COVID-SCORE Spain: public perceptions of key government COVID-19 control measures

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Background: Spain was initially one of the countries most affected by the coronavirus disease 2019 (COVID-19) pandemic. In June 2020, the COVID-SCORE-10 study reported that the Spanish public’s perception of their government’s response to the pandemic was low. This study examines these perceptions in greater detail. Methods: We employed an ordered logistic regression analysis using COVID-SCORE-10 data to examine the Spanish public’s perception of 10 key aspects of their government’s COVID-19 control measures. These included support for daily needs, mental and general health services, communication, information and coordination, which were examined by gender, age, education level, having been affected by COVID-19 and trust in government’s success in addressing unexpected health threats. Results: “Trust in the government” showed the greatest odds of positive perception for the 10 measures studied. Odds of positive perception of communication significantly varied by gender, education level and having been affected by COVID-19, whereas for information and coordination of disease control, odds significantly varied by gender and having been affected by COVID-19. Odds of positive perception for access to mental health services significantly varied by gender and education level. Age was not significant. Conclusion: Public perception of the government’s pandemic response in Spain varied by socio-demographic and individual variables, particularly by reported trust in the government. Fostering public trust during health threats may improve perception of response efforts. Future efforts should tailor interventions that consider gender, education level and whether people have been affected by COVID-19.
Introduction

The coronavirus disease 2019 (COVID-19) pandemic continues to put extreme pressure on governments, economies and communities around the world. Spain was one of the most affected countries during the first wave of COVID-19 in spring 2020. In response, it implemented some of the strictest lockdown measures in Europe, and is now experiencing a new wave that threatens to be even more severe. As of 2 March 2021, there were 3.2 million confirmed cases and 69,609 reported deaths due to COVID-19 nationally, with some regions of Spain being much more affected than others in terms of overall cases and deaths.

The pandemic has highlighted and exacerbated a number of existing challenges in Spain. For example, the national health system has been put under extreme pressure by an overwhelming demand for public health, social services and individual healthcare due to COVID-19 and impacts of a decade of austerity measures and budget cuts. In addition, the underlying political climate, which included longstanding efforts to retain regional autonomy, has meant in part that implementing a coordinated national response to the pandemic has been challenging. Since the national government announced the state of alarm on 14 March 2020, which included a months-long lockdown period ending 21 June 2020, the national government was responsible for the new pandemic measures, whereas later pandemic measures largely devolved to the 17 autonomous communities, which hold broad responsibilities in health. The autonomous communities have implemented a heterogeneous range of COVID-19 prevention and control measures, such as lockdowns, physical distancing, closure of schools, universities, libraries, nursing homes, restaurants, bars and sports centres, and in cases restricting movement between different municipalities and provinces.

Government leadership and public cooperation are essential throughout a pandemic, especially when there is a high level of uncertainty about risk and effective control measures. As individual characteristics can influence the level of public trust in government, it is important to assess how public perceptions of the government’s response to the pandemic may vary by socio-demographic and individual variables. This information may provide useful insights on how to overcome limitations in existing programmes, and areas where, and to whom, the government may need to focus more of their efforts.

COVID-Score was implemented globally in June 2020, when Spain had experienced a severe early first wave of infection, hospitalizations and deaths, similar to neighbouring countries France and Italy, and the population had been subjected to strict home confinement, only allowed to leave to obtain essential goods such as food or medicines. Also, although no COVID-19 vaccine was in an advanced stage of development at the time, a quarter of the Spanish population reported hesitancy in taking it should one become available. The study found Spain to have a mean average COVID-Score of 44.68 out of a maximum of 100, one of the lowest scores across the 19 countries examined. Broadly, these items cover socio-economic support, health service continuity, communication and disease control measures. We explore these perceptions by socio-demographic characteristics and individual variables.

Methods

Data collection

Participants were recruited to the COVID-Score-10 study through multiple international service providers to avoid coverage bias. A sample (n = 748) of adults residing in Spain and who speak Spanish were recruited through demographic strata weighted to be representative of the general population in terms of age, sex and education level. Using a 95% confidence level and margin of error of ±3.7, a minimum sample size of 702 was calculated as necessary to represent the 2020 Spanish population of 47.36 million.

On 16–20 June 2020, participants were provided a Spanish translation of the COVID-Score-10 instrument (see Supplemental file S1) to assess their perception of 10 key government pandemic control measures (see Table 1). Further methodological details are described elsewhere.

