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# Perceived Social Exclusion during the COVID-19 Pandemic: a European Perspective

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## Abstract

This paper aims to study the self-perceived social exclusion of EU citizens during the COVID-19 emergency, taking into account their socio-demographic characteristics and the specific contexts of their countries of residence. To this end, we draw on data from the third round of the *electronic Eurofund Living, working and COVID-19 survey*, conducted between February and March 2021, when countries were still grappling with various levels of lockdown and individuals had been living with COVID-19 restrictions for almost a year. We also rely on data from the *Oxford COVID-19 Government Response Tracker* (OxCGRT), which collected real-time information on government responses to COVID-19 in several countries during the pandemic crisis. We assume that during the pandemic, government accountability and responsiveness were important determinants of social inclusion and well-being. To test our hypothesis, we use multilevel logistic regression. Our dependent variable is a binary indicator of social exclusion. At the country level, we consider two different sets of explanatory variables concerning, respectively, subjective (i.e., citizens' perceptions) and objective (i.e., measures taken) aspects of governments' responses to COVID-19. Our results document a different gradient of social vulnerability across population groups. Our findings also indicate that social exclusion strongly depended on the country context, in addition to individual characteristics and circumstances. Collective perceptions of the efficiency of government responses and levels of trust in government had a positive association with the decrease in the feelings of social exclusion during the first year of the pandemic. Conversely, the objective measures implemented by national governments to mitigate socio-economic and health consequences were not associated with self-reported experiences of social exclusion.

**Keywords** COVID-19 · Social exclusion · Well-being · Europe · Public health · Institutional trust

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Extended author information available on the last page of the article

## 1 Introduction

Since its emergence in December 2019, COVID-19 has had far-reaching consequences for societies around the globe. It is unanimously recognized by scholars and policymakers that the effects of the COVID-19 pandemic go far beyond physical health, impacting individuals' and communities' everyday lives and well-being, including in the domains of education, employment, family life, and mental health. Moreover, COVID-19 had a disproportionate impact on vulnerable persons (e.g. Maestripieri, 2021). Even in countries with well-developed responses, the outbreak and its repercussions imperiled the basic well-being of social groups whose livelihoods are already precarious.

Although there is no universally agreed definition or benchmark for social exclusion, lack of participation in society (i.e., lack of participation in or exclusion from economic, political, cultural, civic and/or social life) is the focus of almost all definitions proposed by scholars, government agencies, non-governmental organizations, and others. Participation can be hampered when people lack access to material resources (e.g., income, employment) and essential services, such as education and health care, or when they cannot express their voices, interact with each other, and when their rights are not equally respected (see United Nations, 2016). EU policies have addressed social exclusion for a long time, with the Commission's 1992 Communication 'Towards a Europe of solidarity' (COM (92) 542) describing social exclusion as the result of "mechanisms whereby individuals and groups are excluded from taking part in the social exchanges, from the component practices and rights of social integration and of identity. Social exclusion goes beyond participation in working life; it is felt and shown in the fields of housing, education, health and access to services". During the COVID-19 pandemic, social distancing and lockdown measures posed new threats to social participation that added to the pre-existing social exclusion mechanisms.

Building on the assumption that COVID-19 did not affect everybody's lives in the same way and that the pandemic is socially patterned not just in terms of COVID-19 morbidity and mortality rates, but also in terms of the impact of the implemented restrictions and emergency lockdown measures (Bambra et al., 2020), the aim of this article is to study the self-perceived social exclusion of EU citizens, taking into account their socio-demographic characteristics and the different contexts of their country of residence. Our main objective is to evaluate how, during the pandemic, feelings of social exclusion were influenced by the extent of policy responses implemented by national governments, as well as by collective perceptions of their efficiency and fairness and general levels of trust in governments. By incorporating both objective and subjective dimensions, the analysis captures not only the formal actions taken by governments but also how these actions were experienced and interpreted by individuals. This dual approach is crucial because government responses, no matter how extensive, may not be effective in mitigating social exclusion if they are perceived as inadequate or unfair by the public.

We use multilevel logistic regression using as dependent variable a binary indicator of social exclusion, drawing on data from the third round of the *electronic Eurofund Living, working and COVID-19 survey* (2021) and on data from the *Oxford COVID-19 Government Response Tracker* (OxCGRT). We consider explanatory variable at the individual and country level. Our study shows that social vulnerability varied across groups and was shaped not only by individual factors but also by country context. While trust in government and

positive perceptions of its response reduced feelings of exclusion during the pandemic's first year, objective government measures had no clear impact on self-reported exclusion.

This paper is organized as follows. Section 2 provides the theoretical background, beginning with an overview of the evolution of the concept and meanings of social exclusion (2.1). We then examine social exclusion during the COVID-19 pandemic (2.2) and review evidence regarding institutional trust during this period (2.3), which leads to the formulation of our research hypotheses (2.4). Section 3 details the data sources utilized, specifically the Living, Working and COVID-19 online survey conducted by Eurofound (3.1) and the Oxford COVID-19 Government Response Tracker (3.2). Section 4 outlines the methods employed in our analysis. In Section 5, we present the main results of our research, followed by the conclusion in Section 6.

## 2 Background

### 2.1 Understanding social exclusion

The term social exclusion was introduced by Lenoir (1974), the former French Secretary of State for Social Action, to describe groups of individuals (“*Les exclus*”) who fell through the social safety net. The concept quickly spread to other countries and gained prominence as a new paradigm in European poverty studies during the 1990s.. Social exclusion became increasingly important on the political agenda, culminating in the European Union’s declaration of 2010 as the European Year for Combating Poverty and Social Exclusion.. While no universally accepted definition of social exclusion exists, a systematic literature review conducted by Morgan et al. (2007) identifies several key elements that most studies agree on: a lack of participation in different aspects of society; the multifaceted nature of exclusion; its dynamic nature (i.e. individual levels of participation can vary over time); and the multilevel causes (i.e. factors at the level of individual, household, community and institutional level).

As Boardman et al. (2022) observe, the term social exclusion “implies exclusion from ‘something’”; they settle on a broad definition as lack of participation in “key activities of society” (cf. Levitas, 2006; Silver, 1994). The scope of this definition depends in turn on how “key activities of society” are understood. A particular focus in policy literature has been on economic activity: employment, consumption, etc. Morgan et al. (2007) note that the concept of social exclusion is sometimes defined and used in ways that overlap (or are even nearly synonymous) with the concepts of poverty, precarity, and material deprivation (p. 479; cf. Littlewood & Herkommer, 1999). However, the utility of the concept of social exclusion is in its multidimensionality: poverty, precarity, and material deprivation are causally intertwined with social exclusion, but there are other causes and aspects of social exclusion as well (Levitas, 2000; Mela & Toldo, 2019). A relational and processual perspective is thus critical to understanding social exclusion (Silver, 2007; Bellani & Fusco, 2018). Social exclusion must furthermore be framed as an explicitly political and socio-legal process, and the conditions of social exclusion as artifacts of policy (Lyons & Huegler, 2013).

