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Public Perceptions Of COVID-19 Lockdown Policies In Europe: Socioeconomic Status And Trust Were Factors

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ABSTRACT **During the COVID-19 pandemic, governments worldwide implemented nonpharmaceutical lockdown policies to mitigate the impact of the virus. The effectiveness of these policies depended on public support, and they came with serious consequences for the population. Given that people's perceptions can influence their support for lockdown policies, we aimed to elicit perceptions of policy stringency among people in Denmark, France, Germany, Italy, the Netherlands, Portugal, and the United Kingdom in early 2021 as part of the European Covid Survey. We examined the extent to which objective measures of policy stringency and other factors were associated with these perceptions, focusing on disadvantaged populations. We found that objective measures of stringency did not accurately capture the impact of lockdown policies on people. Moreover, we found that socioeconomically disadvantaged people perceived policies as stricter than did less disadvantaged people and that trust in information sources greatly influenced such perceptions. Our findings underscore the importance of understanding factors influencing policy perception to help policy makers develop more effective and equitable infection containment strategies.**

During the early stages of the COVID-19 pandemic, the rapid spread of infections and subsequent rise in mortality rates compelled governments worldwide to implement nonpharmaceutical interventions to "flatten the curve" of infections. The aim was to reduce excess mortality and prevent health care systems from becoming overburdened while vaccines were being developed. An important aspect of nonpharmaceutical interventions is their focus on encouraging or mandating behavioral changes in specific population groups or the general population.[1] These interventions encompass various policies, ranging from less intrusive actions, such as social distancing, face mask usage, and frequent handwashing, to more stringent measures, such as stay-at-home policies and school closures.[1] In this article we refer to all government-mandated nonpharmaceutical interventions as lockdown policies.

Although they were seemingly effective at mitigating the transmission of SARS-CoV-2,[2,3] lockdowns came with serious consequences for the public.[4,5] They took a toll on economies worldwide[6] and resulted in widespread financial hardship and employment challenges.[7,8] In addition, limitations on movement and social interactions were linked to decreased mental health.[9–12] Importantly, the impact of lockdowns was not uniform across all communities, as a heavier burden was placed on specific population groups.[4] For instance, people with lower incomes or families with children tend to experience greater risks from income losses resulting from unemployment or underemployment,[5] which may lead to

discontent and decreasing adherence to lockdown policies, thereby undermining these policies' effectiveness. Indeed, public support for lockdown policies proved to be crucial for adherence to them, and thus to their overall success; studies investigating adherence in this context have highlighted the importance of trust in governments and their institutions.[13,14] Therefore, continuously measuring public support for these policies is crucial to detecting any changes in public opinion as early as possible. However, whereas objective measures of the stringency of lockdown policies can provide a general impression of the burden they impose, one way to help approximate their true burden on individuals is to use subjective measures, such as people's perceptions of them. In this study we defined *objective measures* as those that are independent of personal beliefs and that are reliably measurable by neutral observers, such as the mortality rate of a disease. In contrast, *subjective measures* were defined as those that are dependent on personal beliefs and cannot be reliably measured by neutral observers, such as a person's political beliefs.

To date, few studies have used such subjective measures, whether to measure perceptions of policy stringency or to investigate the determinants of these perceptions. Sanguk Lee and colleagues[15] examined which factors influenced perceived COVID-19 policy stringency in the US between June and October 2020. They also explored the influence of perceived policy stringency on mask wearing and social distancing. Their findings revealed that factors such as the COVID-19 mortality rate negatively influenced perceived stringency, whereas the infection rate had no impact. In addition, the association between political ideology and perceived policy stringency was weakened when people sought information about COVID-19 on social media. Adherence to both mask wearing and social distancing decreased with higher perceived policy stringency. Importantly, Lee and colleagues found that objective and perceived policy stringency were not correlated, suggesting that these are distinct and independent constructs.[15] Some studies have also investigated the correlation between objective policy stringency and other subjective measures, focusing on the mental health impact of lockdowns.[10–12]

We aimed to investigate further the relationship between objective measures of the stringency of lockdown policies and people's perceptions of policy stringency. We specifically examined the perspectives of vulnerable groups, to uncover inequities in the perceived burden of these policies. Our research combined data from the European Covid Survey[16] with data from the Oxford COVID-19 Government Response Tracker[17] and used panel-ordered logistic regression with random effects to assess the determinants of perceived policy stringency. In addition, we sought to identify the perceptions of relevant subgroups within the populations by differentiating the results between sexes, households with and without children, people with and without financial difficulties, degrees of trust in social media information, and countries.

