



The societal responses to COVID-19: Evidence from the G7 countries

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This paper provides a picture of how societies in the G7 countries have responded to the COVID-19 pandemic. Our point of departure is to examine the effects of the pandemic in terms of **four fundamental normative sources for well-being**: Solidarity (S; willingness for social cooperation), Agency (A; empowerment to shape one's prospects through one's own efforts), GDP (G), and Environmental Performance (E)—SAGE for short. The normative foundations of SAGE are communitarianism, classical liberalism, materialistic utilitarianism, and ecoethics. We find that although G and E responded predictably and uniformly to the pandemic (such as G declining and carbon emissions improving), the societal responses were strikingly different. Societies that are cohesive and empowered (high S and A) may be expected to cope with the pandemic better than those that are fragmented and disempowered (low S and A). Furthermore, the pandemic has had diverse effects on S and A; while some societies became cohering and empowering (rising S and A), others became fragmenting and disempowering (falling S and A), and yet others became fragmenting and empowering. We also show that most G7 countries experienced greater tribalization (measured as the difference between inward S and outward S) during the pandemic. These trends are a matter of concern since they suggest that the willingness and perceived ability to address collective challenges collectively have waned. The analysis also suggests that governments' social policies may have an important role to play alongside economic and health policies in coping with the pandemic.

COVID-19 | well-being | social sustainability | empowerment | beyond GDP

The COVID-19 pandemic changed the relationship between the market economy, government, and society in the G7 countries (Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States) and beyond. While market economies shut down everywhere in response to health restrictions, government and civil society have gained new significance in protecting people from the pandemic's effects. While government responses to the pandemic and epidemiological factors have been investigated in detail elsewhere,^{*} the response of civil societies has received far less attention. This study explores the civil society response to the pandemic in terms of the headline indicators of the SAGE Dashboard,[†] resting on normative components of societal well-being.

The SAGE Dashboard provides an empirical framework to measure economic and social prosperity. It is composed of four main indexes: Solidarity, Agency, gross domestic product (GDP), and Environmental Performance—SAGE for short. The movement of these indicators during the pandemic can shed light on the effect of the pandemic on well-being and offer prescriptive insights on how societies can cope with the challenges of the pandemic.

This study provides a picture of how countries have responded to the COVID-19 pandemic—one that tells quite a different story from the conventional analyses focusing on GDP alone. It shows that whereas the economic and environmental impacts were qualitatively similar—such as GDP declining, CO₂ emissions falling, and plastic waste rising—the societal responses of the G7 countries, in terms of Solidarity and Agency, were quantitatively and qualitatively disparate. We adduce empirical evidence indicating that these societal responses had important implications for well-being (in terms of how well people coped with the pandemic) and policy (in terms of the potential for solidarity- and agency-enhancing social policies).

^{*}The empirical evidence on government responses to the pandemic is vast [e.g., the IMF's "Policy Responses to COVID-19" (1), the OECD's "Key policy responses from the OECD" (2), Oxford's Blavatnick School "COVID-19 government response tracker" (3), and Our World in Data's "Policy Responses to the Coronavirus Pandemic" (4)] as well as academic analysis (e.g., ref. 5). The empirical literature in this area is also vast (e.g., refs. 6 and 7).

[†]The SAGE Dashboard is an outgrowth of the research initiative in "Recoupling economic and social prosperity" (8).

Significance

We examine the effects of the pandemic in terms of normative foundations for societal well-being in terms of Solidarity, Agency, GDP, and Environmental Performance. Our findings show that while G7 countries experienced similar qualitative changes in GDP and environmental performance in 2020, they had markedly divergent experiences with respect to Solidarity and Agency. This has potentially important implications for assessing societal well-being beyond GDP and environmental sustainability. Since Solidarity and Agency are amenable to policy influence, our findings suggest that the current preoccupation with economic policies in response to the pandemic may need to be supplemented by solidarity- and agency-enhancing social policies.

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Solidarity and Agency may be expected to influence the effectiveness of government policy. The policy effectiveness of a legitimate government (i.e., a government that is accepted as acting in the interests of its citizens and one that formulates policies that citizens are able to follow) depends on public compliance. Such compliance depends significantly on 1) the degree of social cohesion (inducing citizens to recognize that they are in the same boat regarding national challenges and to be willing to adhere to government policy) and 2) the degree to which citizens feel empowered to act in accordance with government policy. The first phenomenon is related to Solidarity, whereas the second is related to Agency.

Our analysis suggests that societies that are cohesive and empowered (relatively high Solidarity and Agency) tend to be more successful in containing the pandemic and mitigating its adverse effects than societies that are fragmented and disempowered (relatively low Solidarity and Agency). We also show that the pandemic brought with it significant changes in Tribalism (defined as the difference between inward and outward Solidarity), representing the difference between in-group and out-group cooperativity (defined below).

Furthermore, we provide evidence suggesting that these social characteristics vary significantly from year to year and are potentially amenable to government interventions (for which we cite some indirect evidence). This insight is potentially important since G7 governments have addressed the pandemic primarily through economic and health policies rather than through social policies. Social policies appear to have a potentially important—and thus far, largely unexploited—role in promoting countries' effectiveness in managing the pandemic crisis.

The scope of our analysis is restricted in two respects. First, it focuses on aggregate social indicators. Such aggregate indicators are clearly important for the same reasons that macroeconomic indicators, such as national income, are important. Distributional considerations—which are also important—are beyond the scope of this paper.[‡] Second, while we allude to potentially important policy implications of our results, a rigorous empirical examination of these implications is also beyond our reach in this study. There are reflexive interactions between government policy and psychosocial factors that will also deserve rigorous empirical attention in future research.

The paper is organized as follows. *The SAGE Dashboard* provides the conceptual background. *Diverse Social Responses to the Pandemic* summarizes the diversity of solidarity and agency responses to the pandemic. *Response Patterns to the Pandemic* examines differences in patterns of social responses, explores changes in these response patterns, and investigates the role of Tribalism in responding to the pandemic. *Note on Distributional Issues* covers some distributional issues, and *Further Considerations: Putting Fundamental Human Needs and Purposes at the Heart of Policy Making* concludes.

The SAGE Dashboard

The four indexes of the SAGE Dashboard may be described intuitively as follows. 1) Solidarity covers the need for social belonging and embeddedness in the society. 2) Agency covers the need to influence one's own fate through one's own

[‡]The distributions of Solidarity and Agency within a country play a useful role in assessing the health of civil society, much like the distributions of income and wealth are useful in assessing the health of an economy (*Note on Distributional Issues*).

efforts. Our measures of 3) GDP and 4) environmental sustainability[§] are conventional and receive little further attention. Data provided were used to take up the already established indexes of GDP and environmental sustainability on the one hand and to determine the indexes first presented with the SAGE Dashboard on the other hand. The indexes of solidarity and agency are based on the data exclusively provided. In our Solidarity index, country performance is measured across the key components social support, giving behavior, satisfaction with efforts to deal with the poor, and minority rights. Our Agency index is composed of confidence in empowering institutions, freedom of life choice, vulnerable employment, and life expectancy. The Solidarity and Agency indexes are calculated as the arithmetic mean of the standardized input variables. Data sources and methodology are further described in *SI Appendix, section 2*. The SAGE indexes and subindexes are given in *SI Appendix, section 3*.

