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IZA DP No. 15961

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ABSTRACT

Health System Trust and Compliance with COVID-19 Restrictions

We examine the extent to which exposure to higher relative COVID-19 mortality (RM), influences health system trust (HST), and whether changes in HST influence the perceived ease of compliance with pandemic restrictions during the COVID-19 pandemic. Drawing on evidence from two representative surveys covering all regions of 28 European countries before and after the first COVID-19 wave and using a difference in differences strategy together with Coarsened Exact Matching (CEM), we document that living in a region with higher RM during the first wave of the pandemic increased HST. However, the effect is driven by individuals over 45 years of age, and the opposite is true among younger cohorts. We find that a higher HST reduces the costs of complying with COVID-19 restrictions, but only so long as excess mortality does not exceed the average by more than 20%, at which point the ease of complying with COVID-19 restrictions significantly declines, offsetting the positive effect of trust in the healthcare system. Our interpretation of the estimates is that RM is interpreted as a risk signal among those over 45, and as a signal of health-care system failure among younger age individuals.

JEL Classification: I13, Z1

Keywords: healthcare system trust, mortality, lockdown, Eurobarometer, difference in differences, COVID-19

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1. Introduction

Given that clinical processes and quality are complex and poorly understood by the public, users' trust in the health system can serve as a behavioural guide. People's beliefs about the efficacy and effectiveness of health care services can be critical in navigating a crowded healthcare system (Ramalingam et al., 2020)[1]. Nonetheless, under pandemic circumstances like COVID-19, cooperation with pandemic regulations depends heavily on people's goodwill. As a result, health system trust (HST) becomes a low-cost heuristic for users deciding whether or not to comply with COVID-19 restrictions and treatment compliance (O'Malley et al. 2004; Ozawa and Sripad 2013; Kittelsen and Keating 2019, Rogers and Prentice-Dunn, 1997; Voeten et al., 2009; van der Weerd et al., 2011). According to Hall et al. (2001), HST refers to a person's belief that healthcare institutions and professionals in general are concerned about their health. However, it is founded on normative value judgements derived from knowledge of other people's experiences and information disseminated through the media, rather than solely on personal experience (Thiessen, 2009)[2].

In a pandemic, HST can influence the perceived cost of compliance with social distancing (Bargain and Aminjonov, 2020; Clark et al., 2020)[3], as well as individual's likelihood of reporting a positive test, and more generally, adhering to self-isolation or

[1] In extreme cases, excess reliance on trust can crowd out preventive healthcare behaviours Including skipping breast and cervical cancer screenings (Yang et al., 2011), reducing contact with doctors (Trachtenberg et al., 2005; LaVesit et al., 2009), or disregarding medical advice (Egede and Ellis, 2008).

[2] According to Zengh et al. (2003) trust can be explained by four dimensions (both inter-personal and public): (i) *fidelity,* or upholding the patient's interests above all else, (ii) *competence,* or ability to produce the best possible outcomes, (iii) *honesty*, avoiding deliberate misrepresentation, and (iv) c*onfidentiality,* or the correct use of sensitive information.

[3] Similarly, some studies establish an association between institutional trust and ease of compliance with recommendations in the context of the H1N1 epidemic in the UK (Rubin et al., 2009) and Italy (Prati et al., 2011), SARS in Hong Kong (Tang and Wong, 2003) and Ebola in Liberia (Morse et al., 2016). Relatedly, lack of trust in health institutions is associated with increased difficulties in dealing with bioterrorism threats (Meredith et al., 2009; McKee et al., 2009).

quarantine requirements (Gilson, 2003, Department for International Development, 2020). These were historically unprecedented interventions limiting individuals' freedoms[4]. However, so far, we know little how does the severity of a pandemic influence HST. To date, it is unclear how individuals interpret changes in a country's relative COVID-19 mortality, whether it is a signal of higher risk calling for further confidence in the healthcare system experts given the complexity of the pandemic causes, or instead it is interpreted as a sign of failure of the health system regulations to stop the pandemic.

This paper adds to the literature by shedding light on how HST changes with exposure to COVID-19 mortality, which was a piece of information heavily communicated. We disentangle whether they are interpreted as a proxy of further risk, or health system failure. Next, we examine whether HST impacts on individuals' perceived ease of compliance with lockdown restrictions[5]. We exploit evidence from two representative survey datasets from 28 European countries from before and after the first wave of the pandemic, as well as regional level NUTS-2[6] mortality data. We use a difference-in-difference strategy combined with Coarsened Exact Matching (CEM); a matching methodology developed by Iacus et al. (2012)[7]. We document that RM increased health system trust (HST), though the effect differs across age groups. HST

[4] These include the effects on loneliness, unemployment, educational interruption, and interrupted healthcare, especially undeserved individuals. Indeed, some evidence suggests that whist early spring 2020 lockdown in Europe and the United States reduced mortality by 10.7%, later lockdowns did not (Herby et al, 2021).

[5] We do not assume that COVID -19 exposure is a risk for everyone, but for the average individual. For instance, it might well be that younger people exposure might develop natural immunity and are thereby better able to protect the vulnerable people the interact with. However, this is not the case for most of the population.

[6] The NUTS classification (Nomenclature of territorial units for statistics) is a hierarchical system for dividing up the economic territory of the EU and the UK. The NUTS-2 classification refers to basic regions for the application of regional policies. Background - NUTS - Nomenclature of territorial units for statistics - Eurostat (europa.eu)

[7] We attempt to improve over existing matching approaches in estimating causal inference by reducing any imbalance in covariates between treated and control units. CEM incorporates exact matching properties, but it allows the balance between treated and control groups to be chosen ex-ante rather than having to be discovered ex-post. This is the first study to use the CEM to estimate the effect of COVID-19 mortality on trust in healthcare.

reduces the costs to comply with COVID-19 restrictions until mortality exceeds 20% with respect to the average, when the ease of compliance with the COVID-19 restrictions markedly declines, thus offsetting the positive effect of trust in the healthcare system.

We structure the article as follows. Section 2 reports the related literature on HST and especially, how it impacts health care decision making. Section 3 presents the data used and the variables that have been constructed. Next, ion section 4 we report the empirical strategy, results are reported in section 5, and finally, section 6 offers the main conclusions.

2. Related Literature

Healthcare system trust and outcomes. Given the credibility of sound health advice, vulnerable people take for granted that doctors and, by extension, other medical professionals are more knowledgeable than they are (Parsons, 1951)[8]. However, when care expectations are not met, trust can be abruptly shattered (Mechanic, 1998), and feelings of betrayal or outrage can take the place of health care trust (Baier, 1986). Previous evidence documents a positive relationship between poorer self-rated health status and lower trust in the healthcare system (Armstrong et al. 2006; Mohseni et al. 2007). The latter might be explained by the higher adherence to treatment of trusting patients, which results in health improvements. Hence, the attainment of higher patient satisfaction, successful care continuity, and medication adherence depends on the health system's ability to be trusted (Thom et al., 1999). However, it is an empirical question whether HST played a similar role in a pandemic, where experience was scarce especially

[8] Consistently, some evidence documents that people with chronic conditions typically have a longer history of interactions with the healthcare system, but they also frequently have higher levels of resilience to setbacks (Hall et al., 2001).

during the first wave of the pandemic, and information about COVID-19 deaths was released in the media.

Health System Trust and Pandemics. In a pandemic, people's compliance with self-protective measures is driven by both risk perceptions (de Zwart et al., 2007; Leppin et al., 2009)[9], and the perceived effectiveness of governments (de Zwart et al., 2009, Blendon et al., 2008). Evidence from previous pandemics suggest a consistent story. Winters et al. (2020) document that more prudent people tend to rely on HST. During the H1N1 pandemic, protective behaviours and vaccination intentions were related to trust in health authorities (Freimuth et al. 2014; Chuang et al. 2015).

Dryhurst et al. (2020) document that trust in government and science influences perceived risk of COVID-19[10]. In an analysis of 27 European countries following the first wave of Covid-19, Beller et al. (2022) found that trust in the health care system plummeted among people with unmet health needs and higher levels of mental distress, for example those who were economically vulnerable and had higher levels of loneliness. In contrast, happier and healthier individuals were more likely to trust China's healthcare system, according to Zhao et al. (2019). As a result, the impact of risk perceptions in the face of a health threat can be a double-edged sword. Some people may change their behaviour if they believe they can deal with the threat, but it may give rise to a counter reaction if they believe they are helpless in facing the threat (Witte and Allen, 2000).

Some research has examined the influence of HST in the context of COVID-19. Eichengreen et al. (2021) studied the effect of exposure to a pandemic on young people in 138 countries documenting a significant reduction in trust in scientists and highlighting

[9] Consistently, the World Health Organization's risk communication guidelines state that "risk perception is the primary predictor of disaster prevention and mitigation behaviours."
[10] Elgar et al. (2020) civic engagement and confidence in state institutions are found to be negatively related to actual COVID-19 mortality.

how distrust caused by COVID-19 is found to reduce compliance with health recommendations and lower rates of childhood vaccination. Consistently, Algan et al. (2022) document that trust in scientists was the most important factor for ease of compliance with distancing measures, while trust in government has a more ambiguous effect. Chan et al. (2020) document that regions with higher trust in the healthcare system are more likely to exhibit mobility reductions once the government orders citizens to stay at home except for essential travel, compared to regions with lower healthcare system trust. Similarly, other studies show that increased trust in public institutions has been found to increase compliance with policy constraints, such as social distancing (Lalot et al. 2020)[11]. However, all these studies focus on the effects of trust rather than on whether the pandemic influenced health system choices.

While previous research has focused on the relationship between compliance and trusts in institutions (Brodeur et al., 2021; Bargain and Aminjonov, 2020; Sarracino et al., 2022), we examine the effect of relate COVID-19 mortality on HST and its subsequent effect on lockdown compliance[12]. The remainder of the paper reports the empirical strategy and results retrieved.

3. Data and Methods

Data. The data used come from two Eurobarometer (EB) survey datasets known as the EB80.2, conducted between November and December 2013 before the COVID-19 pandemic, and the EB93.1, completed between July and August 2020, which provide us with two different cross-sections. Eurobarometer surveys are conducted on behalf of the

[11] For example, Thornton (2022) documents that if citizens' trust with the health system had been the same as their trust in government, the infection rate would have been 13% lower.

[12] According to Plohl and Musil (2021), trust in science (medicine) predict the degree of compliance with restriction regulations, whereas other variables (religiosity, political leaning, curiosity about science) predict compliance through trust in science.

European Commission and are commissioned by the Directorate-General Communication. The regular sample size (in the sense of completed interviews) is approximately 1,000 respondents per country, except the United Kingdom (1,300), Germany (1,000), and Luxembourg, Cyprus and Malta with 500 interviews each. In the following analysis post-stratification weights will be used. These weights adjust each sample in proportion to its share in the total population aged 15 and over of the European Union based on population figures published by EUROSTAT in the Regional Statistics Yearbook.

The EB80.2 interviewed face to face 27,919 individuals living in the EU-28, whereas the EB93.1 interviewed 33,059 citizens living in the EU-27 and United Kingdom (UK). It also included interviews for candidate countries (Albania, Macedonia, Montenegro, Serbia and Turkey) which were not considered for the purpose of this paper. For both surveys, all respondents were residents in the respective country aged 15 and over. Final sample contains only individuals living in EU-27 and UK, aged 18 years and older (Total: 55,371 observations; 27,374 observations for EB80.2 and 27,997 observations for EB93.1). (See Table A1 for detailed description of the initial sample by country).

Dependent variables. We define two dependent variables, namely HST and ease of compliance with lockdown measures. HST is measured as follows: "*Please, tell me if you tend to trust or not to trust overall healthcare in your country: (1) completely trust, (2) somewhat trust, (3) somewhat mistrust and (4) completely mistrust*". We define the variable "*trust in the healthcare system*" (HST) inverting the Likert scale of the survey so that (1) corresponds to "*totally mistrust*" and (4) to "*totally trust*".

The variable ease of compliance with lockdown is measured using the following question: "*Thinking about the measures taken to fight against the Coronavirus outbreak,* *in particular the lockdown measures, would you say that it was an experience easy or difficult to cope with?: (1) very easy to cope with, and even an improvement to your daily life", (2) fairly easy to cope with, (3) both easy and difficult to cope with, (4) fairly difficult to cope with, (5) very difficult to cope with, and even endangering your mental and health*". We define the variable "*ease of compliance with lockdown restrictions*" (COMPLY) inverting the Likert scale, so that (5) corresponds to "*very easy to cope with*" and (1) corresponds to "*very difficult to cope with*".

Explanatory variables. Based on the previous literature (Listhaug and Jackobsen 2017; Newton et al., 2017) we include controls for age, gender, nationality, marital status, occupation, age when finishing full-time education, household composition, difficulties in paying bills, level in society and Internet use. In addition, country-specific data includes size of municipality and region of residence. The lack of specific information of income and wealth is compensated using the difficulty to pay bills and the self-reported level in the society. Descriptive statistics are shown on Table A3. We are constrained by data availability. Eurobarometer datasets do not collect information on the full composition of the household, beyond dependents under 15, hence we can't identify the presence of older individuals in the household. We also do not have information on self-reported health status or whether they suffer from any chronic disease.

We draw on regional data on *COVID-19 Excess mortality*, measured as the excess mortality in 2013 and in 2020 with respect to the average of 2016-2019 and the average 14-day case rate of new COVID-19 cases per 100,000 inhabitants[13]. In the field of environmental pollution, a positive relationship has been documented between the risk perception of individuals exposed to pollution and local mortality records (Interdonato et

[13] These measures have been calculated with reference to the region of residence (NUTS-2) except for Cyprus, Estonia, Latvia, Lithuania, Luxembourg and Malta for which the country as a whole has been taken as a reference. In total, regional information is available for 197 NUTS-2 and 6 countries.

al. 2014, Janmaimool and Watanabe 2014, Wachinger et al. 2013). Although pollution affects people far more equally than COVID-19 and is more visible to individuals, the reporting on individual COVID-19 cases and deaths made it more visible and it was presented as if the risk could affect everyone. In this paper, we pose a similar hypothesis in probability of contagion and risk of death.

Relative mortality in 2013 ($RM_{2013,Nut}$) is computed using registered weekly deaths (all causes) in 2013 by territorial units with respect to average deaths between 2016 and 2019, using information from Eurostat [14],which allows to identify regions with excess mortality if $RM_{2013,Nut} \geq 0$.

$$Relative\ mortality\ 2013_{Nut} = \frac{Deaths_{2013,Nut}}{\sum_{y=2016}^{2019} Deaths_{y,Nut}/4} - 1 \qquad (1)$$

Relative mortality in 2020 ($RM_{2020,Nut}$) is computed using average weekly registered deaths (all causes) between week 11 ($W_{11-2020}$) and week when respondent was interviewed ($W_{EB93.1}$) with respect to average weekly deaths between years 2016 and 2019 by NUTS-2, using the same dataset as before. The variable estimates the community deaths directly or indirectly attributed to COVID-19.

$$Average\ weekly\ deaths\ 2016 - 19\ _{Nut} = \frac{\sum_{y=2016}^{2019} Deaths_{y,Nut}}{4 \cdot 52.14} \qquad (2)$$

$$Relative\ mortality\ 2020\ _{Nut} = \frac{\frac{\sum_{i=W_{11-2020}}^{W_{EB93.1}} Deaths_{w,Nut}}{W_{EB93.1} - W_{11-2020}}}{Average\ weekly\ deaths\ _{2016-2019,Nut}} - 1 \qquad (3)$$

[14] We cannot confirm that the information reported in the press coincides exactly with that appearing in these databases, but we have found that the countries used in this work meet the criteria of reliability and absence of manipulation examined in several studies (Sambridge and Jackson, 2020; Farhadi, 2021; Farhadi and Lahooti, 2021).

The *average cases* is defined as the average of 14-day case rate of newly reported COVID-19 cases per 100,000 population by week and territorial units ($14\ days\ \ cases_{w,Nut}$) between week 11 ($W_{11-2020}$) and the week when the respondent was interviewed ($W_{EB93.1}$). The sources consulted to compute the "Average Case Rate" by NUTS-2 are listed on Table B2.

$$Average\ case\ rate_{Nut} = \frac{\sum_{i=W_{11-2020}}^{W_{EB93.1}} 14\ days{-}Cases_{w,Nut}}{W_{EB93.1}-W_{11-2020}} \tag{4}$$

$$14 - days\ cases\ _{w,Nut} = \sum_{day=1}^{14} \frac{cases\ _{day,Nut}}{14}$$

Figure A1 shows the relationship between relative mortality (RM) in 2013 and 2020 by NUTS-2. 54.55% of the territorial units exhibit a $RM_{2013} \leq 0$ and $RM_{2020} > 0$, but only 1.6% exhibit a $RM_{2013} \leq 0$ and $RM_{2020} > 0$. Table B1 displays the RM in 2013 and 2020 with respect to average 2013-2016, average case rate of newly reported COVID-19 cases, trust in healthcare (2013 and 2020) and ease of compliance with restrictions (2020) by NUTS-2. Figure A2 in the appendix shows a map of European territorial units shaded in red according to RM in 2020 with respect to the 2016-2019 average (higher intensity indicates higher RM), which suggests an association between lower regional RM and higher trust in the healthcare system[15]. Similarly, Figure A3 displays the relationship between ease of compliance with lockdown restrictions and trust in the healthcare, suggesting an association between a region's healthcare system trust and ease of compliance with restrictions[16]. Finally, Figure A4 n the appendix maps the spatial

[15] Regions with the highest RM are Madrid (Spain; 170.94), Lombardy (Italy; 153.03), Castilla La Mancha (Spain; 151.63) and London (United Kingdom; 135.43). In these regions, the lowest trust in the healthcare system is observed in London (2.06) and Madrid (2.34), which is 26.43% and 16.43% lower than the average confidence for all regions. On the other hand, in the regions with lower relative mortality there is a high concentration of Hungarian regions (Del-Alfold, Kozep-Dunantul, Kozep-Magyarorszag, Nyugat-Dunantul), which also show a degree of trust in the healthcare system around 7% higher than the average.

[16] Regions showing the greatest ease of compliance with mobility restrictions are Danish (Sjaelland (3.76), Syddanmark (3.68), Nordjylland (3.65) and Hovedstaden (3.64)). Malta (3.61), Overijssel (3.53) and Zeeland (3.50) in the

distribution of the perceived ease of compliance with lockdown restrictions and the average number of COVID-19 cases per 100,000 inhabitants and displays that in regions with a higher incidence rate, there is greater dispersion in ease of compliance with restrictions[17].

4. Empirical Strategy

4.1 Exposure to COVID-19 and Healthcare System Trust

COVID-19 may have been a one-of-a-kind pandemic in terms of risk information exposure. Indeed, since the outbreak of the pandemic, the media has played a critical role in reporting on cases and deaths (Anwar et al., 2020; Tsao et al., 2021). One way to capture exposure to the pandemic is by examining the effects of regional (excess) mortality in 2020 compared to the periods immediately before the pandemic (2016 to 2019). We hypothesise that individuals' trust in the healthcare system may be affected by relative mortality (RM).

To assess the impact of the pandemic on trust in the healthcare system, we propose a difference-in-difference-in-differences or triple (DiDiD) model, which compares trust in regions with excess mortality versus all other regions, and in 2013 versus 2020. A DiDiD model addressed the potential endogeneity form three types of unmeasured confounders: those that vary over time but affect people in a similar fashion (e.g., changes in the healthcare system between 2013 and 2020), those that vary across people but

Netherlands also stand out. In these regions, confidence in the healthcare system is well above average (32% in the Danish regions, 29% in Malta, 25% in the Dutch regions). In contrast, the greatest difficulties are concentrated in Cantabria (Spain; 1.33) and several Italian regions (Marche, 1.71; Toscana, 1.73; Liguria, 1.87). In these regions, trust in the healthcare system is well below average (52% in Cantabria and 39% in the Italian regions).

[17] The highest average number of confirmed cases per 100,000 inhabitants corresponds to several Spanish regions (Aragon, 168.10; Madrid, 132.87, La Rioja, 117.60) and Smalland Med Arna (Sweden, 119.69). In these regions, the ease of compliance with the restrictions is above average, except in Madrid where it is 6% below average. In contrast, the lowest average infection rate is observed in Northern Ireland (2.17), Scoltland (2.18) and Pohjois-ta Ita-Suomi (Finland, 2.49). In these regions, the ease of compliance with restrictions is above average (13%, 11% and 28%, respectively).

remain constant over time (e.g., fundamental differences among age cohorts), and those that vary over time but affect people differently (e.g.,, mortality)

The DiDiD specification allows for differential trends across regions and by respondent's age . Following this assumption, we estimate the following DiDiD equation using ordinary least squares (OLS):

$$HST_{irct} = \alpha_0 + \alpha_1 Age_{irct} + \alpha_2 RM_{rct} + \alpha_3 POST_t +$$

$$+\alpha_4 Age_{irct} POST_t + \alpha_5 RM_{rct} POST_t + \alpha_6 Age_{irct} RM_{rct} + \alpha_7 Age_{irct} RM_{rct} POST_t +$$

$$\gamma' X_{irct} + \delta_r + \nu_c + \varepsilon_{irct} \qquad (5)$$

where HST_{irct} is the level of trust in healthcare system (according to the Likert scale, from (4) corresponding to "*totally trust the health system*" to (1) corresponding to "*totally mistrust the health system*" of individual living in region *r* and country *c* who is interviewed on year *t*. Age_{irct} depicts the age cohort to which the individual belongs: 18-30 (omitted category), 31-45, 46-64 and 65 and older. Finally, RM_{rct} depicts the relative mortality of region *r* in year *t* (2013, 2020) with respect to the average mortality in the period 2016-2019. We define RM as a *binary variable*, that takes the value 1 if RM in that region and year is positive, and alternatively, as a *continuous variable*, indicating higher excess mortality as its values increase.

$POST_t$ refer to an indicator variable equal to 1 if the individual is interviewed in 2020 (0 if interviewed in 2013), and the vector X_{irct} measures a series of controls including gender, nationality, marital status, relation with economic activity, age when stopped full-time education, household composition, having internet at home, difficulties in paying bills, level in society and Internet use. Finally, δ_r and ν_c denote regional and country fixed effects. They capture long-term NUTs-specific differences and common changes that occurred in all states in the same year (i.e., those linked to the economic cycle). Robust standard errors are obtained with clusters at regional level[18].