Our study's main contribution was to map the relationship between the objective and perceived stringency of lockdown policies during the COVID-19 pandemic in Europe. We especially focused on the increased pressures faced by vulnerable groups during the pandemic. This allowed us to point out which groups (for example, families with children or those facing financial difficulties) were disproportionately affected by the implemented containment policies. Our analysis identified trust as an important influence on perceived policy stringency, revealing that those who trusted information from social media perceived measures as stricter, whereas higher trust in information from the government had the opposite effect. When designing containment policies in future pandemics, decision makers in the US and Europe may wish to consider the additional challenges experienced by vulnerable populations, as well as using new channels for factual information—such as social media—to enhance adherence to nonpharmaceutical containment policies.

Study Data And Methods

DATA The European Covid Survey was an online panel survey that tracked policy attitudes, people's willingness to get vaccinated, and the concerns of the European population during the COVID-19 pandemic.[18] The survey collected data approximately every two months from April 2020 through December 2022 in seven European countries (Denmark, France, Germany, Italy, the Netherlands, Portugal, and the United Kingdom), spanning eleven waves. For our analysis, we used data from waves 5–7, which were collected in 2021 from January 19–February 1, April 2–19, and June 21–July 5, respectively. In each wave, the sample consisted of about 1,000 people per country and was representative in terms of age, sex, and geographic region.[18] The final study sample comprised 21,348 observations from 12,842 people. In addition, we merged data from the European Covid Survey with the Oxford COVID-19 Government Response Tracker stringency index developed by the University of Oxford.[17] The Oxford data set provides comprehensive information on government responses

to the COVID-19 pandemic.[19] Starting on January 1, 2020, it captured daily changes in various indicators for more than 180 countries, including policies related to containment and closure, economics, health systems, and vaccination. Finally, information on COVID-19 mortality rates in the seven countries came from Our World in Data.[20]

VARIABLES AND ANALYSIS The dependent variable in our analysis was survey participants' perception of the stringency of the lockdown policies in place at the time of the respective wave of the European Covid Survey. Each participant rated this perception on a scale from 0 to 100 (with 0 being "not strict at all" and 100 being "very strict"). The main independent variable was objective policy stringency, obtained from the Oxford COVID-19 Government Response Tracker stringency index. The index consists of eight indicators related to containment and closure policies, such as school closures and stay-at-home orders, and one indicator on health care system policies—specifically, public information campaigns.[19] The indicators are combined into a single 0–100 scale (with 0 being no restrictions and 100 being the highest restrictions possible) for the respective country and at a specific point in time. Furthermore, we included covariables for sex, age, education level, income difficulties, household composition (that is, living with or without children), trust in information from the national government and from social media regarding COVID-19, vaccination status, perceived risk for COVID-19, health status, and country-specific COVID-19 mortality rate. In addition, we used dummy variables to account for country- and wave-specific variations.

To analyze the determinants of perceived stringency, we used panel-ordered logistic regression with random effects. We first ran the full model for baseline values and subsequently conducted separate analyses based on sex, income difficulties, household composition, trust in social media information, and country. Further information on methodology and the sensitivity analyses is in the online appendix.[21] All statistical analyses were conducted using Stata, version 17.0.

LIMITATIONS Our analysis was subject to several important limitations. First, the data we used were collected within a specific and short time frame during the COVID-19 pandemic when most countries had just started their vaccination campaigns. Thus, we could not fully capture the highly dynamic nature of policy and other changes, as at the beginning of the pandemic. As a result, some changes may have been missed. Second, the Oxford COVID-19 Government Response Tracker stringency index and the measure of perceived policy stringency in the European Covid Survey are somewhat difficult to compare. Although the Oxford index offers a clearly defined measure, perceived stringency is inherently ambiguous and can encompass a range of interpretations. Last, the values of the Oxford index represent national averages, which might not reflect the true situation in areas in which policies were implemented by local rather than national governments. We believe that this had no major impact on our results, because in early 2021 in some European countries (for example, Germany), most lockdown policies were decided on a national level, and few variations existed between regional entities.

