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Marta Styrc

Institute of Statistics and Demography
SGH Warsaw School of Economics
mstyrc@sgh.waw.pl
ORCID: 0000-0002-4257-7911

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COVID-19 preventive behaviours among population 50+ in Poland

Abstract

During the COVID-19 pandemic several preventive behaviours were recommended to reduce the spread of the disease and protect individual health. In this article I analyse factors associated with utilisation of the following preventive measures: (1) washing hands, (2) using hand sanitisers and disinfection fluids and (3) covering cough and sneeze among men and women aged 50+ in Poland. Using the Survey of Health, Ageing, and Retirement data I estimate logistic regression models for the utilisation of the preventive behaviours on the set of demographic, health, socio-economic, and psychological characteristics. The results indicate that individuals of more advanced age and single men are of a special concern with respect to practising hygiene measures. Health-related variables, although expected to correlate with the perceived threat of COVID-19, had little effect on the behavioural response.

Keywords: COVID-19, preventive behaviours, Health Belief Model, SHARE, population 50+, logistic regression, Poland

Introduction

Following the outbreak of the COVID-19 pandemic health organisations and governments have formulated guidelines and regulations aimed at reducing the virus transmission. The individual measures of infection prevention involved reducing spatial mobility and staying at home, wearing face masks when in public, keeping social distance in public, often and careful washing hands with soap, using disinfectants, covering one's mouth and nose when coughing or sneezing. The strategies are essential for reducing the speed of transmission on the societal level but also an effective way individuals can protect themselves from contracting COVID-19 (Anderson, Heesterbeek, Klinkenberg, & Hollingsworth, 2020). Despite strong arguments in favour of safety measures, some people do not adhere to the guidelines beneficial for themselves and their community. Thus, understanding the disposition of individuals towards compliance with the rules is important for more successful protection of public health (West, Michie, Rubin, & Amlôt, 2020).

This study contributes to the research on health behaviours by investigating factors associated with employment of three personal strategies of infection prevention: washing hands, using hand sanitisers and disinfection fluids, covering cough and sneeze. Those simple hygiene measures are effective and undisputed means of infection prevention, and they are easy to implement with no major costs incurred in terms of money, time or emotional well-being. I focus on the population aged over 50 years in Poland because older adults are at a higher risk of falling down with a severe illness, hospitalisation, or even death of COVID-19. Their vulnerability in the current pandemic was stressed from the very beginning and several measures were implemented to protect the older population. Therefore, investigating the hygiene practices of older adults has the advantage of analysing the behavioural response of individuals whose risk perceptions are high and who decide about engaging in simple, effective, and low cost safety measures. In this way I attempt to reduce the interfering incentives and conditions that could blur the finding about the factors differentiating preventive behaviours.

The analysis is based on multivariable logistic regressions estimated separately by sex for each of the three behaviours. The regressors include demographic, health, socio-economic, and psychological characteristics. The data come from the 8th wave of the Survey of Health, Ageing, and Retirement (SHARE) conducted in 2020.

Theoretical background and a literature review

In my considerations I refer to the Health Belief Model (HBM), which has been widely used to describe and analyse individual health decisions including preventive behaviours (Rosenstock, 1974). Even if not all studies of preventive behaviours refer to the HBM directly, some of its elements are usually present and thus this model offers a systematic and complex framework for an overview of the available literature and my own analysis. The revised version of the HBM specifies six factors that drive health promoting behaviours (Champion & Skinner, 2008):

(1) Perceived severity: belief about the seriousness of the adverse health condition;
(2) Perceived susceptibility: belief about getting the adverse health condition;
(3) Perceived benefits: belief about the potential positive aspects of a health action;
(4) Perceived barriers: belief about the potential negative aspects of adopting the protective behaviour;
(5) Self-efficacy: belief that one can achieve the required behaviour and an individual's confidence in his or her ability to take action;
(6) Cues to action: external factors that trigger action.

Factors (1)–(5) are individual perceptions that can be also shaped by the external cues to action, for example through promoting individual awareness of susceptibility, severity, or benefits. The perceptions are differentiated by personal characteristics, for example by age, gender, education, or personality traits. To apply the HBM one should measure the perceptions or cues to action with multiple items, which is seldomly possible with the data from general social surveys without a psychological focus. Thus, social studies refer most often to the HBM model by arguing how some observed characteristics are linked to perceptions and hypothesising about the potential pathways of influence on health behaviour.

Most of the empirical studies acknowledge perceived susceptibility and severity as the important constructs linked to decisions on health behaviours. Susceptibility and severity may be labelled together as perceived threat. Feeling at a higher risk of contracting a disease and seeing its consequences as severe induces a stronger behavioural response (Bordalo, Coffman, Gennaioli, & Shleifer, 2020; Bruine de Bruin & Bennett, 2020; Jaspal, Fino, & Breakwell, 2020) as did fear of COVID-19 (Breakwell, Fino, & Jaspal, 2021; Harper, Satchell, Fido, & Latzman, 2021). The correlation between engagement in preventive measures and the perceived susceptibility and severity is well established and it was even used to confirm the validity of the index of COVID-19 preventive behaviours (Breakwell et al., 2021). It was also often used as an underlying assumption for hypothesising about the potential effect of observed individual characteristics.

For example, having health risk conditions was known to increase the severity of COVID-19 and thus may be expected to stimulate the adherence to preventive behaviours. The expected direction of dependency was found in many studies (Bordalo et al., 2020; Sand & Bristle, 2021) but there are also less consistent results for selected precautionary measures (Bíró, Branyiczki, & Elek, 2021). The analogous argumentation through increased expected severity may be applied to behavioural risk factors, such as smoking, excessive alcohol consumption, physical inactivity and unhealthy food intake but the empirical results showed either no association with the behavioural change or a negative effect depending on the preventive measures taken into consideration (Mendoza-Jiménez, Hannemann, & Atzendorf, 2021). Exposure to COVID-19 among the members of the social network was also argued to work through the pathway of perceived severity (Litwin & Levinsky, 2021).

