio-demographics, social networks and economic situation) on increased MHRA and loneliness among the elderly.

Multiple logistic models are constructed to estimate the odds ratio (proportion between positive and negative answers) of increased MHRA and loneliness depending on two groups of determinants. The first group consists of the aforementioned socio-demographic and economic variables. The variables for the frequency of contact during the outbreak with own children; relatives; neighbours, friends or colleagues are selected in the second group.

We also refer the data from SHARE Corona survey <sup>146</sup> with macro-level potential factors that are taken into account. The macro-factors are derived from the Stringency Index<sup>47</sup>, Global database of government response tracker<sup>48</sup> (morbidity and mortality rates), as well as country data for Covid-19 outbreak from the European Centre for Disease prevention and control or Oxford Covid-database, Johns Hopkins<sup>49</sup>.

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<sup>46</sup> For methodological details, please refer to A. Scherpenzeel; K. A. Axt; M. Bergmann, et al., “Collecting survey data among the 50+ population during the COVID-19 outbreak: the survey of health, ageing and retirement in Europe (SHARE)”, *Survey Research Methods*: 14 (2020): 217. <https://doi.org/10.18148/SRM/2020.V14I2.7738>.

<sup>47</sup> H. Ritchie; E. Ortiz-Ospina; D. Beltekian, et al., *Coronavirus Pandemic (COVID-19)*...

<sup>48</sup> T. Hale; N. Angrist; R. Goldszmidt, et al., “A global panel database...529-538.

<sup>49</sup> European Centre for Disease Prevention and Control (ECDC), *Covid-19 data*...

	<b>Bulgaria</b>	<b>Romania</b>	<b>Greece</b>
	n=674	n=1209	n=3135
<b>Gender</b>			
male	41.8%	44.3%	44.6%
female	58.2%	55.7%	55.4%
<b>Age group</b>			
60-69	42.7%	51.8%	41.1%
70-79	39.9%	33.1%	34.7%
80 and more	17.4%	15.1%	24.3%
<b>Partner in household</b>			
Yes	60.2%	67.3%	70.5%
No	39.8%	32.7%	29.5%
<b>Living alone</b>			
No	68.8%	82.5%	76.4%
Yes	31.2%	17.5%	23.6%
<b>Household's ability to make ends meet since outbreak<sup>50</sup></b>			
	n=464	n=804	n=2248
with difficulty	69.4%	69.0%	89.8%
easily	30.6%	31.0%	10.2%