Socioeconomically vulnerable groups perceived lockdown policies as stricter, reflecting the fact that they may bear a greater burden from these restrictions.

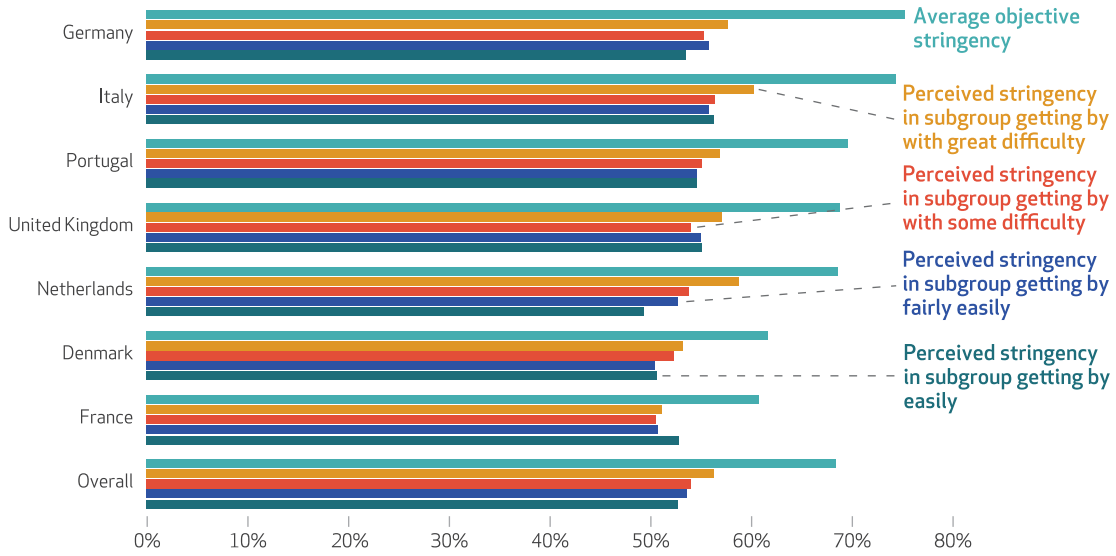
Study Results

DESCRIPTIVE TREND ANALYSIS Characteristics of the overall sample are provided in full in the appendix.[21] On average, European Covid Survey participants rated perceived policy stringency at 53.85 out of 100 points. In contrast, the average objective policy stringency, measured using the Oxford COVID-19 Government Response Tracker stringency index, was 68.45 points. Perceived stringency varied across subgroups. For example, across all waves, respondents who were male, young, or living with children consistently perceived the policies as stricter. Moreover, in most countries, respondents experiencing greater income difficulties perceived the policies as more stringent than those facing fewer difficulties (exhibit 1).

Overall, although average objective and perceived policy stringency decreased over time, the trend was stronger for objective stringency (exhibit 2). Indeed, by the last survey wave in our analysis, the difference between objective and

EXHIBIT 1

Average objective stringency and perceived stringency of lockdown policies during the COVID-19 pandemic in 7 European countries, by income difficulties, 2021



