



Perceived deterioration in health status among older adults in Europe and Israel following the first wave of the COVID-19 pandemic

Aviad Tur-Sinai^{1,2} · Netta Bentur³ · Giovanni Lamura⁴

Accepted: 4 April 2022

© The Author(s), under exclusive licence to Springer Nature B.V. 2022

Abstract

The COVID-19 pandemic has created challenges in providing medical care for people with health conditions other than COVID-19. The study aims to assess the prevalence of older adults' reportage of decline in health relative to pre-pandemic and to identify its determinants.

The study is based on the Survey of Health, Ageing and Retirement in Europe (SHARE) data collected during the pandemic. It comprised 51,778 people in twenty-seven European countries and Israel. Participants were asked about changes in their health status relative to pre-pandemic. Bivariate analysis and logistic regression were used to identify factors associated with worsening of health.

Nine percent of people (average age 70 years) reported a worsening of health relative to pre-pandemic. A logistic regression revealed a significant relation of the probability of a downturn in health to forgoing, postponing, or being denied an appointment for medical care. Multiple chronic illnesses, developing COVID-19, having at least one form of psychosocial distress, higher age, and lower economic capacity were also found significantly related to the probability of a decline in health.

Older adults' comprehensive health needs must be addressed even when healthcare services are under strain due to pandemic outbreaks. Policymakers should attend to the healthcare needs of people whose vulnerability to the pandemic is amplified by chronic health conditions and low socioeconomic status. Public healthcare systems may experience a massive rebound of demand for health care, a challenge that should be mitigated by delivery of healthcare services and the provision of the financial resources that they need.

Keywords Decline health status · Forgoing health care · Postponing health care · Being denied medical care · Economic capacity

Responsible Editor: Morten Wahrendorf.

✉ Aviad Tur-Sinai
avts2309@netvision.net.il

Netta Bentur
nettabentur51@gmail.com

Giovanni Lamura
g.lamura@inrca.it

¹ Department of Health Systems Management, The Max Stern Yezreel Valley College, 1930600 Yezreel Valley, Israel

² School of Nursing, University of Rochester Medical Center, Rochester, NY 14642-8404, USA

³ The Stanley Steyer School of Health Professions, Sackler Faculty of Medicine, Tel-Aviv University, Tel-Aviv, Israel

⁴ INRCA IRCCS—National Institute of Health and Science on Ageing, Centre for Socio-Economic Research On Ageing, 60124 Ancona, Italy

Introduction

The COVID-19 pandemic has had an enormous impact on people worldwide, subjecting the global population to illness, death, fear, anxiety, and other dire manifestations (Brooks et al. 2020; Killgore et al. 2020; Losada-Baltar et al. 2021; Whitehead et al. 2021; Richter & Heidinger, 2021). The resulting overload with COVID-19 patients has placed healthcare services under enormous strain, stress, and pressure, challenging their ability to provide medical care for people with health conditions other than COVID-19 and causing these people hardship in seeking medical care (DeJong et al. 2020). Other observed barriers are fears of exposure to the coronavirus in healthcare services, lockdowns, and financial concerns such as unemployment and lack of health insurance (Smolić et al. 2021; Arnault et al. 2021; Gonzalez et al. 2020).

While many studies show a substantial decrease in the number of non-COVID-19 emergency department admissions and hospitalizations due to non-COVID diagnoses during the pandemic, much fewer studies explore the decline in the use of community health services. In a study that investigated several national polls in the USA, it was found in that during the first phase of the pandemic people with chronic diseases and other non-COVID-19 conditions were inclined to obtain less medical care than they needed or compared with the pre-pandemic year (Findling et al. 2020). Another study from the USA showed that 41 percent of respondents forwent medical care and 52 percent of those who reported needing care forwent it (Anderson et al. 2021). In a study from Switzerland, 38.5% reported forgoing health care (Baggio et al. 2021). In another study from Switzerland, it was found that the weekly consultation counts in the first months of the shutdown were 16.5 percent lower among people with hypertension, 17.5 percent for diabetes, and 17.6 percent for cardiovascular disease relative to the pre-pandemic period (Rachamim 2021).

