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Risky restrictions? Mobility restriction effects on risk awareness and anxiety

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ABSTRACT

Although mobility restrictions during the COVID-19 pandemic were intended to change behaviours by influencing risk awareness, they might have prompted a rise in risk anxiety ('worry for one's health') both among individuals exposed to such restrictions and those living in border countries. This paper studies this question by examining survey data from 22 European countries in the first wave of the COVID-19 pandemic (March 20th and April 6th 2020). Drawing on an event study analysis we show that COVID-19 mobility restrictions raised individuals COVID-19 *risk awareness* both in the exposed and border countries for almost a week after the announcement. The spillover effect on border countries accounts for about 67% of the effect in the exposed country. However, mobility restrictions gave rise to an increase in *risk anxiety* in low-risk countries (which is between 4 and 7 times higher than moderate and high-risk countries). These effects are heterogeneous across age, education and socioeconomic status.

1. Introduction

The COVID-19 pandemic is qualitatively different from previous pandemics. The publc exposure to the spread of COVID-19 cases and risk information has been unprecedented [1]. COVID-19 has shown a greater transmission rate than any previous pandemics and has posed extremely serious challenges to health systems, including the risk related to the congestion of emergency care services [2]. Accordingly, almost all countries, have implemented some type of mobility restrictions as a risk mitigation strategy [3]. Such restrictions are intended not only to slow the spread of the virus, but to *raise awareness* in the population about the risk associated with COVID-19 so that individuals engage in protective behaviours [4,5]. This is important because individual reluctance to wear a mask and to engage in social distancing is explained by low-risk awareness [6]. However, the release of daily information on cases and fatalities, can engender a sense of health related unease, which we define as risk anxiety'. Such risk anxiety can be harmful to a person's mental health and increase the use of otherwise unnecessary care, at a cost to the health system.

Evidence from previous pandemics suggests that strengthening risk communication, by reporting on a daily basis the number of cases and deaths in a pandemic, increases the awarness of the risk of infection among the population. Higher risk awarness is important for individuals to engage in essential and low-cost protective behaviours, such avoiding handshaking and frequent hand washing [7], which result in lower risk of contagion [8]. However, we do not know what the appropiate level of risk is at which health autorities should prompt the implementation of mobility restrictions. That is, how should policy makers trade-off increased risk awareness (which is critical to protect the population against an interdependent risk such as COVID-19) with risk anxiety, which has a negative impact on the population's mental health. This paper contributes to providing an adequate response to such a question [9].

In this paper we examine cross-country survey data and we exploit the variation in individuals' risk awarness and risk anxiety after the implementation of mobility restrictions in countries exposed to high and low-risk of COVID-19 as defined by the COVID-19 Risk Index, which takes into account the number of infection cases, as well as cases of individuals recovered. Our data is comprised of individual observations of 22 European countries, with samples collected between March 20th and April 6th, 2020. Using an event study design, we investigate the impact of policy restrictions (and those of a neighboring country) on risk anxiety and risk awareness [10].

We report four sets of findings. First, we show that mobility

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restrictions in both an individual's home country and its neighboring countries influence both risk awareness and risk related anxiety. Second, while the announcement of mobility restrictions is associated with a higher risk awareness in high-risk countries, the impact of these measures on risk anxiety is greater in low-risk countries (4.6 and 7 times higher than moderate and high-risk countries). Finally, in low-risk countries, the announcement of restrictive measures is associated with increased trust in government performance, which increases in 9 percentage points (pp) on the day after the announcement, an increased compliance with health recommendations (e.g., stay at home).

2. Related literature

Following the World Health Organization's declaration of COVID-19 as a pandemic (March 11th, 2020), nearly all countries and territories implemented mobility restrictions, saving at least three million lives [11]. Mobility restrictins were effective, and specifically, Jacobsen et al. [12] estimates an average decrease in population mobility in the United States of about 30% in states without stay-at-home orders which compares to 40% in states with stay-at-home orders. Indeed, Alexander et al. [13] documents a 6–7% reduction in mobility at the county level in the two days following the stay-at-home order's entry into force.Consistently, such mobility restrictions influence risk awarness and perceptions. For instance, Wise et al. [14] show that the perceived risk of contracting COVID-19 increased dramatically within 5 days after WHO declared COVID-19 a pandemic. According to Jarvies et al. [15], physical distancing measures implemented in the UK helped to reduce the levels of contact, which led to lower cases and hospitalizations. Similarly, Davies et al. [16] show that prolonged lockdown periods help prevent hospital overcrowding.

Nonetheless, while raising risk awareness is important to steer individuals' protective behaviours, mobility restrictions can have significant behavioral costs, such as anxiety, post-traumatic stress disorder, confusion, and anger [17]. However, behavioral responses vary by gender and age. Whilst men are more hesitant to comply with protective measures [18,19], older people are more likely to comply with mobility restrictions. However, existing evidence is mostly country-specific, and it does not always take advantage of the rich cross-country variation in risk exposure and policy restrictions. Finally, previous literature does not consider the interplay of risk awareness and anxiety. This will be the main focus of the rest of the paper.

3. Materials and methods

3.1. Risk Information processing

In a pandemic such as COVID-19, individuals can re-evaluate their risk judgments based on the daily release of information on cases and deaths. One way to model such judgments is to assume that individuals form their risk judgments using a partial learning model in which they weight new risk information against prior beliefs (as if they were Bayesian learners). Hence, if we classify all sources of information in terms of prior risk assessment (q_i), experience (E_i) and information (INF)), the three information sources are expected to influence the risk judgements of an individual i (p_i), in addition to random influencess captured y the parameter e_i i Eq. (1). Experience not only refers to the circumstances linked to COVID-19, but also is influenced by individual characteristics such as age, gender, education, and health status (comorbidities). Individuals awareness of risk affects the utility gain of mobility decisions U(p_i), which includes the detrimental effects on mental health defined as risk anxiety.

We distinguish two sources of information, namely: (i) epidemiological information (INF_{EP}) referring to the number of confirmed cases, number of deaths and number of cases recovered which individuals learn from the media (both traditional media such as press, radio and television), and other sources such as digital newspapers and social networks), and (ii) government's announcements (INF_{GOV}) of the implementation of new mobility restrictions which can range from less severe ones such as national mobility restrictions, flight restrictions, non-essential shops closure, to those that bring the economy to a standstill (lockdowns and interruptions of essential activities). Hence, risk awareness and risk anxiety result from the following estimate:

$$p_i = \vartheta_1 q_i + \vartheta_2 E_i + \vartheta_3 INF_{EP} + \vartheta_4 INF_{GOV} + ei \quad (1)$$

Given that governmental risk information not only influences p_i, but it can influence individual's risk anxiety (worries about one's health), in providing risk information and putting forward mobility restrictions, governments should trade off the positive effects of risk information updating on risk awarness, and the detrimental effect on risk anxiety [17,20].

Risk awareness refers to , the awareness of the potential hazards that can result in individual harm [21]. We measure risk awareness with the number of self-reported COVID-19 cases, and risk anxiety with the level of concern about one's health. Risk anxiety refers to percevied bodily sensations or changes, including but not limited to those associated with infectious diseases (e.g., fever, coughing, aching muscles), as symptoms of illness [22].

3.2. Data

Our data has been collcted using a survey launched online through the website https://COVID19-survey.org/ [23]. The questionnaire was translated into 69 languages. The first call of the online survey was published via social media on 20th March 2020. In the period between March 20th and April 6th, 103,153 questionnaires were collected from 178 countries.[1] All the information collected in the surveys is available without restrictions at https://osf.io/3sn2k/.[2] Our sample includes individuals from 22 European countries, which makes a final sample of 48, 026 individuals (Table B1 provides the sample size by country). We have focused our attention on European countries because at the time of the survey, the pandemic was hitting the European continent harder than the Americas (250,516 confirmed cases in Europe vs. 60,834 in America; 11,986 deaths in Europe vs. 813 in America; WHO, 2021).

3.3. Dependent variables

Risk awareness refers to the subjective perception of the exposure to COVID-19 in each country. The survey elicits the individually reported total numbers of infected individuals in each country which has been weighted by million population.

Risk anxiety ('worry about one's health') refers to the individual self-reported concern (worry) about their own health on a scale of 1 to 5. That is, how each individual perceives the COVID-19 pandemic is going to affect their '*personal health*'. For a more accurate interpretation of the results, the variable has been transformed to a scale of 1 to 100. Descriptive statistics for dependent variables are shown on Table B1.