Parallel trends assumption. An important limitation of a DiDiD analysis is that that the outcomes in the treatment and control groups would have followed parallel trends in the absence of the pandemic. For this purpose, we have relied on coarsened exact matching. Coarsened exact matching (CEM) is a matching strategy developed by Iacus et al. (2012), which reduces the impact of confounding on observational causal inference. The strategy consists of simultaneously matching using a set of possible confounders which are "coarsened", reducing the number of possible matching values for a given covariate with the aim of increasing the number of matches achieved[19].

After applying the CEM method, a weighting variable is obtained to equalise the number of observations within the comparison groups, which takes values between 0 and 1. To check the balance of two comparison groups, the multivariate imbalance measure L1 is used, whose size depends on the dataset and the selected covariates, and which takes values between 0 (perfect overall balance) and 1 (maximum imbalance), i.e. a larger value represents a larger imbalance between two groups. When good matching occurs, a substantial reduction in L1 is obtained (Green et al., 2015)[20].

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[18] In additional specifications, we also show that our results are robust to using the Donald and Lang (2007) method to calculate standard errors.

[19] CEM works as follows. First, it makes a copy of the set of covariates chosen for matching. Second, the variables are broken down into different meaningful strata (i.e., into equal intervals of the same size or into intervals of different dimension from each other), through user choice automatically or through the CEM algorithm. Third, a unique stratum is created for each observation and each observation is placed in a stratum. The strata created are reassigned to the original data set, and any strata that does not contain at least one treated and one control unit is removed. Thus, the treatment effect is based on the matching provided by the algorithm, since the difference between treated and control units is obtained from the difference in the outcome variable between units belonging to the same strata. Finally, the higher the coarsening (higher number of strata), the lower the imbalance, as well as the lower the number of matches provided by the CEM.

[20] See Table A2 for L1 statistics before and after CEM.

In our study, CEM has been used to make the two groups of respondents to the Eurobarometer surveys (80.2 and 93.1) statistically equivalent, based on age, gender, age when finishing education, household size, relation with economic activity and size of municipality[21]. The final sample after CEM contains 51,861 observations (25.874 from EB80.2 and 25,987 from EB93.1), which represents 93.66% of the initial sample.

An additional advantage of the CEM estimator over the standard matching procedure is that it allows us to control for unobserved time invariant factors. This implies that we assume that the outcome variables of interest of the treated and control units, in the absence of any treatment show the same growth trajectory, i.e., the parallel trend assumption of the DiD method.

Canonical estimation. The canonical DiDiD model presumes the existence of two groups, the treated and the control group, two time periods. When a common trend assumption is satisfied, the two-way fixed effects estimator is a linear combination of treatment effects across treated units. However, such estimates can be biased when treatment effects change over time within treated units (Goodman-Bacon 2020). Treatment effect heterogeneity call for a series of alternative estimators (Callaway and Sant'Anna 2020, Sun and Abraham 2020). However, these estimators may have less statistical power than the pooled estimator, and Marcus and Sant'Anna, (2021) find that when facing a limited number of groups and time periods (as in our case), it may be reasonable to adopt a "weaker" version of the parallel trend assumption[22].

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[21] Muenning et al. (2017) and Tetteh et al. (2019) have found that CEM is preferable to other matching procedures (e.g., propensity score matching) in terms of more efficient processing and reduced model dependence, variance and bias. Ripollone et al. (2015) also showed that optimal performance is warranted only when the vector of important confounders is relatively small (fewer than 10), which is fulfilled in our case.

[22] As the weights are proportional to the residuals from a regression of treatment on country, region and year effects, we have checked that the residuals from a regression of the outcome variable on region and year fixed effects are linearly related to the residuals from a regression of treatment on region and year fixed effects and the slope of this linear relationship does not differ between the treatment group and the comparison group (results available upon request).

The DiDiD is an intention-to-treat analysis in which the coefficient α_7 represents the effect of the pandemic on trust among older respondents in regions with higher RM. To interpret the DiDiD effect as the causal effect of COVID-19, the incidence of the pandemic must be uncorrelated with other time-varying determinants of trust in healthcare in our sample. This assumption would be violated if the pandemic induced selection into our sample (for example, if the level of trust in the healthcare system of those who died between the two waves of the Eurobarometer were not randomly distributed, which would affect the sample of respondents in 2020).

To evaluate the plausibility of these concerns, we present the results from regressions that estimate the DiDiD model using observable respondent characteristics as dependent variables (and thus omitting the controls X_{irct}). As we do not include individual-level controls in these regressions, we collapse the data to respondent's age-region/year level. Results in Tables A4-A6 suggest that the pandemic is fundamentally uncorrelated with the explanatory variables Therefore, it seems unlikely that differential demographic trends drive the results shown in section 5.1.

4.2. Effect of trust in healthcare over ease of compliance with lockdown restrictions

Previous research indicates that public trust in government is an important determinant of social response and adherence to regulations (Chanley et al., 2000)[23], insofar as trust is the cornerstone for the legitimacy of government decisions (Marien and Hooghe, 2011), especially when individual freedoms are restricted (e.g., in a lockdown). Below we examine whether trust in the healthcare system impacts on the ease of compliance with pandemic regulations as follows:

[23] For example, in relation to the SARS outbreak in Singapore, high trust in government made it easier for most Singaporeans to comply with control measures (Deurenberg-Yap et al., 2005). In contrast, during the Ebola outbreak in West Africa, distrust in institutions was found to significantly decrease the likelihood of ease of compliance with control recommendations (Blair et al., 2017).

$$COMPLY_{irc} = \beta_0 + \beta_1 HST_{irc} + \beta_2 RM_{rct} + \beta_3 Casesf_{rc} + \kappa' X_{irc} + \lambda_r + \mu_c + \varsigma_{irct} \quad (6)$$

where $COMPLY_{irct}$ measures the ease of compliance with lockdown restriction of individual i living in region r of country c (using the Likert scale from (4) which corresponds "*very easy to cope with*" to (1) which denotes "*very difficult to cope with*"). HST_{irc} , RM_{rct} and X_{irc} are defined as in the previous model. As in the DiDiD model, RM is entered in the regression either as a binary variable or as a continuous variable. $Casesf_{rc}$ denote the average of 14-day case rate of newly reported COVID-19 cases per 100,000 inhabitants for region r of country c (since the onset of the pandemic until the day of the interview).

Further, we examine the so-called "*Cummings effect*" to support the causal effect of trust in health authorities. This effect is named after Dominic Cummings, senior aide to the British Prime Minister, who was caught not complying with lockdown regulations, traveling with his wife (a COVID-19 suspect) and his son. Numerous scientists expressed their concern that such actions could undermine confidence in the health authorities[24]. Similar regulation breaches have been detected in Greece[25], New Zealand[26], Norway[27], Spain[28] , which can undermine trust and individuals' behaviours, contributing to further outbreaks[29], and relaxing their adherence to health recommendations, which may lead to further outbreaks (Wong and Jensen, 2020).

[24] Fancourt et al. (2020) analysed 220,755 interviews conducted with 40,597 individuals between April 24 and June 11, 2020, in England, Scotland and Wales, and reported a reduction in confidence in government in England, starting on May 22nd, although no comparable behaviour was found for confidence in the governments of the devolved nations. A knock-on effect of such actions was a decrease in public adherence to the guidelines of the health authorities (Marien and Hooghe, 2011). Fancourt et al. (2020) shows that before the Cummings breach became known (on May 22) there had been a relaxation in compliance, but the gap between England and Wales and Scotland widened in the weeks that followed.

[25] Greek PM accused of breaking coronavirus lockdown rules — again – POLITICO

[26] Coronavirus: NZ health minister breaks lockdown at beach - BBC News

[27] Norway's prime minister investigated for breaking lockdown rules | Financial Times (ft.com)

[28] Fernando Simón, sábado de surf en Portugal en plena oleada de rebrotes (abc.es)

[29] Vinck et al. (2019) explored the role of mistrust and misbeliefs on preventive behaviours during an Ebola outbreak in the Republic of Congo. They reported a lower likelihood of seeking healthcare in case of presenting symptoms and adopting preventive behaviours.

As for the effect of high mortality and a higher number of reported cases, we hypothesise that it may increase risk perception (Bundorf et al, 2021), thereby increasing the preferences for staying at home (Eder et al., 2021) and making it easier to comply to regulations (Lunn et al., 2020). However, this is an empirical question as a very strict lockdown may increase the likelihood of breaking the rules. Therefore, the potential endogeneity of the variables relative mortality (RM_{rc}) and average case rate ($Cases_{rc}$) should be considered.

$$RM_{rc} = \gamma_0 + \gamma'_1 Z + \gamma_2' X_{irc} + \tau_r + \upsilon_c + \varrho_{irct} \quad (7)$$

$$Cases_{rc} = \delta_0 + \delta'_1 Z + \delta' X_{irc} + \psi_r + \iota_c + \varphi_{irct} \quad (8)$$

In equations (7) and (8), the vector Z refers to exogenous variables. In this paper, we use as instrumental variables the classification of the 28 countries into quartiles according to the INFORM Covid Risk Index[30], which relies on three dimensions: "Hazard and Exposure", "Vulnerability" and "Lack of Coping Capacity" which focus on structural factors[31]. Using the value of the index, we classify the values into quartiles (very low risk, low risk, moderate risk and high risk) as reported on Table C1 (see Appendix C for more information of the items included in each dimension)[32]. Table C2 displays the average values of HST by RM and the number of confirmed cases in 2020.

[30] The INFORM COVID-19 Risk Index is an adaptation of the Inform Epidemic Risk Index that tries to identify: "*countries at risk from health and humanitarian impacts of COVID-19 that could overwhelm current national response capacity, and therefore lead to a need for additional international assistance*" (Poljanšek, 2020).

[31] Each of the 3 dimensions is measured on a scale between 0 and 10 in which a higher value indicates that the country faces more adverse conditions. The aggregation of the indicators has been performed following the INFORM model (De Groeve et al., 2014).

[32] The use of the INFORM Covid-19 Risk Index might raise some doubts about its suitability, if one suspects that countries with higher values of this index, and therefore less preparedness to face a health emergency, would have opted to impose more restrictive mobility measures. However, this hypothesis does not seem at all plausible for three reasons. First, the INFORM Covid-19 Risk Index was published on April 20th, 2020, e.g., when the first wave of the pandemic had already begun[32]. Second, Table C3 shows the chronology of mobility and containment restrictions approved in all the countries analysed, and all countries had enacted severe containment measures before the date of publication of this index. Third, Figure C1 shows the relationship between the INFORM Covid-19 Risk Index and the average Oxford Covid-19

5. Results

5.1 Trust in healthcare system

Table 1 displays the results of the model estimation for HST. The first three specifications M1-M3 use RM defined as a binary variable (1 if excess mortality exceeds zero, i.e., mortality in the respective wave was higher than the 2016-2019 average, 0 otherwise). The subsequent three specifications M4-M6 draw on RM defined as a continuous variable. Models M1 and M4 correspond to the estimation of a DiD model that compares the changes in trust before and after the pandemic between the 31-45, 46-64 and 65+ cohorts (treatment group) with respect to the youngest cohort (control group). M2 and M4 report the estimates of a DiD specification that compares the changes in trust before and after the pandemic in regions with over-mortality relative to the 2016-2019 average (treatment group) and with RM below the 2016-2019 average (control group). Finally, models M3 and M6 estimate the DiDiD model of equation (5). Furthermore, we report the effect of a one standard deviation increase of the covariate on HST (continuous variables) and the average value of HST as (as a binary variable).

[Insert Table 1 about here]

Our descriptive analysis reveals an increase in HST in the year 2020 (compared to 2013) ranging between 2.67% in M1 and 6.24% in M3. However, living in a region with excess mortality leads to an additional reduction of HST (-0.29% in M1; -0.27% in M3). *One standard deviation increases in RM decreases HST by 0.0005 points* (M4) and

Stringency Index during the first wave of the pandemic, showing that there is no positive relationship between the two variables.

by 0.0025 points (M6). Our estimates show the negative effect of RM accentuated in 2020.

Nonetheless, the effects vary by age cohorts, people aged 46-64 and 65+ reveal a higher HST (6.59% and 10.17% in M3, respectively), and HST significantly increase compared to 2013 (2.96% for 46-64 and 6.14% for 65+ in M1). As expected, the effect is lower when a region exhibits excess mortality among individuals aged 45-64 and over 65 + (-0.20% according to M3) age cohort years of ages. Such a negative effect is offset by the coefficient of the triple interaction of age, year and region over mortality, *which is positive for both age cohorts, although the overall effects turn out to be negative for the cohort aged 31-45 years (-0.20%)*.

Using the RM as a continuous variable, Figure 1 displays the predicted HST by age cohort. For all ages, HST is higher in 2020 than 2013, unless excess mortality exceeds the average of 2016-2019. *Indeed, HST increases with RM until the excess mortality threshold of 20% relative for the period 2016-2019, where we observe a change in trend for all age cohorts*.

[Insert Figure 1 about here]

5.2 Heterogeneity

Table 2 reports the heterogeneous effects of several relevant covariates extending the specification M6 of Table 1. In 2020, a higher relative exposure to regional excess COVID-19 mortality gives rise to a sharp increase in HST among nationals (46-64 and 65+). Similarly, we find a compatible effect when we evaluate the effect among migrants, but the effect is significantly lower. Next, we examine the level of difficulty in making ends meet, and we document that, as expected, the negative effect is higher among the cohort aged 65+ years, which exceeds by more than 10 times that of those who have no difficulties at all. Thus, in 2020 and in the presence of excess mortality, lower income households have been more prone to reduce HST, and the gap between households' income increases with age[33]. Finally, we document significant heterogeneity by educational attainment. We observe a stronger decrease in HST for all age cohorts among those that left school before the age of 16.

[Insert Table 2 about here]

5.3. Ease of compliance with COVID-19 restrictions

Next, we examine how variations in HST affect people's ease of compliance with lockdown restrictions drawing on an instrumental variable strategy[34].

[Insert Table 3 about here]

Table 3 displlays the OLS and IV estimation results for the degree of ease in complying with lockdown constraints. IV estimation are performed by 3SLS, which uses GLS and provides more efficient estimates than a simple GLS (Greene, 2008). The upper part of the table shows the results for the variables considering that RM is a binary

[33] These estimates are consistent with estimates of the self-reported social class: in the cohort aged 31-45 years, we document a different effect among those regarding themselves as "working class", an effect nearly 30 times higher than that of those who consider themselves to be "higher class".

[34] First, we verify that the referred instruments satisfy two conditions: (1) relevance or being sufficiently correlated with the suspected endogenous variable, and (2) exogeneity or being distributed independently of the error process. The results presented in Table C4 strongly reject the null hypothesis of under-identification. To detect weak instruments, there are several informal procedures, such as the first-stage partial R^2, which measures the contribution of the excluded instruments to explain variation in the endogenous variable, and the first-stage partial F-statistics on the excluded instruments. All the F-statistics are above 10 and the partial R^2 suggesting that our instruments are relevant and strong. Since the Cragg-Donald-based test for weak instruments assumes homoscedastic errors, we also present the Kleibergen-Paap Wald rk F-statistic, which is valid in case of non-i.d. errors (Kleibergen and Paap, 2006). We find that the Cragg-Donald and Kleibergen-Paap Wald rk F statistics reject the weakness of the instruments. As the number of instruments is larger than the number of potential endogenous variables, we test for over-identification using the Hansen-Sargan (Hansen, 1982). The null hypothesis is that the instruments are valid (e.g., uncorrelated with the error term) and that the excluded instruments are correctly excluded from the estimated equation. The test statistics show that exogeneity is rejected at the 5% significance level. All three instrument options have been validated.

variable (1 if it is positive, 0 otherwise). The lower panel of the table shows the results considering that RM is a continuous variable. For both, OLS and IV estimations, we proceed by a progressive incorporation of explanatory variables.

The OLS estimates underestimate the effect of HST but overestimate the effect of RM and the case rate. Estimates suggest that individuals are more likely to comply with lockdown restrictions if they live in high contagion or high mortality regions after the pandemic. However, IV estimates reveal that this is not the case. The real underlying motivation lies in HST. So, if the epidemiological situation leads health authorities to recommend a lockdown, and individuals understand that the underpinning reason is to protect their health by avoiding a health system collapse, they are more likely to cooperate in complying with mobility restrictions. *One standard deviation increase in HST increases the probability in complying with the restrictions, and the effect ranges between 0.0046 and 0.0065 points (IV).*

Similarly, when we focus on OLS estimates, we find that a one standard deviation increase in HST gives rise to an increase in ease of compliance with COVID-19 regulations of 0.0007 points, but such effect becomes negligible in the IV estimation. Living in a region with excess mortality (binary variable) increases ease of compliance with mobility constraints by 5.22% compared to the mean value (that is, one percentage point smaller compared to M4 in the OLS estimation). Similarly, when we consider the continuous dimension of this variable, estimates suggest that a one standard deviation increase in RM increases the perceived ease of compliance with the pandemic regulations by 0.0006 points (compared to 0.0103 in the OLS estimation).

Figure 2 displays the predicted level of ease of compliance with pandemic regulations as a function of age cohort, HST and mortality in 2020 relative to the 2016-2019 average. Consistently with estimates suggesting lower levels of HST among such age group, we show that younger cohorts (18-30, 31-45 years) reveal a reduction in the perceived ease of compliance (or an increase in lockdown compliance difficulties: -0.08 or -0.07 points, or a decrease by 2.2%-2.6% with respect to the mean) for mortality levels above 10% compared to the 2016-2019 average.

[Insert Figure 2 about here]

Finally, its worth noting that we find a nonlinear effect in older cohorts (46-64, 65+ years), namely an initial decline (easier compliance with lockdown), but only up to a RM of 105. From this point on, the ease of compliance rises to a RM of 120. That is, when COVID-19 mortality exceeds 120, all cohorts, we find a decrease in the perceived ease (or increase in the difficulty) of compliance with restriction irrespectively of the age of the respondent. Although we hypothesised that the high mortality rate could be interpreted as an increased risk of contagion and, as a result, a greater preference to seek safety at home, our estimates suggest the opposite effect, probably indicating that higher level of relative COVID-19 are a signal of health system failure to control the pandemic.

5.4. Heterogeneity for ease of compliance perceptions

Table 4 shows the results of the IV estimates of the effect of HST on ease of compliance by age, nationality, age at leaving school and two measure of socio-economic status, namely difficulties in making ends meet and self-reported social class.

[Insert Table 4 about here]

We find that the effect of HST increases with restrictions, and [35]is 45% higher among older cohorts and. with years of education[36]. Indeed, the effect of HST is 105%

[35] One standard deviation increase in HST increases ease of compliance by 0.0086 points for the 18-30 and 31-45 age cohorts, 0.0107 points for 46-64 years and 0.125 points for 65+.

[36] So that one standard deviation increase in trust increases ease of compliance by 0.0078 points if studying up to 15 years or less, 0.0114 points (16-18 years), 0.0121 points (19-22 years) and 0.0160 points (23 years or older).

higher among the highest educated (compared to the lowest educated)[37]. That said, more educated people may have higher expectations about the performance of political institutions (Cook and Gronke, 2005) and might be less tolerant with corruption (Hakhverdian and Mayne, 2012)[38].

Next, we turn to examine the effects by nationality, and we find that nationals exhibit a 10% higher perceived ease of compliance than migrants, though HST reduces such ga[39] As expected, we find that the effect of trust on the ease of compliance is greater for households that do not face financial constraints[40], and consistently, the average degree of ease of compliance with restrictions is almost 16% among those who consider themselves belonging to higher class compared to working class. This result is consistent with Newton et al. (2017) and Rieger and Wang (2022) who document higher levels of trust among the population among socioeconomic status individuals, as lower-income people are more likely to work in jobs not suitable for home working (Adam-Prassl et al., 2020), are more likely to experience financial stress (Berchick et al., 2019).

5.5. Mechanisms

[37] Most studies that have addressed the relationship between trust and education have focused on trust in political powers. Some studies (Hetherington, 1998; Anderson and Singer, 2008) document a positive relationship between trust and education.

[38] Hence, education is a proxy variable for both cognitive skills and information processing ability and is found to reinforce the effect of trust in the healthcare system on ease of compliance to a greater extent than biological age.

[39] The survey does not provide information on the health coverage of respondents, but it could be that unequal access to healthcare between nationals and immigrants is the cause of the effect among immigrants.

[40] One standard deviation increase in trust in the healthcare system increases the ease of compliance with restrictions by 0.0107 points if there are no difficulties in making ends meet, compared to 0.058 points for households that always struggle to make ends meet (i.e., almost twice).

Finally, we propose two mechanisms to help explain our effect, namely the compulsory nature of the restrictions[41], which might not be seen as justified, and the effect of the restrictions on the economy.

We rely on two questions from Eurobarometer 93.1. The first question refers to whether the restrictions impact on the country's economy[42]. We define three binary variables to represent the three possible responses: 41% of respondents thought there was a balance between health and economic protection, while 35% thought it was too focused on health at the expense of the economy (see Table A3). Table A7 displays the results of the OLS regressions for each of the three binary variables defined above. For each dependent variable, eight different specifications have been estimated, four using RM_t as a binary variable and another four using RM_t as a continuous variable, and in turn, in each of these four models the explanatory variables were introduced progressively. One standard deviation increase in HST decreases the probability of believing that measures are too much focused-on health by 0.0012 pp, or too much focused-on economy by 0.0021 pp. In contrast, one standard deviation increase in HST, increases the probability of believing that there is a good balance between health and economy by 0.0030 pp.

An increase in RM in 2020 or an increase in relative case rate is consistently associated with a decrease in the perception that measures are overly focused on health versus the economy. Living in a region with high mortality raises the perception that restrictions (are overly focused on the economy and lowers the perception that restrictions are overly focused on health.

[41] Indeed, Schmelz (2021) contends that when these measures are voluntary rather than mandatory, people are more willing to comply. Other evidence documents that higher confidence in public institutions increases compliance with health regulations (Adamecz-Völgyi and Szabó-Morvai, 2021).