Given the policy relevance of the social exclusion concept, significant efforts have been dedicated to defining indicators on the national and EU levels (Levitas, 2006). Eurostat, for instance, has defined an indicator of “persons at risk of poverty or social exclusion” based

on the EU Survey of Income and Living Conditions (EU-SILC) (Eurostat, 2022). This indicator “corresponds to the sum of persons who are: at risk of poverty after social transfers, severely materially deprived or living in households with very low work intensity” (Eurostat, 2022). In order to be flagged as “at risk”, a data subject must fulfil two of three conditions: 1) equalised disposable income below the risk-of-poverty threshold in the country of residence; 2) experience seven out of 13 “deprivation items”, such as inability to pay rent or bills, keep one’s home adequately warm, cope with unexpected expenses, etc.; 3) live in a household in which adults (age 18–64) work 20% or less than their “total work potential” over the year preceding data collection.

Such indicators serve a critical policy purpose. However, indicators based solely on objective socioeconomic criteria can also obscure the multidimensional aspect of social exclusion, vis-à-vis material deprivation. It is important to distinguish between social *exclusion* and the *lack of social inclusion*. It is more precisely the latter that refers to a simple lack of participation in social activities; the former implies processes and structures that actively *exclude* individuals and groups from participation. It is thus impossible to define “social exclusion thresholds” based on objective socio-economic and socio-demographic data points alone (United Nations Department of Economic & Social Affairs, 2016). Accordingly, we have taken a different approach in this study: to define social exclusion based on the subjective sense of having been excluded.

Perceived social exclusion concerns individuals’ subjective experience of feeling excluded from society. Differently from objective indicators of exclusion, such as poverty or unemployment, perceived social exclusion is grounded on personal evaluations of one’s social standing, sense of belonging, and ability to engage in social and economic life. It is influenced by both individual and structural factors such as socioeconomic status (SES), societal injustice, and own perceptions of discrimination or marginalization (Böhnke, 2004; Bude & Lantermann, 2006). As it captures the sense of detachment, inferiority, and powerlessness that individuals may feel when they perceive themselves as unable to participate in societally valued activities or as lacking a meaningful role in society, it can have significant consequences for well-being, mental health, and social cohesion.

The literature on perceived social exclusion highlights both its predictors and its outcomes. The predictors of perceived social exclusion are socio-economic status (SES), precarious living conditions, structural factors, perceived injustice, lack of social support and integration (Böhnke, 2004). In particular, previous studies have shown that low income and unemployment, are very good predictors of perceived social exclusion at the individual level. Together with low SES, precarious living conditions such as lack of education and illness increase the risk of feeling excluded. Lack of family integration, social belonging, and solidarity are also key elements of perceived social exclusion (Marlier & Atkinson, 2010). Structural factors such as GDP and poverty rate may contribute to perceived social exclusion. However, their effect has been reported to be weaker compared to individual factors. Perceived social exclusion is also shaped by societal injustices, such as welfare cuts and economic inequality.

From a psychological and social point of view perceived social exclusion outcomes are: diminished well-being, depression, powerlessness, and alienation (Hommerich & Tiefenbach, 2018). From a behavioral perspective, perceived social exclusion may lead to dissenting attitudes toward social norms, leading to rule-breaking, aggression, or even socio-

psychological breakdown (Böhnke, 2004). At the societal level, perceived social exclusion may affect societal cohesion, reducing trust in institutions and increasing social conflict.

## 2.2 Social Exclusion and Policy during COVID-19

The COVID-19 pandemic, and the policy measures implemented to contain it, have had complex and multilayered impacts on health and living conditions. An evident trend is that effects were most severe on individuals and groups who already suffered from health and/or socioeconomic vulnerabilities. However, these effects vary nationally and regionally, and care must be taken when formulating cross-country hypotheses. This is also the case with social exclusion: findings and conclusions vary based on how social exclusion is defined, as well as on the scope of analysis and the data sources used.

Regarding the narrow definition of social exclusion as the risk of poverty or material deprivation, a majority of published analyses cited in a scoping review by Beese et al. (2022) associated the progression of the pandemic with worsening or, at best, maintaining area-based indicators of socioeconomic inequality. Mahler et al. (2022) estimated that the pandemic significantly increased economic inequality on a global level, while also moderately increasing inequality in many individual countries: “the world in 2020 witnessed the largest single-year increase in global inequality and poverty since 1990 [when the reference World Bank study began]” (pg. 3). They identified five potential mechanisms at work: the health impacts of the virus itself; the economic impacts of lockdowns and other regulations, which disproportionately affected low-skilled and low-income workers (cf. Bundervoet et al., 2022); the disparity between countries of funding available for economic relief measures; and indirect effects of overall economic dampening, such as reduced demand for exports, migrant remittances, and tourism (5). Shifting focus to Europe, impacts appeared to have been mixed (Clark et al., 2021; Almeida et al., 2021). Based on an analysis of economic forecasts, Almeida et al. (2021) predicted that on an EU level, the pandemic would lead to a more significant drop in income among the lowest deciles. In Sweden, Angelov and Waldenström (2023) determined through a comparative tax-return registers that COVID-19 did lead to a decrease in the earnings of low-income earners and the young, while barely affecting middle- and high-income earners. Likewise, Casquilho-Martins & Rocha (2022) found through secondary data and policy analysis that COVID-19 and the measures implemented to contain it placed Europe Strategy 2020 (ES2020) targets at risk, including social exclusion mitigation targets. Conversely, however, Clark et al. (2021) found a fall in absolute disposable income inequality in France, Germany, Italy, and Spain. These varying findings are in part an artifact of the discrepancies in the data sources used in the different studies.

There is also significant evidence that the pandemic worsened the exclusion of vulnerable individuals and groups from specific domains of social participation. Examples included increased loneliness and isolation among older people (Pentaris et al., 2020; Tsetoura, 2022), constrained youth participation in education (Tsolou et al., 2021), and exacerbated exclusion of migrants (Fouskas et al., 2022), Roma (Macías León & Del Pino-Brunet, 2023), and other minority groups from access to formal employment, education, housing, health care, etc. Such phenomena are inevitably linked to economic marginalisation: e.g., Petersen et al. (2022) found that persons at risk of poverty were more likely to suffer both reduced income and increased psychological and social risks. Schippers (2020) hypothesised that a “vicious cycle” of reciprocal economic, educational, and psychosocial harms could lead to

long-term, even intergenerational personal and social trauma. There is also evidence that the impacts of the pandemic worsened subjective dimensions of social exclusion. Lilly et al. (2024), for instance, explored this phenomenon using the concepts of individual relative deprivation (IRD) and group relative deprivation (GRD) – that is, the belief that one is deprived relative to other individuals, and that one's in-group is deprived relative to other groups. On a very general level, respondents surveyed under lockdown conditions tended to report higher levels of relative deprivation; however, significant variations in responses were found when disaggregating for IRD vs. GRD, ethnicity, gender, specific lockdown period, etc. As with findings on objective measures of social exclusion, this demonstrates the complexity of pandemic impacts and the difficulty of drawing conclusions that are valid beyond a small sample. A clear cross-cutting conclusion is that more consistent and robust cross-country data collection is needed.

### 2.3 Institutional Trust during COVID-19

Institutional trust can be defined as the degree to which citizens perceive that judicial, economic, and governmental bodies fulfil their role in a satisfactory way (Hudson, 2006). During periods of crises such as COVID-19 pandemic, the level of trust in the authorities is particularly relevant as citizens' compliance with the policies enacted by governments is required for these policies to succeed in shorter timeframes and without coercion. Therefore, institutional trust has had a pivotal role in preserving social stability during COVID-19: perceptions of governments as trustworthy supported citizen confidence in their decisions (Yuan et al., 2022).

