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Do government responses impact the relationship between age, gender and psychological distress during the COVID-19 pandemic? A comparison across 27 European countries

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ABSTRACT

Rationale: Governments around the world have developed a range of responses to deal with the COVID-19 pandemic, including containment and closure, health system and economic policies. Despite their ubiquity, little is known regarding how government policies interact with age and gender to predict individual-level psychological outcomes.

Objective: This study examines how three types of national-level government responses to the COVID-19 pandemic moderate the relationship between age and psychological distress as well as gender and psychological distress.

Method: We use a multilevel model to assess how government policies moderate the relationship between age as well as gender and psychological distress. Individual-level data are based on the SHARE COVID-19 Survey (n = 51,467 from 27 countries). Government policies are assessed using data from the Oxford COVID-19 Government Response Tracker.

Results: Results show that containment and closure policies increase psychological distress more for women compared to men. Health system policies increase psychological distress more for women compared to men and more for older individuals compared to younger individuals.

Economic policies do not interact with age or gender to predict psychological distress.

Conclusions: While containment and closure policies and health system policies interact with age and gender to predict psychological distress, their overall effect is comparably modest.

1. Introduction

The COVID-19 pandemic has impacted mental and physical well-being of individuals significantly (e.g., Van Bavel et al., 2020). Governments across the world have responded to the pandemic by developing a range of responses, including containment and closure, health system, and economic policies (Hale et al., 2020). Containment and closure policies, such as self-isolation or social distancing, are designed to limit the spread of COVID-19. Health system policies, such as public information campaigns or access to testing for COVID-19, increase alertness regarding the virus and better equip health systems. Economic policies help alleviate economic hardships for individuals.

Government policies affect the perceived threat of COVID-19 as well as its attendant economic, social and psychological stressors. However,

with some exceptions (e.g., Götz et al., 2021), research that considers the joint impact of individual-level characteristics and macro-level policies on psychological outcomes during the COVID-19 pandemic is limited and there is a need to better understand how different government responses influence psychological outcomes (Zacher and Rudolph, 2021). The main objective of this article is to investigate how individual-level characteristics including age and gender relate to psychological distress of individuals and how government responses interact with age and gender to predict psychological distress. We study these questions using the data from the SHARE COVID-19 Survey and the Oxford COVID-19 Government Response Tracker (OxCGRT).

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1.1. Gender, age and psychological distress during the COVID-19 pandemic

Individuals perceive substantial health risks such as COVID-19 as threats to self-preservation, which can negatively affect their psychological well-being (Pyszczyński et al., 2021). As mortality and the risk of severe illness from COVID-19 increase with age (Kluge, 2020), the fear of COVID-19 and resulting psychological distress may increase as well. In fact, some previous studies have found a positive relationship between age and psychological distress during the COVID-19 pandemic (Malesza and Kaczmarek, 2021; Qiu et al., 2020; Zhou and Guo, 2021). However, prior work also suggests that older individuals are less responsive to stressful life events, employ more effective coping strategies, and benefit from significant life experience, including experience with public crises, all of which help them alleviate psychological distress from the COVID-19 pandemic (e.g., Birditt et al., 2021; Kimhi et al., 2020). Therefore, the relationship between age and psychological distress may be positive or negative.

Women generally report higher psychological distress than men (Matud, 2004). Higher levels of psychological distress for women are compounded during the pandemic, when women are often required to take on more responsibilities for caring and domestic work, which depletes their psychological resources (e.g., Alon et al., 2020). Women also tend to ruminate more about the COVID-19 pandemic (Petzold et al., 2020), and rumination tends to prolong and exacerbate psychological distress (Nolen-Hoeksema and Corte, 2004). Therefore, we expect to find higher levels of psychological distress for women.

