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van de Poel, Ibo; de Wildt, Tristan; van Kooten Pássaro, Dyami

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Chapter 2
COVID-19 and Changing Values

Ibo van de Poel, Tristan de Wildt, and Dyami van Kooten Pássaro

2.1 Introduction

The coronavirus pandemic and the measures taken to mitigate its effects, such as lockdowns, have hugely affected people's lives. It seems likely, therefore, that it may have also affected people's values, at least in the short term. Our aim in this chapter is to explore whether the COVID-19 pandemic has led to value changes in society, and if so, how.

There have been a few studies addressing value change due to the COVID-19 crisis. Steinert (2020) addresses the possibility of value change due to what he calls emotional contagion through social media, which, according to him, may lead to more emphasis on values stressing security preservation and threat avoidance. Lampert et al. (2021) and Reeskens et al. (2021) report relevant results from value surveys. While the latter find that values remain largely stable, the former – among others – find that "[t]he pandemic and the economic crisis it brought have led to an increased focus on individual free choice and the non-material aspects of life. At the same time, the support for […] law and order have decreased. People are increasingly calling for inclusive growth and for reducing the gap between rich and the poor" (Lampert et al., 2021: 3). Similarly, Liscio et al. (2021) examine values in the COVID-19 pandemic, although they do not address value change.

The limited studies available also make seemingly contradictory speculative claims about how values (may) change due to the corona pandemic, from an increasing emphasis on security values (Steinert, 2020) to no value change (Reeskens et al., 2021) to more emphasis on post-materialist values (Lampert et al., 2021). Our study adds to this ongoing debate by studying possible value changes based on how news

I. van de Poel (✉) · T. de Wildt · D. van Kooten Pássaro
Delft University of Technology, Delft, The Netherlands
e-mail: I.R.vandePoel@tudelft.nl; T.E.deWildt-1@tudelft.nl;
D.vanKootenPassaro@student.tudelft.nl

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reports on the corona pandemic. We analysed a large number of such articles about the COVID-19 crisis from six countries (US, UK, India, South Africa, Japan, South Korea) to trace how often certain values were addressed. Additionally, we looked at news articles from 2016 to early 2020 to see how the COVID pandemic might, or might not, have influenced the frequency with which certain values are addressed in new articles compared to the pre-COVID period. Our analysis looked at eleven different values: health and safety, economic welfare, mental health, socio-economic equality, freedom, democracy, sustainability, privacy, conformity, family and belonging, and hedonism.

To analyse this large set of news articles, we employed a computational tool: topic modelling, which allows tracing the changing frequency of specific topics in a text corpus. For several methodological reasons, topic modelling is likely to provide a more reliable analysis of values, and value changes, than a keyword-based counterpart (de Wildt et al., 2021). However, as we will explain, care should be taken in interpreting the results of such analyses, as what we find are changes in the frequency of references to certain values, which leaves open the question of what such changes signify and whether they truly reflect the importance people attach to values in their lived lives. Moreover, we remain open to the possibility that the way in which we construed the value topics in our computational topic model may not always fully or adequately reflect the values we are interested in.

We proceed as follows. Section 2.2 gives some background on the notion of 'value' and introduces the eleven values we have analysed. Section 2.3 explains our methodology. Section 2.4 presents the main results. Section 2.5 discusses possible interpretations of these results. We finish by elaborating on these various interpretations in our conclusion.

2.2 Values in the COVID-19 Pandemic

2.2.1 What Are Values?

Values are generally taken to be expressions of what is 'good' or 'desirable'. However, beyond this general consensus, there are marked differences in how different disciplines and scholars have understood the term 'value' and how they have understood value change. Therefore, before discussing relevant values – and possible value changes – for the COVID-19 crisis, we will start with a brief overview of the notion of value as it has been roughly understood in psychology, sociology and (moral) philosophy.

Psychologists usually view values as part of an individual's personality (Steg & De Groot, 2012). They are often taken to be beliefs about what is, in general terms, desirable (Rokeach, 1973; Schwartz, 1992). Furthermore, values are seen as abstract, general, and relatively stable over a person's life. Like Schwartz (1992), some psychologists take values to be universal, although their relative importance

may change over time and between nations and cultures. Examples of values distinguished by Schwartz are benevolence, achievement, and security.

In addition to this more psychological notion of value, one might distinguish a more sociological one, which understands value as a social phenomenon or cultural resource (cf. Demski et al., 2015; Jasanoff & Kim, 2015). Understood in this way, values are shared anchors that people use to justify their behaviour to others and to which they orient their actions to a greater or lesser extent. For example, generosity may be a social value in the sense that in a specific society or community, people expect each other to be generous to one another. Such social values may be influential even if they deviate from the more personal values distinguished by psychologists. This is because they typically express social expectations about how others will behave and what behaviour others will – and will not – accept. So even people that do not have a generous personality may behave generously because others expect them to do so. Although such social values may be stable over long time periods, they may also change; new values may emerge, etc. Moreover, there is usually some room for agents to (re)interpret these values and their meaning and what they imply for the desirability of certain actions or technologies.

A third relevant notion of values is that of moral values. Moral values express what is normatively or morally good and desirable. For example, fairness is often considered a moral value. In (moral) philosophy, there are many different (meta-ethical) accounts of values. Still, an important distinction is between accounts that associate values with (subjective) mental states like desires and accounts that take values to be objective and real in some sense. However, even most accounts that associate values with desires do not equate them with actual desires. Instead they associate them with, for example, informed desires or desires under certain conditions. Concretely this can be something like seeing the world from behind a veil of ignorance about one's specific position in society (e.g., Rawls, 1999 [1971]).

In the remainder of this chapter, we will use the terms 'personal values', 'social values' and 'moral values' to refer to these three different types of value. It should be stressed that our usage of these terms connate different uses of the term 'value', not necessarily distinctions in the content of a value. Thus, sustainability can be a personal as well as a social or a moral value. Moreover, it can be all three simultaneously. This is because three usages of the term 'value' are not necessarily conflicting, but rather refer to different phenomena; namely, a person's personality ('personal value'), shared anchors in society ('social value'), and expressions of what is morally good and desirable ('moral value').

2.2.2 Relevant Values for the COVID-19 Pandemic

For the methodology we have used in this chapter (explained in Sect. 2.3), we used a computational tool to trace values and value changes in large text corpora, in this case, news articles about COVID-19. This approach is particularly appropriate for tracing social values, as it seems likely that news articles would refer to shared

values in society to a more significant extent than, say, their authors' personal values or moral values. Still, it would seem reasonable to assume that the values we find this way also tell us something about a population's personal values and what members of this population consider to be morally important. The latter is not necessarily the same as moral values, of course, but is often a proxy for them.

In making an inventory of relevant values, we have first brainstormed together (as authors) on what the relevant (social) values in the COVID-19 crisis could be. Additionally, we have used the results of a study by Liscio et al. (2021), who let two teams of human annotators identify values in text corpora based on a PVE (Participatory Value Evaluation) study on relaxing COVID-19 measures in the Netherlands (Mouter et al., 2021). This resulted in the addition of three values; see Appendix 2 for details. Below, we briefly give a short explanation of each value and justify why we consider these values relevant. We do not claim that our list of relevant values is exhaustive, although we believe it is relatively comprehensive.

Health and safety: Health has been defined by the World Health Organisation (WHO) as the "state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity" (World Health Organization, 2006: 1). Safety may be understood as the absence – or at least the reduction in as far as reasonably possible – of risks, in this case mainly health risks. Health and safety are obviously relevant: at the moment of writing, there are almost 4 million confirmed deaths worldwide due to COVID-19, with actual numbers likely reaching much higher due to limited testing and attribution difficulties (Ritchie et al., 2020).

Economic welfare may be understood as the level of prosperity and the standard of living of a country or individual. We understand it here primarily in economic terms, and the value is therefore different from a value like wellbeing. The pandemic is estimated to lead to a loss in global GDP (gross domestic product) of 4.5% in 2021, equaling around 3.94 trillion US dollars in lost economic output (Szmigiera, 2021). As soon as May 2020, 30% till 35% of respondents in Germany, the UK and the US reported a loss in income due to corona[1]; Eurostat reports a loss in median income in the EU in 2020 of 5.2% compared to 2019.[2]

The WHO defines *mental health* as "a state of well-being in which every individual realises his or her potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community."[3] While it might be argued that the value of 'mental health' is part of the value 'health and safety', we distinguish it here as a separate value because it denotes quite specific considerations. Some of the measures deemed necessary to achieve health and safety, like lockdowns, are detrimental to mental health. In a US health tracking poll in July 2020, 53% of the respondents reported a negative impact

[1] https://www.statista.com/statistics/1108061/losing-income-due-to-the-covid-19-corona-pandemic/. Accessed 22-5-2021.

[2] https://ec.europa.eu/eurostat/web/products-eurostat-news/-/ddn-20201210-2. Accessed 22-5-2021.

[3] https://www.who.int/news-room/fact-sheets/detail/mental-health-strengthening-our-response. Accessed 22-6-2022.

on their mental health.[4] Similarly, the share of adults in the US reporting symptoms of anxiety disorder and/or depressive disorder raised four-fold (from 11% to 41%) between January–June 2019 and January 2021.[5]

In this paper, *socio-economic equality* is understood as equality between different social groups, including differences in race, gender, age, and between nations. It relates to equality of opportunity but also equality of outcome (e.g., income). There are numerous signals that both the impact of COVID-19, as well as those of countermeasures, is unequally distributed over the population in many countries, as well as worldwide. In many cases, the vulnerable and already disadvantaged groups take on the most significant part of the burden (Perry et al., 2021; Clouston et al., 2021; Cifuentes et al., 2021; Lopez et al., 2021).

Freedom may be understood as the ability to direct one's life (autonomy), but it is also often understood as the absence of external constraints and hindrances. The latter seems particularly relevant in the COVID-19 crisis, which has a considerable impact on freedom due to social distancing, lockdowns, night curfews and bans on (large) gatherings.

Democracy as a value does not only refer to a particular mode of government, but also to equal access to a number of democratic and human rights as well as respect for the rule of law and political equality. Unfortunately, democratic values have come under pressure because slowing the spread of the SARS-CoV-2 virus has required extraordinary governmental measures that can be hard to publicly justify in a democracy. According to a report from the Freedom House, the conditions of democracy and human rights have worsened in 80 (out of 192) countries during the pandemic (Repucci & Slipowitz, 2020).[6]

Environmental sustainability refers to the value of sustaining environmental resources and reducing environmental pollution and degradation. For example, the pandemic is reported to have led to a reduction in greenhouse gas emissions and improved (local) air and water quality, as well as to an increase in medical waste and consequent shoreline pollution (Cheval et al., 2020; Bhat et al., 2021; Rume & Didar-Ul Islam, 2020; Rupani et al., 2020).

Privacy in this context is understood as the protection of the personal sphere against intrusion by others. For the COVID-19 pandemic, informational privacy, which refers to the ability to decide what information about oneself to share with others or keep confidential, is essential. Privacy is particularly an issue because of the privacy risks of COVID-19 tracing apps and home monitoring technology (Chan & Saqib, 2021; Gerke et al., 2020).

Conformity is understood here in terms of the population's willingness to abide by anti- COVID-19 measures, mainly from governments. Schwartz situates

[4] https://www.kff.org/coronavirus-covid-19/report/kff-health-tracking-poll-july-2020/. Accessed 22-5-2021.

[5] https://www.kff.org/coronavirus-covid-19/issue-brief/the-implications-of-covid-19-for-mental-health-and-substance-use/. Accessed 22-5-2021.