[42] "*Thinking about the measures taken by the public authorities in your country to fight the Coronavirus and its effects, would you say that: (1) these measures focus too much on health to the detriment of the economy; (2) these measures focus too much on economy to the detriment of health; (3) a balance has been reached?".*

The second question asks the extent to which the respondent regards restrictions to be justified: "*Thinking about the measures taken by the public authorities in your country to fight the Coronavirus and its effects, would you say that the limitations to public liberties were: (1) absolutely justified, (2), somewhat justified, (3) not very justified or (4) not at all justified?"*. 44% reveal that the measures were absolutely justified whilst 37% reveal they were quite justified (see Table A3).

Table A8 shows the results of the OLS regressions for each of the three binary variables defined above. For each dependent variable, eight different models have been estimated, four using RM_t as a binary variable and another four using RM_t as a continuous variable, and in turn, in each of these four models the explanatory variables were introduced progressively. We find that one standard deviation increase in HST increases the probability of believing that lockdown measures are absolutely justified by 0.0026 pp. Importantly, living in a region with excess mortality increases (decreases) the beliefs that measures are somewhat justified (not very justified) by 49.8% (57.8%)[43].

6. Conclusion

This paper has examined whether changes in relative COVID-19 mortality (RM) builds or weakens healthcare system trust (HST), and whether HST influences how costly it was for individuals to comply with COVID-19 regulations. We document three sets of findings.

First, we find that on average that RM increased health system trust (HST), and that HST reduces the costs to comply with COVID-19 restrictions. However, the effect is non-

[43] In other words, one standard deviation increases in relative mortality in 2020 with respect to average 2016-2019 increases the probability that containment measures are absolutely justified by 0.002 pp. and decreases the probability of believing that measures are not at all justified by 0.004 pp.

linear, as we show that 20% above average mortality reduces significantly, the propensity to comply with regulations, offsetting the positive effect of trust in the healthcare system.

Second, HST increases with age and the effect of RM on HST during the pandemic was heterogeneous across individuals age groups. That is, it increased HST among people 45-64 and 65 and over as they were mostly affected by the pandemic, but it decreases it among younger cohorts.

Third, we find that a one standard deviation increase in HST leads to an increase in the perceived ease of compliance with COVID-19 restrictions which was heterogeneous across age groups and varied between 0.0086 points (18-30 years) and 0.107 points (over 65 years). That is, the effect of HST and perceived ease of compliance is 45% stronger for the older cohort.

There are several explanations for these results including higher economic difficulties among younger individuals, as proxied by an effect of individuals reporting "difficulty in making ends meet" and "self-reported social class". We document that the effect of HST on the ease of compliance is weaker among households that face financial constraints. The negative effect of RM on this groups can be explained as blaming the health system for the spread of the pandemic and the consequences it has had for their lives, jobs or businesses.

These results suggest that higher RM strengthens HST among individuals that are perceived to be more vulnerable. However, even such effect it only holds so long as it does not exceed 20% of the average RM. This evidence suggests that the pandemic was especially challenging among younger age groups, for whom RM is not necessarily entailed higher risk exposure, for whom higher RM is interpreted as a sign of failure that weaken their trust in the health system. Altogether, these estimates suggest that building

HST is important and can make a difference to the perceived costs of compliance of the regulations necessary to fight future pandemics, and provides an explanation for the heterogeneous costs of compliance in regulation across age groups, which might suggest that in the event of the pandemic, younger age individuals out to be compensated, if HST is expected to remain strong among such an age group

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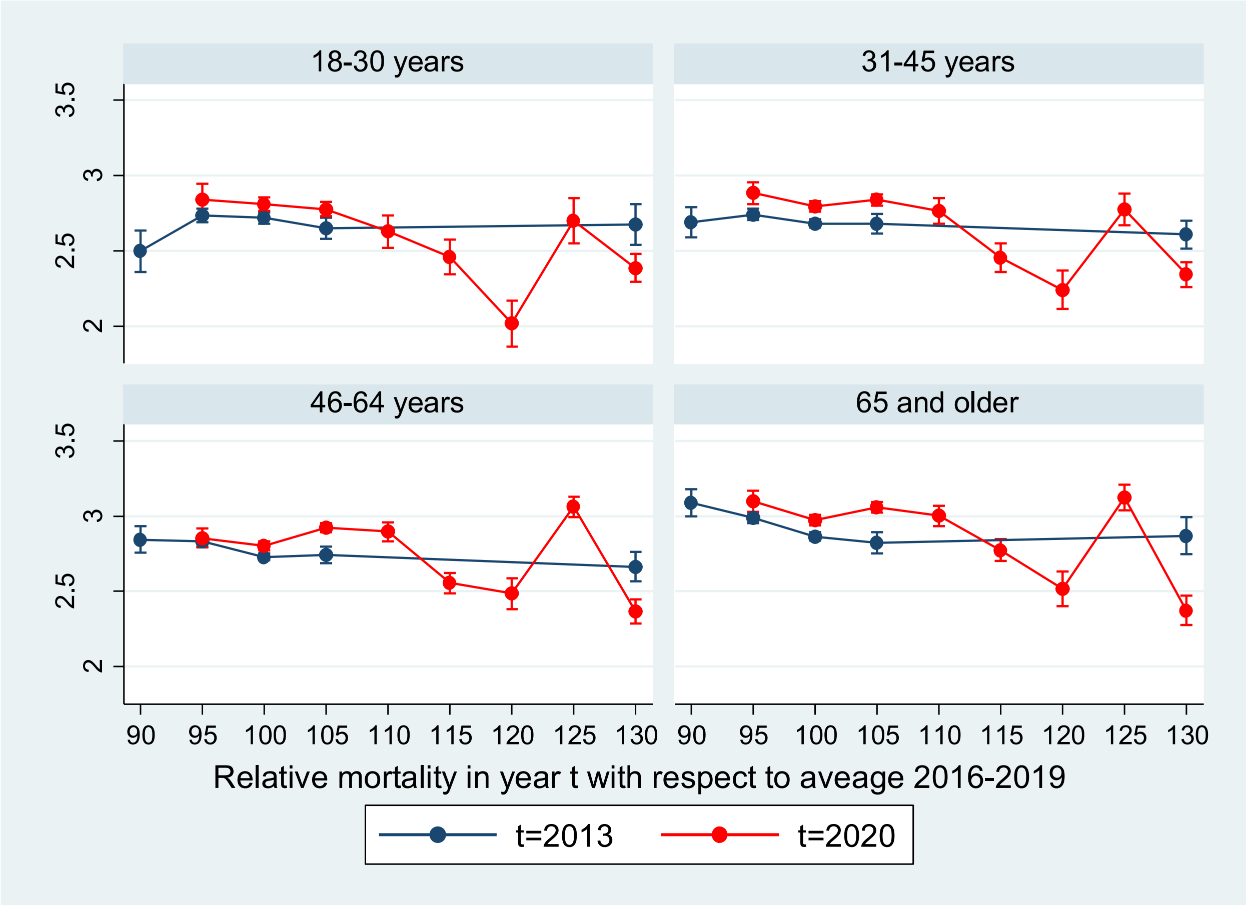
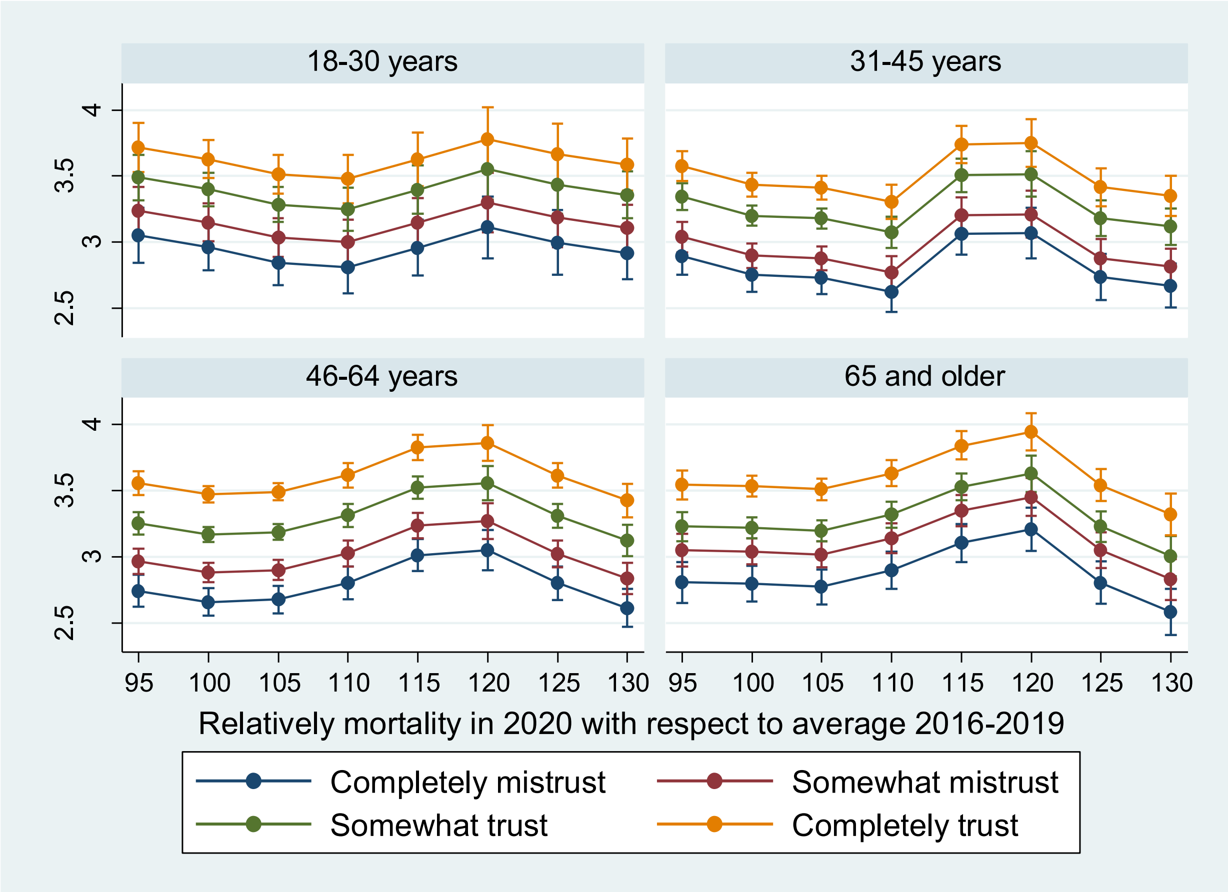
Figure 1. Predicted trust in healthcare system after estimation of DiDiD model (model M6 of Table 1)



Estimations have been performed using the final sample after CEM.

Predicted trust in healthcare system after estimating a DiDiD model with interactions between age cohort, year 2020 and relative mortality with respect to average 2016-2019, and the following explanatory variables: sex, marital status, years of education, nationality, relation with economic activity, household size, number of household members (aged 15 and older, between 10 and 14 year, less 10 years), size of municipality of residence, difficulties for making ends meet, having internet at home, self-reported social class, territorial unit. Robust standard errors clustered at NUTS-2 level.

Figure 2. Predicted ease of compliance with lockdown restrictions after estimation of IV model for the variables 'trust level in healthcare system' and 'relative mortality (RM)' with interactions by age.



Estimations have been performed using the final sample after CEM.
Note: Predicted probabilities obtained after estimating an IV regression with the following explanatory variables: sex, nationality and region of residence, marital status, age when finishing education, relation with economic activity, household characteristics (size and number of people younger than 10, between 10 and 15, aged 15 and older), difficulties for making ends meet, having internet and self-reported social class. Endogenous variables (relative mortality in 2020 with respect to average 2016-2019 (continuous variable), trust in healthcare system and their interaction with age. Instruments used: classification of countries by Inform COVID-19 Risk Index. Robust standard errors clustered at NUTS-2 level.

Table 1. The effect of relative mortality and age cohort exposure on for health system trust (HST) – Difference in differences (DiD) and triple differences (DiDiD) estimates

Dependent variable: HST	**RM_t binary variable**			**RM_t continuous variable**		
	M1	**M2**	**M3**	**M4**	**M5**	**M6**
	DiD Age·$Year_{2020}$	**DiD $RM_t Year_{2020}$**	**DiDiD**	**DiD Age·$Year_{2020}$**	**DiD $RM_t Year_{2020}$**	**DiDiD**
Relative Mortality (RM_t)	-0.0081***	-0.0079***	-0.0077***	-0.0464***	-0.0474***	-0.0658***
	(0.0005)	(0.0014)	(0.0032)	(0.0091)	(0.0150)	(0.0327)
	-0.2893	**-0.2822**	**-0.2751**	**-0.0005**	**-0.0008**	**-0.0025**
Age 31-45	-0.0074	-0.0155	-0.0121	-0.0077	-0.0171	-0.0129
	(0.0170)	(0.0121)	(0.0150)	(0.0170)	(0.0122)	(0.0170)
	-0.2643	**-0.5551**	**-0.4329**	**-0.2751**	**-0.6128**	**-0.4616**
Age 46-64	0.0608***	0.0865***	0.1745***	0.0606***	0.0866***	0.1759***
	(0.0160)	(0.0113)	(0.0794)	(0.0160)	(0.0113)	(0.0760)
	2.2125	**3.1722**	**6.5899**	**2.2051**	**3.1760**	**6.6456**
Age 65+	0.2038***	0.2320***	0.2618***	0.2049***	0.2329***	0.2672***
	(0.0170)	(0.0118)	(0.0425)	(0.0170)	(0.0119)	(0.0468)
	7.7698	**8.9257**	**10.1651**	**7.8147**	**8.9631**	**10.3936**
$Year_{2020}$	0.0732***	0.1497***	0.1657***	0.0796***	0.1451***	0.1699***
	(0.0194)	(0.0413)	(0.0334)	(0.0195)	(0.0400)	(0.0353)
	2.6716	**5.6087**	**6.2385**	**2.9119**	**5.4276**	**6.4059**
Age 31-45 ·$Year_{2020}$	0.0491**		0.0511***	0.0522***		0.0581***
	(0.0245)		(0.0213)	(0.0245)		(0.0226)
	1.7427* **		**1.8533**	**1.8939**		**2.1123**
Age 46-64 ·$Year_{2020}$	0.0834		0.0809***	0.0841***		0.0866***
	(0.0229)		(0.0230)	(0.0229)		(0.0206)
	3.0551* **		**2.9608**	**3.0815**		**3.1760**
Age 65+ ·$Year_{2020}$	0.1506		0.1633***	0.1576***		0.1644***
	(0.0541)		(0.0373)	(0.0541)		(0.0320)
	5.9208		**6.1430**	**5.9208**		**6.1868**
$RM_t \cdot Year_{2020}$		-0.0479***	-0.0468***		-0.4579***	-0.4534***
		(0.0023)	(0.0022)		(0.0302)	(0.0302)
		-1.7353	**-1.7272**		**-0.0508**	**-0.0501**
Age 31-45· RM_t			0.0050			0.0430***
			(0.0042)			(0.0142)
			-0.1784			**-0.0007**
Age 46-64· RM_t			0.0158***			-0.0392***
			(0.0039)			(0.0119)
			-0.5660			**-0.0005**
Age 65+· RM_t			0.0250***			-0.0313**
			(0.0042)			(0.0168)
			-0.2034			**0.0028**
Age 31-45· $RM_t \cdot Year_{2020}$			0.0057			0.0421
			(0.0045)			(0.0580)
			-0.8984			**-0.0006**
Age 46-64· $RM_t \cdot Year_{2020}$			0.0217			0.1611***
			(0.0042)			(0.0545)
			0.7789			**0.0101**
Age 65+· $RM_t \cdot Year_{2020}$			0.0275***			0.1711***
			0.0045)			(0.0591)
			0.9891			**0.0117**
Intercept	3.6106***	3.5571***	2.3055***	2.7857***	2.7627***	2.7885***
	(0.0476)	(0.1314)	(0.3060)	(0.0132)	(0.0101)	(0.0131)
N	51,861	51,861	51,861	51,861	51,861	51,861
R^2	0.2176	0.2175	0.2187	0.0122	0.2125	0.2135
F	1287.96	1797.98	1937.20	884.15	1224.51	1686.29

Note: The table reports estimate of a canonical of a triple difference in differences specification based examining the effect of relative mortality and age cohorts on health system trust (HST). We report in bold the effect of one standard deviation increase over dependent variable for continuous regressors or percentage increase over average dependent variable for binary regressors. The estimations have been performed using the final sample after CEM.All regressions include as explanatory variables: sex, marital status, years of education, nationality, relation with economic activity, household size, number of household members (aged 15 and older, between 10 and 14 years, less 10 years), size of municipality of residence, difficulties for making ends meet, having internet at home, self-reported social class, territorial unit. Robust standard errors clustered at NUTS-2 level. Models M1, M2 and M3 include the continuous variable relative mortality in year t (t=2013, 2020) with respect to average 2016-2019. Models M4, M5 and M6 include the binary variable: 1 if $RM_t > 0$ and 0 otherwise. Bold figures correspond to the effect of one standard deviation increase of the regressor over the dependent variable (for continuous variables) or the percentage variation with respect to the mean (for binary variables) Standard deviations in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 2. Heterogeneous estimates of health system trust (HST) – DiDiD estimates

Dependent variable:	**Citizenship**		**Difficulties making ends meet**			**Self-reported social class**			**Age stopped education**			
HST	**Immigrant**	**National**	**Always**	**Sometimes**	**Never**	**Working class**	**Middle class**	**Higher class**	**<=15years**	**16-18 years**	**19-22 years**	**>=23 years**
Mean(Trust)	2.8819	3.1377	2.5024	2.7225	3.0190	2.7494	2.9496	3.0737	2.8664	2.8172	2.8878	2.9758
Std.Dev.(Trust)	(0.870)	(0.842)	(0.9179	(0.853)	(0.844)	(0.866)	(0.865)	(0.896)	(0.885)	(0.867)	(0.875)	(0.863)
RM_t	-0.0079***	0.0244**	-0.0024	0.0019	-0.0283***	-0.0103***	-0.0057	0.0027	-0.0352***	-0.0046	-0.0093**	-0.0067**
	(0.0017)	0.0108)	(0.0018)	(0.0033)	(0.0020)	(0.0028)	(0.0021)	(0.0134)	(0.0050)	(0.0031)	(0.0035)	(0.0030)
	-0.00004	**-0.00020**	**-0.00003**	**0.00000**	**-0.00010**	**-0.00005**	**-0.00003**	**0.00003**	**-0.00020**	**-0.00003**	**-0.00003**	**-0.00005**
$Year_{2020}$	0.3668**	6.8655***	0.8396	0.8106***	-1.0844***	-0.1127	0.6757	39.0808	-1.9776***	0.5852*	0.3394	0.4856
	(0.1819)	(-1.7936)	(0.5452)	(0.3442)	(0.2194)	(0.2996)	(0.2304)	(12.6685)	(0.5277)	(0.3260)	(0.3743)	(0.3216)
	12.8812	**135.1306**	**31.6832**	**28.7548**	**-32.3819**	**-4.1911**	**22.9057**	**426.7587**	**-66.7624**	**20.8667**	**11.9055**	**16.4271**
$RM_t Year_{2020}$	-0.0027	-0.0600***	-0.0085***	-0.0076**	0.0116***	-0.0014	0.0061	-0.0125	-0.0199***	0.0061*	0.0022	0.0035
	(0.0018)	(0.0117)	(0.0033)	(0.0034)	(0.0022)	(0.0030)	(0.0024)	(0.0137)	(0.0053)	(0.0033)	(0.0037)	(0.0032)
	0.0000	**-0.0005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**-0.0002**	**0.0001**	**0.0000**	**0.0000**	**0.0000**
Age 31-45· $RM_t \cdot Year_{2020}$	-0.0163	0.1448	-0.3089**	0.0219	0.0415	-0.0305***	0.2270	0.1948***	-0.3127	0.1246*	-0.1251	-0.0625
	(0.0441)	(0.4235)	(0.1457)	(0.0799)	(0.0635)	(0.0085)	(0.0708)	(0.0528)	(0.2557)	(0.0776)	(0.0833)	(0.0842)
	-0.0007	**0.0531**	**-0.0358**	**0.0017**	**0.0027**	**-0.0021**	**0.0139**	**0.0595**	**-0.0675**	**0.0089**	**-0.0095**	**-0.0050**
Age 46-64· $RM_t \cdot Year_{2020}$	0.1478***	0.9083**	-0.0887**	0.1537**	0.0152**	-0.0562***	0.0607***	0.1798***	-1.0281***	0.3772***	0.1867*	0.0420**
	(0.0483)	(0.6131)	(0.0444)	(0.0817)	(0.0071)	(0.0188)	(0.0234)	(0.0838)	(0.3262)	(0.0869)	(0.1073)	(0.0186)
	0.0051	**0.4106**	**-0.0095**	**0.0100**	**0.0008**	**-0.0034**	**0.0033**	**0.0564**	**-0.1435**	**0.0190*** **	**0.0120***	**0.0036***
Age 65+· $RM_t \cdot Year_{2020}$	0.1288***	2.8525***	-0.1170***	0.0333**	0.0070***	-0.0092	-0.0278	0.4872	-0.2421***	0.4563	0.0735	0.1308
	(0.0438)	(0.6334	(0.0408)	(0.0167)	(0.0307)	(0.0765)	(0.0550)	(0.5911)	(0.0950)	(0.0778)	(0.0276)	(0.0483)
	0.0059	**5.0801**	**0.0188**	**0.0034**	**0.0004**	**-0.0008**	**-0.0017**	**0.4520**	**-0.0241**	**0.0369*** **	**0.0074*** **	**0.0149*** **
Intercept	3.4110***	12.991***	2.7041***	2.4585***	5.0325***	3.5159***	3.2912***	2.5137**	5.2899***	3.0952	3.5204	3.3658
	(0.1676)	(1.0059	(0.4809)	(0.3156)	(0.2008)	(0.2692)	(0.2113)	(1.5027)	(0.4829)	(0.2930)	(0.3418)	(0.2911)
N	51,861	51,861	51,861	51,861	51,861	51,861	51,861	51,861	51,861	51,861	51,861	51,861
R^2	0.2237	0.2885	0.2138	0.2094	0.2318	0.2193	0.2283	0.2528	0.2327	0.2259	0.2301	0.2285
F	726.512	42.139	40.828	47.693	661.473	184.179	531.103	108.219	148.016	253.670	243.533	242.098