Various studies found several national and individual motives for the decline in healthcare supply and usage. In a European study, it was found that although income-related horizontal inequity in unmet needs of European older people during the first wave of the pandemic was not evident in most countries, income inequality occurred in less affluent countries (González-Touya et al. 2021). Contrarily, Arnault et al. (2021) found significant differences in accessing health care during the pandemic according to economic vulnerability and stated that access was notably worse among those in poor health before the outbreak and among the oldest individuals.

Researchers also searched for individual characteristics associated with involuntarily delayed care or canceled care that was not initiated by the patient. It was found that older age, being in fair or poor health, having greater education, and having health insurance, was associated with a stronger likelihood of experiencing an involuntary delay in accessing medical care (Callison and Ward 2021). However, a study from Switzerland found that forgoing health care was more frequent among younger people, women, people with lower education, and those with a chronic disease (Baggio et al. 2021). In yet another study, this time that among older adult beneficiaries of Medicare in the USA, the likelihood of forgoing medical care was higher among those who reported feeling more stressed or anxious than among those who did not, those who reported feeling more lonely or sad than among those who did not, and higher among those who reported feeling less socially connected (Park and Stimpson 2021).

When older adults and people with chronic conditions forgo routine screening and incur delays in diagnosis and treatments, it may be translated into adverse health

outcomes, reduced quality of life, and harmful health conditions that become harder to treat later (Mehrotra and Prochazka 2015). However, while studies show a decline in the use of healthcare services as a result of the pandemic, there is scant information about the relation of such a decline to change in health status. A study in Sweden found that older adults at large rated their well-being as high as before but that those who worried more reported a decline in well-being (Brogårdh et al. 2021) while a study in Belgium reported a significant decrease in sleep quality and well-being during the pandemic (De Pue et al. 2021). Another study in Europe detected gender differences in changes in self-reported health and social activities following the onset of the pandemic, such that women experienced larger negative changes across all health measures than did men (Scheel-Hincke et al. 2021). These studies, however, while exploring the well-being of older adults during the pandemic, drew no connection between this parameter and to health decline or abstaining from use of healthcare services. Therefore, the current study aims to assess the prevalence of older adults' reportage of forgoing, postponing, or being denied health care relative to the pre-pandemic period and to identify the individual characteristics of the problem. It is assumed as a hypothesis that older adults did abstain from using healthcare services and that this was bad for their health.

Measures and methods

The study is based on data from the Survey of Health, Aging and Retirement in Europe (SHARE), collected by telephone in June–August 2020 from people aged 50+ in twenty-six European countries and Israel (Tur-Sinai et al. 2021).

During the acute COVID-19 period, it became necessary to revise the way the SHARE data were collected. Data gathering via interviews in respondents' homes was halted and replaced by telephone questionnaires. During that time, the regular SHARE questionnaire was replaced with a special SHARE-COVID-19 questionnaire. This special-purpose survey centered on a series of topics related to respondents' general health, mental health, ways of coping with the virus in the medical sense, coping in the labor market, and social network characteristics (Tur-Sinai et al. 2021). The sample for the SHARE-COVID-19 questionnaire included (1) panel members who had not been interviewed in the regular SHARE questionnaire before the suspension of the fieldwork and (2) panel members who had already been interviewed in the regular SHARE questionnaire immediately before the suspension of the fieldwork. Both respondent groups received the same questionnaire; the only difference is that the panel members who had not been interviewed in the regular SHARE questionnaire before the suspension of the

fieldwork were asked about changes in their household composition since their last interview (Stuck et al. 2021). The individual response rates in all participating countries were slightly lower than the household response rates because of non-cooperation among some household members. With the exception of Israel, which had household and individual response rates of 58 percent and 47 percent, respectively, all countries were below the 30 percent mark. By implication, interviewers in these countries found it increasingly difficult to recruit household and individuals due to the uncertainty surrounding regarding COVID-19 (Bergmann and Börsch-Supan 2021). Missing data due to item non-response were imputed; since the fraction of missing values was generally far below 3 percent, the imputation procedure for this dataset drew mainly of the hot-desk method (Bergmann and Börsch-Supan 2021).