[6] The cited study is based on a survey among 398 experts from 105 countries and additional field and desk research.

obedience as being motivationally close to values like conformity and tradition, both of which relate to the subordination of the self to social expectations (Schwartz, 1992). It has, however, also been suggested that obedience to COVID-19 rules is not only (or primarily) to be explained in terms of conformity and authority, as it might also be based on a perception of procedural justice (Reicher & Stott, 2020).

Family and belonging is the value of being part of – and deriving part of one's identity from – a larger social group, like one's family, friends, neighbourhood, cultural group, or nation. Because of anti-COVID-19 measures, some important social ties for belonging like work, school, or the university, have been weakened. Meanwhile, others, in particular the family, may have been strengthened.

Hedonism. In moral philosophy, hedonism is the theory that equates the value of human wellbeing with pleasurable experience. Similarly, psychologists associate hedonism with excitement, pleasure, new experiences, and self-indulgence (Schwartz, 1992). However, COVID-19 has obviously made such activities more difficult. During the pandemic, many have found it difficult to express their hedonistic values, which may have resulted in more emphasis on other values and/or a negative impact on mental health.

2.3 Method

2.3.1 Topic Modelling as a Method to Trace Value Change

Values tend to be discussed in a latent manner in text corpora. Rather than explicitly naming the value in question, authors often use a wide range of words for referring to a value. For example, when an author discusses the impact of COVID-19 on the current energy transition, the probability that the author explicitly mentions the value 'environmental sustainability' is limited; the author might use such words as 'renewable', 'durability' and 'planet' to refer to the idea of environmental sustainability. The fact that values tend to be discussed in a latent manner has implications for how value change can be studied in text corpora. Studying value change using topic modelling typically requires a large number of texts to ensure that the trends observed are not arbitrary. Furthermore, using many texts calls for the use of keywords instead of a manual analysis to identify those texts which are addressing values of interest.

Nevertheless, the fact that values are latent means that it is difficult to find a set of keywords that matches the idea of a value (de Wildt et al., 2021). The set of words used by authors to refer to a value can be considerable. Some of these words (e.g. 'durability' and 'planet') may not be related to environmental sustainability when used in different contexts (e.g. material sciences or planetary science). Using only the relevant value term (like 'environmental sustainability') as a keyword typically leads to underestimating the number of texts addressing this value, while adding more keywords might lead to overestimating it.

A limited number of approaches exists in the academic literature to study values in text corpora. Liscio et al. (2021) propose the 'Axies' approach, which helps identify context-specific values and related keywords. While complemented by Natural Language Processing, the process still relies on human annotation to identify values, which may be time-intensive. Sun et al. (2014) propose an approach entitled Automatic Estimation of Schwartz Values (AESV). This approach focuses on identifying Schwartz values (Schwartz, 1992) in social media and can calculate the value proprieties of individuals and groups. Similarly, de Wildt et al. (2018) propose an approach based on probabilistic topic models (Blei & Lafferty, 2009) to capture the gist of text corpora that address values. This approach, further refined by de Wildt et al. (2021), is used here.

Using probabilistic topic models, values are defined using distributions of words instead of keywords. Probabilistic topic models originate from the field of text mining. In a topic model, a topic is defined as a distribution of words. For example, a topic on vaccines as measures against Covid-19 might have high probabilities on terms such as 'RNA' and 'shot' and low probabilities on 'mask' and 'hand'. The construction of a topic model can be done in an unsupervised or semi-supervised manner: In the first case, resulting topics will tend to converge to the most frequent themes in the text corpus. In the second case, topics can be shaped so that they represent some themes of interest, like – in our case – values. Texts addressing values can then be identified by comparing the distribution of words in a text and the distribution of words of topics built to reflect the idea of specific values.

A number of potential biases need to be considered when using probabilistic topic models to trace value change (cf. de Wildt et al., 2021). On one side, probabilistic topic models allow for better capturing the idea of a value in comparison to keywords. The dataset analyzed can be large, thereby helping to explore a wider set of sources expressing different perspectives. On the other side, the type of corpus analyzed might affect the type of values identified and the way they are discussed. For example, newspaper articles often focus on human values while a corpus composed of patents might concentrate on technical ones. Also, the time length of the dataset might affect the type of value change observed (e.g. temporary punctuated shock or durable value change). Finally, we use the frequency of occurrence of values in texts as a proxy for the (relative) importance of values. We discuss how to interpret topic model outcomes given these potential biases in Sect. 2.3.2 ('Interpreting outcomes'). We reflect further on these biases when interpreting topic model results in Sect. 2.5.

2.3.2 Data Collection and Analysis

The process of exploring value change using topic models involves three steps: (1) selecting the dataset, (2) choosing the number of topics to search and (3) creating topics that represent the relevant values (de Wildt et al., 2021). The topic model created can also be exported and applied to new datasets. This section describes how

each step has been used for this research. We also discuss how to interpret model outcomes, i.e. what frequencies mean regarding the importance of values. The datasets and notebook used for this analysis can be found online.[7]

Selecting the Dataset

To pull from a robust set of articles for the topic modelling analysis, we have used the following four guidelines for finding and using datasets for this research:

First, we looked for text sources that could help trace potential value change occurring from the start of the COVID-19 crisis until the time of analysis. We have selected newspaper articles as they are expected to depict important values in society. In contrast, the typically long publication process of scientific articles might not allow observing value change occurring within a timeframe of several months. However, different types of text corpora might concentrate on different values, and their analysis might depict different kinds of value change (de Wildt et al., 2021). We have considered this in the interpretation of our results and discuss this limitation in Sect. 2.6.

Second, we looked for both datasets that are specifically on COVID-19, allowing us to explore value change in dealing with the COVID-19 crisis, as well as datasets not explicitly related to COVID-19, allowing us to explore how the crisis has affected overall values in society.

Third, the datasets need to be sufficiently large to ensure representativeness. The minimum number of texts depends on the length of the timeline analysed and the precision of the analysis required. For most analyses, a minimum number of 1000 texts is required.

Fourth, the sources needed to be in English as a topic model would typically not be able to form one topic if it is discussed in different languages due to semantic differences.

The following three datasets of news articles were ultimately used for this research. A detailed overview of the datasets, including the number of news articles and newspaper sources, is provided in Appendix 1.

- A corpus with news articles on the COVID-19 pandemic from the United States (US), United Kingdom (UK) and South Africa for the period January 2020 – August 2020. This corpus is drawn from a dataset from Aylien Ltd. (2020), from which we have extracted 5000 randomly selected news articles for every country mentioned.
- A corpus with news articles on the COVID-19 pandemic from January 2020 – January 2021 from Japan, India and South Korea. This corpus is based on a dataset collected by Ghasiya and Okamura (2021).
- A corpus with text articles from Reuters (category ‘world news’) for the period January 2016 – March 2020. This corpus also contained news articles not related to COVID-19. This corpus is based on a dataset from Thompson (2020), from which we selected all articles with category ‘world news.’

[7] https://doi.org/10.4121/20134163

Choosing the Number of Topics to Search

The creation of a topic model requires indicating the number of topics that the algorithm needs to find. The number of topics should be sufficiently large to ensure that enough space is given to semi-supervised topics created (e.g. representing values) and other topics occurring in the dataset to converge to. However, an excessively high number of topics (e.g. 1000 topics) will vastly increase the time required by the algorithm to create the topic model. Therefore, we have set the number of topics to 200 and have verified that this number was sufficient to develop topics that represent relevant values for the COVID-19 pandemic.

Creating Topics that Represent Values

Creating topics that represent values is a process of pushing and pulling anchor words to ensure that each distribution of words formed adequately represents the relevant value (de Wildt et al., 2021). Anchor words are words used as input to a semi-supervised topic model and help steer the topic in a particular direction (i.e. a specific distribution of words). For example, the words 'health', 'safety', 'death' and 'immune' can be used to create a topic for the value *health & safety*. However, in case the newly created topic still includes aspects that are not related to *health & safety*, these unrelated words can be used as anchor words to create a separate topic, hereby pulling out this aspect from the topic on *health & safety* into a separate topic and specifying the topic of *health & safety* to suit our understanding of the value.

Table 2.1 provides an overview of the anchor words used to create topics representing values. The column 'Topic created' shows the 10 highest probability words for the distributions of words formed for each topic.

We have verified the quality of topics in two ways: we have manually verified that documents assigned to topics on values were indeed addressing the values in question as well as verified that none of the topics not related to values still contained aspects of values by looking through the list of all generated topics.

Interpreting Outcomes

In interpreting the outcome of the analysis, three important considerations should be borne in mind:

First, the analysis performed reports about frequencies (i.e. the percentage of newspaper articles addressing a value at a specific moment in time). At the same time, we are ultimately interested in changes in the importance of values. For example, the fact a value is named more frequently might be caused by an emerging problem concerning this value (for example, a new technology that creates a moral issue), as well as by a technical or regulatory solution that has been found to better address this value (e.g. a new COVID-19 vaccine). Thus, while changing frequencies of values might be signs of changes in importance, a further reflection about what could have caused changes in frequencies is essential before conclusions can be drawn.

Second, uncertainty always exists about the quality of topics. This is particularly the case for the topic of values, since values are sometimes hard to separate semantically from how they are being operationalised (e.g. the system used to act upon them). An example of this is 'democracy', which strongly refers to both a value and

Table 2.1 Anchor words and topics created (10 most prominent terms displayed) that represent values

Values	Anchor words	Topic created
Health & Safety	Safety, health, healthy, deaths	[Health, deaths, public health, the health, of health, health and, public, health minister, safety, health officials]
Mental Health	Isolation, depression, suicide, solitude, somber, anxiety, sadness, mental health	[Isolation, anxiety, mental health, depression, self-isolation, in isolation, self, mental, sadness, suicide]
Economic Welfare	Economic, costs, cost effective, stimulus, bankruptcy, debt	[Economic, stimulus, debt, economy, billion, costs, financial, market, business, the economy]
Socio-Economic Equality	Equality, equal, fairness, socio-economic, socio-economic class, inequality, unequal, working class, equity, income differences, living standard, insecurity, divide	[Equal, equity, inequality, equality, divide, insecurity, working class, unequal, toward, policies]
Privacy	Privacy, private, personal, secret, tracking, invisible, security, monitoring	[Personal, private, security, monitoring, tracking, privacy, and private, of personal, security and, and personal]
Freedom	Freedom, choice, autonomy, personal responsibility, independence	[Choice, freedom, freedom of, power, speech, independence, reality, diverse, views, no choice]
Democracy	Choice, suppression, public opinion, opinion, rights, totalitarian, authority, democracy	[Rights, opinion, democracy, political, leaders, human rights, legal, authority, society, human]
Environmental Sustainability	Sustainability, sustainable, renewable, durability, climate change, global warming, pollution, environment, environmental, air pollution, water quality	[Environment, sustainable, environmental, climate change, sustainability, pollution, climate, creation, the environment, the creation]
Hedonism	Enjoyment, pleasure, wellbeing, friendship, pleasurable, enjoy, stress, self-esteem, fun, hobby, new experience, experience, sports, pub, alcohol, conviviality, entertainment, enjoy, positivity, outdoors, leisure, joy, partying	[Experience, entertainment, stress, fun, enjoy, joy, outdoors, pleasure, friendship, positivity]
Community and Family	Community, family, belonging, group, relatives, friends, friend, children, neighbour, neighbours, neighbor, neighbors	[Family, children, friends, relatives, friend, parents, the family, family and, his family, friends and]
Conformity	Conformity, restriction, follow the rules, obedience, conventional, law, order, obedience, norms, culture, heritage	[Order, law, order to, in order, culture, the law, law enforcement, enforcement, restriction, home order]

a system of government. This potential bias does not prevent comparisons of frequencies of one value between multiple countries, as this bias is likely to be the same for every country. Neither does it hamper a qualitative comparison of patterns of value frequencies within and between countries, as this bias is the same over the timeline of the dataset. However, a numerical comparison between values – for example stating that one has become more frequent than the other – should be treated with care. The validity of such a comparison would depend on the extent to which both topics genuinely represent the value they aim to represent.