Note: This table reports the effects of triple difference (DiDiD) estimate of relative mortality and across age cohorts on HST. The coefficient in bold report effect of one standard deviation increase of regressor over trust for continuous variable or percentage increase of average trust for binary regressors). Relative mortality in 2020 is a continuous variable in all regressions (using model M6 of Table 1 All regressions have been estimated using the final sample after applying CEM. Covariates include age cohort include sex, nationality, region of residence, marital status, age when finishing education, relation with economic activity, household characteristics (size and number of people younger than 10, between 10 and 15, aged 15 and older), difficulties for making ends meet, having internet and self-reported social class. Robust standard errors clustered at NUTS-2 level. Standard deviations in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table 3. OLS and IV estimations of the HST effect on the perceived ease of compliance with lockdown restrictions

Dependent variable: COMPLY	Relative Mortality (RM_{2020}) as a binary variable							
	OLS				IV			
	M1	**M2**	**M3**	**M4**	**M1**	**M2**	**M3**	**M4**
HST	0.2198***	0.2195***	0.2179***	0.2117***	0.4555***	0.3643***	0.3601***	0.2964***
	(0.0120)	(0.0123)	(0.0122)	(0.0120)	(0.0153)	(0.0162)	(0.0162)	(0.0165)
	0.0025	**0.0025**	**0.0025**	**0.0024**	**0.0065**	**0.0055**	**0.0055**	**0.0046**
RM_{2020}	0.3849***	0.4218***	0.4161***	0.2066***	0.1774***	0.1704***	0.1718***	0.1648***
	(0.0210)	(0.0442)	(0.0491)	(0.0533)	(0.0135)	(0.0138)	(0.0138)	(0.0137)
	12.2048	**13.3748**	**13.1941**	**6.5511**	**5.6252**	**5.4032**	**5.4476**	**5.2256**
Case rate	0.1266***	0.1301***	0.1251***	0.0954***	0.0002	0.0003	0.0003	0.0005*
	(0.0035)	(0.0058)	(0.0064)	(0.0077)	(0.0002)	(0.0003)	(0.0003)	(0.0003)
	0.0004	**0.0007**	**0.0008**	**0.0007**	**0.00001**	**0.00001**	**0.00001**	**0.00001**
N	27,997	27,997	27,997	27,997	27,997	27,997	27,997	27,997
R^2	0.1714	0.1746	0.1755	0.1807	0.0213	0.0562	0.0583	0.0809
F/chi2	340.412	436.733	361.383	359.986	12,345.994	15,797.916	16,347.532	21,914.695
p	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	Relative Mortality (RM_{2020}) as a continuous variable							
	OLS				IV			
	M1	**M2**	**M3**	**M4**	**M1**	**M2**	**M3**	**M4**
HST	0.2198***	0.2195***	0.2179***	0.2117***	0.4730***	0.3803***	0.3764***	0.3093***
	(0.0120)	(0.0123)	(0.0122)	(0.0120)	(0.0154)	(0.0163)	(0.0163)	(0.0166)
	0.0025	**0.0025**	**0.0025**	**0.0024**	**0.0068**	**0.0058**	**0.0058**	**0.0048**
RM_{2020}	0.3849***	0.4218***	0.4161***	0.2066***	0.0774***	0.0704***	0.0718***	0.0480***
	(0.0210)	(0.0442)	(0.0491)	(0.0533)	(0.0135)	(0.0138)	(0.0138)	(0.0137)
	0.0076	**0.0175**	**0.0192**	**0.0103**	**0.0010**	**0.0009**	**0.0009**	**0.0006**
Case rate	0.0765***	0.0809***	0.0800***	0.0702***	0.0006	0.0006**	0.0006**	0.0008***
	(0.0010)	(0.0018)	(0.0020)	(0.0023)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
	0.0001	**0.0001**	**0.0002**	**0.0002**	**0.00001**	**0.00001**	**0.00001**	**0.00001**
N	27,997	27,997	27,997	27,997	27,997	27,997	27,997	27,997
R^2	0.1714	0.1746	0.1755	0.1807	0.0168	0.0536	0.0557	0.0798
F/chi2	340.336	444.075	366.365	363.049	12,521.952	15,980.474	16,561.554	22,089.808
p	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note: Bold figures correspond to the effect of one standard deviation increase of the regressor over the dependent variable (for continuous variables) or the percentage variation with respect to the mean (for binary variables). The upper part of the table report OLS and IV regressions using "Relative Mortality in 2020 with respect to average 2016-2019" as a binary variable (1 if relative mortality is above zero and 0 otherwise). Lower part of the able report OLS and IV regressions using "Relative Mortality in 2020 with respect to average 2016-2019" as a continuous variable. Model M1 includes as explanatory variables: age cohort, sex, nationality and region of residence. Model M2 includes the same explanatory variables as M1 and additionally marital status and age when finishing education. Model M3 includes the same explanatory variables than M2 and also relation with economic activity. Model M4 includes the same explanatory variables than M3 and also household characteristics (size and number of people younger than 10, between 10 and 15, aged 15 and older), difficulties for making ends meet, having internet and self-reported social class. Robust standard errors clustered at NUTS-2 level. IV regressions use four instruments (high risk countries, moderate risk countries, low risk countries and very low risk countries according to the Inform COVID-19 Risk Index) to instrument the potential endogenous variables (trust in healthcare, relative mortality in 2020 and average case rate). Standard deviations in brackets . *** p<0.01, ** p<0.05, * p<0.1

Table 4. Heterogeneous IV estimates of the HST effect on perceived ease of compliance with lockdown restrictions

Dependent variable: COMPLY	**Age 18-30**	**Age 31-45**	**Age 46-64**	**Age 65 +**	**National**	**Immigrant**	**Stopped educ <=15years**	**Stopped educ 16-18 years**
Mean (Comply)	3.1035	3.1035	3.1666	3.2434	3.1627	2.8790	2.9373	3.0470
Std.dev. (Comply)	1.0493	1.0493	1.0640	1.0617	1.0602	1.1687	1.1137	1.0661
HST	0.3249***	0.3431***	0.5066***	0.5174***	0.5002***	-0.0195**	0.2361***	0.4326***
	(0.0278)	(0.0308)	(0.0224)	(0.0257)	(0.0152)	(0.0090)	(0.0370)	(0.0282)
	0.0086	**0.0086**	**0.0107**	**0.0125**	**0.0072**	**-0.0002**	**0.0078**	**0.0114**
RM_{2020}	0.0200	0.0222	0.0522***	0.0501***	0.0442***	-0.0061	-0.0182	0.0533***
	(0.0160)	(0.0157)	(0.011)1	(0.013)	(0.0075)	(0.0101)	(0.0171)	(0.0130)
	0.0003	**0.0003**	**0.0005**	**0.0006**	**0.0003**	**-0.0001**	**-0.0003**	**0.0006**
Case rate	0.0011	0.0001	0.0053***	0.0542***	0.0000	0.0014*	0.0014*	0.0005
	(0.0007)	(0.0006)	(0.0004)	(0.0004)	(0.0003)	(0.0008)	(0.0008)	(0.0006)
	0.00001	**0.00001**	**0.00001**	**0.00001**	**0.00001**	**0.00001**	**0.00001**	**0.00001**
N	3,897	6,283	9,653	7,514	27,090	907	1,131	10,664
R^2	0.0312	0.0379	0.0204	0.0243	0.0094	0.0090	0.0250	0.0219
chi2	1,445.718	1,620.450	5,594.064	4,538.750	11,841.831	267.849	561.802	2,526.799
p	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

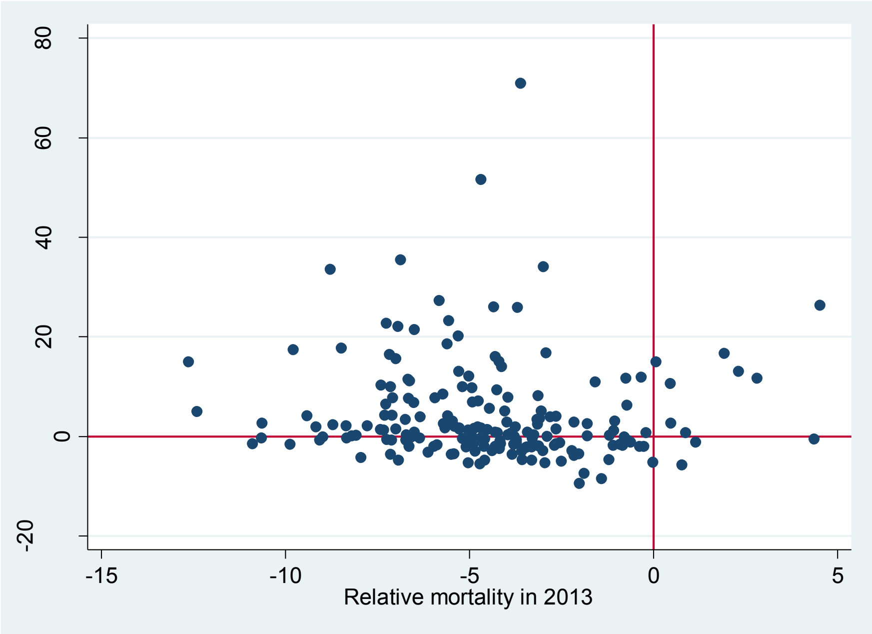
	Finished Education before 22 years	**Finished Education after 23 years**	**Difficulties making ends meet: Never**	**Difficulties making ends meet: Sometimes**	**Difficulties making ends meet: Always**	**Working class**	**Middle class**	**Higher class**
Mean (Comply)	3.2055	3.3008	3.3258	2.8717	2.6136	2.9789	3.1763	3.4544
Std.dev. (Comply)	1.0397	1.0399	1.0039	1.0682	1.1624	1.1042	1.0461	1.0038
HST	0.4880***	0.6104***	0.4858***	0.3034***	0.3322***	0.2038***	0.4434***	0.3925***
	(0.0261)	(0.0272)	(0.0255)	(0.0316)	(0.0175)	(0.0310)	(0.0178)	(0.0259)
	0.0121	**0.0160**	**0.0107**	**0.0090**	**0.0058**	**0.0057**	**0.0075**	**0.0101**
RM_{2020}	0.0442***	0.0560***	0.0851***	-0.0190	0.0422***	0.0382***	0.0432***	0.0851***
	(0.0131)	(0.0122)	(0.0232)	(0.0132)	(0.0080)	(0.0131)	(0.0091)	(0.0211)
	0.0006	**0.0006**	**0.0017**	**-0.0002**	**0.0003**	**0.0004**	**0.0004**	**0.0018**
Case rate	0.0001	0.0007*	0.0023**	0.0013*	0.0004	0.0019***	0.0002	0.0017***
	(0.0005)	(0.0004)	(0.0011)	(0.0007)	(0.0003)	(0.0006)	(0.0003)	(0.0007)
	0.00001	**0.00001**	**0.00001**	**0.00001**	**0.00001**	**0.00001**	**0.00001**	**0.00001**
N	8,713	4,880	6,770	6,548	2,097	2,621	18,316	6,770
R^2	0.0334	0.0176	0.0317	0.0303	0.0256	0.0237	0.0225	0.0212
F/chi2	2,920.171	14,511.475	2,312.434	1,158.804	4,764.929	2,035.889	6,755.778	3,183.789
p	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note. Bold figures correspond to the effect of one standard deviation increase of the regressor over the dependent variable. Estimates refer to IV estimates for ease of compliance with lockdown restrictions using four instruments (high risk countries, moderate risk countries, low risk countries and very low risk countries according to the Inform COVID-19 Risk Index) to instrument the potential endogenous variables (trust in healthcare, relative mortality in 2020 and average case rate). In all regressions, RM_{2020} is a continuous variable. Covariates include age cohort include sex, nationality, region of residence, marital status, age when finished education, relation with economic activity, household characteristics (size and number of people younger than 10, between 10 and 15, aged 15 and older), difficulties for making ends meet, having internet and self-reported social class. Robust standard errors clustered at NUTS-2 level. Standard deviations in brackets. *** p<0.01, ** p<0.05, * p<0.1

Online Appendix

Appendix A. Descriptive statistics

Figure A1. Relationship between relative mortality in 2013 and relative mortality in 2020 by NUTS-2.



Note: Relative mortality in 2013: registered deaths in 2013 by NUTS-2 with respect to average deaths between years 2016 and 2019 by NUTS-2.

$$Relative\ mortality\ 2013_{Nut} = \frac{Deaths_{2013,Nut}}{\sum_{y=2016}^{2019} Deaths_{y,Nut}/4} - 1$$

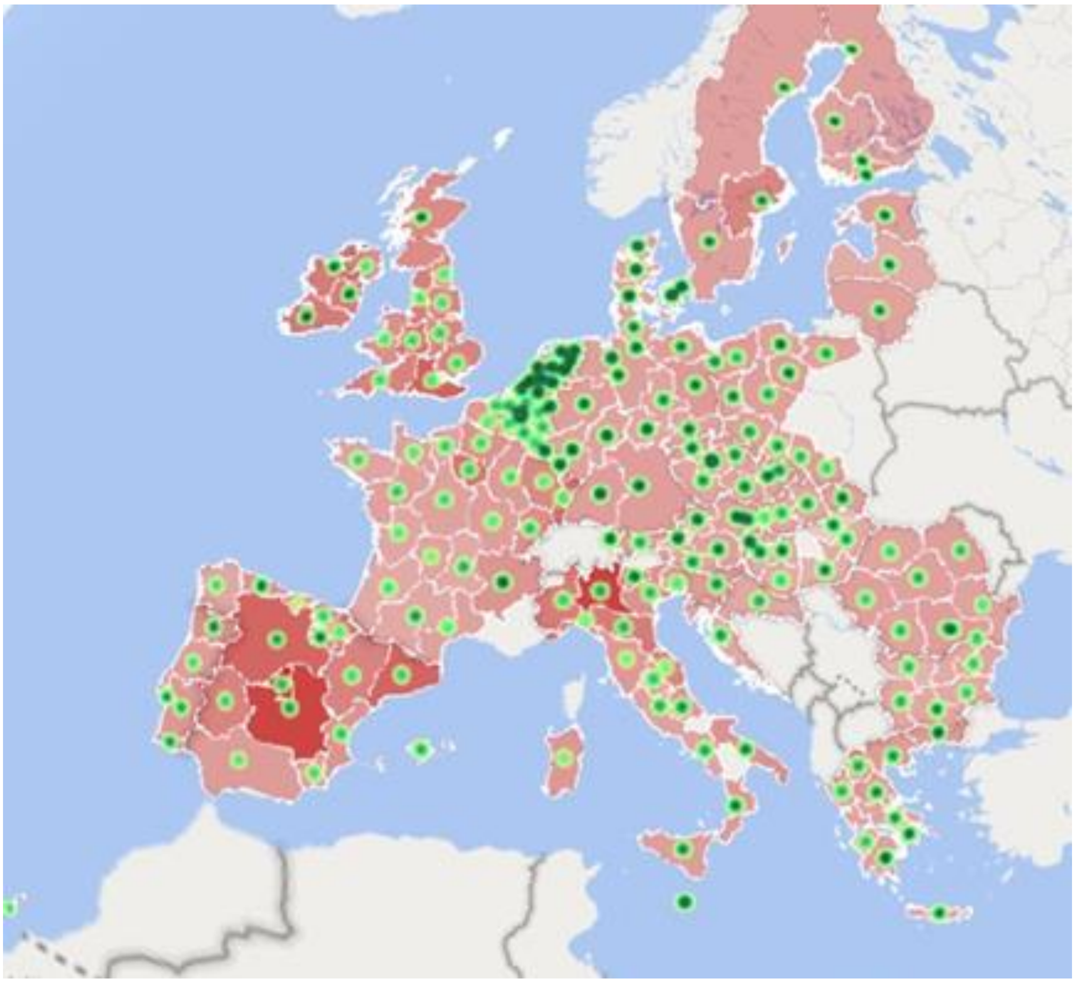
Relative mortality in 2020: average weekly registered deaths (all causes) between week 11 ($W_{11-2020}$) and week when respondent was interviewed ($W_{EB93.1}$) with respect to average weekly deaths between years 2016 and 2019 by NUTS-2.

$$Average\ weekly\ deaths\ 2016-19\ _{Nut} = \frac{\sum_{y=2016}^{2019} Deaths_{y,Nut}}{4 \cdot 52.14}$$

$$Relative\ mortality\ 2020\ _{Nut} = \frac{\dfrac{\sum_{i=W_{11-2020}}^{W_{EB93.1}} Deaths_{w,Nut}}{W_{EB93.1} - W_{11-2020}}}{Average\ weekly\ deaths\ _{2016-2019,Nut}} - 1$$

Source: own work using data from Table A1.

Figure A2. Relationship between HST (green circles) and relative mortality in 2020 with respect to average 2016-2019 (red areas) by NUTS-2.



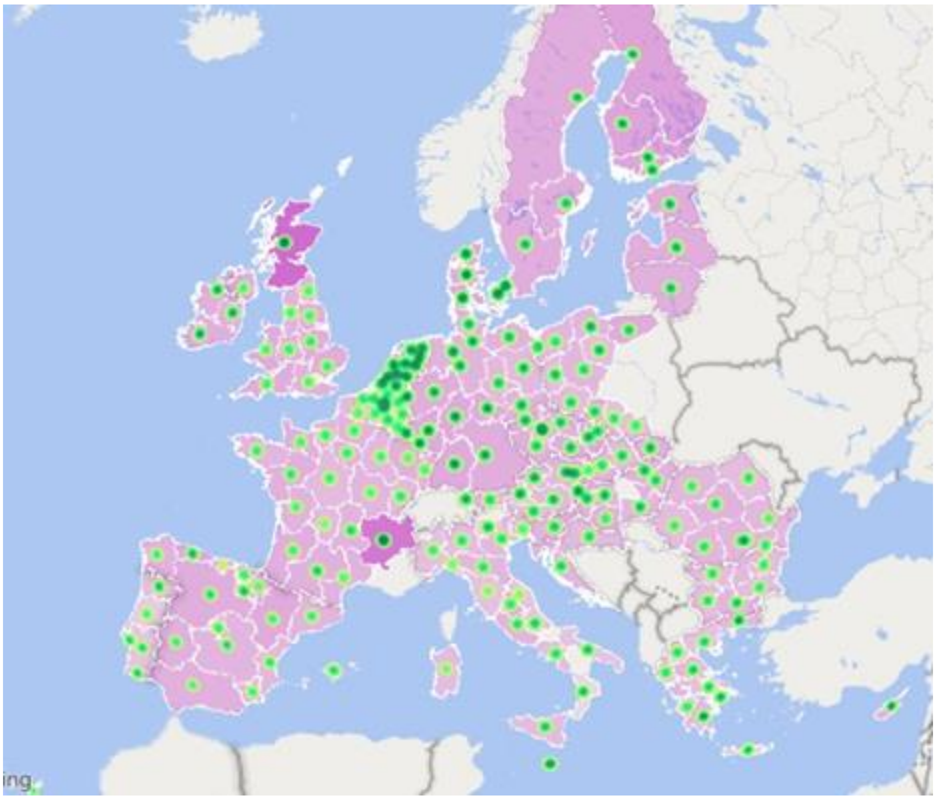
Note: Green circles denote trust in healthcare, the higher the intensity of the colour, the higher the level of confidence. Red areas denote the relative mortality 2020, considering average weekly registered deaths (all causes) between week 11 ($W_{11-2020}$) and week when respondent was interviewed ($W_{EB93.1}$) with respect to average weekly deaths between years 2016 and 2019 by NUTS-2. The higher the colour intensity, the higher the relative mortality in 2020 with respect to average 2016-2019.

$$Average\ weekly\ deaths\ 2016-19\ _{Nut} = \frac{\sum_{y=2016}^{2019} Deaths_{y,Nut}}{4 \cdot 52.14}$$

$$Relative\ mortality\ 2020\ _{Nut} = \frac{\frac{\sum_{i=W_{11-2020}}^{W_{EB93.1}} Deaths_{w,Nut}}{W_{EB93.1} - W_{11-2020}}}{Average\ weekly\ deaths\ _{2016-2019,Nut}} - 1$$

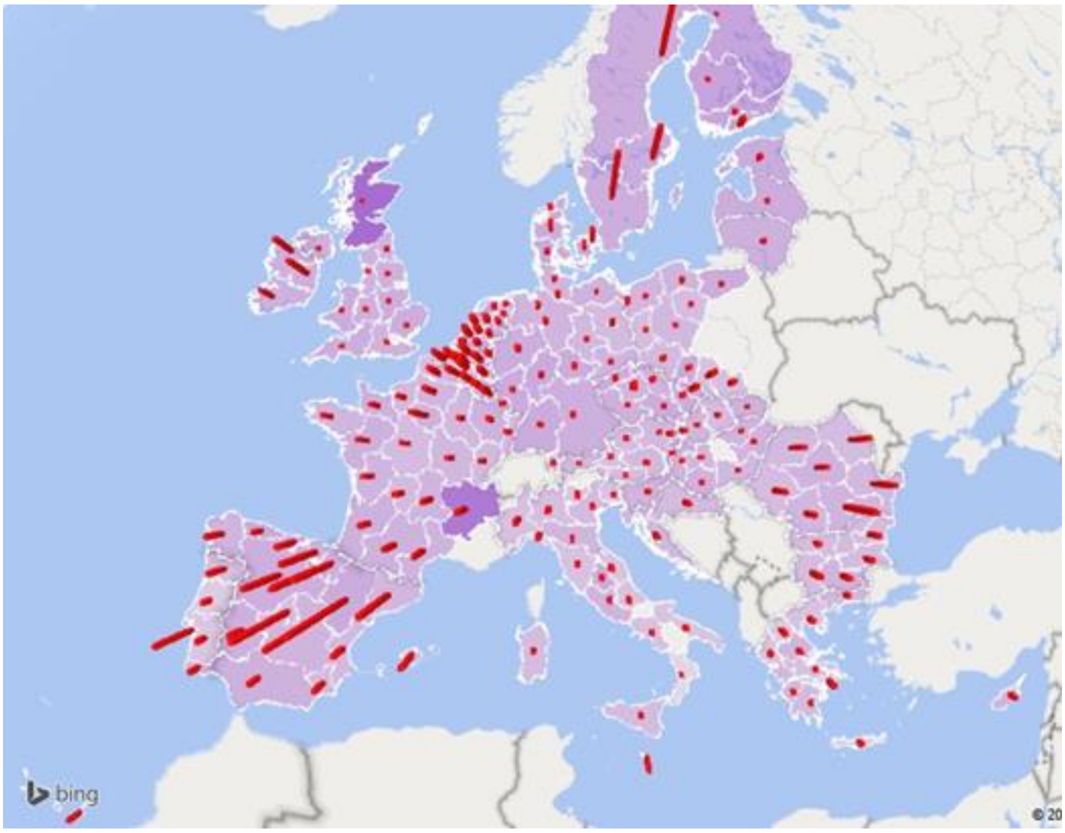
Source: own work using data from Table A1.