Several studies conducted during the COVID-19 pandemic showed that the emergency led to an increase in citizens' trust in governments across European countries. For instance, the studies of Bol et al., (2020) in 15 European countries and of Esaiasson et al. (2021) in Sweden found both a rise in citizens' trust in governments. Schraff (2020), utilizing a longitudinal model, demonstrated that the heightened trust in government observed during the COVID-19 pandemic was a true rally effect, rather than simply a byproduct of the lockdown measures imposed by governments (Caplanova et al., 2021; Roccato et al., 2021).

Previous research has extensively examined the relationship between institutional trust and life satisfaction across various global regions finding a positive link between trust in public institutions and life satisfaction of individuals (e.g. Soukiazis and Ramos, 2016; Mironova, 2015; Macchia & Plagnol, 2019; Glatz & Eder, 2020; Shiroka-Pula et al., 2023).

On the other hand, individuals who feel not satisfied and perceive themselves as socially excluded, can report lower social and institutional trust (Putnam, 2002). Indeed, there is a strong link between trust in government and perceived social exclusion as they are both embedded in individuals' feeling of belonging and inclusion within society. Individuals who have strong trust in government and institutions, have in general lower levels of perceived social exclusion. This is linked to the stability and on the fairness of the government and its institutions. The more they work to reduce inequalities within the society, the less citizens feel excluded from it. The other way around is represented by those individuals that feel excluded because of being unemployed, discriminated against and not sufficiently protected by the government, through social security, anti-discrimination and egalitarian policies. Those individuals will feel also lower trust in institutions. More generally, the perception of being excluded may have a negative impact on social cohesion, because the individuals per-

ceiving themselves as excluded might be not able to be involved in socially valued activities and they might also face difficulties in establishing or maintaining connections with organizations and societal institutions (Huxhold et al., 2022). In a study conducted by Eurofound (2018), analysing the individual and macro-level variables effect on trust in institutions in the EU, the regression results clearly indicate that a lack of social cohesion is linked to low trust in institutions. Experiencing social exclusion and perceiving societal tension can lead to a decline in trust in institutions. Individuals who feel excluded from society are more likely to have reduced confidence in institutional structures.

## 2.4 Research Hypotheses

Based on this literature, we formulate the following research hypotheses:

While previous research has established that social exclusion disproportionately affects vulnerable groups, this study extends the literature by examining how the pandemic exacerbated existing exclusion mechanisms. By incorporating multiple socio-demographic factors, this analysis identifies specific vulnerabilities that heightened perceived exclusion during the crisis. Therefore, we hypothesize that:

- a. At individual level, social vulnerability played a significant role in shaping social exclusion during the pandemic.
- b. While prior studies have explored the role of government intervention in mitigating economic and health disparities, less attention has been given to its association with social exclusion. This study advances the literature by distinguishing between objective and subjective government responses and assessing their respective association with perceived social exclusion. Our hypotheses at the macro-level are therefore split in 2 sub-hypotheses taking into account both objective and subjective dimension. We believe that:
- c. Objective government responses are captured through two distinct indicators: **economic support measures** and **health surveillance measures**. We hypothesize that these indicators influenced perceived social exclusion, but in potentially different ways. Economic support measures are expected to reduce perceived exclusion by alleviating the economic burden of the pandemic. In contrast, health surveillance measures may have ambivalent effects (see also Johansson & Edwards, 2024), as they can simultaneously heighten feelings of isolation and reinforce a sense of safety and protection. Additionally, while research suggests that public trust in institutions shapes social cohesion, this study specifically examines whether positive perceptions of government accountability and fairness mitigated exclusion, independent of the actual policy measures implemented. Our hypothesis is that:
- d. Positive perceptions of government accountability have a positive association with the reduction of perceived social exclusion. To capture this dimension, we operationalize subjective government responses at the country level by aggregating individual evaluations. This approach allows us to measure the broader socio-political climate rather than treating these perceptions as purely individual-level covariates, and is consistent with the multilevel design of the study.

### 3 Data

#### 3.1 Living, Working and COVID-19 Survey

The *Living, working and COVID-19* online survey was carried out by Eurofound to collect real-time data regarding the impact on the lives of EU citizens of both the pandemic and policy responses intended to mitigate its effects. The survey was fielded online, among people aged 18 years and older, residing in EU member states, and with access to the internet. Respondents were reached through Eurofound stakeholders and social media advertising. The survey was launched in April 2020, when a large part of European society was shut down following the onset of the crisis, to gauge its immediate social and economic effects. It includes questions about respondents' employment situation, their work–life balance, and their use of telework during the COVID-19 crisis. It also examines quality of life and social conditions, with questions ranging from life satisfaction, happiness, and optimism to health and levels of trust in institutions.

To date, five different rounds of the survey have been completed; starting from Round 2, a panel component (in addition to the cross-sectional one) has been included. However, the panel component was not available at the time of this study. The fieldwork for each round took place at different stages of the pandemic, providing valuable insights. Round 1 was launched on 9 April 2020, when most Member States were in their first lockdown. Round 2 was launched in July 2020, when economies and societies were gradually reopening. Round 3 started in March 2021, as countries were still dealing with various levels of lockdown. Round 4 took place in October–November 2021, recontacting panel respondents only, to track developments since the start of the pandemic. Round 5 was carried out between 29 March and 2 May 2022, to look at how life changed in Europe after two years of pandemic. In parallel, a pilot survey was fielded in 10 neighbouring countries using an adapted questionnaire.

This study builds on Round 3 of the survey, with a sample size of 46,628 individuals (see Table 1), carried out between February and March 2021. The choice of the time reference is motivated by the fact that, at the time, European countries were still dealing with various levels of lockdown. In fact, by March 2021, most Europeans had experienced a full year of restrictions on economic activity, mobility and social interactions, and several countries had gone through a series of complete lockdowns. The initial responses of EU member states were similar, with national governments introducing strict measures immediately, followed by a divergence of measures that depended on health and economic data, but also political considerations. Overall, however, much of Europe was under comparatively strict lockdown in Spring 2021. Therefore, after nearly a year of living with COVID-19 restrictions, we believe that the data is the most suitable to shed the relationship between national responses to COVID-19 and people's well-being in Europe.

##### 3.1.1 Oxford COVID-19 Government Response Tracker

When COVID-19 emerged, systems to track national policy responses were not in place, although it quickly became clear that such data—along with epidemiological information—was essential in combating the pandemic. Since 2020, several separate trackers have been established to monitor public health and social measures, gathering information on the types

**Table 1** Sample distribution by country

Country	<i>N</i>	%
Austria	970	2.1
Belgium	1,792	3.8
Bulgaria	3,200	6.9
Croatia	1,438	3.1
Cyprus	683	1.5
Czechia	1,512	3.2
Denmark	1,282	2.8
Estonia	1,046	2.2
Finland	1,026	2.2
France	1,301	2.8
Germany	2,845	6.1
Greece	5,783	12.4
Hungary	3,299	7.1
Ireland	2,643	5.7
Italy	2,014	4.3
Latvia	1,217	2.6
Lithuania	1,942	4.2
Luxembourg	406	0.9
Malta	645	1.4
Netherlands	898	1.9
Poland	1,353	2.9
Portugal	2,147	4.6
Romania	2,103	4.5
Slovakia	1,645	3.5
Slovenia	1,034	2.2
Spain	1,516	3.3
Sweden	888	1.9
<b>Total</b>	<b>46,628</b>	<b>100.0</b>