The demographic and socio-economic variables mostly do not show any consistent pattern except for the finding that men are less likely to follow protective measures than women (Kim & Kim, 2020; Moussaoui, Ofosu, & Desrichard, 2020). Low education was found to be associated negatively with taking the preventive measures (Lüdecke & von dem Knesebeck, 2020). Presence of older household members (Kim & Kim, 2020) as well as of children (Uddin et al., 2021) was shown to stimulate compliance with behavioural practices. Many studies found no effect of age (Breakwell et al., 2021; Clark, Davila, Regis, & Kraus, 2020) or inconsistent or nonlinear pattern of age dependency (Lüdecke & von dem Knesebeck, 2020; Raude et al., 2020). It was also shown to be positively correlated with preventive actions (Faasse & Newby, 2020; Kim & Kim, 2020) and other studies have found a declining engagement in protective behaviours with advancing age (Pasion, Paiva, Fernandes, & Barbosa, 2020). The effect of age may be different depending on the behaviour analysed. For example, among older Europeans age was positively correlated with the social distancing behaviours (no walks, no shopping, no meeting with family and with others), uncorrelated with physical distancing and masks wearing, and negatively correlated with hand washing and using sanitisers (Bíró et al., 2021). Although there is no clear picture of age-related pattern of preventive behaviours, it seems that among the very young and older adults the engagement in health practices recommended to prevent infections was more dubious. The non-adherence of the older population is of particular concern given that they are at a higher risk for COVID-related medical complications and mortality.

Psychological characteristics are the second set of individual differences in the patterns of behaviours and they are often operationalised as personality traits. The model of personality dominant in the recent research refers to five factors (Big Five): extraversion, neuroticism, agreeableness, conscientiousness, openness (Bermúdez,

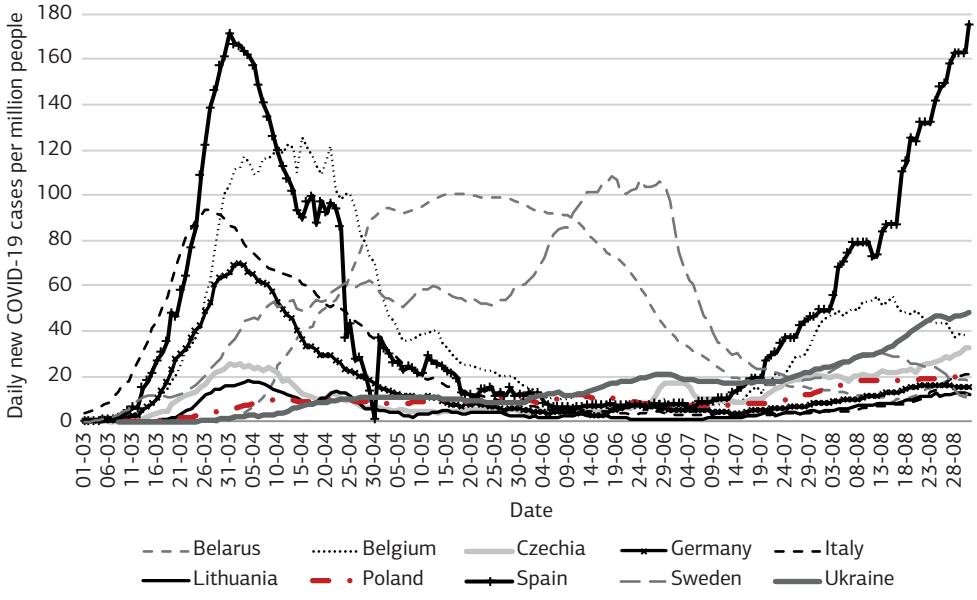
1999). Theoretically, some traits, like conscientiousness or openness, are linked to problem-focused, active coping strategies aimed at reducing or solving the problems, whereas other, like neuroticism, are positively related to maladaptive and passive coping strategies of denial, wishful thinking, or self-blame (Agbaria & Mokh, 2021; Watson & Hubbard, 1996). Behavioural strategies for reducing COVID-19 transmission are constructive actions and thus they are expected to be positively correlated with conscientiousness and negatively with neuroticism. In the context of the COVID-19 pandemic, the studies on behaviour of older Europeans found that the conscientiousness and neuroticism were positively correlated with preventive measures (Litwin & Levinsky, 2021; Mendoza-Jiménez et al., 2021; Sand & Bristle, 2021). The results for extraversion, agreeableness, and openness were mixed and depended, among other, on the type of behaviour that was under consideration.

The overview of the available studies suggests that different factors may work differently for different types of behaviours, for example, the behavioural risk factors were associated with hygiene practices but not with the isolation and regulated measures (Mendoza-Jiménez et al., 2021), age was unrelated to wearing face masks but linked negatively to hand hygiene (Lee & You, 2020). Despite such puzzling differences, they are seldomly discussed and explained even if only in a speculative way. This may be an important question for future research and the HBM may offer a helpful framework for such considerations. Obviously, the variety of behaviours included in the studies contributes to the heterogeneity of results regarding their correlates. And not only do the behaviours vary but so does the way they are asked about and measured. Breakwell, Fino, and Jaspal (2021) expose this plurality by noting that the selection of behaviours is arbitrary, the questions may refer to the behaviour in the past or in the presence, to the actual behaviour, or intention, or likelihood of it, and there is a variety of response categories. Altogether, the literature review leads me to the following conclusions: Firstly, I find little encouragement to combine the preventive behaviours into an index or a score since the behaviours differ so much by the perceptions and external incentives that drive them. Secondly, the selection of the preventive behaviour to be analysed is of relevance for the results and, while selecting the behaviours for this investigation, I look at them within the HBM framework. Thirdly, despite the abundant number of studies, the findings about the factors influencing the precautionary behaviour are inconclusive and more scientific inquiries are needed to understand what drives the human behaviour in face of the pandemic threat.

