Divided We Survive? Multilevel Governance during the COVID-19 Pandemic in Italy and Spain

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We compare the intergovernmental health system responses to the first wave of the COVID-19 pandemic in Italy and Spain, two countries where healthcare is managed at the regional level and the impact of the first wave was highly localized. However, whereas in Italy the regional government allowed for a passively accepted central level of coordination without restricting autonomy ("descentralised coordinantion"), in Spain, the healthcare system was *de facto* centralized under a "single command" ("hierarchical centralization"). We argue that the latter strategy crowded out incentives for information sharing, experimentation and regional participation in decision-making. This article documents evidence of important differences in health outcomes (infected cases and deaths) and outputs (regular and emergency hospital admissions) between the two countries, both at the national and regional levels. We then discuss several potential mechanisms to account for these differences. We find that given the strong localized impact of the pandemic, allowing more autonomy in Italy (compared to centralized governance in Spain) can explain some cross-country differences in outcomes and outputs.

Although the management of pandemics, such as the recent COVID-19 pandemic, require the highest level of intergovernmental coordination, the design of policy responses for subnational governments presupposes critical information sharing and local knowledge about how to best address the pandemic's heterogeneous needs across the territory. This issue is relevant in several European Union healthcare systems, where health policy expertise is shared within various levels of government (Costa-Font and Greer 2012). Indeed, territorial health system governance has been at the heart of previous policy responses to pandemics and epidemics, and the balance of power between highly centralized and more decentralized coordination allows for a heterogeneous solution within a country's institutions.

In unitary states that have decentralized some of their policy responsibilities, one can typically contemplate two different governance models as a reaction to the pandemic. A common model is *hierarchical centralization*, which refers to a *uniform* response to the pandemic to counteract adverse effects of territorial self-interest to fight the virus after a state of alarm (e.g., not circulating essential

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protective equipment) implemented in France and, as we argue, in Spain during the first wave of the pandemic. An alternative governance structure is that of *decentralized coordination*, common when the expertise in the regulation of health care is in the hands of regional governments. The main advantage of such descentralised coordination, even when led by the central government, is that it provides incentives for information sharing and experimentation, especially when policies vary in their stringency. Cross-country and cross-regional coordination allow for the rapid exchange of information about the pathogen's characteristics, collect comparable data and enact regulations to manage the actions of infected patients, thus preventing the virus from spreading further (including border closures and quarantines).[1] While coordination across borders is required at the European level to respond to a global pandemic, it is equally important within countries, as regional responses are more flexible to respond to idiosyncratic needs. In contrast, a "one-size-fits-all" approach might be a less-efficient governance design when the impact of policies is highly uncertain as is the case in the presence of a completely new virus.

This article examines the effects of different reactions to COVID-19 in Italy and Spain by exploiting the *first wave of the pandemic*, when the new virus was largely unknown and governments (both at the central and at the local level) had to decide rapidly on what must be done to protect the health of citizens with almost no information on the potential impact of specific policies. Strikingly, Italy and Spain adopted different coordination strategies despite the health system being funded and organized in a rather similar way. Even private hospitals in both countries exhibited the same overall share of private hospital beds—32 per cent of all beds in 2020, according to the OECD (2020). Finally, both countries have adopted a similar model of healthcare decentralization (Costa-Font and Turati 2018): regional governments have a large range of powers in designing healthcare programs, and most of the knowledge regarding health system expertise is at the regional level.[2]

In Italy, regional governments remained active in the first wave and issued regional ordinances aimed at imposing restrictive measures beyond those adopted at the national level, such as the closure of regional borders in Campania, compulsory flu vaccinations in Lazio, and the closure of all educational institutions in Marche (Alber et al. 2021).[3] Similarly, less affected regions were able to propose ordinances to ease the lockdown, the Bolzano provincial government eased the lockdown a week before the rest of the country. This was possible due to the weaker central government role compared to regional governments, which was illustrated by the failure of regional governments to implement legally binding central-level interventions. That is, the Italian response to the pandemic resulted from some form of informal regional cooperation in which regional governments passively agreed to more active central-level coordination.

In contrast to Italy, Spain's central government was far more proactive and adopted the so-called "single command" model, after the state of alarm which allowed the central government to suspend, and then assume, regional healthcare responsibilities that were then delegated to the different central level ministers. The Minister of Health formally took over the responsibility for decision-making and coordination of health policy decisions.[4] However, the lack of experience of the central government and the limited access to operational data turned out to limit government effectiveness (Kölling 2020). Although the coordination body of Spain's regional health system (the Inter-Territorial Council for the Health System) met weekly, it was more for information sharing than co-governance purposes. However, the period of single command ended in May 2020, which gave rise to a period of "co-governance" with regions. In contrast, following the end of the first wave of the COVID-19 pandemic, the positions swapped, and regions in Spain reclaimed their healthcare responsibilities, whereas the central government in Italy introduced highly centralized policies (later confirmed by a decision of the Constitutional Court). Hence, the evidence from the first period of the pandemic provides important insights into the effect of multilevel governance on pandemic outcomes (mortality and cases) and outputs (use of hospital care and intensive care units (ICUs)).

This article compares the policy response to the COVID-19 pandemic in Spain, where regions were unable to formulate their health policies and had little incentives to cooperate with the central government, to the policy response in Italy, based on regional co-governance, experimentation, and informal cooperation, whereby regions could still add to the central government's restrictive measures to adjust to their regional-specific needs. More specifically, we examine whether the effect of the different models of governance and cooperation during the first wave can explain the evolution of trends in the number of outputs, cases and mortality, as discussed further below.

We add to the growing multidisciplinary literature by investigating how decentralized health systems dealt with the pandemic's spread (e.g., Bailey et al. 2020; Casula and Pazos-Vidal 2021; Dodds et al. 2020). More specifically, we study the impact of two different forms of multilevel governance during COVID-19 on a variety of outcomes in Italy and Spain following the declaration of a state of emergency. This is important because, theoretically, it is unclear whether regional autonomy provides an advantage in the face of a pandemic, especially when policy effects are uncertain, as in the case during the first wave of COVID-19. Hence, this article takes advantage of the different governance of the first wave of the pandemic, by two otherwise similar health systems, to shed some light on the question of the health system effect of multilevel governance.