Analysis

Ordered logistic regressions for each of the 10 COVID-Score items compared those who ‘somewhat agreed’ and ‘completely agreed’ with those who ‘were neutral/[had] no opinion’, ‘somewhat disagreed’ and ‘completely disagreed’. We performed regression analyses with three socio-demographic variables: age, gender, education level and two individual variables: whether the respondent had been affected by COVID-19 (yes or no/unsure), and whether the respondent trusted their government to successfully address unexpected health threats (yes or no). Transgender and other gender responses were excluded from this analysis because of an insufficient minimum sample. Analyses were conducted using Stata version 14.2.

Ethics statement

The Emerson College Institutional Review Board (IRB protocol number 20-023-F-E6/12) approved the data collection materials and methods for the original COVID-Score-10 study. This study uses these data, which were collected by an online questionnaire administered by Emerson College, USA.

Table 1 COVID-Score-10 questions to assess public perception of 10 key government pandemic control measures

| Question                                                                 | Description                                                                 |
|--------------------------------------------------------------------------|------------------------------------------------------------------------------|
| (1) The government helped me and my family meet our daily needs during the COVID-19 epidemic in terms of income, food and shelter. |                                                                                   |
| (2) The government communicated clearly to ensure that everyone had the information they needed to protect themselves and others from COVID-19, regardless of socio-economic level, migrant status, ethnicity or language. |                                                                                   |
| (3) I trusted the government’s reports on the spread of the epidemic and the statistics on the number of COVID-19 cases and deaths. |                                                                                   |
| (4) The government had a strong pandemic preparedness team that included public health and medical experts to manage our national response to the COVID-19 epidemic. |                                                                                   |
| (5) The government provided everyone with access to free, reliable COVID-19 testing if they had symptoms. |                                                                                   |
| (6) The government made sure we always had full access to the healthcare services we needed during the epidemic. |                                                                                   |
| (7) The government provided special protections to vulnerable groups at higher risk such as the elderly, the poor, migrants, prisoners and the homeless during the COVID-19 epidemic. |                                                                                   |
| (8) The government made sure that healthcare workers had the PPE they needed to protect them from COVID-19 at all times. |                                                                                   |
| (9) The government provided mental health services to help people suffering from loneliness, depression and anxiety caused by the COVID-19 epidemic. |                                                                                   |
| (10) The government cooperated with other countries and international partners such as the World Health Organization to fight the COVID-19 pandemic. |                                                                                   |
Table 2 Descriptive statistics and distribution of COVID-Score-10 responses in Spain (n = 748)

| Item | Mean score | SD | % of max score (5.00) | Completely agree | Somewhat agree | Neutral/no opinion | Somewhat disagree | Completely disagree |
|------|------------|----|----------------------|------------------|----------------|-------------------|------------------|-------------------|
| Item 1 | 2.63 | 1.33 | 62 | 64 (9) | 167 (22) | 157 (21) | 149 (20) | 211 (28) |
| Item 2 | 3.11 | 1.48 | 57 | 163 (22) | 210 (28) | 81 (11) | 133 (18) | 161 (22) |
| Item 3 | 3.23 | 1.44 | 59 | 103 (14) | 213 (28) | 78 (10) | 160 (21) | 194 (26) |
| Item 4 | 3.01 | 1.49 | 60 | 152 (20) | 196 (26) | 90 (12) | 131 (18) | 179 (24) |
| Item 5 | 2.09 | 1.33 | 42 | 57 (8) | 92 (12) | 82 (11) | 150 (20) | 367 (49) |
| Item 6 | 3.06 | 1.41 | 61 | 129 (17) | 231 (31) | 95 (13) | 141 (19) | 152 (20) |
| Item 7 | 2.65 | 1.39 | 53 | 87 (12) | 162 (22) | 111 (15) | 176 (24) | 212 (28) |
| Item 8 | 2.41 | 1.35 | 48 | 59 (8) | 151 (20) | 91 (12) | 187 (25) | 260 (35) |
| Item 9 | 2.61 | 1.32 | 52 | 73 (10) | 142 (19) | 161 (22) | 167 (22) | 205 (27) |
| Item 10 | 3.46 | 1.27 | 69 | 174 (23) | 249 (33) | 157 (21) | 84 (11) | 84 (11) |

a: Mean scores and SDs for each item used to calculate the percentage of a maximum possible score were first reported in Lazarus et al.10

Results

Our sample includes 345 females and 401 males (see Supplemental file S2). Most respondents (56%) completed a university degree or higher education. The average age is 41 years, and the median is 39. Each of the 17 autonomous communities was represented in the study with 38% of participants living in the Community of Madrid and Catalonia (see Supplemental file S3).