Country background

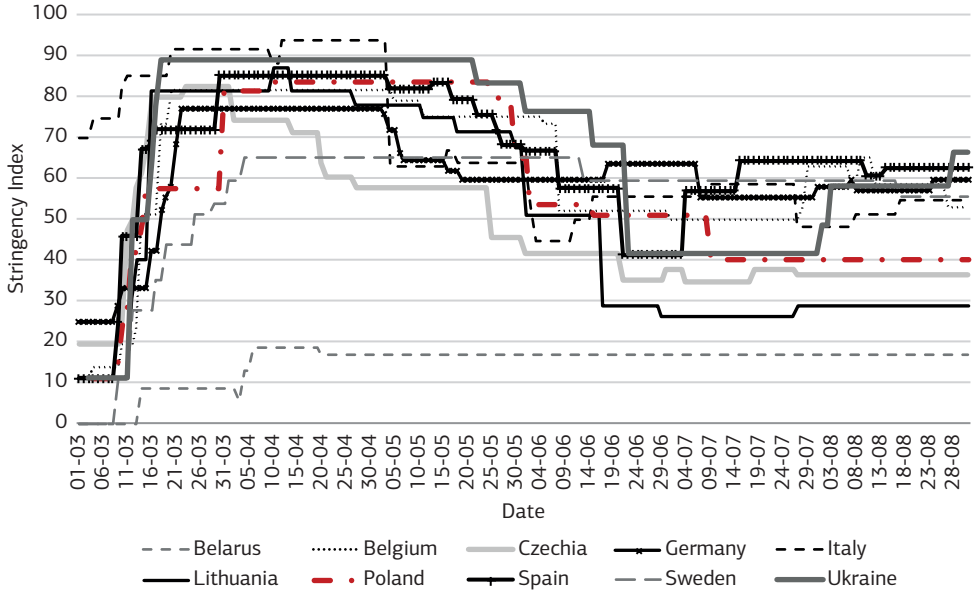
This section describes the situation in Poland during the first stage of the pandemic, i.e., from March till August 2020, which is the period relevant from the point of view of this study. The first wave of the COVID-19 pandemic did not affect Poland as hard as some other European countries. The numbers of infections and related deaths were among the lowest in Europe, although the comparability of the data was clearly affected by the low intensity of testing in Poland. Figures 1 and 2 present the daily new confirmed COVID-19 cases per million people and the Government Stringency Index for the period from March till August 2020 in selected European countries. The Stringency Index is the composite indicator measuring how strict the national policies were aimed at the containment of COVID-19. Comparing Poland to its neighbouring countries and to Spain, Belgium, Italy, and Sweden, representing countries with the dramatic course of the first wave, it is revealed that Poland had a low number of cases combined with strict regulations aimed at reducing the virus transmission.

Figure 1. Daily new confirmed COVID-19 cases (7 days smoothed) per million people in selected European countries, March 2020–August 2020



Source: own elaboration on the basis of Our World in Data COVID-19 dataset (retrieved from https://covid.ourworldindata.org/, accessed: 06.02.2021).

Figure 2. Government Stringency Index in selected European countries, March 2020–August 2020



Source: own elaboration on the basis of Our World in Data COVID-19 dataset (retrieved from https://covid.ourworldindata.org/, accessed: 06.02.2021).

In Poland the first case of SARS-CoV-2 infection was confirmed at the beginning of March 2020 and the first restrictions on gatherings of more than 1,000 people in open spaces and more than 500 people in confined spaces were implemented starting from March 10th. Two days later, schools, preschools, nurseries, universities, and cultural institutions closed and converted to remote teaching. Five days later also restaurants, bars, and clubs were banned from accepting incoming guests, with only home deliveries allowed. Gatherings of more than 50 people were prohibited. Remote work was recommended and implemented. The strict lockdown was introduced on March 24th 2020 and lasted till April 20th. In the lockdown only the essential outings (work-related, shopping for necessities, and volunteering in the fight against COVID-19) and of maximum two persons were allowed, visiting forests and parks was prohibited, non-family gatherings of more than two people were banned and religious ceremonies restricted to five persons. During the lockdown also the requirement of physical distancing of at least 2 metres and of wearing face masks became mandatory. Starting from the end of April, the restrictions of the full lockdown were being relaxed in a stepwise manner till the end of May. The relaxation started from easing the physical distancing rules: opening forests and parks, and

raising participation limits for gatherings of different kinds. On May 6th nurseries and preschools opened again for the pupils, and on May 25th also schools reopened. On May 30th the requirement to cover one's mouth and nose was cancelled. Despite easing the national restrictions, the general public was advised to continue applying individual strategies of infection prevention. In the summer months the adherence to preventive measures decreased and more relaxed attitudes were observed in the general public (Duszyński et al., 2020). On the other hand, according to the public opinion poll the number of people applying safety measures was higher in August 2020 than in March 2020 and utilisation of preventive measures was increasing by age, with the highest prevalence among people aged 65 or older (CBOS, 2020).

Since the early announcement of the pandemic, older people and people with pre-existing medical conditions, like asthma, diabetes, and heart diseases were identified as more vulnerable to COVID-19, at a high risk of hospitalisation and death. This message was articulated very clearly also in Poland and at the initial stage of the pandemic there was an emphasis that senior citizens should remain at home if possible. To protect older people who had to do their own shopping, so called 'hours for senior citizens' were announced in the period from March 31st to May 3rd: within two hours before the noon of every working day grocery shops and pharmacies could be accessed exclusively by people over 65 years old.

It needs to be mentioned that some statements and actions of officials and leading politicians contradicted the measures demanded from the general public. For example, in February the Minister of Health questioned the benefits of wearing face masks, or in April, in the middle of the strict lockdown, numerous politicians of the ruling party gathered together to celebrate the anniversary of the tragic plane crash in Smoleńsk (Troszyński et al., 2020). Such inconsistencies in the messages sent and apparent disrespect for the law could be confusing and undermine the belief in the severity of the situation as well as the necessity of recommended measures. Moreover, the measures of personal distancing and of wearing face masks were often debated and questioned in the discussions raised by the proponents of conspiracy theories. At the same time, the basic measures of personal hygiene: washing hands, using disinfecting fluids and covering one's mouth when coughing and sneezing were rather free from controversy. In particular, washing one's hands was trained as a measure of infection prevention since the early education, starting from nurseries and preschools.

To sum up, the first wave of the COVID-19 pandemic in Poland was mild, with relatively low intensity of infections, but it was accompanied by strict public actions aimed at infection prevention and a great emphasis on protection of the most vulnerable group of senior citizens. Thus, despite some inconsistencies in the communication

and disputes about particular measures, it seems that the message about the threat, especially to older people and with chronic health conditions, was distinct and should find the reflection in people's perceptions.

This study

In this study I investigate hygiene practices as means of COVID-19 prevention among people above 50 years of age in Poland. By choosing older adults I focus on a population for which the message about the threat of COVID-19 and the necessity to prevent the infection was stressed the most. Therefore, I expect their risk perceptions to be more pronounced and less volatile than it might be the case in younger age groups.