In Italy, health system governance was driven by informal cooperation and co-governance; that is, regions did not oppose a leading central state role.[5] In contrast,

in Spain, the central government did not attempt to implement any form of co-governance during the first wave of the pandemic and adopted a more hierarchical approach like that of France. The distinction lies in the way authority and influence are distributed. Whilst we observe different policy restrictions across Italian regions, particularly Veneto and Lombardy, in Spain, Catalonia and Madrid were barely different in their policies during the first wave of the pandemic. However, whether outcomes and outputs differ across both countries is an empirical question that we address later in the article.

The following section of the article provides the context for this study, discusses previous studies, and describes the pandemic policy in both countries. Subsequent sections provide the data and methods; present the findings; discuss the findings in light of the literature and questions; and summarize the article's conclusions.

Background

The Origins of Different Coordination Models

Whereas in Spain, the Constitution defines the circumstances of a "state of emergency," the Italian Constitution does not contemplate such an "emergency provision," and only allows the national government to legislate by temporal decree in cases of "necessity and urgency". National legislation does not define the level of government responsible in such circumstances, so it can refer to regional or even local government. This means that unlike in Spain, regions and local governments in Italy could develop and implement their emergency plans in accordance with national framework regulations (Alber et al. 2021).

The Pandemic in Italy and Spain

Italy and Spain share common institutional backgrounds (e.g., decentralized healthcare systems), but adopted a different model of governance during the first wave of the COVID-19 pandemic (Casula and Pazos-Vidal 2021). Both countries were hit hard by the pandemic at approximately the same time: Spain was only a few weeks behind Italy in the spread of the virus. In May 2020, when the "first wave" was reaching an end and countries gradually re-opened their economies, reported cases in Italy (230,000) were comparable to those reported in Spain (240,000), and the same applies to deaths (33,000 and 29,000, in Italy and Spain, respectively). However, despite sharing a heavily decentralized health system (and, hence, important regional-level expertise), their central governments responded differently during the crisis. Whereas the Spanish government centralized the purchase of healthcare equipment and imposed a central level of coordination in all policy domains related to pandemic management, the Italian government did not enforce full coordination among the regional governments. In addition, before

the central government called a national lockdown, regional governments were *de facto* allowed to differ in their policy priorities: Lombardy prioritised hospital coordination, while Veneto focused on contact tracing (largely because of the different model health care integration, as argued in Costa-Font et al., 2022). This was not possible during the first wave of the pandemic in Spain, given that decision making was organised along the lines of a single command model.

Given the different governance responses to the first wave of the COVID-19 outbreak, comparing evidence from Italy and Spain can be informative of the *balance of territorial power* allocation, and specifically, the welfare effects of healthcare de/centralization. Hierarchical centralization by the central government can crowd out bottom-up coordination and information sharing. A uniform response across the entire national territory is still possible when effective cooperation takes place, as has been the case of the countries in the UK during the first wave of the pandemic. In contrast, decentralized designs allow for experimentation in identifying a regional-specific policy solution to face the spread of the virus. When the latter proves effective, then other regions can learn from such effects and adjust their response. Given the regional expertise in the management of the health system, the central government faced problems of scarcity in hospitals in Spain, giving rise to shortages of protective equipment including facemasks, ventilators, and equipment in hospitals, discoordination in collecting and elaborating health datasets primarily. Indeed, the centralized single command in Spain resulted in deficits in planning and delays in decision-making, uncovering structural weaknesses (Erkoreka et al. 2021; Erkoreka and Hernando-Pérez 2022).

In this article, besides studying national aggregate data, we also consider four regional case studies, Lombardy and Veneto in Italy and Madrid and Catalonia in Spain, and we argue that an effective policy solution was found by the Veneto Region in Italy. Despite bordering the Lombardy Region, Veneto experienced fewer than 20,000 cases, compared to about 80,000 cases in Lombardy during the first wave of COVID-19. In contrast, Madrid and Catalonia exhibited a similar response, given the limited role of regional policies allowed by the central government in Spain. There are two further reasons to examine those four regions: first, those regions were the focus of the first wave of the pandemic in their respective countries, and second, as we argue below, they can be clustered according to the level of integration of private healthcare providers (Costa-Font et al, 2022).

Policy Reactions to COVID-19 in Italy

The first COVID-19 case in Italy was officially identified on 20 February 2020, at a public hospital in Codogno, a small town close to Milan, in Lombardy, thanks to the intuition of an anesthesiologist, who tested a 38-year-old patient *against* the

national advice for COVID-19 testing (before detecting this first case, the people to be checked and tested were only those returning directly from China according to directions from the Ministry of Health). The Italian Prime Minister declared a national emergency via an "emergency decree" on 31 January 2020, for a period of six months, during the following weeks did not enact any important measures to counter the virus.

Another similar town to Codogno was Vo' Euganeo, an even smaller jurisdiction in the surroundings of Padua, in Veneto, where an outbreak was early discovered. Both Codogno and Vo' Euganeo were locked down into a *red zon*e by the central government after 23 February 2020, which entailed temporary closures of all economic activities but for essential services, and stay-at-home orders for all the people residing in the area. On 8 March 2020, the entire Lombardy, as well as a few provinces in the bordering regions of Veneto, Piedmont, and Emilia Romagna were locked into *red zones* too. Finally, the whole country was locked down in a national *red zone* a few days later after 11 March 2020. Upon months of lockdown, a de-escalation of measures began in early May, ending the first wave of the COVID-19 pandemic in Italy.

Despite enacting a national lockdown, the evolution of the first wave of the epidemic in Italy was largely regionally heterogeneous. More specifically, Northern Italy was more exposed to COVID-19 infection compared to both the Centre and South, where the spread of the new coronavirus did not follow a similar growth. In Northern Italy, Lombardy was by far the most affected region, and one of the most affected in the world during the first wave. Conversely, in Veneto, the evolution of contagion had been more mitigated. These are the two Italian regions that we consider as case studies below.

The Italian National Healthcare System has provided universal healthcare coverage since 1978, and it is financed with taxes, mostly collected at the central level. During the 1990s, several policy reforms transferred administrative and organizational responsibilities from the central government to the regional administrations, so that Italian regions have significant autonomy in organizing their healthcare system (Turati 2013). This autonomy not suspended during the pandemic despite the declaration of a national emergency, which helps explain the different policy patterns followed by Lombardy and Veneto.

