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Role of individual characteristics and national distancing policies for COVID-19 protective behaviour among older adults: a cross-sectional study of 27 European countries

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ABSTRACT

Objective Evidence on how individual characteristics and distancing policies during the first wave of COVID-19 together influenced health behaviours is scarce. The objective of this study is to fill in this gap by studying how the propensity to engage in protective behaviours in Europe was shaped by the interplay of individual characteristics and national policies.

Design Data on individual behaviour in 27 countries came from the 'Corona Survey' module of the Survey of Health, Ageing and Retirement in Europe, collected in summer 2020. As outcomes, we considered avoidant behaviours (never leaving home, reducing frequency of walks and reducing frequency of social meetings) and preventive behaviour (wearing a face mask). Among relevant policies, we considered stay-at-home restrictions, mask wearing policies and gathering restrictions. Individual characteristics comprised gender, health risk of COVID-19 (older age and poor health) and activity (employment and providing help to other households).

Participants Nationally representative samples of older adults (50 years and over), n=51 540 respondents (58% of women).

Results Active people (employed and helping other households) were more likely to wear face masks but less likely to use avoidant behaviours. People at health risk (older people and those in poor health) were more likely to use all types of protective behaviours. Protective behaviours were also more frequent among women than among men. Longer duration of distancing polices correlated with more frequent protective behaviours. Distancing policies reduced social differences in the rate of protective behaviours only in case of social meetings and mask wearing.

Conclusions Protective behaviours responded to distancing policies, but our results suggest that people used them voluntarily, especially if they were at health risk.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ We used individual data for 27 European countries for a population aged 50+ (N between 41 227 and 51 540 individuals).
⇒ The data were collected with a standardised and strictly comparable questionnaire.
⇒ It is the first analysis considering individual-level and country-level predictors of protective behaviours on a large cross-national sample.
⇒ The study is cross-sectional and does not account for the changes of policies over time.
⇒ The data did not allow analyses of cross-regional differences within countries.

INTRODUCTION

In the first half of 2020, when pharmaceutical measures were not yet available, protective behaviour was the only way to contain COVID-19.[1] The prevalence of protective behaviour targeting COVID-19 varied across countries, reflecting distancing policies such as stay-at-home orders, social gatherings limitations, or requirements to wear face masks.[2] However, under the same policies, the propensity to use protective measures differed among social categories. This paper contributes to the literature by studying how the interplay of individual characteristics and policies shaped protective behaviour among older adults in 27 European countries.

We conceptualise protective behaviours during the COVID-19 pandemic using the health belief model (HBM).[3 4] HBM lists factors which may shape the probability of health behaviour: (1) perception of threat (comprising the expected risk and severity of infection) and (2) evaluation of behaviour's effectiveness and perceived costs and barriers.[5] Additionally, cues to action (eg, governmental recommendations) and individual characteristics (eg, risk aversion) may also affect behaviours.[3]

Supporting HBM, past research showed that people who considered themselves more vulnerable (higher risk of infection) and more at health risk (higher expected seriousness of infection) of COVID-19 were

more likely to use protective behaviours, including physical distancing, hand sanitising, and mask wearing.[6–10] As COVID-19 was a greater health risk among older adults and those with coexisting diseases, protective behaviours were more common among older adults and those in bad health.[8–13] Also, risk aversion increased protective behaviours.[14] Consistent with the lower propensity of women to take risky behaviours, women were shown to be more compliant with distancing regulations than men: they were more prone to reduce mobility, sanitise hands often and wear masks.[10 12 15–18] On the other hand, barriers, such as being employed and obliged to work outside of home, reduced the rate of protective behaviours.[6–8]

However, not all protective behaviours are equal. In particular, the literature differentiates between *avoidant* behaviours, which are focused on avoiding situations perceived as risky (eg, never leaving home and reducing frequency of walks or social meetings), and *preventive* behaviours (eg, mask wearing and hand sanitising), which aim to reduce the probability of infection in risky situations.[19] Although both avoidant and preventive behaviours were recommended (sometimes enforced) by governments in response to the COVID-19 pandemic, barriers to avoidant behaviour could be higher than barriers to preventive behaviours, especially in more active segments of the population. For example, being employed could have made it impossible to never leave home but was likely compatible with mask wearing. Moreover, although preventive and avoidant behaviours all serve as protective measures, some substitution between them is possible. This happened in Italy when the end of the stay-at-home order forced people to return to their workplaces, which substantially increased mask wearing.[20] Extending this argument, different social groups may be more prone to use different protective behaviours. Specifically, employment or other types of activity may increase the rate of preventive behaviours but act as a barrier against avoidant behaviours. In contrast, being at higher health risk may increase the rate of both avoidant and preventive behaviours. Supporting this, risk avoidance seems to be the main motivation of using protective measures among older adults and those in poor health.[21] Considering the propensity of women to avoid risky behaviours in general, this also suggests their higher rate of preventive and avoidant behaviours alike.[10 12 15–18]