The participants were asked: “If you compare your health with that before the outbreak of the coronavirus, would you say your health has improved, worsened, or stayed about the same?” On the basis of the answers, a dichotomous variable was specified: 1 = health status worsened; 0 = health status

did not worsen (i.e., either did not change or improved). This screening yielded a study sample of 51,778 respondents in twenty-seven European countries (including Israel). Their average age was 70.56 (S.D. 9.25), 57.75 percent were women, and 28.38 percent had higher education (Table 1). The explanatory variables fall into five groups:

- A. Abstaining from the use of healthcare services since the outbreak of the pandemic, due to: (a) forgoing medical care (“Did you forgo medical treatment because you were afraid to become infected by the coronavirus?”); (b) postponing medical care (“Did you have a scheduled medical appointment that the doctor or the medical facility decided to postpone due to the pandemic?”); or (c) denial of care (“Did you ask for an appointment for a medical treatment since the outbreak and did not get one?”). The answers to these questions were dichotomous: 1 = yes; 0 = no;
- B. Respondents’ health status, including number of chronic illnesses and experiencing of symptoms that might be attributed to COVID-19;

Table 1 Characteristics of the study population by worsening of health (percent)

		Total (N=51,778)	Worsening of health	
			Not worsened (N=47,142)	Worsened (N=4636)
Forwent medical treatment*	No	87.87	91.79	8.21
	Yes	12.13	85.71	14.29
Postponed medical appointment*	No	73.67	92.16	7.84
	Yes	26.33	87.95	12.05
Denied appointment*	No	94.91	91.63	8.37
	Yes	5.09	80.40	19.60
No. of chronic diseases * (mean, S.D.)	1.84 (1.62)	1.77 (1.58)	2.54 (1.83)	
Experienced COVID-19*	No	98.11	91.34	8.66
	Yes	1.89	75.91	24.09
Psych-mental (at least one) *	No	42.69	96.77	3.23
	Yes	57.31	86.80	13.20
Felt nervous	No	69.76	94.97	5.03
	Yes	30.24	82.10	17.90
Felt sad or depressed*	No	73.95	94.96	5.04
	Yes	26.05	80.08	19.92
Had sleeping problems	No	72.06	93.96	6.04
	Yes	27.94	83.58	16.42
Felt lonely*	No	71.19	93.65	6.35
	Yes	28.81	84.94	15.06
Male*	Female	57.75	90.33	9.67
	Male	42.25	92.02	7.98
Age (mean, S.D.) *	70.56 (9.25)	70.25 (9.13)	73.54 (9.84)	
Education*	Basic	71.62	90.63	9.37
	Higher	28.38	92.03	7.97
Economic capacity (mean, S.D.) *	2.18 (0.96)	2.16 (0.95)	2.42 (1.02)	

*P < 0.001

- C. Respondents' psychosocial characteristics in the course of the pandemic, based on information elicited by means of four questions: "Did the respondent feel in the past month (a) irritable, anxious, or stressed? (b) sad or depressed? (c) difficulty in sleeping? (d) lonely during the day?" On the basis of these four questions, a dichotomous variable was specified: 1 = if the person answered in the affirmative to at least one question; 0 = otherwise. This was done in order to take into account the impact of any of the four different forms of psychosocial symptoms;
- D. Sociodemographic and economic characteristics: gender, age, education, and economic capacity (household's ability to make ends meet): 1=with great difficulty, 2=with some difficulty, 3=fairly easily, 4=easily;
- E. The twenty-seven countries that were included in the study. They were aggregated in the investigation by means of a dummy variable for each country (with Slovakia as the baseline country).

Data analysis

The data were analyzed using STATA version 15.1. Differences between respondents who reported a decline in health status and those reporting no worsening were assessed using a Chi-square test for categorical variables and a t-test for

continuous variables. A logistic regression identified the factors that were associated with worsening health. All variables with $p < 0.01$ in bivariate comparisons were entered into the model. Observations in which data were missing for one or more variables of each model were not included in the estimations. The accepted level of significance was $\alpha = 0.05$.

Results

Nine percent of the respondents said that their health had worsened relative to that preceding the outbreak of COVID-19. A significant relation was found between each of the three measures of abstaining from the use of healthcare services (forgoing, postponing, and denial of appointment) and decline in health. Being infected with the coronavirus, having more chronic illnesses, reporting at least one psychosocial effect of the pandemic, and sociodemographic and economic characteristics were all found significantly associated with degradation of health.