There already exist many well-known indexes of societal welfare that extend beyond GDP (indicators that adjust GDP or measure human capacities, psychological and sociological measures of well-being, or hybrid indicators).[¶] Where the SAGE Dashboard breaks ground is in its focus on Solidarity and Agency as fundamental social characteristics shedding light on both well-being and society's response to collective challenges. In particular, the SAGE Dashboard is a measure of social prosperity resting entirely on a few major ethical foundations. Solidarity is the focus of communitarianism (covering people's social needs and purposes), agency is the central value of classical liberalism (focusing on individual empowerment, civil liberties, and human capabilities), GDP is central to the utilitarian consequentialism that underlies the discipline of economics, and environmental performance covers the domain of environmental ethics (the value and moral status of the environment). This normative basis for measuring well-being is significant for three reasons. First, living in accordance with one's moral values is a major source of well-being. Second, most of our moral values can be understood as potent instruments for inducing social cooperation, creating well-being from the satisfaction of collective interests. Third, moral values are imbued with normative force, inducing people into action. In other words, the SAGE Dashboard aims to capture components of well-being that people are especially inclined to act on.

The SAGE Dashboard combines this distinctively normative feature with the characteristics of brevity, regularity, and breadth. Regarding brevity, the dashboard contains only four indexes, matching the average working memory storage capacity of humans (9). People's capacity to keep meaningful items simultaneously in mind is important for policy making (since policy makers need to keep multiple objectives in mind when making their decisions) and for communication with the general public. As for regularity, the dashboard is assessed on an annual basis, comparable with annual GDP statistics. Finally, regarding breadth, the dashboard covers a large number

[§]For simplicity, we use CO₂ emissions as a proxy for environmental sustainability. Broader proxies, such as the Environmental Performance Index (reported in *SI Appendix*), also suit the purposes of this analysis.

[¶]For example, there are indicators that adjust GDP (such as the Index of Sustainable Economic Welfare, the Green GDP, Genuine Savings, and Brynjolffson's GDP-B metric); others measure human capacities (such as the Human Development Index). There are psychological measures of well-being (such as the Personal Well-Being Index and the Happy Life Years Index) and sociological measures of well-being (such as the Physical Quality of Life Index and the Social Progress Index). Furthermore, there are indexes of happiness (such as the Gross National Well-Being and the World Happiness Report). Finally, there are hybrid indicators (containing objective and subjective measures, such as the OECD Better Life Index) and indexes of desirable outcomes (such as the Sustainable Development Goals of the 2030 Agenda for Sustainable Development).

of countries (currently over 150) so as to allow country comparisons to be made. For the purposes of this paper, however, we focus solely on the G7 countries.

The four indexes of the dashboard do not move in tandem with one another. In particular, movements of GDP do not provide an adequate account of how Solidarity, Agency, and Environmental Sustainability evolve. If GDP grows while solidarity, agency, and environmental sustainability stagnate or decline, we can say that economic prosperity has become “decoupled” from social and environmental prosperity. Then, the aim of policy should be to “recouple” these separate domains, ensuring that economic prosperity serves social prosperity, not vice versa.

The SAGE indexes are not routinely substitutable for one another since they address separate human needs and motivations (10, 11). For example, severe social alienation and disempowerment cannot be compensated for by material rewards (e.g., refs. 12 and 13). Thus, these indexes need to be assessed separately rather than averaged in a single index—much like the altitude and speed on an airplane’s dashboard need to be measured separately rather than averaged.

We distinguish between inward solidarity (representing social cohesion within social groups) and outward solidarity (representing willingness to cooperate with strangers).[#] Inward solidarity promotes cooperation with one’s affiliates but may lead to conflict with out-groups. Populism, for example, represents a form of inward solidarity that often generates hostility to immigrants, from which social conflicts within countries can arise. Under these circumstances, inward solidarity generates positive externalities for in-group members but negative externalities for out-group members. However, inward solidarity could also be positively related to outward solidarity—as when people with a strong sense of national identity welcome immigrants and benefit from the resulting cultural exchange—thereby generating positive externalities for in- and out-group members alike. (The psychological relationship between inward and outward solidarity is complex [for example, ref. 14].)

Inward solidarity is relevant as a coping mechanism during the pandemic since this reflects people’s willingness to help one another in times of trouble and may also be associated with the willingness to comply with a government’s pandemic regulations. Outward solidarity is also relevant for pandemic control since effective mitigation requires cooperation among countries, which depends in part on voter approval for such cooperation. Agency is relevant since it reflects the degree to which citizens feel empowered to mitigate the effects of the pandemic through their own efforts.

The political and social implications of decoupling are momentous. For example, 2 y before Donald Trump won the US presidential election, agency suffered a steep decline, and Inward Solidarity stagnated, while Outward Solidarity fell.^{||} These psychosocial developments were masked by a steady rise in GDP. In the United Kingdom, 1 y before the Brexit referendum, Outward Solidarity plummeted, and Inward Solidarity rose, while Agency declined.^{**} This too provides a very different

[#]In what follows, we capitalize “Inward Solidarity” and “Outward Solidarity” when we refer to our indexes but use the lowercase when referring to the underlying generic phenomenon.

^{||}In the period from 2006 to 2016, solidarity (both Inward Solidarity and Outward Solidarity) fell by 6% and agency dropped by 12% in the United States (as shown in Figs. 1 and 2).

^{**}From 2006 to 2016, Inward Solidarity in the United Kingdom fell by 2%, Outward Solidarity was stagnant, and agency fell by 5% (as shown in Figs. 1 and 2).

picture of British well-being than the consistent rise of the United Kingdom’s GDP. Had such phenomena received the serious attention that they deserved, US politicians could have gained a deeper understanding of Donald Trump’s electoral appeal, UK politicians could have better recognized the social problems leading to Brexit, and insights could have been gained into ways of dealing with the underlying discontent. (“This time, it’s not the economy, stupid.”)

Diverse Social Responses to the Pandemic

It was inevitable that the G7 economies would suffer grievously from the onslaught of the coronavirus. The spread of the pandemic necessitated social distancing and lockdowns, making it impossible for the market economy to function along accustomed lines. The result was the “Great Economic Mismatch” (15) (empirical evidence is provided by ref. 16, among others), characterized by deficient demand for things requiring close interpersonal physical interactions and deficient supply of medical products and health services as well as services compatible with social distancing (such as delivery services, video conferencing, and film streaming). The G7 economies, along with the other economies worldwide, suffered significant damage since markets were unable promptly to perform the requisite reallocation of resources.