To our knowledge, no past research documented the differences in individual predictors of avoidant and preventive behaviours. Providing such evidence for Europe is the first goal of this article. Following the theoretical framework of the HBM and our reading of the literature, we formulate the following hypotheses:

H1a: Employment (or other activity) acts as a barrier to avoidant behaviours.

H1b: Employment (or other activity) facilitates preventive behaviours.

H1c: Older age and worse health (predictors of health risk of COVID-19), as well as being a woman (associated with risk aversion), facilitate avoidant behaviours.

H1d: Older age and worse health (predictors of health risk of COVID-19), as well as being a woman (associated with risk aversion), facilitate preventive behaviours.

Beyond individual characteristics, also the corresponding policies should affect the propensity of protective behaviours. In terms of HBM, policies and recommendations constitute cues for action, but enforcing policies (eg, through fines) may also affect costs of certain behaviours. Research confirmed that policies shaped the rate of mask wearing and mobility reductions.[12 17 22] However, strict distancing policies may not be necessary to shape individuals' behaviour. An American study showed that distancing policies explained almost none of mobility reduction in industries with high risk of virus transmission: people reduced their mobility in these sectors before introduction of policies, in response to mere recommendations.[22]

Plausibly, the effect of policies differed across social categories. Research showed that the gender gap in the intention to wear a mask almost disappeared if mask wearing was mandatory.[15 23] It is likely that distancing policies increased behaviours especially in social categories that were most resistant to given behaviour; such mechanism would reduce the importance of individual characteristics under distancing policies. On the other hand, however, policies might serve as a cue on how dangerous the epidemiological situation is. This implies that distancing policies may exacerbate the importance of individual characteristics for protective behaviours. Testing these competing predictions is the second goal of this paper:

H2a: Distancing policies reduced individual differences in protective behaviours.

H2b: Distancing policies increased individual differences in protective behaviours.

This study, to our knowledge, is the first analysis considering individual and country-level predictors of protective behaviours on a large cross-national sample. Most studies covered a limited (up to eight) number of countries, which hampered the possibility to systematically study the effects of policies.[16 24] Among exceptions, some studies relied on large international samples (77 or 60 countries), but these analyses did not explicitly measure policies.[3 10] To our knowledge, the only large-scale comparative study that accounted simultaneously for policies and behaviours measured behaviours merely on a regional and not on an individual level.[21]

METHODS

The data on individual behaviour came from the Survey of Health, Ageing and Retirement in Europe (SHARE).[25 26] SHARE is a cross-national, multidisciplinary panel study of people aged 50+ initiated in 2004 and coordinated by European Research Infrastructure Consortium. This analysis used data from the special 'Corona Survey' module, run on a subsample of regular panellists between June and August 2020. The data were collected using

computer-assisted telephone interviews in 26 European countries and Israel; the sample included people aged 50 or more and their spouses.[27] The total sample included 52 061 respondents; country samples varied between 787 in the Netherlands and 4519 in Estonia.

Measures

Our dependent variables recorded protective behaviour of respondents. Avoidant behaviours comprised (1) not leaving home since the beginning of the pandemic (yes/no), (2) frequency of walks (never/less often than before COVID-19/the same/more often) and (3) frequency of social meetings (never/less often than before COVID-19/the same/more often). Preventive behaviours included (4) frequency of mask wearing when outside of one's home in a public space (always/often/sometimes/never). The Corona Survey recorded also other types of behaviour (such as keeping physical distance from others or sanitising hands); however, the four behaviours mentioned earlier corresponded most closely to policies implemented by governments.

Among individual-level characteristics we studied, age (linear and quadratic components) and health before the pandemic as measures of potential health risk associated with COVID-19 infection. We included linear and quadratic components of age to allow for non-linear relationship between health and protective behaviour: plausibly, age difference play a smaller role among people in their 60s but may be much more important at advanced old age. (In the main analysis, we estimate linear effects of poor prepandemic health; an additional analysis in online supplemental table 1 showed that including health as a categorical variable produced results fully consistent with our main analysis.) Additionally, we included two measures of activity which might constitute barriers to avoidant behaviours: employment status at the beginning of the pandemic and providing help to other households during the pandemic. Finally, we accounted for gender, as women were shown to be more prone to protective behaviours.