Third, the choice of the datasets was primarily based on availability. As it was very hard to find (publicly available) relevant datasets, we decided to reuse datasets collected by others (see Appendix 1). This means that we could not ourselves ensure the representativeness of the datasets nor correct for potential biases in the dataset (e.g. partisan views in the US). Nevertheless, we have no reason to assume that the datasets are not representative or biased; but obviously caution should be taken in the interpretation of the results for this reason.

2.4 Results

Here we present the main results of our analysis of how the frequency of specific values has changed over time in different countries compared to the pre-corona period. Figures 2.1, 2.2, 2.3, 2.4, 2.5, and 2.6 show the results of the six countries we have analysed. Please note that the time span is somewhat different for the different countries due to the (dis)availability of data.

Based on the results for these six countries, we make the following observations:

1. At the start of the pandemic (January–February 2020), the value of *safety and health* is addressed in at least 60% of the news articles in all six countries, with somewhat higher frequencies for Japan and India (up to 80%). However, in all countries, this percentage drops to about 40% from April–June 2020 and then stabilises.
2. The general pattern for the other values seems to be that the trend in frequency goes up over time for most of them. However, there are distinct differences between countries and values here (see our successive observations). What is also worth observing is that in South Korea, as early as April 2020, at least one other value becomes as frequent as *safety and health*, while in India this takes until the end of 2020.
3. Concerning the value of *economic welfare*, we see three different patterns:
    1. In Japan and South Korea, we see a considerable increase in frequency until April 2020 and then a stabilisation at a relatively high level (around 35–40%).
    2. In both the US and the UK, we see a peak in frequency in March 2020 (around 30%) and then a stabilisation at a lower level (approximately 25% in the US and 20% in the UK).

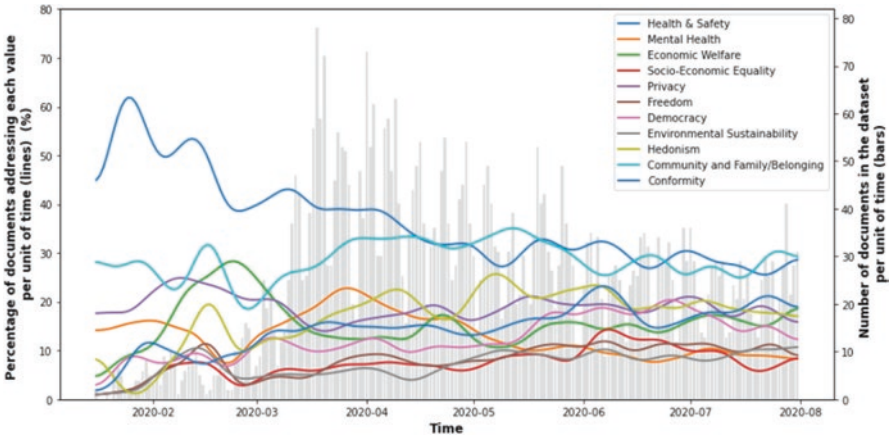

Fig. 2.1 United Kingdom

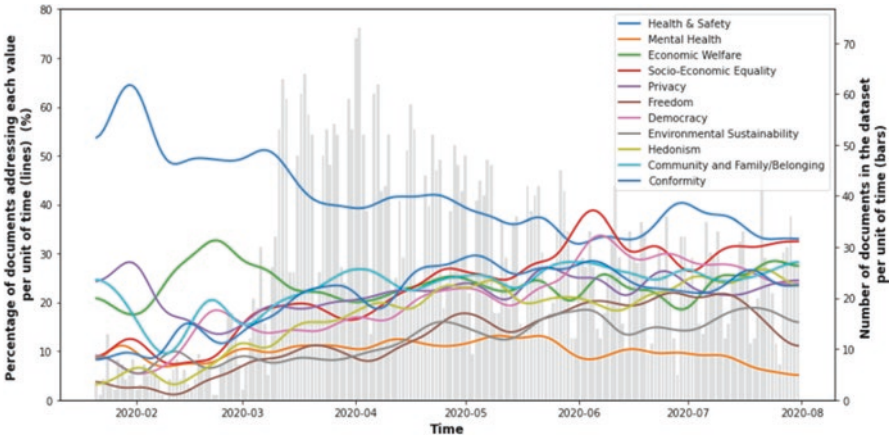

Fig. 2.2 United States

3. In South Africa and India, we see an increase over time at a relatively low overall level of frequency (around 10–20%).

4. While we see an increase in frequency over time for the values of *democracy* and *privacy* in all six countries, the growth is most marked in South Africa (up to around 40% in August 2020) and India (approximately 30% in the second half of 2020).
5. In the US, we also see a marked increase in the value of *socio-economic equality* frequency from about 10% in early 2020 to around 40% between June and August 2020. In other countries, we also witness an increase in the frequency of this value over time, but at a slower pace and never reaching quite such a high percentage.

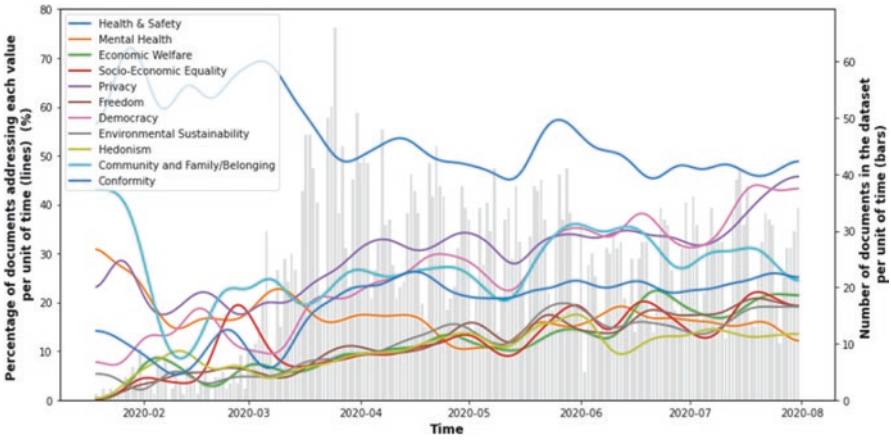

Fig. 2.3 South Africa

6. Although the value of *hedonism* seems to increase in frequency in all six countries, it goes up most markedly in the US, where it rose from below 10% in January 2020 to around 30% in August 2020. In contrast, it tends to go up less steeply in the other countries, rising from approximately 10% to only about 20%.
7. Concerning the value *conformity*, we observe that the frequency increases in the US, the UK and South Africa while remaining relatively stable in other countries.

Figure 2.7 shows the results for the corpus with new articles in the period 2016–20, including non-COVID news. It very clearly shows the effect of the COVID-19 pandemic on the frequency in which specific values are addressed in news articles. *Health & safety* increase from below 10% to above 50% in three months. *Hedonism*, *mental health* and *economic welfare* also show an increase in frequency in early 2020, although the frequency of these values does not deviate from their bandwidth in the period before 2020.[8] The other values show a drop in frequency. For *democracy*, *privacy* and *socio-economic equality,* this is a drop well below the bandwidth of the values in the period 2016–20.

2.5 Discussion

We discuss the following four points:

- The general pattern of value change and whether we can expect any long-term value changes due to the COVID-19 pandemic.
- Possible explanations for differences between countries we found.

[8] Given the large number of articles in this dataset, this bandwidth would seem a reliable indication for 'normal' variations in the frequency of values in the pre-COVID time span.

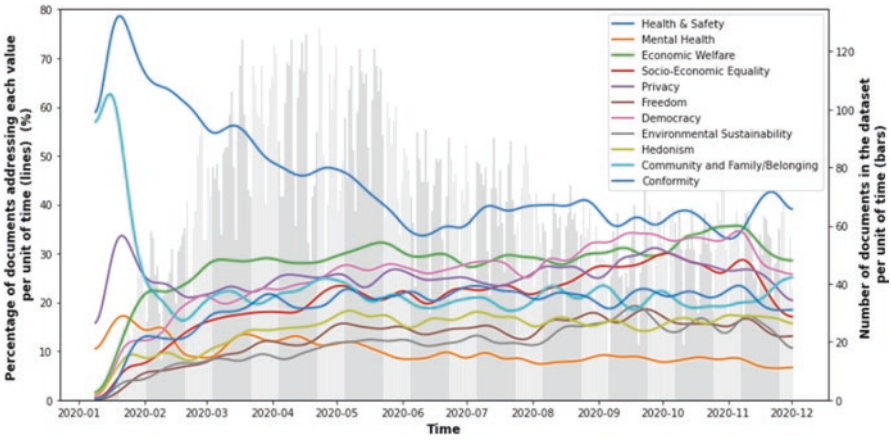

Fig. 2.4 Japan

- A comparison of our results with what might be expected based on existing value theories.
- Potential moral implications of our findings.

General Pattern of Value Change

As Fig. 2.7 shows, the COVID-19 pandemic has led to a punctuated shock in the frequency in which certain values are addressed in news articles. In particular, the value of health and safety went up rapidly in frequency at the start of the pandemic. We also see that some other values at stake in – or somewhat threatened by – the pandemic, such as mental health, economic welfare, and hedonism, go up in frequency, although this increase is not significant compared to previous fluctuations in the 2016–20 period. Conversely, the frequency of all other values drops, particularly for democracy, privacy, and socio-economic equality. An explanation for this may be that these values are not, or at least not immediately or initially, associated with COVID-19 .[9]

When it comes to the long-term effect we might expect from this punctuated value change, the earlier observations 1 and 2 are significant. Together, they suggest that the impact of the punctuated value change we see in Fig. 2.7 in the first three months of 2020 is already *cancelling out* in the following months of the pandemic.[10] Thus, although it is hard to say anything definitive about whether the pandemic will lead to long-term value change, the pattern we can already witness *during* the

[9] One thing that should also be kept in mind is that if one value goes drastically up in frequency, like in this case health and safety, other are likely to go down as the amount of news articles will typically remain rather stable and articles will often address a limited number of values.

[10] Here, it should be kept in mind that the country trends in Figs. 2.1, 2.2, 2.3, 2.4, 2.5, and 2.6 are based on COVID news articles, not on all news articles, so that percentages cannot be directly compared with those in Fig. 2.7.

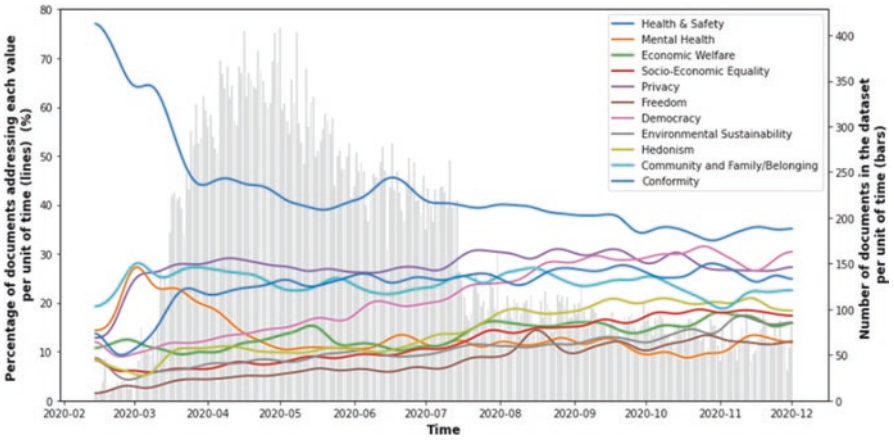

Fig. 2.5 India

pandemic suggests that the long-term effects on values may well be limited.[11] Instead, the pandemic may have led to punctuated shock reflected in a temporary change in the frequency in which certain values are addressed in news articles, which may smoothen out over time. Only time will tell whether this is really the case or whether there are also more enduring long-term effects.