3.4. Controls, risk exposure and mobility restrictions

Individual level controls. Given that risk awareness and risk anxiety are influenced by several alternative drivers, we control for socio-demographic characteristics such as age, gender, number of comorbidities, household income before taxes and the number of years of education of the respondent. Descriptive statistics of the explanatory variables are displayed in Table B2. The rationale for the inclusion of these covariates refers to evidence that COVID-19 risk awareness

[1] Pierce et al. (2020) also use data from an only survey but with a shorter interview window (April 23rd-30th).

[2] We thank Fetzer et al. (2020) for the availability of the database and the description of the questionnaire.

increases with age [24], and men generally report lower levels of perceived risk [25] Finally, low socioeconomic status (proxied by income adjusted for household size and years of education) is associated with a higher probability of COVID-19 contagion [26].

Epidemiological risk exposure: during the first wave of the COVID-19 pandemic, individuals could update their risk information from several information sources almost in real time. Hence, both risk awareness and risk anxiety are likely to depend on the release of epidemiological information. Given that the survey instrument used in this study is an online survey, respondents are expected to be sensitive to the almost immediately released on line information. Hence, it is even more plausible that respondents are immediately awarness of any publicly available statistical data on the evolution of the pandemic cases and deaths in their country. Using data from the Coronavirus Pandemic Data Explorer, we compute the number of confirmed cases, recovered episodes and COVID-19 deaths per 1,000,000 inhabitants by country and date. Descriptive statistics by country are displayed in Table B1.

Government restrictions: Table A1 lists government mobility restrictions in 22 countries including the day of the announcement of such mobility restrictions (schools/universities closures national movement restrictions, international mobility restrictions, flight restrictions, non-essential shops closure, events cancelled, lockdowns, use of compulsory face masks) in chronological order between March 5th and April 2nd.

Fig. B1 reports the number of confirmed and self-reported COVID-19 cases (per 1,000,000 inhabitants) and the country average risk anxiety (worry about one's health for each country). Dashed lines depict the announcement of restrictions by national governments during the period of analysis, and straight dashed lines correspond to the introduction of mobility restrictions in neighbouring countries. For example, in the UK we observe a spike on the 5 April that may be related to the hospitalisation of Prime Minister Boris Johnson[3], and in Spain a spike on 31 March may be related to the fact that the head of Spain's Centre for Health Emergencies (Fernando Simón) also tested positive for coronavirus[4].

We define two binary variables: (i) "national restrictive measures" taking the value 1 on the day a restriction is announced in a country, and (ii) given that countries are exposed to information externalities, we consider restrictive measures imposed in neighbouring countries. Accordingly, we compute a binary variable measuring "restrictions in border countries" which take the value 1 if a restrictive measure has been adopted in a border country for each day of the survey. Table A2 desribes which are the border countries for each of the 22 countries in the sample and Table A3 displays the list of mobility restrictions anounced in those countries that are not part of the sample but exhibit a border with countries in our sample .

3.5. Empirical strategy

Our empirical strategy relies an event-study approach, based on the assumption that there have been no other events during the event window considered as follows:

$$Y_{ict} = \gamma_0 INF_{ct}^{EP} + \sum_{j=-7}^{j=7} \gamma_{2j} D_{jc} INF_{ct}^{GOV} + \sum_{j=-7}^{j=7} \gamma_{3j} D_{jc} INF_{ct}^{BOR} + \gamma_4 X_{ict} + C_c + T_t + \varepsilon_{ict} \tag{2}$$

where Y_{ict} refers to risk awarness or risk anxiety (health worry) of an individual *i* living in country *c*, who has respondend to the online survey on date *t*. We use two indicadors of risk awarness: (i) the number of self-reported COVID-19 cases per 1,000,000 inhabitants, and (ii) the level of concern about personal health.

INF_{ct}^{EP} refers to epidemiological information disseminated by the media on day *t* and country *c* (number of confirmed COVID-19 cases, recovered people and deaths per 1,000,000 inhabitants). We consider the effect of mobility restrictions both in the country and in border countries. INF_{ct}^{GOV} refers to a dummy variable taking the value 1 if the national government has announced a mobility restriction on day *t* and country *c*. INF_{ct}^{BOR} is a dummy variable taking the value 1 if the government of a bordering country has announced a mobility restriction on day *t* and country *c*. (See Tables A1, A2 and A3 for detailed description of restrictive measures).

We use a window of seven days before and after the implementation of both types of measures (D_{jc} refer to dummy variables for the seven days before/after the mobility restriction became effective).[5] To control for differences in composition, we include X_{ict} which refers to socio-demographic characteristics (age, gender, marital status, years of education, income, number of comorbidities); $C_c$and T_t denoting country fixed effects and day fixed effects, and ε_{ict} is an error term. Robust standard errors clustered at the country and day level. Finally, Eq. (2) is estimated differentiating according to each country's pre-existing risk to cope with a health emergency (as estimated from the Covid-19 Risk Index). The description of the index and the classification of the 22 countries into the three risk groups (high, moderate and low) is shown in Table A4.

4. Results

The estimates of Eq. (2), which predict COVID-19 risk awareness and individual risk anxiety are displayed in Table 1. Estimates show the expected sign (positive for confirmed cases and deaths and negative for recovered people). However, the magnitude of the effect is much smaller than the impact of the announcement of restrictive measures. Indeed, we find that restrictive measures exert a positive and significant effect on the day of the announcement as well as during the following seven days. On the day of the announcement, the coefficient of a country specific restrictive measure is 22 times higher than the effect of COVID-19 mortality in HR (high risk) countries, 42 times higher in MR (moderate risk) countries, and nearly 7 times higher in LR (low risk) countries.

Nonetheless, the effect of mobility restrictions is not limited to country borders alone; restrictions in border countries exert a significant impact on the date of the announcement and indeed the seven following days, especially day after the announcement. When we compare the effect of restrictions on each country, and its neighboring countries. In fact, we find that residents in HR countries are much more sensitive to information from neighboring countries, though overall effect of restrictions in border countries compares to about 67% of the effect of such restrictions in the country introducing a restriction (on day T+1), whereas such effects drops to 50% in LR countries.

When we examine the effects risk exposure and restrictions on risk anxiety (concern about one's health), the only similarity with the previous result is the fact that the impact of national and neighbourinf country restrictions is positive and significant in the day of the announcement and the 7 following days, with the maximum effect being on day after the introduction of a restriction (T+1). Importantly, we show that the announcement of restrictive measures raises risk anxiety by 4.7 percentual points (pp) on the day of the announcement and by 8.6pp the following day in LR countries. This effect is 4.6 (T) and 3.1 (T+1) times higher in MR countries, and 7 (T) and 3.8 (T+1) times higher in HR countries. Such estimates are consistent with a learning

[3] Coronavirus: Boris Johnson admitted to hospital over virus symptoms - BBC News

[4] Fernando Simón da positivo por coronavirus | Sociedad | EL PAÍS (elpais.com)

[5] Therefore, the eighth day before the announcement of the measure is the reference period.