Table 3

Descriptive statistics

Source: SHARE Wave 8 COVID-19 Survey 1, Release version: 0.0.1 beta

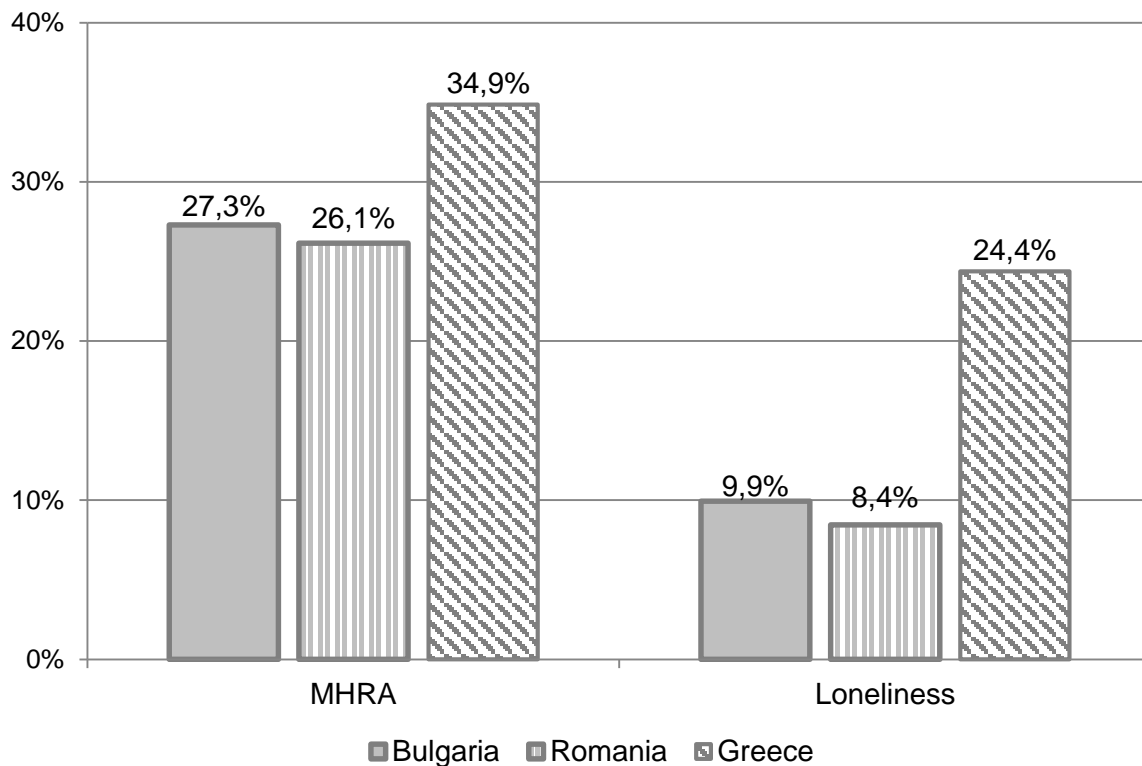
## RESULTS

There are peculiarities across the countries in terms of socio-demographic characteristics among the 60+ population, as well as self-assessment of the economic status of the household since the start of the pandemic. The degree of MHRA and loneliness varies between countries and corresponds to the severity of the anti-epidemic measures introduced. Participation in social networks during the pandemic also differs between countries and among various socio-demographic groups. The results of the logistics models support the hypothesis that factors influencing increased anxiety and loneliness are country specific.

The share of positive answers for MHRA and loneliness by country is presented in Figure 1. Greece has the highest share of positive answers for both indicators. Nearly 1/3 of the target population in Greece experiences MHRA (CI 33.2%; 36.5%<sup>51</sup>). There is no statistically significant difference in the share of people with MHRA since the outbreak in Bulgaria (CI 23.9%; 30.7%) and Romania (CI 23.6%; 28.6%). The share of positive answers to the question “Do you feel more or less lonely since the outbreak” in Greece is 24.4% (CI 22.9%; 25.9%) and is almost 2.5 times higher than the share in Bulgaria (CI 7.7%; 12.9%) and Romania (6.8%; 10.0%).

<sup>50</sup> The calculations are based on number of valid answers.

<sup>51</sup> The confidence intervals (CI) are calculated with 95% probability.



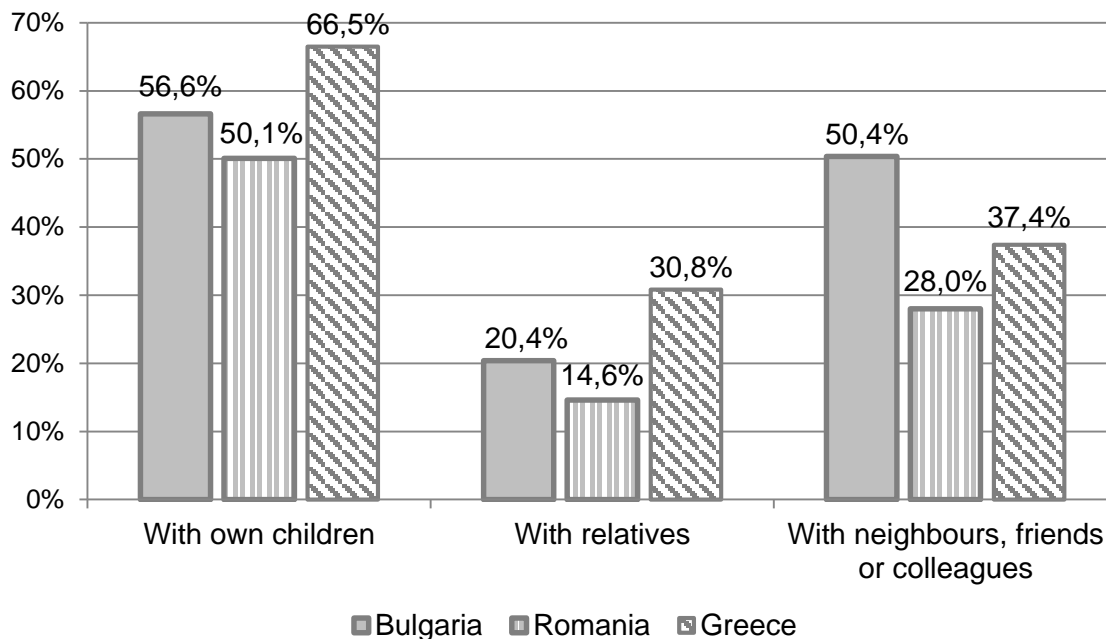
Source: SHARE Wave 8 COVID-19 Survey 1, Release version: 0.0.1 beta