Figure A3. Relationship between HST (green circles) and ease of compliance with lockdown restrictions (purple areas) by NUTS-2.



Note: Purple areas denote the degree of ease for complying with lockdown restrictions, the higher the colour intensity, the easier it is to comply with the lockdown restrictions. Green circles denote trust in healthcare, the higher the intensity of the colour, the higher the level of confidence. Source: own work using data from Table A1.

Figure A4. Relationship between average 14-day case rate of COVID-19 cases per 100,000 inhabitants (red bricks) and ease of compliance with lockdown restrictions (purple areas) by NUTS-2.



Note: Purple areas denote the degree of ease for complying with lockdown restrictions, the higher the colour intensity, the easier it is to comply with the lockdown restrictions.
Red bricks denote the average of 14-day case rate of average of 14-day case rate of newly reported COVID-19 cases per 100 000 population by week and NUTS-2 between week 11 ($W_{11-2020}$) and week when respondent was interviewed ($W_{EB93.1}$). Longer bricks denote higher case rate.

$$Average\ notification\ rate_{Nut} = \frac{\sum_{i=W_{11-2020}}^{W_{EB93.1}} Notification_{w,Nut}}{W_{EB93.1} - W_{11-2020}}$$

Source: own work using data from Table A1.

Table A1. Description of the sample

	Initial sample				Final sample (after CEM)			
	Eurobarometer 80.2 June 2014		Eurobarometer 93.1 July-August2020		Eurobarometer 80.2 June 2014		Eurobarometer 93.1 July-August2020	
	N	%	N	%	N	%	N	%
Austria	1,011	3,69	1,001	3,58	943	3.64	945	3.64
Belgium	1,073	3,92	1,005	3,59	1,024	3.96	941	3.62
Bulgaria	986	3,60	1,008	3,60	920	3.56	924	3.56
Croatia	991	3,62	1,018	3,64	945	3.65	955	3.67
Cyprus	493	1,80	986	3,52	463	1.79	644	2.48
Czech Republic	1,010	3,69	998	3,56	964	3.72	933	3.59
Denmark	998	3,65	987	3,53	933	3.61	920	3.54
Estonia	990	3,62	1,006	3,59	945	3.65	941	3.62
Finland	968	3,54	1,028	3,67	905	3.50	942	3.63
France	1,008	3,68	988	3,53	961	3.71	925	3.56
Germany	1,578	5,76	1,503	5,37	1,462	5.65	1,371	5.27
Greece	1,001	3,66	1,015	3,63	956	3.69	952	3.66
Hungary	986	3,60	1,041	3,72	920	3.56	955	3.67
Ireland	978	3,57	1,005	3,59	932	3.60	941	3.62
Italy	987	3,61	1,009	3,60	923	3.57	924	3.56
Latvia	975	3,56	968	3,46	929	3.59	907	3.49
Lithuania	987	3,61	988	3,53	923	3.57	907	3.49

Luxembourg	504	1,84	550	1,96	478	1.85	512	1.97
Malta	496	1,81	483	1,73	465	1.80	473	1.82
Netherlands	1,033	3,77	1,001	3,58	985	3.81	939	3.61
Poland	891	3,25	1,004	3,59	832	3.21	922	3.55
Portugal	1,046	3,82	1,044	3,73	998	3.86	978	3.76
Romania	988	3,61	1,099	3,93	923	3.57	1,008	3.88
Slovakia	978	3,57	1,062	3,79	932	3.60	972	3.74
Slovenia	1,100	4,02	1,001	3,58	1,026	3.97	939	3.61
Spain	1,000	3,65	994	3,55	953	3.68	912	3.51
Sweden	997	3,64	1,052	3,76	956	3.70	965	3.71
United Kingdom	1,321	4,83	1,153	4,12	1,278	4.94	1,340	5.16
Total	27,374	100,00	27,997	100,00	25,874	100.00	25,987	100.00

Source: own work using EB80.2 and EB 93.1

Table. A2. L1 statistic before and after CEM (coarsened exact matching method)

	Initial sample	Sample after CEM
Man	0.110(− 0.141)	1.8e-14 (1.1e-12)
Age	0.011(0.011)	1.4e-14 (1.4e-12)
Age when stopped	0.114(0.148))	1.4e-14 (− 2.8e-12)
Household size	0.057(−0.057)	4.4e-12 (1.1e-11)
Single	0.075(0.078)	1.1e-14(1.0e-12)
Household size	0.114(−0.148)	7.1e-12(1.4e-11)
Employed	0.080(0.011)	4.1e-12(4.4e-11)
Unemployed	0.047(0.052)	1.5e-14(−1.7e-13)
Retired	0.011(−0.011)	7.4e-14(7.7e-11)
Rural area	0.105(0.111)	2.5e-12(8.0e-11)
Big city	0.185(0.170)	5.4e-12(5.8e-11)
Multivariate L_1	0.512	2.404e-12
N	55,371	51,861
Matched	-	51,861 (93.66%)
Unmatched	-	3,510 (6.34%)

Note: In brackets difference in means

Table A3. Descriptive statistics

	Initial sample		Final sample (after CEM)		
	EB 80.2 Nov-Dec 2013	EB 93.1 July-Aug 2020	EB 80.2 Nov-Dec 2013	EB 93.1 July-Aug 2020	Test equality of means EB 80.2 vs EB. 93.1
Trust in healthcare system (HST)	2.77	2.83	2.75	2.89	4.512
	(0.81)	(0.92)	(0.81)	(0.92)	
Ease of compliance with restrictions (COMPLY)	-	3.13	-	3.18	
	-	(1.06	-	(1.07)	
Man	48.40	48.64	49.57	49.82	0.783
Woman	51.60	51.35	52.93	52.67	0.881
Age	46.92	48.31	48.39	48.48	0.999
	(18.43)	(18.44)	(18.60)	(18.61)	0.884
18-30	16.13	16.18	16.16	16.21	0.767
31-45	24.27	23.52	24.33	24.58	0.873
46-64	33.73	34.09	33.84	33.21	1.005
65 and +	25.87	26.21	25.67	26.01	0.903
Regions with excess mortality					
18-30	20.42	19.62	20.63	20.82	0.762
31-45	24.65	23.99	24.95	24.28	0.851
46-64	34.24	34.09	34.83	34.67	1.005
65 and +	20.69	22.30	19.59	20.24	0.928
Regions with excess mortality					
18-30	18.82	17.25	18.09	17.40	0.839
31-45	21.44	22.30	21.67	21.75	1.077
46-64	33.65	33.64	33.22	33.21	1.177
65 and +	26.09	26.80	27.02	27.64	1.036
National	97.81	97.88	98.13	98.20	
Marital status					
Married/cohabiting	51.12	48.46	50.99	49.63	0.663
Separated/divorced	6.83	8.80	7.35	8.30	0.880
Single	33.29	33.98	33.84	34.04	0.883
Widow	7.52	7.92	7.55	7.95	0.651
Missing marital status	1.25	0.84	0.26	0.07	0.639
Age stopped education	18.54	19.13	18.52	19.31	0.878
	(4.08)	(4.36)	(4.08)	(4.37)	0.908
Still studying	8.69	8.04	8.69	8.07	0.664
Missing age stopped education	0.97	0.00	0.97	0.00	
Household composition					
Household size	2.70	2.61	2.66	2.58	0.613
	(1.37)	(1.92)	(1.36)	(1.90)	
Number aged 15+ (except respondent)	2.24	2.20	2.21	2.18	0.856
	(1.02)	(1.57)	(1.03)	(1.13)	
Number aged between 10-14 years	1.20	1.29	1.19	1.28	0.934
	(0.49)	(1.30)	(0.49)	(1.29)	
Number aged less than 10 years	1.50	1.51	1.49	1.50	0.767
	(0.74)	(0.99)	(0.74)	(0.99)	
Relation with economic activity					
Working	49.91	53.18	50.03	51.69	0.716
Self-employed					
Farmer	1.11	0.88	1.10	0.88	0.615
Other self-employed	4.66	4.96	4.55	4.84	0.577
Employee					
White-collar	20.30	23.45	20.09	22.18	0.658
Blue-collar	20.45	21.14	20.24	20.92	1.075
Non-qualified	3.39	2.74	3.04	2.89	1.281
Unemployed	8.08	6.95	7.75	6.71	1.066
Studying	8.69	8.91	8.31	8.51	0.837
Homeworker	7.76	6.06	7.46	5.88	1.051
Retired	25.57	24.91	26.44	27.21	1.303
Lives in					
Rural area	32.39	29.86	32.07	30.14	1.102
Middle town	41.38	43.33	41.52	43.39	0.825
Large town	26.21	26.79	26.37	26.43	1.005
Missing residence	0.03	0.03	0.04	0.03	1.307
Difficulties for making ends meet					
Most of the time	11.49	7.49	11.42	7.46	4.988
From time to time	26.7	23.39	26.34	23.12	4.542
Almost never/Never	61.82	69.12	59.91	66.73	4.204
Has internet at home	72.29	96.98	69.68	92.28	4.475
Self-reported social class					
Higher class	2.2	9.36	2.20	9.32	4.365

Middle class	50.65	65.42	49.37	63.28	4.396
Working class	44.82	24.18	43.82	23.89	4.939
Missing class	2.32	10.13	2.32	10.08	5.012
Measures taken by the public authorities in your country to fight the Coronavirus and its effects		34.77		34.17	
Focus too much on health to the detriment of the economy		23.77		23.49	
Focus too much on economy to the detriment of health		41.46		40.60	
A balance has been reached					
Limitations imposed by the public authorities in your country to fight the Coronavirus and its effects				0.00	
Absolutely justified		43.9		42.94	
Somewhat justified		37.22		36.53	
Not very justified		13.45		13.36	
Not at all justified		5.42		5.41	
N	27,374	27,997	25,874	25,987	

Source: own work using EB80.2 and EB 93.1. Standard deviation in brackets.

Table A4. Effects of age cohort, year and relative mortality over sociodemographic characteristics. OLS regressions

Dependent variable:	Male	National	Difficulties making ends meet: always	Difficulties making ends meet: sometimes	Difficulties making ends meet: never	Working class	Middle class	Higher class	Married
RM_t	-0.0039	0.0056	-0.0039	0.0055	0.0006	-0.0092	0.0035	0.0030	-0.0086
	(0.0046)	(0.0071)	(0.0031)	(0.0040)	(0.0041)	(0.0073)	(0.0043)	(0.0020)	(0.0430)
Age 31-45	-1.1112	0.2475	-0.0193	0.0675	0.1520	-0.6010	0.1979	0.1811	5.4724
	(0.8723)	(0.2474)	(0.4039)	(0.4765)	(0.5487)	(0.5231)	(0.5518)	(0.2157)	(5.4424)
Age 46-64	-0.8836	0.5782	0.0252	0.2355	-0.0085	-0.9643	0.5623	0.1932	-6.7402
	(0.5405)	(0.3517)	(0.3673)	(0.5010)	(0.5065)	(0.5689)	(0.5887)	(0.2056)	(5.4796)
Age 65+	-0.4168	0.5383	-0.5771	0.1176	0.6804	-1.5391	1.4428	-0.1594	-11.6221
	(0.6145)	(0.3432)	(0.4224)	(0.5280)	(0.4969)	(0.5868)	(0.9197)	(0.2149)	(7.6423)
$Year_{2020}$	-0.4402	0.5554	-0.3306	0.4601	0.1433	-1.1824	0.4476	0.3687	-2.4079
	(0.5035)	(0.4075)	(0.3227)	(0.4337)	(0.4432)	(0.4680)	(0.4687)	(0.2036)	(5.2229)
Age 31-45 $\cdot Year_{2020}$	1.1015	-0.1446	-0.0665	-0.0412	-0.0945	0.4651	-0.0820	-0.1607	-5.6662
	(0.8954)	(0.2513)	(0.4164)	(0.4978)	(0.5742)	(0.5530)	(0.5892)	(0.2333)	(5.6888)
Age 46-64 $\cdot Year_{2020}$	0.9207	-0.6081	-0.1022	-0.1335	-0.0125	1.1237	-0.6304	-0.2821	6.4823
	(0.8665)	(0.4537)	(0.3797)	(0.5200)	(0.5320)	(0.5939)	(0.6178)	(0.2164)	(5.6945)
Age 65+ $\cdot Year_{2020}$	0.5017	-0.3754	0.6569	-0.2085	-0.6384	2.0672	-1.8495	0.0815	14.3873
	(0.6436)	(0.4350)	(0.4339)	(0.5516)	(0.5285)	(0.6214)	(0.6567)	(0.2244)	(8.3754)
$RM_t Year_{2020}$	0.0040	-0.0051	0.0028	-0.0051	-0.0001	0.0082	-0.0026	-0.0030	0.0245
	(0.0048)	(0.0041)	(0.0031)	(0.0041)	(0.0042)	(0.0044)	(0.0044)	(0.0020)	(0.0446)
Age 31-45$\cdot RM_t$	0.0093	-0.0024	0.0003	-0.0006	-0.0016	0.0059	-0.0020	-0.0020	-0.0441
	(0.0074)	(0.0024)	(0.0039)	(0.0046)	(0.0052)	(0.0050)	(0.0052)	(0.0021)	(0.0466)
Age 46-64$\cdot RM_t$	0.0076	-0.0053	-0.0004	-0.0027	0.0007	0.0094	-0.0057	-0.0021	0.0456
	(0.0051)	(0.0044)	(0.0036)	(0.0048)	(0.0048)	(0.0054)	(0.0056)	(0.0020)	(0.0468)
Age 65+$\cdot RM_t$	0.0037	-0.0049	0.0050	-0.0024	-0.0044	0.0140	-0.0130	0.0015	0.1109
	(0.0058)	(0.0033)	(0.0041)	(0.0050)	(0.0047)	(0.0085)	(0.0088)	(0.0022)	(0.0850)
Age 31-45$\cdot RM_t \cdot Year_{2020}$	-0.0094	0.0014	0.0005	0.0005	0.0010	-0.0045	0.0004	0.0021	0.0517
	(0.0056)	(0.0025)	(0.0040)	(0.0047)	(0.0054)	(0.0052)	(0.0055)	(0.0023)	(0.0480)
Age 46-64$\cdot RM_t \cdot Year_{2020}$	-0.0080	0.0055	0.0012	0.0017	-0.0005	-0.0097	0.0056	0.0028	-0.0497
	(0.0053)	(0.0044)	(0.0037)	(0.0049)	(0.0050)	(0.0086)	(0.0058)	(0.0021)	(0.0481)
Age 65+$\cdot RM_t \cdot Year_{2020}$	-0.0044	0.0055	-0.0057	0.0027	0.0048	-0.0130	0.0135	-0.0010	-0.1445
	(0.0060)	(0.0033)	(0.0042)	(0.0052)	(0.0050)	(0.0088)	(0.0081)	(0.0022)	(0.0965)
N	51,861	51,861	51,861	51,861	51,861	51,861	51,861	51,861	51,861
R^2	0.1601	0.4161	0.6177	0.5290	0.7397	0.6563	0.5079	0.3813	0.7281
F	33.6265	32.8846	154.5113	209.4915	672.3605	338.9442	192.4565	51.3099	214.7176
p	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note: Estimations performed with the final sample after CEM.Outcomes are shown in column headings. Data is collapsed by year, NUTS-2 and age cohort. Regressions identify the correlation between characteristics of individuals aged 65 and older with that of younger individuals, in regions with excess mortality versus all other regions, and in 2013 versus 2020. Robust standard errors clustered at NUTS-2 level. Standard deviations in brackets. . *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table A5. Effects of age cohort, year and relative mortality over sociodemographic characteristics. OLS regressions. (continuation I)

Dependent variable:	Separated Divorced	Single	Widow	Working	Unemployed	Retired	Home-worker	Student	Rural area
RM_t	-0.0011	-0.0037	0.0045	-0.0010	-0.0016	-0.0031	0.0026	0.0054	-0.0032
	(0.0042)	(0.0020)	(0.0043)	(0.0016)	(0.0045)	(0.0015)	(0.0021)	(0.0041)	(0.0046)
Age 31-45	-0.0260	-0.6453	0.3247	-0.0821	-0.7348	0.0183	1.3109	0.5582	0.3277
	(0.4929)	(0.4232)	(0.5001)	(0.1698)	(0.5243)	(0.1749)	(0.8432)	(0.4016)	(0.5702)
Age 46-64	0.4494	-0.2365	-0.2370	-0.0450	-0.8660	-0.0977	0.8867	0.2615	-0.0521
	(0.5242)	(0.2572)	(0.4579)	(0.1762)	(0.5466)	(0.2753)	(0.8665)	(0.3988)	(0.5836)
Age 65+	0.9382	-0.2131	-0.5978	-0.2103	-0.3124	-0.1174	1.1311	0.2573	-0.4746
	(0.5433)	(0.2332)	(0.4510)	(0.3570)	(0.5482)	(0.4377)	(0.8779)	(0.3989)	(0.6796)
$Year_{2020}$	-0.0055	-0.5143	0.6874	-0.2528	0.1610	-0.4917	0.4058	0.0970	-0.0547
	(0.4428)	(0.4982)	(0.4677)	(0.1722)	(0.4838)	(0.1667)	(0.2195)	(0.4314)	(0.5052)
Age 31-45 $\cdot Year_{2020}$	0.4879	0.3697	-0.8420	0.0998	0.8813	-0.0068	-1.0540	-0.0107	-0.1727
	(0.5292)	(0.2331)	(0.5420)	(0.1794)	(0.5579)	(0.1821)	(1.6833)	(0.4370)	(0.6101)
Age 46-64 $\cdot Year_{2020}$	0.2767	0.3563	-0.7825	0.1809	0.7290	0.3681	-1.1364	-0.0674	-0.0731
	(0.5541)	(0.2755)	(0.4976)	(0.1847)	(0.5818)	(0.2835)	(1.5811)	(0.4337)	(0.6203)
Age 65+ $\cdot Year_{2020}$	-0.6675	0.4190	-0.3977	0.8251	-0.7400	0.7595	-1.5772	-0.0700	0.2989
	(0.5736)	(0.2452)	(0.4890)	(0.6828)	(0.5845)	(0.4512)	(1.7350)	(0.4339)	(0.7151)
$RM_t Year_{2020}$	-0.0002	0.0051	-0.0061	0.0025	-0.0014	0.0048	-0.0043	-0.0011	0.0008
	(0.0044)	(0.0040)	(0.0047)	(0.0017)	(0.0048)	(0.0038)	(0.0033)	(0.0043)	(0.0050)
Age 31-45$\cdot RM_t$	0.0046	0.0030	-0.0064	0.0006	0.0125	0.0000	-0.0088	-0.0049	-0.0009
	(0.0049)	(0.0022)	(0.0050)	(0.0017)	(0.0053)	(0.0018)	(0.0078)	(0.0041)	(0.0057)
Age 46-64$\cdot RM_t$	0.0003	0.0037	-0.0039	0.0011	0.0089	0.0037	-0.0084	-0.0056	0.0013
	(0.0053)	(0.0027)	(0.0046)	(0.0018)	(0.0055)	(0.0028)	(0.0083)	(0.0041)	(0.0058)
Age 65+$\cdot RM_t$	-0.0049	0.0028	-0.0015	0.0055	-0.0020	0.0116	-0.0111	-0.0056	0.0056
	(0.0055)	(0.0024)	(0.0046)	(0.0036)	(0.0055)	(0.0084)	(0.0154)	(0.0041)	(0.0067)
Age 31-45$\cdot RM_t \cdot Year_{2020}$	-0.0048	-0.0037	0.0078	-0.0010	-0.0083	0.0001	0.0100	0.0002	0.0015
	(0.0053)	(0.0024)	(0.0054)	(0.0018)	(0.0055)	(0.0018)	(0.0079)	(0.0044)	(0.0060)
Age 46-64$\cdot RM_t \cdot Year_{2020}$	-0.0026	-0.0035	0.0071	-0.0019	-0.0061	-0.0045	0.0110	0.0008	(0.0004
	(0.0055)	(0.0028)	(0.0049)	(0.0019)	(0.0057)	(0.0029)	(0.0143)	(0.0043)	(0.0061)
Age 65+$\cdot RM_t \cdot Year_{2020}$	0.0067	-0.0038	0.0034	-0.0082	0.0073	-0.0165	0.0148	0.0008	-0.0035
	(0.0057)	(0.0025)	(0.0049)	(0.0038)	(0.0058)	(0.0102)	(0.0156)	(0.0043)	(0.0069)
N	51,861	51,861	51,861	51,861	51,861	51,861	51,861	51,861	51,861
R^2	0.6812	0.4101	0.8810	0.7605	0.8562	1.0444	0.3289	0.6779	0.6042
F	213.5663	56.7831	616.8206	185.6013	632.6810	630.7045	47.4545	122.8395	684.0990
p	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note: Estimations performed with the final sample after CEM..Outcomes are shown in column headings. Data is collapsed by year, NUTS-2 and age cohort. Regressions identify the correlation between characteristics of individuals aged 65 and older with that of younger individuals, in regions with excess mortality versus all other regions, and in 2013 versus 2020.Robust standard errors clustered at NUTS-2 level. Standard deviations in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table A6. Effects of age cohort, year and relative mortality over sociodemographic characteristics. OLS regressions (continuation II)

