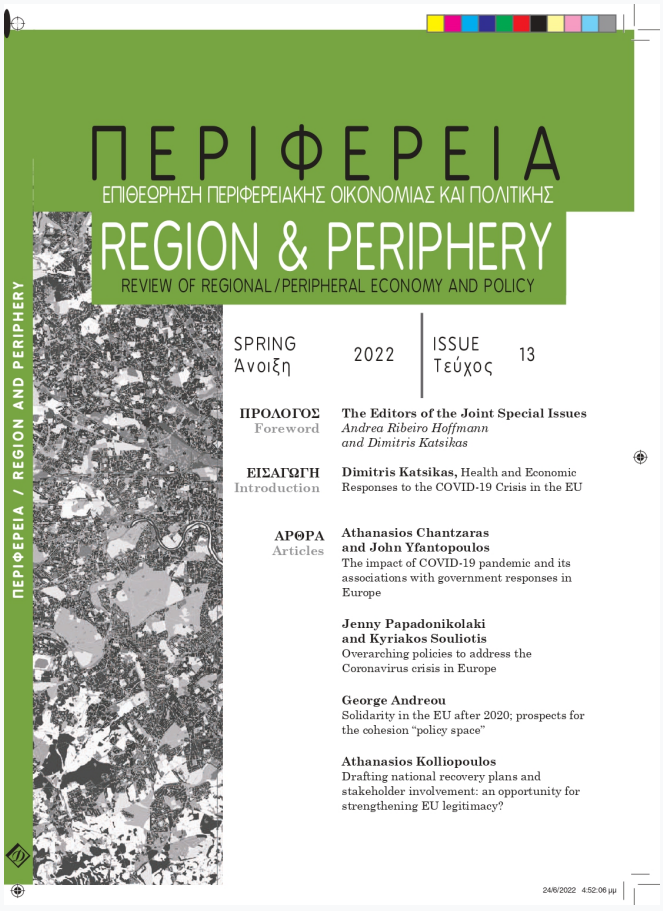
Περιφέρεια

Τόμ. 13, Αρ. 13 (2022)

Περιφέρεια | Region & Periphery - Regional Health and Economic Responses to the COVID Crisis in the EU and Latin America



Οι επιπτώσεις της πανδημίας COVID-19 σε σχέση με τις κυβερνητικές πολιτικές στην Ευρώπη

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doi: 10.12681/rp.30758

Βιβλιογραφική αναφορά:

Χαντζάρας Α., & Υφαντόπουλος Ι. (2022). Οι επιπτώσεις της πανδημίας COVID-19 σε σχέση με τις κυβερνητικές πολιτικές στην Ευρώπη. *Περιφέρεια*, *13*(13), 23–40. https://doi.org/10.12681/rp.30758

Περιφέρεια Τεύχος 2022 (13), 23-40
Region & Periphery Issue 2022 (13), 23-40

The impact of COVID-19 pandemic and its associations with government responses in Europe

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Abstract

Although stringent containment strategies are generally effective in slowing COVID-19transmission, they also entail severe socioeconomic implications. This study uses aggregated data from Eurostat and the Oxford COVID-19 Government Response Tracker (OxCGRT) to quantify changes in GDP and their association with the stringency index.We examine the evolution of Covid-19 cases and deaths per 100.000 thousand inhabitants in Europe and discuss the impact on the economy. On average,EU member states witnessed a 11.4% reduction in their GDP, due to the COVID-19 crisis. The impact on the southern member stateswas even greater. We use OxCGRT methodology to rank the European countries on their performance against COVID-19 on the base of four aggregate indices referring to: i) the overall government response, ii) containment and health measures, iii) the stringency index and iv) economic support measures. It is shown that the southern European states and Ireland, top the rankings in terms of the stringency of the implement strategies to contain the pandemic.

KEY-WORDS: Pandemic, COVID-19, OxCGRT methodology, economic impact, response measures, Europe, South Europe.