Among Italian regions, Lombardy has a population of 10 million residents. The healthcare system comprises approximately 150 hospitals generating 1.5 million discharges annually. A regional reform in 1997 radically transformed the healthcare system so that citizens are free to choose the provider, regardless of its ownership (private or public). Unlike other Italian regions, the healthcare system in Lombardy is entirely built on a clear separation between insurers (the Local Health Authorities) and providers, resources are allocated based on a prospective payment system based on diagnosis related groups (DRGs), and the reimbursement is

restricted to accredited providers (Brenna 2011). The unfolding of the COVID-19 pandemic led to a rise in hospitalizations, allowing the virus to spread into the hospitals which forced authorities in the provinces of Bergamo and Brescia to convert entire hospitals into COVID-19 wards, increasing bed capacity in intensive care units (ICU), and moving physicians and nurses from their usual activity to care for coronavirus patients. This policy (experiment) of increasing ICU bed capacity was later adopted across the country.

In contrast to Lombardy, Veneto organizes health care along the lines of an integrated healthcare model, which allows the regional government coordinate its network of hospitals. This model appeared more ready to deal with the epidemic *outside the hospital*. Veneto addressed the COVID-19 epidemic by extensive testing of symptomatic and asymptomatic citizens, broad contact tracing around positive cases, quarantine for cases supported with daily telephone monitoring, detailed practical guidelines on home isolation, minimization of contacts with physicians and nurses, and limited hospital admissions to patients with major healthcare needs (Binkin et al. 2020).

Policy Reactions to COVID-19 in Spain

During the first wave, Spain had one of the highest numbers of COVID-19 cases in the world, after the United States. The first positive case was detected on 31 January 2020, but it was only in March that the diagnoses began to increase exponentially. As of 25 February 2020, cases in Spain skyrocketed because people with pneumonia of unknown origin were tested for COVID-19. On the same day, four new cases related to the Italian cluster were confirmed in Spain. By 13 March 2020, cases had been confirmed in all 50 provinces of the country. A state of alarm and a national lockdown were imposed on 14 March, and the central government was allocated full responsibility to coordinate and implement interventions to deal with the COVID-19 crisis. On 29 March 2020, it was announced that beginning the following day, all non-essential workers were to stay home for the next 14 days. On 28 April, the government announced a plan for easing lockdown restrictions, but people were allowed out of their homes for short walks and individual sports only from 2 May. This put an end to the first wave also in Spain, which implied a gradual de-escalation in four phases based on epidemiological indicators. Mobility restrictions were lifted on a region-by-region basis until 21 June, when the state of alarm ended. On 25 October 2020, the Spanish government declared a second state of alarm; however and in contrast to the first state of alarm in March, the second was implemented in a decentralized manner and managed primarily by the regional governments (Erkoreka et al. 2021).

Spain and Italy are probably the most similar health systems in Europe, which makes them especially suitable for comparative analysis. Indeed, the health system

in Spain compares to the Italian one in all its relevant design features: it is organized along the lines of a National Health System and the governance of the system is decentralized at the regional level. Seventeen regions in Spain, and twenty regions in Italy, are constitutionally entitled to healthcare responsibilities including provider organisation and resource allocation. The system is funded by central level tax revenues that are allocated to regions following an unadjusted block grant formula and, to a lesser extent, by regionally devolved and own taxes. So far, evidence indicates that decentralized governance plays a role in lowering regional inequalities in healthcare use and in stimulating innovation (Costa-Font and Turati 2018; Costa-Font and Rico 2006; Rico and Costa-Font 2005). However, strikingly, in Spain a newly appointed Minister of Health coordinated the commandment of the health system amidst the state of alarm, which was declared on 14 March 2020. The decree centralized the purchase of medical equipment and the suspension of flights from Italy.

At the time of the first wave, healthcare policies were already highly heterogeneous across regions since regional governments were run by different political coalitions. At the time of the first outbreak, the region of Madrid was run by a conservative coalition government which has been engaged in a plan of significant healthcare privatization, and during the pandemic pushed ahead outsourcing healthcare services to private for-profit providers. In contrast, Catalonia was run by a regional coalition, and continued with a system of integration of public and private health care provision. Finally, the central government was supported by a newly elected left-wing coalition with different regional supports. Madrid was the focal point of the pandemic in Spain, followed by Catalonia. Yet, although exposure to the pandemic differed considerably across regions (e.g., besides Madrid and Catalonia, other heavily affected regions were the two Castile's, Basque Country, Navarra, and Andalusia), a state of emergency and central-level coordination was imposed. In contrast, in the second and third waves, regional governments kept their responsibilities. This provides some level of policy variation to examine the effects of decentralization on relevant health outcomes.

In addition, some regions in Spain share important similarities with some regions in Italy. For instance, the private sector in Catalonia is mostly not for profit and integrated into the public health system like in Veneto,[6] whereas in Madrid it is for profit and mostly not integrated into the health system like in Lombardy. That is, in Catalonia, private providers work mainly with the public healthcare network and 24 per cent are contracted-out private healthcare providers, whereas in Madrid, this figure is about 9 per cent (Ministry of Health, Ministerio de Sanidad, Cuentas Satélite del Gasto Sanitario Público 2020). The region with the higest private healthcare spending per capita in Spain is Madrid with 791€, which compares to 659€ in Catalonia (Ministry of Health and Consumption, 2020).[7]

Material and Methods

Data

This study aims to compare the reaction to the first wave of the COVID-19 pandemic in Spain and Italy to learn about the effect of decentralization in the management of the pandemic. We focus on the first wave as this period is characterized by the novelty of COVID-19, and the uncertainty surrounding policies aimed at containing the spread of the virus. Spanish data are gathered from the website of Instituto de Salud Carlos III (https://COVID19.isciii.es), while Italian Civil Protection provides daily updated data in a GitHub repository (https://github.com/pcm-dpc/ COVID-19).

Data reliability is clearly an issue for the comparison of performance in the first wave, and more generally, for research related to COVID-19 (e.g., Odone et al. 2020). In collecting data, there were some concerns regarding data quality, since a common framework at both supra-national and national levels to guarantee comparability was missing, especially for the first wave. First, information on the number of cases is influenced by the number of people that have developed the symptoms, have been treated in hospitals, and tested by swab (the only method that produces reliable information). However, the use of swabs as a test procedure to identify COVID-19 infections has been very different across countries, and across regions within countries. In addition, testing policies have also changed during the pandemic for different reasons. Second, the number of hospitalizations, especially in intensive care units (ICU), has been influenced by the policies adopted by different regions and countries, and by the availability at the local level of beds, which were adapted according to the needs to be able to treat all patients (see, e.g., Fagiuoli et al. 2020, on the dramatic situation experienced at the Hospital Giovanni XXIII in Bergamo, Lombardy). Third, similarity, the number of deaths, might be biased due to the rise of in-hospital mortality for other causes. The absence of accepted standards for counting patients dying from COVID-19 produces noisy statistics. Notwithstanding these issues, ICU admissions and hospitalizations seem to be the most reliable information available at the time of writing this article (Nacoti et al. 2020).