Thus, it is no surprise that in all G7 countries, we see a sharp drop in GDP due to the pandemic. Nor is it surprising that we observe a corresponding drop in CO₂ emissions in all these countries. The uniformity of qualitative response in the economic and environmental domains is illustrated by the arrows in the GDP and Environment columns of Table 1 (GDP and CO₂ emissions fell in all G7 countries). This uniformity stands in sharp contrast to the diversity of social responses to the challenge of cooperation that the coronavirus posed as shown by the arrows in the Solidarity and Agency columns in Table 1.

Average solidarity decreased in three of the G7 countries, stagnated in one country, and increased in three countries. Distinguishing between Inward Solidarity and Outward Solidarity, we observe that Inward Solidarity rose in four countries (signaling the resilience of civil societies in providing social support networks where the economic ones had crumbled) and remained roughly constant in the three remaining countries. By contrast, Outward Solidarity fell in four countries [mirroring the well-documented rise in nationalism, including support for the globally damaging “vaccine nationalism” (17)], rose in two countries, and remained constant in one. Needless to say, a fall in Outward Solidarity may be expected to hinder voter support for multilateral efforts to eradicate the pandemic worldwide. Agency rose in four countries (signaling an enhanced sense of empowerment that comes from rising to a new challenge) and remained roughly constant or declined in the three remaining countries.

The only clear pattern that emerges for the G7 is that Inward Solidarity and Outward Solidarity have drifted apart in all G7 countries except Japan (as shown below in more detail). Otherwise, the movements in Solidarity and Agency were highly idiosyncratic.

In order to gain some insight into what underlies this diversity of social responses to the pandemic, we now examine the movements of Solidarity and Agency in greater detail.

The Solidarity Response to the Pandemic. Fig. 1 shows the time series for Inward Solidarity (Fig. 1, *Left*) and Outward Solidarity (Fig. 1, *Right*) in the G7 countries from 2006 to 2020. These indexes are based on data from the Gallup World

Table 1. SAGE responses to the pandemic

Country	Average Solidarity		Inward Solidarity		Outward Solidarity		Agency		GDP per capita	Environment (CO ₂ emissions in Mt CO ₂)		
	Level 2020	1-y change, %	Level 2020	1-y change, %	Level 2020	1-y change, %	Level 2020	1-y change, %	2020, \$	1-y change, %	2020	1-y change, %
Canada	0.75	-1.0	0.93	0.6	0.57	-3.5	0.82	-1.3	43,142	-6.4	644	-11.3
France	0.71	-1.7	0.94	-0.5	0.47	-4.0	0.77	-0.2	39,427	-8.4	264	-9.0
Germany	0.70	0.8	0.90	2.8	0.50	-2.6	0.84	1.2	47,464	-5.1	606	-7.9
Italy	0.65	4.9	0.89	6.8	0.41	1.1	0.68	3.4	35,424	-8.6	293	-7.4
Japan	0.61	2.7	0.89	1.4	0.33	6.1	0.77	0.4	40,626	-3.8	1,034	-5.0
United Kingdom	0.72	-3.7	0.93	-0.9	0.51	-8.5	0.79	1.7	39,474	-10.4	311	-9.5
United States	0.74	1.4	0.94	2.2	0.55	0.0	0.77	3.0	58,382	-4.0	4,582	-9.4

The Solidarity and Agency indexes are based on our own calculations. Data sources and methodology are described in *SI Appendix, section 2*.

Poll.^{††} Inward Solidarity reflects social support received by friends and family. Outward Solidarity is composed of giving behavior, satisfaction with efforts to deal with the poor, and minority rights.

Inward solidarity has increased (to varying degrees) in most G7 countries. Crisis events are often perceived as socially integrative in retrospect because these events can be a catalyst for strengthening social ties. We observe that, indeed, Inward Solidarity, the feeling that one is embedded in a social group and can count on help from friends and family, has increased (or at least remained unchanged) in most G7 countries, signaling the resilience of civil societies in providing social support networks where the economic ones had crumbled.

In contrast to this broadly positive social response to the pandemic, we observe a decrease in Inward Solidarity over the past 10 y in four of the seven countries (Canada, Germany, Japan, and the United Kingdom).

Outward solidarity has decreased in most G7 countries. Despite the self-evident need for global cooperation to overcome the pandemic, most governments have sought to supply their own citizens with vaccines first, even at considerable cost to global pandemic response effectiveness. Governments that favored equal vaccine rights for all nations were often criticized by their voters.

Thus, the “My Country First” approach of many governments appears to reflect the sentiment of their citizens. We observe that, in contrast to Inward Solidarity, Outward Solidarity has declined or stagnated in five countries (Canada, France, Germany, the United Kingdom, and the United States). In particular, the giving index—a component of Outward Solidarity composed of helping a stranger, donating money, and volunteering time—declined sharply in all G7 countries (*SI Appendix, section 1* has subindex movements).

The Agency Response to the Pandemic. The Agency index^{‡‡} has four components (confidence in empowering institutions, freedom of life choice, vulnerable employment, and life

^{††}The input variables were chosen in a way so that they reflect the underlying construct and fulfill the requirements of regularity—at least annually reported—and breadth for as many countries possible. The interitem correlation (Cronbach's alpha) is high and indicates that the input variables are measuring the same underlying construct. Furthermore, there is no sign of collinearity between components. More detailed descriptions of the input variables and our methodology as well as tests of collinearity and reliability are in *SI Appendix, section 2*.

^{‡‡}The input variables for the Agency index were chosen on the basis of the same statistical criteria as for the Solidarity index. Once again, the input variables and methodology as well as tests of collinearity and reliability tests are in *SI Appendix, section 2*.

expectancy) and is calculated using data from the Gallup World Poll and the World Bank. Changes in Agency are to be understood in relation to the challenges that people have faced during the pandemic. An increase in Agency may be viewed as an enhanced sense of empowerment that comes from rising to a new challenge, such as dealing with the diverse social and economic problems associated with the loss of social contact and work during the pandemic. Under these difficult circumstances, people may get care and support within their communities—opportunities that may be absent under normal conditions. Conversely, a fall in Agency suggests a sense of being overwhelmed and increasingly helpless in the face of the crisis. Agency rose in four of the G7 countries (Germany, Italy, the United Kingdom, and the United States), remained roughly constant in two countries (France and Japan), and fell in one country (Canada).

Fig. 2 shows the time series for Agency in the G7 countries from 2006 to 2020.

The changes in Agency across countries are not noticeably correlated with the changes in solidarity. Only in Italy was a rise in Agency accompanied by a rise in Inward Solidarity and Outward Solidarity, signaling a rise in the ability and willingness of civil society to take a proactive role in the face of economic breakdown. In Canada, by contrast, all three indexes fell, signaling the opposite.