1.2. The role of government responses

Containment and closure policies. Containment and closure policies such as lockdowns disrupt social support and enforce physical isolation, increasing psychological distress (e.g., Anglim and Horwood, 2021). Younger individuals, who are socially and economically active, may experience severe reductions in social ties due to these policies. In comparison, older individuals may be already retired, living alone, or widowed, implying that containment and closure policies do not increase social isolation as much (Birditt et al., 2021). Older individuals also have fewer responsibilities with regard to work and childcare. Consequently, they may be less affected by containment and closure policies, which disrupt work and childcare arrangements and reduce social contacts more significantly for younger individuals. Therefore, we expect that containment and closure policies will increase psychological distress more for younger individuals compared to older individuals.

More stringent containment and closure policies involve school closures which increase the childcare burden of many women (Alon et al., 2020), contributing to psychological distress. Women typically also have stronger close social relationships than men (Etheridge and Spantig, 2020). These relationships are substantially reduced following more stringent containment and closure policies, leading to higher increases in psychological distress for women. Consequently, we expect that containment and closure policies will increase psychological distress more for women compared to men.

Health system policies. Health system policies such as emergency investments in health care, public information campaigns, rules on face coverings or extensive contact tracing may amplify public awareness of the severity of the COVID-19 pandemic and increase the perceived health threat posed by COVID-19. As mortality and severe illness from COVID-19 increase with age (Kluge, 2020), stringent health system policies can increase the perceived threat more significantly for older individuals. Consequently, health system policies may increase psychological distress more for older individuals.

On the other hand, individuals may interpret stringent health system policies as a government response which reduces the actual health risk from COVID-19. In that regard, stringent health system policies may provide reassurance and therefore reduce psychological distress more

for older individuals who are at more risk from COVID-19 (Kluge, 2020).

Women are more distressed by health risks in general (McDonough and Walters, 2001), and feel more threatened by COVID-19 in particular (Petzold et al., 2020). More stringent health system policies, if perceived as amplifying the threat of COVID-19, may increase psychological distress more for women. Conversely, if health system policies are instead perceived as a response which reduces the health risks from COVID-19, more stringent health system policies may decrease psychological distress more for women.

Economic policies. The COVID-19 pandemic has resulted in economic shocks which contribute to psychological distress, as people are concerned about financial hardship (Mann et al., 2020). Economic government policies which financially support individuals can alleviate economic anxiety, contributing to overall lower levels of psychological distress. Older individuals may be less concerned by the availability of economic support, as they are less likely to have dependents and may be retired or approaching the end of their working careers (Jin et al., 2020). On the other hand, younger individuals care more about the economic risks from COVID-19, in particular the prospect of unemployment (Fetzer et al., 2020). Consequently, more supportive economic policies may alleviate psychological distress more for younger individuals.

Since women have lower average earnings than men and more caring responsibilities, economic anxiety affects women disproportionately (Weissman et al., 2020). Women are generally more exposed to economic risks from COVID-19, in particular regarding job loss (Alon et al., 2020). Consequently, we expect economic policies, which provide financial support, to decrease psychological distress more for women.

2. Methodology

2.1. Data

We use the SHARE COVID-19 Survey, for which data were collected between June and August 2020 (Börsch-Supan, 2020). The complete sample includes 52,310 individuals from 27 countries. Due to missing data, our sample includes 51,467 individuals from 27 countries. In order to assess the three types of country-level government policies, we incorporated data from OxCGRT (Hale et al., 2020). More information on both surveys can be found in the online supplement.

2.2. Measures

Age was measured in years. Gender was measured as a dummy variable (0 = Male, 1 = Female). Psychological distress is measured using four items capturing anxiety, depression, insomnia, and loneliness during the COVID-19 pandemic compared to before the outbreak of the pandemic. A sample item is "In the last month, have you felt nervous, anxious, or on edge? Has that been more so, less so or about the same as before the outbreak of Corona?". Following previous work (Bergmann and Wagner, 2021; Litwin and Levinsky, 2021), we dichotomized the responses to take the value of 0 if respondents did not experience more anxiety, depression, insomnia, or loneliness (No/never, Less so and About the same), and 1 if respondents did experience more (More so). We then summed responses across all four indicators to obtain a measure of overall psychological distress ranging from 0 to 4. A factor analysis was used to validate this measure, showing high factor loadings all above 0.68 as well as a high average communality of 0.6.