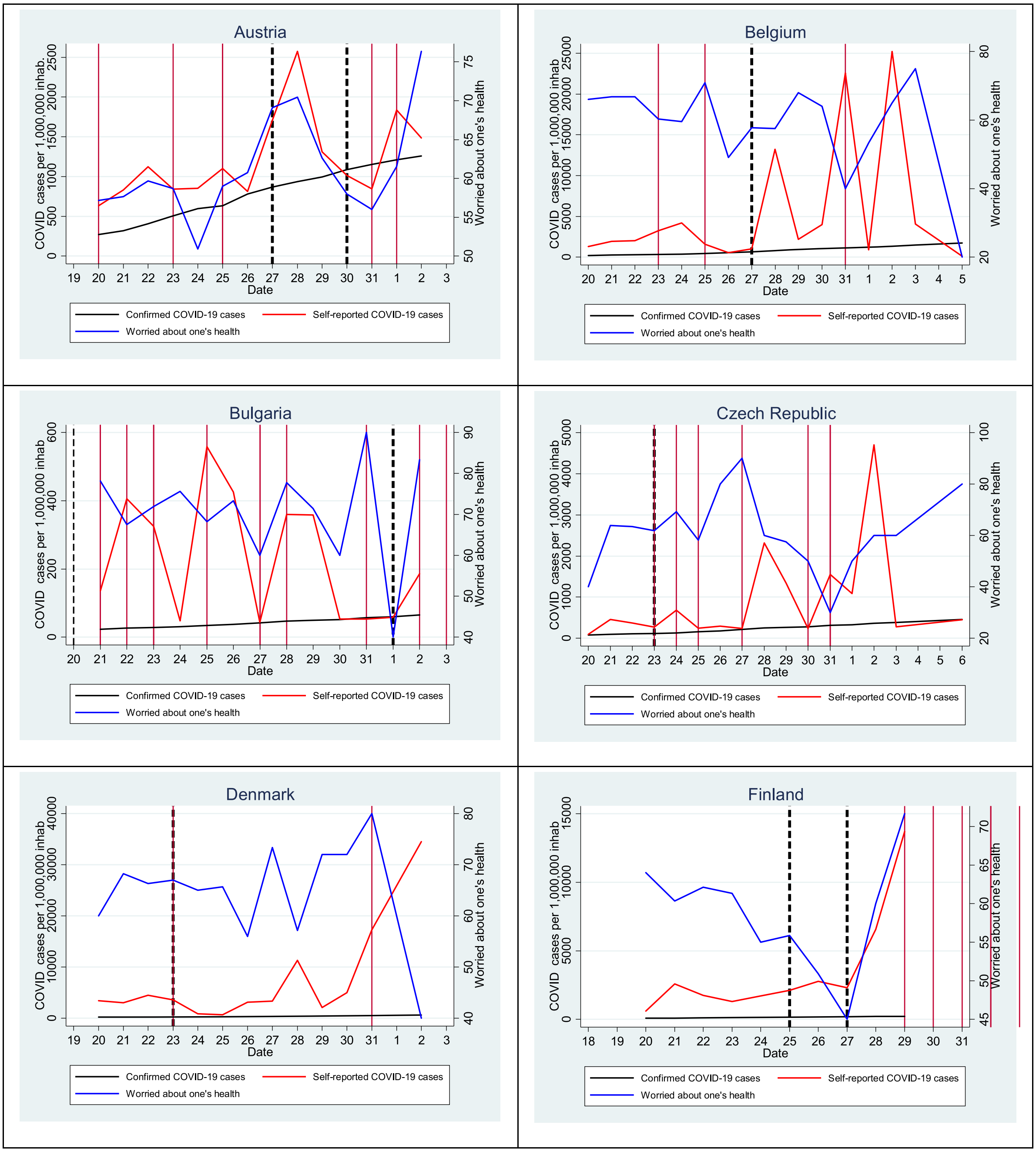

Fig. B1. Note: The figures reports the trends in confirmed COVID-19 cases (per 100,000 inhabitants), self-reported COVID-19 cases (per 100,000 inhabitants) and the risk anxiety item “feeling worried about one’s health” (scale 0-100). Black dashed lines depict to the announcement of mobility restrictions in the country. Red straight lines depict to mobility restrictions in neighbouring countries.

model where individuals update their preferences with some delay at times.

In contrast, the effect of epidemiological variables, reveals much smaller coefficients. In HR, LR, and RM countries, for example, the effect of the announcement on day T+1 is 82, 55, and 33 times larger than the effect of the number of deaths per million inhabitants. When we look at restrictions in border countries, we find an increase in risk anxiety, especially among LR countries. Interestingly, our results suggest that on the day after the announcement of a policy restricting mobility, risk anxiety is twice as high in LR countries than in HR or MR countries.

Next, we estimated several heterogeneous effects based on age cohort, number of comorbidities, income quartile, and years of education (Table 2). The results are reported as a percentage of the mean value to facilitate interpretation. Table B3 in the appendix reports the mean values of the dependent variables by age, gender, years of education, number of comorbidities, and income quartile.

When we compare the standard deviations of the coefficient estimates for the days before and after the country’s announcement of a mobility restriction, we find estimates that are roughly ten times higher than the latter. This suggests that the dispersion in the number of self -reported COVID-19 cases is greater prior to the announcement of a mobility restriction measure, suggesting evidence of significant heterogeneity.

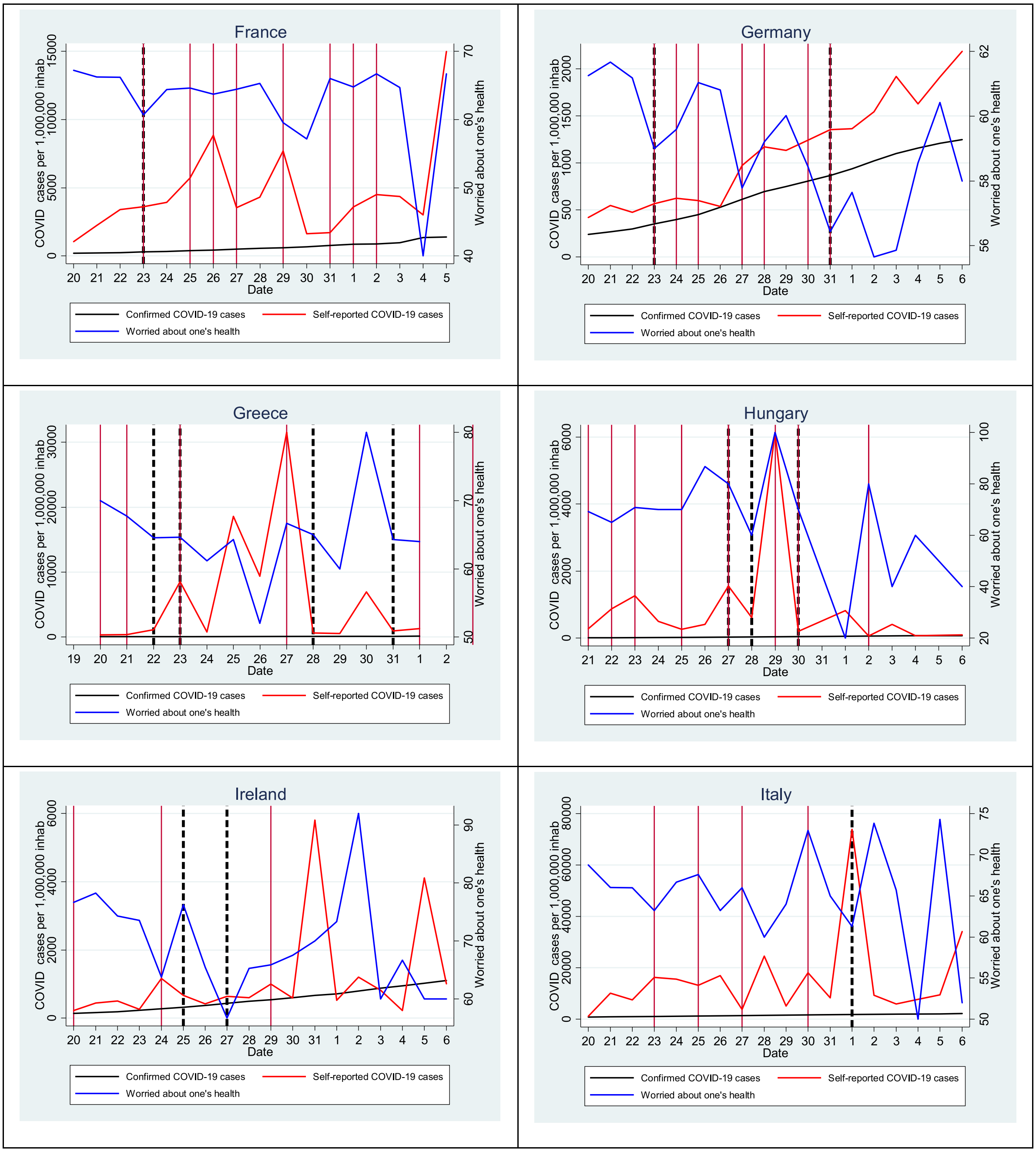

Fig. B1. (*continued*).

4.1. Heterogeneity

4.1.1. Gender effects

We find that the introduction of restrictive measures increases the number of self-reported (SR) COVID-19 cases more among women than men across all groups of countries. Such a difference is higher in HR countries, where the number of SR-COVID cases increases nearly twice as rapidly among women (compared to men) on the day of the announcement and the day after. When we look at risk anxiety, we find that again effects are larger among women, especially in LR countries (14.9% among women versus 10.6% among men in T+1).

4.1.2. Age effects

The announcement of restrictive measures increases the perception of SR-COVID-19 cases (per 1,000,000 inhabitants) among the oldest respondents in HR countries (59.4% compared to the mean) compared to a samller increase (by 22.3%) in LR countries. However, the impact in terms of risk anxiety is higher in LR countries (4.9% in T and 8.4% in T+1) than in HR countries (3.6% in T and 5.2% in T+1). In contrast, the youngest cohort experiences a lower risk awarness in HR countries (29.3% with respect to the mean) compared to 33.6% in LR countries. The latter rises risk anxiety by 2.85% (3.48%) on the day of the announcement in HR (LR) countries and by 3.5% (5.84%) on the day after the announcement.