Dependent variable:	Middle town	Large town	Household size	Household members +15 years	Household members 10-14 years	Household members Less 10 year	Has internet
RM_t	0.0126	-0.0089	0.0222	0.0146	-0.0043	0.0099	0.0026
	(0.0083)	(0.0054)	(0.0188)	(0.0154)	(0.0212)	(0.0157)	(0.0032)
Age 31-45	-0.1102	-0.0518	-12.0399	-10.6223	22.2144	0.0678	0.0681
	(1.1486)	(0.7494)	(17.7144)	(14.2430)	(18.9482)	(1.5562)	(0.5580)
Age 46-64	-0.0454	0.1013	0.0779	-0.5052	-0.4779	-1.6539	-0.1335
	(1.1717)	(0.7587)	(1.9659)	(1.7326)	(0.9510)	(5.8844)	(0.8220)
Age 65+	0.5921	0.0848	0.1007	0.5996	11.0633	-2.5320	-0.0344
	(1.2909)	(0.8261)	(1.1064)	(1.2871)	(9.1280)	(2.4506)	(1.1470)
$Year_{2020}$	1.3979	-1.3899	0.9286	0.0519	-0.4399	1.4055	1.3298
	(0.9851)	(0.9440)	(1.3790)	(1.3267)	(1.7793)	(1.3956)	(1.4968)
Age 31-45 $\cdot Year_{2020}$	0.3824	-0.0962	3.4610	2.7078	2.6358	-0.1499	-0.0458
	(1.2721)	(0.7822)	(2.4774)	(1.6731)	(1.9790)	(1.3418)	(0.5764)
Age 46-64 $\cdot Year_{2020}$	0.2988	-0.1728	0.2614	13.6586	1.0906	1.0668	0.1035
	(1.2902)	(0.7908)	(1.6921)	(15.1568)	(2.0342)	(1.5972)	(0.8377)
Age 65+ $\cdot Year_{2020}$	-0.2094	-0.1364	-0.2156	-0.1114	-1.2839	13.6428	-0.3266
	(1.4073)	(0.8581)	(1.7862)	(1.6690)	2.1937)	(8.0876)	1.1704)
$RM_t Year_{2020}$	-0.0082	0.0074	-0.0098	-0.0007	0.0001	-0.0143	-0.0052
	(0.0052)	(0.0038)	(0.0162)	(0.0141)	(0.0001)	(0.0148)	(0.0032)
Age 31-45$\cdot RM_t$	0.0007	0.0003	0.0176	0.0086	0.0266	0.0004	-0.0006
	(0.0058)	(0.0043)	(0.0190)	(0.0152)	(0.0202)	(0.0137)	(0.0035)
Age 46-64$\cdot RM_t$	0.0000	-0.0012	-0.0058	0.0034	0.0049	0.0061	-0.0004
	(0.0059)	(0.0043)	(0.0181)	(0.0158)	(0.0209)	(0.0160)	(0.0046)
Age 65+$\cdot RM_t$	-0.0039	-0.0012	-0.0131	-0.0139	-0.1372	0.0298	-0.0047
	(0.0063)	(0.0046)	(0.0182)	(0.0163)	(0.1107)	(0.0276)	(0.0058)
Age 31-45$\cdot RM_t \cdot Year_{2020}$	-0.0025	0.0009	-0.0329	-0.0296	-0.0281	0.0011	0.0004
	(0.0061)	(0.0044)	(0.0197)	(0.0156)	(0.0210)	(0.0142)	(0.0036)
Age 46-64$\cdot RM_t \cdot Year_{2020}$	-0.0020	0.0015	-0.0027	-0.0149	-0.0103	-0.0090	0.0005
	(0.0062)	(0.0044)	(0.0189)	(0.0162)	(0.0217)	(0.0169)	(0.0046)
Age 65+$\cdot RM_t \cdot Year_{2020}$	0.0020	0.0012	0.0021	0.0011	0.1551	-0.0160	0.0065
	(0.0069)	(0.0049)	(0.0215)	(0.0187)	(0.1832)	(0.0424)	(0.0061)
N	51,861	51,861	51,861	51,861	51,861	51,861	51,861
R^2	0.5380	0.8304	0.6267	0.7997	0.6123	0.2561	0.2096
F	905.50	2199.33	303.5821	311.2827	147.8790	151.8962	225.4781
p	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Note: Estimations performed with the final sample after CEM..Outcomes are shown in column headings. Data is collapsed by year, NUTS-2 and age cohort. Regressions identify the correlation between characteristics of individuals aged 65 and older with that of younger individuals, in regions with excess mortality versus all other regions, and in 2013 versus 2020.Robust standard errors clustered at NUTS-2 level. Standard deviations in brackets. *** p<0.01, ** p<0.05, * p<0.1

Table A7. OLS regression for the perceived effect of limitations imposed by public authorities to fight against COVID-19

	Relative Mortality (RM_{2020}) is a binary variable				Relative Mortality (RM_{2020}) is a continuous variable			
	M1	M2	M3	M4	M1	M2	M3	M4
Focus too much on health to the detriment of the economy								
HST	-0.0579***	-0.0598***	-0.0596***	-0.0600***	-0.0579***	-0.0598***	-0.0596***	-0.0600***
	(0.0081)	(0.0082)	(0.0082)	(0.0080)	(0.0081)	(0.0082)	(0.0082)	(0.0080)
	-0.0012	**-0.0013**	**-0.0013**	**-0.0012**	**-0.0012**	**-0.0013**	**-0.0013**	**-0.0012**
RM_{2020}	-0.5356***	-0.5326***	-0.5220***	-0.4995***	-0.0561***	-0.0547***	-0.0542***	-0.0527***
	(0.0137)	(0.0200)	(0.0201)	(0.0377)	(0.0012)	(0.0014)	(0.0013)	(0.0025)
	-	**-**	**-**	**-**	**-0.0002**	**-0.0002**	**-0.0002**	**-0.0003**
Case rate	-0.1057***	-0.1038***	-0.1026***	-0.0990***	-0.0139***	-0.0142***	-0.0138***	-0.0127***
	(0.0024)	(0.0030)	(0.0029)	(0.0057)	(0.0006)	(0.0008)	(0.0008)	(0.0016)
	-0.0007	**-0.0008**	**-0.0008**	**-0.0015**	**-0.0000**	**-0.0000**	**-0.0000**	**-0.0001**
N	27,997	27,997	27,997	27,997	27,997	27,997	27,997	27,997
R2	0.2257	0.2282	0.2283	0.2289	0.2257	0.2282	0.2283	0.2289
Focus too much on economy to the detriment of health								
	M1	M2	M3	M4	M1	M2	M3	M4
HST	-0.1001***	-0.0986***	-0.0984***	-0.0974***	-0.1001***	-0.0986***	-0.0984***	-0.0974***
	(0.0072)	(0.0071)	(0.0071)	(0.0071)	(0.0072)	(0.0071)	(0.0071)	(0.0071)
	-0.0022	**-0.0021**	**-0.0021**	**-0.0021**	**-0.0022**	**-0.0021**	**-0.0021**	**-0.0021**
RM_{2020}	0.9630***	0.9225***	0.9298***	0.9054***	0.0646***	0.0622***	0.0625***	0.0612***
	(0.0114)	(0.0171)	(0.0180)	(0.0211)	(0.0010)	(0.0012)	(0.0012)	(0.0014)
	-	-	-	-	**0.0002**	**0.0002**	**0.0002**	**0.0003**
Case rate	0.1235***	0.1205***	0.1212***	0.1179***	0.0177***	0.0186***	0.0189***	0.0177***
	(0.0020)	(0.0025)	(0.0026)	(0.0032)	(0.0004)	(0.0007)	(0.0007)	(0.0009)
	0.00075	**0.00091**	**0.00095**	**0.00114**	**0.00002**	**0.00004**	**0.00004**	**0.00005**
N	27,997	27,997	27,997	27,997	27,997	27,997	27,997	27,997
R2	0.1514	0.1506	0.1507	0.1522	0.1514	0.1506	0.1507	0.1522
A balance has been reached								
	M1	M2	M3	M4	M1	M2	M3	M4
HST	0.1680***	0.1688***	0.1683***	0.1675***	0.1680***	0.1688***	0.1683***	0.1675***
	(0.0077)	(0.0075)	(0.0075)	(0.0074)	(0.0077)	(0.0075)	(0.0075)	(0.0074)
	0.0031	**0.0031**	**0.0031**	**0.0030**	**0.0031**	**0.0031**	**0.0031**	**0.0030**
RM_{2020}	-0.2460***	-0.2709***	-0.2883***	-0.2706***	-0.0110***	-0.0106***	-0.0112***	-0.0103***
	(0.0137)	(0.0191)	(0.0202)	(0.0336)	(0.0011)	(0.0013)	(0.0014)	(0.0022)
	-	-	-	-	**-0.0000**	**-0.0000**	**-0.0000**	**-0.0001**
Case rate	-0.0252***	-0.0256***	-0.0272***	-0.0249***	-0.0072***	-0.0083***	-0.0089***	-0.0081***
	(0.0023)	(0.0028)	(0.0030)	(0.0051)	(0.0005)	(0.0007)	(0.0008)	(0.0015)
								-
	-0.00014	**-0.00017**	**-0.00020**	**-0.00031**	**-0.00001**	**-0.00001**	**-0.00002**	**0.00003**
N	27,997	27,997	27,997	27,997	27,997	27,997	27,997	27,997
R2	0.2744	0.2777	0.2782	0.2792	0.2744	0.2777	0.2782	0.2792

Note: The effect of relative mortality on different preferences with regards to the balance between health and the economy during the pandemic. In bold: effect of one standard deviation increase over dependent variable for continuous regressors. The left panel of the table reports OLS regressions using "Relative Mortality in 2020 with respect to average 2016-2019" as a binary variable (1 if relative mortality is above zero and 0 otherwise); the right part of the able report OLS regressions using "Relative Mortality in 2020 with respect to average 2016-2019" as a continuous variable. Model M1 includes as explanatory variables: age cohort, sex, nationality, and region of residence. Model M2 includes the same explanatory variables as M1 and additionally marital status and age when finished education. Model M3 includes the same explanatory variables than M2 and relation with economic activity. Model M4 includes the same explanatory variables than M3 and household characteristics (size and number of people younger than 10, between 10 and 15, aged 15 and older), difficulties for making ends meet, having internet and self-reported social class. Robust standard errors clustered at NUTS-2 level.

Table A8. OLS regression for the perceived justification of limitations imposed by public authorities to fight against COVID-19

	Relative Mortality (RM_{2020}) is a binary variable				Relative Mortality (RM_{2020}) is a continuous variable			
	M1	M2	M3	M4	M1	M2	M3	M4
Absolutely justified								
HST	0.1465***	0.1456***	0.1448***	0.1440***	0.1465***	0.1456***	0.1448***	0.1440***
	(0.0079)	(0.0077)	(0.0077)	(0.0077)	(0.0079)	(0.0077)	(0.0077)	(0.0077)
	0.0027	**0.0027**	**0.0026**	**0.0026**	**0.0027**	**0.0027**	**0.0026**	**0.0026**
RM_{2020}	0.0535***	0.0554***	0.0303	0.0344	0.0405***	0.0411***	0.0403***	0.0401***
	(0.0128)	(0.0192)	(0.0206)	(0.0272)	(0.0011)	(0.0013)	(0.0014)	(0.0018)
	-	-	-	-	**0.0001**	**0.0001**	**0.0001**	**0.0002**
Case rate	0.0635***	0.0650***	0.0629***	0.0627***	0.0028***	0.0023***	0.0031***	0.0030***
	(0.0022)	(0.0028)	(0.0030)	(0.0041)	(0.0005)	(0.0007)	(0.0008)	(0.0011)
	0.00033	**0.00043**	**0.00045**	**0.00061**	**0.00000**	**0.00000**	**0.00001**	**0.00001**
N	27,997	27,997	27,997	27,997	27,997	27,997	27,997	27,997
R2	0.2017	0.2020	0.2032	0.2043	0.2017	0.2020	0.2032	0.2043
Somewhat justified								
	M1	M2	M3	M4	M1	M2	M3	M4
HST	0.0420***	0.0442***	0.0446***	0.0444 ***	0.0420***	0.0442***	0.0446***	0.0444***
	(0.0082)	(0.0082)	(0.0082)	(0.0081)	(0.0082)	(0.0082)	(0.0082)	(0.0081)
	0.0009	**0.0009**	**0.0009**	**0.0009**	**0.0009**	**0.0009**	**0.0009**	**0.0009**
RM_{2020}	0.5442***	0.5474***	0.5309***	0.4982***	0.0421***	0.0427***	0.0419***	0.0396***
	(0.0112)	(0.0196)	(0.0197)	(0.0260)	(0.0010)	(0.0013)	(0.0014)	(0.0018)
	-	-	-	-	**-0.0001**	**-0.0001**	**-0.0001**	**-0.0002**
Case rate	-0.1003***	-0.1035***	-0.1016***	-0.0962***	-0.0314***	-0.0335***	-0.0329***	-0.0314***
	(0.0020)	(0.0029)	(0.0030)	(0.0040)	(0.0004)	(0.0008)	(0.0008)	(0.0011)
	-0.0005	**-0.0008**	**-0.0008**	**-0.0010**	**-0.0000**	**-0.0001**	**-0.0001**	**-0.0001**
N	27,997	27,997	27,997	27,997	27,997	27,997	27,997	27,997
R2	0.2494	0.2491	0.2495	0.2503	0.2494	0.2491	0.2495	0.2503
Not very justified								
	M1	M2	M3	M4	M1	M2	M3	M4
HST	-0.0847***	-0.0841***	-0.0839***	-0.0833***	-0.0847***	-0.0841***	-0.0839***	-0.0833***
	(0.0048)	(0.0047)	(0.0047)	(0.0048)	(0.0048)	(0.0047)	(0.0047)	(0.0048)
	-0.0016	**-0.0015**	**-0.0015**	**-0.0016**	**-0.0016**	**-0.0015**	**-0.0015**	**-0.0016**
RM_{2020}	-0.5798***	-0.5862***	-0.5934***	-0.5785***	-0.0128***	-0.0127***	-0.0129***	-0.0122***
	(0.0078)	(0.0128)	(0.0143)	(0.0168)	(0.0007)	(0.0008)	(0.0009)	(0.0011)
	-	-	-	-	**-0.0000**	**-0.0000**	**-0.0000**	**-0.0001**
Case rate	-0.0516***	-0.0531***	-0.0538***	-0.0520***	-0.0307***	-0.0323***	-0.0326***	-0.0320***
	(0.0014)	(0.0018)	(0.0021)	(0.0025)	(0.0003)	(0.0005)	(0.0006)	(0.0007)
	-0.0003	**-0.0004**	**-0.0004**	**-0.0005**	**-0.0000**	**-0.0001**	**-0.0001**	**-0.0001**
N	27,997	27,997	27,997	27,997	27,997	27,997	27,997	27,997
R2	0.2242	0.2257	0.2259	0.2267	0.2242	0.2257	0.2259	0.2267
Not at all justified								
	M1	M2	M3	M4	M1	M2	M3	M4
HST	-0.0617***	-0.0636***	-0.0634***	-0.0631***	-0.0617***	-0.0636***	-0.0634***	-0.0631***
	(0.0047)	(0.0048)	(0.0048)	(0.0048)	(0.0047)	(0.0048)	(0.0048)	(0.0048)
	-0.0101	**-0.0106**	**-0.0106**	**-0.0106**	**-0.0101**	**-0.0106**	**-0.0106**	**-0.0106**
RM_{2020}	-0.0606***	-0.0692***	-0.0676***	-0.0828***	-0.0112***	-0.0113***	-0.0114***	-0.0124***
	(0.0060)	(0.0098)	(0.0094)	(0.0126)	(0.0006)	(0.0007)	(0.0007)	(0.0009)
	-	-	-	-	**-0.0002**	**-0.0003**	**-0.0003**	**-0.0004**
Case rate	-0.0516***	-0.0531***	-0.0516***	-0.0531***	-0.0032***	-0.0031***	-0.0031***	-0.0024***
	(0.0011)	(0.0015)	(0.0014)	(0.0019)	(0.0002)	(0.0004)	(0.0003)	(0.0005)
	-0.00057	**-0.00080**	**-0.00076**	**-0.00119**	**-0.00002**	**-0.00004**	**-0.00003**	**-0.00004**
N	27,997	27,997	27,997	27,997	27,997	27,997	27,997	27,997
R2	0.2095	0.2240	0.2246	0.2250	0.2095	0.2240	0.2246	0.2250

Note: The effect of relative mortality on different preferences with regards to COVID-19 restrictions during the pandemic. In bold: effect of one standard deviation increase over dependent variable for continuous regressors. the left part of the table report OLS regressions using "Relative Mortality in 2020 with respect to average 2016-2019" as a binary variable (1 if relative mortality is above zero and 0 otherwise); the right part of the able report OLS regressions using "RelativeMortality in 2020 with respect to average 2016-2019" as a continuous variable.Model M1 includes as explanatory variables: age cohort, sex, nationality and region of residence. Model M2 includes the same explanatory variables as M1 and additionally marital status and age when finished education. Model M3 includes the same explanatory variables than M2 and also relation with economic activity. Model M4 includes the same explanatory variables than M3 and also household characteristics (size and number of people younger than 10, between 10 and 15, aged 15 and older), difficulties for making ends meet, having internet and self-reported social class. Robust standard errors clustered at NUTS-2 level.

Appendix B. Epidemiological variables

- **Comply with lockdown:** "Thinking about the measures taken to fight the Coronavirus outbreak, in particular the lockdown measures, would you say that it was an experience easy or difficult to cope with? (5) very easy to cope with, and even an improvement to your daily life, (4) fairly easy to cope with, (3) both easy and difficult to cope with, (2) fairly difficult to cope with, (1) very difficult to cope with, and even endangering your mental and health".

- **Trust in healthcare:** "Please, tell me if you tend to trust or not to trust overall healthcare in your country: (4) completely trust, (3) somewhat trust, (2) somewhat mistrust and (1) completely mistrust".

- **Average case rate**: average of 14-day case rate of newly reported COVID-19 cases per 100,000 population by week and NUTS-2 between week 11 ($W_{11-2020}$) and week when respondent was interviewed ($W_{EB93.1}$).

$$Average\ case\ rate_{Nut} = \frac{\sum_{i=W_{11-2020}}^{W_{EB93.1}} 14\ days{-}Notification_{w,Nut}}{W_{EB93.1} - W_{11-2020}}$$

$$14 - days\ Notification_{w,Nut} = \sum_{day=1}^{14} \frac{Notification_{day,Nut}}{14}$$

- **Relative mortality in 2013**: registered weekly registered deaths (all causes) in 2013 by NUTS-2 with respect to average deaths between years 2016 and 2019 by NUTS-2.

$$Relative\ mortality\ 2013_{Nut} = \frac{Deaths_{2013,Nut}}{\sum_{y=2016}^{2019} Deaths_{y,Nut}/4} - 1$$

- **Relative mortality in 2020**: average weekly registered deaths (all causes) between week 11 ($W_{11-2020}$) and week when respondent was interviewed ($W_{EB93.1}$) with respect to average weekly deaths between years 2016 and 2019 by NUTS-2.

$$Average\ weekly\ deaths\ 2016 - 19\ _{Nut} = \frac{\sum_{y=2016}^{2019} Deaths_{y,Nut}}{4 \cdot 52.14}$$

$$Relative\ mortality\ 2020\ _{Nut} = \frac{\dfrac{\sum_{i=W_{11-2020}}^{W_{EB93.1}} Deaths_{w,Nut}}{W_{EB93.1} - W_{11-2020}}}{Average\ weekly\ deaths\ _{2016-2019,Nut}} - 1$$

Table B1. Epidemiological variables by NUTS

	NUTS-2 ID	Country	NUTS-2 NAME	Relative mortality with respect 2016-19		Average case rate	Trust in healthcare		Comply with lockdown
				2013	2020		2013	2020	
1	AT34	Austria	Vorarlberg	-8.194	0.043	12.933	3.659	3.064	3.312
2	AT33	Austria	Tirol	-6.588	-0.242	28.276	3.407	2.568	2.845
3	AT32	Austria	Salzburg	-4.686	-0.398	15.450	3.592	3.197	2.578
4	AT31	Austria	Oberoesterreich	-2.018	-3.558	20.301	3.313	3.132	2.787
5	AT21	Austria	Kaernten	-5.484	-3.668	6.875	3.232	2.754	2.717
6	AT22	Austria	Steiermark	-6.718	-0.801	11.914	3.428	2.951	2.829
7	AT11	Austria	Burgenland	-2.997	-2.914	10.884	3.332	3.385	3.883
8	AT12	Austria	Niederoesterreich	-4.87	-1.346	15.313	3.273	3.118	2.946
9	AT13	Austria	Wien	-0.25	-2.097	32.146	3.338	3.222	3.253
10	BE10	Belgium	Bruxelles-Capitale	4.526	26.339	69.109	3.361	2.453	2.684
11	BE21	Belgium	Prov. Antwerpen	-0.744	11.664	57.379	3.582	2.400	3.448
12	BE22	Belgium	Prov. Limburg (BE	-5.557	23.175	57.379	3.568	2.324	3.645
13	BE23	Belgium	Prov. Oost-Vlaanderen	0.46	10.619	57.379	3.421	2.499	3.594
14	BE24	Belgium	Prov. Vlaams-Brabant	-1.574	10.893	57.379	3.465	2.768	3.647
15	BE25	Belgium	Prov. West-Vlaanderen	-0.327	11.86	57.379	3.572	2.357	3.484
16	BE31	Belgium	Prov. Brabant wallon	-4.923	9.715	55.408	3.153	2.756	3.006
17	BE32	Belgium	Prov. Hainaut	2.313	13.031	55.408	3.215	2.258	2.930
18	BE33	Belgium	Prov. Liege	0.081	14.911	55.408	3.329	2.426	3.017
19	BE34	Belgium	Prov. Luxembourg	-0.715	6.251	55.408	3.229	2.273	3.006
20	BE35	Belgium	Prov. Namur	2.825	11.669	55.408	3.199	2.566	3.246
21	BG31	Bulgaria	Severozapaden	-1.402	-8.545	14.321	2.343	2.519	2.650
22	BG32	Bulgaria	Severen tsentralen	-2.944	-5.307	14.130	1.861	2.448	2.810
23	BG33	Bulgaria	Severoiztochen	-4.174	-2.511	26.764	2.197	2.394	2.770
24	BG34	Bulgaria	Yugoiztochen	-3.556	-4.742	19.931	1.922	2.381	2.727
25	BG41	Bulgaria	Yugozapaden	-3.828	-3.631	31.978	2.159	2.558	2.723
26	BG42	Bulgaria	Yuzhen tsentralen	-6.112	-3.209	24.356	2.005	2.877	3.126
27	HR03	Croatia	Jadranska	-7.945	-4.279	33.349	2.574	2.741	2.961
28	HR04	Croatia	Kontinentalna	-1.828	-4.279	30.660	0.000	2.587	2.766
29	CY0	Cyprus	fkosia/Nicosia	-12.397	4.98	13.247	2.881	3.456	3.126
30	CZ01	Czech Republic	Praha	-0.693	-0.791	37.496	2.827	2.929	3.243
31	CZ02	Czech Republic	Stredni Cechy	-2.646	-1.58	19.545	3.016	2.736	3.043
32	CZ03	Czech Republic	Jihozapad	-2.206	-2.892	10.586	3.027	2.742	3.297