In a comparison of the participating countries in regard to the percent of participants who reported a decline in health status relative to the pre-COVID-19 period, it was found that, on average, 8.9 percent of persons aged 50+ reported a decline. The rate varied among the countries, from slightly fewer than 6 percent in Denmark and Hungary as against 14 percent or more in Israel and Lithuania (Fig. 1).

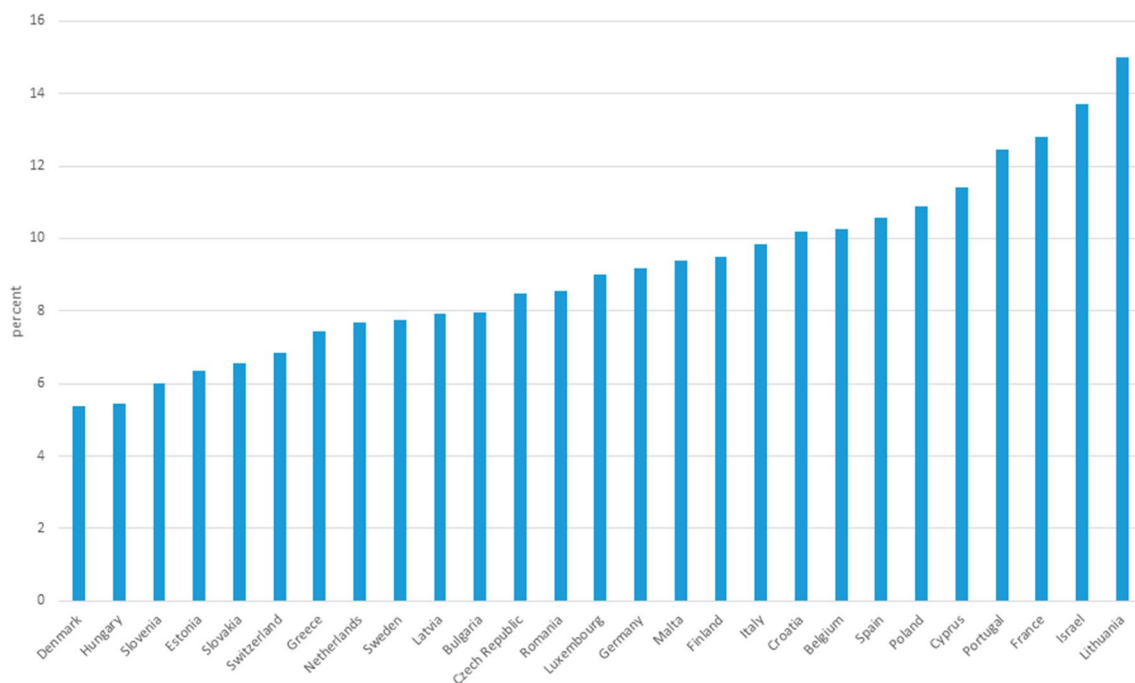


Fig. 1 Share of participants aged 50+ reporting a deterioration in health status following the first wave of the COVID-19 pandemic, European countries and Israel

In a logistic regression analysis, it was found that the probability of a decline in health as opposed to no change or improvement is independently and significantly related to forgoing medical care, postponing medical care, and denial of an appointment for medical care. Denial of an appointment had the largest upward effect on the likelihood of a decline in health; postponement of medical care had the smallest effect (Table 2, Model 1). A higher number of chronic illnesses also had an independent significant effect on the worsening of an individual's health, as did being infected with the coronavirus (Model 2). Experiencing at least one form of psychosocial distress (irritability, anxiety, or stress; sadness or depression; trouble sleeping; loneliness) had the largest upward effect on the likelihood of a downturn in health, even surpassing infection with the virus (Model 3). No significant differences were found regarding gender and education, but higher age (Model 4) and lower economic capacity (Model 5) significantly raised the probability of a decline in health. France, Italy, Israel, Lithuania, and Malta were characterized by a significant probability of worsening of health, whereas all the other countries were indifferent in this respect (data not presented in the table).