Source: Authors' calculations on Eurofound *Living, working and COVID-19*—Round 3

of policies implemented to safeguard populations. Among these, the Oxford COVID-19 Government Response Tracker (OxCGRT, Hale et al., 2021) emerged as one of the most important data sources throughout the pandemic. OxCGRT recorded policy data for each day between 1 January 2020 and 31 December 2022 from 185 countries and 210 subnational jurisdictions (in Australia, Brazil, Canada, China, India, Italy, the United Kingdom, and the United States), making this information publicly and freely available online. The data was collected and updated in real time by a team of over 1500 volunteers. The project tracked governments' policies and interventions across a standardised series of indicators ranking government strictness across different domains using a categorical ordinal scale. The indicators are organized into the following five groups each with a specific focus:

- **Closure and containment indicators** measure restrictive policies such as limitations on gatherings, workplace closures, and travel controls.
- **Economic indicators** measure policies such as financial support and debt relief provided by the government.
- **Health indicators** measure health surveillance policies such as the presence of contact

tracing or mask requirement, and health information campaign mostly focused on measures aimed at limiting transmission (e.g., stay-at-home campaigns, guidance on protective equipment, hand hygiene, and social distancing awareness).

- **Vaccine indicators** measure policies such as which groups are prioritised groups to receive vaccines and any vaccine mandates.
- An additional indicator measures any **miscellaneous** policies that are identified which do not fit within the other four categories.

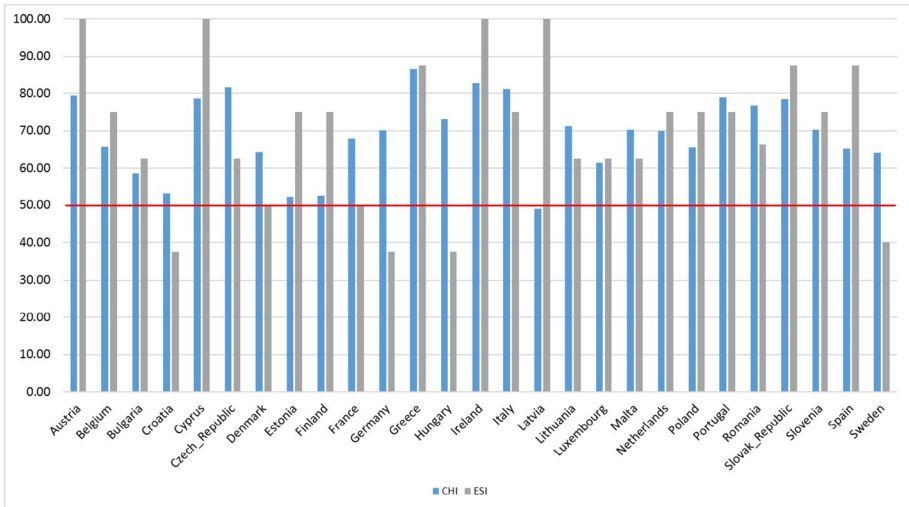
The primary purpose of the OxCGRT indices is to facilitate efficient and straightforward cross-national comparisons of government interventions. In total, the OxCGRT dataset contains more than 8 million data points. To synthesise this information, the OxCGRT project has developed and released the following composite indicators<sup>1</sup>: Government Response Index (GRI); Severity Index (SI); Containment and Health Index (CHI); Economic Support Index (ESI). The composite indicators have scores ranging from 0 to 100 and are calculated as the additive average of the respective policy response indicators (for more details, see Hale et al., 2023). However, the four composite indicators share many of the individual policy response indicators, and are, therefore, correlated.

For the purposes of this study, we focus on the CHI and ESI indicators, as they provide overall measures of the intensity and scope of closure and containment policies, and the extent of financial assistance to households, respectively. To ensure temporal homogeneity, we selected CHI and ESI values from 12 February to 31 March 2021—the period during which data from the third round of the Eurofound Living, Working, and COVID-19 survey were collected—and calculated the average values of these indicators for each country over this period (see Table 4 in the Appendix). During this time, nearly every country enacted relatively stringent policies, as reflected by the CHI index values; Latvia was the only country with a value below 50 (Fig. 1).

## 4 Methods

Self-perceived social exclusion is captured in the *Living, working and COVID-19* survey through the following question: *To what extent do you agree or disagree with the following statement? “I feel left out of society”*. Respondents could answer by choosing between one of the following options: *Strongly Agree—Agree—Neither agree nor disagree—Disagree—Strongly disagree*. Based on this information, we built a marker of social exclusion during the pandemic: the indicator is equal to 1 if the individual agreed or strongly agreed to feel left out of society and is equal to 0 in the remaining cases. The proportion of individuals reporting social exclusion varies across countries, ranging from a high of 33.2% in Cyprus to a low of 11.5% in Italy (Fig. 2). Indeed, it is well known that social exclusion depends strongly on the country context in addition to individual characteristics and circumstances (e.g., United Nations, 2016).

<sup>1</sup>As Haile et al. (2023) observe, government responses to COVID-19 were highly nuanced and heterogeneous, which presents significant challenges when attempting to compare national responses systematically. To address these challenges, composite indicators of policy response were developed. While this approach involves some loss of detail, composite indicators help mitigate the risk of over- or misinterpretation of any single measure. Furthermore, they enable the synthesis of large datasets and manage complexity effectively.



**Fig. 1** CHI and ESI OxCGRT indicators. Country averages between 12 February and 31 March 2021. Source: authors calculations on OxCGRT database. The highest value of the CHI index was recorded in Greece, followed by Ireland, Czech Republic and Italy which recorded values above 80. Economic support measures were considerably fewer in Sweden, Croatia, Germany and Hungary compared to other countries (ESI index below 50), while the highest number of economic interventions was recorded in Austria, Cyprus and Ireland (ESI=100), followed by Latvia, Greece, Slovak Republic and Spain (ESI above 80)



**Fig. 2** Share of individuals reporting to feel socially excluded by country (% values). Source: Authors' calculations on Eurofound *Living, working and COVID-19 survey* – Round 3

To examine the influence of various factors on social exclusion at both individual and country levels, we implemented a series of two-level logistic regression models, where the log-odds of perceived social exclusion for individual  $i$  in country  $j$  are modeled according to the following general specification:

$$\text{logit}(P_{ij}) = \log\left(\frac{P_{ij}}{1 - P_{ij}}\right) = \beta_{00} + \sum_{r=1}^p \beta_{r0} X_{rij} + \sum_{s=1}^q \beta_{0s} Z_{sj} + \delta_{ij} + \varepsilon_j \quad (1)$$

where:

- $i$  denotes individuals and  $j$  denotes countries;
- $P_{ij}$  is the probability that individual  $i$  in country  $j$  reports feeling socially excluded;
- $X_r$  and  $Z$  are explanatory variables at the individual and country level, respectively;
- $\beta_{00}$  is the intercept;
- $\beta_{r0}$  and  $\beta_{0s}$  are the fixed effects coefficients for individual- and country-level predictors;
- $\delta_{ij}$  is the level-1 residual (individual-level variation);
- $\varepsilon_j$  is the level-2 residual (country-level random effect).

More specifically, to assess the relative contribution of these predictors, we estimate six models. Model 1 serves as the baseline, including only the intercept and the random effect for countries, which allows us to quantify between-country variation. Model 2 introduces individual-level variables. Models 3 and 4 add country-level variables, with Model 3 including subjective country-level indicators and Model 4 focusing on objective indicators. Model 5 combines both sets of country-level variables, and Model 6 represents the full model, incorporating all individual- and country-level predictors simultaneously. This comprehensive model allows us to evaluate the combined effects of individual and country-level factors, while accounting for both individual variation and country-level random effects.