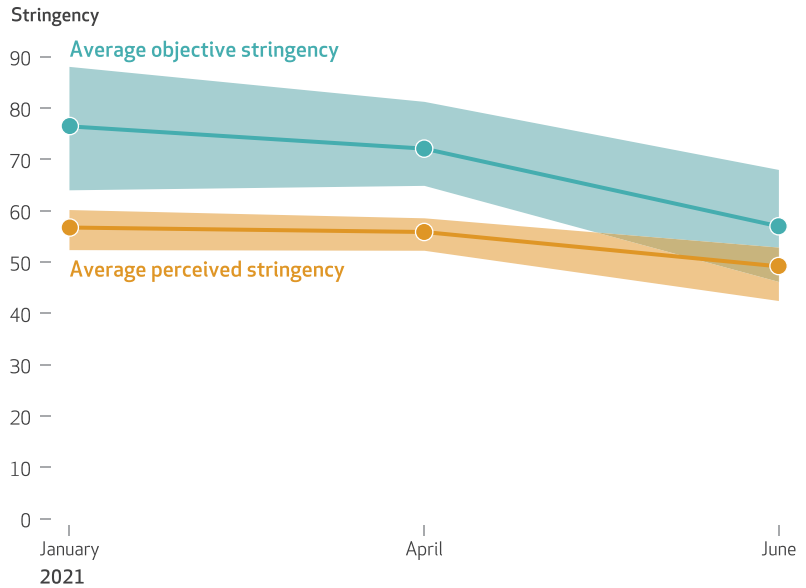
SOURCES Authors' depiction of data from the European Covid Survey between January 19 and July 5, 2021. Objective policy stringency data were drawn from the Oxford COVID-19 Government Response Tracker. **NOTES** Values are averages across survey waves 5–7 and per country (Denmark, France, Germany, Italy, the Netherlands, Portugal, and the United Kingdom). Income difficulty in the measure of perceived policy stringency was determined by participants' responses to the question, "Thinking of your household's total monthly income, would you say that your household is able to make ends meet?"

perceived stringency had diminished to the extent that in France and the UK, average perceived stringency was higher than objective stringency (appendix exhibit A2).[21] Perceptions of reductions in policy stringency varied by country as well. For example, in the United Kingdom, objective policy stringency decreased by 36.57 points but was only perceived as a 4.46-point reduction by respondents. In contrast, in Italy, a decrease in objective policy stringency of 6.14 points was perceived as a reduction of 7.56 points.

REGRESSION ANALYSIS Exhibit 3 visualizes the results of the main regression analysis. As anticipated, higher objective policy stringency was associated with an increased likelihood of perceiving the stringency of policies as high. In addition, higher age and female sex were associated with lower perceived policy stringency. In contrast, living with children increased the likelihood of perceiving lockdown measures to be highly stringent. Although education level did not show a significant association with perceived policy stringency, a higher income (that is, fewer income difficulties) did, decreasing the likelihood of perceiving the policies as very strict. Trust in government information on COVID-19 was associated with a lower likelihood of perceiving lockdown policies as strict. However, greater

EXHIBIT 2

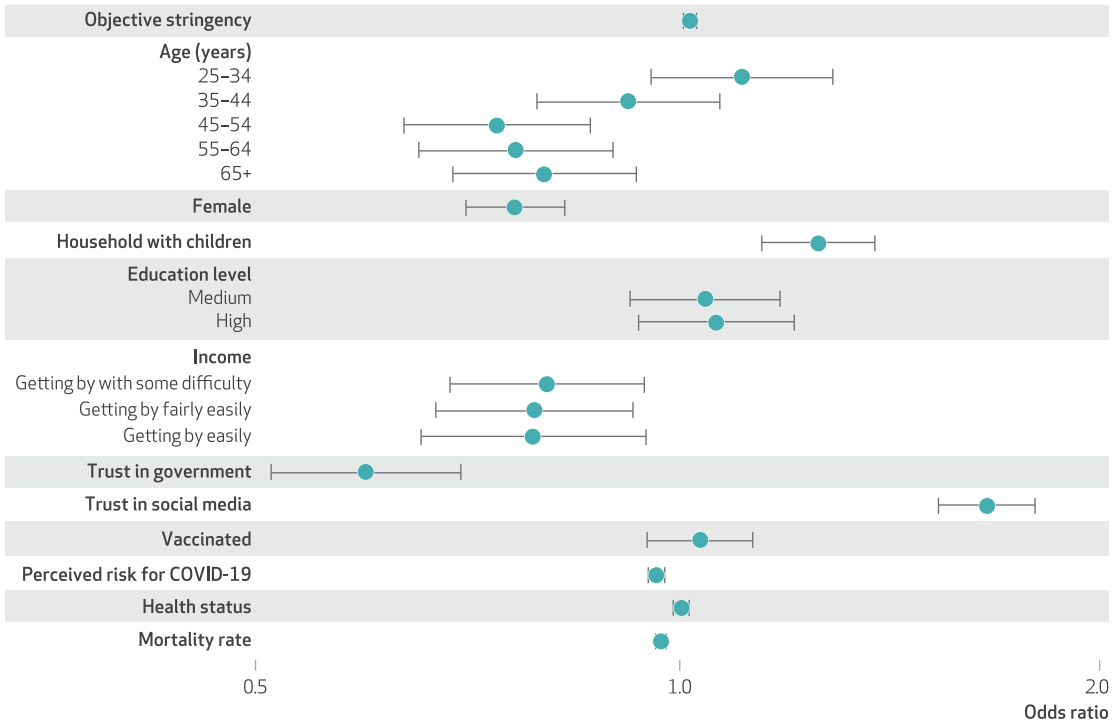
Average objective stringency and perceived stringency of lockdown policies over time during the COVID-19 pandemic in 7 European countries, 2021