In addition to data on COVID-19 outcomes, we collect data on the Stringency index (SI) produced by the Blavatnik School of Government at the University of Oxford (available at https://www.bsg.ox.ac.uk/research/research-projects/coronavirus-government-response-tracker) to compare the restrictions applied in our countries of analysis. The index provides a better representation of the lockdown imposed in the two countries, detailing information on the policy response by governments, for example, school closures and stay-at-home orders (Hale et al. 2020).

Supplementary Appendix Table A.2 provides descriptive statistics for all the variables included in our two datasets, one considering aggregate national data for

both Spain and Italy and the other pooling information related to our four regional case studies.

Methods

Our discussion is based on a descriptive analysis of COVID-19 outcomes measured at the national level in Italy and Spain, and at the regional level considering four selected case studies in the two countries. We examine the total number of COVID-19 cases, hospitalized patients, and patients admitted to ICU, together with evidence on regional and country-specific mortality. To better interpret the evolution of the pandemic, we paired the time series for each country following the timeframe resulting from the day when Italy and Spain exhibited the same number of hospitalized patients, namely 7 March 2020 in Spain and 25 February 2020 in Italy (t_0). Furthermore, we considered the same length in days of the time series (75) which for Italy was truncated on the 9 May and for Spain on 20 May (t_{75}), corresponding to the end of the first wave of emergency.

Given that trends across spatial units might be affected by factors like differences in population age groups, we also consider a simple regression model to complement our descriptive analysis. First, considering national data, we estimate the following model:

$$y_{i,t} = \alpha + \beta_1 \mathrm{SI}_{i,t} + \sum \beta_{2,t} d\_\mathrm{Month}_t + \beta_3 d\_\mathrm{ITA}_i + \varepsilon_{i,t} \quad (1)$$

where y is one of the four COVID-19 outcomes (cases, hospitalizations, ICU admissions, and deaths) observed in country i ($i = \textit{Italy, Spain}$) in day t, SI is the overall Stringency Index (summarizing several restrictive measures), d_Month are time dummies (February as a reference category, March, April, May), and ε represents the error term. The coefficient of interest is β_3 for the dummy d_ITA, which is equal to 1 for Italy and 0 for Spain. This coefficient estimates the differences between Italy and Spain in each COVID-19 outcome.

To explore regional differences, we select four regional case studies (Veneto and Lombardy in Italy, Catalonia and Madrid in Spain). Pooling data referring to these four regions, we then estimate the following model:

$$y_{i,t} = \alpha + \beta_1 \mathrm{SI}_{i,t} + \sum \boldsymbol{\beta}_{2,t} \boldsymbol{d\_\mathrm{Month}_t} + \sum \boldsymbol{\beta}_{3,i} \boldsymbol{d\_\mathrm{Reg}_i} + \varepsilon_{i,t} \quad (2)$$

where all the variables are defined as before, except for the regional dummies, included to control for differences in the management of COVID-19. The vector of coefficients $\boldsymbol{\beta}_3$ is associated with the dummies $\boldsymbol{d}$**_Reg**, a vector of four regions: Veneto, Lombardy, Madrid, and Catalonia (excluded as a reference category).

Results

Descriptive Evidence at the National Level

Figure 1 displays the cross-country comparisons of the four COVID-19-related measures examined: number of COVID-19 cases and deaths (measuring *outcomes*), hospitalizations, and admissions in ICU (measuring *outputs of the health system* that can explain the above outcomes). We draw on aggregate figures at the national level and all the measures are standardized rates in terms of population. To obtain a comparable scale for all plots, the number of cases and hospitalizations rates are multiplied by 100, whereas admissions in ICU and deaths are multiplied by 1,000. The values on the x-axis refer to days t_0–t_{75}, as defined above. All figures reveal a consistent path: although Spain has a population of about 47 million people compared to about 60 million people in Italy, Spain recorded a higher number of confirmed cases, hospitalized patients, patients admitted to ICUs, and deaths. More strikingly, while hospitalizations and admissions to the ICU tail off after 30 days in Italy, they continue growing in Spain. This descriptive evidence points toward better performance of a governance model allowing for regional differentiation of policies.

One potential explanation for the differences between Italy and Spain lies in the stringency of measures implemented. Next, we examine the trends in the stringency index (SI) produced by the Blavatnik School of Government. The index details the lockdown policies adopted by the countries, summarizing information about the following measures: school and workplace closures, cancelling public events, limits on private gatherings, closing of public transport, and restrictions on internal movement between cities/regions. The index is computed at the national level, and it ranges from 0 to 100: a higher value of the SI suggests that the overall government response has become stronger. The comparison between Italy and Spain (see Supplementary Appendix Table A.2) in terms of the SI suggests that although in the early days of the pandemic, the two countries differed in the stringency of measures implemented to fight the pandemic, both countries ended up exhibiting similar values of the index. In the following analysis, we consider the overall index provided by the Blavatnik School of Government, instead of single specific policy domains included in the index. Most of the measures (relative to school closures, international travel controls, or cancelling public events) were implemented early on in both countries. However, restrictions on workplaces or public transportation were applied later in Spain compared to Italy. However, the t_0 in the two countries was different: 7 March in Spain and 25 February in Italy. Hence, the central government in Madrid took longer to adopt harsh measures compared to Italy (on this, see e.g., Montesò-Curto et al. 2020).