4.1.3. Pre-existing conditions: comorbidities

Individuals exhibiting more than two comorbidities report higher risk awarness in a magnitude of about 75.5% (20.7%) with respect to the

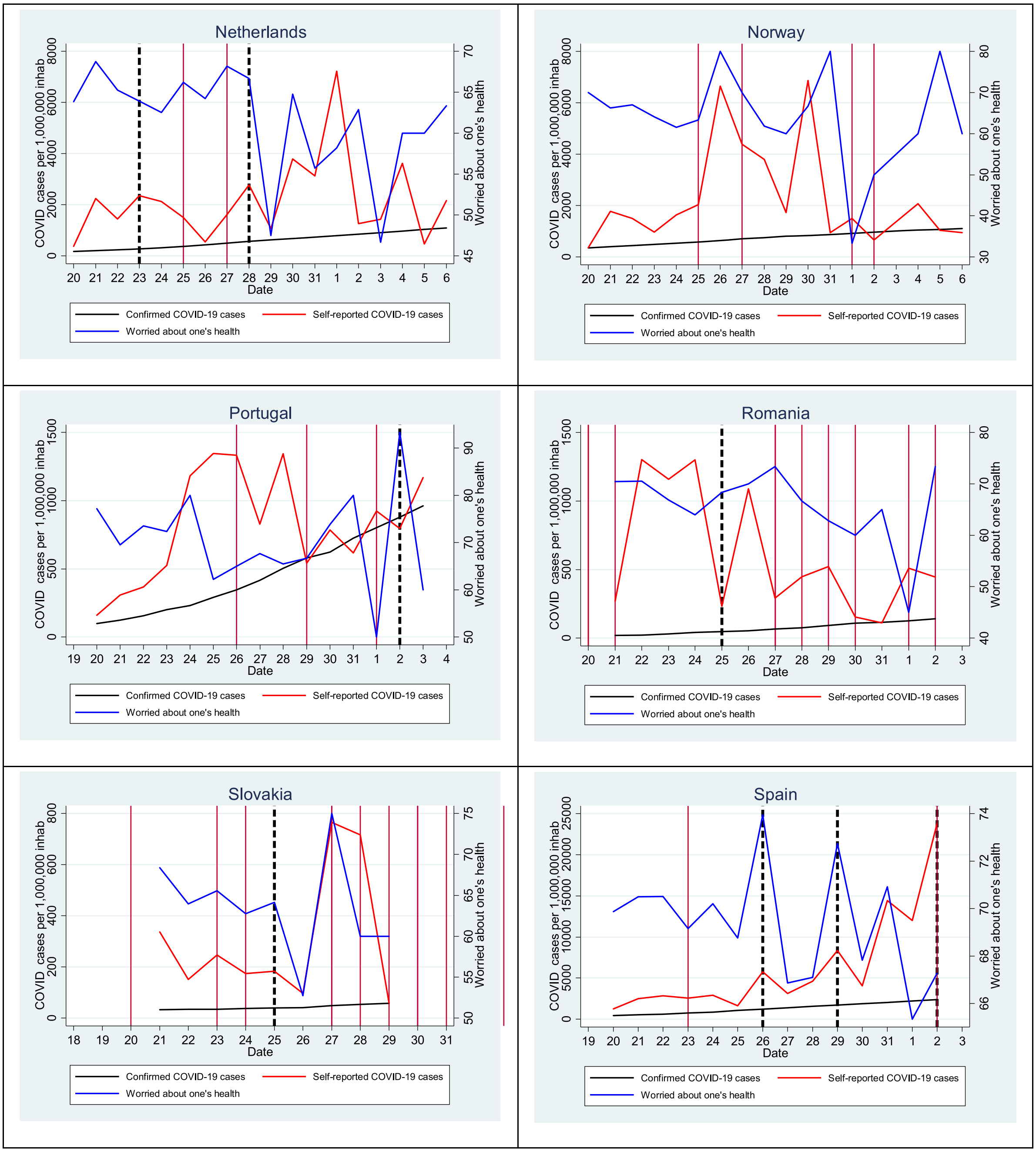

Fig. B1. (*continued*).

mean in HR (LR) countries, while risk anxiety increases by 5% (36.5%), respectively. Among those with only one comorbidity, the increase in the number of SR-COVID-19 cases at day T (T+2) is 7.2 pp (9.09) higher in LR countries compared to HR countries. Nevertheless, risk anxiety is higher in LR countries (e.g., on day T+1 increases by 6.9% in HR countries compared to 5.5% in LR countries).

Finally, among those individuals with no comorbidities, risk awarness is higher in HR countries (e.g., on day T, 8.75 pp higher for HR with respect to LR countries), but risk anxiety increases the most in LR countries (e.g., on day T, 1.45 pp higher for LR with respect to HR countries).

4.1.4. *Differential income groups*

We find a positive correlation between income and the impact of restrictive measures on the number of risk awarness in HR countries (on day T+1, we find an increase of 37.30% with respect to the mean for the lowest quartile to +48.71% for the highest one). However, no evidence of such correlation is found in MR and LR countries. Importantly, among the lowest income quartile, the increase in risk awarness is higher in HR countries (37.3% on day T+1) compared to that of LR countries (33-3%), but the increase in risk anxiety triples in LR countries (11.9% vs. 3.7% in LR countries on day T+1).

4.1.5. *Education groups*

The effect of restrictive measures on risk awarness differs by education according to the group of countries considered: it increases with the number of years of education in HR countries but shows an inverted U-shape in LR countries. Individuals with more than 20 years of

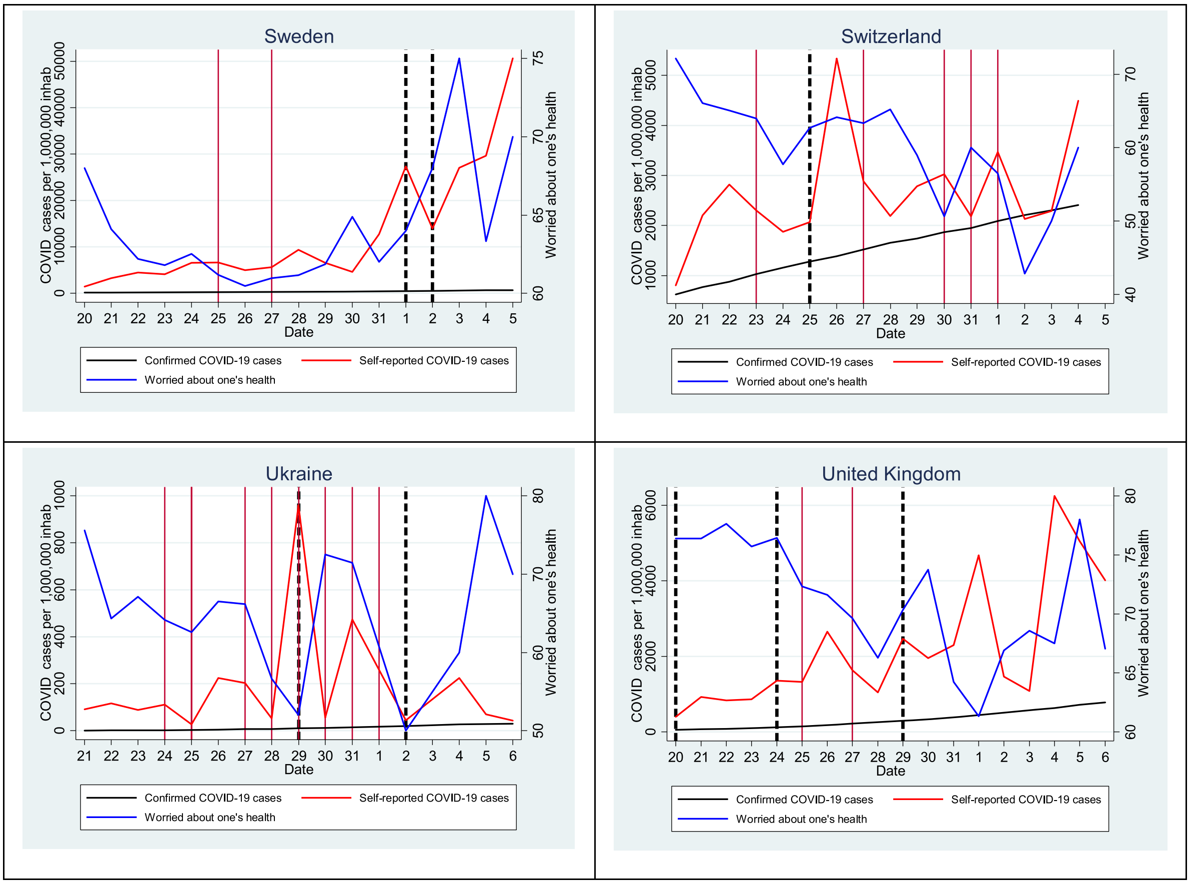

Fig. B1. (*continued*).

compleated education reveal a higher risk awarness (72% larger in HR countries compared to 28.2% in MR and 25.6% in LR countries).