Building on existing research on the socio-demographic factors related to social exclusion (e.g. United Nations, 2016), we consider the following covariates at the individual level: gender (male, female),<sup>2</sup> age group (18–24, 35–49, 50–64, 65+), highest completed level of education (primary, secondary, tertiary), activity status (employed, self-employed, unemployed, retired, other), area of residence (village/village, city/periphery), cohabitation with spouse/partner (yes, no), making ends meet (with difficulties/easily), presence of children up to 17 in the household (yes, no), presence of disability or chronic illness (yes, no).

At the country level, we include two types of explanatory variables aimed at capturing government responsiveness from both objective and subjective perspectives. To assess the objective dimension of government intervention, we rely on the CHI and ESI indicators calculated by the OxCGRT project (as described in Section 3.2). These indicators measure inter-country variations in the mean number of policy interventions put in place by national governments to counter the health (CHI) and economic (ESI) consequences of the pandemic in the considered period. On the other hand, information from the Eurofound's *Living, working and COVID-19* survey is used to assess citizens' perceptions of the efficiency and fairness of national policies, as well as the general level of trust in government. While levels of trust in government (T) are captured directly in the survey questionnaire, we combine

<sup>2</sup>In the original data, the gender variable has three modes: male, female, other. However, due to the limited number of 'other' answers, we decided to limit our analysis to those who answered 'male' or 'female'.

**Table 2** Country-level subjective indicators

Variable	Label	Value	Indicator
C007_03	Trust in your country's government	Scale of 1–10 how much you personally trust the institution	Trust (T)
D234_01	The rules for obtaining support are clear and transparent	1 = Strongly agree; 2 = Agree; 3 = Neither agree nor disagree; 4 = Disagree; 5 = Strongly disagree	Efficiency (E)
D234_02	Obtaining support from public services is easy and efficient	1 = Strongly agree; 2 = Agree; 3 = Neither agree nor disagree; 4 = Disagree; 5 = Strongly disagree	

Source: Living, working and COVID-19 survey – Round 3

different information asked in the questionnaire to build a composite indicator of the collective perceptions of the efficiency (E) of support measures (see Table 2). The indicator is calculated as the country-mean of the scores assigned to the selected questionnaire items (see also Aassve et al., 2013). The indicators are then normalized to use the same scale (0–100) adopted by the OxCGRT database.

Sensitivity analyses were conducted in two main directions. First, building on previous studies using OxCGRT data that highlighted the complex and sometimes conflicting effects of health and containment policies (e.g., Toffolutti et al., 2022, on mental health, and Plach et al., 2024, on fertility dynamics), we replaced the CHI index—which includes policies related to disease surveillance—with the Stringency Index. The Stringency Index captures only closure and containment measures at the country level. Second, we employed the original five-category response variable ("To what extent do you agree or disagree with the following statement: 'I feel left out of society?'"), with response options ranging from Strongly Agree to Strongly Disagree, and conducted OLS regressions. In both cases, the results (presented in Tables 8, 9, 10, 11 and 12 in the Appendix) were consistent with those from our original analysis.

## 5 Results

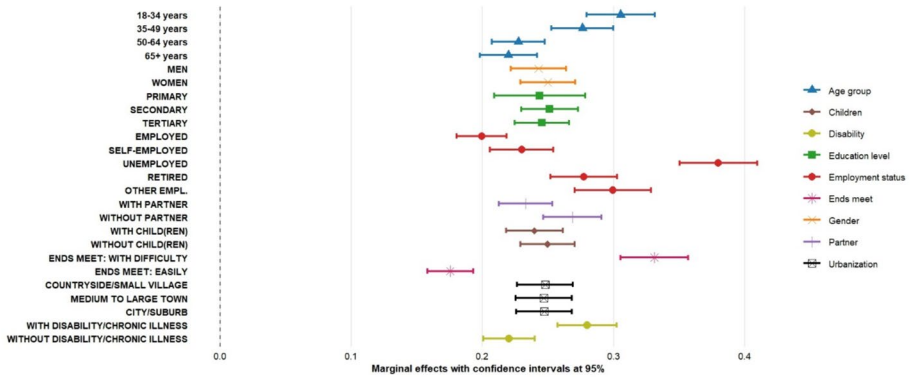
As discussed in Section 4, we estimate six models. The sample distributions of the individual variables used in the multivariate analysis are provided in Table 5 in the Appendix. Model 1 serves as the null model and is used to calculate the Intra-Class Correlation (ICC), which quantifies the variation in the outcome between level-2 units. The ICC estimates, presented in Table 3, reveal significant variability between countries, accounting for 4.3% of the total variability.

Model 2 adds individual-level variables to assess their relationship with social exclusion. Models 3 and 4 introduce country-level variables: Model 3 uses subjective country-level variables (derived from the Eurofound *Living, Working, and COVID-19* survey), while Model 4 includes objective country-level variables (derived from the OxCGRT). Model 5 combines both sets of country-level variables, and Model 6 represents the full model, encompassing both individual and country-level predictors. The marginal effects

**Table 3** Covariance parameter estimates

	Estimate	SE	Pr>Z	ICC %
Intercept	0.148	0.041	0.000	4.296

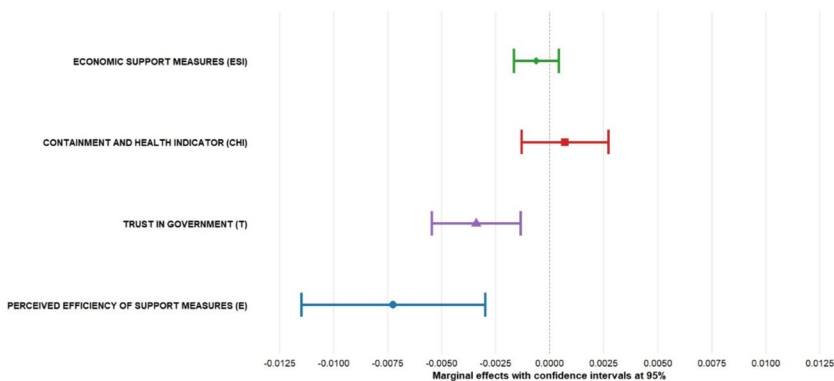
Source: authors calculations on *Living, working and COVID-19* survey – Round 3 and OxCGRT database



**Fig. 3** Predictive margins of feeling left out of society according to individual-level variables. Source: authors calculations on *Living, working and COVID-19* survey – Round 3 and OxCGRT database. Sample size: 46,628 individuals. Note: perceived efficiency of support measures, trust in government, Containment and Health Index (CHI), and Economic Support Index (ESI)

from Model 6 are presented in Figs. 3 and 4, illustrating the relationship between perceived social exclusion and both individual- and country-level variables. Results from the remaining models are presented in Tables 6 and 7 in the Appendix.