Response Patterns to the Pandemic

We now explore patterns of social responses to the pandemic. 1) Level-based influences indicate that country differences in the levels of Solidarity and Agency are associated with differences in how well societies have dealt with the pandemic. 2) Change-based influences indicate how solidarity and agency changed during the pandemic, suggesting that Solidarity and Agency are not fixed characteristics but rather, subject to significant variation from year to year.

Furthermore, we indicate that the levels of Solidarity and Agency, along with Tribalism (measured as the difference between Inward Solidarity and Outward Solidarity), are potentially influenceable by government policies. This consideration is potentially important since G7 government policies during the pandemic have been focused primarily on cushioning economies, not societies. The implicit assumption is that governments are responsible for economic management and public health, while societies are left largely to their own devices.

Our results suggest a different approach based on the recognition that both governments and societies have distinctive

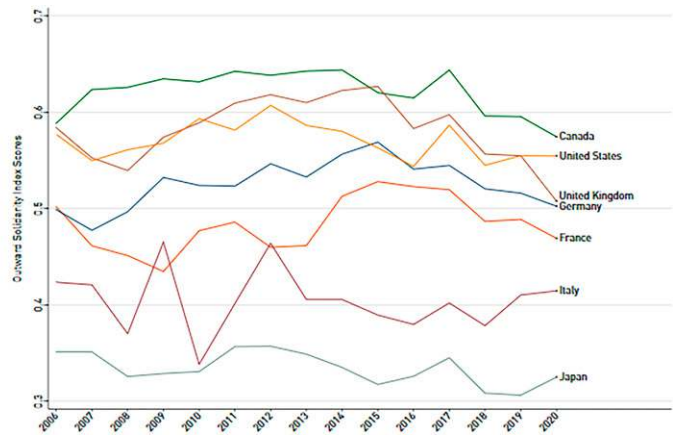
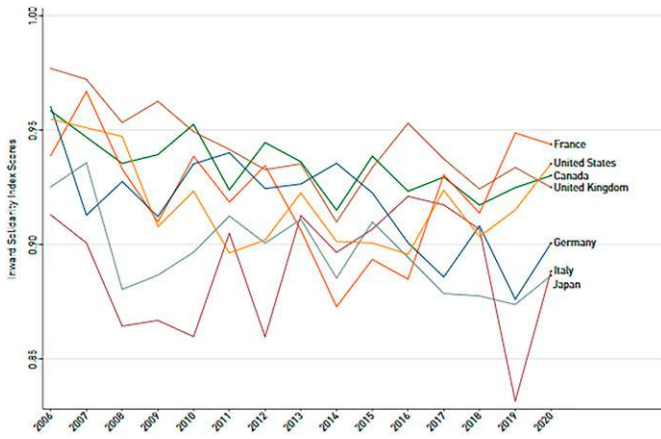


Fig. 1. Inward Solidarity and Outward Solidarity indexes over the past 15 y in G7 countries.

roles to play in helping people deal with the pandemic. Government policy often works top down through tax subsidy, incentives, and regulations, while societal responses work bottom up through norms, values, and narratives. By focusing primarily on economic and health policies, governments run the risk of overlooking an important array of social policy instruments (elaborated in the next section), comprising solidarity-enhancing policies (such as community-building urban policies) and agency-enhancing policies (such as active labor market policies) that promote the societal capacity to deal with the pandemic shock— analogously to vaccines, which promote an individual’s capacity to cope with exposure to COVID-19.

Level-Based Influences: Cohesive vs. Fragmented and Empowered vs. Disempowered and Societies. Various sources of empirical evidence suggest that the levels of solidarity and agency help shape people’s ability to cope with the challenges of the pandemic. Psychologists (18) provide evidence that shared human values—particularly ones related to our measure of solidarity—are important in both driving behavioral compliance to government guidelines and promoting prosocial behaviors to alleviate the stresses generated by a prolonged pandemic. Shared values induce people to engage in collective action to contain the pandemic, and the recognition that they are being shared elicits a sense of social connectedness that reinforces the collective action. Pre-pandemic evidence shows that individuals who are able to relate to others and their environment (self-transcendence) are more likely to volunteer and donate money as well as to cooperate with others (19). In addition, affective empathy (i.e., a concern for

and an understanding of vulnerable others) has been shown to promote altruism and caring (20–22).

Evidence from the first phase of the pandemic indeed shows that higher empathy toward vulnerable groups in the COVID-19 pandemic was associated with a stronger motivation to engage in physical distancing and wearing of face masks (23), while low solidarity (among young adults) was associated with noncompliance with social distancing rules and low concern for vulnerable groups (24). Furthermore, higher interpersonal trust—an important determinant of giving behavior and the feeling of being supported by friends and family—has been associated with more hygienic practices, greater compliance with social distancing, and consequently, lower mortality rates (25–27). Cross-cultural agreement on the importance of values associated with social solidarity and personal agency suggests that they can provide a psychological anchor for policy interventions to combat the pandemic (18). Furthermore, the evidence above suggests that policy initiatives promoting the salience of such shared values can increase the effectiveness of the pandemic mitigation efforts of both governments and societies.

In addition, there is evidence that trust in the national government (a component of our Agency index) has been a key factor for successful pandemic management in the early stages of the COVID-19 pandemic (28–30) and has even been linked to fewer COVID-19 deaths (31). Both pre-outbreak levels of trust in the government (28, 29, 31) as well as trust that the government is able to fight the pandemic (30) have been found to be associated with compliance with COVID-19 measures.

In short, there is substantial empirical evidence indicating that higher levels of solidarity and agency play an important role in promoting societal engagement in pandemic control. On this account, we classify the G7 countries in terms of their levels of Solidarity and Agency.

- A country is denoted as “cohesive” if Solidarity is above the G7 average and as “fragmented” when solidarity is below average.
- A country is denoted as “empowered” when Agency is above the G7 average and “disempowered” when it is below average.

Accordingly, we can divide the G7 countries into the broad categories presented in Fig. 3. The evidence above suggests that the countries classified as “cohesive and empowered” can be associated with relatively favorable societal responses to pandemic control, whereas those classified as “fragmented and disempowered” may have relatively unfavorable societal responses.

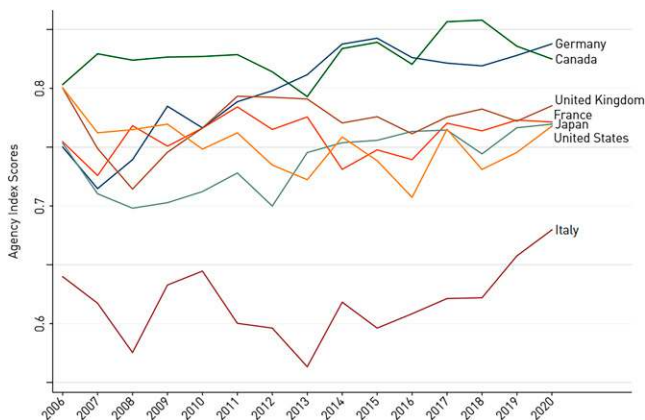


Fig. 2. Agency index over the past 15 y in G7 countries.