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Περίληψη

Αν και οι στρατηγικές περιορισμού της πανδημίας είναι γενικά αποτελεσματικές στην επιβράδυνση της μετάδοσης του COVID-19, συνεπάγονται επίσης σοβαρές κοινωνικοοικονομικές επιπτώσεις. Η μελέτη αυτή χρησιμοποίησε μακροοικονομικά στατιστικά στοιχεία από την Ευρωπαϊκή Στατιστική Υπηρεσία (Eurostat) και το Oxford COVID-19 Government Response Tracker (OxCGRT) για να διερευνήσει την συσχέτιση μεταξύ του ΑΕΠ και του εύρους των πολιτικών πρόληψης και δημόσιας υγείας που υιοθετήθηκαν στις Ευρωπαϊκές χώρες. Εξετάζοντας τις επιπτώσεις του COVID-19 στην οικονομία διαπιστώθηκε ότι κατά μέσο όρο οι χώρες της Ευρωπαϊκής Ένωσης (ΕΕ-27) αντιμετώπισαν μια μείωση στο ΑΕΠ λόγω της πανδημίας κατά 11.4%. Οι οικονομικές επιπτώσεις στις χώρες της Νότιας Ευρώπης ήταν ακόμη πιο βαριές. Χρησιμοποιούμε τη μεθοδολογία OxCGRT για να κατατάξουμε τις ευρωπαϊκές χώρες ως προς την απόδοσή τους έναντι του COVID-19 με βάση τέσσερις συγκεντρωτικούς δείκτες που αναφέρονται: i) στην κυβερνητική ανταπόκριση, ii) στα μέτρα περιορισμού για την υγεία, iii) στον δείκτη αυστηρότητας και iv) στα μέτρα οικονομικής στήριξης. Διαπιστώνεται ότι οι χώρες της Νότιας Ευρώπης, συμπεριλαμβανομένης της Ιρλανδίας, κατατάσσονται στο υψηλότερο επίπεδο απόδοσης λόγω των αυστηρότερων στρατηγικών που εφαρμόστηκαν για τον έλεγχο και τον περιορισμό της πανδημίας.

ΛΕΞΕΙΣ-ΚΛΕΙΔΙΑ: Πανδημία, COVID-19, OxCGRT μεθοδολογία, οικονομικές επιπτώσεις, μέτρα αντιμετώπισης, Ευρώπη, Νότια Ευρώπη.

1. Introduction

The COVID-19 pandemic was initially identified in Wuhan China in December 2019, and the virus spread across the world in an unprecedented manner. COVID-19 became soon a global public health issue. After the economic crisis of the 2010s the European economy was confronted with another economic recession which led to rising unemployment, civil unrest, and strict quarantine laws and policies to mitigate the spread of SARS-CoV-2(Yfantopoulos and Yfantopoulos 2015, Yfantopoulos 2020). The pandemic brought economic uncertainty, social isolation, and disruption of daily lives (Donnelly and Farrina 2021). Since the outbreak of the pandemic and up to the beginning (2nd) of February 2022, there have been recorded globally, by the WHO dashboard, 377 million confirmed cases, and 5.7 million deaths (WHO Dashboard 2022).The corresponding figures for the European region are146 million cases and 1.8 million deaths.

COVID-19 has revealed long standing health and economic inequalities among income groups, countries, and regions and problems of access to health services (Public Health England 2021). Health systems across the world confronted critical challenges due to overload in the capacity of health services and the excess demands for health personnel. Analyzing the impact of COVID-19 across the European countries we witness disproportional economic and psychological effects among the richer and poorer social groups as well as among the northern and the southern European states. The pandemic showed early on the need for swift and wide-ranging policy responses to contain the evolving health crisis (Di Longet al. 2021).

Although government strategies varied substantially across countries the mitigation measures generally involved limiting human mobility (e.g., travel restrictions and quarantines), physical distancing measures (e.g., forbidding mass gatherings), closures (e.g., of schools, public spaces and businesses) and public health interventions (e.g., mandatory mask-wearing and population-scale testing)(Souza et al. 2021, Cross et al. 2020). Even though these restrictions were broadly effective in slowing viral transmission, they were also slowing down the economies of most countries (Decerf et al. 2021, Bessell 2021). As the economic cost of 'flattening the epidemic curve' continued to accrue, several scientists, policymakers, and parts of society began questioning the rationale of imposing strict non-pharmaceutical measures that produce negative effects on the economy (Cross et al. 2020, Decerf et al. 2021). Hence, the health crisis was accompanied by an economic shock and the world has had to consider flattening both the pandemic and the recession curves at the same time.

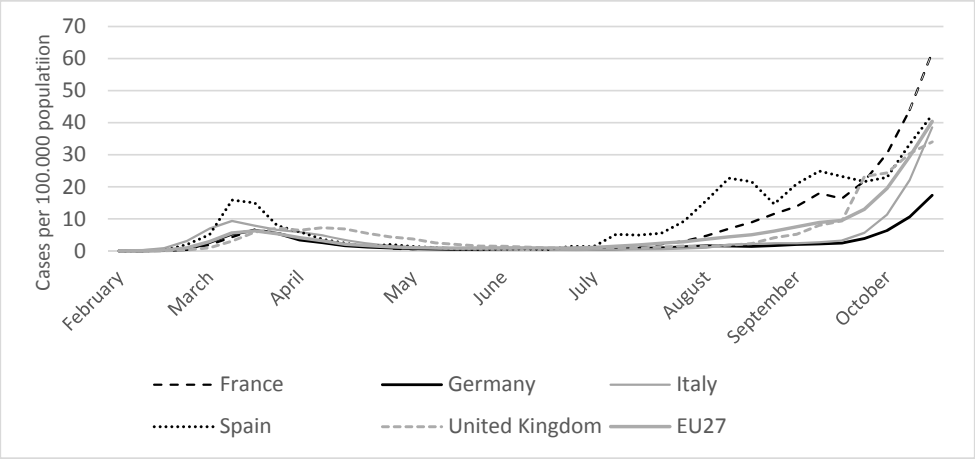
On top of that, it is by now abundantly clear that health risks are not the only consequences related to the COVID-19 pandemic that are unequally distributed across countries and population groups (e.g., older individuals and those with pre-existing chronic diseases are at higher health risk). In addition, this 'black swan' event is also associated with unequally experienced knock-on socio-economic effects (Decerf et al. 2021, Bessell 2021, Cuesta and Pico 2020, Laborde et al. 2021). More specifically, the most economically disadvantaged groups of society are particularly vulnerable to the economic consequences of the pandemic and the policy responses that ensued (Patel et al. 2020, Anser et al. 2020, Rammelt 2020). The purpose of this study is to examine the trends of the COVID-19 virus in Europe with an emphasis on the southern European countries and explore the associations between different types of responses to the pandemic (strictness, economic support) and the overall economic performance measured with GDP as an aggregate indicator.