The slight delay in response by the Spanish government with respect to the actions taken in Italy can be gauged also by looking at excess mortality in 2020

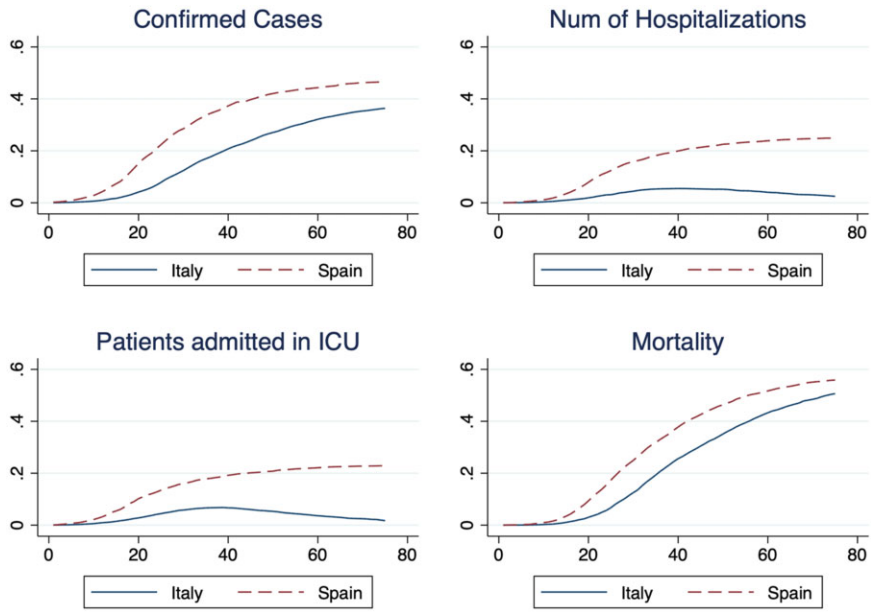

Figure 1 Evolution of COVID-19 first wave in Italy and Spain.

compared to mortality estimates in 2019. Information about overall mortality in Spain is gathered from the Spanish Mortality Monitor (MoMo, available at https://www.isciii.es). Spanish data are daily collected and include all-cause mortality obtained from the General Register of Civil Registers and Notaries of the Ministry of Justice, distributed among all the regions (Autonomous Communities) including the fifty-two provincial capitals. During 2020, MoMo in Spain includes deaths from all causes from 3,929 computerized civil registries, representing 92 per cent of the Spanish population. Daily data are available from 5 April 2018 up to 22 April 2020. The Italian Institute of Statistics (ISTAT) provides data about overall mortality in Italy. ISTAT focused on the municipalities with reliable data that show at least ten deaths in the period 1 January–31 May 2020 and that recorded a 20 per cent increase in mortality in the period 1 March–4 April 2020 compared to the average mortality for the same period in the years 2015–2019. ISTAT made available the data of 7,357 municipalities (out of a total of 7,904, 93.1 per cent) for which consolidation was possible until 31 May 2020 and covering 95 per cent of the population resident in Italy. Figure 2 depicts a comparison of Spain and Italy based on the first four months of data from (January–April) 2019 and 2020, and the mortality rate is computed by considering the population of the two countries. Excess mortality is higher in Italy than in Spain. However, it is also evident that excess mortality sharply rose after t_0, while the same pattern is identified in Italy

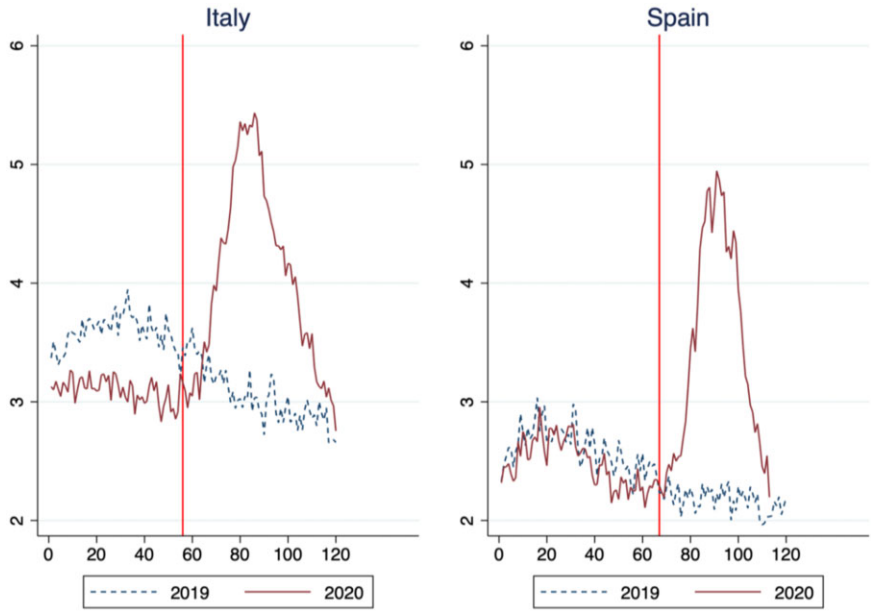

Figure 2 Excess mortality 2019–2020 (January–April).

Source: MoMo for Spanish data and ISTAT for Italian data.

about ten days earlier. Once again, this supports the view that the Spanish government was late in adopting the same measures implemented by the Italian government. That said, mortality was higher in Italy also in 2019 compared to Spain, suggesting that differences in the age structure of the population might affect the trends in mortality. For instance, Islam et al. (2021) show that when accounting for the different age structures of European countries, Italian excess mortality in 2020 is lower than that recorded in other European countries, including Spain, Belgium, and the UK.

A further and connected explanation for the differences observed in the number of cases and the number of excess deaths, calling into question the role of governance, is that the pandemic was strongly concentrated in very few regions in Italy because of the early adoption of severe restrictions, while in Spain the region of Madrid remained open for longer, which contributed to the spread of the pandemic to other regions. To better understand the concentration and the evolution of the pandemic, we compute the Gini index of the number of deaths in each region and each week from t_0 to t_{75}. Results (not reported here for brevity) confirm a higher concentration of the COVID-19 pandemic in Italy than in Spain, which implies that centralized governance allows for more homogeneous outcomes

across regions, while a decentralized solution allows to identify best practices from those regions that have adopted unsuccessful choices. The concentration index also shows a decreasing trend for Spain, suggesting even more homogeneous outcomes as the pandemic spreads to areas where the virus did not initially strike.

Regional-Level Evidence

To better understand the role of regional patterns, we examine the regional trends of COVID-19 outcomes, selecting as case studies two of the most affected regions in the two countries under analysis, namely Lombardy and Veneto in Italy, and Catalonia and Madrid in Spain. As for Italy, the importance of focusing on Veneto and Lombardy is well described by Binkin et al. (2020) in terms of the different approaches to the COVID-19 epidemic in the two Italian regions. The authors showed that the community-based approach adopted in Veneto seems to be correlated with a limited rate of cases, hospitalizations, and deaths, whereas the approach based on a strong hospitalization of positive cases adopted in Lombardy overwhelmed the healthcare system with major consequences on the whole regional population. Similar arguments are discussed also by Costa-Font et al. (2022), who focus their attention on the different models of managed competition adopted by the two regions.