Turning to the individual variables presented in Fig. 3, we found that gender was not significantly related to the probability of social exclusion during the pandemic. Specifically, the marginal effect for men was 0.2428 (Standard Error, SE: 0.0107), while for women it was 0.2498 (SE: 0.0106), indicating no substantial difference. Similarly, no significant associations were found for educational attainment, urbanization, or the presence of children under 18 in the household. Predicted probabilities for different levels of education—primary (0.2435, SE: 0.0177), secondary (0.2512, SE: 0.0110), and tertiary (0.2452, SE: 0.0106)— were closely aligned. Marginal effects were also similar across urbanization



**Fig. 4** Predictive margins of feeling left out of society according to country-level variables. Source: authors calculations on *Living, working and COVID-19* survey – Round 3 and OxCGRT database. Sample size: 46,628 individuals. Note: The model controls for the following individual-level variables: gender, age group, educational attainment, employment status, presence of partner/spouse, presence of child(ren), ability to make ends meet, degree of urbanization of the place of residence, presence of disability/ chronic illness

levels: countryside/small village (0.2478, SE: 0.0108), medium to large towns (0.2468, SE: 0.0110), and cities/suburbs (0.2471, SE: 0.0108). Respondents with children (0.2397, SE: 0.0110) and without children (0.2496, SE: 0.0106) also reported comparable probabilities of social exclusion.

Age, however, showed a significant relationship with social exclusion. Individuals in the 18–34 age group exhibited the highest probability of being socially excluded compared to other age groups, with a coefficient of 0.3053 (SE: 0.0133). The probability of exclusion decreased progressively with age, with individuals aged 65 and above showing the lowest marginal effect (coefficient=0.2198, SE: 0.0111). This finding aligns with prior studies, which highlight the disproportionate impact of the pandemic on European youth, who faced challenges such as transitioning to distance learning, difficulties entering or remaining in the labor market, and heightened feelings of loneliness and isolation due to lockdowns (e.g., Bundervoet et al., 2022; Tsolou et al., 2021).

In terms of employment status, individuals who are unemployed (coefficient=0.3798, SE: 0.0152) exhibited the highest marginal effect, indicating a strong association with social exclusion. This stands in stark contrast to employed individuals (coefficient=0.1995, SE: 0.0097), who displayed a significantly lower likelihood of exclusion. Self-employed individuals (coefficient=0.2299, SE: 0.0123) also showed a substantial marginal effect, although their larger standard error suggests greater uncertainty around this estimate. These findings emphasize that the pandemic strongly affected certain categories of workers (Bundervoet et al., 2022), with unemployment being a significant driver of exclusion.

Cohabiting with a spouse or partner was another protective factor against social exclusion. The results indicate that individuals without a partner (coefficient=0.2686, SE: 0.0113) had a higher probability of social exclusion than those with a partner (coefficient=0.2329, SE: 0.0103). Previous research has highlighted the increased loneliness and isolation experienced during the pandemic, particularly among older individuals living alone (Pentaris et al., 2020; Tsetoura, 2022).

The financial strain captured by the "Ends meet" variable revealed a strong relationship with social exclusion. Those who reported difficulty meeting their financial needs (coefficient=0.3310, SE: 0.0131) had a significantly higher likelihood of exclusion compared to those who found it easy to make ends meet (coefficient=0.1754, SE: 0.0089). This finding is consistent with previous studies, such as Angelov and Waldenström (2023), which showed that low-income earners were severely impacted by the pandemic. However, the results from this variable should be interpreted with caution, as the relationship between government interventions and social exclusion might be partially mediated by individuals' financial situations. Specifically, government measures may alleviate financial strain, which, in turn, could reduce the likelihood of exclusion. Therefore, it is important to consider this variable as a potential mediator when examining the association of government responses with social exclusion.<sup>3</sup>

Finally, individuals with a disability or chronic illness had a higher likelihood of experiencing social exclusion. The presence of a disability or chronic disease is a significant factor, with those reporting such conditions (coefficient=0.2798, SE: 0.0115) having a higher

<sup>3</sup>To further examine the role of this variable as a potential mediator in the relationship between government responses and social exclusion, we conducted an additional sensitivity analysis (not presented in the Appendix but available upon request). Specifically, we re-estimated the full model—combining individual- and country-level variables—while excluding the “end meet” variables. T

likelihood of exclusion compared to those without (coefficient=0.2202, SE: 0.01). This finding aligns with previous research highlighting the added challenges faced by individuals with health conditions during the pandemic (e.g., Nandi et al., 2020).

The results for country-level predictors, presented in Fig. 4, show that subjective variables—specifically, the perceived efficiency of support measures (coefficient=-0.0072, SE=0.0022) and trust in government (coefficient=-0.0034, SE=0.0011)—had small but statistically significant effects on perceived social exclusion. This suggests that higher levels of perceived government efficiency and trust were associated with a lower likelihood of exclusion. In contrast, objective indicators of government action—represented by the CHI and ESI indices—had negligible effects (coefficient for CHI=0.0007, SE=0.0010; coefficient for ESI=-0.0006, SE=0.0005), showing no meaningful association with exclusion. These findings imply that individuals' experiences of exclusion were more influenced by how government actions were perceived, rather than the formal policies themselves.

Overall, the results emphasize that both individual-level vulnerabilities—such as employment status, financial insecurity, health conditions, and social isolation—and perceptions of institutional responsiveness at the country level, reflected in trust in government and the perceived effectiveness of support measures, were important in shaping the diverse experiences of social exclusion during the pandemic.

## 6 Discussion and Conclusions

This article examines social exclusion across 20 European countries during the COVID-19 pandemic, particularly focusing on the lockdown periods. Acknowledging the multidimensional nature of social exclusion and the challenges of capturing its full scope, we opted for a subjective measure—specifically, individuals' feelings of being excluded from society—rather than an objective one. In accordance with intersectionality theory, at the individual level, we consider a number of individual characteristics that can affect vulnerability. We also take into consideration the different national contexts. To this end, we relied on two different sets of indicators: the first, based on the OxCGRT database, captured the objective dimension of government interventions (i.e., economic and closure/confinement measures), while the second relied on microdata from the Eurofound's Living, Working and COVID-19 survey to gauge collective perceptions of government efficiency and reliability.

Overall, our results corroborate our first hypothesis (i), highlighting the role played at individual level by social vulnerability in shaping the pandemic outcomes in terms of social exclusion. More specifically, our findings indicate that individuals with fewer economic resources, as well as the unemployed and self-employed—whose jobs were less secure—reported heightened feelings of social exclusion during the pandemic. These findings are not surprising, as studies realized before the pandemic, have already highlighted that socio-economic status and precarious living conditions are good predictors of perceived social exclusion. However, while considering also age, our results show that younger generations, who typically have fewer resources and more unstable jobs compared to the older ones, experienced higher levels of social exclusion during the pandemic. Compared to the findings of studies realized before the pandemic, our results show the pandemic severely affected European youth. Young people faced multiple challenges such as the transition to distance learning, difficulties entering or remaining in the labor market, heightened feelings

of isolation and mental health strain due to lockdown measures (e.g., Bundervoet et al., 2022; Toffolutti et al., 2022; Tsolou et al., 2021).

Consistently with studies considering the pre-pandemic period, our results show that cohabiting with a spouse or partner was a protective factor against perceived social exclusion (Marlier & Atkinson, 2010). Several studies that considered the pandemic period, have indeed stressed that isolation and loneliness have increased during this period (Pentaris et al., 2020; Tsetoura, 2022). The pandemic has also worsened the feeling of loneliness and isolation of the population, while we could not verify. Prior disabilities or chronic illnesses also intensified feelings of exclusion. As noted by Mladenov and Brennan (2021), responses to COVID-19 tended to be disability-exclusive rather than inclusive, leading to significant injustices, including inaccessibility to public information and communication, reductions in community support (such as personal assistance), increased institutionalization, and discrimination in healthcare.