2. The health impact of COVID19 in European countries

The first statistics on reported cases and deaths due to covid-19 in Europe started to be recorded in February 2020. The virus, after a mild phase with few cases and deaths, spread very rapidly across Europe infecting initially northern European countries, like the U.K., Belgium, France, and the Czech Republic, which had high confirmed cases per million people, but also Italy and Spain (Figure 1).

During that time, several public health measures were adopted by governments aiming at an effective control of the spread of the virus. From late August onwards,after the gradual withdrawal of health measures during the summer there was an exponential increase in the number of infections (Figure 1). Southern and easter European countries did not experience the same trends in COVID-19 infections as northern European countries.

Figure 1. Evolution of COVID-19 cases, in selected EU Countries 2020



Differences in the spread of the virus have not only been observed between the northern versus the southern EU member states but also within the European South. Figures 2 to 5 provide updated evidence on the trends (seven days moving average) of reported cases and deaths from COVID-19, standardized per 1 million of population for four southern European states (Greece, Portugal, Spain, Italy). The period under consideration is January 2020 until end of January 2022. Comparing the evolution of deaths (black lines) with the evolution of cases (solid blue areas) we observe different epidemiological profiles in terms of the number of waves and their duration. Greece (Figure 2) appears to have a different profile compared to the rest of the southern European countries with four peaks in deaths and five in cases. In total 1.74 million cases and 22,366 deaths have been recorded in Greece. Portugal (Figure 3),appears to portray an interesting epidemiological profile with an impressive control of deaths and cases (only one peak of deaths and three peaks of cases were recorded). The total number of COVID-19 cases in Portugal is 2.06 million and 19,447 deaths. Spain (Figure 4) and Italy (Figure 5),suffered more severe effects of the virus on the corresponding popoulations, with six peaks in Spain and four peaks in Italy in the number of reported COVID-19 cases. Both countries achieved an overall control in the evolution of deaths with declining trends. The number of recorded cases in Spain reached the level of 8.83 million and in Italy 9.42 million. The coresponding number of deaths is 91,599 in Spain and 142,590 in Italy.

Figure 2. Evolution of COVID-19 cases and deaths per 1 million of population, Jan. 2020-Jan. 2022: Greece

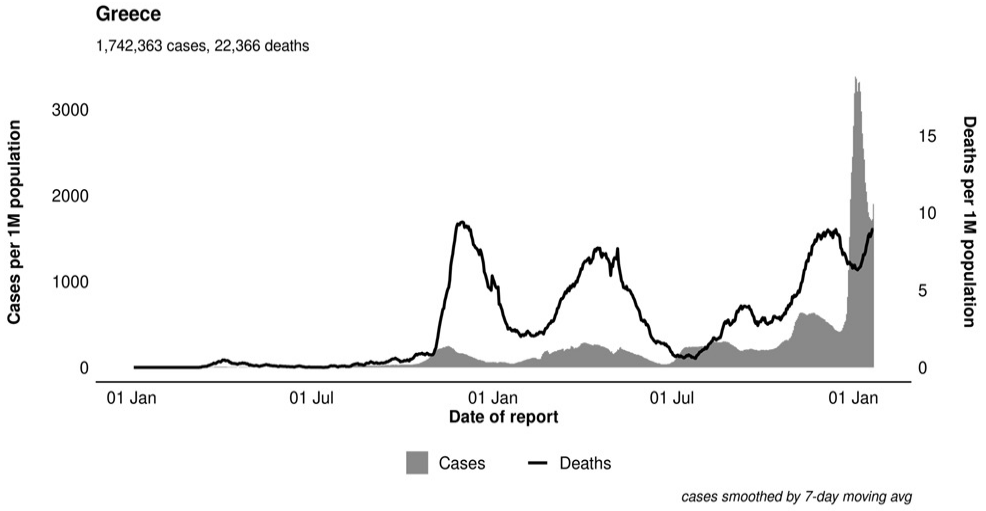


Figure 3. Evolution of COVID-19 cases and deaths per 1 million of population, Jan. 2020 – Jan. 2022: Portugal