As for Spain, the importance of focusing on Madrid and Catalonia is supported by, for example, Legido-Quigley et al. (2020). The Madrid region was the epicentre of the crisis in Spain. Catalonia requested a complete shutdown of the region together with a full range of social distancing measures, but the royal decree declaring a national emergency contained new controversial measures attributing to the central government more and new powers over health services. The panels in figure 3 are defined following t_0–t_{75} at the national level. They compare the four regions in the two countries, standardizing all measures by the population in each region. The panel representing confirmed cases shows evidence that the two regions that were the focus of the pandemic in both countries (Lombardy and Madrid) reveal increasing trends in terms of confirmed cases, but Catalonia in Spain follows Madrid closely, while Veneto in Italy presents a very different picture to that of Lombardy.

Panels relative to the number of hospitalizations and patients admitted to ICU describe the trends in the two variables in each of the four regions. The two Spanish regions clearly stand above Lombardy and Veneto following very similar patterns, while Lombardy performs differently from Veneto. As for mortality, Lombardy exhibits much higher numbers than all the other regions; the trend in Madrid is very similar to the trend in Catalonia, while Veneto follows a very different pattern compared to Lombardy. This is consistent with the differential

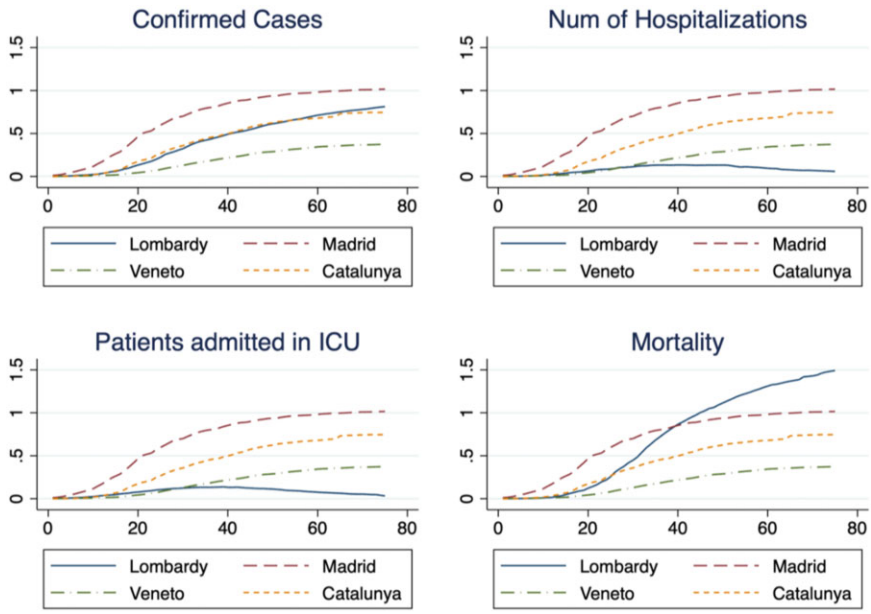

Figure 3 Evolution of COVID-19 first wave in four regions in Italy and Spain.

Source: MoMo for Spanish data and ISTAT for Italian data.

role of regional autonomy in Veneto and Lombardy, compared to the much more centralized management of the crisis in Spain.

Regression Analysis

Estimates of Equation (1) based on aggregate national data are reported in Table 1, Panel A. We use robust standard errors in all specifications. The coefficient for the stringency index (SI) is consistently positive and significant for all outcomes: when cases are increasing, severe measures are more likely to be implemented as the number of cases rise. Monthly dummy variables are also significant and positive, picking up the increasing trend in the outcomes during the severe phase of the pandemic. The country dummy (negative and statistically significant) shows that all the outcomes are lower in Italy than in Spain, suggesting a different approach to the management of the pandemic between the two countries.

We estimate Equation (1) also first differencing the four outcome variables.[8] The results are reported in Table 1, Panel B. Estimates suggest that the measures adopted by the two countries to contain the spread of the COVID-19 led to a change in both outputs and outcomes. Interestingly, monthly dummies are not all significant and increasing with respect to February when the epidemic started for hospitalizations and ICU admissions. As for the country dummy, all outputs and

Table 1 Estimates of Equation (1)—Countries

Variables	(1) Cases	(2) Hospitalizations	(3) ICU	(4) Deaths
Panel A: Outputs and outcomes measured in levels				
SI	0.0560***	0.0822***	0.0737***	0.0890***
	0.005	0.004	0.006	0.010
Mar versus Feb	3.0026***	2.3452***	2.1305***	3.4229***
	0.259	0.240	0.209	0.266
Apr versus Feb	4.2420***	2.8315***	2.2997***	5.0149***
	0.263	0.248	0.236	0.315
May versus Feb	4.8592***	3.4397***	2.7216***	6.0028***
	0.304	0.282	0.243	0.365
Italy versus Spain	−0.6462***	−1.7064***	−1.6730***	−0.5912***
	0.136	0.104	0.093	0.192
Constant	3.1447***	1.5801***	0.5327	−2.7606***
	0.336	0.315	0.419	0.625
Observations	150	150	150	150
R^2	0.874	0.920	0.908	0.880
Panel B: Outputs and outcomes measured as first differences				
SI	0.0314***	0.0676***	0.0356***	0.0600***
	0.005	0.006	0.006	0.010
Mar versus Feb	2.4601***	1.5118***	1.9445***	3.3527***
	0.284	0.483	0.726	0.327
Apr versus Feb	2.1052***	−0.1188	0.3261	3.4327***
	0.294	0.524	0.754	0.369
May versus Feb	0.9887***	−1.2617**	−0.9632	2.7753***
	0.332	0.528	0.755	0.401
Italy versus Spain	−0.3137**	−2.1667***	−1.6059***	−0.4175**
	0.140	0.167	0.151	0.183
Constant	3.3230***	1.6410***	1.3129*	−2.3372***
	0.332	0.575	0.787	0.639
Observations	147	113	112	148
R^2	0.597	0.756	0.710	0.666

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

outcomes show that Italy displays lower values compared to Spain. This result is in line with the descriptive analysis presented above and can be explained by the delay in the adoption of restrictive measures and the multilevel governance implemented in Italy. Before turning to the regional analysis, we also tested two further

specifications of Equation (1). We consider the number of hospitalized and ICU patients (standardized by the number of infected cases) as additional outcomes in Equation (1). The results are reported in the Supplementary Appendix Table A.3. The country dummy for Italy still shows a negative coefficient for both hospitalizations and ICU admissions, except for the model in first differences for ICU patients. Interestingly, the SI coefficient is now positive and significant only when the outcome refer to the number of patients, suggesting that more stringent measures were associated with the rise in the number of patients needing to be hospitalized.