4.2. Mechanisms and robustness checks

4.2.1. Trust in government

Our results can be explained by the effects of the announcement of restrictive measures on trust in the government, if they are perceived as a necessary restriction to either ’bend the virus curve’ or, alternatively, as an unexpected measure if the government had previously conveyed the feeling that the situation was under control. The question "*how factually truthful do you think your country’s government has been about the coronavirus outbreak*" is used to analyse this issue. The distribution of the different levels of government trust for each country is shown in Table B4.

Explanatory variables are the same as in the main model, but due to space constraints only the effects of the epidemiological variables and the effects of national restrictive measures on the day of the announcement and the three days thereafter are shown. Estimated coefficients are displayed in Table 3. We find that the announcement of restrictive measures is associated with increased government trust in LR countries (3.9pp at T, 9 pp at T+1). In contrast, the probability of believing that the government is very untruthful decreases by 3.9pp on T and 9.1pp at T+1. Hence, these estimates suggest that individuals do not seem to interpret these measures as a reaction to a limite transparency about the severity of the pandemic.

The opposite effect is observed in HR and MR countries, where trust decreases sharply (.6pp (HR) and 1.6pp (MR) at T, 14pp (HR) and 2.1pp at T+1 (MR)). There is also a significant effect among those who consider that the government has been somewhat untruthful, with an increase by 9pp (HR) and 7.5pp (MR) on the day after the announcement. In these countries, the adoption of restrictive measures is interpreted primarily as evidence of the government’s control over the evolution of the pandemic.

4.2.2. Preventive behaviours

Increasing risk anxiety can give rise to the adoption of preventive behaviours to avoid the spread of infection. For this reason, we examine the effect of the announcement of restrictive measures on 5 preventive behaviours including the following: stayed at home, did not attend social gatherings, keep a distance of at least 2 meters with people, inform others if they had Covid-19 symptoms and wash hands more frequently[6]. Each of these variables is measured using a scale from 0 to 100. The percentage of the population reporting compliance with each of these measures in each country is shown in Table B5 in the appendix.

Table B6 in the appendix shows the results of the estimation. The explanatory variables are the same as in Table 1, but we only report the estimated coefficients for risk exposure and national restrictive measures on the day of the announcement and three days after. Consistently with our baseline findings, we find that *the impact of mobility restrictions on the implementation of preventive behaviours is much higher in LR countries*. In MR and HR countries it takes two days after the announcement to identify a significant effect on the first three measures, and yet, the effect is three times higher in LR as compared to HR countries. Unlike

[6] The main individual preventive measures recommended were hand washing (with soap and water for 20 s or with an alcohol-based lotion) and keeping a distance of at least 2 m from other people (CDC, 2021). Other non-pharmaceutical interventions were also applied to reduce the spread of COVID-19, such as movement restriction and restriction of mass gatherings (Ayouni et al., 2021).

Table 1
Event-study for the effect of COVID-19 restrictions on the number of self-reported COVID-19 cases and risk anxiety (the feeling of being worried about one's health)

	Awarness of COVID cases per 1,000,000 inhab			Worried about one's health(scale 0-100)		
	High risk countries	Moderate risk countries	Low risk countries	High risk countries	Moderate risk countries	Low risk countries
Confirmed cases T-1 (per 1,000,000 inhab.)	0.360***	0.608***	4.179***	0.003***	0.010***	0.002*
	(0.049)	(0.025)	(0.163)	(0.000)	(0.000)	(0.001)
Recovered T-1 (per 1,000,000 inhab.)	-8.471***	-3.723***	-9.013***	-0.022***	-0.051***	-0.085***
	(0.283)	(0.146)	(0.911)	(0.001)	(0.002)	(0.003)
Deaths T-1 (per 1,000,000 inhab.)	48.865***	20.001***	44.280***	0.030***	0.084***	0.158***
	(0.702)	(0.784)	(1.672)	(0.003)	(0.004)	(0.006)
National restrictive measures						
T-7	2.621	325.546	-248.327	1.437	-3.830	-16.491
	(3.818)	(245.629)	(188.746)	(2.158)	(2.211)	(10.744)
T-6	631.725	510.895	-105.901	-1.726	0.415	-9.862
	(431.735)	(340.127)	(113.133)	(2.139)	(2.198)	(7.614)
T-5	451.810	322.861	68.991	0.722	-0.633	-7.214
	(323.042)	(240.749)	(103.872)	(1.141)	(1.144)	(5.565)
T-4	-845.250	186.199	-302.762	2.394	4.734	-0.315
	(623.356)	(139.839)	(281.439)	(2.138)	(3.146)	(1.518)
T-3	-278.359	-112.900	-689.360	-0.856	2.635	-3.828
	(222.764)	(135.137)	(587.065)	(1.121)	(2.142)	(2.454)
T-2	512.348	-106.838	235.309	0.055	-0.974	-0.091
	(425.256)	(132.874)	(265.990)	(1.114)	(1.158)	(1.385)
T-1	83.021	-1037.819	22.767	1.696	2.008	-2.528
	(95.318)	(740.349)	(48.813)	(2.140)	(2.096)	(2.314)
T	1088.664***	857.651***	303.777***	0.665***	1.029***	4.715***
	(19.233)	(23.348)	(15.913)	(0.052)	(0.112)	(0.116)
T+1	1668.766***	1494.155***	557.748***	2.477***	2.771***	8.653***
	(19.634)	(28.771)	(19.981)	(0.194)	(0.093)	(0.120)
T+2	1266.294***	909.575***	526.133***	1.741***	2.478***	5.729***
	(16.170)	(20.185)	(18.324)	(0.150)	(0.079)	(0.126)
T+3	1209.838***	353.080***	500.652***	0.913***	2.366***	3.445***
	(16.446)	(21.725)	(27.908)	(0.126)	(0.057)	(0.104)
T+4	998.298***	204.887***	459.619***	0.534***	1.638***	2.515***
	(22.948)	(25.673)	(21.935)	(0.136)	(0.079)	(0.136)
T+5	560.232***	125.895***	192.401***	0.223	1.440***	2.265***
	(22.923)	(18.577)	(24.133)	(0.139)	(0.068)	(0.180)
T+6	554.146***	123.465***	83.542***	0.118	0.264***	1.762***
	(26.775)	(17.020)	(20.404)	(0.143)	(0.056)	(0.160)
T+7	427.539***	78.856***	29.424*	0.022	0.255**	0.002
	(31.917)	(16.719)	(17.879)	(0.130)	(0.110)	(0.106)
Restrictive measures in border countries						
T-7	-1667.428	-327.962	-554.188	-0.775	-0.171	-4.107
	(938.423)	(226.677)	(460.947)	(1.092)	(1.240)	(3.347)
T-6	-1078.381	-514.663	-114.305	1.157	0.727	5.478
	(631.444)	(78.833)	(78.477)	(1.100)	(1.196)	(3.318)
T-5	-873.069	-1010.413	42.152	0.720	5.462	0.016
	(629.173)	(732.383)	(48.855)	(1.112)	(4.182)	(0.285)
T-4	-154.985	-112.582	-88.069	0.186	-2.897	-1.196
	(121.067)	(84.147)	(73.222)	(1.083)	(1.132)	(1.239)
T-3	91.935	-592.963	350.911	-1.554	-5.845	3.721
	(75.893)	(322.815)	(233.614)	(1.079)	(3.162)	(3.195)
T-2	-511.023	-267.453	-98.385	-2.026	1.105	-0.335**
	(317.477)	(319.392)	(89.934)	(1.067)	(1.109)	(1.141)
T-1	408.182	448.267	230.957	-1.976	-3.292	2.051
	(315.284)	(323.139)	(216.478)	(2.080)	(2.095)	(10.117)
T	800.991***	344.556***	127.816***	0.597***	0.716***	4.634***
	(18.748)	(14.797)	(41.896)	(0.065)	(0.081)	(0.275)
T+1	1123.123***	527.942***	225.059***	2.101***	2.112***	5.072***
	(14.894)	(13.990)	(23.768)	(0.051)	(0.146)	(0.093)
T+2	1054.475***	432.177***	210.122***	1.503***	1.583***	4.107***
	(15.942)	(15.650)	(20.029)	(0.055)	(0.186)	(0.087)
T+3	643.169***	388.094***	181.838***	0.854***	1.399***	3.236***
	(17.516)	(13.458)	(22.371)	(0.059)	(0.138)	(0.089)
T+4	503.775***	334.113***	166.731***	0.788***	1.210***	1.926***
	(15.010)	(11.794)	(19.498)	(0.063)	(0.101)	(0.098)
T+5	255.966***	259.481***	165.917***	0.687***	1.209***	0.457***
	(17.156)	(14.967)	(27.588)	(0.052)	(0.157)	(0.074)
T+6	171.313***	127.546***	89.415***	0.483***	0.619***	0.383***
	(12.985)	(12.372)	(13.964)	(0.045)	(0.130)	(0.084)
T+7	10.266	70.255***	34.623*	0.262***	0.468***	0.119
	(18.329)	(14.317)	(20.868)	(0.061)	(0.149)	(0.077)
	399.214***	764.502***	4394.31***	62.152***	76.227***	69.407***
	(57.626)	(24.851)	(26.326)	(0.091)	(0.155)	(0.362)
N	7,817	17,205	23,004	7,817	17,205	23,004