33	CZ04	Czech Republic	Severozapad	-0.782	-0.168	16.336	2.760	2.960	3.450
34	CZ05	Czech Republic	Severovychod	-0.898	-1.631	13.706	2.871	2.819	3.176
35	CZ06	Czech Republic	Jihovychod	-4.162	-1.033	14.132	2.850	2.899	3.504
36	CZ07	Czech Republic	Stredni Morava	-0.201	0.694	15.103	2.871	3.040	3.516
37	CZ08	Czech Republic	Moravskoslezsko	-1.789	2.527	41.277	2.726	2.768	3.303
38	DK01	Denmark	Hovedstaden	-0.825	-1.89	37.858	3.127	3.658	3.524
39	DK02	Denmark	Sjaelland	-5.026	1.211	18.606	3.106	3.778	3.754
40	DK03	Denmark	Syddanmark	-2.683	-1.803	10.525	3.203	3.698	3.714
41	DK04	Denmark	Midtjylland	-3.725	-0.836	24.075	3.165	3.511	3.605
42	DK05	Denmark	Nordjylland	-0.375	-2.059	8.377	3.156	3.661	3.651
43	EE0	Estonia	Estonia	-1.789	0.12	8.280	2.774	3.076	3.554
44	FI19	Finland	Lansi-Suomi	-5.082	-2.191	4.013	3.218	3.207	3.982
45	FI1B	Finland	Helsinki-Uusimaa	-7.08	7.751	18.631	3.265	3.258	3.827
46	FI1C	Finland	Etela-Suomi	-3.117	-1.991	4.707	3.162	3.200	3.935
47	FI1D	Finland	Pohjois- ja Ita-Suomi	-3.953	0.324	2.494	3.157	3.167	4.053
48	FR10	France	Ile de France	-4.341	26.017	75.150	3.161	2.291	3.239
49	FRF2	France	Champagne-Ardenne	-3.974	2.841	29.712	2.660	2.193	2.944
50	FRE2	France	Picardie	-3.954	7.769	51.815	2.980	2.222	3.072
51	FRD2	France	Haute-Normandie	-5.104	-0.591	28.636	3.074	2.323	2.960
52	FRB0	France	Centre	-5.18	-0.432	30.850	2.939	2.255	2.756
53	FRD1	France	Basse-Normandie	-6.344	-0.348	28.636	2.935	2.069	3.351
54	FRC1	France	Bourgogne	-5.272	1.639	28.727	3.197	2.004	3.006
55	FRE1	France	Nord - Pas-de-Calais	-1.052	3.068	51.815	2.960	2.027	2.801
56	FRF3	France	Lorraine	-5.28	13.008	29.712	3.137	1.929	3.281
57	FRF1	France	Alsace	-5.816	27.297	29.712	3.041	2.068	2.944
58	FRC2	France	Franche-Comte	-7.135	9.935	28.727	3.135	2.397	2.839
59	FRG0	France	Pays de la Loire	-8.079	0.157	33.068	3.139	2.398	3.321
60	FRH0	France	Bretagne	-6.64	-2.058	25.724	3.009	2.305	3.046
61	FRI3	France	Poitou-Charentes	-4.38	-2.885	34.732	3.128	2.064	3.183
62	FRI1	France	Aquitaine	-6.926	-4.778	34.732	3.185	2.201	3.379
63	FRJ2	France	Midi-Pyrenees	-7.135	-3.681	46.640	3.218	2.736	3.265
64	FRI2	France	Limousin	-2.533	-1.32	34.732	2.842	1.754	2.819
65	FRK2	France	Rhone-Alpes	-7.266	6.452	45.642	3.082	2.143	3.122
66	FRK1	France	Auvergne	-4.581	-4.867	45.642	3.109	2.586	3.166
67	FRJ1	France	Languedoc-Roussillon	-8.979	-0.152	46.640	3.010	2.065	3.207
68	FRK2	France	Alpes-Cote d'Azur	-7.326	1.271	79.805	3.273	2.121	3.121
69	DE1	Germany	Baden-Wuerttemberg	-6.997	1.425	26.186	3.257	3.427	3.578
70	DE2	Germany	Bayern	-4.687	1.701	31.196	3.257	3.196	3.404
71	DE3	Germany	Berlin	-5.654	1.683	22.024	3.177	3.062	2.697
72	DE4	Germany	Brandenburg	-6.731	3.356	12.494	2.844	2.818	2.814
73	DE5	Germany	Bremen	0.481	2.67	24.349	3.079	3.511	3.107
74	DE6	Germany	Hamburg	-2.15	2.881	21.351	3.812	3.240	3.580
75	DE7	Germany	Hessen	-3.285	-0.467	18.291	3.128	3.360	3.671
76	DE8	Germany	Mecklenburg-Vorpommern	-6.496	0.804	3.935	2.975	2.884	3.251
77	DE9	Germany	Niedersachsen	-3.778	0.016	15.137	3.185	3.078	3.150
78	DEA	Germany	Nordrhein-Westfalen	-3.249	0.327	23.658	3.160	3.108	3.455
79	DEB	Germany	Rheinland-Pfalz	-3.721	-1.321	14.847	3.171	3.365	3.599
80	DEC	Germany	Saarland	-4.289	-2.105	23.172	3.134	3.343	3.728
81	DED	Germany	Sachsen	-3.426	-2.16	9.782	3.040	3.016	3.178
82	DEE	Germany	Sachsen-Anhalt	-3.455	-2.269	7.039	2.909	2.814	2.943
83	DEF	Germany	Schleswig-Holstein	-5.961	-2.06	9.649	3.125	2.926	3.090
84	DEG	Germany	Thueringen	-5.417	-3.499	12.696	2.993	3.237	3.551
85	EL30	Greece	Attiki	-9.071	-0.781	20.400	1.866	3.129	2.626
86	EL43	Greece	Kriti	-9.863	-1.663	8.748	1.931	2.930	1.926
87	EL51	Greece	Anatoliki Makedonia	-6.339	3.934	11.405	2.040	3.259	2.826
88	EL52	Greece	Kentriki Makedonia	-10.634	2.649	15.746	2.109	2.778	2.430
89	EL53	Greece	Dytiki Makedonia	-4.031	5.023	19.063	2.193	2.632	2.066
90	EL54	Greece	Ipeiros	-4.593	-2.067	9.316	2.193	2.538	2.349
91	EL61	Greece	Thessalia	-7.303	4.17	11.448	2.413	2.866	3.022
92	EL63	Greece	Dytiki Ellada	-4.964	-1.005	4.405	1.879	2.479	2.991
93	EL64	Greece	Sterea Ellada	-10.892	-1.546	4.120	2.022	2.795	2.523
94	EL65	Greece	Peloponnisos	-7.245	-0.681	4.695	1.785	3.401	2.897
95	HU10	Hungary	Kozep-Magyarorszag	-2.504	-5.012	24.257	2.316	3.044	3.135
96	HU31	Hungary	Eszak-Magyarorszag	-2.005	-9.538	4.516	2.399	2.992	3.154
97	HU32	Hungary	Eszak-Alfold	-4.706	-5.586	5.903	2.539	2.690	3.156
98	HU33	Hungary	Del-Alfold	-1.877	-7.466	8.113	2.369	2.925	2.940
99	HU23	Hungary	DEl-Dunantul	-1.205	-4.714	3.425	2.329	2.281	3.257
100	HU21	Hungary	Kozep-Dunantul	-5.025	-5.299	12.927	2.212	3.027	3.006
101	HU22	Hungary	Nyugat-Dunantul	-0.014	-5.19	3.774	2.321	2.980	3.132
102	IE04	Ireland	Northern and Western	-2.694	21.187	44.600	2.567	3.129	3.338
103	IE05	Ireland	Southern	-3.662	21.187	31.117	2.428	3.217	3.377
104	IE06	Ireland	Eastern and Midland	-5.149	21.187	52.917	2.575	3.131	3.346
105	ITC1	Italy	Piemonte	-5.292	20.187	53.373	2.568	2.267	2.523
106	ITC3	Italy	Liguria	0.167	18.874	47.725	2.557	1.872	2.537
107	ITC4	Italy	Lombardia	-7.148	53.032	55.740	2.755	2.507	2.603
108	ITF1	Italy	Abruzzo	-2.802	3.88	18.277	2.428	2.766	2.473
109	ITF3	Italy	Campania	-3.689	-2.206	8.017	2.576	2.588	2.509
110	ITF4	Italy	Puglia	-7.785	7.878	9.045	2.429	2.856	2.332
111	ITF6	Italy	Calabria	-6.156	3.608	4.593	2.751	2.977	1.878
112	ITG1	Italy	Sicilia	-4.873	1.545	5.423	2.276	2.810	2.726
113	ITG2	Italy	Sardegna	-8.055	5.187	8.377	2.568	1.786	2.723

114	ITH2	Italy	Trento	-3.685	25.859	60.337	2.748	3.007	2.254
115	ITH3	Italy	Veneto	-5.115	8.111	27.877	2.370	2.456	2.907
116	ITH4	Italy	Friuli-Venezia Giulia	-0.876	2.497	17.839	2.378	2.055	2.463
117	ITH5	Italy	Emilia-Romagna	-4.725	20.396	39.894	2.750	2.463	3.046
118	ITI1	Italy	Toscana	-3.088	3.615	19.453	2.370	1.731	2.488
119	ITI2	Italy	Umbria	-2.141	-0.304	8.656	2.366	2.379	3.694
120	ITI3	Italy	Marche	-4.131	15.265	23.162	2.370	1.712	2.414
121	ITI4	Italy	Lazio	-5.898	-0.319	13.228	2.369	2.555	3.112
122	LV0	Latvia	Latvija	0.78	-5.739	4.018	2.408	3.029	3.500
123	LT0	Lithuania	Lietuva	4.375	-0.619	7.858	2.648	2.913	3.297
124	LU0	Luxembourg	Luxembourg	-9.168	1.899	67.952	3.221	3.296	3.291
125	MT0	Malta	Malta	-9.413	4.14	32.022	3.302	3.621	2.694
126	NL11	Netherlands	Groningen	-3.791	-1.684	7.952	3.445	3.352	3.668
127	NL12	Netherlands	Friesland	-5.881	-1.698	8.161	3.376	3.261	3.874
128	NL13	Netherlands	Drenthe	-7.766	2.122	6.869	3.287	3.291	3.731
129	NL21	Netherlands	Overijssel	-5.713	8.474	16.897	3.314	3.538	3.889
130	NL22	Netherlands	Gelderland	-7.393	10.224	24.033	3.324	3.408	3.777
131	NL23	Netherlands	Flevoland	-6.511	6.719	25.445	2.859	3.368	3.508
132	NL31	Netherlands	Utrecht	-6.661	11.395	31.775	3.290	3.250	3.651
133	NL32	Netherlands	Noord-Holland	-4.909	6.866	31.775	3.249	3.404	3.810
134	NL33	Netherlands	Zuid-Holland	-5.935	7.68	44.903	3.156	3.467	3.725
135	NL34	Netherlands	Zeeland	-3.151	3.381	17.768	3.151	3.512	4.261
136	NL41	Netherlands	Noord-Brabant	-9.785	17.394	28.477	3.384	3.363	3.812
137	NL42	Netherlands	Limburg	-6.492	21.395	26.597	3.085	3.483	3.585
138	PL11	Poland	Lodzkie	1.15	-1.154	19.226	2.155	2.131	3.062
139	PL12	Poland	Mazowieckie	-3.417	0.842	15.293	2.452	2.663	2.977
140	PL21	Poland	Malopolskie	-5.396	2.027	20.952	2.079	2.272	2.577
141	PL22	Poland	Slaskie	-3.751	1.86	41.403	2.085	2.478	2.497
142	PL31	Poland	Lubelskie	-1.095	-1.845	7.031	2.338	2.728	2.791
143	PL32	Poland	Podkarpackie	-4.767	1.846	10.936	2.332	2.775	2.952
144	PL33	Poland	Swietokrzyskie	-1.079	1.099	10.760	2.004	2.574	3.037
145	PL34	Poland	Podlaskie	-3.3	-2.143	10.088	1.970	2.607	2.827
146	PL41	Poland	Wielkopolskie	-4.293	0.86	5.903	2.282	2.612	2.953
147	PL42	Poland	Zachodniopomorskie	-5.452	3.089	5.903	1.770	2.451	3.041
148	PL43	Poland	Lubuskie	-4.982	-0.076	5.903	1.961	2.914	2.630
149	PL51	Poland	Dolnoslaskie	-4.927	-0.041	12.155	2.252	2.712	2.795
150	PL52	Poland	Opolskie	-2.883	-0.066	15.616	2.266	2.716	3.674
151	PL61	Poland	Kujawsko-Pomorskie	-5.274	1.407	5.656	2.158	2.989	2.679
152	PL62	Poland	Warminsko-Mazurskie	-4.585	-0.607	5.780	1.872	2.683	3.532
153	PL63	Poland	Pomorskie	-8.334	-0.368	10.380	2.339	3.101	3.097
154	PT11	Portugal	Norte	-4.755	7.128	36.039	2.582	2.908	2.504
155	PT15	Portugal	Algarve	-8.71	2.336	20.052	2.644	2.798	3.171
156	PT16	Portugal	Centro (PT)	-2.639	1.497	17.249	2.386	2.214	1.976
157	PT17	Portugal	Lisboa	-5.588	4.08	71.208	2.513	2.760	2.805
158	PT18	Portugal	Alentejo	-2.635	4.003	18.856	2.087	2.664	2.267
159	RO11	Romania	Nord-Vest	-4.144	-1.491	45.495	2.049	2.307	2.911
160	RO12	Romania	Centru	-6.457	0.103	34.398	2.096	2.583	3.220
161	RO21	Romania	Nord-Est	-6.712	0.326	52.933	2.100	2.461	2.739
162	RO22	Romania	Sud-Est	-7.112	-0.784	56.090	1.900	2.069	2.930
163	RO31	Romania	Sud - Muntenia	-4.509	1.348	82.320	1.918	2.468	3.096
164	RO32	Romania	Bucuresti - Ilfov	-7.094	4.189	62.654	2.140	2.489	3.214
165	RO41	Romania	Sud-Vest Oltenia	-0.618	-1.237	30.473	1.783	2.506	2.989
166	RO42	Romania	Vest	-4.239	0.738	42.546	1.751	2.291	2.742
167	SK01	Slovakia	Bratislavsky kraj	-3.299	-4.857	20.460	2.257	2.089	2.680
168	SK02	Slovakia	Zapadne Slovensko	-3.579	-2.99	9.157	2.349	2.498	3.049
169	SK03	Slovakia	Stredne Slovensko	-2.145	-3.823	9.426	2.546	2.760	2.755
170	SK04	Slovakia	Vychodne Slovensko	-1.19	0.204	6.585	2.563	3.023	3.266
171	SI0	Slovenia	Slovenia	-4.842	2.362	14.350	2.884	2.764	3.062
172	ES11	Spain	Galicia	-4.453	-3.044	36.632	3.134	2.229	3.180
173	ES12	Spain	Principado de Asturias	-3.046	5.639	19.874	2.884	2.962	3.633
174	ES13	Spain	Cantabria	-6.628	5.106	46.806	3.121	1.336	3.445
175	ES21	Spain	Pais Vasco	-8.478	11.085	95.484	3.261	2.283	3.032
176	ES22	Spain	Navarra	-7.257	17.648	107.878	3.511	2.006	3.509
177	ES23	Spain	La Rioja	-7.17	22.685	117.603	3.229	2.881	3.759
178	ES24	Spain	Aragon	-3.604	16.385	168.102	3.102	2.179	3.590
179	ES30	Spain	Comunidad de Madrid	-8.783	70.945	132.867	2.989	2.356	2.896
180	ES41	Spain	Castilla y Leon	-4.681	33.513	87.034	2.442	2.590	3.424
181	ES42	Spain	Castilla-la Mancha	-6.992	51.63	81.965	3.051	2.623	3.090
182	ES43	Spain	Extremadura	-2.991	15.587	30.364	2.837	2.297	3.299
183	ES51	Spain	Cataluna	-6.653	34.008	110.326	2.819	2.239	3.057
184	ES52	Spain	Comunidad Valenciana	-8.352	7.586	33.841	3.209	2.414	2.920
185	ES53	Spain	Illes Balears	-5.703	2.084	49.857	2.894	2.547	3.382
186	ES61	Spain	Andalucia	-7.406	2.56	25.269	2.412	2.090	3.330
187	ES62	Spain	Region de Murcia	-10.653	1.309	29.081	2.386	2.224	2.880
188	ES70	Spain	Canarias	-12.623	-0.337	21.415	3.285	2.412	2.532
189	SE1	Sweden	Stockholm	-3.858	14.934	73.059	3.142	2.843	3.501
190	SE2	Sweden	Smaland med oarna	0.88	0.586	119.687	3.233	2.945	3.482
191	SE3	Sweden	Norra Mellansverige	1.93	0.711	94.758	3.361	2.994	3.529
192	UKC	United Kingdom	North East (UK)	-5.607	16.657	2.984	3.177	2.078	3.225
193	UKD	United Kingdom	North West (UK)	-4.125	18.532	2.984	3.323	2.176	3.193
194	UKE	United Kingdom	Yorkshire and The Humber	-4.194	13.982	2.984	3.189	2.172	3.275

195	UKF	United Kingdom	East Midlands (UK)	-6.938	15.042	2.984	3.156	2.347	3.540
196	UKG	United Kingdom	West Midlands (UK)	-4.287	22.026	2.984	3.074	2.252	3.289
197	UKH	United Kingdom	East of England	-6.871	15.979	2.984	3.001	2.233	3.462
198	UKJ	United Kingdom	London	-2.912	35.431	2.984	3.185	2.068	3.210
199	UKK	United Kingdom	South East (UK)	-4.254	16.71	2.984	3.208	2.201	3.455
200	UKN	United Kingdom	South West (UK)	-3.135	9.262	2.984	3.232	2.112	3.316
201	UKM	United Kingdom	Northern Ireland (UK)	-5.013	8.125	2.174	3.177	2.071	3.475
202	UKM	United Kingdom	Scotland	-5.185	12.101	2.179	3.020	1.956	3.401
203	UKL	United Kingdom	Wales	-3.149	9.897	3.309	2.773	2.135	3.512

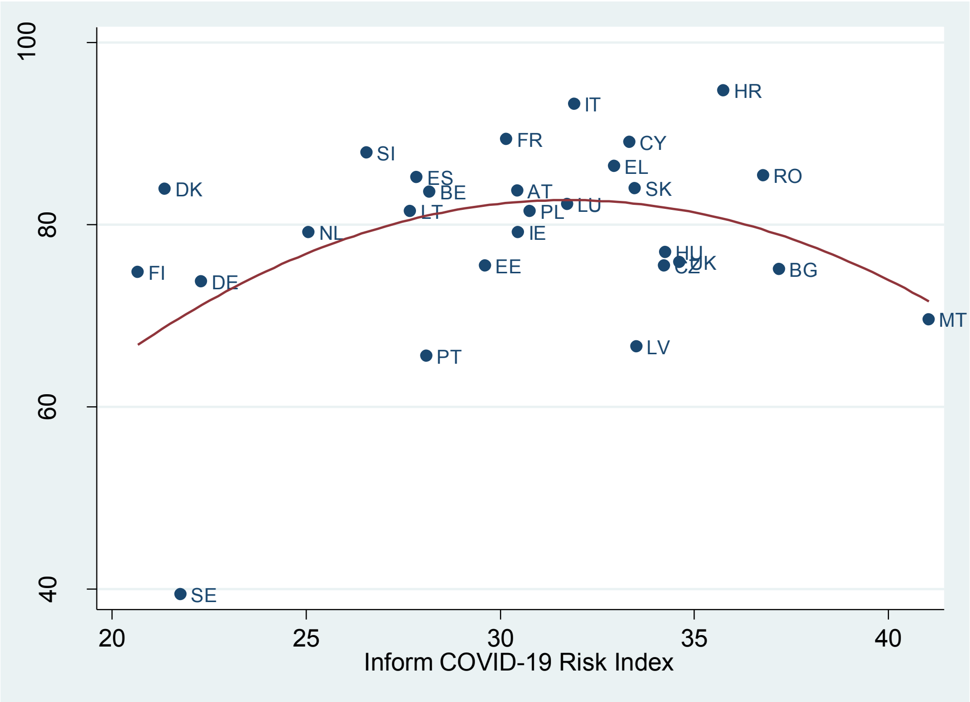
Source: Own work using Eurostat. Regional statistics by NUTS-2 Demographic statistics (Database - Eurostat (europa.eu)) for "Relative mortality in 2013" and "Relative mortality in 2020"; EB80.2 and EB 93.1 for "Trust in healthcare"; EB93.1 for "Comply with lockdown". The sources consulted to compute the "Average Case Rate" by NUTS-2 are listed on Table B2.