Hygiene measures are voluntary behaviours that belong to the private sphere of an individual, with only very limited influence of external conditions. In contrast, behaviours like staying at home, mask-wearing, mobility, physical distancing, shops' operations and gatherings' size were partly regulated by the government and in those cases the compliance includes more motives than infection prevention, e.g., social conformity or fear of being fined for non-adherence. Additionally, the rules for the regulated preventive measures were changing over time and their enforcement differed regionally, which is difficult to take into account in the analysis. Some of the measures of protection were also questioned and doubted about due to conspiracy theories and missing information. Hygiene practices, on the other hand, were largely unchallenged and they were recommended as effective measures of infection prevention also prior to the COVID-19 pandemic. Moreover, the barriers of applying the hygiene measures, including financial burden, are low and do not vary much for different individuals. Other measures, like staying at home or physical distancing, may be much more costly to some people than to others due to their professional or family obligations. Altogether, for many preventive behaviours there are numerous interfering conditions related to the aspects different than health. If they are not measured adequately, they might be a source of hidden heterogeneity distortive to the results. Focusing on hygiene practices allows me to reduce the complexity of incentives because hygiene behaviours are fully in control of an individual, the motivation to use them is straightforward and their costs are low, they were not enforced by law but only recommended through some guidelines that were consistent over time.

Both the choice of the behaviours and of the population to be studied aim at reducing the variability and at simplifying interplay of the HBM constructs. I expect that in the analysed population the perceptions of high severity and susceptibility

are dominant, the perceived benefits of hygiene behaviours outweigh the cost of their implication and people feel able to apply those measures supported with firm guidelines from the health authorities.

Data and method

The data comes from the 7th and 8th wave of SHARE (Börsch-Supan, 2020). SHARE is a biannual panel survey conducted in European countries and Israel about the economic, social, and health situation of people from generation 50+ (Börsch-Supan et al., 2013). In reaction to the COVID-19 pandemic, during the 8th wave the fieldwork switched to telephone administered interviews (CATI) with a modified scope of the questionnaire (SHARE-COVID). The CATI questionnaire targeted the living situation under the COVID-19 pandemic and covered one's physical and mental health, health behaviours, healthcare, changes in one's economic situation and social networks (Scherpenzeel et al., 2020).

The total sample size in Poland was 2,936 individuals. I included in the analysis the respondents who were older than 50 years of age, lived in private households and in their usual homes (alternative response was: lives temporarily elsewhere) and were interviewed without a help of the proxy person. The decision on the last condition was motivated by the assumption that persons who were not able to participate in an interview without help could have also had a limited ability to make independent decisions about their hygiene practices. After applying the selection criteria and excluding the respondents with missing values on the independent variables, 2,322 respondents remained in the analytic sample.

I analysed three COVID-19 preventive behaviours that were asked about in the 8th wave of the SHARE survey:

- Washing hands more frequently than usual (CAH014_);
- Using special hand sanitisers or disinfection fluids more frequently than usual (CAH015_);
- Paying special attention to covering cough and sneeze (CAH016_).

With respect to each behaviour, a respondent declared whether he or she did or did not adopt the behaviour (yes/no response).

The models included demographic, health, socio-economic, and psychological variables tested for their effect on practising safety measures related to COVID-19:

- Age – measured in years;
- Household composition: informs whether (1) the respondent constitutes a single person household (2) lives only with a partner (3) lives with a partner

and other household members (4) lives without a partner but with other household members;
- Education, based on ISCED-97 codes from the 7th wave, with three levels distinguished: primary, vocational, or none (ISCED-97 coded 0 1 and 2), secondary (ISCED-97 codes 3 and 4), tertiary (ISCED-97 codes 5 and 6);
- Economic activity: an indicator of being employed or self-employed at the time when the COVID-19 pandemic broke out;
- Subjective health: self-rated health before the outbreak of the coronavirus, coded with three modalities: (1) excellent or very good, (2) good, (3) fair or poor;
- Health worsening: a binary variable indicating health worsening compared to the time before the outbreak of the coronavirus;
- Chronic diseases: an indicator of the respondent having at least one chronic condition;
- Mental health problems: captures if the respondent felt nervous, sad, or depressed, had trouble sleeping or felt lonely; for the respondents who reported any of those problems it also distinguishes whether the situation remained the same or worsened;
- COVID-19 experience: an indicator that either the respondent or somebody who is close to the respondent had symptoms attributable to COVID-19, was hospitalised due to a coronavirus infection, tested positive for the coronavirus or died due to infection;
- Staying home: an indicator that the respondent has not left home since the outbreak of the pandemic;
- Personality (Big Five): the respondent's scores on five basic dimensions of personality: neuroticism, extraversion, openness, agreeableness, and conscientiousness.

Variables capturing education and personality traits were retrieved from the 7th wave because they were supposed to be constant between wave 7 and 8. Personality traits are considered as permanent features of a person and changing the educational level by individuals aged 50+ is unlikely. The rest of the explanatory variables was from the 8th wave to ensure up-to-date description of the respondents' situation. The content of the CATI interview was minimal and for that reason I could not use the variety of measures in the domains of one's health, economic situation and family life that SHARE used to collect in the previous waves. Table 1 presents the descriptive statistics for the variables used as predictors in this analysis.

In order to evaluate the effects of demographic, health, psychological, and socio-economic factors on the practice of safety behaviours I estimated multiple logistic regression models for each of the three preventive behaviours. The regressions were estimated separately for men and women.

Table 1. Descriptive statistics of variables included in the regression models (mean and standard deviation for continuous variables, frequency and percentage for categorical variables)

Variable	Level	Men n=982	Women n=1340
Age, mean (SD)		67.4 (8.3)	66.8 (8.7)
Living arrangment	living alone	104 (10.6%)	242 (18.1%)
	with a partner only	524 (53.4%)	592 (44.2%)
	with a partner and others	298 (30.3%)	327 (24.4%)
	without a partner with others	56 (5.7%)	179 (13.4%)
Education	vocational, primary or none	198 (20.2%)	357 (26.6%)
	secondary	646 (65.8%)	815 (60.8%)
	tertiary	138 (14.1%)	168 (12.5%)
Living in a rural area (binary)		520 (53.0%)	673 (50.2%)
Working before COVID-19 (binary)		305 (31.1%)	310 (23.1%)
Subjective health before the COVID-19 pandemic	excellent, very good	125 (12.7%)	158 (11.8%)
	good	542 (55.2%)	764 (57.0%)
	fair or poor	315 (32.1%)	418 (31.2%)
Health worsening during the COVID-19 pandemic (binary)		81 (8.2%)	151 (11.3%)
Suffering from chronic conditions (binary)		799 (81.4%)	1115 (83.2%)
Mental health problems	none	453 (46.1%)	363 (27.1%)
	yes, no change	360 (36.7%)	552 (41.2%)
	yes, worsened	169 (17.2%)	425 (31.7%)
Expierence of COVID-19 (binary)		37 (3.8%)	72 (5.4%)
Not leaving home since the outbreak of the pandemic (binary)		57 (5.8%)	124 (9.3%)
Extraversion, mean (SD)		3.3 (0.6)	3.3 (0.7)
Agreeableness, mean (SD)		3.2 (0.7)	3.1 (0.7)
Conscientiousness, mean (SD)		4.0 (0.7)	4.1 (0.7)
Neuroticism, mean (SD)		2.7 (0.8)	2.9 (0.9)
Openness, mean (SD)		3.1 (0.8)	3.3 (0.8)