(continued on next page)

Table 1 (*continued*)

	Awarness of COVID cases per 1,000,000 inhab			Worried about one's health(scale 0-100)		
	High risk countries	Moderate risk countries	Low risk countries	High risk countries	Moderate risk countries	Low risk countries
R^2	0.811	0.884	0.920	0.443	0.892	0.783
F-test	1304.446	2768.722	5283.017	134.001	2981.499	1647.332
p-value	0.000	0.000	0.000	0.000	0.000	0.000

Note: High risk countries: Bulgaria, Czech Republic, Hungary, Italy, Romania, Slovakia, Spain, Ukraine.
Moderate risk countries: Austria, Belgium, France, Greece, Ireland, Portugal, United Kingdom
Low risk countries: Denmark, Finland, Germany, Netherlands, Norway, Sweden, Switzerland.
All regressions include the following covarates : male, other gender (omitted: women), age and its squared, married (omitted: single), years of education, number of household members (omitted_ living alone), having any comorbidity and number of comorbidities, household income quartile (omitted: lowest quartile), day fixed effects and country fixed effects. Individual sample weights have been used to correct for differences in income, education, age and gender structure between the general population of the country and the corresponding sample. Robust standard errors. ***, ** and * denote statistical significance at the 1%, 5% and 10% level.

the other two groups, HR countries do not experience an increase in the probability of informing people in the environment if they have symptoms compatible with COVID-19. Frequent hand washing is the only behaviour for which an increase in frequency is observed for all three groups of countries.

Table B7 in the appendix reports the heterogeneity of the effects on preventive health behaviours by gender, age, comorbidities, income and education. Our estimates suggest no significant evidence of gender differences in high or moderate risk countries. In contrast, in low-risk countries, the likelihood of complying with any of the five health recommendations analysed is higher for women. Furthermore, the probability of staying home, not attending social gatherings and maintaining social distance is larger in low-risk countries for all age cohorts. In contrast, in high and moderate risk countries, we estimate a higher probability of staying at home, not attending social meetings, and maintaining the safety distance among the 46–60 and +60 age cohorts. As expected, the probability of staying at home, not attending social events and maintaining a safe distance progressively increases among those who exibited two or more comorbidities.

Next, we document some evidence of heterogeneity by income. We find that the probability of staying at home, not attending social events and maintaining a safe distance progressively increases for the second, third- and fourth-income quartiles. Finally, when we examine the effects by education, we find that in low-risk countries the probability of staying at home, not attending social events and maintaining a safe distance increases with the number of years of education. However, such evidence is not observed in low or medium risk countries.

4.2.3. Placebo test on the effect of day light saving time

As a robustness check, we examine the impact of day light saving time on the number of self-reported COVID-19 cases and the risk anxiety. The time T corresponds to Sunday 29th March and the delays (T-1 to T-7) and advances (T+1 to T+7) correspond to the 7 days before and after. Table C1 in the Appendix shows that for no country group did the time change have a significant effect on risk awarness.

4.2.4. Limitations

We are aware that this study faces with several limitations. First, we draw on self-reported data. It has not been not possible to ascertain whether any medical diagnosis could affect risk awarness , nor how preexistent subclinical symptomatology in the weeks or months prior to confinement affected the responses collected in the survey. Secondly, given that the data collection was conducted through an online survey, participants who did not have access to the Internet at home might not be represented. Therefore, if there is selection on fixed unobservables over time that differ between internet users and non-users (e.g., individuals who were more worried about the COVID-19 pandemic were disproportionately more likely to take or share this survey), they could bias our estimates. To address this problem, observations have been weighted to improve their representativeness at the country level, according to respondents' gender, age, income and education. Additionally, to validate the robustness of our findings, we have performed a test following the spirit of Oster [27], which shows that a positive correlation between the R-squared and the absolute size of the coefficients indicating that omitted variables if they exist, are likely to exert a downward bias on the coefficient of interest, hence our estimates should be interpreted as a lower bound[7].

5. Discussion

Our findings indicate that actual risk exposure has a much smaller impact on risk awareness and risk anxiety than the implementation of mobility restrictions in the country or neighboring countries. Given that the evolution of epidemiological measures of risk exposure, particularly the number cases and deahs, have been reported by the media on a daily (or multiple times daily) basis, a question arises as to whether mobility restrictions (mandatory) are always required to raise citizens' risk awareness, or whether they should be dependent on the individual specific geographical risk exposure. That said, risk exposure in a pandemic can exhibit a dramatic change in a short period of time, which suggests that mobility restrictions should still be routinely monitored and evaluated, but should factor in the effects of risk anxiety too.

Our estimates suggest the following policy implications. First, both individual risk awareness and risks axiety are critical for a timely and effective crisis response. Second, our results suggest that at low levels of risk exposure, governments should consider carefully the introduction of mobility restrictions insofar as they are a source of risk anxiety, which can be more detrimental to individuals, and costly to the health system than the effect of mobility restrictions. Third, the implementation of mobility restrictions influences risk awarness and anxiety in border countries, and could be more effective if they targeted specific groups. More specifically, younger and both lower educated and income individuals appear to be less sensitive to the effects of mobility restrictions. Such targeting could encourage "less motivated" groups to comply with the recommendations. Fourth, risks communication should provide accurate health information to avoid the effects of rumours about COVID-19 making individuals vulnerable to misinformation [28]. Although the internet and social media play an important role in influencing behaviour and can help prevent disease, they can exert a negative impact increasing risk anxiety, if not used effectively [28,29].

6. Conclusion

This paper has examined the effect of policy restrictions on both risk awareness and risk anxiety amidst the COVID-19 pandemic. This is an important question that contributes to both the design of policy restrictions in a pandemic, and suggests that although risk communication

[7] The inclusion of control variables increases the effect size , a result which increase confidence in our estimates and at the same time justify the use of a comprehensive set of control variables.

Table 2
Effect of national restrictions on self-reported COVID-19 cases and risk anxiety (feeling worried about one's health) by gender, age, number of comorbidities, income and education.