The percentage of a possible maximum score for each item across the sample of Spanish individuals (table 2) indicates an overall low perception of all 10 key aspects of the government’s pandemic response. Respondents most agreed with government cooperation with other countries and international partners (item 10, 69% of the maximum possible score). The government’s response in providing free, reliable access to COVID-19 testing was rated lowest among respondents (item 5, 42% of the maximum possible score, while 49% of all respondents completely disagreed).

For all 10 items, the odds that someone who trusted the government to successfully address unexpected health threats agreed with the government’s COVID-19 control measures were at least five times higher than someone who did not (table 3). These odds were highest for item 3: trustworthy information [odds ratio (OR) 12.99; 95% CI (9.12–18.52)], item 4: formulation of a pandemic preparedness and response team [OR 11.94; 95% CI (8.51–16.76)] and item 5: provision of access to COVID-19 testing [OR 11.77; 95% CI (7.77–17.82)].

Having been affected by COVID-19 showed lower odds of agreement with the government’s response than those who had not been affected for item 2: communication [OR 0.67; 95% CI (0.45–1.00)], item 3: information [OR 0.65; 95% CI (0.43–0.98)], item 4: formulation of a pandemic preparedness and response team [OR 0.61; 95% CI (0.41–0.91)] and item 7: special protections for vulnerable groups [OR 0.59; 95% CI (0.39–0.88); table 3].

Compared to female respondents, male respondents had lower odds of agreeing with the government response in item 2: communication [OR 0.69; 95% CI (0.50–0.94)], item 3: information [OR 0.66; 95% CI (0.48–0.91)] and item 4: formulation of a pandemic preparedness and response team [OR 0.68; 95% CI (0.50–0.94)]. Conversely, male respondents had a 36% greater odds of agreeing with the government’s response for item 9: provision of mental health services compared with female respondents [OR 1.36; 95% CI (1.01–1.85); table 3].

Those who reported having a university degree or higher education had lower odds of agreeing with the government’s response for item 2: communication [OR 0.54; 95% CI (0.38–0.81)], compared with those with a lower level of education (table 3).

Discussion

Many factors may have influenced the Spanish public’s perception and cooperation with their governments’ recommended COVID-19 control measures, including perceived risk,15 trust in government capabilities and political, ideological and cultural values.16 Although there is a lack of clarity about the impact of these contributing factors, public trust in government during a public health threat may improve when governments communicate with competency, consistency, credibility, honesty and transparency.7 Evidence suggests that low or declining levels of public trust in the government may reflect a gap between individual expectations about what the government should accomplish and the government’s actual performance.9 In addition, trust in government may be negatively affected when public officials disagree or even contradict themselves over a policy or restriction measure, thus generating confusion and uncertainty.

In mid-2020, the Spanish public’s perception of their government’s response to the COVID-19 pandemic was low, and varied by key pandemic control measures, similar to France and Italy at the same time.10 We found that respondents who reported trust in their government to successfully address unexpected health threats showed the greatest odds of positive perceptions across the 10 key pandemic control measures as compared with those who did not. The competence of leading experts advising governments is also associated with the confidence inspired in citizens by the government in managing the crisis. Our results show that the odds of having positive perceptions of the government’s response in terms of communication, information, formulation of a pandemic preparedness and response team and provision of mental health services significantly varied by gender and whether respondents reported having been affected by COVID-19.

Below, we discuss the 10 key aspects of the Spanish government’s COVID-19 control measures reported on in this study, which cover socio-economic support, health service continuity, communication and disease control.

Socio-economic support (items 1 and 7)

Spain, like most of Europe,17 has been affected in terms of physical and psychosocial health, as well as economic well-being due in part to prevention and control measures, such as restrictions on free movement and reductions in business activity, contributing to permanent and temporary layoffs and short-term workforce reductions.18 Some social groups have been disproportionately affected by the pandemic; e.g. gender inequalities in paid and unpaid work became exacerbated during the confinement period,19 and the rate...
Table 3 OR of agreement with each COVID-SCORE item by socio-demographic and individual variables (n = 746)