Estimates of Equation (2) based on pooled data of the four regions examined (Lombardy, Veneto, Madrid, and Catalonia) are displayed in Table 2, Panel A (levels) and Panel B (first differences). All the previous findings are consistent with previous estimates. More interestingly, dummies for regional governments are almost all statistically significant; however, the dummy for Veneto is consistently negative, both for the model in levels and in first differences, across all the outcomes. In addition, the dummy for Lombardy is positive for cases and deaths but negative for hospitalizations and ICU admissions. These results suggest that regional differences are much larger in Italy than in Spain, where the management of COVID-19 has been largely centralized.

To further discuss this point, in figure 4, we report the predictive margins for regional dummies retrieved from estimates of Equation (2), both in levels and first differences. Several insights emerge. First, Lombardy and Madrid seem to be largely comparable across most outcomes. The fact that they serve as hubs for their countries, share connections with the rest of the world and the rest of the country, and have a lively and strong economy explain the spread of the pandemic and the restrictions implemented. Second, and much more important for our purpose here, Catalonia and Madrid appear reveal more similar patterns than Veneto and Lombardy. This supports the view that a centralized solution in the management of a pandemic crisis homogenizes the outputs and outcomes across the regions, not allowing for experimentation and policy innovation, which—on the contrary—might offer useful insights when the governments are facing an unknown challenge like COVID-19 in the first wave.

Discussion

COVID-19 has put multilevel governance systems under unprecedented strain. It has forced public authorities to coordinate with different levels of government to implement mobility restrictions, including national lockdowns. However, the question of how, in the face of a crisis, the decision-making power should be balanced between national and sub-national governments is not trivial. Therefore, comparing countries, such as Italy and Spain, that in the absence of a pandemic

Table 2 Estimates of Equation (2)—Regions

Variables	(1) Cases	(2) Hospitalizations	(3) ICU	(4) Deaths
Panel A: levels				
SI	0.0620***	0.1123***	0.0822***	0.0837***
	0.005	0.008	0.006	0.006
Mar versus Feb	2.4765***	1.4755***	1.3427***	2.6567***
	0.184	0.168	0.142	0.208
Apr versus Feb	3.5791***	1.6521***	1.3650***	4.3147***
	0.203	0.226	0.185	0.229
May versus Feb	4.2732***	2.5046***	1.8715***	5.2897***
	0.222	0.236	0.177	0.267
MAD versus CAT	0.7458***	0.6914***	0.7587***	0.9587***
	0.096	0.109	0.101	0.118
LOM versus CAT	0.2161*	−1.0247***	−0.9755***	0.7159***
	0.118	0.133	0.116	0.157
VEN versus CAT	−1.3314***	−3.1002***	−2.6209***	−1.8051***
	0.122	0.135	0.120	0.162
Constant	1.5017***	−1.5067***	−0.9712**	−3.4621***
	0.364	0.503	0.420	0.376
Observations	300	300	300	300
R^2	0.883	0.915	0.890	0.894
Panel B: first differences				
SI	0.0382***	0.0661***	0.0331***	0.0540***
	0.007	0.007	0.009	0.007
Mar versus Feb	1.9206***	1.0620***	0.8959***	2.4405***
	0.296	0.273	0.332	0.251
Apr versus Feb	1.4275***	−0.4776	−0.5055	2.5846***
	0.325	0.365	0.420	0.277
May versus Feb	0.3644	−1.6224***	−1.7700***	1.9934***
	0.330	0.359	0.431	0.299
MAD versus CAT	0.1380	0.3985***	0.3908**	0.4714***
	0.135	0.128	0.182	0.142
LOM versus CAT	0.1468	−1.4359***	−0.7753***	0.5370***
	0.135	0.201	0.224	0.169
VEN versus CAT	−1.4245***	−3.5264***	−2.3468***	−1.6130***
	0.137	0.257	0.253	0.170
Constant	1.9120***	0.5995	0.7073	−2.6512***
	0.538	0.474	0.620	0.496
Observations	294	227	217	287
R^2	0.611	0.694	0.449	0.623

*** Significant at 1% level; ** Significant at 5% level; * Significant at 10% level.

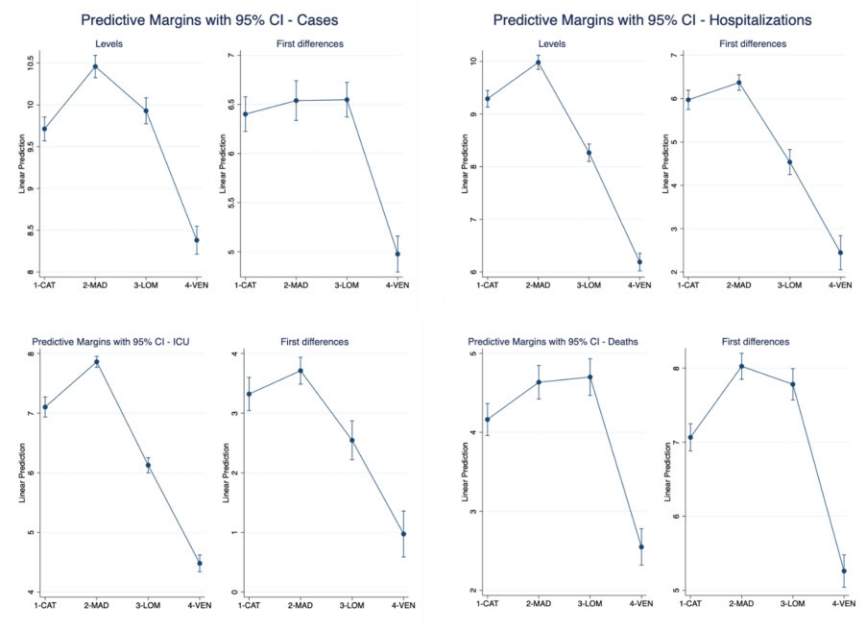

Figure 4 Predictive margins for the four regions—Catalonia, Madrid, Veneto, and Lombardy.

share similar health system characteristics and regional governance (Costa-Font and Turati 2018) can tell us something about the influence of different types of multilevel governance on health outputs and outcomes during the pandemic. We have focused on the first wave of the pandemic, where political actors at different levels of government had little information to anticipate the effects of the pandemic. However, the expertise in running the health system both in Italy and Spain was located at the regional level. In such a context, we examine whether a more centralized hierarchical response, as opposed to decentralized cooperation, affects outputs and outcomes.