SOURCES Authors' depiction of data from the European Covid Survey between January 19 and July 5, 2021. Objective policy stringency data were drawn from the Oxford COVID-19 Government Response Tracker. **NOTES** Values are averages across all seven European Covid Survey countries (listed in the exhibit 1 notes) for survey waves 5–7. The points in the figure note the average value across all seven European countries during that particular wave, and the shaded areas show the highest and lowest averages from the seven countries during each wave. Stringency is expressed as points on a 0–100 scale, with 0 being "not strict at all" and 100 being "very strict."

EXHIBIT 3

Average objective stringency and determinants of perceived stringency of lockdown policies during the COVID-19 pandemic in 7 European countries, 2021



SOURCES Authors' analysis of data from the European Covid Survey between January 19 and July 5, 2021. Objective policy stringency data were drawn from the Oxford COVID-19 Government Response Tracker. Data on COVID-19 mortality rates were drawn from Our World in Data. **NOTES** Odds ratios indicate the odds of a respondent's perceiving the stringency of lockdown policies as high. If the symbol is to the right of 1.0, the association with perceived stringency is positive, and the odds of perceiving stringency for the respective variable increase. The figure is logarithmically scaled. The reference category for age is 18–24. The reference category for education is "low." The reference category for income is "great difficulty."

trust in information from social media was associated with an increase in perceived policy stringency. Notably, respondents' vaccination status did not show a significant association with perceived stringency. Last, we found that the mortality rate and perceived risk for COVID-19 both decreased the likelihood of perceiving policy stringency as high, whereas the participants' health state had no significant association.

Most subgroup analyses yielded similar results across all variables, while also uncovering some differences. When examining differences by sex (appendix exhibit A4),[21] we found that living with children had a larger positive association with perceived policy stringency in women compared with men. In addition, among women, age and income difficulties mostly did not show a significant association with perceived policy stringency, whereas for men, both of these factors decreased the likelihood of perceiving the stringency of lockdown policies as high. When we conducted separate analyses based on income (appendix exhibit A6),[21] we observed that living with children was more strongly associated with higher perceived policy stringency among people with income difficulties than among those without such difficulties. Moreover, among people with income difficulties, trust in information from social media had a greater impact on perceived policy stringency than among those without such difficulties. Furthermore, comparing households with and without children (appendix exhibit A5),[21] we found that age and having fewer income difficulties decreased the likelihood of perceiving policy stringency as high among people with children. In contrast, no significant association was found with age or income difficulties among households without children. Trust in information from social media influenced perceived policy stringency more strongly among households with children than among those without. Finally, being vaccinated increased the likelihood of perceiving policy stringency as high among people living with children. Comparing by trust in information on social media (appendix exhibit A7),[21] we found that age and income were only associated with perceived stringency for people who did trust social

Efforts should be made to consider and incorporate the circumstances of those who are most heavily affected by lockdown policies.

media and decreased the likelihood of perceiving policy stringency as high. Being vaccinated decreased the likelihood of perceiving policy stringency as high among those who did not trust social media, whereas it had the opposite effect among those who did trust social media. Finally, subgroup analyses by country did not generate clear results, although trust both in information from the government and in social media was consistently significant across all countries (appendix exhibits A8–A10).[21]

Finally, our six sensitivity analyses (appendix exhibits A11 and A12)[21] showed that results were mostly stable in their size and direction over different model configurations. Only in the model with a fully balanced subsample did age, household composition, and income lose their significance while still maintaining comparable odds ratios.