Government Responses. For each of the three policy domains, OxCGRT provides an overall index (from 0 to 100), which is based on several component indicators and calculated for every day of the year since the beginning of 2020 (Hale et al., 2020). A higher index score indicates a stronger government response. We averaged each of the three OxCGRT indices over the data collection period of the respective countries included in the survey.

The index for *containment and closure policies* is based on nine different component indicators such as "Close public transport" (from 0

= no measures to 2 = require closing) and “Cancel public events” (from 0 = no measures to 2 = require cancelling).

The index for health system policies is based on five component indicators, including “Public information campaigns” (from 0 = no Covid-19 public information campaign to 2 = coordinated public information campaign) or “Contact tracing” (from 0 = no contact tracing to 2 = comprehensive contact tracing).

The index for economic policies was calculated using two component indicators, including “Income support” (from 0 = no income support to 2 = government is replacing 50% or more of lost salary) and “Debt/contract relief” (from 0 = no debt/contract relief to 2 = broad debt/contract relief).

Control variables included are the size of respondent household, whether the respondent has tested positive for coronavirus (0 = no, 1 = yes), and the respondent’s health before the COVID-19 outbreak (originally coded as 1 = excellent to 5 = poor and reverse-coded for the analyses), and whether respondents lived with a partner (0 = no, 1 = yes).

2.3. Results

To account for the nested structure of our data (individuals within countries), we estimated multilevel regressions using a maximum likelihood estimator, with level-1 and level-2 predictors centered. Descriptive statistics are available in the online supplement. The average psychological distress is 0.576, which suggests most individuals did not experience more psychological distress compared to before the pandemic. Since missingness in variables of interest is very low (1.61%) and statistical power nearly unaffected by imputation methods, we analyzed all our models using complete case analysis. As a robustness check, we reanalyzed all our models using multiple imputation and the results were almost identical.

Table 1 reports the results of the analyses for the dependent variable psychological distress. Model 1 includes control variables as well as direct effects for age and gender. The coefficient for age is significant and negative, showing that psychological distress decreases with age. The coefficient for female gender is positive and significant, indicating higher psychological distress for women.

Model 2 shows that the cross-level interaction coefficient for containment and closure policies and age is not significant. The coefficient for the cross-level interaction between containment and closure policies and female is positive and significant. The corresponding

interaction plot (Fig. 1) shows that these policies increase psychological distress more for women. The difference in psychological distress between women at a high level of containment and closure policies (one SD above mean) and men at a low level of containment and closure policies (one SD below mean) is 0.34, which corresponds to a difference of 8.39% on the scale for psychological distress.

Model 3 includes cross-level interactions between health system policies and age and gender. The coefficient for the cross-level interaction between age and health system policies is significant and positive. The interaction plot (Fig. 2) shows that health system policies weaken the positive relationship between age and psychological distress. The difference in psychological distress between younger individuals (one SD below mean) and high health system policies (one SD above mean), and older individuals and low health system policies is 0.24, which corresponds to a difference of 6.01%. The coefficient for the cross-level interaction between gender and health system policies is positive and significant. The corresponding interaction plot (Fig. 3) shows that health system policies increase psychological distress more for women. The difference in psychological distress between women at a high level of health system policies and men at a low level of health system policies is 0.40, which corresponds to a difference of 10.07%.

Model 4 contains the cross-level interactions between economic policies and age and gender. None of the interactions are statistically significant.

3. Discussion

Governments across the world have developed a range of responses to curb the spread of COVID-19 and limit the economic and social consequences of the pandemic. These responses impact people’s lives by influencing their behaviors, social interactions, health risks and economic conditions (Van Bavel et al., 2020), which can also affect mental well-being. By investigating how three distinct types of government responses moderate the relationship between individual characteristics (age and gender) and psychological distress, our study makes several contributions.