Figure 1

The share of positive answers for MHRA and loneliness by country

Some of the possible factors for MHRA and loneliness among people aged 60+ are self-isolation, the reduction or even the suspension of physical contact with family members, relatives and friends due to lockdown measures, or fear of infection. The share of respondents in the countries studied who declared frequency of contact with their own children, relatives, neighbours, friends or colleagues during the outbreak at least once a week are presented in figure 2. We observe the highest share of frequent contacts with own children and relatives in Greece – 2/3 of respondents reported contact with own children at least once a week and almost 1/3 with relatives.

The share reporting contact with children is also high in Bulgaria and Romania – more than half of respondents. However, the share with frequent contact with relatives is lower – 20.4 and 14.6% in Bulgaria and Romania respectively. Bulgaria has the highest share of respondents with frequent contact with neighbours, friends or colleagues. All differences between the shares in the different countries are statistically significant ( $\alpha < 0.05$ ).



Source: SHARE Wave 8 COVID-19 Survey 1, Release version: 0.0.1 beta

Figure 2

Share of respondents with contact once a week or more frequently during the outbreak

A hypothesis about a significant relationship between gender, age group, household composition and self-evaluation of household economic situation since the outbreak for each country is tested in order to explore the influence of socio-demographic and economic factors on the increase of MHRA and loneliness during the outbreak in 2020 (Table 4). The differences in the presence or absence of MHRA and loneliness among the male and female populations are statistically significant in all countries and the share of females who reported an increase is about 7 pp higher than the share of males.

Age group is a factor for MHRA in Greece only, and affects loneliness in the three observed countries, but the share of respondents who reported an increase in the level of loneliness is much higher in the 80+ population. According to preliminary assumption and theory, those living with a partner or with another household member feel less lonely and depressed. But, surprisingly, the impact of household status on MHRA is statistically significant only in Greece. At more than 10 pp Romania sees the greatest difference in positive answers regarding MHRA and loneliness among respondents from households with favourable and unfavourable economic situation.