Individual controls included household structure (single-person household/with partner only/with partner and other people/with other people only) to control for the cross-country differences in population structure of older adults, which could be correlated with the propensity to use protective measures. We also controlled for past experience with COVID-19 ('Did you or anyone close to you experience symptoms that you would attribute to COVID-19, for example, cough, fever or difficulty breathing?' with answers yes/no), a likely confounder because COVID-19 experience might correlate with protective behaviour and distancing policies. All cases with missing data on any of the individual variables were excluded listwise.

Data on policies came from the 'Our World in Data' database (Oxford Policy Tracker, https://ourworldindata.org/coronavirus), which provides harmonised statistics on the development of the COVID-19 pandemic and tracks the policy responses.[2 28] As individual data described behaviour over a period of about 4 months ('since the beginning of the pandemic'), we measured policies as duration of the period when strict distancing policies were in force. We focused on policies which regulated the behaviours of interest: (1) requirement not to leave the house with exceptions (as opposed to 'recommendation only' or 'no policy'); (2) requirement to wear masks when social distancing was not possible (vs 'required in some specific places only', recommendation only or no policy); and (3) restrictions on gatherings of fewer than 10 people (vs 'less strict restrictions'). For each policy, we used the length of the period (between 1 March and 30 June) when the policy was in force in a given country, expressed in months. Out of 27 countries considered in this paper, 7 countries did not make masks obligatory in spring 2020, and six countries did not introduce stay-at-home order (ie, in these countries, the duration of policies was 0). For details of country-level variables, see online supplemental table 2.

To control for severity of pandemic in a country, we included the maximum recorded daily number of deaths per million of population[2 28]; this is a possible confounder because it may correlate with distancing policies and with the prevalence of protective behaviour. All variables are summarised in table 1.

Analytical methods

We used the statistical method of multilevel regression. Multilevel regression controls for clustering of individual observations within countries, and it is the method of choice for cross-national comparative data, especially for estimating effects of country-level characteristics, such as policies.[29] We estimated random intercept models, which assume that the cross-country variation of protective behaviour has a random component. To investigate the effects of individual characteristics and policies on prevalence of protective behaviours, we inspected the main (fixed) effects of relevant variables. To investigate social differences in the effects of policies (H2a and H2b), we inspected cross-level interactions, that is, interactions between individual characteristics and policies. For dichotomous outcome (never leaving home), we estimated multilevel logistic regression models; for ordered categorical dependent variables, we estimated ordered logit models. As effect sizes from such models are difficult to interpret, we additionally present the predicted probabilities of protective behaviour.

Patient and public involvement

It was not appropriate or possible to involve patients or the public in the design, conduct, reporting or dissemination plans of our research.

RESULTS

Descriptive results

Figure 1 presents the cross-country variation in the prevalence of protective behaviours and duration of distancing

Table 1 Sample characteristics

	Mean or %	SD	Min	Max	Nr obs
Individual-level variables					
Never left home since the outbreak	18%		0	1	51 784
Walked more often (1)	11%		0	1	41 377
Walked the same (2)	43%		0	1	41 377
Walked less often (3)	31%		0	1	41 377
Walked never (4)	15%		0	1	41 377
Meetings more often (1)	1%		0	1	41 369
Meetings the same (2)	11%		0	1	41 369
Meetings less often (3)	32%		0	1	41 369
Meetings never (4)	56%		0	1	41 369
Masks never (1)	19%		0	1	42 235
Masks sometimes (2)	11%		0	1	42 235
Masks often (3)	12%		0	1	42 235
Masks always (4)	58%		0	1	42 235
Woman	58%		0	1	52 061
Age in 2020	70.56	9.3	50	104	52 061
Excellent health before the pandemic (–2)	7%		0	1	51 773
Very good health before the pandemic (–1)	16%		0	1	51 773
Good health before the pandemic (0)	44%		0	1	51 773
Fair health before the pandemic (1)	26%		0	1	51 773
Poor health before the pandemic(2)	7%		0	1	51 773
Poor health before the pandemic	0.11	1.0	–2	2	51 773
Employed	21%		0	1	52 061
Provided help to other households	15%		0	1	52 061
Household: single person	24%		0	1	52 060
Household: partner only	53%		0	1	52 060
Household: partner and others	17%		0	1	52 060
Household: others, no partner	7%		0	1	52 060
Somebody had symptoms	11%		0	1	51 582
Country-level variables					
Required to stay home (months)	1.0	0.8	0.0	2.5	27
Restrictions on gatherings of 10 people or less (months)	2.1	0.7	0.7	3.5	27
Mask wearing required (months)	1.4	1.0	0.0	3.1	27
Policy Stringecy Index >70 (months)	1.2	0.7	0.0	2.2	27
New deaths per million	22.8	11.5	7.8	46.9	27