First, this study demonstrates that containment and closure policies affect psychological distress levels of women disproportionately. Women may be more affected by containment and closure policies due to more household and caring responsibilities or even domestic violence (Connor et al., 2020). Second, our results also show that health system policies increase psychological distress more for older individuals. While

Table 1
Results of multilevel model estimation (DV: Psychological distress).

	Model 1		Model 2		Model 3		Model 4	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Constant	0.482***	0.033	0.484***	0.032	0.483***	0.030	0.4777***	0.0330
Gender (female)	0.246***	0.009	0.246***	0.009	0.247***	0.009	0.2463***	0.0088
Age	-0.004***	0.001	-0.004***	0.001	-0.004***	0.001	-0.00442***	0.0005
Previous health	-0.195***	0.005	-0.195***	0.005	-0.195***	0.005	-0.1955***	0.0048
Tested positive for COVID-19	0.294***	0.062	0.293***	0.062	0.293***	0.062	0.2939***	0.0616
Household size	-0.035***	0.005	-0.035***	0.005	-0.034***	0.005	-0.0353***	0.0052
Partner	-0.082***	0.011	-0.083***	0.011	-0.084***	0.011	-0.0823***	0.0109
Containment & closure policies			0.003***	0.003				
Contain. & clos. pol. x Female			0.003***	0.001				
Contain. & clos. pol. x Age			0.00004	0.00005				
Health system policies					0.007**	0.003		
Health system policies x Female					0.002**	0.001		
Health system policies x Age					0.00011**	0.00004		
Economic policies							0.0019	0.0018
Economic policies x Female							-0.00005	0.0005
Economic policies x Age							0.00001	0.00003
Observations	51,467		51,467		51,467		51,467	
Log likelihood	-70,558.81		-70,550.41		-70,550.03		-70,558.24	
Wald chi2	3009.7***		3027.32***		3028.30***		3010.80***	

** and *** denote significance at 5% and 1% levels, respectively.

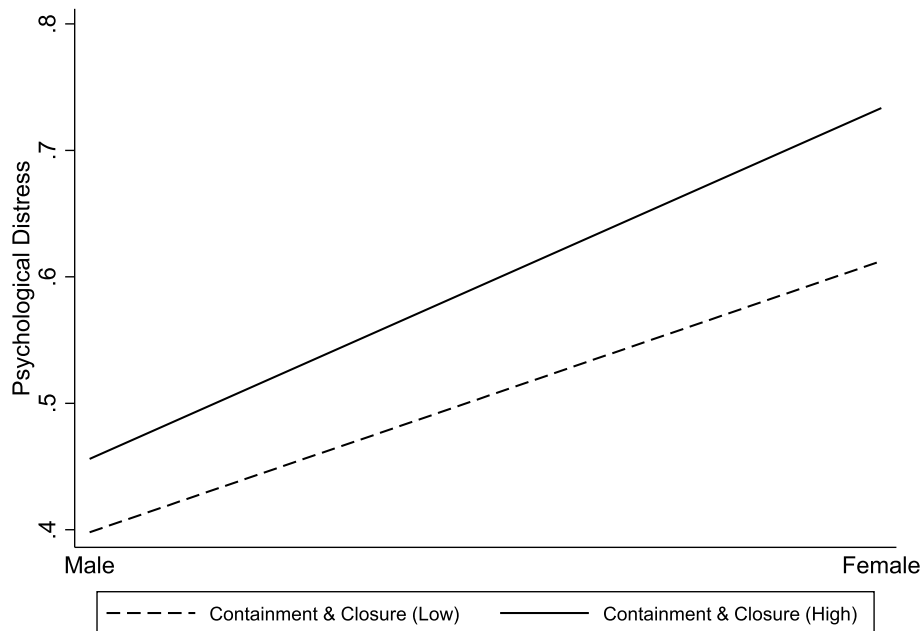


Fig. 1. Interaction Plot Containment & Closure Policies x Gender.