		Self-reported COVID cases(per 1,000,000 inhabitants)			Worried about one's health(0-100)		
		High risk	Moderate risk	Low risk	High risk	Moderate risk	Low risk
Man							
T	Coef	829.380***	657.024***	339.963**	0.277**	1.139***	4.356***
	Std.dev	(37.90)	(21.37)	(66.61)	(0.125)	(0.130)	(0.411)
	% mean	57.14	29.17	8.23	0.45	1.69	5.98
T+1	Coef	982.195***	719.306***	578.649***	1.084***	2.084***	7.758***
	Std.dev	(31.64)	(44.49)	(24.82)	(0.035)	(0.109)	(0.303)
	% mean	67.66	31.93	14.00	1.76	3.09	10.65
Woman							
T	Coef	1870.002***	1020.169***	550.449***	0.390***	1.047***	4.859***
	Std.dev	(29.29)	(20.67)	(45.31)	(0.133)	(0.102)	(0.372)
	% mean	117.12	37.93	18.14	0.63	1.55	6.72
T+1	Coef	1952.469***	1625.801***	681.683***	3.127***	2.747***	10.759***
	Std.dev	(24.97)	(36.34)	(23.32)	(0.051)	(0.087)	(0.256)
	% mean	122.29	60.45	22.46	5.05	4.07	14.88
Age 18-30							
T	Coef	539.28***	598.634***	987.48***	1.753***	3.073***	2.463***
	Std.dev	(35.826)	(40.624)	(46.848)	(0.106)	(0.245)	(0.345)
	% mean	29.31	30.38	33.63	2.85	4.59	3.48
T+1	Coef	611.07***	940.105***	1,018.517***	2.166***	3.715***	4.137***
	Std.dev	(41.368)	(36.342)	(64.336)	(0.122)	(0.219)	(0.473)
	% mean	33.21	47.70	34.68	3.53	5.55	5.84
Age 31-45							
T	Coef	644.767***	743.176***	1,111.308***	1.501	3.080***	3.121***
	Std.dev	(29.878)	(34.198)	(46.313)	(0.095)	(0.191)	(0.427)
	% mean	41.56	33.05	38.23	2.43	4.57	4.32
T+1	Coef	648.966***	1,029.276***	1,227.088***	2.226***	4.181***	4.628***
	Std.dev	(36.221)	(29.641)	(63.474)	(0.116)	(0.165)	(0.586)
	% mean	41.83	45.78	42.22	3.60	6.20	6.41
Age 46-60							
T	Coef	479.591***	715.082***	1,183.818***	2.347***	3.394***	4.722***
	Std.dev	(35.698)	(34.028)	(57.372)	(0.113)	(0.212)	(0.446)
	% mean	34.05	25.65	30.18	3.79	5.00	6.44
T+1	Coef	673.52***	1,157.95***	1,282.749***	3.028***	4.497***	4.94***
	Std.dev	(43.273)	(31.079)	(99.502)	(0.137)	(0.194)	(0.773)
	% mean	47.82	41.53	32.71	4.88	6.62	6.74
Age +60							
T	Coef	804.586***	783.171***	1,136.479***	2.204***	3.715***	3.607***
	Std.dev	(31.770)	(33.339)	(73.610)	(0.108)	(0.186)	(0.594)
	% mean	59.41	26.31	22.27	3.57	5.45	4.90
T+1	Coef	881.252***	1,221.365***	1,295.657***	3.211***	5.433***	6.177***
	Std.dev	(37.947)	(29.063)	(120.925)	(0.129)	(0.162)	(0.976)
	% mean	65.07	41.03	25.39	5.19	7.97	8.39
No comorbidities							
T	Coef	613.41***	847.50***	1,155.59***	1.71***	1.95***	3.06***
	Std.dev	(21.894)	(16.314)	(43.219)	(0.068)	(0.094)	(0.344)
	% mean	40.87	33.58	32.12	2.76	2.89	4.21
T+1	Coef	619.70***	960.29***	1,218.30***	2.61***	2.63***	4.22***
	Std.dev	(18.210)	(18.544)	(29.340)	(0.057)	(0.107)	(0.234)
	% mean	41.29	38.05	33.87	4.21	3.89	5.81
One comorbidity							
T	Coef	568.98***	727.28***	1,131.57***	2.56***	3.33***	3.52***
	Std.dev	(48.156)	(60.908)	(112.565)	(0.177)	(0.385)	(0.977)
	% mean	32.39	30.74	39.57	4.16	4.93	4.92
T+1	Coef	638.93***	1,014.12***	1,256.07***	3.38***	4.36***	4.98***
	Std.dev	(41.637)	(64.479)	(71.203)	(0.153)	(0.408)	(0.618)
	% mean	36.37	42.87	43.92	5.48	6.46	6.96
Two comorbidities							
T	Coef	1,250.61***	1,345.51***	1,160.75***	2.42***	3.34***	4.79***
	Std.dev	(138.322)	(194.545)	(20.788)	(0.417)	(1.038)	(0.019)
	% mean	65.91	58.94	37.47	3.96	4.92	6.73
T+1	Coef	1,398.81***	1,220.45***	1,676.14***	4.88***	5.01***	5.66***
	Std.dev	(124.284)	(215.736)	(73.132)	(0.375)	(1.151)	(0.696)
	% mean	73.72	53.46	54.11	7.98	7.38	7.94
More than two comorb.							
T	Coef	1,787.64***	1,316.39***	1,159.84***	3.03***	5.49***	26.10***
	Std.dev	(557.122)	(451.095)	(240.937)	(1.069)	(0.996)	(0.055)
	% mean	75.46	60.74	20.67	4.97	7.99	36.55
T+1	Coef	1,799.49***	1,443.88***	1,250.45***	5.10***	6.34***	7.04***
	Std.dev	(368.750)	(271.339)	(252.692)	(0.708)	(1.207)	(2.069)
	% mean	75.96	66.62	22.28	8.35	9.22	9.85
1stincome quartile (lowest)							
T	Coef	545.93***	743.24***	1,176.39***	2.23***	3.51***	3.64***

(*continued on next page*)

Table 2 (*continued*)

		Self-reported COVID cases(per 1,000,000 inhabitants)			Worried about one's health(0-100)		
		High risk	Moderate risk	Low risk	High risk	Moderate risk	Low risk
	Std.dev	(40.905)	(32.561)	(75.817)	(0.130)	(0.197)	(0.587)
	% mean	34.48	29.82	32.94	3.61	5.18	5.03
T+1	Coef	590.61***	902.54***	1,190.13***	2.31***	5.07***	8.61***
	Std.dev	(34.163)	(34.800)	(51.668)	(0.108)	(0.211)	(0.400)
	% mean	37.30	36.22	33.32	3.73	7.48	11.89
2nd income quartile							
T	Coef	561.29***	700.24***	1,168.49***	1.94***	4.02***	4.10***
	Std.dev	(36.650)	(33.312)	(81.559)	(0.118)	(0.187)	(0.564)
	% mean	36.29	27.48	36.10	3.13	5.97	5.67
T+1	Coef	602.82***	1,010.68***	1,191.80***	2.59***	4.26***	4.69***
	Std.dev	(30.190)	(39.020)	(56.092)	(0.097)	(0.218)	(0.388)
	% mean	38.98	39.66	36.82	4.19	6.33	6.49
3rd income quartile							
T	Coef	628.45***	733.78***	1,177.59***	1.98***	2.89***	2.27***
	Std.dev	(40.064)	(30.340)	(73.840)	(0.123)	(0.183)	(0.557)
	% mean	41.90	31.22	33.09	3.22	4.27	3.11
T+1	Coef	682.03***	1,028.35***	1,210.28***	2.76***	4.02***	4.11***
	Std.dev	(34.009)	(36.441)	(49.931)	(0.105)	(0.220)	(0.377)
	% mean	45.47	43.75	34.01	4.49	5.95	5.65
4th quartile (higheset)							
T	Coef	635.27***	739.38***	1,137.34***	1.98***	2.29***	3.19***
	Std.dev	(41.867)	(29.330)	(84.803)	(0.132)	(0.166)	(0.832)
	% mean	42.91	28.27	31.10	3.20	3.40	4.39
T+1	Coef	721.22***	1,089.80***	1,260.63***	2.83***	3.31***	3.98***
	Std.dev	(35.695)	(32.583)	(56.537)	(0.112)	(0.185)	(0.555)
	% mean	48.71	41.66	34.48	4.57	4.91	5.48
Less than 10 years							
T	Coef	607.29***	1,343.77***	1,205.75***	2.06***	3.48***	5.52***
	Std.dev	(58.873)	(58.819)	(222.526)	(0.177)	(0.348)	(3.660)
	% mean	19.25	48.14	38.19	3.26	5.22	8.11
T+1	Coef	877.21***	1,547.11***	1,244.78***	2.93***	5.50***	20.23***
	Std.dev	(52.718)	(51.549)	(77.902)	(0.159)	(0.305)	(1.281)
	% mean	27.81	55.42	39.42	4.63	8.27	29.75
Between 11 and 15 years							
T	Coef	606.09***	606.96***	1,201.15***	2.49***	4.01***	3.72***
	Std.dev	(20.860)	(15.745)	(41.109)	(0.067)	(0.097)	(0.323)
	% mean	50.42	24.35	42.27	4.07	5.99	5.09
T+1	Coef	615.39***	867.19***	1,214.21***	2.67***	5.23***	5.41***
	Std.dev	(17.478)	(18.844)	(27.815)	(0.056)	(0.116)	(0.219)
	% mean	51.19	34.80	42.73	4.36	7.82	7.39
Between 16 an 20 years							
T	Coef	597.93***	639.14***	1,089.48***	1.92***	2.99***	3.08***
	Std.dev	(26.362)	(17.771)	(47.756)	(0.086)	(0.108)	(0.383)
	% mean	48.79	25.98	29.90	3.12	4.44	4.17
T+1	Coef	623.05***	822.51***	1,197.03***	2.61***	5.05***	5.34***
	Std.dev	(21.793)	(21.553)	(32.309)	(0.071)	(0.131)	(0.259)
	% mean	50.84	33.44	32.85	4.24	7.49	7.23
More than 20 years							
T	Coef	882.86***	618.80***	1,067.42***	2.39***	4.19***	2.12***
	Std.dev	(68.216)	(42.578)	(103.879)	(0.236)	(0.258)	(0.841)
	% mean	72.04	28.20	25.60	3.88	6.11	2.87
T+1	Coef	991.40***	813.03***	1,173.09***	2.48***	4.34***	4.87***
	Std.dev	(54.473)	(52.803)	(69.244)	(0.188)	(0.320)	(0.561)
	% mean	80.90	37.05	28.14	4.01	6.33	6.60