| Item   | Government trust (95% CI) | P-value | Affected by COVID-19 (95% CI) | P-value | Age (95% CI) | P-value | Gender—male (95% CI) | P-value | Some college (95% CI) | P-value | University or higher (95% CI) | P-value |
|--------|---------------------------|---------|--------------------------------|---------|--------------|---------|-----------------------|---------|------------------------|---------|-------------------------------|---------|
| Item 1 | 6.75 (4.90–9.28) *        | 0.00    | 1.13 (0.77–1.63) *             | 0.53    | 1.00 (1.00–1.01) | 0.35    | 1.16 (0.87–1.56) *    | 0.30    | 0.97 (0.62–1.50) *          | 0.89    | 0.91 (0.64–1.27) *           | 0.57    |
| Item 2 | 9.14 (6.58–12.68) *       | 0.00    | 0.67 (0.45–1.00) *             | 0.05    | 1.01 (1.00–1.02) | 0.27    | 0.69 (0.50–0.94) *    | 0.02    | 0.72 (0.44–1.17) *          | 0.19    | 0.54 (0.38–0.81) *           | 0.00    |
| Item 3 | 12.99 (8.12–18.52) *      | 0.00    | 0.65 (0.43–0.98) *             | 0.04    | 1.01 (1.00–1.02) | 0.10    | 0.66 (0.48–0.91) *    | 0.01    | 0.98 (0.60–1.60) *          | 0.93    | 0.94 (0.64–1.37) *           | 0.74    |
| Item 4 | 11.94 (8.51–16.76) *      | 0.00    | 0.61 (0.41–0.91) *             | 0.02    | 1.01 (1.00–1.02) | 0.18    | 0.68 (0.50–0.94) *    | 0.02    | 0.85 (0.53–1.38) *          | 0.52    | 0.89 (0.61–1.29) *           | 0.53    |
| Item 5 | 11.77 (7.77–17.82) *      | 0.00    | 0.88 (0.57–1.36) *             | 0.56    | 1.00 (0.99–1.01) | 0.49    | 0.92 (0.66–1.28) *    | 0.62    | 1.37 (0.83–2.27) *          | 0.22    | 1.05 (0.71–1.54) *           | 0.82    |
| Item 6 | 8.55 (6.22–11.74) *       | 0.00    | 0.76 (0.52–1.13) *             | 0.18    | 0.99 (0.98–1.00) | 0.07    | 0.79 (0.58–1.07) *    | 0.13    | 0.87 (0.54–1.39) *          | 0.55    | 0.88 (0.61–1.26) *           | 0.47    |
| Item 7 | 7.32 (5.24–10.21) *       | 0.00    | 0.59 (0.39–0.88) *             | 0.01    | 1.00 (0.99–1.01) | 0.34    | 0.99 (0.73–1.34) *    | 0.95    | 0.88 (0.55–1.40) *          | 0.60    | 0.75 (0.53–1.06) *           | 0.10    |
| Item 8 | 7.28 (5.02–10.56) *       | 0.00    | 0.65 (0.42–1.00) *             | 0.052   | 0.99 (0.98–1.00) | 0.06    | 1.02 (0.74–1.42) *    | 0.89    | 1.10 (0.68–1.80) *          | 0.70    | 0.83 (0.57–1.21) *           | 0.33    |
| Item 9 | 5.19 (3.74–7.19) *        | 0.00    | 0.81 (0.55–1.20) *             | 0.29    | 1.01 (1.00–1.02) | 0.11    | 1.36 (0.91–1.85) *    | 0.05    | 1.02 (0.66–1.66) *          | 0.92    | 0.71 (0.50–1.01) *           | 0.054   |
| Item 10| 5.25 (3.78–7.27) *        | 0.00    | 0.90 (0.60–1.34) *             | 0.60    | 0.99 (0.98–1.00) | 0.21    | 0.85 (0.62–1.16) *    | 0.30    | 1.32 (0.81–2.13) *          | 0.26    | 1.11 (0.77–1.60) *           | 0.58    |

*: P values ≤ 0.050. Bold text indicates OR coefficient.
receives the correct information, and to ensure community input on the messages to ensure their effectiveness. Validated techniques should be used to evaluate the impact and reach of targeted messaging.

Television, news and social media play a key role in framing and shaping public perception by selecting which issues are reported, and how and who represent them and in so doing can influence or bias public opinion. The rigour of science-based reporting varies in quality and accuracy across media types, which can be a challenge for the public to manage and evaluate, given the diverse types of media. A study of COVID-19 information in daily newspapers’ front pages in Spain and Italy from late February to early April 2020 found that in Spain, the media outlets offered slightly more political coverage of the crisis than in Italy, with national political figures serving as the primary information providers and highlighting political conflicts in the management of the pandemic. In line with previous findings, this may have partly contributed to the lower levels of public perception in the government’s response as reported in this study.