Table B2. Databases used for obtaining information about 14-day case rate of newly reported COVID-19 cases per 100 000 population by week and NUTS-2

Austria	Neuartiges Coronavirus (2019-nCov) (sozialministerium.at)
Belgium	Epistat – COVID-19 Belgian Dashboard (wiv-isp.be)
Bulgaria	COVID-19 - Коронавируса в България - Статистики, новини и информация в реално време (lanix.org)
Croatia	Informacije o koronavirusu po županijama
Cyprus	Πύλη Πληροφόρησης Πανεπιστημίου Κύπρου για το COVID-19 (ucy.ac.cy)
Czechia	COVID-19 | Onemocnění aktuálně od MZČR (mzcr.cz)
Denmark	Overvågning af COVID-19 (ssi.dk)
Estonia	Koroonaviiruse andmestik | Terviseamet
Finland	Varmistetut koronatapaukset Suomessa (COVID-19) (arcgis.com)
Germany	RKI COVID-19 Germany (arcgis.com)
Greece	Ημερήσια Επισκόπηση | CoVid19.gov.gr
Hungary	Fertőzöttek | Koronavírus (gov.hu)
Ireland	gov.ie - Latest updates on COVID-19 (Coronavirus) (www.gov.ie)
Italy	ArcGIS Dashboards
Latvia	COVID-19 apstiprināto gadījumu skaits un 14 dienu kumulatīvā saslimstība pa administratīvajām teritorijām - COVID-19 pa administratīvajām teritorijām - Latvijas Atvērto datu portāls (data.gov.lv)
Liechtenstein	Regierung des Fürstentums Liechtenstein
Luxembourg	Coronavirus - Informations officielles - Luxembourg (public.lu)
Malta	Novel Coronavirus - English (gov.mt)
Netherlands	COVID-19 dataset (rivm.nl)
Norway	Daily report and statistics about coronavirus and COVID-19 - NIPH (fhi.no)
Poland	Raport zakażeń koronawirusem (SARS-CoV-2) - Koronawirus: informacje i zalecenia - Portal Gov.pl (www.gov.pl)
Portugal	Ponto de Situação Atual em Portugal - COVID-19 (min-saude.pt)
Romania	Distribuția pe județe a cazurilor confirmate cu COVID-19 în România (arcgis.com)
Slovakia	Koronavírus na Slovensku v číslach - Koronavírus a Slovensko (gov.sk)
Slovenia	Dnevno spremljanje okužb s SARS-CoV-2 (COVID-19) | www.nijz.si
Spain	Ministerio de Sanidad, Consumo y Bienestar Social - Profesionales - Situación actual Coronavirus (mscbs.gob.es)
Sweden	Tabeller för talsyntes (arcgis.com)
United Kingdom	Download data | Coronavirus in the UK

Appendix C. Inform COVID-19 Risk Index.

Figure C1. Relationship between Inform COVID-19 Risk Index and Oxford COVID-19 Stringency Index



Note: Country labels: AT: Austria, BE: Belgium, BG: Bulgaria, HR: Croatia, CY: Cyprus. CZ: Czech Republic, DK: Denmark, EE: Estonia, FI: Finland, FR: France, DE: Germany, EL: Greece, HU: Hungary, IE: Ireland, IT: Italy, LV: Latvia, LT: Lithuania, LU: Luxembourg, MT: Malta, NL: Netherlands, PL: Poland, PT: Portugal, RO: Romania, SK: Slovakia, SI: Slovenia, ES: Spain, SE: Sweden, UK. United Kingdom.
Source: own work using data from https://www.bsg.ox.ac.uk/research/research-projects/oxford-COVID-19-government-response-tracker and https://drmkc.jrc.ec.europa.eu/inform-index/INFORM-COVID-19
The Stringency Index is a composite measure obtained by additive score of nine indicators measured on an ordinal scale, and rescaled afterwards in order to vary from 0 to 100[44].

[44] . The nine items included are the following ones:

1. School closing (0: no measures; 1: recommend closing; 2: require closing); Workplace closures (0: no measures; 1: recommend closing; 2: require closing for some sectors or categories of workers; 3: require closing all but essential workplaces).
2. Cancel public events (0: no measures; 1: recommend cancelling; 2: require cancelling); restrictions on gatherings (0: no restrictions; 1: restrictions on gatherings above 1,000 people, 2: restrictions on gatherings between 100 and 1,000 people; 3: restrictions on gatherings between 10 and 100 people; 4: restrictions on gatherings of less than 10 people).
3. Close public transport (0: no measures; 1: recommend closing or significantly reduce volume or transport available; 2: require closing or prohibit most citizens from using it).
4. Public information campaigns (0: no public information campaign; 1: public officials urging caution about COVID-19; 2: coordinated public information campaign across traditional and social media).
5. Stay at home (0: no measures; 1: recommend not leaving house; 2: require not leaving house with exceptions for daily exercise, grocery shopping and essential trips; 3: require not leaving house with minimal exceptions).
6. Restrictions on internal movement (0: no measures: 1: recommend movement restriction; 2: restrict movement).
7. International travel controls (0: no measures; 1: screening; 2: quarantine arrivals from high-risk regions; 3: ban on high-risk regions; 4: total border closure).
8. Testing policy (0: no testing policy; 1: only those who have symptoms and meet specific criteria, such as, key workers, admitted to hospital, came into contact with a known case or returned from overseas; 2: testing anyone showing COVID-19 symptoms; 3: open public testing).
9. Contact tracing (0: no contact tracing; 1: limited contact tracing, that is not done for all cases; 2: comprehensive contact tracing, that is, done for all cases).

The Inform COVID-19 Risk Index is an adaptation of the Inform Epidemic Risk Index that tries to identify: "countries at risk from health and humanitarian impacts of COVID-19 that could overwhelm current national response capacity, and therefore lead to a need for additional international assistance" (Poljanšek, 2020).
The COVID-19 Risk Index contains tree dimensions: Hazard & Exposure, Vulnerability and Lack of Coping Capacity dimensions. Each of them focus on several structural factors.

- The Hazard & Exposure ($H\&E$) dimension tries to measure the probability of exposure to infectious agents.
- The Vulnerability (V) dimension describes how severely exposed people can be affected (i.e., health vulnerability due to the social, economic, ecological, migratory behavioural and hazards characteristics of the country).
- The Lack of Coping Capacity (LCC) dimension measures the shortfalls in physical infrastructure, healthcare system capacity, institutional and management capacity.

Each of the 3 dimensions is measured on a scale of 0 to 10 and a higher value represents worse conditions. The aggregation of the indicators has been performed following the INFORM model (De Groeve et al., 2014). The Inform COVID-19 Risk Index is obtained as:

$$COVID - 19\ Risk\ Index = H\&E^{1/3} \cdot V^{1/3} \cdot LCC^{1/3}$$

Table C1. Inform COVID-19 Risk Index and corresponding dimensions

	Hazard & Exposure (0-10)	Vulnerability (0-10)	Lack of Coping Capacity (0-10)	COVID-19 Risk Index (0-10)	Group of risk
Austria	2.5	4.7	2.4	3.0438	Low
Belgium	3.4	4.7	1.4	2.8177	Low
Bulgaria	2.7	5.6	3.4	3.7183	High
Croatia	2.4	5.6	3.1	3.5751	High
Cyprus	2.9	4.4	2.9	3.3323	Moderate
Czech Republic	2.8	5.3	2.7	3.4219	Moderate
Denmark	2.9	4.8	0.7	2.1359	Very low
Estonia	2.3	4.7	2.4	2.9604	Low
Finland	2.3	4.8	0.8	2.0671	Very low
France	2.8	4.9	2	3.0162	Low
Germany	2.2	5.6	0.9	2.2299	Very low
Greece	2.2	5.6	2.9	3.2936	Moderate
Hungary	2.4	5.4	3.1	3.4250	Moderate
Ireland	3.1	3.8	2.4	3.0464	Low
Italy	2.8	5.8	2	3.1906	Moderate
Latvia	2.4	5.6	2.8	3.3511	Moderate
Lithuania	2.4	5.2	1.7	2.7684	Low
Luxembourg	3.8	4.2	2	3.1722	Moderate
Malta	4.7	4.9	3	4.1033	High
Netherlands	3.5	4.5	1	2.5066	Very low
Poland	2	5.2	2.8	3.0765	Low
Portugal	2.2	5.6	1.8	2.8095	Low
Romania	2.4	5.6	3.7	3.6773	High
Slovakia	2.5	5	3	3.3472	Moderate
Slovenia	2	5.2	1.8	2.6552	Low
Spain	2.5	5.4	1.6	2.7850	Low
Sweden	2.8	4.6	0.8	2.1760	Very low
United Kingdom	3.2	6.5	2.0	3.4612	Moderate

Source: own work using https://drmkc.jrc.ec.europa.eu/inform-index/INFORM-COVID-19
The risk group has been calculated taking into consideration the 28 countries analyzed. Taking as a reference the maximum value (4.48) and the minimum (1.49), quartiles have been obtained, so that countries in the first quartil exhibit very low risk and countries in the fourth quartil exhibit high risk.

The list of factors encompassed in each dimension is the following one (Poljanšek et al., 2020):

1. Hazards and Exposure
   - Population
     - Population density (people per sq. km of land area)
     - Urban population growth (annual %)
     - Population living in urban areas (%)
     - Population living in slums (% of urban population)
     - Average household size (number of members)
   - WaSH
     - People using at least basic sanitation services (% of population)
     - People using at least basic drinking water services (% of population)
     - People practicing open defecation (% of population)

2. Vulnerability

- Movement:
    - International movement:
        - Air transport, passengers carried: Air passengers carried include both domestic and international aircraft passengers of air carriers registered in the country.
        - International tourism, number of arrivals: International inbound tourists (overnight visitors) are the number of tourists who travel to a country other than that in which they have their usual residence, but outside their usual environment, for a period not exceeding 12 months and whose main purpose in visiting is other than an activity remunerated from within the country visited.
        - IHR (International Health Regulation) points of entry (airports, ports, ground): The proportion/percentage of attribute (a set of specific elements or functions which reflect the level of performance or achievement of Points of Entry) that have been attained.
    - National movement:
        - Access to Cities: The indicator has been derived by JRC from the predicted travel time (minutes) to nearest city. This is a predictive map showing the estimated time to travel from every point on earth to the nearest (in time) city.
        - Road density: Road density (km of road per 100 sq. km of land area)
- Behavior:
    - Adult literacy rate, population 15+ years
    - Mobile cellular subscriptions: Mobile cellular telephone subscriptions are subscriptions to a public mobile telephone service using cellular technology, which provide access to the public switched telephone network. Post-paid and prepaid subscriptions are included.
    - Individuals using the Internet (% of population)
- Demographic and comorbidities:
    - Proportion of total population with at least one underlying condition relevant to severe COVID-19 disease and older than 50 without underlying conditions.
- Socio-economic vulnerability
    - Development and deprivation
        - Human Development Index
        - Multidimensional Poverty Index
    - Inequality
        - Gender Inequality Index
        - Income Gini coefficient
    - Economic Dependency Index
        - Public Aid per capita (current USD)
        - Net Official Development Assistance received (% of GNI)
        - Volume of remittances (in United States dollars) as a proportion of total GDP (%)
- Vulnerable groups
    - Unprotected groups
        - Refugees and asylum-seekers by country of asylum
        - Internally displaced persons
        - Returned refugees
    - Gender based violence
        - Proportion of ever-partnered women and girls subjected to physical and/or sexual violence by a current or former intimate partner in the previous 12 months (18-49)
        - Attitudes towards violence: percentage of women who agree that a husband/partner is justified in beating his wife/partner under certain circumstances
    - Health conditions
        - HIV prevalence among adults aged 15-49 years (%)
        - Number of new HIV infections per 1,000 uninfected population
        - Malaria incidence per 1 000 population at risk (per 1 000 population)
        - Estimated incidence of tuberculosis (per 100 000 population)
        - Number of people requiring interventions against neglected tropical diseases (number) as percentage of the total population
    - Food security
        - Average dietary supply adequacy (% of the average dietary energy requirement.)
        - Prevalence of undernourishment: the probability that a randomly selected individual from the population consumes a number of calories that is insufficient to cover her/his energy requirement for an active and healthy life.

3. Lack of coping capacity

- Governance
    - Corruption Perception Index
- Institutional
    - Average of 13 International Health Regulations core capacity scores. The 13 core capacities are: (1) National legislation, policy and financing; (2) Coordination and National Focal Point communications; (3) Surveillance; (4) Response; (5) Preparedness; (6) Risk communication; (7)

Human resources; (8) Laboratory; (9) Points of entry; (10) Zoonotic events; (11) Food safety; (12) Chemical events; (13) Radionuclear emergencies.
    - Operational readiness index: based on the IHR (2005) State Parties Annual Reporting (SPAR) tool[45].
- Access to healthcare
    - Current health expenditure per capita, PPP (current international $)
    - Resources
        - Density of physicians (per 1,000 population)
        - Hospital beds
    - Maternal mortality ratio
        - Ratio of maternal deaths per 100,000 live births
    - Immunization coverage
        - Proportion of the target population with access to three doses of diphtheria-tetanus-pertussis (DTP3) (%)
        - Proportion of the target population with access to measles-containing-vaccine second dose (MCV2) (%)
        - Proportion of the target population with access to pneumococcal conjugate third dose (PCV3) (%)

Table C2. Trust in healthcare (HST) and epidemiological variables according to country classification using Inform Covid Risk Index

	Very low risk countries	Low risk countries	Moderate risk countries	High risk countries
Trust in healthcare (HST)	3.053	2.719	2.829	2.669
	(0.916)	(0.877)	(0.922)	(0.962)
Relative mortality in 2020	105.574	106.971	99.950	98.243
	(8.265)	(12.285)	(9.336)	(3.375)
Average case rate	29.081	32.771	20.373	35.705
	(32.699)	(27.683)	(17.770)	(14.839)
N	6,256	9,340	8,050	3,362
	23.17%	34.58%	29.81%	12.45%

- Very low risk countries: Denmark, Finland, Germany, Netherlands, Sweden and United Kingdom
- Low risk countries: Austria, Belgium, Estonia, France, Ireland, Lithuania, Poland, Portugal, Slovenia and Spain
- Moderate risk countries: Cyprus, Czech Republic, Greece, Hungary, Italy, Latvia, Luxembourg and Slovakia
- High risk countries: Bulgaria, Croatia, Malta and Romania.

Table C3. Chronology of mobility restriction and confinement measures

Country	Measure	Start date	Month
Czech Republic	Flight restrictions	5	March
Italy	Lockdown	9	March
Romania	Flight restrictions	9	March
Austria	Flight restrictions	10	March
Italy	Schools/Universities closure	10	March
Austria	International movement restrictions	11	March
Greece	Schools/Universities closure	11	March
Malta	International movement restrictions	11	March
Netherlands	Events stop	12	March
Netherlands	National movement restrictions	12	March
Romania	Schools/Universities closure	12	March
Slovakia	Events stop	12	March
Slovakia	Flight restrictions	12	March
Slovakia	Schools/Universities closure	12	March
Sweden	Events stop	12	March
Bulgaria	Events stop	13	March
Bulgaria	Schools/Universities closure	13	March
Bulgaria	Lockdown	13	March
Czech Republic	Events stop	13	March
Czech Republic	Schools/Universities closure	13	March
Denmark	International movement restrictions	13	March
Denmark	Schools/Universities closure	13	March
Denmark	Lockdown	13	March
France	Events stop	13	March
Ireland	Events stop	13	March
Ireland	Schools/Universities closure	13	March
Malta	Schools/Universities closure	13	March
Netherlands	Flight restrictions	13	March
Portugal	Events stop	13	March

[45] https://apps.who.int/iris/bitstream/handle/10665/272432/WHO-WHE-CPI-2018.16-eng.pdf?sequence=1

Portugal	Flight restrictions	13	March
Portugal	International movement restrictions	13	March
Portugal	National movement restrictions	13	March
Portugal	Non-essential shops closure	13	March
Portugal	Schools/Universities closure	13	March
Czech Republic	Non-essential shops closure	14	March
France	Non-essential shops closure	14	March
Romania	International movement restrictions	14	March
Spain	Events stop	14	March
Spain	Flight restrictions	14	March
Spain	International movement restrictions	14	March
Spain	National movement restrictions	14	March
Spain	Non-essential shops closure	14	March
Spain	Schools/Universities closure	14	March
Spain	Lockdown	14	March
Austria	Events stop	16	March
Austria	National movement restrictions	16	March
Austria	Schools/Universities closure	16	March
Austria	Lockdown	16	March
Austria	Non-essential shops closure	16	March
Czech Republic	International movement restrictions	16	March
Czech Republic	National movement restrictions	16	March
Czech Republic	Lockdown	16	March
Finland	Events stop	16	March
Finland	Flight restrictions	16	March
Finland	International movement restrictions	16	March
Finland	National movement restrictions	16	March
Finland	Schools/Universities closure	16	March
Finland	Lockdown	16	March
France	Schools/Universities closure	16	March
Hungary	Schools/Universities closure	16	March
Luxembourg	Schools/Universities closure	16	March
Ireland	National movement restrictions	16	March
Netherlands	Non-essential shops closure	16	March
Netherlands	Schools/Universities closure	16	March
Netherlands	Lockdown	16	March
Norway	Events stop	16	March
Norway	Flight restrictions	16	March
Norway	International movement restrictions	16	March
Norway	National movement restrictions	16	March
Norway	Non-essential shops closure	16	March
Norway	Schools/Universities closure	16	March
Slovakia	Non-essential shops closure	16	March
Slovakia	Lockdown	16	March
France	Flight restrictions	17	March
France	International movement restrictions	17	March
France	National movement restrictions	17	March
France	Lockdown	17	March
Germany	Schools/Universities closure	17	March
Germany	Lockdown	17	March
Italy	Events stop	17	March
Italy	Flight restrictions	17	March
Italy	International movement restrictions	17	March
Italy	National movement restrictions	17	March
Italy	Non-essential shops closure	17	March
Romania	Events stop	17	March
Romania	National movement restrictions	17	March
Romania	Non-essential shops closure	17	March
Slovakia	International movement restrictions	17	March
Slovakia	National movement restrictions	17	March
United Kingdom	International movement restrictions	17	March
Belgium	Events stop	18	March
Belgium	Flight restrictions	18	March
Belgium	International movement restrictions	18	March
Belgium	National movement restrictions	18	March
Belgium	Non-essential shops closure	18	March
Belgium	Schools/Universities closure	18	March
Belgium	Lockdown	18	March
Bulgaria	Flight restrictions	18	March
Bulgaria	International movement restrictions	18	March
Denmark	Events stop	18	March
Denmark	Non-essential shops closure	18	March
Germany	Flight restrictions	18	March
Germany	International movement restrictions	18	March
Greece	Events stop	18	March
Greece	Non-essential shops closure	18	March

Hungary	Events stop	18	March
Hungary	Flight restrictions	18	March
Hungary	Non-essential shops closure	18	March
Luxembourg	International movement restrictions	18	March
Malta	Non-essential shops closure	18	March
Malta	Non-essential shops closure	18	March
Sweden	Flight restrictions	18	March
Sweden	Schools/Universities closure	18	March
Denmark	Flight restrictions	19	March
Netherlands	International movement restrictions	19	March
Portugal	Lockdown	19	March
Sweden	International movement restrictions	19	March
Sweden	National movement restrictions	19	March
United Kingdom	Schools/Universities closure	19	March
Bulgaria	National movement restrictions	20	March
Bulgaria	Non-essential shops closure	20	March
Hungary	International movement restrictions	20	March
United Kingdom	Flight restrictions	20	March
Greece	National movement restrictions	22	March
Czech Republic	Ban on gatherings of more than 2 people	23	March
Denmark	Extension of lockdown until 13 April	23	March
France	Requiriment of self-completed declaration for being out	23	March
Germany	Events stop	23	March
Germany	National movement restrictions	23	March
Germany	Non-essential shops closure	23	March
Greece	Flight restrictions	23	March
Greece	International movement restrictions	23	March
Greece	Lockdown	23	March
Netherlands	Stricter social distancing rules	23	March
United Kingdom	National movement restrictions	24	March
United Kingdom	Non-essential shops closure	24	March
United Kingdom	Lockdown	24	March
Finland	Non-essential shops closure	25	March
Ireland	International movement restrictions	25	March
Ireland	Non-essential shops closure	25	March
Romania	Lockdown	25	March
Slovakia	Compulsory face masks	25	March
Spain	Extension of state of alarm	26	March
Austria	Government announced that pandemic was expected to peak between mid-April and mid-May	27	March
Belgium	Extension of resctrictive measures until 19 April	27	March
Finland	Restriction between Helsinki and the rest of the country	27	March
Hungary	National movement restrictions	27	March
Ireland	Lockdown	27	March
Greece	Suspension of all flights to and from Germany and Netherlands	28	March
Hungary	Lockdown	28	March
Netherlands	Extension of restrictive measures until 28 April	28	March
Spain	Interruption of non-essential activities	29	March
United Kingdom	Events stop	29	March
Austria	Announcement of compulsory face mask (effective 6 April)	30	March
Hungary	Indefinite state of alarm	30	March
Germany	Compulsory face masks in Jena	31	March
Greece	Night curfew in some municipalities	31	March
Bulgaria	Extension of state of emergency until 13 May	1	April
Italy	Extension of the period of lockdown until 13 April	1	April
Sweden	Cancelation of Almedalen Week	1	April
Portugal	Extension of state of emergency until 17 April	2	April
Spain	Biggest rise in history of unemployment	2	April
Sweden	Cancelation of Bicycle race Vatternrundan	2	April

Source: own work using https://Covid-statistics.jrc.ec.europa.eu/Measure/DashboardMeasures

Table C4. First stage regression for trust in healthcare system (HST), relative mortality and average case rate using as instruments the country classification according to Inform COVID-19 Risk Index

	RM_{2020} (Binary)	RM_{2020} (Continuous)	Case rate
Risk: high	7.7617***	0.4975**	10.1227**
	(1.3222)	(0.1222)	(4.1429)
Risk: moderate	4.8191***	0.3646***	9.446**
	(1.7806)	(0.1080)	(4.2981)
Risk: low	1.533***	0.0153**	3.9792**
	(0.2468)	(0.0066)	(1.5172)
N	27,997	27,997	27,997
r2	0.1102	0.1526	0.1612
F	7.771	8.2388	8.486
p	0.0000	0.0000	0.0000
Kleibergen-Paap rk LM statistic	10.923	11.564	9.109
F-test of excluded instruments	19.379	17.902	19.919
Partial R2	0.351	0.412	0.394
Cragg-Donald Wald statistic	21.791	20.212	20.999
Kleibergen–Paap rk Wald F statistic	17.771	19.904	20.005
Sargan Jansen J statistic	1.679	1.341	2.091

All regressions include the following explanatory variables: age, sex, nationality, region of residence, marital status, age when finished education, relation with economic activity, household characteristics (size and number of people younger than 10, between 10 and 15, aged 15 and older), difficulties for making ends meet, having internet and self-reported social class. Robust standard errors clustered at NUTS-2 level. Omitted risk category: very low risk countries.

- Very low risk countries: Denmark, Finland, Germany, Netherlands, Sweden and United Kingdom
- Low risk countries: Austria, Belgium, Estonia, France, Ireland, Lithuania, Poland, Portugal, Slovenia and Spain
- Moderate risk countries: Cyprus, Czech Republic, Greece, Hungary, Italy, Latvia, Luxembourg and Slovakia