Possible Explanations for Differences Between Countries

Here we look for possible explanations for observations 3–7. To do so, we referenced the following additional data for these countries to find possible explanations:

- COVID-19 cases and deaths (see Appendix 4).
- Stringency of measures (see Appendix 5).
- GDP per capita (Fig. 2.8), decline in GDP during corona (Fig. 2.10) and GINI coefficient (Fig. 2.11).
- Hofstede cultural dimensions (Fig. 2.9).

The first two of these additional data do not seem to correlate (in interesting ways) with the frequency of values in news articles; GDP data and the Hofstede dimensions seem relevant in some respects, as we will explain below.

Concerning the value of *economic welfare*, we observed three different trends in three groups of countries, i.e. (1) South Africa and India, (2) Japan and South Korea, and (3) the UK and the US (see observation 3 above). It is noteworthy that these three groups of countries have certain commonalities and, therefore, possibly each represent a larger group of countries. For example, (1) South Africa and India are

[11] Of course to say so, we would need to look at a dataset that also includes non-COVID news. Regretfully we have such a dataset only for the period until early 2021. Nevertheless, the trend we witness in the dataset with only COVID news suggests that the initial change in values may well be cancelled out over time, but to say anything more definitive we would need to know how this affects all news, not just COVID news.

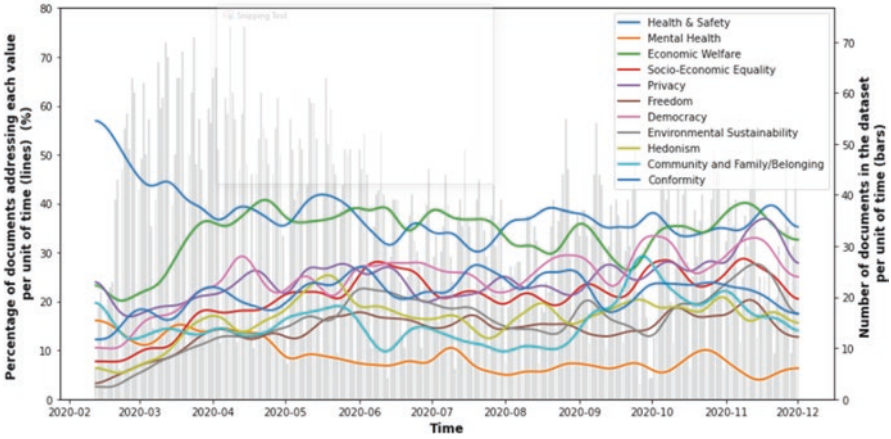

Fig. 2.6 South Korea

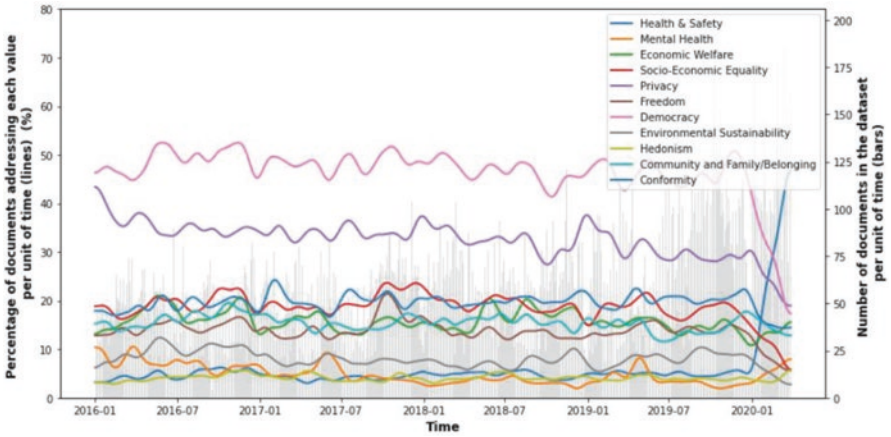

Fig. 2.7 Reuters World new also including non-COVID news

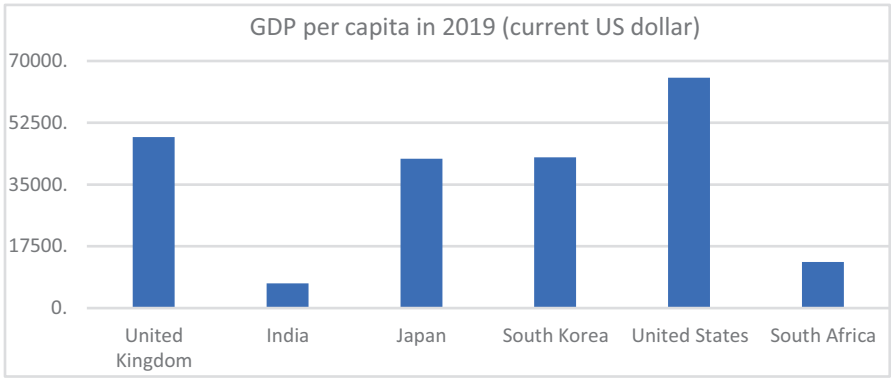

Fig. 2.8 GDP per capita in 2019 in current US Dollar. Data are from the World bank. Retrieved from https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD at 1 July 2021

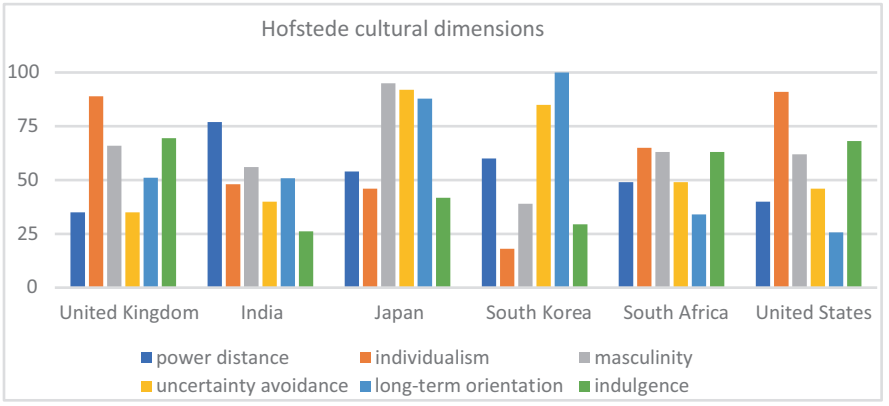

Fig. 2.9 Hofstede cultural dimensions. Data are based on Hofstede et al. (2010). Retrieved from https://geerthofstede.com/research-and-vsm/dimension-data-matrix/ at 1 July 2021

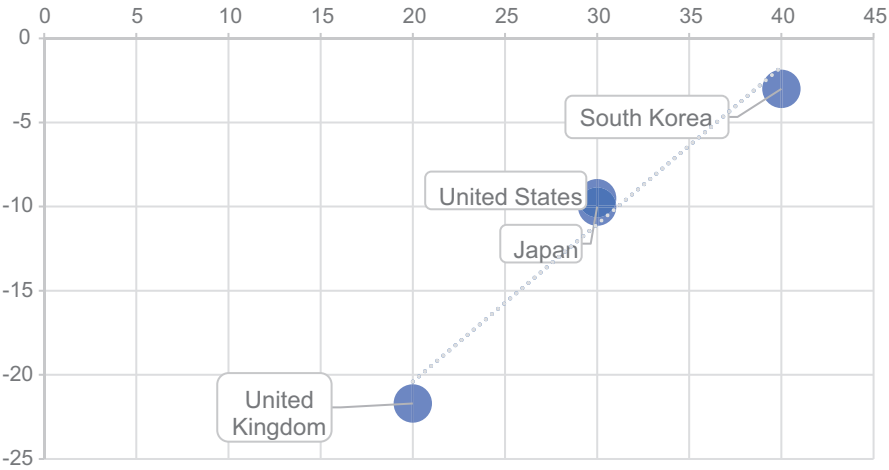

Fig. 2.10 Correlation between frequency of value 'economic welfare' and the percentual loss of GDP in four countries. The horizontal axis shows the frequency of the value 'economic welfare' in August 2020 in our data, and the vertical axis the percentual decrease in GDP in Q2 2020 (compared to Q2 2019). No data were available about decrease in GDP for South Africa and India. The GDP data were retrieved from https://ourworldindata.org/covid-health-economy on 1 July 2021

both countries from what has been called the Global South characterised by relatively low GDP per capita, (2) Japan and South Korea are both high-income countries from Asia, culturally characterised by a high uncertainty avoidance and a high long-term orientation and (3) the US and UK are both Western high-income countries, culturally characterised by a low uncertainty avoidance and a low long-term orientation.

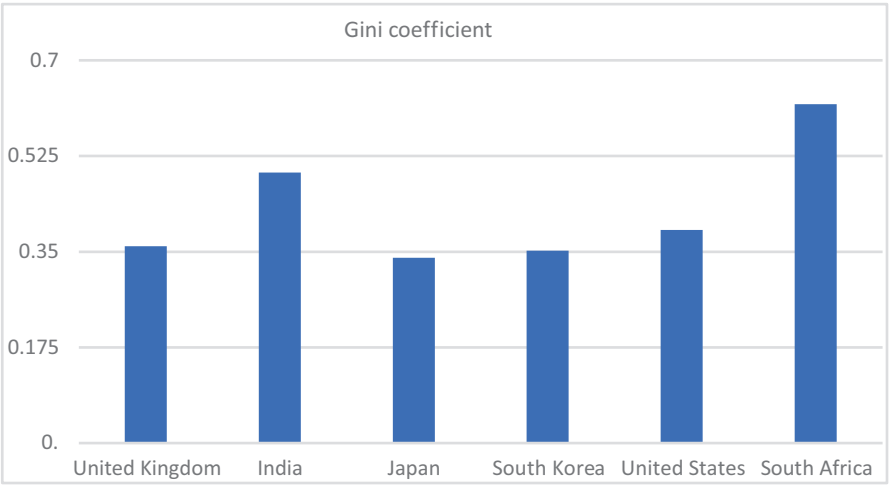

Fig. 2.11 Gini coefficient. 0 means total equality and 1 total inequality. The data are from 2015, except for India, which are from 2011. Data are from the OECD website. Retrieved from https://data.oecd.org/inequality/income-inequality.htm on 8 July 2021

Asian high-income countries, like South Korea and Japan, are likely most active in pursuing economic policies to abate the negative economic consequences of the pandemic; this may be (partly) explained by the cultural dimensions of (high) uncertainty avoidance and (high) long-term planning. Like the UK and US, Western high-income countries may also pursue such economic policies, but due to lower long-term planning and lower uncertainty avoidance, they may well less actively pursue such policies. Countries from the Global South, like India and South Africa, may lack the material means to afford such economic policies.