Source: Own calculation based on SHARE Corona Survey (June–August 2020) and Ritchie *et al*.[28]
Max, maximum; Min, minimum; Nr obs, number of observations; SD, standard deviation; SHARE, Survey of Health, Ageing and Retirement in Europe.

policies. Little over 18% of respondents declared that they never left home between the outbreak of the pandemic and the study period (June/July 2020). The variation among countries was large, with the lowest value in Denmark (2.2%) and the highest value in Malta (49.7%). Among older adults who ever left their homes, 46.2% reduced frequency of walks (11.8% in Denmark, 91.4% in Romania), 56% never met five or more persons from outside of their household (22.1% in Slovakia, over 70% in Luxembourg, Slovenia and Italy), and 58% declared always wearing a face mask in public (1% in Netherlands and Denmark, 90% in Luxembourg, Portugal and Italy).

Not only behaviour but also policies showed considerable cross-country variation. Between 1 March and 30 June 2020, stay-at-home policies lasted on average 1 month (from 0 month in Denmark, Sweden, Finland,

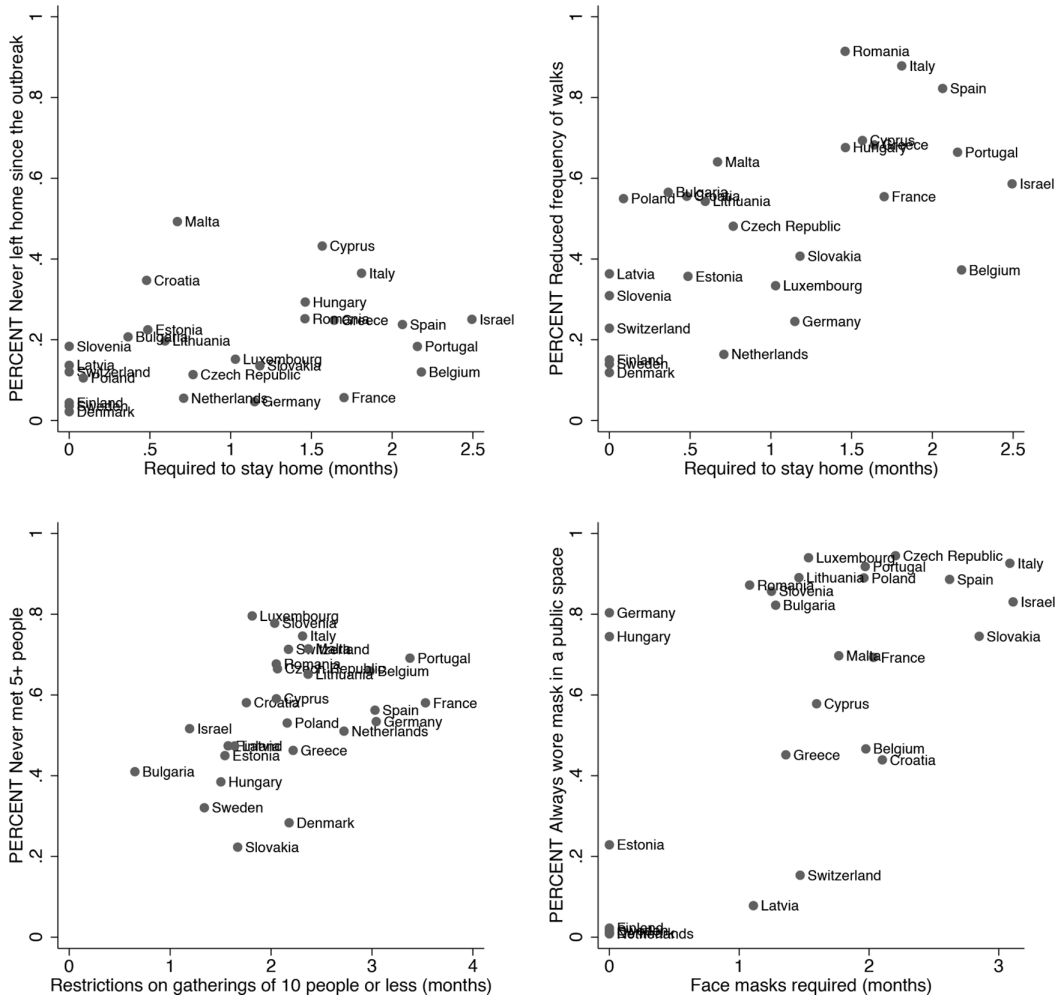

Figure 1 Prevalence of protective behaviour versus national distancing policies.