Discussion

We examined a subjective measure of the stringency of lockdown policies in seven European countries during the COVID-19 pandemic and quantified the extent to which it was associated with an objective measure of policy stringency and other factors. Although we found a consistent but small positive association between people's perceptions and the objective measure of policy stringency, our findings indicate that other factors, such as socioeconomic status and trust, played a more important role. Specifically, people with lower levels of available income tended to perceive lockdown policies as stricter. Furthermore, the variation in the influence of these and other factors across subgroups, as well as in perceived policy stringency across countries, suggests the existence of diverse priorities and concerns.

Contrary to previous research,[15] we found a significant association between objective and perceived measures of policy stringency. Our results confirmed that they are different constructs that measure different aspects of stringency. Because perceived policy stringency can be defined as a subjective assessment of an objective concept that is observable by anyone,[22] a certain association between the two should be expected. Subjective perceptions of policy stringency hold particular relevance for decision makers in future pandemics because these extend beyond objective measures by incorporating the moderating and amplifying effects of personal experiences. Indeed, they can provide valuable insights into the public's attitudes toward, and the individual impacts of, lockdown policies, which cannot be fully captured by quantitative measures alone. Perceived policy stringency may be especially useful in providing insights into the experiences of vulnerable groups, shedding light on how lockdown policies may unintentionally exacerbate existing inequalities.

The importance of such insights is highlighted by the impact of sociodemographic variables in our analysis. Socioeconomically vulnerable groups perceived lockdown policies as stricter, reflecting the fact that they may bear a greater burden from these restrictions. Furthermore, reciprocal and amplifying effects between such policies and existing inequities may exacerbate previous conditions.[4] For example, stay-at-home orders and the closure of nonessential businesses during the pandemic caused significant economic disruption,[6,7] leading to unemployment and underemployment, which are more detrimental for families with children or those already facing financial difficulties.[5] Similarly, school closures are financially disruptive, especially for low-income families who rely on free meal programs in schools. Furthermore, women were more likely to take on the role of caretakers during the pandemic,[23] which may have placed particular strain on women living in households with children. Mental health problems due to lockdown measures may also contribute to people's perceptions; indeed, previous studies have found an association between psychological distress during the pandemic and young age,[9] as well as income difficulties.[24] This can contribute to a heightened perception of stringency and potentially reduce adherence to such policies,[15] leading to increased infection rates and, in turn, resulting in tougher restrictions. These restrictions can further exacerbate inequities, perpetuating an increasingly oppressive cycle for vulnerable groups.

We found that trust was a major and consistent determinant of perceived policy stringency. Higher trust in COVID-19 information from na-

tional governments was associated with lower perceived policy stringency than was lower trust in this source of information. This is in line with previous findings, which indicate that trust in government increased compliance with[13,25] and led to a more positive evaluation of[26] COVID-19 lockdown policies. Furthermore, recent findings show that trust in government is associated with increased trust in and uptake of vaccinations,[27–29] as well as lower COVID-19 infection rates.[29] Although trust in information from the government is not the same as trusting the government in general, it can serve as an approximation.

To our knowledge, this study was the first that analyzed the effect of trust in COVID-19-related information from social media and its detrimental effect on the perception of containment policies. We found that trusting COVID-19-related information from social media was associated with higher perceived policy stringency compared with the perception of those who did not trust this information source. This is an important finding, as most social interactions during pandemics shift to social media,[30] which is known to be a major source of misinformation.[31] Trusting information from social media uncritically, or getting caught in filter bubbles where recommendation algorithms only suggest content that reinforces one's viewpoints, may increase perceived policy stringency as a result of believing misconceptions about COVID-19 or lockdown policies. Previous research has shown that misinformation on social media reduces compliance with lockdown policies[32] and affects vaccination uptake over time.[33] We found strong differences in the impact of vaccination status on perceived stringency, depending on whether people did or did not trust information on social media, which may be an indication that misinformation is influencing the perception of vaccinations or associated policies. Moreover, the greater impact of trust in social media among people with income difficulties or living with children underscores the vulnerability of these groups to misinformation on social media.