**Disease control (items 3, 4, 5 and 10)**

It is crucial for decision-makers and the public to have access to timely, reliable, disaggregated and comprehensive COVID-19 data collection systems, and coordinating bodies at the local, regional and national levels should regularly report an accurate count of COVID-19 cases and deaths to guide policy and service interventions and inform the public. In Spain, there were restrictions on testing and limitations in the COVID-19 data published at the national and regional level; e.g., five autonomous communities offer selected COVID-19 metrics disaggregated by age and sex, and data are not always comparable across regions, which creates a challenge in reporting and monitoring at the national level. Collectively, this reduced the ability to fully understand the dynamics of the virus, including domestic transmission dynamics, and to inform appropriate action. Further, Spain had no aerosol experts advising the government and it was not until 8 November 2020 that the government accepted this mode of virus transmission. This may have hampered public trust and created confusion with regards to transmission of the disease and related control measures.

Spain does not have a National Public Health Agency; rather, the Coordination Centre for Health Alerts and Emergencies (CCAES) reports directly to the Director-General of Public Health within the Ministry of Health, the responsible unit for preparedness planning and response to public health threats and cooperation with international institutions. The CCAES quickly established a coordinated response between the national and regional governments, but faces regular political and logistical challenges including an inability to achieve consensus for numerical criteria to guide response measures.

The creation of a Spanish Public Health Agency for the whole country has been one of the conclusions emerging from the National Commission for Economic and Social Reconstruction established by Spain’s Parliament.

International cooperation can be vital in controlling the spread and mitigating the impact of the pandemic, e.g. management of supply chains and production of PPE, medicines and COVID-19 vaccines. Spain's Parliament established the National Commission for Economic and Social Reconstruction (COMERE) to oversee the recovery process, and this Commission must be a key member of any International Commission for Economic and Social Reconstruction (ICMER) for Europe. International cooperation can be vital in controlling the spread and mitigating the impact of the pandemic, e.g. management of supply chains and production of PPE, medicines and COVID-19 vaccines. Spain's Parliament established the National Commission for Economic and Social Reconstruction (COMERE) to oversee the recovery process, and this Commission must be a key member of any International Commission for Economic and Social Reconstruction (ICMER) for Europe.

Table 4 Policy recommendations to enhance the Spanish (central and regional) governments’ future COVID-19 control measure efforts

| Policy recommendations: |  |
|--------------------------|--|
| **Socio-economic support:** |  |
| - Ensure the timely provision of expanded social and financial protection programmes, particularly for identified vulnerable populations, to facilitate inclusive and sustainable recovery (including housing protection and supportive return-to-work policies). It has sometimes been made public that these initiatives have stagnated during formulation and public announcement, and are not being implemented with the necessary agility for people with pressing needs. It is important to review and address reported and potential administrative barriers to accessing these socio-economic benefits. |  |
| - Secure a coordinated national approach to ensure that documented and undocumented migrants and refugees can access the health and social services they need. |  |
| - Provide infrastructure and conditions for teleworking for those jobs where this is possible. |  |
| - Maintain and expand public spaces for health and well-being, such as for active travel and safely-distanced recreational physical activity. |  |
| **Health service continuity:** |  |
| - Strengthen primary healthcare and public health capacity to meet current and new health service needs. |  |
| - Scale up delivery of mental health services, including outreach to vulnerable groups. |  |
| - Strengthen information systems, and coordination and communication between health and social services to support COVID-19 data collection. |  |
| - Conduct regular service delivery assessments to monitor and overcome ongoing barriers to accessing care. |  |
| **Communication:** |  |
| - Ensure effective cooperation and communication between the government, the media, scientists, health experts, and the public, to ensure quality communication, which may also enhance public perceptions of the authorities’ ability to manage current and future health threats. Share messages via a variety of media and in all relevant languages. |  |
| - Monitor and interact on social media, serving as an official voice for health and the measures taken to control the severity of the pandemic. |  |
| - Develop clear, consistent, tailored messaging on COVID-19 protection measures, how the virus is transmitted, and vaccination opportunities to empower individuals to protect themselves and their communities. |  |
| **Disease control:** |  |
| - Although not a part of our study, there have been calls to establish a national Public Health Agency to support coordination of public health issues, and this warrants careful consideration. |  |
| - Collect and report COVID-19 data disaggregated, at a minimum, by sex, age, and geography, to better monitor the impacts of the pandemic on different social groups in different geographical areas, and health inequalities, to inform the governments’ public health response. |  |
| - Release regular, timely, consistent and comprehensive reports on COVID-19 data, which include updates on tests, cases, hospitalizations (including in intensive care units), deaths, and recoveries. All 17 autonomous communities should employ the same case definitions when providing these data, and these should be aligned across Europe. |  |
| - Ensure universal access to PPE and care for health workers. |  |
| - Strengthen testing and contact tracing capacity, and provide testing outside of health services as well. |  |
| - Provide PCR results in a timely fashion, e.g. within 24–36 h and, when urgent, within 12 h. |  |
| - Strengthen integrated healthcare, coordinating primary and specialized care and optimizing telemedicine. |  |
| - Ensure the timely production of COVID-19 vaccines including, if needed, in Spain for the national population and for export. |  |
| - Micro-eliminate COVID-19 by creating ‘green zones’ in Spain, at the province or autonomous community level, where COVID-19 has been controlled, and ensure that human and other resources in these zones support ‘red zones’ with resources to scale up testing, tracing, vaccination and other pandemic control measures. |  |
vaccines,\textsuperscript{13} and other global public goods, mobilization of resources to areas of greatest need (via e.g. the COVAX Facility) and information and knowledge-sharing. Our study found that government cooperation with international organizations was the best perceived of the 10 pandemic control measures (56\% agreement; see table 2).