Switzerland, Latvia and Slovenia to 2.5 months in Israel), restrictions on gatherings of 10 or fewer people lasted on average 2.1 months (from 0.7 in Bulgaria up to 3.5 in France), and face masks were required for on average 1.4 months (from 0 month in Denmark, Finland, Hungary, Estonia, Germany, the Netherlands and Sweden up to 3.1 months in Israel).

Figure 1 suggests a link between duration of distancing policies and protective behaviours: overall, longer policies correlated with a higher propensity of behaviour. However, the variations in behaviours for a specific duration of policies was considerable. For instance, with over 2 months of stay-at-home order, over 80% of respondents reduced walk frequency in Spain, but only 40% reduced walks frequency in Belgium. Among countries where face masks were not required by national policies, over 70% of respondents in Hungary and Germany always wore them, whereas almost nobody always wore masks in Finland, Denmark and the Netherlands. In Malta, where about 50% of respondents never left their homes, stay-at-home order lasted less than a month. These examples suggest that policy restrictions were only one among various factors shaping people's behaviours: people voluntarily adjusted their behaviour (probably in response to recommendations or information) even if distancing policies were absent or short-term.

Multivariate analysis

Table 2 shows the results of multivariate regression of protective behaviours on individual and country-level characteristics. (For a simpler model without cross-level interactions, see online supplemental table 3.) We expected (H1a) that employment or other activity (providing help to other households) may constitute a barrier to avoidant behaviours, such as never leaving home, reducing walks and reducing social meetings. Consistently, the odds of avoidant behaviours were lower among employed than among non-employed and were lower among people providing help to other households than among people not providing help. The effects of employment and providing help to other households were statistically significant for all types of avoidant behaviours, which support the hypothesis.

We also postulated (H1b) that employment or other activity facilitated preventive behaviours. In fact, probability of mask wearing was higher among employed than among non-employed. However, the probability of mask

Table 2 Prevalence of protective behaviour as a function of individual-level and country-level predictors

	Model 1		Model 2		Model 3		Model 4	
	Never left home		Frequency of walks		Frequency of social meetings		Frequency of wearing a face mask	
	OR	SE	OR	SE	OR	SE	OR	SE
Individual-level predictors								
Woman	1.39***	(0.04)	1.23***	(0.02)	1.42***	(0.03)	1.66***	(0.04)
Age (centred at 70, per 10 years)	1.62***	(0.03)	1.11***	(0.02)	1.19***	(0.02)	0.99	(0.02)
Age squared (centred at 70, per 10 years)	1.19***	(0.02)	1.10***	(0.01)	1.01	(0.01)	0.95***	(0.01)
Poor physical health before the pandemic	1.52***	(0.02)	1.40***	(0.02)	1.17***	(0.01)	1.10***	(0.01)
Employed at the beginning of the pandemic	0.44***	(0.02)	0.85***	(0.02)	0.58***	(0.02)	1.07*	(0.04)
Provided help to other households	0.41***	(0.02)	0.81***	(0.02)	0.91***	(0.02)	1.01	(0.03)
Household: single person (ref: partner only)	1.02	(0.03)	1.07**	(0.03)	0.85***	(0.02)	0.84***	(0.03)
Household: partner and others (ref: partner only)	1.28***	(0.05)	1.08**	(0.03)	0.92**	(0.03)	0.98	(0.03)
Household: others, no partner (ref: partner only)	1.39***	(0.07)	1.13**	(0.05)	0.91*	(0.04)	0.78***	(0.04)
Somebody had symptoms	0.85**	(0.04)	0.86***	(0.03)	0.97	(0.03)	1.17***	(0.04)
Country-level predictors and cross-level interactions†								
1 additional month of requirement to stay at home	1.51	(0.41)	1.60+	(0.38)				
×Woman	1.02	(0.03)	1.12***	(0.03)				
×Age	0.93***	(0.02)	0.94***	(0.02)				
×Poor physical health	0.96+	(0.02)	1.02+	(0.01)				
×Employed	0.92	(0.06)	0.90**	(0.03)				
×Provided help	0.88+	(0.06)	0.95+	(0.03)				
1 additional month of restrictions on <10 people					1.47*	(0.27)		
×Woman					0.89***	(0.03)		
×Age					1.00	(0.02)		
×Poor physical health					0.95**	(0.02)		
×Employed					1.38***	(0.06)		
×Provided help					0.99	(0.04)		
1 additional month of masks required							2.45**	(0.81)
×Woman							1.05+	(0.03)
×Age							0.97	(0.02)
×Poor physical health							0.95***	(0.01)
×Employed							0.95	(0.03)
×Provided help							0.91**	(0.03)
1 additional month of Policy Stringency Index >70	1.09	(0.33)	1.49	(0.41)	1.00	(0.17)	4.65***	(2.17)
Deaths per million (maximum March–June 2020)†	0.99	(0.02)	0.98	(0.01)	1.00	(0.01)	1.04	(0.03)
Random effects								