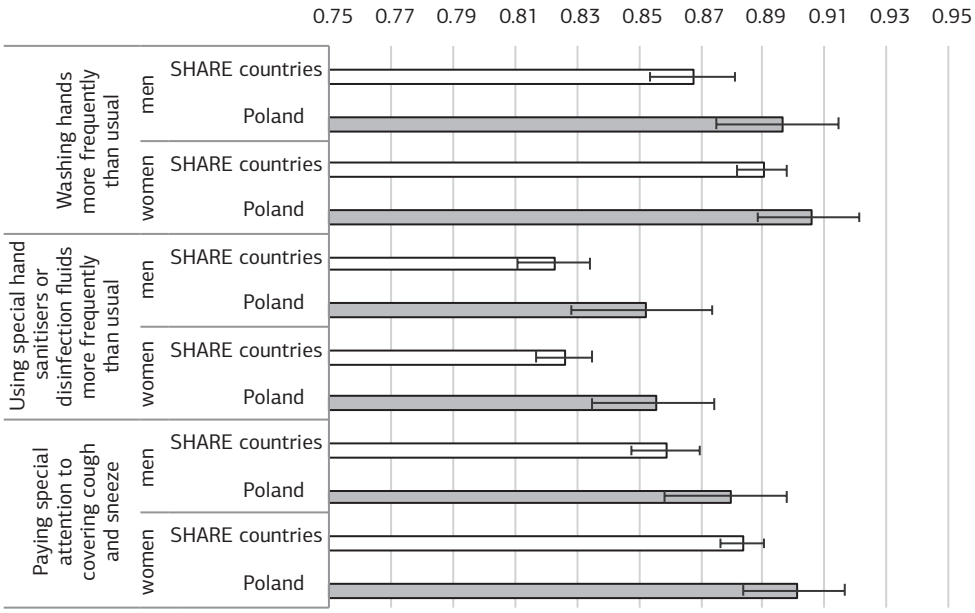
Source: own calculations using the wave 7 and 8 of SHARE data.

Results

The percentage of the respondents over 50 years old complying to the safety measures is presented in Figure 3. The numbers for Poland have been presented against the numbers for all countries participating in the SHARE-COVID survey. The patterns of responses on behaviour change observed in Poland and in SHARE countries are similar. The respondents most often declared that the pandemic has

increased the frequency of washing their hands (90% of men and 91% of women in Poland, 87% of men and 89% of women among all the SHARE-COVID respondents). Paying special attention to covering cough and sneeze was confirmed by 88% men and 90% of women in Poland, and by 86% men and 88% of women among all the SHARE-COVID respondents. Even the behaviour that was affected the least, i.e., using hand sanitisers and disinfection fluids more often, was declared by a vast majority of the respondents (85% of men and 86% of women in Poland, 82% of men and 83% of women among all the respondents). The figures representing compliance to the behavioural guidelines related to the COVID-19 containment show that a great majority of the respondents over 50 years old applied preventive behaviours. In Poland the proportions were as high as among the total of SHARE countries, although Poland was only mildly affected by the first wave of infections. It suggests that the strictness of public response in Poland, comparable to other European countries, spilled over to private behaviours that did not undergo the regulations directly. However, even if the message about the severity of the situation strongly influenced behaviours of the respondents over 50 years old, the reaction was not universal. In the next step I investigate which factors differentiate the behavioural change.

Figure 3. Proportion of respondents aged 50+ in Poland and in all SHARE-COVID countries who are practicing safety measures for reducing COVID-19 transmission, by sex



Source: own elaboration based on the 8th wave of the SHARE data, weighted.

The regression results for the individual preventive behaviour are presented in Table 2 for men and in Table 3 for women. What becomes clear at first glance is that only a few respondents' characteristics were statistically significantly associated with practising safety measures. The two most pronounced results referred to the effect of age and of the household composition. The likelihood of increased practice of all precautionary behaviours decreased with age for men and women (only the result for washing hands by men was insignificant), which means that the frailty increasing with age did not translate into more careful behaviour. The effects of household composition were different for men and women. Men living in a single person household had a lower behavioural response than men living with a partner. The presence of other family members did not have a clear effect on the behaviour of men. For women neither the presence of a partner nor of any other person in the household affected the probability of preventive behaviours.

Table 2. Parameter estimates of logistic regression models for the COVID-19 preventive behaviours, men

	Model for washing hands	Model for using sanitisers and disinfection fluids	Model for covering cough and sneeze
Age	–0.01	–0.04**	–0.04**
	(0.02)	(0.01)	(0.01)
Living arrangement (ref.: with a partner only)			
living alone	–0.74*	–0.70*	–0.75*
	(0.34)	(0.30)	(0.30)
with a partner and others	–0.32	–0.39	0
	(0.26)	(0.23)	(0.25)
without a partner with others	–0.5	–0.7	–0.43
	(0.46)	(0.39)	(0.42)
Education (ref.: vocational, primary or none)			
secondary	0.04	0.43	0.18
	(0.30)	(0.23)	(0.25)
tertiary	–0.72	0.33	0.02
	(0.39)	(0.36)	(0.36)
Living in a rural area	–0.05	–0.42*	–0.02
	(0.24)	(0.21)	(0.21)
Working before COVID	0.19	0.67*	0.3
	(0.29)	(0.29)	(0.29)
Self-rated health before COVID (ref.: excellent or very good)			
good	–0.07	–0.12	0.31
	(0.36)	(0.34)	(0.34)

	Model for washing hands	Model for using sanitisers and disinfection fluids	Model for covering cough and sneeze
fair of poor	0.09	–0.05	0.21
	(0.40)	(0.37)	(0.36)
Health worsening during COVID	–0.3	0.35	–0.26
	(0.40)	(0.39)	(0.34)
Chronic health conditions	0.15	0.05	–0.4
	(0.30)	(0.27)	(0.32)
Mental health problems (ref.: none)			
yes, no change	0.23	–0.33	0.01
	(0.25)	(0.22)	(0.23)
yes, worsening	0.41	0.43	–0.08
	(0.34)	(0.33)	(0.29)
Experience of COVID-19	–0.04	0.95	0.47
	(0.57)	(0.76)	(0.63)
Staying at home	–0.65	–0.74*	–0.39
	(0.40)	(0.34)	(0.36)
Big Five Personality traits			
Extraversion	–0.06	0.21	0
	(0.17)	(0.16)	(0.16)
Agreeableness	–0.01	0.09	–0.02
	(0.17)	(0.15)	(0.15)
Conscientiousness	0.31*	0.28*	0.26
	(0.15)	(0.13)	(0.14)
Neuroticism	0.02	0.17	–0.01
	(0.15)	(0.13)	(0.13)
Openness	0.16	–0.01	0.1
	(0.15)	(0.13)	(0.13)
Constant	1.54	2.27	3.38*
	(1.65)	(1.43)	(1.49)
Log likelihood	–298.99	–356.48	–341.44
Pseudo R2	0.04	0.10	0.06
N	982	982	975

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: own calculations using the wave 7 and 8 of SHARE data.