A logistic regression analysis by gender revealed no differences between men and women (data not presented). A logistic regression analysis by age bracket (50–64; 65–79; 80+) showed that while the probability of a downturn in health among those aged 50–64 and 65–74 was significantly related to the three measures of abstaining from use

of healthcare services, among those aged 80+ only forgoing and denial had this effect. Being infected with the coronavirus was related to the probability of a decline in health to a smaller extent among those aged 65–79 than among those aged 50–64 and 80+; and men aged 50–65 were less likely than women of the same age to experience a worsening of health on that account. Infection with the coronavirus and psychosocial distress had the largest upward effect on the likelihood of worsening health in all three age groups. No significant difference by age groups was found regarding the number of chronic illnesses, psychosocial distress, and economic capacity (Table 3).

Discussion

This study shows that the perceived health of almost one-tenth of European older adults deteriorated during the first wave of the pandemic. Many factors abetted the decline; forgoing, postponing, or denial of medical treatment during the pandemic outbreak was one of them. This is in line with other studies that found an upturn in forgoing healthcare services, although the other studies found higher percentages of forgoing in the USA and Europe than those found in this study—52 percent in the USA. (Anderson et al. 2021) and 38.5 percent in Switzerland. These results support the hypotheses of the current study.

Table 2 Probability of worsening of health, all (odds ratios) (95% CI)

	Model 1	Model 2	Model 3	Model 4	Model 5
Forwent medical treatment	1.639*** (1.491–1.801)	1.540*** (1.399–1.695)	1.380*** (1.252–1.520)	1.396*** (1.266–1.540)	1.371*** (1.243–1.513)
Postponed medical appointment	1.361*** (1.257–1.474)	1.254*** (1.157–1.359)	1.206*** (1.112–1.309)	1.238*** (1.140–1.345)	1.273*** (1.171–1.383)
Denied appointment	2.102*** (1.852–2.385)	1.906*** (1.675–2.170)	1.744*** (1.530–1.988)	1.818*** (1.594–2.074)	1.780*** (1.559–2.031)
Chronic diseases		1.257*** (1.232–1.282)	1.201*** (1.176–1.225)	1.166*** (1.142–1.192)	1.153*** (1.129–1.178)
Experienced COVID-19		3.051*** (2.534–3.673)	2.858*** (2.367–3.450)	3.054*** (2.525–3.695)	3.192*** (2.637–3.864)
Psych-mental			3.772*** (3.396–4.189)	3.647*** (3.277–4.057)	3.463*** (3.111–3.856)
Male				0.965 (0.888–1.048)	0.980 (0.902–1.065)
Age				1.021*** (1.017–1.025)	1.023*** (1.019–1.027)
Education				0.972 (0.891–1.061)	1.058 (0.967–1.157)
Economic capacity					1.204*** (1.156–1.253)
Constant	0.079*** (0.076–0.083)	0.049*** (0.046–0.052)	0.021*** (0.019–0.023)	0.005*** (0.004–0.007)	0.003*** (0.002–0.004)
Log likelihood	-10,511.263	-10,141.030	-9745.923	-9563.287	-9522.972

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

Table 3 Probability of worsening of health, by age group (odds ratios) (95% CI)

	Age 50–64	Age 65–79	Age 80+
Forwent medical treatment	1.710*** (1.396–2.093)	1.261** (1.096–1.450)	1.324** (1.096–1.600)
Postponed medical appointment	1.360*** (1.139–1.625)	1.314*** (1.170–1.476)	1.100 (0.935–1.295)
Denied appointment	2.008*** (1.551–2.600)	1.768*** (1.472–2.124)	1.455*** (1.094–1.934)
Experienced COVID-19	3.926*** (2.826–5.453)	2.650*** (2.011–3.494)	3.362*** (2.111–5.355)
Psych-mental	3.922*** (3.116–4.937)	3.328*** (2.873–3.855)	3.292*** (2.652–4.086)
Chronic diseases	1.197*** (1.138–1.259)	1.181*** (1.145–1.218)	1.115*** (1.074–1.158)
Male	0.792* (0.658–0.954)	1.044 (0.929–1.174)	1.035 (0.886–1.208)
Education	1.096 (0.913–1.315)	0.998 (0.879–1.133)	1.118 (0.937–1.334)
Economic capacity	1.193*** (1.093–1.301)	1.212*** (1.143–1.284)	1.176*** (1.091–1.266)
Constant	0.011*** (0.008–0.014)	0.014*** (0.011–0.017)	0.027*** (0.020–0.036)
Log likelihood	-2099.2309	-4789.2479	-2623.4003