We document that in Spain, the pre-crisis governance mechanisms that would prove crucial in a pandemic were effectively paralyzed with the implementation of a single command that effectively centralized healthcare decision-making, and to large extent, inhibited incentives for cooperation between different governments. That is, the logic of the state of alarm deterred information sharing and regional co-governance (Kölling 2020). The inter-territorial system meetings of Spanish regions that are designed to coordinate health care became purely informative. However, the situation changed in the second and further waves, and further autonomy was then allowed.

In contrast, in Italy, intergovernmental tensions emerged only in the second wave, when it was clearer how to manage the virus. During the first wave of the pandemic, regions passively allowed an increasing coordination role led by the central state. However, given that such coordination was not hierarchically imposed, it did not reduce the incentives to share information on best practices, or to implement more restrictive policies at the regional level. Comparing the reactions to the pandemic in two countries (Italy and Spain) allows us to study whether hierarchical centralization in Spain fared better than informal decentralized coordination implemented in Italy. Our findings suggest that decentralized governance gives rise to better health outcomes and outputs than hierarchical centralization.

Our empirical estimates document a significant gap in the number of COVID-19 cases, hospitalizations, ICU admissions, and deaths in Italy and Spain, both at the national and at regional level. Given the *strong localization of the health needs of the pandemic both in Italy and in Spain*, decentralized coordination can incentivize information sharing as well as foster experimentation and local solutions to local COVID-19 outbreaks. Our empirical evidence suggests that multilevel governance can explain the cross-country differences in such cross-country trends. Unlike what we observe in noncritical times, policy experimentation was deterred in Spain whereas in Italy, regions were able to modify their policy restrictions above and beyond those imposed by the central government.[9] Although we observe evidence of coordination in Italy, it came about spontaneously and passively rather than being actively enacted. In contrast, in the UK and in Germany where policy-making is decentralized, scholars have observed evidence of formal cooperation, which is called "compensation through-participation" (Vampa 2021).[10] Formal cooperation in a decentralized health system such as in Italy and Spain would entail, encouraging regions to participate in central state decision-making, incentivizing them to share relevant local knowledge, and ultimately enhancing an effective coordination.

More generally, an interpretation of our findings is that in a setting where the optimal reaction to a pandemic is unknown as was the case of the first wave of COVID-19, decentralized coordination can make a difference. Given the comparability between the two countries' health systems, our results support the idea that there is a penalty to centralization when information sharing is crucial and experimentation is important to address regional-specific needs and to produce policy information that can be used across the country.

More specifically, encouraging regional cooperation but relying on (informal) decentralized coordination might provide an advantage in facing the challenges during the first wave of the COVID-19 pandemic. The latter might have allowed knowledge sharing of good practices to manage the pandemic, compared to the more centralized approaches, especially when regional needs and knowledge are

largely heterogeneous. That said, whether these good practices are then extended to the whole country during later waves is an interesting issue to be discussed in future work. More specifically, its worth noting that the strategic reactions and tensions that emerged in the second and further waves were different than that of the first wave, which is why this article focuses on the first wave alone.

Finally, an important finding that has to be highlighted refers to the significant differences within countries. For instance, in Italy, there were differences in how the health systems in Lombardy and Veneto responded to the pandemic (Costa-Font et al. 2022). Hence, one could well argue that Italy, and possibly Spain, would have exhibited a more successful policy response had they followed Veneto, a more integrated health system, where private providers work in coordination with the rest of the health system, thereby reducing the costs of information sharing and coordination. These estimates, might point out the need of further policy learning beyond the limits of European countries, possibly in the form of some European level platform, that support a future European health union.

Conclusion

The purpose of this article is to investigate the impact of multilevel healthcare system governance on COVID-19 outcomes and outputs in two countries that, despite similar financing and territorial organization, exhibit significant differences in how the central government addressed the need for health system coordination during the first wave of the COVID-19 pandemic.

Our findings suggest that when the source of the pandemic is localized and policy uncertainty is high (as during the first wave of the pandemic), a decentralized coordination mechanism, even when passively adopted, such as in Italy, would be advantageous (better outcomes and outputs) because it combines enhanced coordination, particularly information sharing and the profiling of their policy restrictions to the regional needs and priorities, above and beyond those of the central government. Such decentralized coordination adopted in Italy starkly contrasts with Spain's "single command" approach during the first wave of the pandemic, which discouraged information-sharing incentives and regional co-governance.

Nonetheless, the institutional design of the health system to address the needs of the COVID-19 pandemic was corrected in the second wave of the pandemic, when Spain followed Italy's lead and kept the pandemic governance decentralized. In contrast, in Italy, attempts were made to turn to more centralized governance in later waves, where in both Italy and Spain, we observe evidence of strategic regional policy-making and tensions along the line of resources as well as different policy preferences.

Supplementary Data

Supplementary data are available at *Publius: The Journal of Federalism* online.

Notes

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1. Such decentralization is implemented at the European Union level, via cross-country coordination and information sharing via the European Centre for Disease Control (ECDC).
2. However, as we discuss here, the central government can cooperate with regions despite an active role of the central government leadership as in Italy, or impose a hierarchical centralization giving rise to central-level coordination, as in Spain during the first wave of the pandemic
3. Veneto is an example of how the more integrated regional healthcare system was an advantage compared to other regions such as Lombardy (Costa-Font et al. 2022).
4. The suspension of self-government did not stop the activity of regional government, but it simply made it respond to the central government's authority following the guidelines marked out by the single command.
5. This was possible because Spain's Constitution embeds a state emergency and has clear rules to overcentralize under a single command which is not present in the Italian constitution. In both countries, there was some forms of centralization of some government functions (Vampa 2021)
6. The development of quasi-markets in Catalonia entailed integrating fully private providers in the public system, and hence putting them under the governance of the public system.
7. In 2020, private healthcare attended to 30 per cent of hospitalizations for COVID-19 and 29 percent of admissions to the ICU.
8. First differences have been computed simply as $\Delta=y_t-y_{t-1}$.
9. Evidence suggests that policy innovation in health care takes place at the local level and then such information might then spread throughout the country in subsequent waves (Costa-Font and Rico 2006).
10. The dynamics between the Länder in the first wave were rather coordinated (though the situation would then change in the second wave) allowing Germany to minimize the number of victims and also contain the territorial inequalities.

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