Table 3. Parameter estimates of logistic regression models for the COVID-19 preventive behaviours, women

	Model for washing hands	Model for using sanitisers and disinfection fluids	Model for covering cough and sneeze
Age	–0.04*	–0.03*	–0.06***
	(0.02)	(0.01)	(0.02)
Living arrangement (ref.: with a partner only)			
living alone	–0.48	–0.47	–0.52
	(0.30)	(0.25)	(0.30)
with a partner and others	–0.13	–0.23	–0.47
	(0.29)	(0.24)	(0.31)
without a partner with others	–0.23	–0.43	–0.24
	(0.33)	(0.26)	(0.33)
Education (ref.: vocational, primary or none)			
secondary	–0.02	0.12	0.27
	(0.27)	(0.21)	(0.26)
tertiary	–0.22	0.61	1.05
	(0.43)	(0.41)	(0.57)
Living in a rural area	–0.62*	–0.55**	–0.13
	(0.24)	(0.19)	(0.24)
Working before COVID	–0.09	0.76*	0.9
	(0.33)	(0.32)	(0.50)
Self-rated health before COVID (ref.: excellent or very good)			
good	–0.45	0.08	0.05
	(0.40)	(0.31)	(0.42)
fair of poor	–0.26	0.09	0.08
	(0.45)	(0.34)	(0.44)
Health worsening during COVID	0.81	0.18	–0.17
	(0.49)	(0.31)	(0.36)
Chronic health conditions	0.24	–0.15	0.23
	(0.30)	(0.27)	(0.34)
Mental health problems (ref.: none)			
yes, no change	0.08	0.13	–0.29
	(0.27)	(0.22)	(0.29)
yes, worsening	0.36	0.43	0.32
	(0.31)	(0.25)	(0.34)
Experience of COVID-19	–0.59	–0.17	–0.94*
	(0.43)	(0.40)	(0.42)
Staying at home	–0.19	–0.38	– 0.67*
	(0.34)	(0.26)	(0.29)

	Model for washing hands	Model for using sanitisers and disinfection fluids	Model for covering cough and sneeze
Big Five Personality traits			
Extraversion	–0.37*	–0.21	0.02
	(0.17)	(0.14)	(0.17)
Agreeableness	0.1	0.19	–0.04
	(0.16)	(0.13)	(0.16)
Conscientiousness	0.22	0.38**	0.04
	(0.15)	(0.12)	(0.16)
Neuroticism	0.13	0.23*	0.2
	(0.14)	(0.11)	(0.14)
Openness	0.27	0.02	0.18
	(0.14)	(0.12)	(0.15)
Constant	4.50**	2.27	5.36**
	(1.66)	(1.32)	(1.65)
Log likelihood	–324.90	–451.46	–309.89
Pseudo R2	0.06	0.09	0.13
N	1339	1339	1326

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Source: own calculations based on the wave 7 and 8 SHARE data.

Surprisingly enough, none of the health-related variables appeared significant for any of the modelled preventive behaviours. The variables that in objective terms increase the severity of COVID-19, like the presence of chronic health conditions or self-assessments that could be linked to higher perceived severity of a coronavirus infection, like a poor rating of own health, reporting health worsening since the beginning of the pandemic and experiencing any mental health problems were insignificant in all the models. The indicator of experience with COVID-19 either by the respondent personally or within his/her social network and the indicator of not leaving home since the beginning of the pandemic could also be linked to the perceptions of threat. The experience with COVID-19 was significant only in one model and the direction of the effect was different than expected: it decreased the likelihood of covering cough and sneeze for women. Staying home was negatively associated with the probability of using hand sanitisers by men and covering cough and sneeze by women. Working before the COVID-19 pandemic was positively associated only with the use of hand sanitisers for men and women, which most likely means that those people who had worked before the pandemic largely kept working at the time of the survey and visiting the workplace was combined with a more frequent use of hand sanitisers and disinfectants. In this case the work environment was probably providing external cue to action.

The respondents living in rural areas were also less likely to increase the use of disinfectants and hand sanitisers (men and women) and wash hands more often (only women). Education, contrary to the expectation, did not appear to be a significant predictor of the behavioural responses in any of the models. Personality traits had only limited effects on the preventive behaviours: men who scored high on conscientiousness were more likely to wash their hands and use hand sanitisers more often; women with high levels of extraversion were less likely to wash their hands more often, women with high levels of conscientiousness and neuroticism were more likely to increase the use of hand sanitisers and disinfectants during the pandemic.

Conclusion

This study is an important step in exploring who adheres to protective measures aimed at reducing the spread of COVID-19. It belongs to a larger body of research investigating the variability in adoption of preventive behaviours recommended by experts and public health organisations as a way to reduce the spread of the current pandemic. The advantage of this study is its representativeness and focus on the mid-age or older population. Many studies available in the literature utilised special surveys conducted online in which the participants were recruited via social media. Although it is a form allowing for a timely reaction to sudden developments in society and compliant with pandemic restrictions it is also prone to coverage issues and selection bias (cf. Cesare, Lee, McCormick, Spiro, & Zagheni, 2018; Sances, 2019). SHARE is based on a probability sample and includes respondents in older age groups who would not be reachable via online media.

I focus on the older age group and hygiene behaviours: washing hands more frequently than usual, using hand sanitisers or disinfection fluids more frequently than usual, paying special attention to covering cough and sneeze. This selection is important from the analytic point of view because it restricts the investigation to individuals who should be the most interested in preventing infection due to potential high severity of the resulting disease. Advanced age and comorbidity were identified as major risk factors of the acquisition and mortality of COVID-19 and these findings guided official communication and public prevention measures right from the beginning of the pandemic. Individuals of younger age could possibly feel safe from the coronavirus and, as I was not able to measure their threat perceptions directly, I decided to focus on a group that had all the reasons to feel at risk and motivated to protect themselves. Selecting hygiene behaviours has the advantage of focusing on motives related to health protection and infection prevention. In the case

of other preventive measures, there are potentially other incentives involved that are not related to health and could distort the results.