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

Additional factors were found to have a sizable upward effect on the likelihood of a downturn in health. Unsurprisingly, and much as has been detected in other studies (Groff et al. 2021; Weerahandi et al. 2021), those who developed COVID-19 (some of whom, during the first wave, without being officially diagnosed) reported a large upturn in the odds of a decline in health. The presence of multiple chronic illnesses among older adults was also related to the probability of a decline in health, as in other studies (Baggio et al. 2021), and the same was found among people with lower economic capacity (Arnault et al. 2021).

The most striking finding, however, is that, with many measures controlled for, the odds ratio of reporting a decline in health status was even higher among those who experienced emotional distress during the month before being interviewed (i.e., who felt nervous, anxious, sad, or depressed) than among those experiencing COVID symptoms (albeit only slightly: 3.46 vs. 3.19). Other studies also found a dramatic effect of emotional distress at the end of the first wave (Richter and Heidinger 2021), decrease in sleep quality and well-being (De Pue et al. 2021; McKinlay et al. 2021). It is important to bear in mind that even if on the whole only 13 percent of those reporting emotional distress reported a decline in health as against 24 percent of those who experienced COVID-19 symptoms, the former group poses a quantitatively much larger and probably more complex challenge from the public-health perspective because it constitutes 7.6 percent of the population as against only 0.4 percent of the population who experienced COVID-19 symptoms (almost twenty times larger). Gender was not found in this study to be related to a decline in self-reported worsening of health; other studies did find that women experienced larger negative changes across all health measures than did men (Scheel-Hincke et al. 2021).

The strengths of the current study are its sizable sample of older adults and the large number of measures explored

that may have a deleterious effect on health. However, this study has several limitations. The first concerns the question on forgoing medical care: It is unknown whether the question was presented only to those who had a scheduled medical appointment that had been forgone, while the questions about postponement and denial of medical care were given only to those who had a scheduled medical appointment or had asked for an appointment and had been turned away. A second limitation is that the data were based on interviews and not on medical records, were obtained by telephone—raising the possibility of recall bias—and may have been affected by emotional status and, therefore, prone to validity problems.

The lack of administrative data about possible deterioration in individuals' health forced us to use self-assessment in this respect. Notably, administrative data are likely to yield more reliable information than self-assessment; the absence of relevant information in this context, however, necessitated an estimate based on subjective assessment.

A fourth limitation is that the survey was conducted during the first wave of the pandemic, making it impossible to detect the long-term effects of the pandemic on health. In addition, we could not compare abstinence from the use of healthcare services among younger people and, therefore, cannot state whether these results are unique to older adults or not.

The last limitation relates with the response rate. As explained above, the response rates in all participating countries during the COVID-19 period were slightly lower (Bergmann and Börsch-Supan 2021) than the response rates before that (Bergmann et al. 2017). The main reason is that interviewers in surveyed countries found it increasingly difficult to recruit household and individuals due to the uncertainty caused by the COVID-19 pandemic. Despite this limitation, it can be assumed that its effect is only minor, since the overarching goal of the SHARE survey is

to ensure accurate representation of population in the age groups examined. Therefore, as compensation for the lower response rate, the SHARE editors made a successful effort to recruit respondents from the entire relevant population, in order to ensure their accurate representation in the survey.

In conclusion, this study contributes to the literature on the decline in use of healthcare services and in health among the older adult population of Europe and Israel during the first wave of the pandemic. The deterioration in health status of one-tenth of older adults several months after the outbreak of the pandemic may be interpreted as reflecting a much smaller impact than one might have predicted. However, since the pandemic persists two years after its onset, these results are doubly important if not more.