Socio-demographic and economic factors	MHRA (share of positive answers)			Loneliness (share of positive answers)		
	Bulgaria	Romania	Greece	Bulgaria	Romania	Greece
<b>Gender</b>						
Male	22.3%	22%	30.1%	7.1%	4.9%	20.7%
Female	30.9%	29%	38.7%	12.0%	11.3%	27.3%
Chi-square	6.01**	8.48**	24.81**	4.39**	16.03**	18.54**
<b>Age group</b>						
60-69	27.1%	24.6%	30.5%	8.7%	6.5%	20.0%
70-79	26.4%	26.3%	33.6%	8.2%	8.8%	23.1%
80 and more	29.9%	31.1%	44.2%	17.1%	14.2%	33.6%
Chi-square	0.5	3.1	40.71**	8.13**	10.83**	49.97**
<b>Partner in household</b>						
Yes	26.4%	25.2%	31.0%	6.4%	5.3%	17.4%
No	28.7%	28.1%	44.2%	15.3%	14.9%	41.1%
Chi-square	0.46	1.2	49.81**	14.27**	32.09**	199.57**
<b>Living alone</b>						
No	26.7%	25.5%	31.4%	7.3%	6.4%	18.2%
Yes	28.6%	29.2%	46.1%	15.7%	17.9%	44.5%
Chi-square	0.25	1.3	53.67**	11.35**	29.96**	212.10**
<b>Household's ability to make ends meet since outbreak</b>						
With difficulty	31.1%	31.2%	36.5%	13.4%	13.7%	28.4%
Easily	23.2%	18.1%	30.9%	8.5%	3.6%	21.3%
Chi-square	2.95*	14.92	2.86*	2.67	18.47**	5.19**

Source: SHARE Wave 8 COVID-19 Survey 1, Release version: 0.0.1 beta, \* $\alpha < 0.1$ ; \*\* $\alpha < 0.05$ .

Table 4

MHRA and loneliness by socio-demographic and economic factors

Additionally, the hypothesis about a significant relationship between the frequency of contact (separately for contact with own children, with relatives and with neighbours, friends or colleagues) and the presence of MHRA and feelings of loneliness is tested and the results are given in Table 5. For extension of the analysis this hypothesis testing is also conducted separately among people living alone. In contrast to the preliminary assumption the results in that sub-group do not differ substantially in comparison to the whole sample.

Contact frequency since outbreak with:	MHRA (share of positive answers)			Loneliness (share of positive answers)		
	Bulgaria	Romania	Greece	Bulgaria	Romania	Greece
<b>Own children</b>						
Once a week or more	26.2%	24.5%	31.1%	8.7%	7.7%	20.9%
Less often or never	29.2%	28.1%	39.6%	11.7%	9.1%	28.9%
Chi-square	73.0%	194.0%	20.15**	161.0%	78.0%	22.46**
<b>Relatives</b>						
Once a week or more	24.2%	20.5%	20.6%	8.3%	9.0%	15.2%
Less often or never	29.1%	27.0%	41.0%	10.7%	8.2%	28.9%
Chi-square	121.0%	3.14*	119.36**	62.0%	12.0%	65.62**
<b>Neighbours, friends or colleagues</b>						
Once a week or more	24.2%	27.7%	22.6%	10.4%	8.5%	18.2%
Less often or never	31.3%	26.2%	42.3%	9.7%	9.1%	28.4%
Chi-square	4.16**	28.0%	123.34**	11.0%	11.0%	40.57**

Source: SHARE Wave 8 COVID-19 Survey 1, Release version: 0.0.1 beta, \* $\alpha < 0.1$ ; \*\* $\alpha < 0.05$ .

Table 5

MHRA and loneliness by contact frequency

Our multiple logistic regression models confirm the results of descriptive statistics and hypotheses testing. Two different factor models are initially constructed in order to estimate the probability of the presence of MHRA and feelings of loneliness: 1) with all socio-demographic and economic determinants, and 2) with all determinants measured the frequency of contacts during the outbreak (Table 6).