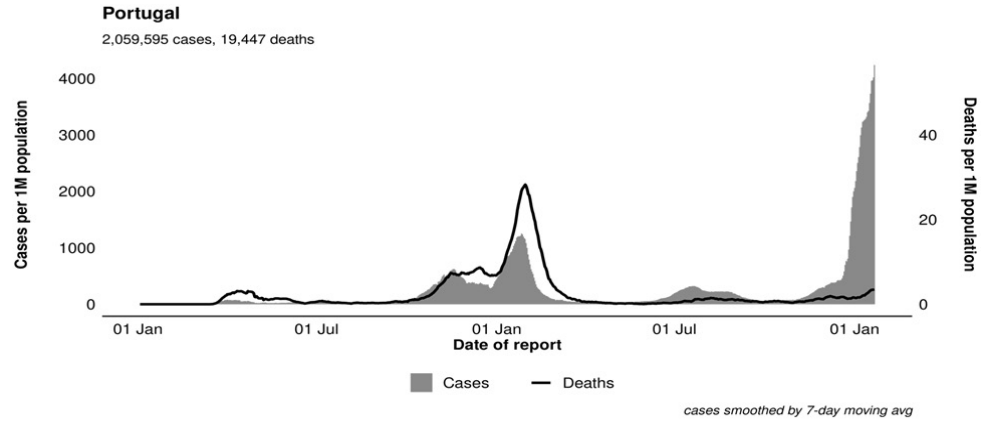


Figure 4. Evolution of COVID-19 cases and deaths per 1 million of population, Jan. 2020 – Jan. 2022: Spain

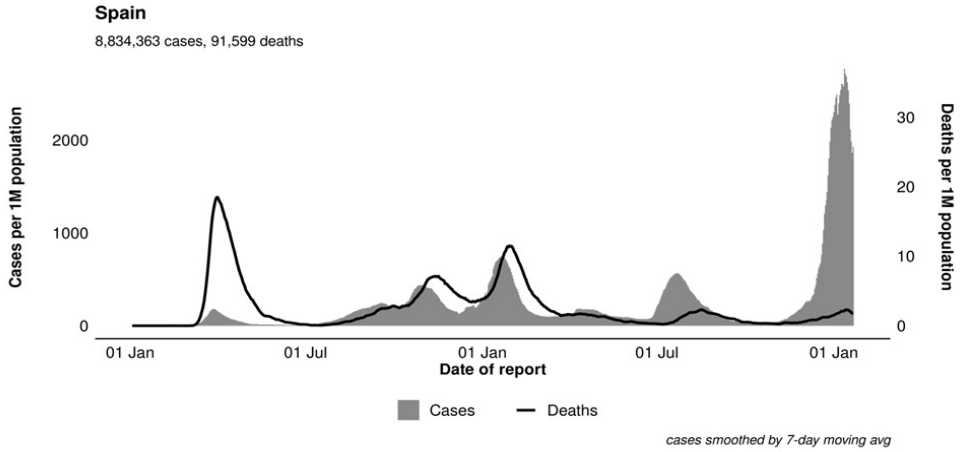
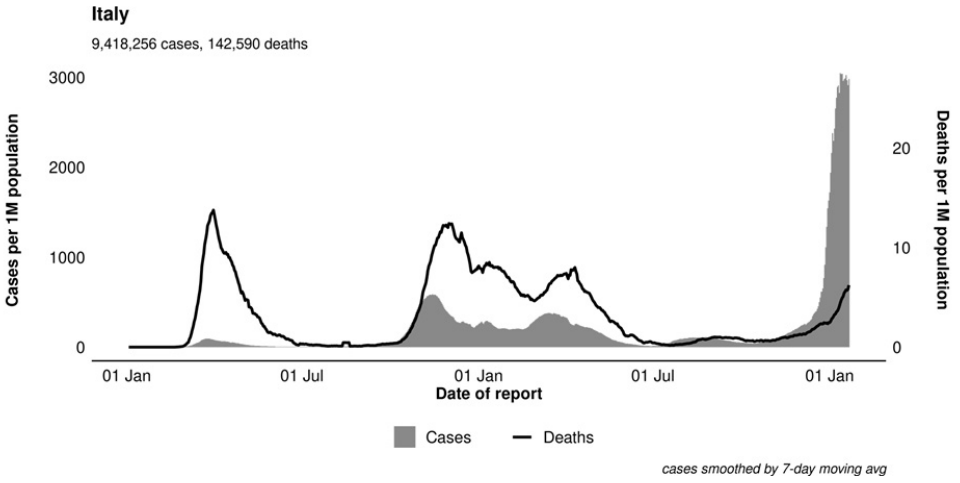


Figure 5. Evolution of COVID-19 cases and deaths per 1 million of population, Jan. 2020 – Jan. 2022: Italy



3. The Stringency Index

Following the evolution of pandemic cases and deaths in the southern European countries is worth investigating further the response of these governments to different viruses' waves. We will make use of the stringency index which is a composite indicator developed by a multidisciplinary team of experts at Oxford University. Its aim is to assess the Government responses to corona virus outbreaks since January 2020. The Oxford COVID-19 Government Response Tracker (OxCGRT) consists of nine indicators related to school and workplace closures, travel bans and other containment measures. It takes values from 0= no measures to 100 = strictest measures. Figure 6 portrays the evolution of the stringency index in Greece and Italy and Figure 7 the corresponding values in Portugal and Spain over the period of two years (January 2020 to January 2022). Greece and Italy present similar trends in the stringency index (see Figure 6) as do Portugal and Spain (Figure 7).