This suggests that the frequency of the value 'economic welfare' does not reflect how hard a country is hit economically by the pandemic, but rather how active it is in abating its adverse economic effects. This possible explanation is supported by Fig. 2.10, which shows a negative correlation between how hard certain countries are hit economically and the frequency of the value of 'economic welfare' in new articles.

When it comes to the values of *privacy and democracy* (observation 4), it is remarkable that the frequency of these values dramatically rises in countries from the Global South (South Africa and India). We do not have an explanation for this, but it belies the idea, sometimes heard[12], that such values may be considered less

[12] For example, Inglehart (2018) suggests that postmaterialist values (like privacy and democracy) are less prominent under conditions of scarcity. See also Inglehart and Welzel (2009). Also others scholars have suggested a correlation between economic development and democracy, although there is no agreement on the strength of the relation and in what direction it works (see e.g., Kauffman, 2021).

relevant in countries with low-income levels; we observe the opposite correlation.[13]

Concerning the value of *socio-economic equality* (observation 5), the US seems to be the exception because the frequency of this value increases here much more steeply than it does in the other countries. We do not see a clear correlation of the value with the GINI coefficients – a measure for income inequality – of the various countries, although the US does have a slightly higher GINI coefficient – i.e. more inequality – than the other high-income countries (Fig. 2.11). A better explanation for the trend in the US is perhaps the BLM (Black Lives Matter) movement which gained traction after the killing of George Floyd on 25 May 2020, immediately before we saw a peak in this value in the US in June 2020. This could be an effect from the news articles about these events being included in our sample (which is possible if they also contain COVID-19 keywords).[14] Furthermore, BLM may have increased awareness of racial and socio-economic inequalities, indirectly influencing the frequency of socio-economic equality in the dataset.

Concerning *hedonism* (observation 6), cultural differences may partly explain why we see a greater increase in frequency for this value in the US than in other countries. The US scores high on the Hofstede dimensions of indulgence and individualism, which may correlate with hedonism. However, it should be noted that the UK also scores high on these dimensions and yet shows a less marked increase in hedonism.

Concerning *conformity* (observation 7), we would like to suggest that the COVID-19 pandemic has led to an increase of its importance in countries in which this value is traditionally less dominant. COVID-19 measures such as self-isolation and social distancing have challenged the acquiescence of populations. Therefore, the measures might have required more value change in countries with high scores for individualism in the Hofstede dimensions (Fig. 2.9). Our results seem to confirm this suggestion. The importance of conformity appears to have increased in countries with individualism scores above 50 (US, UK, South Africa) while remaining relatively stable for those with scores below 50 (Japan, South Korea, India).

Comparison with Existing Value Theories

We will now move to compare our results with what might be expected based on two prominent descriptive value theories, namely Schwartz' theory of universal values (Schwartz, 1992) and Inglehart's modernisation theory of value change (Inglehart, 2018). We start with the latter.

[13] Again we remind the reader that (changes in) frequencies cannot always be interpreted as (changes in) importance, there may be other reasons for changes in frequency. Perhaps, privacy and democracy are better guaranteed through laws and institutions in the other four countries, and this explains why they are less discussed. This is however speculative.

[14] We have tried to separate our value topic 'socio-economic equality' from the topic 'black lives matter', but that was not easy, and we might not have been fully successful. Apart from that, there is – as mentioned in the text- the possibility that BLM indirectly led to more attention to the value of 'socio-economic equality' in COVID news.

Inglehart (2018) has formulated two important value change hypotheses: the socialisation and scarcity hypothesis. The first holds that people's values are usually formed before adulthood and do not change much after that. The second states that virtually everyone values postmaterialist values like freedom and autonomy but prioritises materialist values like physical security and economic welfare under conditions of scarcity. Consequently, people's values reflect the conditions that were prevalent in the years before their adulthood. In increasingly affluent societies, one would therefore expect a gradual shift to postmaterialist values over time because the mix of generations in the total population changes over time. This general expectation indeed seems corroborated by empirical research (Inglehart, 2018). In addition, Inglehart allows for the possibility of more short-term value change due to crises or otherwise exceptional circumstances.

Lampert et al. (2021) report value changes due to COVID-19 pandemic based on surveys that used the methodology of the World Value Survey, which is based on Inglehart's theoretical work. It concerns changes in values between the first and fourth quarter of 2021 aggregated for 24 countries. As explained in detail in Appendix 5, we have translated these outcomes in terms of an increase or decrease of the values we considered in this study and compared them to the trends we found in our study: see Table 2.2 for the results.

In interpreting this result, two things are essential to keep in mind. First, the World Value Survey measures what we have called *personal* values, while our method is more geared up to measure *social* values. We defined social values above as "shared anchors that people use to justify their behaviour to others and to which they orient their actions to a greater or lesser degree." It should be noted that, understood in this way, social values are different from people's preferences or personal values, even if these are aggregated over the entire population.

Table 2.2 Comparison of value change found by Lampert et al. (2021) with our data (last two columns)

Value	Lampert et al. (2021)	Compared to pre-COVID-19	During COVID-19
Health and safety	+	++	−−
Economic welfare	−	+	+
Mental health	+	+	−
Socio-economic equality	+	−−	+
Freedom	+	−	+
Democracy	+	−−	+
Environmental sustainability	+	−	+
Privacy	+	−−	+
Hedonism	−	+	+
Conformity	−	−	+
Belonging	+	−	+
Overall fit (same direction)		2 out of 11	6 out of 11

Second, our method measures changes in the *frequency* of social values, while the World Value Survey measures changes in (subjective) *importance* of personal values. We cannot, therefore, directly compare our results with those from surveys like the World Value Survey. Nevertheless, we believe that one might expect that the trend we find in changes in the frequency of social value – i.e. whether a value is decreasing or increasing in frequency – may well correspond with changes in the subjective importance that people – individually as well as collectively – attribute to certain values. In other words, we may expect that if people subjectively value 'health' higher over time, we also see an increase in frequency of the social value of 'health' in newspaper articles. We may, therefore, expect *similar trends* even if we are not measuring the same construct.

In this light one striking observation is that the trend we observe *during* the Covid pandemic is similar to trend found by Lampert et al. (2021), while the trend we find compared to pre-COVID times seems opposite to the trend found by Lampert et al. (2021). This suggests that what Lampert et al. are actually measuring is a value change *during* the covid pandemic, instead of value change *due to* COVID. This is also not unlikely because they characterise their first measurements in early 2020 as "*just* before the pandemic hit most countries early in 2020" (p. 2; emphasis added).[15] However, our data strongly suggest that value change already took place during the first quarter of 2021 (see, e.g. Fig. 2.7), so that doubts may be raised about their claim that their Q1 survey data really measure pre-covid conditions.

It is also interesting to compare the trends of value change we find with Schwartz theory of basic values, which we briefly described in Sect. 2.2. Figure 2.12 shows the ten basic Schwartz values; Schwartz takes values close together in this figure to be (motivationally) reinforcing, while values far apart or opposite are assumed to be (motivationally) opposite or contradictory. This implies that if, for example, security values become more important, self-direction, and universalism will be emphasised less.

We may use this theoretical idea to formulate certain hypotheses about how values will change. To do so, we have associated our list of values with the Schwartz values. In addition, we might assume that a pandemic like the COVID-19 one will lead to more emphasis on security values (Steinert, 2020). However, our data suggests that the direction of value change for security and survival values reverses during the pandemic. Therefore, we have assumed that the changes in other values are a function of the change in the value of safety and health, following Schwartz' logic of values that reinforce each other or are opposite. The results are shown in Table 2.3. Overall, we find a relatively good fit with what one would expect based on Schwartz' value theory. Particularly for his universalism and self-direction values, we witness a good fit with our observations (see Table 2.3). Therefore, our

[15] The interviews were done online between 23 January and 11 March 2020 (Lampert et al., 2021:45).

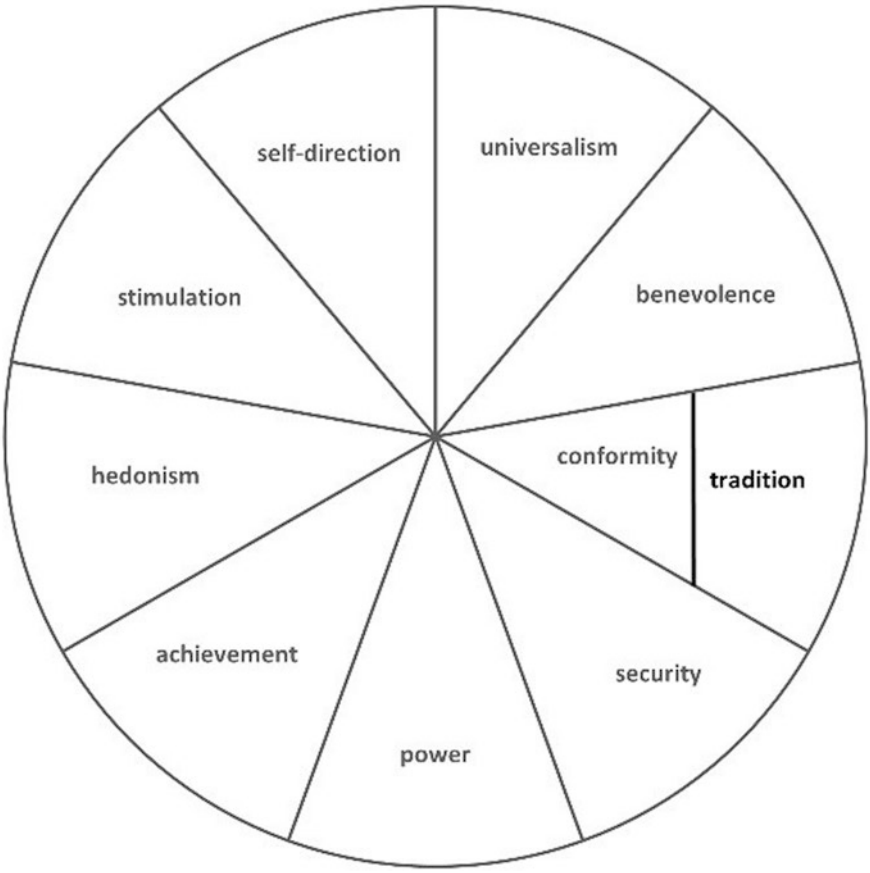

Fig. 2.12 Schwartz values

observations seem to confirm Schwartz's idea that changes in different values are related to each other.

Moral Implications

What do our findings tell us about moral values? While we did not directly trace moral values or changes in them, one might argue that values in news articles reflect values that are considered morally important in a society or country. They may at least reflect what the writers of such news think that people consider (or should consider) morally relevant values. This is agnostic on whether we also always have moral reasons to consider such values important.

Still, some of our findings may have indirect moral implications. One of these implications is related to how we can best phrase some of the moral issues raised by the COVID-19 pandemic. One popular phrase to describe this is "moral dilemmas". For example, it has often been suggested that we need to choose between "life" versus "livelihood", or between the values of "safety and health" versus the value of

Table 2.3 Comparison with value change expectations based on Schwartz' value theory

Value	Schwartz value	Compared to pre-covid		During covid	
		Expectation	This study	Expectation	This study
Health and safety	security	+	++	−	−−
Economic welfare	security	+	+	−	+
Mental health		?	+	?	−
Socio-economic equality	universalism	−	−−	+	+
Freedom	self-direction	−	−	+	+
Democracy	self-direction/ universalism	−	−−	+	+
Environmental sustainability	Universalism	−	−	+	+
Privacy	self-direction	−	−−	+	+
Hedonism	Hedonism	−	+	+	+
Conformity	conformity	+	−	−	+
Belonging	security	+	−	−	+
Overall fit (same direction)		7 out of 10		7 out of 10	

"economic welfare" in deciding on measures against the virus (e.g. Sharma & Mahendru, 2020; Fernandez et al., 2021).[16] Some have also voiced the fear that the COVID-19 pandemic comes at the costs of (moral) values we hold dear like democracy, freedom and privacy.[17]

Without denying the possibility of dilemmas and trade-offs, we find no support for the idea that the moral questions concerning COVID-19 should be understood in the form of dilemmas. For example, while we see a decline in values like democracy, freedom, and privacy at the start of the crisis, their frequency goes up later, without necessarily rising at the expense of attention for safety and health. Furthermore, we consider it to be telling that the same trend can be observed as even more pronounced in low-income countries from the Global South.