Factors (categories)	MHRA						Loneliness						
	Bulgaria		Romania		Greece		Bulgaria		Romania		Greece		
	Exp (B)	Sig.	Exp (B)	Sig.	Exp (B)	Sig.	Exp (B)	Sig.	Exp (B)	Sig.	Exp (B)	Sig.	
<b>Model 1</b>	<b>Gender</b>												
	Male (baseline)												
	Female	1.683	0.03	1.819	0.00	1.243	0.02	1.282	0.47	2.281	0.01	1.106	0.33
	<b>Age group</b>												
	60-69 (baseline)												
	70-79	0.923	0.74	0.967	0.86	1.003	0.98	0.767	0.45	1.495	0.14	1.056	0.65
	80 and more	0.978	0.94	1.134	0.58	1.495	0.00	1.167	0.69	1.808	0.06	1.415	0.01
	<b>Living alone</b>												
	No (baseline)												
	Yes	0.961	0.86	0.991	0.96	1.63	0.00	1.797	0.06	1.920	0.01	3.008	0.00
<b>Household's ability to make ends meet since outbreak</b>													
Easily (baseline)													
With difficulty	1.437	0.12	1.972	0.00	1.235	0.16	1.743	0.11	3.708	0.00	1.411	0.05	
<b>Model 2</b>	<b>Own children</b>												
	Once a week or more (baseline)												
	Less often or never	1.20	0.31	1.07	0.64	1.09	0.34	1.386	0.22	1.121	0.62	1.245	0.02
	<b>Relatives</b>												
	Once a week or more (baseline)												
	Less often or never	1.09	0.74	1.73	0.03	1.76	0.00	1.115	0.77	1.020	0.96	2.004	0.00
<b>Neighbours, friends or colleagues</b>													
Once a week or more (baseline)													
Less often or never	1.47	0.04	0.79	0.17	1.87	0.00	1.102	0.72	0.979	0.94	1.199	0.16	

Source: SHARE Wave 8 COVID-19 Survey 1, Release version: 0.0.1 beta

Table 6

Results from multiple logistic regression models

From all factors, we apply a forward selection procedure in order to verify the significant ones. The selected factors affecting the probability of the presence of MHRA are as follows (table 7):

In Greece the probability of increased MHRA is 1.47 (sig. 0.014) times higher in the 80+ age group compared to the 60-69 age group. Among people living alone the probability is 1.76 higher. The results are similar in the sub-groups of people who have contact with relatives and neighbours, friends or colleagues since the outbreak less than once a week – 1.67 and 1.90 times respectively.

In Bulgaria the probability of increased MHRA is 1.65 higher for females and 1.68 higher among respondents from households with an unfavourable economic situation. In Romania females are 2.2 times more likely to feel anxiety, and respondents from households that have difficulty making ends meet are respectively 2.38 times more likely.

Concerning loneliness (Table 7), the probability of feeling lonely in Greece is 1.48 times higher in the 80+ subgroup compared with those aged 60-69. As expected, the probability is much higher (3.29 times) among respondents living alone. Those who have contact with their own children less than once a week since the outbreak are 1.46 times more likely to feel lonely compared to respondents with contact at least once a week. And the probability for contact with relatives is 2.1 times higher.

In Bulgaria the analysis reveals that only living alone has a statistically significant influence on the probability of feeling lonely - 1.78 times higher among people living alone.

There are two independent variables in the model for Romania: people living alone are 1.86 times more likely to feel lonely. Respondents from households experiencing economic difficulties are 5.01 times more likely to feel lonely than those from households with a favourable economic situation.

Table 7. Selected significant factor variables for MHRA and loneliness models by country

	<b>Bulgaria</b>	<b>Romania</b>	<b>Greece</b>
<b>MHRA</b>	Gender	Gender	
	Household economic situation	Household economic situation	
			Age
			Living alone or not
			Contact with relatives
			Contact with neighbours, friends or colleagues
<b>Loneliness</b>			Age
	Living alone or not	Living alone or not	Living alone or not
		Household's economic situation	Contact with children
			Contact with relatives