Continued

Table 2 Continued

	Model 1		Model 2		Model 3		Model 4	
	Never left home		Frequency of walks		Frequency of social meetings		Frequency of wearing a face mask	
	OR	SE	OR	SE	OR	SE	OR	SE
Random intercept (variance)	0.71		0.58		0.31		2.02	
Number of countries	27		27		27		27	
Number of respondents	51 540		41 232		41 227		42 086	

Source: Own calculation based on SHARE Corona Survey (June–August 2020) and Ritchie *et al*.[28]
Multilevel logistic (model 1) and multilevel ordered logit (models 2–4) models with cross-level interactions of individual characteristics and national policies.
*+ P<0.10, P<0.05, **P<0.01, ***P<0.001.
†All country-level variables are centred on grand average.
OR, odds ratios; SE, standard errors; SHARE, Survey of Health, Ageing and Retirement in Europe.

wearing was not related to providing help to other households. Hence, the support for H1b was only partial.

Furthermore, we expected (H1c) that higher health risk of COVID-19, as approximated by older age and worse health, as well as women's propensity to avoid risks, positively correlated with avoidant behaviours. Indeed, the odds of avoidant behaviours were higher at older age and for individuals with worse prepandemic health. The effect of age was quadratic for never leaving home and for reducing the frequency of walks, whereas propensity to reduce social meetings increased linearly with age. (For detailed analysis modelling health as a categorical variable, see online supplemental table 1.) Moreover, the odds of all avoidant behaviours were higher among women. The aforementioned patterns are consistent with hypothesis H1c.

Hypothesis H1d postulated that health risk of COVID-19 and women's risk aversion facilitated also preventive behaviours, that is, mask wearing. However, in our estimates, the odds of mask wearing did not differ linearly with age: they were highest around the age of 70 and were lower among the younger and older respondents. (For an illustration of health effects for protective behaviours, see online supplemental figure 1.) Nonetheless, the probability of mask wearing was higher among people with worse prepandemic health and was higher among women than among men. The support for H1d is therefore partial.

Models in table 2 show also the effects of policies. Two policies seem to have systematically affected behaviour: longer duration of gathering restrictions increased the odds of reducing social meetings, and longer duration of policies requiring mask wearing increased the propensity to wear a mask. The duration of stay at home order was not related to the odds of never leaving home and correlated with the odds of reducing walks only in the model without cross-level interactions (online supplemental table 3). Additionally, the longer the duration of stringent policies, the higher was the prevalence of mask wearing, which suggests that aspects of policies not directly related to mask wearing served as cues informing people that the epidemiological situation was serious, which could indirectly encourage wearing masks.

An additional analysis excluded the countries which did not introduce the respective policies (see online supplemental table 4) and showed that the effect of mask wearing policies was driven by the difference between countries where masks were and were not compulsory. In other words, once the policy has been introduced, the duration of policy did not correlate with propensity to wear masks. However, the cross-level interactions in online supplemental table 4 inform that longer mask wearing policies increased the propensity to wear masks in specific groups: among women and older respondents.

To inspect the interplay of policies and individual characteristics, we focus on the cross-level interactions (table 2), which inform about differential effects of policies in various groups. The pattern of results was mixed. First, for some outcomes, longer duration of distancing policies reduced social differences in protective behaviours. This applied to never leaving home: longer stay-at-home order reduced mobility among older people less than among the young, which contributed to closing the age gap. A similar pattern showed up also for reducing the frequency of social meetings: longer gathering restrictions reduced social meetings among employed people (OR=1.38, p<0.001), men (OR=0.89, p<0.001) and healthier persons (OR=0.95, p<01) more than among (respectively) the inactive, women and people in worse health. This decreased social differences (between employed and non-employed, between men and women, and between people with excellent and poor health) in reduction of social meetings. Similarly, longer enforcement of mask wearing reduced health differences in the propensity to wear a mask. These patterns are consistent with the hypothesis (H2a) that longer duration of distancing policies reduced social differences in protective behaviours.