A third group of countries, classified as “cohesive and disempowered,” may have ambiguous societal responses.

Note that this classification is relevant only for shedding light on the relative effectiveness of a country’s societal responses, not the country’s overall effectiveness in dealing with the pandemic. The latter, of course, depends significantly on government policy as well. Strong governmental responses can compensate for weak social responses, and strong social responses can be impaired by weak governmental responses. Nevertheless, our analysis suggests that governments have a potentially important role in promoting strong social responses to the pandemic.

Although G7 countries have focused primarily on economic policies (such as unemployment benefits and job retention schemes) in response to the pandemic, social policies to promote a combination of Solidarity and Agency can play an important role as well. By “social policies,” we mean measures that are directed at promoting the workings of society by enhancing social solidarity and cohesion and by promoting a sense of personal and social empowerment.

Solidarity-enhancing policies may take the form of various welfare state measures—such as policies to promote equal access to quality housing, education, and health care—that are aimed at social integration and community building. When these policies are successful, they contribute to the establishment and maintenance of cohesive communities that enable its members to collaborate in dealing with their collective action problems. The Core Design Principles of Ostrom (32) provide some guidelines for such collaboration, which can be promoted through institutions and policies at various levels of local, regional, and national government.

Agency-enhancing policies may take the form of active labor market policies (e.g., refs. 33 and 34)—such as hiring subsidies, training subsidies, and job placement schemes—that give labor market participants incentives to create employment, acquire skills, and thereby, gain a greater sense of economic empowerment. Social protection schemes in the form of universal basic services (e.g., ref. 35) may also promote a greater sense of agency.

Such social policies have often been overlooked by policy makers during the pandemic, as G7 countries have focused more on passive labor market policies than active ones (e.g., ref. 28) and since existing policies have not been able to prevent the pandemic from widening existing inequalities (e.g., ref. 36).

Change-Based Influences: Cohering vs. Fragmenting and Empowering vs. Disempowering Societies. We now examine how the pandemic affected solidarity and agency in the G7 countries, thereby changing the societal response patterns.

- We classify a country as “cohering” if Solidarity rose during the pandemic. By contrast, a country is considered “fragmenting” when Solidarity fell.
- A country is “empowering” when Agency rose and “disempowering” when Agency fell.

Fig. 4 divides countries into broad categories in accordance with their changes in Solidarity and Agency. In the countries classified as “cohering and empowering,” the pandemic is associated with increasingly favorable societal responses, whereas in the “fragmenting and disempowering” countries, the pandemic is associated with increasingly unfavorable responses. Needless to say, these are simply associations. Changes in the societal responses to the pandemic are influenced by more

determinants than the pandemic itself (e.g., changes in government policies).

Taken together, Figs. 3 and 4 shed light on the reflexive interaction between society and the pandemic. Differences in the levels of Solidarity and Agency (Fig. 3) may be associated with differences in how societies affected the pandemic containment, whereas differences in the changes of Solidarity and Agency (Fig. 4) may shed light on differences in how the pandemic affected societies.

Tribalism. A rise of Tribalism (measured, as noted, in terms of the difference between Inward Solidarity and Outward Solidarity) is a cause for concern since a successful social response to the pandemic not only involves social connectedness in mitigating the pandemic and helping people cope with it but also, calls for a willingness to cooperate across national boundaries in pandemic protection and control. Fig. 5 presents time series for Tribalism in the G7 countries from 2006 to 2020.

This figure has three important messages.

- 1) G7 countries differ substantially in their levels of tribalism, with Japan at the upper end of the spectrum (i.e., high difference between Inward Solidarity and Outward Solidarity, indicating a rather closed society) and Canada at the lower end.
- 2) Tribalism is not a fixed characteristic but rather, can vary substantially from year to year. Some of these variations are sufficiently large to change the countries’ rankings in terms of Tribalism.
- 3) Tribalism has increased in all G7 countries except Japan (where Tribalism is already high). The rise in Tribalism started several years before the pandemic in five of the G7 countries. For example, UK Tribalism rose following the Brexit referendum in 2016, and US Tribalism rose with the election of President Trump. While Tribalism has many causes, it is nevertheless noteworthy that most G7 countries experienced significant increases in Tribalism during the pandemic.

The rise of Tribalism^{§§} during the pandemic is troubling insofar as it takes the form of a fall in Outward Solidarity accompanied by a rise (or lesser fall) in Inward Solidarity. Fig. 6 describes Inward Solidarity and Outward Solidarity in 2019 and 2020. This figure indicates not only that Inward Solidarity is substantially higher than Outward Solidarity in all G7 countries (which is to be expected) but also, that the pandemic was accompanied by a substantial fall in Outward Solidarity in four countries (Canada, France, Germany, and the United Kingdom). Meanwhile, Inward Solidarity fell in the United Kingdom and France but rose in the other G7 countries. Only in Japan did Outward Solidarity increase substantially and relatively more than Inward Solidarity.

Those who believe that the global challenge of eradicating the pandemic should have helped prepare the world for dealing with other global challenges are likely to be disappointed. The widespread fall in Outward Solidarity suggests that popular support for multilateral efforts to address global problems—not just pandemics but also, financial crises, cybersecurity, climate

^{§§}The rise of Tribalism does not necessarily imply a rise in social cohesion within a country. The reason is that social and political boundaries often do not overlap well. When Inward Solidarity rises on average in a country, there may nevertheless be sharper divisions among different social groups in that country, provided that the country is socially diverse and Outward Solidarity has fallen. This consideration is relevant to a recent study of the Pew Research Center (33), in which most respondents in the United States, Germany, France, Italy, and the United Kingdom reported that they believed that their country was more divided now than before the coronavirus outbreak. The following section addresses distributional considerations.

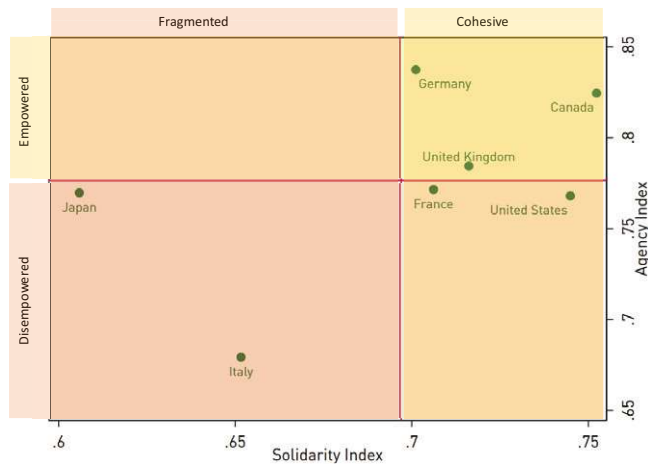


Fig. 3. Solidarity and agency levels in 2020.

change, ocean acidification, biodiversity loss, forced immigration, and much more—is waning. This is particularly unfortunate since these problems are proliferating, and multilateralism is the only way to address them. However, as we have seen, citizens often responded to the pandemic by tribalizing (i.e., relying more heavily on in-group social networks than on international cooperation). This development could reinforce existing fragmentation of society, class anxiety, and distrust, which are harmful for pandemic containment. Some evidence from the early phase of the pandemic hints in this direction by showing an association between social trust and belonging to groups with more deaths, possibly due to behavioral contagion and incongruence with physical distancing policy (37).