The adherence to the hygiene preventive measures among Polish men and women over 50 years old was as high as in other European countries despite the fact that Poland was among the countries least affected by the first wave of the COVID-19 pandemic in Europe. Supposedly, the rigid government's actions and media communication created appropriate awareness of the gravity of the situation among older adults. The regression results revealed that the variables reflecting individual vulnerability to COVID-19, e.g., suffering from chronic health conditions, had no effect on differentiating the hygiene behaviours. The clearer dependencies identified was the declining likelihood of preventive behaviours with advancing age and lower likelihood of preventive behaviours for men living without a partner. Despite including several demographic and socio-economic characteristics only a few of them turned out to be statistically significant and, apart from the consistent effects of age and living arrangement, no other variables showed a systematic pattern. Definitely, there is a scope for getting more understanding of what factors drive the preventive behaviours. Nevertheless, the practical implication of my finding is the indication that people in advanced age and, in particular, single men require special attention when it comes to following behavioural strategies for reducing the transmission of COVID-19 or any other disease. It calls for further research to understand why higher age is associated with lower adherence to preventive measures, whether it is due to lower risk perception, insufficient abilities, rigidity of behaviour, etc. (Bordalo et al., 2020; Pasion et al., 2020).

Interestingly enough, the effect of living with a partner is not parallel for both sexes. For men, the presence of a partner raised the likelihood of behavioural response to the pandemic but it did not matter for women's adherence to precautionary behaviours. This may be a demonstration of gendered health gains from marriage/union when men benefit from their partner's push for health and prevention behaviours (Monin & Clark, 2011; Schone & Weinick, 1998).

There are some caveats to bear in mind when reading the results of our study. Firstly, the fieldwork was conducted in the specific time point: it was after the first wave of the pandemic, which anyway hit Poland only minimally as compared to western and southern European countries, when the lockdown restrictions were lifted, and albeit the recommendations on safety measures were still in place, there was a huge desire to 'return to normality'. Although the questionnaire asked about the behaviours since the outbreak of the coronavirus, there is a possibility that the perception of pandemic risks fading away affected how people reported their preventive behaviours. Secondly, the questions asked about applying the protective behaviours more than

usual (washing hands and using sanitisers) or paying special attention to some others (e.g, covering cough). It is possible that some respondents had implemented those practices before the pandemic to such a degree that there was no scope for improvement after the actions were recommended with respect to the coronavirus protection. Then, the negative response to the survey questions would not reflect correctly the non-adherence to the precautionary practices I want to investigate. It seems, however, that this is rather a theoretical possibility. Thirdly, reporting on the adherence to preventive behaviours may be subject to social desirability bias, i.e., people reporting what they were expected to do rather than what they did in reality. Fourthly, SHARE-COVID included a limited range of variables describing health, economic conditions, and living arrangements. In most cases I could not use the information from the previous waves, because the situation might have changed. But even if the information was not as detailed and multidimensional as in the previous SHARE waves, the regression models covered the important spheres of the respondents' life sufficiently.

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References

[1] Agbaria, Q., & Mokh, A.A. (2021). Coping with Stress During the Coronavirus Outbreak: the Contribution of Big Five Personality Traits and Social Support. *International Journal of Mental Health and Addiction*, doi:10.1007/s11469-021-00486–2

[2] Anderson, R.M., Heesterbeek, H., Klinkenberg, D., & Hollingsworth, T.D. (2020). How will country-based mitigation measures influence the course of the COVID-19 epidemic? *The Lancet,* 395(10228), 931–934, doi:10.1016/S0140-6736(20)30567-5

[3] Bermúdez, J. (1999). Personality and health-protective behaviour. *European Journal of Personality,* 13(2), 83–103, doi:https://doi.org/10.1002/(SICI)1099-0984(199903/04)13:2<83::AID-PER338>3.0.CO;2-M

[4] Bíró, A., Branyiczki, R., & Elek, P. (2021). Time patterns of precautionary health behaviours during an easing phase of the COVID-19 pandemic in Europe. *European Journal of Ageing*, doi:10.1007/s10433-021-00636-4

[5] Bordalo, P., Coffman, K.B., Gennaioli, N., & Shleifer, A. (2020). Older People are Less Pessimistic about the Health Risks of COVID-19. *National Bureau of Economic Research Working Paper Series,* No. 27494, doi:10.3386/w27494

[6] Börsch-Supan, A. (2020). *Survey of Health, Ageing and Retirement in Europe (SHARE) Wave 8. COVID-19 Survey 1.* Release version: 0.0.1. beta. SHARE-ERIC. Data set, doi: 10.6103/SHARE.w8cabeta.001

[7] Börsch-Supan, A. et al. (2013). Data Resource Profile: The Survey of Health, Ageing and Retirement in Europe (SHARE). *International Journal of Epidemiology,* 42(4), 992–1001, doi:10.1093/ije/dyt088

[8] Breakwell, G.M., Fino, E., & Jaspal, R. (2021). The COVID-19 Preventive Behaviors Index: Development and Validation in Two Samples From the United Kingdom. *Evaluation & the Health Professions,* 44(1), 77–86, doi:10.1177/0163278720983416

[9] Bruine de Bruin, W., & Bennett, D. (2020). Relationships Between Initial COVID-19 Risk Perceptions and Protective Health Behaviors: A National Survey. *American Journal of Preventive Medicine,* 59(2), 157–167, doi:10.1016/j.amepre.2020.05.001

[10] CBOS. (2020). *Zmiany w zachowaniach przeciwepidemicznych Polaków [Changes in Poles preventive behaviours]* (2353–5822). Retrieved 26.10.2021, from: https://www.cbos.pl/SPISKOM.POL/2020/K_116_20. PDF

[11] Cesare, N., Lee, H., McCormick, T., Spiro, E., & Zagheni, E. (2018). Promises and Pitfalls of Using Digital Traces for Demographic Research. *Demography,* 55(5), 1979–1999, doi:10.1007/s13524-018-0715-2

[12] Champion, V.L., & Skinner, C.S. (2008). The health belief model *Health behavior and health education: Theory, research, and practice.* 4th ed. (pp. 45–65). San Francisco, CA, US: Jossey-Bass.