However, this pattern was not universal. In particular, longer stay-at-home order reduced women's propensity to

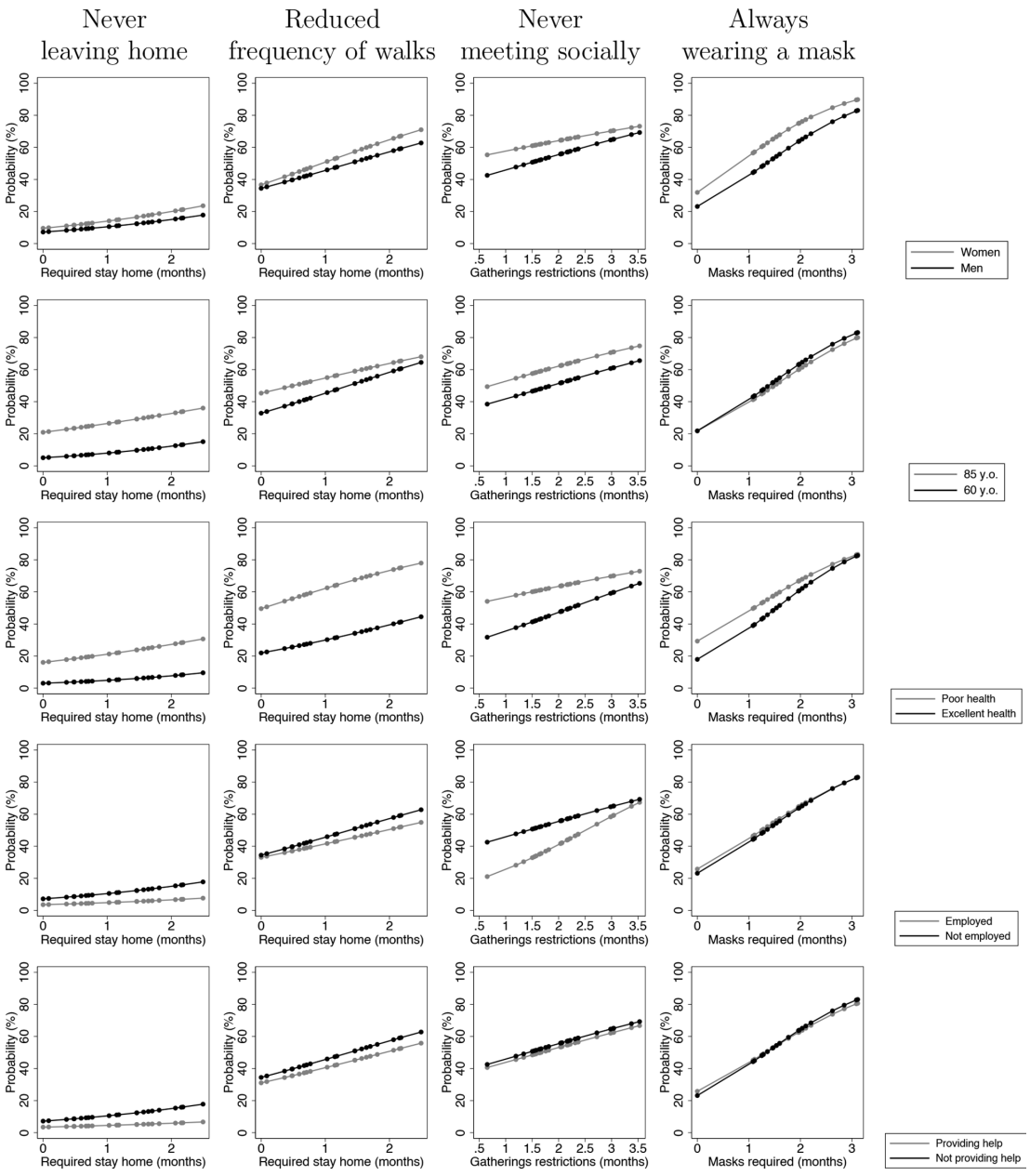

Figure 2 Predicted probabilities of using protective measures as a function of distancing policies in various categories of older adults.

walk more than it reduced men's, thus increasing gender differences in reducing walks. Also the differences in walk reduction between employed and inactive people were greater under longer stay-at-home order. This pattern is consistent with hypothesis H2b, suggesting that, in some cases, distancing policies served as a cue that epidemiological situation is serious.