At the national level, contrary to our hypothesis (ii.a) the “objective” measures implemented by national governments to mitigate socio-economic and health consequences—such as economic aid and closure measures—were not significantly associated with self-reported experiences of social exclusion. This null finding may be due, in part, to limited number of countries used in the analysis, to the use of only one wave of the survey. Another explanation may be that a disconnection between policy implementation and individual lived experiences, especially during a crisis, individuals may not perceive policy uniformly.

In contrast, the hypothesis on subjective dimensions of government accountability (ii.b), was confirmed by our analysis that revealed that collective perceptions of government response efficiency and levels of trust in government were associated with feelings of social exclusion during the first year of the pandemic, although the magnitude of this effect was relatively small. These findings resonate with existing research that highlighted the importance of how the government actions are perceived by citizens (Böhnke, 2004), especially in a period of crisis and isolation like the one lived during the pandemic, they can foster a sense of belonging and inclusion.

There are some limitations to the study, which must be recognized. First, this study is based on a cross-sectional survey. The absence of longitudinal data implies that we cannot assess variations in self-reported social exclusion before and during the pandemic. Moreover, we cannot exclude reverse causality between the variables studied, given the cross-sectional structure of the data. Thus, no causal effects can be inferred from the methods used. Finally, qualitative data could enrich our understanding of how pre-existing vulnerabilities shaped social exclusion outcomes across different national contexts. Nonetheless, this study sheds light on the complex interplay between socio-demographic factors and national contexts in shaping self-perceived social exclusion among EU citizens during the COVID-19 pandemic.

An innovative aspect of this study is its emphasis on the critical role of government accountability and responsiveness in shaping citizens' perceptions of their social inclusion. These insights underscore the importance of tailored policy interventions that consider both individual characteristics and broader socio-political contexts, particularly in times of crisis, and can therefore contribute to social studies of vulnerability and disaster risk management (see Fallah-Aliabadi et al., 2022). By addressing the multifaceted nature of social exclusion, policymakers can better support vulnerable populations and foster a more inclusive society moving forward.

## Appendix

**Table 4** CHI and ESI OxCGRT indicators. Estimates between 12 February and 31 March 2021

	CHI					ESI				
	Mean	Min	Max	$\sigma$	CV (%)	Mean	Min	Max	$\sigma$	CV (%)
Austria	79.40	78.10	82.26	1.12	1.40	99.73	0.00	100.00	5.23	5.24
Belgium	65.66	65.36	70.12	1.15	1.75	75.00	75.00	75.00	0.00	0.00
Bulgaria	58.44	56.07	61.31	1.81	3.10	72.77	62.50	87.50	12.30	16.90
Croatia	53.16	52.86	53.33	0.22	0.42	45.92	37.50	62.50	11.82	25.73
Cyprus	78.57	74.52	82.86	3.54	4.50	100.00	100.00	100.00	0.00	0.00
Czech Republic	81.75	81.07	82.86	0.52	0.64	69.28	37.50	100.00	19.46	28.09
Denmark	64.28	63.81	66.19	0.90	1.40	32.88	0.00	100.00	24.19	73.58
Estonia	52.27	39.73	66.12	9.29	17.78	31.99	0.00	100.00	36.76	114.91
Finland	52.65	51.37	53.69	1.01	1.91	75.00	75.00	75.00	0.00	0.00
France	67.89	64.70	71.25	2.98	4.38	41.64	25.00	50.00	11.79	28.32
Germany	70.05	68.57	71.55	1.27	1.81	37.50	37.50	37.50	0.00	0.00
Greece	86.58	79.29	90.00	3.80	4.39	87.50	87.50	87.50	0.00	0.00
Hungary	73.04	69.76	76.31	3.28	4.48	39.35	25.00	87.50	17.31	43.99
Ireland	82.84	81.43	83.81	0.91	1.10	100.00	100.00	100.00	0.00	0.00
Italy	81.04	78.15	81.73	0.94	1.16	75.00	75.00	75.00	0.00	0.00
Latvia	48.99	47.86	49.29	0.58	1.19	54.18	0.00	100.00	40.98	75.64
Lithuania	71.16	70.12	73.69	1.02	1.43	77.98	50.00	100.00	20.06	25.73
Luxembourg	61.40	57.86	62.62	1.26	2.04	43.18	12.50	62.50	21.67	50.17
Malta	70.26	64.40	78.69	6.75	9.61	62.50	62.50	62.50	0.00	0.00
Netherlands	69.90	69.17	71.55	1.00	1.44	63.70	50.00	75.00	12.44	19.53
Poland	65.42	62.38	68.93	2.58	3.94	85.62	75.00	100.00	12.36	14.43
Portugal	78.94	73.33	85.24	4.18	5.29	75.00	75.00	75.00	0.00	0.00
Romania	76.80	73.93	77.50	0.94	1.23	72.91	62.50	87.50	12.32	16.90
Slovak Rep	78.53	77.80	81.01	1.00	1.27	94.11	87.50	100.00	6.24	6.63
Slovenia	70.25	66.19	72.14	2.35	3.34	67.81	37.50	75.00	12.33	18.18
Spain	65.11	63.57	66.55	0.76	1.17	87.50	87.50	87.50	0.00	0.00
Sweden	64.08	63.16	64.42	0.48	0.75	41.13	25.00	62.50	13.99	34.01

Source: Authors' calculations on OxCGRT database

$\sigma$  Standard deviation; *CV* Coefficient of variation

**Table 5** Characteristics of the sample

Variable	<i>N</i>	%
Gender		
Men	248	0.53
Women	17,172	36.83
Age group		
18–34	29,208	62.64
35–49	6,288	13.49
50–64	11,622	24.92
65+	19,279	41.35
Education		
Primary	9,439	20.24
Secondary	2,564	5.50
Tertiary	788	1.69
Activity status		
Employed	14,100	30.24
Self-employed	29,176	62.57
Unemployed	1,720	3.69
Retired	22,648	48.57
Other	3,903	8.37
Living with partner		
Yes	4,354	9.34
No	11,044	23.69
Living with child(ren)		
Yes	2,959	6.35
No	28,323	60.74
Ends meet		
With difficulty	18,305	39.26
Easily	10,939	23.46
Place of residence		
Countryside/Small village	35,689	76.54
Medium to large town	799	1.71
City/Suburb	20,876	44.77
Chronic illness/disability		
Yes	24,953	53.52
No	175	0.38
	16,210	34.76
	12,366	26.52
	17,877	38.34
	21,280	45.64
	25,348	54.36

Source: authors calculations on *Living, working and COVID-19 survey* – Round 3

**Table 6** Fit statistics for conditional distribution

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
-2 Log Likelihood	51937,43	42265,25	51938,24	51937,44	51938,32	42265,98
Pearson Chi-Square	46526,25	41135,5	46528,4	46525,95	46528,62	41132,18
Pearson Chi-Square/DF	1	0,99	1	1	1	0,99

Source: authors calculations on *Living, working and COVID-19 survey* – Round 3 and OxCGRT database