The results of this study, indicative of the compound effect of healthcare measures and personal characteristics on the degradation of older adults' health, should sound an alarm and have an impact on healthcare policymakers and providers in managing the pandemic. Many people of all ages have been exposing their health to degradation by delaying or forgoing other kinds of medical care, including screening and diagnostic tests routine immunizations, and follow-up for chronic conditions. Therefore, policymakers should address the healthcare needs of people whose vulnerability to the pandemic is amplified by a larger number of chronic health conditions and poor socioeconomic status.

Long-term effects of the pandemic on mental health were observed during the pandemic; policymakers need to give serious thought to this, with maximum celerity.

Even as the pandemic places healthcare services under an enormous strain that challenges them to provide medical care for people with health conditions other than COVID-19, a more balanced attitude should be adopted. A comprehensive approach to the population's health- and social care needs should be taken, with consideration given not only to the direct, more immediate, and visible effects of the pandemic but also to indirect, less immediate, and less visible consequences that are no less pernicious on that account and include contagion containment measures. In addition, there is a need to continue to track and address the forgoing, postponement, and denial of medical care among older adults in order to identify its determinants and meet this population's special needs.

Acknowledgements This article does not contain any studies with human participant performed by any of the authors. This paper uses data from SHARE Wave 8 (<https://doi.org/10.6103/SHARE.w8ca.100>), see Börsch-Supan et al. (2013) for methodological details. The SHARE data collection has been funded by the European Commission, DG RTD through FP5 (QLK6-CT-2001-00360), FP6 (SHARE-I3: RII-CT-2006-062193, COMPARE: CIT5-CT-2005-028857, SHARE-LIFE: CIT4-CT-2006-028812), FP7 (SHARE-PREP: GA N°211909, SHARE-LEAP: GA N°227822, SHARE M4: GA N°261982, DASISH: GA N°283646) and Horizon 2020 (SHARE-DEV3: GA N°676536, SHARE-COHESION: GA N°870628, SERISS: GA N°654221,

SSHOC: GA N°823782) and by DG Employment, Social Affairs & Inclusion through VS 2015/0195, VS 2016/0135, VS 2018/0285, VS 2019/0332, and VS 2020/0313. Additional funding from the German Ministry of Education and Research, the Max Planck Society for the Advancement of Science, the U.S. National Institute on Aging (U01_AG09740-13S2, P01_AG005842, P01_AG08291, P30_AG12815, R21_AG025169, Y1-AG-4553-01, IAG_BSR06-11, OGHA_04-064, HHSN271201300071C, RAG052527A) and from various national funding sources is gratefully acknowledged (see www.share-project.org).

Funding This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

References

- Anderson KE, McGinty EE, Presskreischer R, Barry CL (2021) Reports of forgone medical care among US adults during the initial phase of the COVID-19 pandemic. *JAMA Netw Open* 4(1):e2034882–e2034882
- Arnault L, Jusot F, Renaud T (2021) Economic vulnerability and unmet healthcare needs among the population aged 50+ years during the COVID-19 pandemic in Europe. *Eur J Age* 2:1–15
- Baggio S, Vernaz N, Spechbach H, Salamun J, Jacquerioz F, Stringhini S, Gétaz L (2021) Vulnerable patients forgo health care during the first wave of the Covid-19 pandemic. *Prev Med* 150:106696
- Bergmann M, Börsch-Supan A (2021) SHARE Wave 8 methodology: collecting cross-national survey data in times of COVID-19. Munich: MEA, Max Planck Institute for Social Law and Social Policy
- Bergmann M, Kneip T, De Luca G, Scherpenzeel A (2017) Survey participation in the survey of health, ageing and retirement in Europe (SHARE), Wave. Munich: Munich Center for the Economics of Aging, pp 1–6
- Brogårdh C, Hammarlund CS, Eek F, Stigmar K, Lindgren I, Schouenborg AT, Hansson EE (2021) Self-perceived life satisfaction during the first wave of the COVID-19 pandemic in Sweden: a cross-sectional study. *Int J Environ Res Public Health* 18(12):6234
- Brooks SK, Webster RK, Smith LE, Woodland L, Wessely S, Greenberg N, Rubin GJ (2020) The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *The Lancet* 395(10227):912–920
- Callison K, Ward J (2021) Associations between individual demographic characteristics and involuntary health care delays as a result of COVID-19. *Health Aff* 40(5):837–843
- De Pue S, Gillebert C, Dierckx E, Vanderhasselt MA, De Raedt R, Van den Bussche E (2021) The impact of the COVID-19 pandemic on wellbeing and cognitive functioning of older adults. *Sci Rep* 11(1):1–11
- DeJong C, Katz MH, Covinsky K (2021) Deferral of care for serious non-COVID-19 conditions: a hidden harm of COVID-19. *JAMA Intern Med* 181(2):274
- Findling MG, Blendon RJ, Benson JM (2020) Delayed care with harmful health consequences—reported experiences from national surveys during coronavirus disease 2019. *JAMA Health Forum*. 1(12):e201463–e201463
- Gonzalez D, Zuckerman S, Kenney GM, Karpman M (2020) Almost half of adults in families losing work during the pandemic avoided health care because of costs or COVID-19 concerns. Urban Institute, Washington, DC
- González-Touya M, Stoyanova A, Urbanos-Garrido RM (2021) COVID-19 and unmet healthcare needs of older people: did inequity arise in Europe? *Int J Environ Res Public Health* 18(17):9177