Source: Based on authors' calculations



## CONCLUSIONS AND DISCUSSION

The comparative analysis of mental health alerts and loneliness in the three Balkan countries supports the conclusions of other research during the Covid-19 pandemic, but reveals interesting country specifics. The largest share of elderly living alone is observed in Bulgaria. In Romania, those without partner or spouse outnumber those living alone, leading to the probable conclusion that they live with another family member. The highest share of elderly living alone in Bulgaria could be explained by the migration flow of their adult children abroad or to bigger cities<sup>52</sup>. The most frequent contact with own children is reported by people living alone in Greece, followed by Bulgaria, and Romania. The status of elderly people living alone could be explored further, because there is lack of reliable statistical information, as well as scientific publications about this phenomenon, especially with respect to long-term care challenges in Bulgaria. Traditionally, long-term care for older people in Bulgaria is provided in the form of informal care by family members<sup>53</sup>. The comparative research on SHARE corona data confirms that death rates and high number of days with restrictive measures affect the elderly (aged 80 and over) by increasing the likelihood of anxiety. The risk of feeling lonelier is affected by combining factors such as living alone with high country mortality rates due to COVID-19<sup>54</sup>. In a country context, the highest level of MHRA and loneliness is observed in Greece, although the results in Bulgaria and Romania are almost similar. The high Stringency index in Greece during the first wave and the country strategy of adopting containment policies before any casualties<sup>55</sup> led to the lowest case fatality rate in EU, but probably negatively affected the personal life and mental status of the elderly. In all countries compared, those with increased MHRA and loneliness are mostly women and the oldest age cohorts. Previous research in European countries indicates that older women are vulnerable to feelings of anxiety, and more concerned by the Covid-19 mortality rate<sup>56</sup>. Those living alone report increasing loneliness in line with conclusions from other research about predictors of anxiety in the Covid-19 pandemic<sup>57</sup>. The difference between living and not living alone is very notable in Greece. In Romania the elderly living with economic difficulties are most vulnerable to mental health risks, reporting a striking share of MHRA and loneliness. Increased MHRA in Bulgaria and Romania is affected significantly only by household economic situation and gender. Economic uncertainty among the elderly seems to be the main trigger for mental health risks during the pandemic. Our results are in line with the conclusions that individual situations, such as no longer living with a partner and a decrease in income, are determined<sup>58</sup> as strong factors for anxiety.

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<sup>52</sup> Krasteva, A., *The Bulgarian migration paradox. Migration and development in Bulgaria* (Sofia: Cáritas Bulgaria, 2019). <https://www.caritas.eu/wordpress/wp-content/uploads/2019/06/CommonHomeBulgariaEN.pdf>

<sup>53</sup> European Commission (DG EMPL) and Social Protection Committee (SPC). *Long-term care report. Trends, challenges and opportunities in an ageing society. Volume II, Country profiles* (Luxembourg: Publications Office of the European Union, 2021). <https://doi.org/10.2767/183997>.

<sup>54</sup> J. Atzendorf and S. Gruber, "The mental well-being of older adults... 1-31.

<sup>55</sup> G.J. Delinasios; P.C. Fragkou; A.M. Gkirmpa AM et al., "The Experience of Greece... 1285-1294.

<sup>56</sup> H. Wang; A. M. Verdery; R. Margolis and E. Smith-Greenaway, "Bereavement from COVID-19, Gender, and Reports of Depression among Older Adults in Europe", *The Journals of Gerontology: Series B*, (2021): 1. <https://doi.org/10.1093/geronb/gbab132>.

<sup>57</sup> V.N. Burkova; M.L. Butovskaya; A.K. Randall; J.N. Fedenok et al., "Predictors of Anxiety in the COVID-19 Pandemic from a Global Perspective: Data from 23 Countries", *Sustainability*: num 13 (2021): 1. <https://doi.org/10.3390/su13074017>.

<sup>58</sup> R. de Graaf; M. ten Have; M. Tuithof and S. van Dorsselaer, "First-incidence of DSM-IV mood... 100-107.

In Greece, frequent contact with children, relatives, neighbours, friends and colleagues are a significant factor in lowering MHRA and loneliness during the pandemic. Our analysis supports the conclusions that high rates of depression, distress and suicidal thoughts in the general population of Greece during the lockdown have been registered<sup>59</sup>, and family responsibility, economic change, and age are risk factors.

Although the pandemic was not acute during the first wave of SHARE Corona (July-August 2020), our results confirm an increase in MHRA and loneliness among the elderly. The subsequent two Covid-19 waves with high mortality and hard stringency measures are likely to exacerbate this phenomena, and further research should be done on the basis of the second wave of the SHARE Corona<sup>60</sup> (July-August 2021).

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