Universal access to COVID-19 testing and contact tracing is needed to rapidly identify and isolate new cases and to improve data accuracy. Yet in Spain, testing capacities were low in the initial stage of the pandemic, and laboratories quickly became overwhelmed with the increased demand.\textsuperscript{28,29,31} Recently, it has also become clear that there is a need to intensify in Spain and around the world the limited genomic sequencing to identify and monitor severe acute respiratory syndrome coronavirus (SARS-CoV-2) variants,\textsuperscript{32,33} which required continued and possibly intensified pandemic control efforts, and to monitor for possible resistance to the current vaccines.\textsuperscript{34} Spain came out of lockdown and lifted most control measures without a comprehensive plan or well-established testing and tracing systems in place.\textsuperscript{28} For example, social and health centres, particularly care homes, have reported insufficient access to COVID-19 testing and ineffective communication with the national health service and other centres, which has made it challenging to identify and follow up on COVID-19 cases and trace contacts.\textsuperscript{25} In recent months, testing has been largely scaled up, yet widespread delays in both access to a test and receiving the results are still reported,\textsuperscript{25} and asymptomatic individuals desiring a test, including those who have been in a risk situation, must pay a private provider for one.

By assessing public perceptions during the early stage of the COVID-19 pandemic in Spain, we indirectly identified where there are challenges and subsequently consider potential opportunities to intervene to improve public trust and cooperation with government responses. The effectiveness of the response may influence public trust. As such, we have developed the following list of policy recommendations, some directly relating to our findings, and others that do not directly stem from our study, but were ascertained from the literature and related to the measures we studied (see table 4).

Limitations to our study include its point-in-time design, measuring public perception and trust, which are subjective domains that often change over time, in response to different factors and events, and vary by individuals and social groups. More longitudinal analyses will be needed to observe how public perceptions and trust may change during different waves of the pandemic and with changing (central and regional) government control measures. A major strength of our study was the effort undertaken to ensure the collection of a representative sample of the population; however, one limitation to the use of these data is that they do not explicitly capture the voice of marginalized populations, which have been disproportionately affected.\textsuperscript{40} In addition, respondents were asked to report whether they ‘trusted in their government to successfully address public health threats’. However, the use of the term ‘government’ was not distinguished by level (e.g. national, regional and local), and it is therefore possible to only assess perceptions of the government in broad terms, or to understand that most government actions through June 2020 stemmed from the national government in Spain. Future assessments of government performance should consider this distinction, as this may be particularly relevant in Spain, where health responsibilities, including subsequent government COVID-19 measures, are largely devolved to the 17 autonomous communities, and political tensions exist between different autonomous communities and the central government.

This study of the Spanish general public’s perception of their government’s response during the first wave of the COVID-19 pandemic can be used to guide future government response efforts. Overall, the Spanish public’s perception of their government’s response was low in mid-2020, and this perception varied by key control measures. In addition, perception of some government pandemic control measures, such as communication, significantly varied by socio-demographic characteristics and having been affected by COVID-19, which demonstrates the need for more tailored approaches in government communication and management strategies, alongside the need for a reinforcement of essential social and healthcare services, to protect population health and well-being. Fostering trust may improve the public’s perception of government response efforts and compliance with recommended measures, which will be crucial in 2021 to ensure a high uptake of the COVID-19 vaccine. Further research is needed to understand the influences of public perceptions of and trust in the government during public health threats, why these may vary across different social groups and which determinants (e.g. individual and sociocultural–political values) may contribute. Continuous assessment of public perceptions of government response measures will be important to guide policy and research on the COVID-19 response, and unexpected health threats in the future.