- Groff D, Sun A, Sentongo AE, Ba DM, Parsons N, Poudel GR, Chinchilli VM (2021) Short-term and long-term rates of Postacute Sequelae of SARS-CoV-2 infection: a systematic review. *JAMA Netw Open* 4(10):e2128568–e2128568
- Killgore WD, Cloonan SA, Taylor EC, Dailey NS (2020) Loneliness: a signature mental health concern in the era of COVID-19. *Psychiatry Res* 290:113117
- Losada-Baltar A, Jiménez-Gonzalo L, Gallego-Alberto L, Pedrosa-Chaparro MDS, Fernandes-Pires J, Márquez-González M (2021) “We are staying at home”: Association of self-perceptions of aging, personal and family resources, and loneliness with psychological distress during the lock-down period of COVID-19. *J Gerontol Ser B* 76(2):e10–e16
- McKinlay AR, Fancourt D, Burton A (2021) A qualitative study about the mental health and wellbeing of older adults in the UK during the COVID-19 pandemic. *BMC Geriatr* 21(1):1–10
- Mehrotra A, Prochazka A (2015) Improving value in health care—against the annual physical. *N Engl J Med* 373(16):1485–1487
- Park S, Stimpson JP (2021) Trends in self-reported forgone medical care among medicare beneficiaries during the COVID-19 pandemic. *JAMA Health Forum* 2(12):e214299–e214299
- Rachamin Y, Senn O, Streit S, Dubois J, Deml MJ, Jungo KT (2021) Impact of the COVID-19 pandemic on the intensity of health services use in general practice. *Eur J Public Health* 31:164–136
- Richter L, Heidinger T (2021) Hitting close to home: the effect of COVID-19 illness in the social environment on psychological burden in older adults. *Front Psychol* 4160:1589–1593
- Scheel-Hincke LL, Ahrenfeldt LJ, Andersen-Ranberg K (2021) Sex differences in activity and health changes following COVID-19 in Europe—results from the SHARE COVID-19 survey. *Eur J Pub Health* 31(6):1281–1284
- Smolić Š, Čipin I, Međimurec P (2021) Access to healthcare for people aged 50+ in Europe during the COVID-19 outbreak. *Eur J Age* 3:1–17
- Stuck S, Zuber S, Franzese F, Gruber S (2021) SHARE Corona Survey—Release 1.0.0—Release Guide. Munich: MEA, Max Planck Institute for Social Law and Social Policy
- Tur-Sinai A, Bentur N, Fabbietti P, Lamura G (2021) Impact of the outbreak of the COVID-19 pandemic on formal and informal care of community-dwelling older adults: cross-national clustering of empirical evidence from 23 countries. *Sustainability* 13(13):1–13
- Weerahandi H, Hochman KA, Simon E, Blaum C, Chodosh J, Duan E, Horwitz LI (2021) Post-discharge health status and symptoms in patients with severe COVID-19. *J Gen Intern Med* 36(3):738–745
- Whitehead BR (2021) COVID-19 as a stressor: pandemic expectations, perceived stress, and negative affect in older adults. *The Journals of Gerontology: Series B* 76(2):e59–e64

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.