At the first stage of the pandemic, as soon as the first COVID-19 cases were recorded during January 2020, and until late March 2020, all southern European countries implemented drastic mitigation measures. The governments introduced full lock down including closures of restaurants, cafes, theaters, cinemas, cultural events and education sites. The values of stringency index varied from 85 in Portugal and Greece to 95 in Italy. After April 2020 and until November 2020 a gradual relaxation of measures was introduced allowing an openness to the economy and society with reopening of businesses, schools and cultural activities. The stringency index reached the level of around 40 in Spain and Greece. The relaxation of measures in all southern European countries was accompanied with several public health measures including mandatory COVID-19 testing, use of masks in public spaces and other safety measures.

As the number of cases and deaths increased during the winter of 2020 a new set of stringent policies were introduced until end of May 2021 followed by a gradual removal during the summer of 2021. From September 2021 onwards and until the end of January 2022 Greece and Italy adopted severe containment measures to control the excess deaths and cases of COVID-19. The value of the stringency index doubled in Greece from 42 at the end of August 2021 to 81 during the winter of 2021and until January 2022 (Figure 6). Portugal and Spain portrayed a gradual reduction in the value of their stringency index fluctuating around 40 (Figure 7). These differences may be attributed to the success of the vaccination programmes implemented in these countries. Examining the evolution of vaccination programmes implemented in the southern European countries we witness a successful vaccination programme in Portugal with a vaccination rate of 90%, followed by Spain (81%), Italy (77,5%) and Greece (68,2%).

Figure 6. The stringency index in Greece and Italy, Jan. 2020 – Jan. 2022

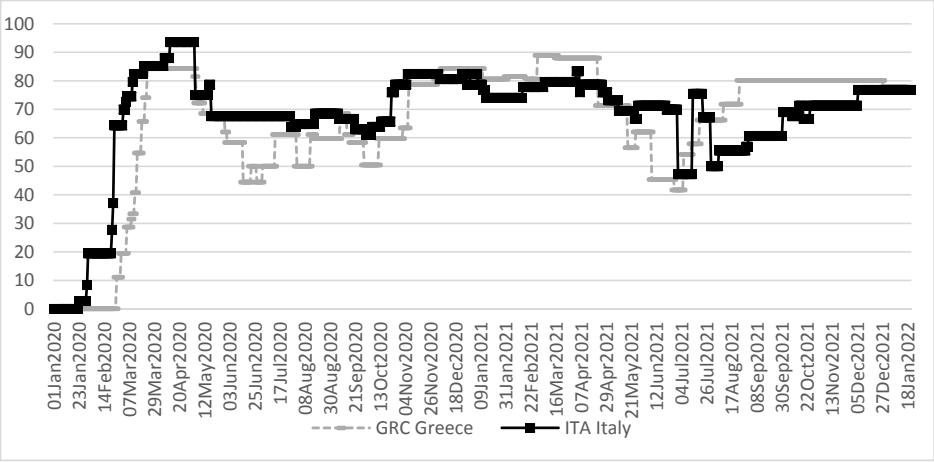
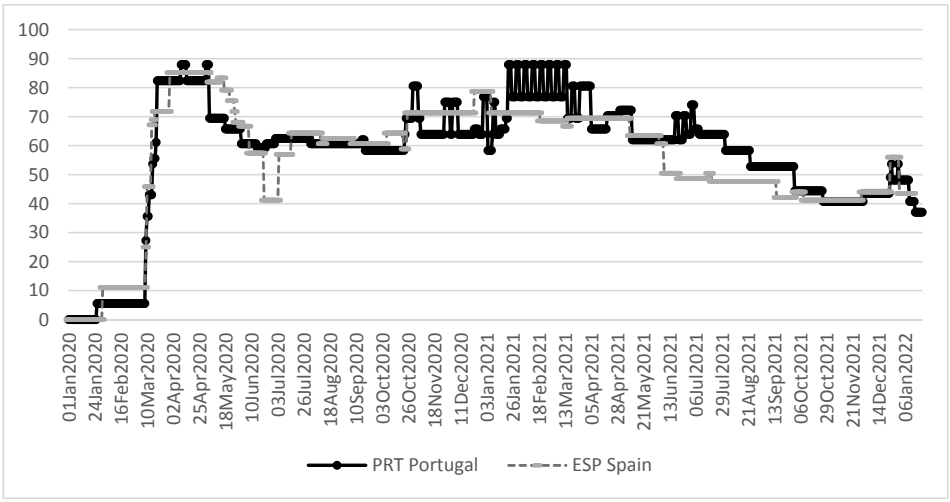