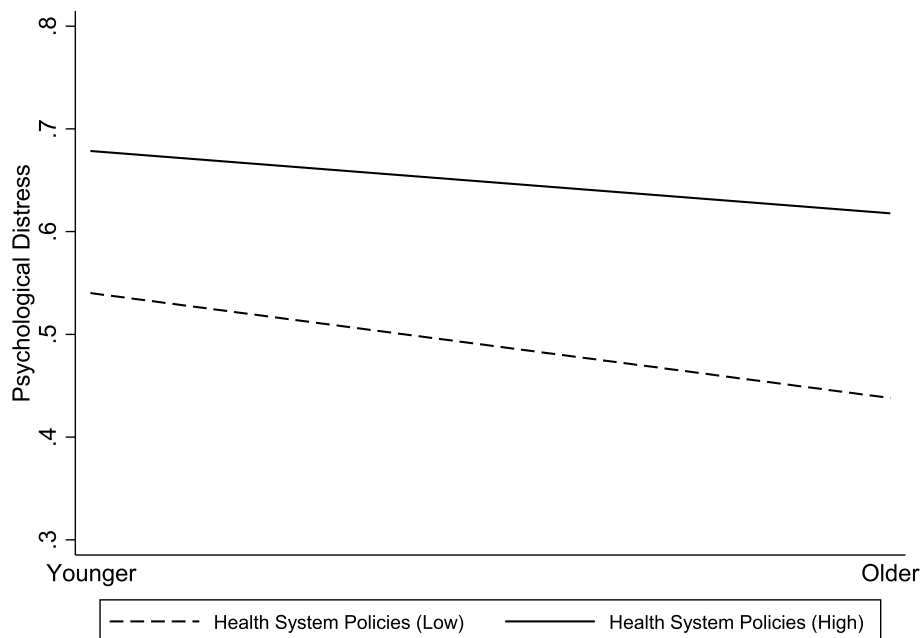


Fig. 2. Interaction Plot Health System Policies x Age.

our study found that older individuals have lower levels of psychological distress levels compared to younger individuals, more stringent health system policies, including extensive communication about COVID-19, may amplify the perceived health threat from the pandemic and increase psychological distress more for older individuals, who are more prone to health risks from COVID-19. Third, our study also shows that more stringent health system policies increase psychological distress more for women. Health system policies can signal the seriousness of the threat posed by COVID-19, and increase psychological distress for women, who are generally more concerned about health risks, compared to men. Finally, even though the COVID-19 pandemic has led to generally more financial risks for women and younger individuals (Alon et al., 2020; Fetzer et al., 2020), economic policies do not interact with gender or age to alleviate psychological distress. A possible

explanation for this is that economic policies make little material difference for individuals who receive them, or that people are unable to access economic aid, regardless of gender or age. By showing how different government responses interact with age and gender to predict psychological distress, this study enriches our understanding of the relationship between macro-level policy and individual-level psychological outcomes (Zacher and Rudolph, 2021) and extends research which investigates individual outcomes of government policies (e.g., Götz et al., 2021).

3.1. Practical implications

As women and younger individuals generally exhibit higher levels of psychological distress, these groups require more mental health support