Figure 2 shows predicted probabilities to give an overview of effect sizes. The predictions show that the gender gap in avoidant behaviours amounted to less than 10–15 percentage points, whereas the activity gap (ie, the effect of being employed or providing help to other households) only exceptionally exceeded 10 percentage points. The biggest was the effect of prepandemic health: the gap in avoidant behaviours between those in poor health and those in excellent health was in most cases above 15 or 20 percentage points. The gaps were visibly smaller for preventive behaviour (ie, mask wearing) than for avoidant behaviours. Finally, social differences in never leaving home were larger in countries with longer duration of distancing policies. In contrast to that, social differences in meeting frequency and mask wearing typically reduced with longer duration of distancing policies.

Recognising the importance of gender differences, we run an additional analysis inspecting gender differences in the effects of cross-level interactions (see online supplemental table 5). Our results showed few gender differences in the determinants of protective behaviours, suggesting that the patterns described in this paper hold for men and women alike.

DISCUSSION

This study assessed how the interplay of individual characteristics and national policies shaped the prevalence of COVID-19 protective behaviours among older adults during spring 2020. Social groups differed in the propensity to use protective behaviours. Being employed and providing help to other households increased (although slightly) the probability of mask wearing but reduced avoidant behaviours, such as never leaving home, reducing frequency of walks or social meetings. In contrast, old age and poor health were associated with higher propensity of almost all protective behaviours (the only exception was mask wearing, which was not higher among older people). Additionally, the rate of all protective behaviours was higher among women than among men. Longer duration of distancing polices correlated with more frequent protective behaviours, but behaviours seemed to be shaped also by other factors, probably recommendations and information. Moreover, the effect of duration of policies imposing mask wearing captured mainly the difference between countries which introduced compulsory masks and countries that did not. Finally, distancing policies reduced social differences in the rate of protective behaviours only in case of social meetings and mask wearing.

The strength of this analysis lies in the broad cross-national data for 27 countries, which allowed us to simultaneously account for national policies and individual characteristics. Such a set-up, integrating policy-level and individual-level predictors, is rare in the literature. The main limitation of our study is that the measures of policies were unavoidably a simplification of a very complex reality. For instance, the rules might have been to a various degree enforced by authorities (eg, the risk of receiving a fine in case of non-compliance could differ among countries), which plausibly affected protective behaviours. Moreover, some policies were introduced on subnational level (eg, regional), but neither the individual nor policy measures used in this analysis allowed an analysis across regions. The second limitation is that policies and behaviours changed over time. Our data did not allow a dynamic analysis and provided a snapshot summarising the period between March and June 2020. Finally, our results pertain to the early stage of the pandemic and may not accurately represent the patterns of behaviour in later periods.

In practical terms, our study contributes to the body of evidence on the effectiveness of policies in shaping people's behaviour. Our results suggest that, although policies shaped protective behaviour, their role was limited: some social groups, in particular those at health risk, used protective behaviours even in the absence of policies or if the distancing policies were introduced for brief periods. Probably such behaviours responded to recommendations and information. This conclusion is aligned with previous research,[22] showing that protective behaviours were chosen voluntarily before introduction of distancing policies. This suggests that not only the policies but also softer measures (such as recommendations and information) may effectively shape people's behaviour.

The second results with practical implication are the social differences in the rate of protective behaviours. This is especially important, considering that some behaviours, especially the avoidant ones, may negatively affect mental health.[30] Especially people at health risk were likely to resort to avoidant behaviours even in the absence of policies. Despite vaccination programmes, COVID-19 infection will remain a health risk for a fraction of society. Monitoring and reducing the mental health consequences of long-term avoidant behaviours in these groups should be among policy goals.

Our results describe behaviours during spring and summer 2020 and may not be valid in later periods. Verifying these patterns for other periods and countries may be the topic of future studies. Moreover, our results suggest that—above and beyond distancing policies—also recommendations and information were driving protective behaviours. However, due to data limitations, we were not able to verify of these conclusions. Future research may do this if suitable data become available. Finally, understanding mental health consequences of restrictive policies and protective behaviours is indispensable for informed policy choices during the further stages of this and perhaps other pandemics. For this reason, a systematic evaluation of mental health consequences of behaviours and policies is a promising avenue for future studies.

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