In part, this response may have arisen from the perception that existing in-group social networks actually deliver support (in five G7 countries, people perceived an increase in support received by friends and family^{¶¶}). Furthermore, there may have been a vicious cycle of confidence and policy effectiveness at play. The inward turn in cooperation may have reduced public support for multilateral cooperation, which may have reduced the willingness of national governments to engage in international pandemic management; this in turn may have reduced the effectiveness of multilateral organizations in delivering support, which may have reduced public support for multilateral cooperation even further and so on.^{###}

Note on Distributional Issues

It is important to note that cross-country analysis can of course only provide a bird's-eye perspective on economic and social prosperity. In all G7 countries, the impact of the pandemic on social and material well-being has varied substantially between population groups depending on age, gender, ethnicity, income, and skills. There is ample evidence that the most vulnerable groups (such as children from disadvantaged households, undocumented immigrants, and minorities) have been hit hardest by the crisis (for example, refs. 35 and 40–42 and useful datasets, such as refs. 43–45). One striking example is the large difference in potential years of life lost due to COVID-19 in the United States, which is

^{¶¶}Indeed, social psychologists argue that inward directed social cohesion is likely to increase in times of existential threat to a population (38, 39).

^{###}Nevertheless, polls revealed support for some global cooperation (particularly among young highly educated adults), even at the expense of own national interests (e.g., ref. 36). With regard to global cooperation that is nevertheless taking place in response to the pandemic (such as the Covax Facility), policy makers in many countries appear to be more inclined to multilateralism than their citizens.

six times higher for Black Americans in comparison with White Americans (27), suggesting a decline in one aspect of Agency for Black Americans. In case of age, the largest declines in social connectedness (a prerequisite for Solidarity) as well as job insecurity (affecting Agency) have been observed for young adults across the OECD countries (27).

Within-country disparities in Solidarity and Agency complicate the assessment of the civil society response to the pandemic and its implications for policy effectiveness. Nations differ in their degree to which social fragmentation—in terms of Solidarity and Agency—responded to the pandemic. For example, in some countries, disagreements among cohesive groups became more pronounced (e.g., refs. 46 and 47); other nations have experienced an across-the-board decline in social cohesion and rising individualism (for example, ref. 42). Some of these developments are related to economic disparities. For example, prepandemic income levels had a much higher effect on pandemic-related job losses in France than in Germany (27), which could have had an effect on the Agency score (agency in Germany increased, while it stagnated in France).

Some aggregate changes in Solidarity and Agency have been influenced by governments' responses in terms of distributional policy. For example, in Japan, the government approved a cash payment to all residents (including foreign residents) along with additional child allowances and low-income support to cushion the economic impact of the pandemic (48). These policy efforts may have influenced the strong ascent of the Solidarity index in Japanese society. However, the stigma and precarity derived from temporary work (primarily affecting single mothers, divorced people, and the elderly) may have been reflected in the stagnation of the Agency index.

The analysis of these and other distributional issues is beyond the scope of this paper and constitutes a topic of future research.

Further Considerations: Putting Fundamental Human Needs and Purposes at the Heart of Policy Making

Our analysis suggests that the common preoccupation with economic and health responses to the pandemic misses something potentially important: the role of societies in controlling and coping with the pandemic. We have shown that, in terms of aggregate indicators of social Solidarity and Agency, different countries have addressed the pandemic with quite different social

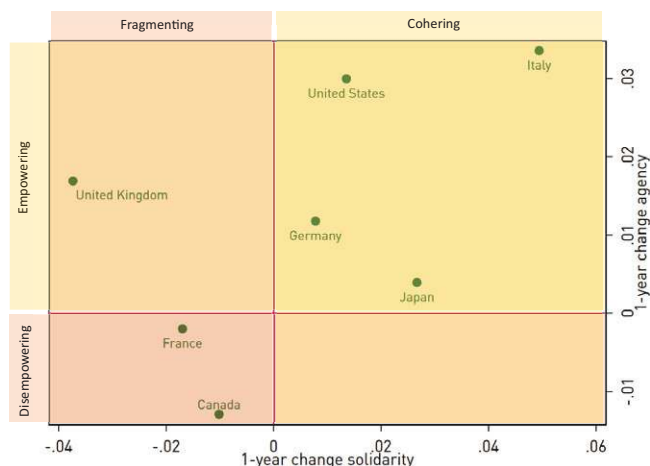


Fig. 4. Solidarity and agency changes from 2019 to 2020.

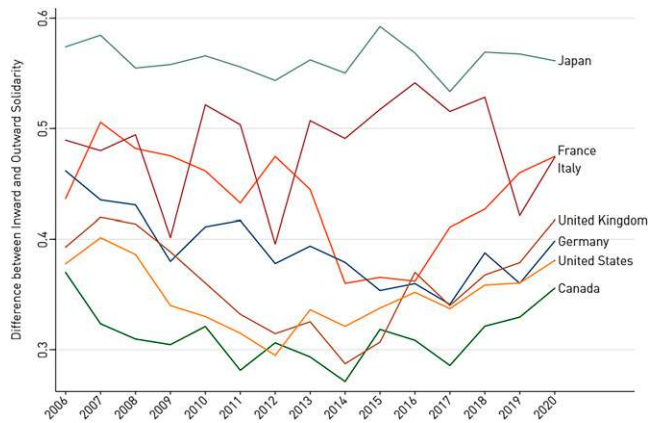


Fig. 5. The evolution of Tribalism.

characteristics ranging from cohesive to fragmented and from empowered to disempowered societies (where these terms are defined in relative terms). We have also seen how the pandemic was associated with changes in these social characteristics ranging from cohering to fragmenting and from empowering to disempowering changes (again defined in relative terms). Furthermore, we have examined the widespread rise of Tribalism during the pandemic. All these developments have a straightforward bearing on societies' capacity to cushion people from the pandemic shock and suggest potentially important avenues for government policies in strengthening such social capacity.

The success of public health measures to control the spread of the pandemic—particularly the success of social distancing measures—depends heavily on public compliance. Such public compliance relies strongly on social solidarity (49) and agency. Inward solidarity is the binding force that induces members of a society to pursue a common purpose. Outward solidarity is essential to deliver public support for multilateral efforts to contain the pandemic. Moreover, if confidence in the existing political and judicial institutions (part of our agency measure) is high, then the government can mobilize as sense of common purpose in the public interest.