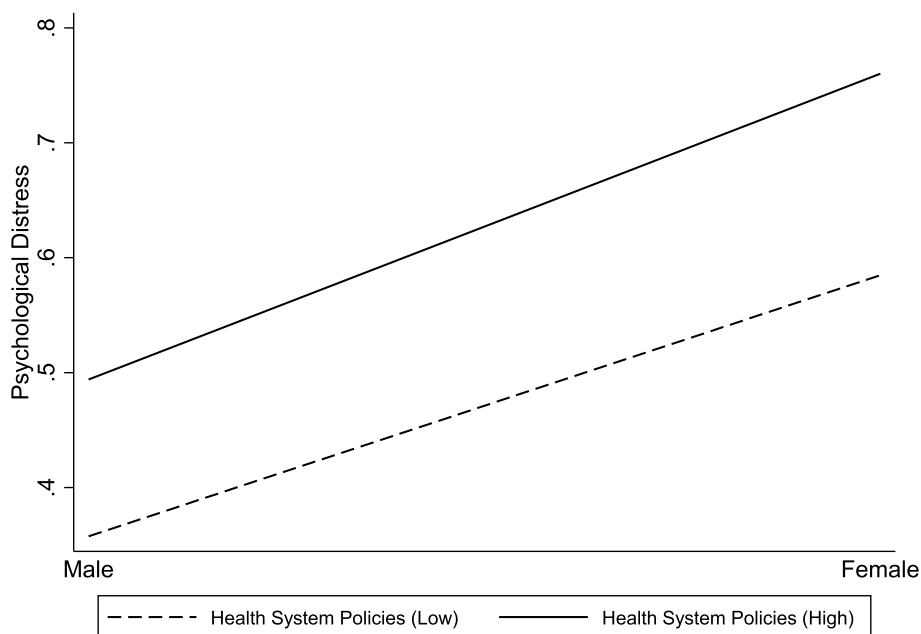


Fig. 3. Interaction Plot Health System Policies x Gender.

to cope with the adverse psychological effects of the pandemic. Women exhibit on average higher increases in psychological distress with more stringent containment and closure policies. Regulators may need to provide more interventions which address social isolation and domestic violence, or support for childcare and other domestic or caring responsibilities, which help to reduce the impact of containment and closure policies on women (e.g., Connor et al., 2020). More stringent health system policies are associated with higher increases in psychological distress for older individuals as well as for women. Government action in the context of health system policies therefore needs to be accompanied by communication targeted specifically at women as well as older individuals, which makes clear how government action serves to lower the risk of contracting COVID-19. This may reduce the perceived threat of COVID-19, leading to decreased psychological distress for women and older individuals.

3.2. Limitations and future research

The results of this study should be interpreted in light of several limitations. First, we do not measure to which extent and how people perceive government policies. However, in most countries, government communication and media coverage of policies regarding the COVID-19 pandemic is ubiquitous, so it is plausible to assume that individuals are commonly aware of government policies such as those discussed here. Nevertheless, future research might investigate how individuals perceive government communication and action as a moderator of the relationship between government responses and psychological distress. Furthermore, cross-country differences in psychological distress following the COVID-19 pandemic might be due to cultural or institutional differences. For instance, it has been suggested that countries with loose, more ‘rule-breaking’ cultures are more negatively affected by the COVID-19 pandemic (Gelfand, 2021). Future research might consider the role of cultural values, such as cultural tightness or looseness, collectivism or uncertainty avoidance in the context of individual responses to government action. Finally, future work may validate the results of this study with a sample which includes more individuals in younger age ranges.

Overall, the overall effect of government policies on the relationship between age and psychological distress as well as gender and psychological distress is comparably modest. It is conceivable that only a small

effect for government responses could be observed because of the timing of the survey data collection. The SHARE COVID-19 Survey was conducted between June and August 2020, when the incidence of COVID-19 in Europe was low, and deaths as well as hospitalization numbers attributable to COVID-19 had dropped, meaning that the threat from COVID-19 was perhaps considerably reduced for many individuals. This gives reason to assume that there might be a stronger impact of government responses at times when the perceived threat from COVID-19 is higher. This could be the case for colder months, which favor transmission of the coronavirus and which are associated with higher mortality and hospitalization rates, leading to repeated lockdowns which entail deleterious psychological and economic consequences. Future work might investigate the relationships hypothesized above during a time or in a location of heightened incidence of the coronavirus.

Credit author statement

Michael Koch: Conceptualization, Methodology, Software, Formal analysis, Writing – original draft, Writing- Reviewing and Editing, Visualization, Investigation. Sarah Park: Conceptualization, Methodology, Software, Formal analysis, Writing – original draft, Writing- Reviewing and Editing, Visualization, Investigation.

Declaration of competing interest

We have no conflicts of interest to disclose.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.socscimed.2021.114583>.

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