Data sharing statement

All individual participant data, the data codebook, and the Spanish language COVID-SCORE are available in Supplementary files.

Supplementary data

Supplementary data are available at EURPUB online.

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Conflicts of interest: None declared.

Key points

- This first study, analyzing the Spanish public’s perception of key pandemic control measures implemented by its government and examining these perspectives amongst different socio-demographic groups, offers lessons to Spain to improve its response to the coronavirus disease 2019 (COVID-19) pandemic.
- Our study found that individual and socio-demographic factors are associated with the Spanish public’s poor perception of government control measures, suggesting that fostering public trust during public health threats, and developing and implementing more tailored interventions may improve public perception and response to government efforts.
• Public perceptions of metrics for mental health services and social protections for vulnerable groups were found to be especially low, highlighting areas that deserve greater attention and more targeted policies and programmes to improve pandemic response efforts.

• Existing COVID-19 policies, interventions and health communications strategies in Spain remain weak and should be reviewed to consider our results with respect to different target audiences, namely men, women, those that experienced COVID-19, as well as biologically and socially vulnerable groups.

• In particular, the Spanish central and regional governments should better collaborate and prioritize interventions that address gender inequities and the groups most psychosocially impacted by the pandemic.

References

1. Legido-Quigley H, Mateos-García JT, Campos VR, et al. The resilience of the Spanish health system against the COVID-19 pandemic. Lancet Public Health 2020; 5:e251–2. Available at: www.thelancet.com/public-health (23 August 2020, date last accessed).

2. The Lancet Public Health. COVID-19 in Spain: a predictable storm? Lancet Public Health 2020;5:e568.

3. Worldometer. United States Coronavirus [Internet]. 2020 [cited 2021 Apr 14]. Available at https://www.worldometers.info/coronavirus/country/spain/.

4. Ministry of Health (Ministerio de Sanidad) of Spain. COVID-19 data and documentation [Internet]. 2020. Available at: https://covid19.isciii.es/covid19/decon/entidades-y-datos (9 December 2020, date last accessed).

5. Crespo J, Calleja JL, Zapatero A. Widespread covid-19 infection among Spanish healthcare professionals did not occur by chance. BMJ Opinion. 2020. Available at: https://blogs.bmj.com/bmj/2020/06/01/widespread-covid-19-infection-among-spanish-healthcare-professionals-did-not-occur-by-chance/ (23 April 2021, date last accessed).

6. Bernal E, Sandra D, Juan G-A, et al. Spain: health system review. Health Syst Transit 2019;20. Available at: https://www.healthobservatory.eu (25 March 2020, date last accessed).

7. Vaughan E, Tinker T. Effective health risk communication about pandemic influenza for vulnerable populations. Am J Public Health 2009;99:5324–32.

8. Quinn SC, Parmer J, Freimuth VS, et al. Exploring communication, trust in government, and government credibility during the initial stage of the 2020 Coronavirus pandemic (COVID-19) in Spain. Brain Behav Immun 2020;87:172–6.

9. Jacobs-Aviño C, López-Jiménez T, Medina-Perucha L, et al. Gender-based approach on the social impact and mental health in Spain during COVID-19 lockdown: a cross-sectional study. BMJ Open 2020;10:e044617. Available at: https://bmjopen.bmj.com/lookup/doi/10.1136/bmjopen-2020-044617 (4 December 2020, date last accessed).

10. Ministerio de Salud de España. Equidad en Salud y COVID-19: Análisis y Propuestas Para Abordar la Vulnerabilidad Epidemiológica Vinculada a Las Desigualdades Sociales. 2020. Available at: https://www.mscbs.gob.es/profesionales/saludPublica/cayetes/alertasActual/nCov/documentos/Covid19_Equidad_en_salud_y_covid19.pdf (23 April 2021, date last accessed).

11. Tejedor S, Cervi L, Tusa F, et al. Information on the covid-19 pandemic in daily newspapers’ front pages: case study of Spain and Italy. Int J Environ Res Public Health 2020;17:1–16.

12. Larson HJ, Cooper LZ, Eskola J, et al. Addressing the vaccine confidence gap. Lancet 2011;378:526–35.

13. Moros MIS, Monge S, Rodríguez BS, et al. COVID-19 in Spain: view from the eye of the storm. Lancet Public Health 2020; 6(1): e10.

14. Tria S, Himos S, Alustiza A, Prats C, et al. The need for detailed COVID-19 data in Spain. Lancet Public Health 2020; 5:e576.