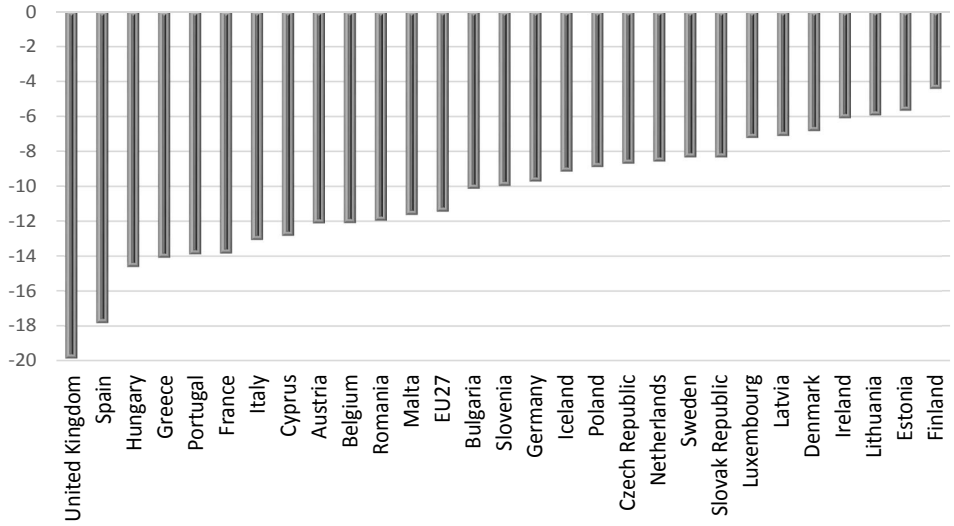
Figure 7. The stringency index in Portugal and Spain, Jan. 2020 – Jan. 2022



4. The economic impact of COVID-19 in European countries

In the literature on health economics it has often been argued that there is a close relationship between health and economic crises (Chantzaras and Yfantopoulos 2018). Examining the impact of COVIC-19 on the economic growth of the European States we can see from Figure 8 that all countries experienced negative economic growth in the second quarter of 2020. On average, the reduction of GDP in the EU-27, due to the COVID-19 crisis was 11.4%. The United Kingdom and the European South were severely affected with 20% per cent reduction of GDP in the U.K, and 17% in Spain, 14% in Greece and Portugal and 13% in Italy. The Scandinavian countries were less affected with reductions in their GDP of around 5%.

Figure 8. The impact of COVID-19 on economic growth in European countries, 2nd quarter, 2020



5. European governments' responses to the pandemic

In order to assess the impact of the European Governments' responses to the COVID-19 pandemic we will make use of a set of indicators developed by Oxford University. The aggregate data used in this study were collected from two major sources: i) the Oxford COVID-19 Government Response Tracker (OxCGRT) (Hale et al. 2021) and ii) Eurostat (Eurostat 2021) databases. The OxCGRT uses a wide range of indexes ranging on a scale from 0 to 100, with higher scores indicating a stronger policy response to the pandemic. However, it should be noted that a higher score does not necessarily reflect the degree of appropriateness or effectiveness of a country's response. We will focus on four composite indicators: i) the economic support index, ii) the stringency index, iii) the containment health index and iv) the government's response index.

The **economic support** index provides a measure of overall financial assistance to households (i.e., income support to individuals who lost their jobs or cannot work, and debt relief).

The **stringency index** considers the strictness of closure and containment strategies (closures, movement restrictions) that primarily restrict people's behavior, and information campaigns.

The **containment and health index** combines the strictness of restrictions with health measures (e.g., testing policy, contact tracing, and investments in healthcare and vaccines).

The **government response** index captures the full range of government responses for each country. Data from 1 January to 31 December 2020 regarding 30 European countries were downloaded from the OxCGRT dataset.

Table 1 presents the mean values of countries' responses to the pandemic in 2020 along with the ranking of countries. On average, Italy was ranked as the country with the highest overall score in: i) government response, ii) containment and health and iii) the stringency index, followed by Cyprus, Ireland, and Greece. Analyzing the overall ranking of the countries, it appears that the southern European states and Ireland, rank high in terms of the stringency of the measures that were implemented to contain the pandemic (Table 1). Economic support measures varied significantly and disproportionally across countries. Cyprus, Ireland and Luxembourg rank high in this respect with the most generous economic support policies (Table 1).