Similarly, there seems to be little evidence that we face a dilemmatic choice between "safety and health" versus "economic welfare". The countries in our sample in which we see a relatively strong emphasis on economic welfare – Japan and South Korea – are also those that do best at minimising the effects of the Covid pandemic in terms of health and fatalities (see Appendix 3). Moreover, the overall stringency of measures in these two countries was not larger, or even smaller, than in the other four countries. This may be due to the fact that these countries have taken measures earlier (see Appendix 4). Furthermore, data from *Our World in Data*

[16] For another example, see https://www.lse.ac.uk/philosophy/blog/2020/10/21/lives-v-livelihoods/. Accessed 9 July 2021.

[17] For example, https://freedomhouse.org/report/special-report/2020/democracy-under-lockdown. Accessed 9 July 2021.

suggest a significant *positive* correlation between the degree to which countries succeeded in reducing new cases and fatalities and how successful they were in reducing the negative economic effects of the crisis (Ritchie et al., 2020).[18] Therefore, the suggestion that we face a moral dilemma, in the terms we have set out her, seems misleading (at best) and morally dangerous (at worst). This is because it stands to be misused by policy makers to pursue favoured policies for which there is no firm moral ground. Of course, it does not follow that other pandemic-related choices faced by governments in the future will not be dilemmatic; this will very much depend on the specific case. Whether a choice is dilemmatic is something we may sometimes only find out along the way, and it might not be evident at the moment of choice.

More generally, our observations may offer ground for some optimism in the sense that after a worrying decrease in the frequency of some morally important values like democracy and socio-economic equality, we clearly see these values increase in frequency at a later stage. We might interpret this as a sign of what may be termed *moral resilience*, i.e. the ability of a society to pay attention to morally important values despite these values being put under pressure in a crisis. That does not necessarily mean that these values are also better addressed or realised. We cited literature in Sect. 2.2 that gives reason to doubt so, but this observation at least implies that these values get more attention in the news and are connected to collective discussions about the pandemic. That is at least a start to ensuring that these moral values get the attention they deserve. One development that is nevertheless worrying in this respect is that the perceived importance to the value of mental health seems to have declined during the crisis (see Figs. 2.1, 2.2, 2.3, 2.4, 2.5, and 2.6), as this value certainly seems under pressure and would seem to require more rather than less attention from a moral point of view; this may then be considered an important moral blind spot.

2.6 Conclusions

We find that the first few months of the COVID-19 pandemic led to a punctuated change in social values. While the value of safety and health sharply increased in frequency, the values of *democracy*, *privacy* and *socio-economic equality* significantly declined. However, after this first shock, we see a relative decline in the value of *safety and health* in COVID-related news, while most other values have increased in frequency. While we lack the data to make strong claims about long-term effects, the pattern we find suggests that it may well be possible that the long-term effects of the pandemic in terms of social value change are limited.

[18] https://ourworldindata.org/covid-health-economy, Accessed 1 July 2021. Whether this correlation is the same for the remainder of the pandemic remains to be seen, of course.

Perhaps somewhat surprisingly, we find that the three seemingly contradicting studies we mentioned in the introduction are all right in some respect: Reeskens et al. (2021) are correct that the long-term effect of the pandemic on values may be limited; Steinert (2020) is right in the sense that the pandemic at least initially led to more stress on security and survival values; and the apparent change toward postmaterialist values found by Lampert et al. (2021) may well reflect value changes during the pandemic rather than a value change compared to pre-covid times. We further conclude that the patterns of value change we found are more or less in line with Schwartz' value theory that poses that specific values have opposing tendencies.

We also found and discussed some differences in value change between countries, which we could – to some extent – explain by economic and cultural differences between those countries. Concerning moral implications, we found no evidence that the pandemic has a clearly dilemmatic character. Instead, our findings suggest that the countries studied showed some moral resilience in the sense that morally important values began to increase in frequency again after their initial decline. While this certainly does not mean that these values are sufficiently addressed in actual policies, it means that they are at least addressed in news articles.

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Appendix 1: Text Corpora Used

Countries	Newspapers	No. of articles	Dataset
India	Hindustan Times, The Indian Express	47,342	Ghasiya and Okamura (2021)
Japan	The Japan Times, Asahi Shimbun, Mainichi Shimbun	21,039	Ghasiya and Okamura (2021)
South Korea	Korea Herald, Korea Times	102,278	Ghasiya and Okamura (2021)
UK	bbc.co.uk, mirror.co.uk, sky.com, express.co.uk, theguardian.com, thesun.co.uk, metro.co.uk, dailymail.co.uk, thetimes.co.uk, cnet.com, msn.com, alaraby.co.uk, skysports.com, dailystar.co.uk, thomsonreuters.com, digitalspy.com, channel4.com, parliament.uk, www.gov.uk, hitc.com, reuters.com, telegraph.co.uk, economist.com, nature.com, bmj.com, www.nhs.uk, ft.com, ox.ac.uk, barclays.co.uk, europa.eu	5000	Aylien Ltd. (2020)

Countries	Newspapers	No. of articles	Dataset
USA	thehill.com, washingtonpost.com, cbslocal.com, chicagotribune.com, theadvocate.com, qz.com, businessinsider.com, nypost.com, rollingstone.com, huffingtonpost.com, cnbc.com, forbes.com, deadline.com, cnn.com, sfgate.com, nbcnews.com, go.com, denverpost.com, politico.com, breitbart.com, foxnews.com, psu.edu, msn.com, ucdavis.edu, bgr.com, npr.org, bizjournals.com, nydailynews.com, latimes.com, google.com, cnet.com, nbcsports.com, usatoday.com, newsweek.com, brobible.com, motorsport.com, usnews.com, marketwatch.com, thedailybeast.com, cbsnews.com, bustle.com, dailycaller.com, cbssports.com, yahoo.com, psychologytoday.com, mashable.com, buzzfeed.com, vox.com, nymag.com, delta.com, complex.com, scientificamerican.com, techcrunch.com, hbr.org, fastcompany.com, foxbusiness.com, vanityfair.com, androidcentral.com, pbs.org, cdc.gov, ca.gov, wired.com, newyorker.com, aol.com, fivethirtyeight.com, apnews.com, gsmarena.com, slate.com, variety.com, billboard.com, snopes.com, theatlantic.com, pitchfork.com, tmz.com, harvard.edu, nih.gov, cosmopolitan.com, bloomberg.com, acs.org, issuu.com, sciencedaily.com, cisco.com, ew.com, techtarget.com, eonline.com, chron.com, menshealth.com, legacy.com, vulture.com, nba.com, digitaltrends.com, yelp.com, mit.edu, producthunt.com, zdnet.com, umich.edu, archdaily.com, arizona.edu, nytimes.com, usda.gov	5000	Aylien Ltd. (2020)
South-Africa	news24.com	4296	Aylien Ltd. (2020)
Worldwide	Reuters	91,180	Thompson (2020)

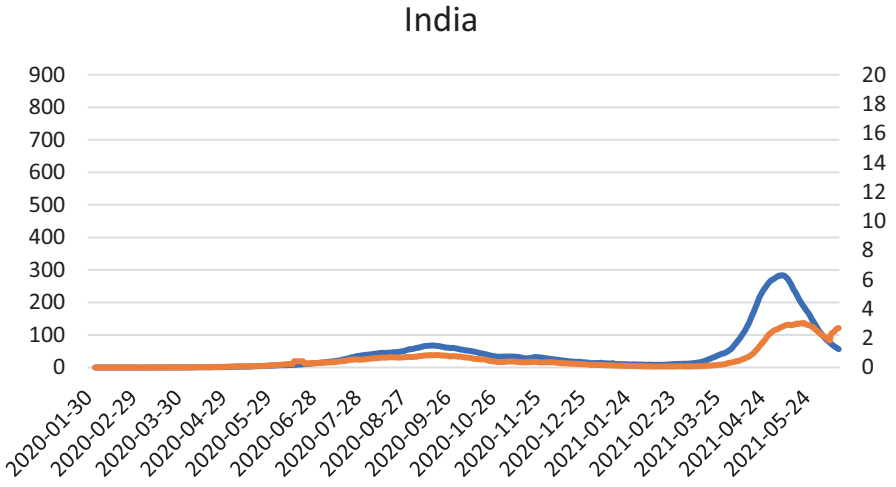
Appendix 2: Values Identified

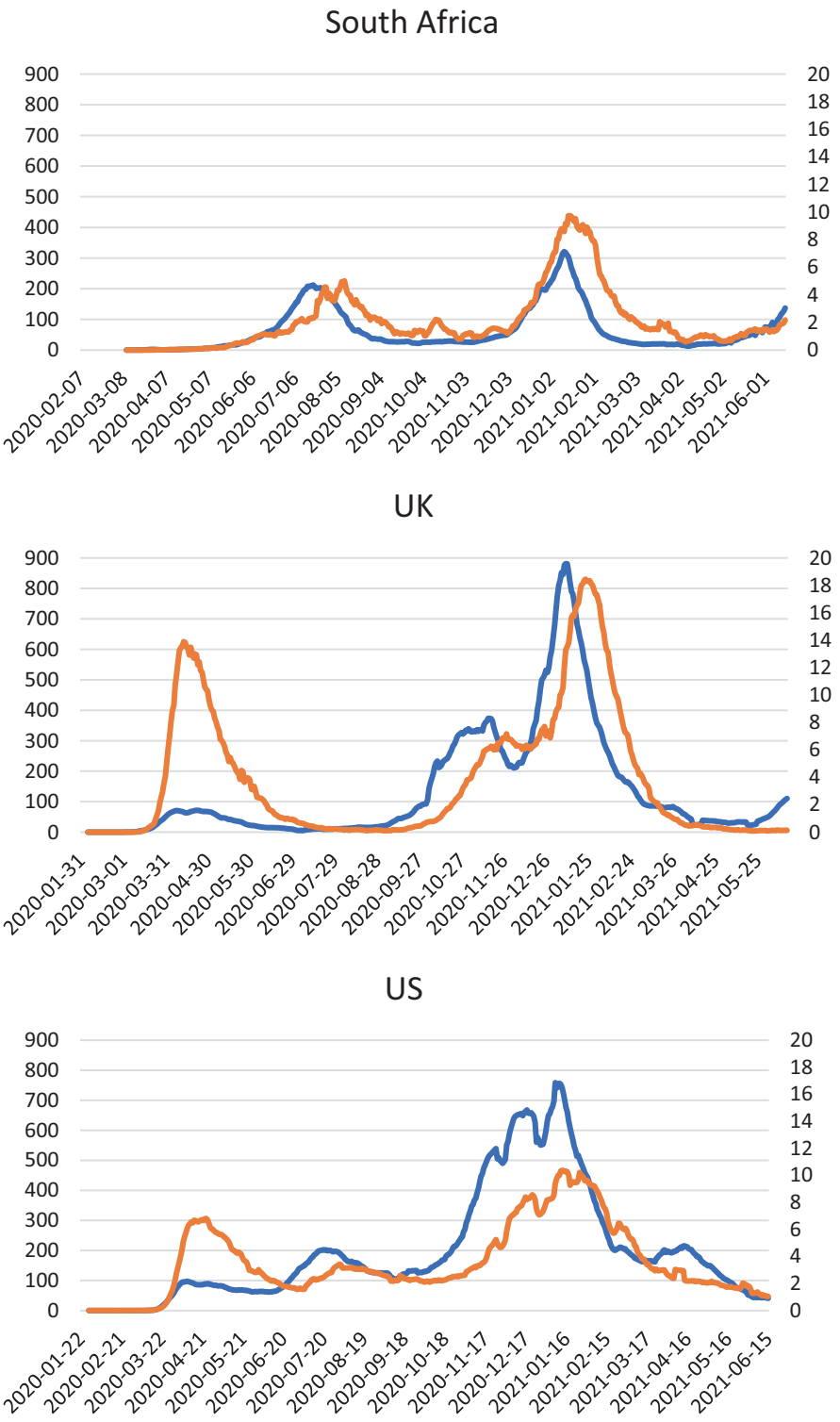
The first eight values in the table below are based on a brainstorm of the authors. The last three values were added on basis of the values that resulted from the brainstorm with the values found in Liscio et al. (2022); they latter let two teams of human annotators identify values in text corpora based on a PVE (Participatory Value Evaluation) study on relaxing COVID-19 measures in the Netherlands (Mouter et al. 2021).