[13] Clark, C., Davila, A., Regis, M., & Kraus, S. (2020). Predictors of COVID-19 voluntary compliance behaviors: An international investigation. *Global Transitions,* 2, 76–82, doi:https://doi.org/10.1016/j.glt.2020.06.003

[14] Duszyński, J. et al. (2020). *Zrozumieć COVID-19. Opracowanie zespołu ds. COVID-19 przy Prezesie Polskiej Akademii Nauk [To understand COVID-19]*. Retrieved 20.09.2021, from: https://informacje.pan.pl/images/2020/opracowanie-covid19-14–09–2020/ZrozumiecCovid19_opracowanie_PAN_interactive.pdf

[15] Faasse, K., & Newby, J. (2020). Public Perceptions of COVID-19 in Australia: Perceived Risk, Knowledge, Health-Protective Behaviors, and Vaccine Intentions. *Front Psychol,* 11(2553), doi:10.3389/fpsyg.2020.551004

[16] Harper, C.A., Satchell, L.P., Fido, D., & Latzman, R.D. (2021). Functional Fear Predicts Public Health Compliance in the COVID-19 Pandemic. *International Journal of Mental Health and Addiction,* 19(5), 1875–1888, doi:10.1007/s11469-020-00281-5

[17] Jaspal, R., Fino, E., & Breakwell, G.M. (2020). The COVID-19 Own Risk Appraisal Scale (CORAS): Development and validation in two samples from the United Kingdom. *Journal of Health Psychology*, 1359105320967429, doi:10.1177/1359105320967429

[18] Kim, S., & Kim, S. (2020). Analysis of the Impact of Health Beliefs and Resource Factors on Preventive Behaviors against the COVID-19 Pandemic. *International journal of environmental research and public health,* 17(22), 8666.

[19] Lee, M., & You, M. (2020). Psychological and Behavioral Responses in South Korea During the Early Stages of Coronavirus Disease 2019 (COVID-19). *International journal of environmental research and public health,* 17(9), 2977.

[20] Litwin, H., & Levinsky, M. (2021). Network-Exposure Severity and Self-Protective Behaviors: The Case of COVID-19. *Innovation in Aging,* 5(2), igab015-igab015, doi:10.1093/geroni/igab015

[21] Lüdecke, D., & von dem Knesebeck, O. (2020). Protective Behavior in Course of the COVID-19 Outbreak – Survey Results From Germany. *Frontiers in Public Health,* 8(567), doi:10.3389/fpubh.2020.572561

[22] Mendoza-Jiménez, M.-J., Hannemann, T.-V., & Atzendorf, J. (2021). Behavioral Risk Factors and Adherence to Preventive Measures: Evidence From the Early Stages of the COVID-19 Pandemic. *Frontiers in Public Health,* 9(679), doi:10.3389/fpubh.2021.674597

[23] Monin, J.K., & Clark, M.S. (2011). Why do men benefit more from marriage than do women? Thinking more broadly about interpersonal processes that occur within and outside of marriage. *Sex Roles: A Journal of Research,* 65 (5–6), 320–326, doi:10.1007/s11199-011-0008-3

[24] Moussaoui, L.S., Ofosu, N.D., & Desrichard, O. (2020). Social Psychological Correlates of Protective Behaviours in the COVID-19 Outbreak: Evidence and Recommendations from a Nationally Representative Sample. *Applied psychology. Health and well-being,* 12(4), 1183–1204, doi:10.1111/aphw.12235

[25] Pasion, R., Paiva, T.O., Fernandes, C., & Barbosa, F. (2020). The AGE Effect on Protective Behaviors During the COVID-19 Outbreak: Sociodemographic, Perceptions and Psychological Accounts. *Front Psychol,* 11(2785), doi:10.3389/fpsyg.2020.561785

[26] Raude, J., Lecrique, J.M., Lasbeur, L., Leon, C., Guignard, R., du Roscoät, E., & Arwidson, P. (2020). Determinants of Preventive Behaviors in Response to the COVID-19 Pandemic in France: Comparing the Sociocultural, Psychosocial, and Social Cognitive Explanations. *Front Psychol,* 11, 584500, doi:10.3389/fpsyg.2020.584500

[27] Rosenstock, I.M. (1974). The Health Belief Model and Preventive Health Behavior. *Health Education Monographs,* 2(4), 354–386, doi:10.1177/109019817400200405

[28] Sances, M.W. (2019). Missing the Target? Using Surveys to Validate Social Media Ad Targeting. *Political Science Research and Methods,* 9(1), 215–222, doi:10.1017/psrm.2018.68

[29] Sand, G., & Bristle, J. (2021). *The Relationship of Threat Perceptions and Optimistic Attitude with Protective Behavior in the COVID-19 Crisis*. MEA Discussion Paper. Retrieved 25.06.2021, from: https://ssrn.com/abstract=3832914

[30] Scherpenzeel, A. et al. (2020). 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(2), 217–221, doi:10.18148/srm/2020.v14i2.7738

[31] Schone, B.S., & Weinick, R.M. (1998). Health-Related Behaviors and the Benefits of Marriage for Elderly Persons. *The Gerontologist,* 38(5), 618–627, doi:10.1093/geront/38.5.618

[32] Troszyński, M., Bieliński, J., Bukowska, X., Iwińska, K., Markowska, B., Nowicka, M., & Sałkowska, M. (2020). *Czas pandemii w polskich mediach społecznościowych*. Retrieved 22.09.2021, from: https://www.civitas.edu.pl/wp-content/uploads/2020/07/czas_pandemii_w_polskich_mediach_spolecznosciowych.pdf

[33] Uddin, S., Imam, T., Khushi, M., Khan, A., & Moni, M.A. (2021). How did socio-demographic status and personal attributes influence compliance to COVID-19 preventive behaviours during the early outbreak in Japan? Lessons for pandemic management. *Personality and Individual Differences, 175*, 110692, doi:https://doi.org/10.1016/j.paid.2021.110692

[34] Watson, D., & Hubbard, B. (1996). Adaptational style and dispositional structure: Coping in the context of the five-factor model. *Journal of Personality,* 64(4), 737–774, doi:https://doi.org/10.1111/j.1467-6494.1996.tb00943.x

[35] West, R., Michie, S., Rubin, G.J., & Amlôt, R. (2020). Applying principles of behaviour change to reduce SARS-CoV-2 transmission. *Nature Human Behaviour,* 4(5), 451–459. doi:10.1038/s41562-020-0887-9