Table 1. European countries' responses to the first year of the pandemic (2020) according to the Oxford indicators

Country	Government Response		Containment & Health		Stringency		Economic Support	
	Mean 2020	Rank	Mean 2020	Rank	Mean 2020	Rank	Mean 2020	Rank
Italy	60.8	1	61.7	1	64.7	1	53.8	18
Cyprus	55.8	2	52.1	3	53.2	7	81.7	1
Ireland	54.1	3	51.0	5	56.0	3	75.4	4
Greece	53.1	4	52.6	2	54.5	4	56.3	14
France	52.6	5	51.7	4	54.3	5	58.8	13
Slovakia	52.1	6	49.8	8	45.5	19	68.0	7
Spain	51.6	7	49.2	10	56.3	2	68.0	6
Portugal	51.5	8	50.3	7	54.2	6	60.0	12
Austria	50.9	9	47.9	13	47.1	16	71.5	5
Belgium	50.8	10	48.8	11	51.2	9	65.2	10
Malta	49.7	11	49.7	9	45.8	17	49.7	23
Germany	48.9	12	50.8	6	51.8	8	35.8	28
Slovenia	48.8	13	48.1	12	50.0	10	53.2	19
Luxembourg	48.0	14	44.1	19	42.7	22	75.8	3
Croatia	48.0	15	47.0	14	43.3	21	55.3	16
Netherlands	47.9	16	45.5	16	49.2	12	64.8	11
Czech Republic	47.5	17	46.3	15	44.8	20	55.9	15
Iceland	47.0	18	42.7	24	39.4	28	77.0	2
Romania	46.2	19	43.2	22	50.0	11	67.0	8
Hungary	45.3	20	45.1	17	48.5	14	46.7	25
Denmark	45.0	21	41.9	25	45.6	18	66.6	9

Latvia	44.3	22	43.2	23	42.5	23	52.5	21
Sweden	44.2	23	44.4	18	49.0	13	42.9	26
Poland	42.9	24	43.4	21	47.7	15	39.9	27
Switzerland	42.4	25	43.8	20	42.3	24	32.8	29
Lithuania	42.1	26	-		42.1	25	52.7	20
Finland	38.5	27	-		38.9	29	54.1	17
Bulgaria	37.8	28	-		40.4	27	50.9	22
Norway	35.4	29	-		41.7	26	29.4	30
Estonia	35.0	30	-		36.4	30	47.5	24
Average	47.3		45.9		47.6		57.0	

Examining further the stringency and economic support measures adopted by European countries we may classify them into four groups (Table 2). The first one includes the European states with governmental measures aiming at low stringency and low support, the second with high stringency and low support, the third with high stringency and high support, and finally the fourth with low stringency and high support. As a cut-off point, separating low from high level responses, the median for each response index was used.

Table 2. Classification of European countries based on their type of stringency and economic support response in 2020

Type of stringency and economic support response			
Low stringency/ low support	*High stringency/ low support*	*High stringency/ high support*	*Low stringency/ high support*
Bulgaria	Germany	Belgium	Austria
Croatia	Hungary	Cyprus	Czech Republic
Estonia	Italy	France	Denmark
Finland	Poland	Greece	Iceland
Latvia	Slovenia	Ireland	Luxembourg
Lithuania	Sweden	Netherlands	Slovakia
Malta		Portugal	
Norway		Romania	
Switzerland		Spain	

Interestingly, most Mediterranean countries were categorized as having a high stringency and high support response, on average, except for Italy which opted for a high stringency and low support strategy (Table 2).

6. Correlations between COVID-19 and European response measures

Table 3 presents the results of the correlation matrix between the four indices and the number of COVID-19 cases and deaths. As expected, the correlation between confirmed cases and deaths per 100,000 of the population are positively and significantly correlated ($r = 0.72$) at a high statistical level ($p<0.01$). The COVID-19 cases are not related to any of the four Government response indices. The COVID-19 deaths exhibit a moderate correlation to the stringency index ($r= 0.389$) ($p<0.05$) and no other statistically significant correlation to any other Governmental measure. It is interesting to note the negative, but not statistically significant relationship between deaths and economic support index.

Table 3. Correlation Matrix between COVID-19 cases and European response measures

Correlations

		Confirmed Cases per 100,000 end 2020	Confirmed Deathsper 100,000 end 2020	Government reponse index mean (2020)	Containment & Health reponse index mean (2020)	Stringency reponse index mean (2020)	Economic Support reponse index mean (2020)
Confirmed Cases per 100,000 end 2020	Pearson Correlation	1	.716**	.188	.174	.062	.125
	Sig. (2-tailed)		.000	.320	.359	.746	.510
	N	30	30	30	30	30	30
Confirmed Deathsper 100,000 end 2020	Pearson Correlation	.716**	1	.285	.340	.389*	-.049
	Sig. (2-tailed)	.000		.126	.066	.034	.795
	N	30	30	30	30	30	30
Government reponse index mean (2020)	Pearson Correlation	.188	.285	1	.963**	.827**	.539**
	Sig. (2-tailed)	.320	.126		.000	.000	.002
	N	30	30	30	30	30	30
Containment & Health reponse index mean (2020)	Pearson Correlation	.174	.340	.963**	1	.870**	.293
	Sig. (2-tailed)	.359	.066	.000		.000	.116
	N	30	30	30	30	30	30
Stringency reponse index mean (2020)	Pearson Correlation	.062	.389*	.827**	.870**	1	.217
	Sig. (2-tailed)	.746	.034	.000	.000		.249
	N	30	30	30	30	30	30
Economic Support reponse index mean (2020)	Pearson Correlation	.125	-.049	.539**	.293	.217	1
	Sig. (2-tailed)	.510	.795	.002	.116	.249	
	N	30	30	30	30	30	30