Value	Corresponding values from Liscio et al. (2021)
Health and safety	Safety and health, safety, control
Economic welfare	Economic security, economic prosperity, feasibility
Mental health	Mental health, well-being, care
Socio-economic equality	Equality, fairness
Freedom	Autonomy
Democracy	
Environmental sustainability	
Privacy	
Hedonism	Pleasure, enjoyment, being social
Conformity	Acceptance of misbehaviour, conformity
Belonging	Belonging to a group, nuclear family

Appendix 3: COVID-19 Cases and Deaths over Time

The graphs in this appendix are based on data from Ritchie et al. (2020). Retrieved from https://ourworldindata.org/coronavirus on 16 June 2021. The blue line indicates the number of new cases per million inhabitants in a country on a daily base (left axis), while the orange line indicates the number of new deaths per million inhabitants on a daily base (right axis).




South Africa
900
800
700
600
500
400
300
200
100
0
20
18
16
14
12
10
8
6
4
2
0
2020-02-07
2020-03-08
2020-04-07
2020-05-07
2020-06-06
2020-07-06
2020-08-05
2020-09-04
2020-10-04
2020-11-03
2020-12-03
2021-01-02
2021-02-01
2021-03-03
2021-04-02
2021-05-02
2021-06-01
UK
2020-01-31
2020-03-01
2020-03-31
2020-04-30
2020-05-30
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2020-08-28
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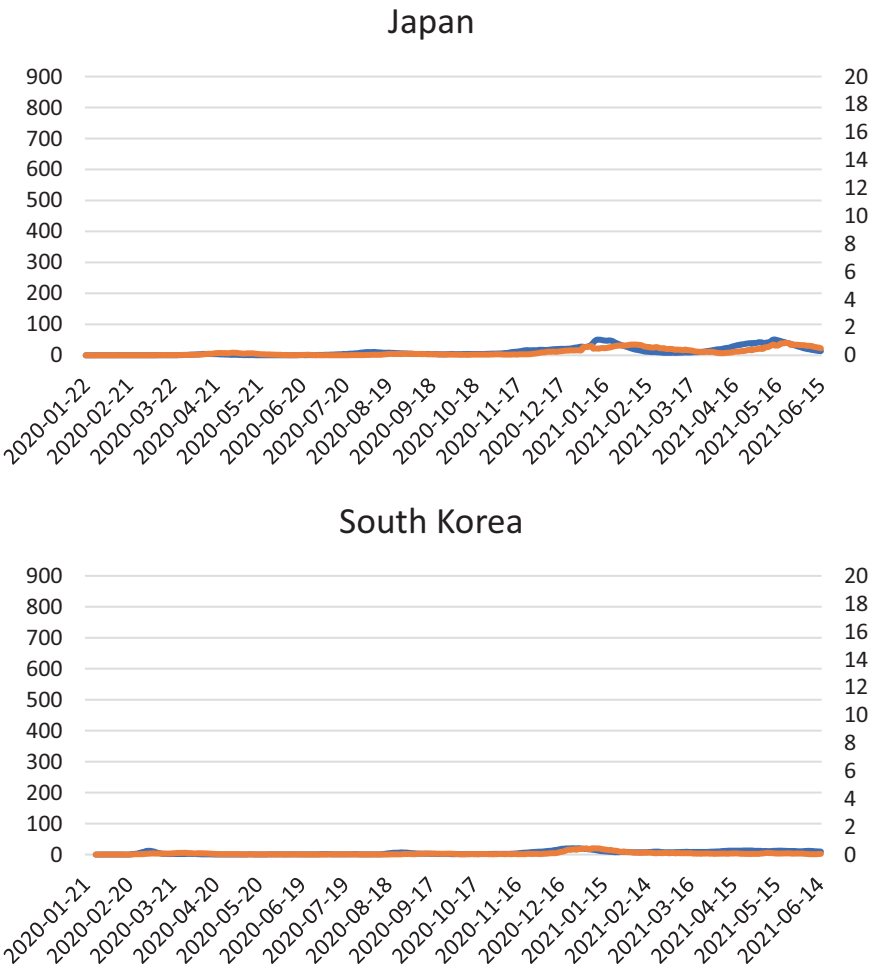
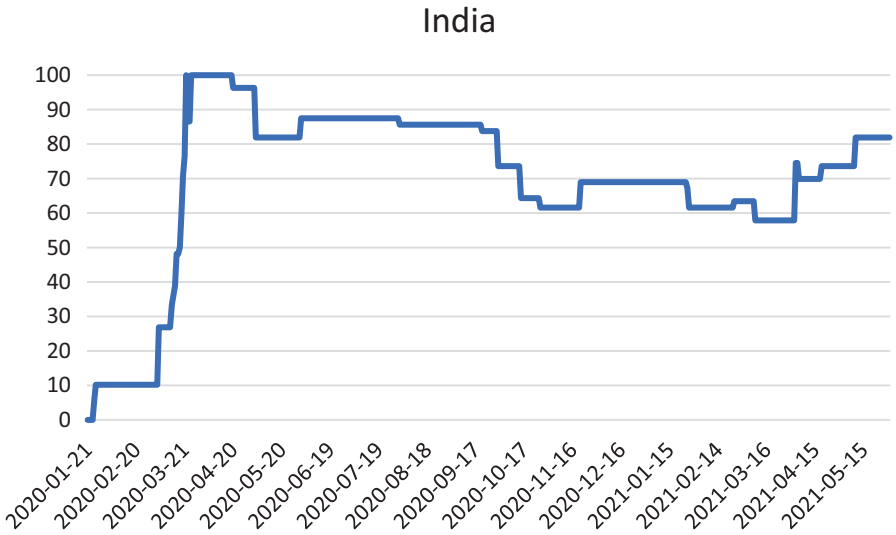
2021-06-15

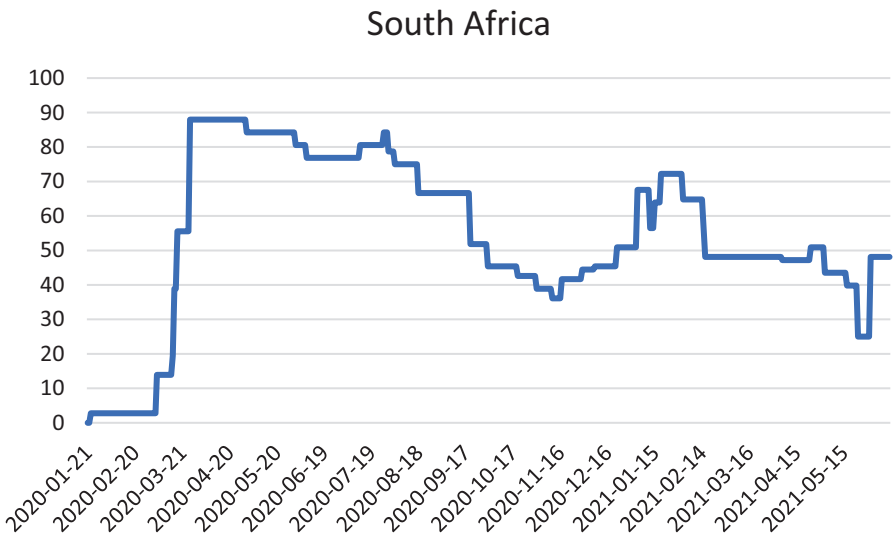


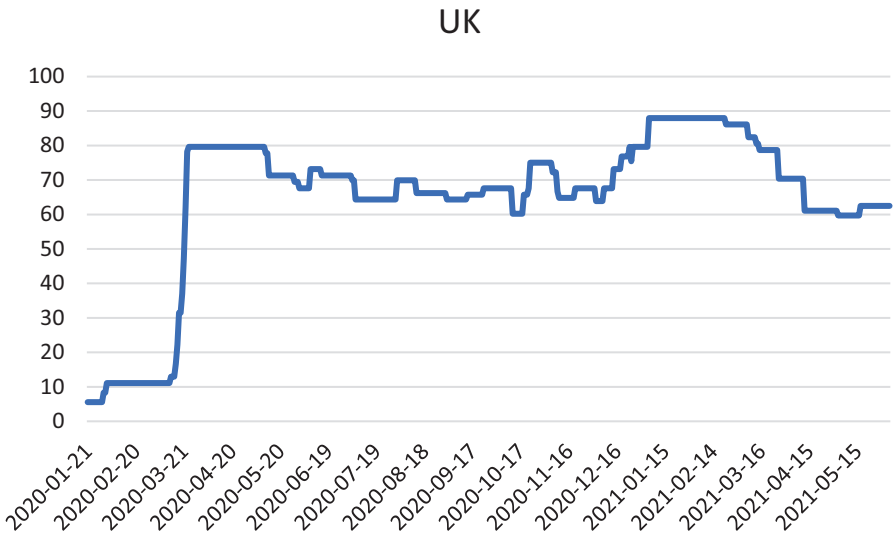
Appendix 4: Stringency of Measures

The graphs in this appendix are based on data from Ritchie et al. (2020). Retrieved from https://ourworldindata.org/covid-stringency-index on 16 June 2021. These data are originally from Hale et al. (2021). The following explanation is given at the website about the used stringency index: "The Oxford Coronavirus Government Response Tracker (OxCGRT) project calculate a Stringency Index, a composite measure of nine of the response metrics. The nine metrics used to calculate the Stringency Index are: school closures; workplace closures; cancellation of public events; restrictions on public gatherings; closures of public transport; stay-at-home requirements; public information campaigns; restrictions on internal movements;

and international travel controls. … The index on any given day is calculated as the mean score of the nine metrics, each taking a value between 0 and 100" (https://ourworldindata.org/covid-stringency-index, accessed 8 July 2021).