15. Henriquez I, Gonzalo-Almoro X, García-Goiti M, Psilocib. The first months of the COVID-19 pandemic in Spain. Health Policy Technol 2020;9:560–74.

16. González-Candelas F, Coscolla M, Comas I, Consortium S-S. Genomic epidemiology of SARS-CoV-2 in Spain. In: ESCMID Conference on Coronavirus Disease, 2020. Available at: https://digital.cscis.es/handle/10261/220158 (19 February 2021, date last accessed).

17. European Centre for Disease Prevention and Control. Sequencing of SARS-CoV-2: First Update. 2021. Available at: https://www.ecdc.europa.eu/en/publications-data/sequencing-sars-cov-2 (19 February 2021, date last accessed).

18. World Health Organization. Genetic Sequencing of SARS-CoV-2: A Guide to Implementation for Maximum Impact on Public Health, 2021. Available at: https://apps.who.int/iris/handle/10665/338480 (23 April 2021, date last accessed).

19. Ministerio de Salud Goberno de España. Pruebas Diagnosticas: Total PCR Realizados Hasta el 6 de Agosto de 2020. 2020. Available at: https://www.mscbs.gob.es/profesionales/saludPublica/cayetes/alertasActual/nCov/documentos/COVID-19_pruebas_diagnosticas_06_08_2020.pdf (23 April 2021, date last accessed).

20. Nieuwenhuijsen MJ. COVID19 and the city: from the short term to the long term. Environ Res 2020;191:110066.
Selective perimeter lockdowns in Madrid: a way to bend the COVID-19 curve?

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Lockdowns have been widespread used to limit social interaction and bend the epidemic curve. However, their intensity and geographical delimitation have been variable across different countries. Madrid (Spain) implemented perimeter lockdowns in September with the purpose of bending the COVID-19 curve. In this article, we compared, using join point regressions, the evolution of COVID-19 cases in those areas where this intervention was implemented and those where it was not. According to our analysis, the decrease in the epidemic curve started before the impact of the perimeter lockdown could be reflected.

Introduction

The use of interventions aiming to limit mobility and economic activity has been a widespread non-pharmaceutical intervention (NPI) to control the transmission of SARS-CoV-2.¹ Lockdown interventions have been seen as one of the most effective ways to bend the epidemic curve.² However, their intensity and geographical delimitation have been variable. Thus, an individual evaluation of each strategy is required to determine their effectiveness in order to design future NPI to mitigate the effect of COVID-19 transmission.³

Madrid is one of the most affected European regions throughout the pandemic and the Spanish region with the highest number of cases and deaths: until 16 December, 369,522 COVID-19 cases and 11,619 deaths have been declared, meaning an estimated seroprevalence of 18.6% since the beginning of the pandemic, as shown in a recent report.⁴ One study showed that Madrid was the Spanish region with the largest drop in weekly life expectancy during the first wave of the pandemic.⁵

In 21 September, in the middle of the second wave of the pandemic, Madrid regional government implemented the so-called ‘perimeter lockdowns’ in the Basic Health Zones (BHZ)⁶ (the smallest health territorialization units, composed of a mean population of 22,290 inhabitants) where community transmission was reaching critical levels (14-day COVID-19 cases rate per 100,000 > 1000 on 15 September). This perimeter lockdowns restricted mobility in-and-out of the BHZ except for essential purposes (work or academic activities, caring for dependent people or carrying out administrative procedures) as well as limited capacity of business but without closing restaurants or restricting other types of economic activity. This type of lockdown was only comparable with the ‘dynamic confinements’ in Chile, whose effectiveness has been questioned.⁷ Thus, we want to assess whether the trend of 14-day COVID-19 rate changed in the BHZ affected by perimetral lockdown with respect to other BHZ in the city of Madrid that were not affected by the perimetral lockdown.

Methods

Data source

We collected publicly available weekly data on the 14-day COVID-19 rate per 100,000 population between 7 July and 1 December from the open COVID-19 open portal dataset of the Health Department of the regional government.

First, we selected all BHZ within the city of Madrid, excluding the rest of the region to avoid the potential bias of the rural areas. From this, we selected the 26 BHZ that were affected by the perimeter lockdowns and a control group of 29 BHZ that had a 14-day COVID-19 rate above 700 cases per 100,000 on 15 September, corresponding the highest tertile of transmission when first perimeter lockdown was decided. We chose this cut-off point for the control group in order to have a comparable group in terms of similar COVID-19 transmission at the time of the lockdown decision. A sensitivity analysis of all the BHZ without perimeter lockdown is included in Supplementary file.