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The overall impression from the correlation analysis is that the COVID-19 cases and deaths do not have a direct impact on the government response policies. This may be attributed to the high levels of uncertainty in predicting the evolution of the virus and the lack of accurate epidemiological models. A

more detailed econometric analysis based on time lag models may produce better explanatory results on the evolution of the COVID-19 virus and the corresponding Governmental response measures.

7. Discussion

Although strategies that aim at suppressing human mobility in public spaces are generally effective in containing infection rates, they also entail severe economic implications. Previous studies have demonstrated the negative impact of more stringent policies to the economy (Cross et al. 2020, Glocker and Piribauer 2021). This study examined the type of government responses with respect to the level of stringency and economic support policies in 30 European countries. Several studies have demonstrated not only the aggregate – macroeconomic effects of COVID-19 on GDP but also the distributional issues across different income and social groups. Evidence has revealed that the socioeconomic shock for the lower strata of society is significantly higher in countries that implemented high stringency tools to contain the epidemic curve without providing analogous financial and other aid to mitigate the socioeconomic ramifications of these measures and of the pandemic overall (Doti 2021, Sarkodie and Owusu 2021, Whitehead et al. 2021, Tavares and Betti 2021).

It is generally accepted that low socioeconomic status is associated with an increased risk of infection and severe COVID-19 symptoms (Doti 2021, Sarkodie and Owusu 2021). Economically disadvantaged people are more likely to be employed in occupations that do not allow for remote working (e.g., retail and warehouse workers), while they often live in overcrowded accommodations with poor housing conditions and in degraded neighborhoods (Patel et al. 2020, Krumer-Nevo and Refaeli 2021, Lynch 2020, Cuesta and Pico 2020, Whitehead et al. 2021). In addition, prevalence of some conditions, like asthma or diabetes, which increase the risk of serious complications from COVID-19, are more prevalent in the poorer strata of the society (Krumer-Nevo and Refaeli 2021, Whitehead et al. 2021). Low socioeconomic groups are also more likely to delay seeking necessary healthcare treatment, which may lead to poorer health outcomes (Patel et al. 2020, Krumer-Nevo and Refaeli 2021). Finally, people of lower socioeconomic status are usually less educated and are working in sectors of the economy that are at higher risk of layoffs (Cuesta and Pico 2020).

Overall, it appears that both from a macro-economic and a microeconomic perspective, that the pandemic affects disproportionally the richer and the poorer countries as well as the poorer strata of the society not only in health terms, but also socioeconomically. Therefore, policymakers should certainly consider the idiosyncrasies of each country as well as the course of the epidemic curve.

In this context, it is interesting to observe that southern European countries, which were mostly hit by the crisis of the previous decade, implemented the most stringent measures, perhaps fearing that their health infrastructure would not be able to handle an increased number of cases.

This study has obvious limitations. Firstly, it employed measures of the average intensity of government responses. Nevertheless, the speed of escalation, the maximum strength, and the timing of the responses may also affect the socioeconomic magnitude of these policies. This issue has not been investigated thoroughly yet. However, a previous study has shown that rapid responses are associated with decreased infection rates as well as lower annual GDP growth rates in the short-term, whereas a more delayed response may have even more detrimental knock-on long-term repercussions (OECD 2020, Cross et al. 2020). Secondly, the OxCGRT composite indices do not consider subtle differences in sub-national government responses. Furthermore, it is assumed that the measures introduced by the governments were also successfully implemented, whereas their effectiveness may vary by country or region (Cross et al. 2020). Thirdly, the size of the sample was small, as for some countries detailed data on the impact of COVID-19 on the economy and society were not available (yet).

8. Conclusion

The fight against the pandemic is typically construed as a trade-off between human and economic health or between lost lives and lost livelihoods, e.g., income and jobs. Financial assistance and other social protective measures can really help in cushioning the socioeconomic consequences of the pandemic. Policymakers should implement variety of fiscal and economic interventions along with public health policies by viewing them through social welfare lens. Furthermore, there is a continuum in the extent and the stringency of restrictions as well as the level of the financial and other support that a government may provide to its citizens, and one size does not fit all. Therefore, the main task for each government is to strike the right balance and to determine the optimum mix of policies that mitigate not only the health and socioeconomic effects of the pandemic but also their distributional and equity aspects in the population.

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