Pandemics cannot be effectively controlled through individualistic behavior patterns. Although governments can—and often do—impose financial and other punishments for breaking social distancing rules, these tend to be weak incentives since the infractions are inherently difficult to police. At best, the punishments serve as a symbol of moral values that citizens are intrinsically motivated to follow. These moral values highlight

the importance of serving collective purposes. When individuals are driven by common values defining common purpose, they can cooperate effectively without contractual obligations. Solidarity, agency, material gain, and environmental sustainability represent such common values (as noted, the values of communitarianism, classical liberalism, utilitarianism, and ecoethics). (Ref. 50 examines the proclivity to pursue common purpose with respect to tight vs. loose cultures in the COVID-19 pandemic.)

Needless to say, societies are not homogeneous. Some individuals have a strong sense of common purpose, while others free ride. In order to keep the free riders from undermining social cohesion during a pandemic, it is important for the government to set unambiguous rules of behavior where social coordination is vital for public health. These rules should ensure an equitable distribution of contributions to public health and welfare and a correspondingly equitable distribution of benefits. All members of society should perceive that the government is seeking to ensure that sacrifices and rewards are fairly shared.

The principle of subsidiarity has an important role to play in this process since it serves to promote a sense of agency. Members of society must feel that each of their contributions counts and that each is important for achieving the collective goal. For this purpose, collective action should be conducted at the most local level that is consistent with the resolution of the collective problem. (Ref. 49 finds that altruistic acts during the COVID-19 pandemic are mainly local rather than national or global in the United States and Italy.) This means that the national government should intervene only when doing so is more effective than actions taken at regional or local levels. For national, regional, and local levels to act consistently with one another, it is important to ensure fair and inclusive decision-making across these levels. Agreed behaviors must be monitored, and there must be graduated rewards and punishments for helpful and unhelpful behaviors. Fast and fair conflict resolution mechanisms must be in place to deal with disagreements.

This framework is in accord with Ostrom's Core Design Principles, the observance of which has enabled societies to address collective action problems effectively (e.g., refs. 32 and 51–53) primarily because they promote solidarity and agency in the public interest.

From this enumeration of prerequisites, two things are clear. First, civil society and state institutions (at the supranational, national, regional, and local levels) need to work harmoniously with one another to overcome the health and economic crises generated by COVID-19.

Second, most countries around the world still have a long way to go in dealing successfully with pandemics and other global collective action problems (such as climate change). The conventional measures of a country's success—focused primarily on GDP and its distribution across the population—miss something important in assessing the social and environmental prerequisites for such success. The SAGE Dashboard helps provide a richer foundation for evaluating national success and highlights the role of two fundamental normative aspects of well-being—solidarity and agency—in controlling and coping with pandemic challenges.

Data Availability. All data files, including raw data and Stata do-files, have been deposited in the Open Science Framework (https://osf.io/xjwzt/?view_only=af5e8f9437ea4f0e80101911a495a917).

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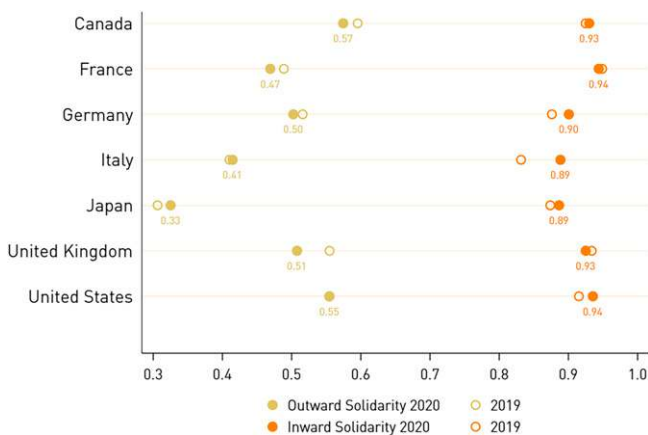


Fig. 6. Inward Solidarity and Outward Solidarity in 2019 and 2020.