**Table 7** Tests of fixed effects

	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	Estimate -1.518 <i>-0.101</i> Pr> t  <0001	Estimate 2.660 <i>0.975</i> Pr> t  0.0115	Estimate -1.402 <i>0.534</i> Pr> t  0.0148	Estimate 2.885 <i>1.087</i> Pr> t  0.0142	Estimate 2.507 <i>1.223</i> Pr> t  0.0520
Gender (ref. Women)					
Men	-0.042 <i>0.026</i> 0.1012	-	-	-	-0.042 <i>0.026</i> 0.1029
Age group (ref. 65+)					
18–24 years	0.500 <i>0.057</i> <0001	-	-	-	0.499 <i>0.057</i> <0001
35–49 years	0.339 <i>0.053</i> <0001	-	-	-	0.340 <i>0.053</i> <0001
50–64 years	0.048 <i>0.044</i> 0.2709	-	-	-	0.044 <i>0.044</i> 0.2581
Education					
Primary	-0.014 <i>0.090</i> 0.8790	-	-	-	-0.013 <i>0.090</i> 0.8890
Secondary	0.036 <i>0.027</i> 0.1729	-	-	-	0.035 <i>0.027</i> 0.1880
Employment status (ref. Employed)					
Self-employed	0.195 <i>0.046</i> <0001	-	-	-	0.194 <i>0.046</i> <0001
Unemployed	0.977 <i>0.040</i> <0001	-	-	-	0.977 <i>0.040</i> <0001
Retired	0.466 <i>0.044</i> <0001	-	-	-	0.466 <i>0.044</i> <0001
Other	0.583 <i>0.049</i> <0001	-	-	-	0.586 <i>0.049</i> <0001



Tables 8 and 9 Sensitivity Analysis using Stringency index instead of CHI as county-level objective variable

**Table 8** Fit statistics for conditional distribution

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
-2 Log Likelihood	51937,43	42265,25	51938,24	51937,44	51938,3	42265,93
Pearson Chi-Square	46526,25	41135,5	46528,4	46525,64	46528,38	41132,67
Pearson Chi-Square/DF	1	0,99	1	1	1	0,99

Source: authors calculations on *Living, working and COVID-19* survey – Round 3 and OxCGRT database





Tables 10, 11 and 12 Sensitivity Analysis: OLS Regression with 5-Category Social Exclusion Response Variable

**Table 10** Covariance parameter estimates and intra-class correlation (ICC)

	Subject	Stima	SE	Z value	Pr>Z	ICC %
Intercept	Country	0,06445	0,0178	3,62	0,0001	4,30
Residual		1,4356	0,009439	152,09	<.0001	

Source: authors calculations on Living, working and COVID-19 survey – Round 3 and OxCGRT database

**Table 11** Fit statistics for conditional distribution

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
-2 Log Likelihood	148,078.1	126,839.5	148,078.7	148,078.1	148,078.8	126,840
Pearson Chi-Square	66,415.08	51,593.57	66,415.9	66,415.09	66,416.02	51,594.24
Pearson Chi-Square/DF	1.43	1.24	1.43	1.43	1.43	1.24

Source: authors calculations on Living, working and COVID-19 survey – Round 3 and OxCGRT database

**Table 12** Tests of fixed effects

	Model 2		Model 3		Model 4		Model 5		Model6	
	Estimate	Pr> t	Estimate	Pr> t	Estimate	Pr> t	Estimate	Pr> t	Estimate	Pr> t
Intercept	3.710 <i>0.054</i>	<.0001	0.940	0.1258	3.714	<.0001	0.823	0.2204	1.045 <i>0.673</i>	0.1337
Gender (ref. Men)										
Women	0.017 <i>0.012</i>	0.1437	–	–	–	–	–	–	0.017 <i>0.012</i>	0.1450
Age group (ref. 65+)										
18–24 years	-0.282 <i>0.026</i>	<.0001	–	–	–	–	–	–	– <i>0.281</i>	<.0001
35–49 years	-0.199 <i>0.024</i>	<.0001	–	–	–	–	–	–	– <i>0.200</i>	<.0001
50–64 years	-0.028 <i>0.021</i>	0.1723	–	–	–	–	–	–	– <i>0.028</i>	0.1650
Education (ref. tertiary)										
Primary	-0.071 <i>0.043</i>	0.1002	–	–	–	–	–	–	– <i>0.072</i>	0.0948
Secondary	-0.055 <i>0.013</i>	<.0001	–	–	–	–	–	–	– <i>0.055</i>	<.0001
Employment status (ref. employed)										
Self-employed	-0.050 <i>0.020</i>	0,0140	–	–	–	–	–	–	– <i>0.050</i>	<.0001
Unemployed	-0.549 <i>0.020</i>	<.0001	–	–	–	–	–	–	– <i>0.549</i>	<.0001
Retired	-0.216 <i>0.021</i>	<.0001	–	–	–	–	–	–	– <i>0.216</i>	<.0001
Other	-0.289 <i>0.024</i>	<.0001	–	–	–	–	–	–	– <i>0.290</i>	<.0001
	Model 2		Model 3		Model 4		Model 5		Model6	
	Estimate	Pr> t	Estimate	Pr> t	Estimate	Pr> t	Estimate	Pr> t	Estimate	Pr> t
Presence of partner/spouse (ref. without)										
With partner/spouse	0.134 <i>0.012</i>	<.0001	–	–	–	–	–	–	0.134 <i>0.012</i>	<.0001
Presence of children (ref. without)										
With children	0.044 <i>0.015</i>	0.0029	–	–	–	–	–	–	0.044 <i>0.015</i>	0.0026
Ends meet (rif. Easily)										

**Table 12** (continued)

	Model 2		Model 3		Model 4		Model 5		Model 6	
	Estimate	Pr> t	Estimate	Pr> t	Estimate	Pr> t	Estimate	Pr> t	Estimate	Pr> t
Ends meet: with Diffi- culty	-0.569	<.0001	-	-	-	-	-	-	-	<.0001
	<i>0.012</i>								<i>0.012</i>	
Urbanization (ref. city/suburbs)										
Coun- tryside/ small village	-0.025	0.0609	-	-	-	-	-	-	-	0.0554
	<i>0.013</i>								<i>0.013</i>	
Medium to large town	-0.018	0.1984	-	-	-	-	-	-	-	0.1948
	<i>0.014</i>								<i>0.014</i>	
Presence of disability (ref. without)										
With	-0.206	<.0001	-	-	-	-	-	-	-	<.0001
	<i>0.011</i>								<i>0.011</i>	
Per- ceived effi- ciency	-	-	0.025	0.0005	-	-	0.026	0.0003	0.029	<.0001
			<i>0.007</i>				<i>0.007</i>		<i>0.007</i>	
Trust in govern- ment	-	-	0.020	<.0001	-	-	0.020	<.0001	0.015	<.0001
			<i>0.003</i>				<i>0.003</i>		<i>0.003</i>	
CHI	-	-	-	-	-0.005	0.3118	-0.001	0.6753	-	0.4709
					<i>0.005</i>		<i>0.003</i>		<i>0.003</i>	
ESI	-	-	-	-	0.002	0.5277	0.002	0.1549	0.003	0.1237
					<i>0.003</i>		<i>0.002</i>		<i>0.002</i>	

Source: authors calculations on Living, working and COVID-19 survey – Round 3 and OxCGRT database  
Standard errors in italics

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**Data Availability** The datasets analysed during the current study are available upon request to be addressed to Eurofound: <https://www.eurofound.europa.eu/en/surveys/living-and-working-eu-e-survey>  
The statistical analyses were performed using SAS 9.4. Code files are available upon request to the authors.

**Declarations**

**Competing interests** The authors have no relevant financial or non-financial interests to disclose.

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