Policy Implications

The diverse COVID-19 policy responses of the European countries in our sample compare with the individual responses of states in the US. In both Europe and the US, policy makers have taken different approaches to tackle the pandemic, with stark differences in policies, approaches, and how these policies were perceived (for example, New York compared with Florida and Germany compared with Denmark).[15,17,34] As a consequence, our findings may hold implications for policy makers in both the US and Europe in case of future disease outbreaks or pandemics. According to our results, decision makers should focus on trust and socioeconomic inequities to improve public acceptance of lockdown policies. This may hold special relevance in countries such as the US, where distrust in government institutions is relatively widespread.[35] Although establishing trust takes time, a first step is to invest in transparency and community engagement, which research has shown to foster trust in the government.[36,37] Promoting and supporting respected members or local organizations of vulnerable communities to act as intermediaries with policy makers may improve both aspects. Such trusted messengers have been shown to help bolster public trust and disseminate public health information.[37] They can communicate tailored and scientific information to the community while also providing a feedback channel back to the government. This direct feedback supports adjustment of policies and alleviating inequities that are relevant for strongly affected groups. Indeed, this may increase perceptions of government competence and fairness of policies that have been shown to be associated with increased trust in the government.[14,38]

Trusted messengers need a strong presence both on- and offline, so that pandemic-related lockdown policies do not diminish their outreach in the community. Furthermore, both trusted messengers and the government should promote information literacy in vulnerable populations through community courses and educational materials. Being able to navigate and find verified and reliable information increases the likelihood of identifying misinformation online.[39] In general, policy makers should boost their social media presence, as it can bolster public trust through increased transparency[36] and credibility.[40] Because we found that parts of the population, such as people with income difficulties and families with children, trusted COVID-19-related information on social media, policy makers have to ensure that there is information available that is factual and trustworthy. Taking steps to occupy the information space and challenge misinformation may lessen or prevent the negative impact of social media.[31]

Our results further highlight the need to address socioeconomic inequities for vulnerable populations when designing containment policies. Efforts should be made to consider and incorporate the circumstances of those who are most heavily affected by lockdown policies. Previous research has devised policy development frameworks that offer guidance on evaluating and mitigating the equity harms caused by lockdown policies.[4] When equity harms cannot

be avoided, financial support can be leveraged. For instance, the US offered stimulus checks to the public as financial relief from pandemic and lockdown pressures, and these checks have been credited with reducing poverty rates.[41] Targeted supports, such as child allowances, can be particularly effective in assisting low-income families, especially if the supports are adopted as a permanent solution.[42] These allowances can help offset the additional expenses caused by school or day care closures and can partly compensate for income losses experienced by parents resulting from layoffs or the need for child care at home. There is, however, no one-size-fits-all solution to improving the living conditions of every vulnerable population. Indeed, our results underscore the diverse concerns held by different groups about lockdown policies and the pandemic.

Conclusion

We investigated the relationship between objective and subjective measures of the stringency of lockdown policies during the COVID-19 pandemic in seven European countries. We also sought to identify factors influencing perceptions of policy stringency. We found that perceived policy stringency was not only correlated with objective policy stringency but also strongly linked to socioeconomic factors and trust in information sources. Our findings highlight that relying solely on objective measures of policy stringency to capture the impact of lockdown policies on individuals is insufficient. In particular, families with children and low-income households experienced a greater burden from these policies, resulting in a heightened perception of stringency. Moreover, trust emerged in our study as a consistent and substantial determinant of perceived policy stringency, underscoring the threat posed by misinformation on social media about the mischaracterization of the COVID-19 pandemic. At the same time, this finding suggests that social media could have a positive impact if harnessed, for instance, to cultivate trust in government or provide accurate information on lockdown policies. Regardless, policy makers must consider the potentially unequal impact of lockdown policies on vulnerable groups to avoid exacerbating existing inequities or creating new ones. Measuring perceived policy stringency can help identify such inequities and develop targeted approaches to support affected individuals and communities in future disease outbreaks and pandemics. ■

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NOTES

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