1. International Monetary Fund, Policy responses to COVID-19. <https://www.imf.org/en/Topics/imf-and-covid19/Policy-Responses-to-COVID-19>. Accessed 22 February 2022.
2. Organisation for Economic Co-operation and Development, Key policy responses from the OECD. <https://www.oecd.org/coronavirus/en/policy-responses>. Accessed 22 February 2022.
3. University of Oxford Blavatnik School of Government, COVID-19 government response tracker. <https://www.bsg.ox.ac.uk/research/research-projects/covid-19-government-response-tracker>. Accessed 22 February 2022.
4. H. Ritchie *et al.*, Policy responses to the coronavirus pandemic. <https://ourworldindata.org/policy-responses-covid>. Accessed 22 February 2022.
5. T. Hale *et al.*, Government responses and COVID-19 deaths: Global evidence across multiple pandemic waves. *PLoS One* **16**, e0253116 (2021).
6. How epidemiology has shaped the COVID pandemic. *Nature* **589**, 491–492 (2021).
7. S. Dhar Chowdhury, A. M. Oommen, Epidemiology of COVID-19. *J. Dig. Endosc.* **11**, 51–57 (2020).
8. K. Lima de Miranda, D. J. Snower, Recoupling economic and social prosperity. *Glob. Perspect.* **1**, 11867 (2020).
9. N. Cowan, The magical mystery four: How is working memory capacity limited, and why? *Curr. Dir. Psychol. Sci.* **19**, 51–57 (2010).
10. S. T. Fiske, *Social Beings: Core Motives in Social Psychology* (John Wiley & Sons, 2018).
11. J. E. Heckhausen, H. E. Heckhausen, *Motivation and Action* (Cambridge University Press, 2008).
12. T. Kasser, *The High Price of Materialism* (MIT Press, 2002).
13. R. E. Lane, *The Loss of Happiness in Market Democracies* (Yale University Press, 2000).
14. M. B. Brewer, The psychology of prejudice: Ingroup love and outgroup hate? *J. Soc. Issues* **55**, 429–444 (1999).
15. D. J. Snower, The socio-economics of pandemics policy. <https://www.brookings.edu/research/the-socioeconomics-of-pandemics-policy/>. Accessed 22 February 2022.
16. J. M. Barrero, N. Bloom, S. J. Davis, "COVID-19 is also a reallocation shock" (BFI Rep. 2020-59, Becker Friedman Institute, University of Chicago, Chicago, IL, 2020).
17. T. J. Bollyky, C. P. Bown, The tragedy of vaccine nationalism: Only cooperation can end the pandemic. *Foreign Aff.* **99**, 96 (2020).
18. L. J. Wolf, G. Haddock, A. S. R. Manstead, G. R. Maio, The importance of (shared) human values for containing the COVID-19 pandemic. *Br. J. Soc. Psychol.* **59**, 618–627 (2020).
19. L. Sagiv, S. Roccas, J. Cieciuch, S. H. Schwartz, Personal values in human life. *Nat. Hum. Behav.* **1**, 630–639 (2017).
20. C. D. Batson, B. D. Duncan, P. Ackerman, T. Buckley, K. Birch, Is empathic emotion a source of altruistic motivation? *J. Pers. Soc. Psychol.* **40**, 290 (1981).
21. C. Sassenrath, S. Diefenbacher, A. Siegel, J. Keller, A person-oriented approach to hand hygiene behaviour: Emotional empathy fosters hand hygiene practice. *Psychol. Health* **31**, 205–227 (2016).
22. A. R. Todd, P. Burgmer, Perspective taking and automatic intergroup evaluation change: Testing an associative self-anchoring account. *J. Pers. Soc. Psychol.* **104**, 786–802 (2013).
23. S. Pfattheicher, L. Nockur, R. Böhm, C. Sassenrath, M. B. Petersen, The emotional path to action: Empathy promotes physical distancing and wearing of face masks during the COVID-19 pandemic. *Psychol. Sci.* **31**, 1363–1373 (2020).
24. J. Grütter, M. Buchmann, Developmental antecedents of young adults' solidarity during the COVID-19 pandemic: The role of sympathy, social trust, and peer exclusion from early to late adolescence. *Child Dev.* **92**, e832–e850 (2021).
25. A. K. Bartscher, S. Seitz, S. Sieglöcher, M. Slotwinski, N. Wehrhöfer, Social capital and the spread of COVID-19: Insights from European countries. *J. Health Econ.* **80**, 102531 (2021).
26. J. Adriaans, P. Eisnecker, M. Kroh, S. Kühne, "Corona-Pandemie: Vertrauensvolle Menschen sind eher zur Impfung bereit und halten sich eher an AHA-Regeln" (DIW Aktuell 66, Deutsches Institut für Wirtschaftsforschung, Berlin, Germany, 2021).
27. C. A. Makridis, C. Wu, How social capital helps communities weather the COVID-19 pandemic. *PLoS One* **16**, e0245135 (2021).
28. OECD, *COVID-19 and Well-Being: A Sustainable, Resilient Recovery after COVID-19* (OECD Responses to Coronavirus, OECD, 2021).
29. O. Bargain, U. Aminjonov, Trust and compliance to public health policies in times of COVID-19. *J. Public Econ.* **192**, 104316 (2020).
30. Q. Han *et al.*, PsyCorona Collaboration, Trust in government regarding COVID-19 and its associations with preventive health behaviour and prosocial behaviour during the pandemic: A cross-sectional and longitudinal study. *Psychol. Med.*, 10.1017/S0033291721001306 (2021).
31. F. J. Elgar, A. Stefaniak, M. J. A. Wohl, The trouble with trust: Time-series analysis of social capital, income inequality, and COVID-19 deaths in 84 countries. *Soc. Sci. Med.* **263**, 113365 (2020).
32. E. Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge University Press, 1990).
33. OECD, *Building Inclusive Labour Markets: Active Labour Market Policies for the Most Vulnerable Groups* (OECD Policy Responses to Coronavirus, OECD, 2021).
34. D. J. Snower, Beyond capital and wealth. *Economics* **12**, 20180021 (2018).
35. A. Coote, A. Percy, *The Case for Universal Basic Services* (John Wiley & Sons, 2020).
36. B. L. Perry, B. Aronson, B. A. Pescosolido, Pandemic precarity: COVID-19 is exposing and exacerbating inequalities in the American heartland. *Proc. Natl. Acad. Sci. U.S.A.* **118**, e2020685118 (2021).
37. Pew Research Center, People in advanced economies say their society is more divided than before pandemic. <https://www.pewresearch.org/global/2021/06/23/people-in-advanced-economies-say-their-society-is-more-divided-than-before-pandemic/>. Accessed 22 February 2022.
38. R. Thornhill, C. L. Fincher, *The Parasite-Stress Theory of Values and Sociality: Infectious Disease, History and Human Values Worldwide* (Springer, 2014).
39. Pew Research Center, International cooperation welcomed across 14 advanced economies. <https://www.pewresearch.org/global/2020/09/21/international-cooperation-welcomed-across-14-advanced-economies/>. Accessed 22 February 2022.
40. R. Blundell, M. Costa Dias, R. Joyce, X. Xu, COVID-19 and inequalities. *Fisc. Stud.* **41**, 291–319 (2020).
41. United Nations, "The impact of COVID-19 on women" (United Nations Policy Brief, United Nations, New York, NY, 2020).
42. Public Health England, *Disparities in the Risk and Outcomes of COVID-19* (Public Health England, 2020).
43. H. Ritchie *et al.*, Coronavirus pandemic (COVID-19). <https://ourworldindata.org/coronavirus>. Accessed 22 February 2022.
44. World Health Organization, WHO Coronavirus (COVID-19) Dashboard. <https://covid19.who.int/measures>. Accessed 22 February 2022.
45. COVINFORM, Models and data sets. <https://www.covinform.eu/knowledge-repository/models-data-sources/>. Accessed 22 February 2022.
46. A. Gollwitzer *et al.*, Partisan differences in physical distancing are linked to health outcomes during the COVID-19 pandemic. *Nat. Hum. Behav.* **4**, 1186–1197 (2020).
47. L. Hedayatifar, R. A. Rigg, Y. Bar-Yam, A. J. Morales, US social fragmentation at multiple scales. *J. R. Soc. Interface* **16**, 20190509 (2019).
48. W. Pascha, P. Köllner, A. Croissant, *Japan Report. Sustainable Governance in the Context of the COVID-19 Crisis* (Bertelsmann Stiftung, 2021).
49. C. Mishra, N. Rath, Social solidarity during a pandemic: Through and beyond the Durkheimian Lens. *Soc. Sci. Humanit. Open* **2**, 100079 (2020).
50. M. J. Gelfand *et al.*, The relationship between cultural tightness-looseness and COVID-19 cases and deaths: A global analysis. *Lancet Planet. Health* **5**, e135–e144 (2021).
51. G. Grimalda *et al.*, Altruism in the time of COVID-19: We are all in this together, but who is we? (2021). <https://assets.researchsquare.com/files/rs-139076/v2/ff8a5c32-ee16-4991-bba4-0fe1d7046f6f.pdf>. Accessed 22 February 2022.
52. D. S. Wilson, E. Ostrom, M. E. Cox, Generalizing the core design principles for the efficacy of groups. *J. Econ. Behav. Organ.* **90**, 21–32 (2013).
53. P. W. Atkins, D. S. Wilson, S. C. Hayes, *Prosocial: Using Evolutionary Science to Build Productive, Equitable, and Collaborative Groups* (New Harbinger Publications, 2019).