High risk countries: Bulgaria, Czech Republic, Hungary, Italy, Romania, Slovakia, Spain, Ukraine.
Moderate risk countries: Austria, Belgium, France, Greece, Ireland, Portugal, United Kingdom
Low risk countries: Denmark, Finland, Germany, Netherlands, Norway, Sweden, Switzerland.
All regressions include days before national restrictive measures (from T-1 to T-7), days after national restrictive measures (from T+2 to T+7) and days before/after border countries restrictive measures (from T-7 to T+7), but have been omitted due to space constraints. Additional explanatory variables: male, other gender (omitted: women), married (omitted: single), years of education, number of household members (omitted: living alone), having any comorbidity and number of comorbidities, household income quartile (omitted: lowest quartile), day fixed effects and country fixed effects. Individual sample weights have been used to correct for differences in income, education, age and gender structure between the general population of the country and the corresponding sample. Robust standard errors. ***, ** and * denote statistical significance at the 1%, 5% and 10% level.

and mobility restrictions can influence desirable protective behaviours, they can increse risk anxiety too, which comes at a cost to the health system.

Our study reveals that need trade-off the effects of mobility restrictions on risk awareness and risk anxiety. More specifically, we find that the adoption of restrictive measures is more important in modifying risk awareness, compared to the daily dissemination of epidemiological evidence. However, restrictive measures are associated with an erosion of government trust in high-risk countries, interpreted as a reaction to tackle a problem that could have been prevented in the first place. Importantly, we find that these restrictive measures can significantly increase risk anxiety (defined as worries for one's health), as well as compliance with health recommendations, but only in low-risk countries.

Table 3
Effect of national restrictive measures on how truthful does the respondent think his/her country's government has been about the coronavirus outbreak. (Dependent variables: 0-1).

	Very untruthful	Somewhat untruthful	Neither truthful nor untruthful	Somewhat truthful	Very truthful
High risk countries					
Confirmed cases T-1 (per 1,000,000 inhab.)	0.006	0.014***	0.013***	-0.083**	-0.103***
	(0.004)	(0.005)	(0.004)	(0.006)	(0.005)
Recovered T-1 (per 1,000,000 inhab.)	-0.150***	-0.096***	0.035*	0.153***	0.129***
	(0.017)	(0.022)	(0.019)	(0.026)	(0.020)
Deaths T-1 (per 1,000,000 inhab.)	0.318***	0.077	0.062	-0.406***	-0.411***
	(0.047)	(0.061)	(0.052)	(0.071)	(0.056)
National restrictive measures					
T	0.076***	0.081***	0.043**	-0.053***	-0.096***
	(0.012)	(0.015)	(0.019)	(0.014)	(0.016)
T+1	0.136***	0.090***	0.048***	-0.066***	-0.140***
	(0.014)	(0.014)	(0.012)	(0.015)	(0.012)
T+2	0.092***	0.056***	0.034***	-0.031*	-0.069***
	(0.011)	(0.012)	(0.013)	(0.019)	(0.018)
T+3	0.069***	0.038**	0.023*	-0.017	-0.037***
	(0.016)	(0.016)	(0.013)	(0.017)	(0.014)
Constant	0.251***	0.267***	0.195***	0.352***	0.166***
	(0.021)	(0.024)	(0.020)	(0.028)	(0.022)
N	7,817	7,817	7,817	7,817	7,817
F	24.993	15.339	5.349	12.960	15.714
Moderate risk countries					
Confirmed cases T-1 (per 1,000,000 inhab.)	0.018***	0.041***	-0.009***	-0.036***	-0.032***
	(0.002)	(0.003)	(0.003)	(0.004)	(0.003)
Recovered T-1 (per 1,000,000 inhab.)	-0.065***	-0.055**	0.064***	0.164***	0.120***
	(0.018)	(0.026)	(0.019)	(0.029)	(0.023)
Deaths T-1 (per 1,000,000 inhab.)	0.116***	0.415***	-0.029	-0.150**	-0.351***
	(0.044)	(0.063)	(0.046)	(0.071)	(0.055)
National restrictive measures					
T	0.021*	0.050***	0.007***	-0.017***	-0.016***
	(0.011)	(0.017)	(0.002)	(0.008)	(0.04)
T+1	0.033***	0.075***	0.018**	-0.029**	-0.021***
	(0.005)	(0.013)	(0.008)	(0.014)	(0.010)
T+2	0.001	0.020	0.007	-0.024**	-0.014 ***
	(0.009)	(0.013)	(0.010)	(0.010)	(0.04)
T+3	0.006	0.016	0.011	-0.027*	-0.005
	(0.009)	(0.013)	(0.010)	(0.015)	(0.011)
Constant	0.122***	0.303***	0.217***	0.373***	-0.086***
	(0.013)	(0.019)	(0.014)	(0.022)	(0.017)
N	17,205	17,205	17,205	17,205	17,205
F-test	10.243	24.626	24.626	24.626	154.974
Low risk countries					
Confirmed cases T-1 (per 1,000,000 inhab.)	0.002***	0.005***	0.005***	-0.021***	-0.034***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
Recovered T-1 (per 1,000,000 inhab.)	-0.001	0.002	0.008**	0.026***	0.037***
	(0.002)	(0.004)	(0.004)	(0.006)	(0.006)
Deaths T-1 (per 1,000,000 inhab.)	0.002	0.011	-0.107***	-0.694***	-0.811***
	(0.022)	(0.037)	(0.038)	(0.061)	(0.060)
National restrictive measures					
T	-0.039***	-0.032**	0.023**	0.029**	0.039***
	(0.009)	(0.014)	(0.010)	(0.014)	(0.012)
T+1	-0.091***	-0.070***	0.032***	0.037**	0.090***
	(0.013)	(0.017)	(0.010)	(0.018)	(0.012)
T+2	-0.035***	-0.028**	0.022**	0.027*	0.021**
	(0.013)	(0.014)	(0.010)	(0.015)	(0.009)
T+3	0.021*	0.004	0.001	-0.009	-0.018*
	(0.011)	(0.012)	(0.011)	(0.015)	(0.009)
Constant	0.315***	0.303***	0.217***	0.373***	-0.016
	(0.022)	(0.019)	(0.014)	(0.022)	(0.017)
N	23,004	23,004	23,004	23,004	23,004
F-test	29.169	38.439	11.256	17.074	69.024

Note: High risk countries: Bulgaria, Czech Republic, Hungary, Italy, Romania, Slovakia, Spain, Ukraine.
Moderate risk countries: Austria, Belgium, France, Greece, Ireland, Portugal, United Kingdom
Low risk countries: Denmark, Finland, Germany, Netherlands, Norway, Sweden, Switzerland.
All regressions refer to the days before national restrictive measures (from T-1 to T-7), days after national restrictive measures (from T+4 to T+7), days before/after border countries restrictive measures (from T-7 to T+7) male, other gender (omitted: women), age and its squared, married (omitted: single), years of education, number of household members (omitted: living alone), having any comorbidity and number of comorbidities, household income quartile (omitted: lowest quartile), day fixed effects and country fixed effects. Individual sample weights have been used to correct for differences in income, education, age and gender structure between the general population of the country and the corresponding sample. Robust standard errors. ***, ** and * denote statistical significance at the 1%, 5% and 10% level.

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Declaration of Competing Interest

The authors have no conflict of interest to disclose.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.healthpol.2022.08.009.

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