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2020-01-21
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2020-05-20
2020-06-19
2020-07-19
2020-08-18
2020-09-17
2020-10-17
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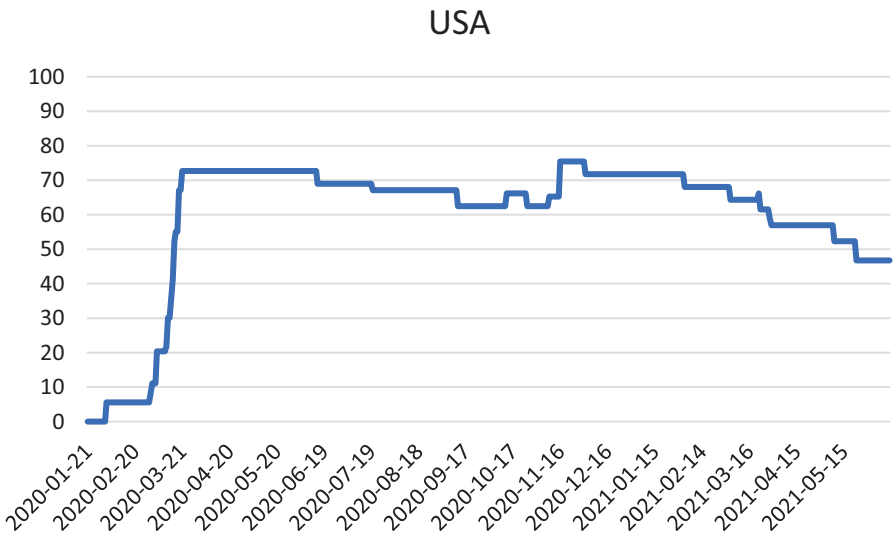
2021-02-14
2021-03-16
2021-04-15
2021-05-15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2020-06-19
2020-07-19
2020-08-18
2020-09-17
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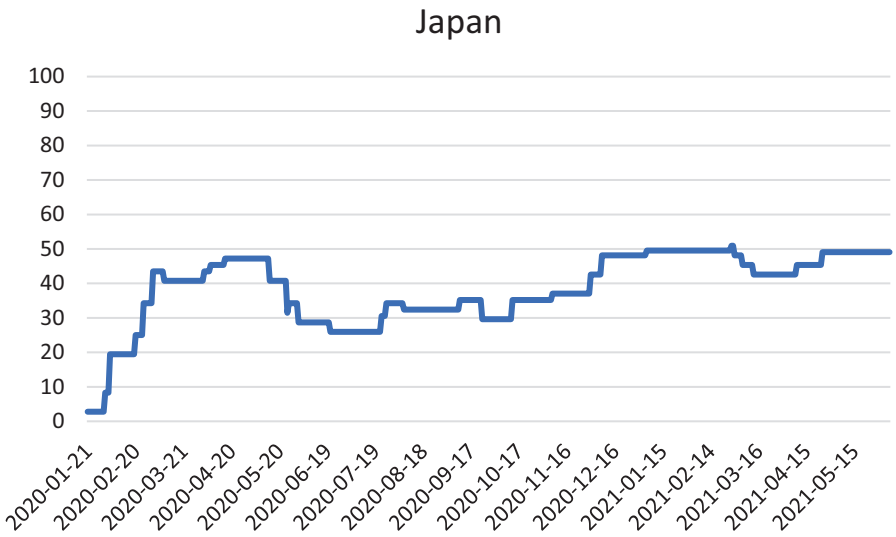
2021-02-14
2021-03-16
2021-04-15
2021-05-15


Japan
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90
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2020-03-21
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2020-05-20
2020-06-19
2020-07-19
2020-08-18
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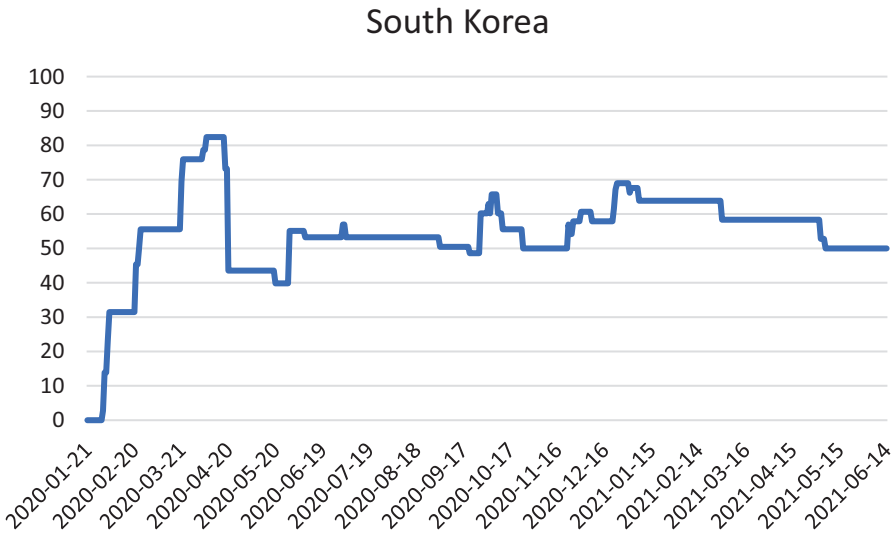
2021-02-14
2021-03-16
2021-04-15
2021-05-15


South Korea
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2020-01-21
2020-02-20
2020-03-21
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2020-05-20
2020-06-19
2020-07-19
2020-08-18
2020-09-17
2020-10-17
2020-11-16
2020-12-16
2021-01-15
2021-02-14
2021-03-16
2021-04-15
2021-05-15
2021-06-14

Appendix 5: Value Change Found in World Value Survey

The data in this appendix are based on a value survey done by Lampert et al. (2021). We have associated the relevant items in their survey with values in our study (according to our interpretation), and we have then looked whether they observe a decrease or increase in the importance of these values if we assume that the items measured are indicative for the values with which we associated them. The last column indicates the direction of change of each of the values, we derived from this survey.

	Value survey 24 countries (Lampert et al. 2021)			
Value	Item	Q1–2020	Q4–2020	Direction of change
Health and safety	In order to prevent any risks, I take precautionary measures	3.74	3.77	Increase
Economic welfare	Materialism/postmaterialism index (higher = postmaterialism)	2.33	2.43	Decrease
Mental health	I often feel lonely	2.98	2.9	Increase
	I sometimes feel that the future holds nothing for me	2.99	3.08	
	I feel let down by society	2.98	3.07	
	Life is easy	2.49	2.45	
Socio-economic equality	Every person in the world should be treated equally	4.14	4.2	Increase
	I think that differences between high and low incomes should be smaller	3.98	4.04	
Freedom	Control/freedom index (higher = more freedom)	3.47	3.52	Increase
	Materialism/postmaterialism index (higher = postmaterialism)	2.33	2.43	
Democracy	The country really needs more law and order and not more civil rights	3.04	2.93	Increase
	Materialism/postmaterialism index (higher = postmaterialism)	2.33	2.43	
Environmental sustainability	I worry about the damage humans cause to the planet	4.06	4.12	Increase
	I try living eco-consciously	3.82	3.86	
Privacy	Control/freedom index (higher = more freedom)	3.47	3.52	Increase
Hedonism	I often have the urge to experience something new	3.71	3.64	Decrease
	My most important aims are to have fun and enjoy myself	3.55	3.36	

Value	Value survey 24 countries (Lampert et al. 2021)			
	Item	Q1–2020	Q4–2020	Direction of change
Conformity	Control/freedom index (higher = more freedom)	3.47	3.52	Decrease
	Etiquette (rules determining what good manners are) is very important to me	3.84	3.8	
	Materialism/postmaterialism index (higher = postmaterialism)	2.33	2.43	
	The country really needs more law and order and not more civil rights	3.04	2.93	
Belonging	I feel strongly involved with what is happening in my community	3.28	3.31	Increase

References

Aylien Ltd. (2020). *Coronavirus news dataset*. https://aylien.com/resources/datasets/coronavirus-dataset?utm_referrer=https%3A%2F%2Faylien.com%2F

Bhat, S. A., Bashir, O., Bilal, M., Ishaq, A., Din Dar, M. U., Kumar, R., Bhat, R. A., & Sher, F. (2021). Impact of COVID-related lockdowns on environmental and climate change scenarios. *Environmental Research, 195*, 110839. https://doi.org/10.1016/j.envres.2021.110839

Blei, D. M., & Lafferty, J. D. (2009). Topic models. In A. Srivastava & M. Sahami (Eds.), *Text mining: Theory and applications* (pp. 71–89). Taylor and Francis. https://doi.org/10.1145/1143844.1143859

Chan, E. Y., & Saqib, N. U. (2021). Privacy concerns can explain unwillingness to download and use contact tracing apps when COVID-19 concerns are high. *Computers in Human Behavior, 119*, 106718. https://doi.org/10.1016/j.chb.2021.106718

Cheval, S., Mihai Adamescu, C., Georgiadis, T., Herrnegger, M., Piticar, A., & Legates, D. R. (2020). Observed and potential impacts of the COVID-19 pandemic on the environment. *International Journal of Environmental Research and Public Health, 17*(11), 4140. https://doi.org/10.3390/ijerph17114140

Cifuentes, M. P., Rodriguez-Villamizar, L. A., Rojas-Botero, M. L., Alvarez-Moreno, C. A., & Fernández-Niño, J. A. (2021). Socioeconomic inequalities associated with mortality for COVID-19 in Colombia: A cohort nationwide study. *Journal of Epidemiology and Community Health, 75*, 610–615. https://doi.org/10.1136/jech-2020-216275

Clouston, S. A. P., Natale, G., & Link, B. G. (2021). Socio-economic inequalities in the spread of coronavirus-19 in the United States: A examination of the emergence of social inequalities. *Social Science & Medicine, 268*, 113554. https://doi.org/10.1016/j.socscimed.2020.113554

de Wildt, T. E., van de Poel, I. R., & Chappin, E. J. L. (2021). Tracing long-term value change in (energy) technologies: Opportunities of probabilistic topic models using large data sets. *Science, Technology, & Human Values, 47*(3), 429–458. https://doi.org/10.1177/01622439211054439

de Wildt, T. E., Chappin, E. J., van de Kaa, G., & Herder, P. M. (2018). A comprehensive approach to reviewing latent topics addressed by literature across multiple disciplines. *Applied Energy, 228*, 2111–2128. https://doi.org/10.1016/j.apenergy.2018.06.082

Demski, C., Butler, C., Parkhill, K. A., Spence, A., & Pidgeon, N. F. (2015). Public values for energy system change. *Global Environmental Change, 34*, 59–69. https://doi.org/10.1016/j.gloenvcha.2015.06.014

Fernandez, B., Marcela, P., Mejia-Mantilla, C., Olivieri, S. D., Ibarra, G. L., Haaker, R., & Javier, F. (2021). *Lives or livelihoods? The costs of staying healthy – COVID-19 in LAC Washington*. World Bank.

Gerke, S., Shachar, C., Chai, P. R., & Glenn Cohen, I. (2020). Regulatory, safety, and privacy concerns of home monitoring technologies during COVID-19. *Nature Medicine, 26*(8), 1176–1182. https://doi.org/10.1038/s41591-020-0994-1

Ghasiya, P., & Okamura, K. (2021). Investigating COVID-19 news across four nations: A topic modeling and sentiment analysis approach. *IEEE Access, 9*, 36645–36656. https://doi.org/10.1109/ACCESS.2021.3062875

Hale, T., Angrist, N., Goldszmidt, R., Kira, B., Petherick, A., Phillips, T., Webster, S., Cameron-Blake, E., Hallas, L., Majumdar, S., & Tatlow, H. (2021). A global panel database of pandemic policies (Oxford COVID-19 Government Response Tracker). *Nature Human Behaviour, 5*(4), 529–538. https://doi.org/10.1038/s41562-021-01079-8

Hofstede, G. H., Hofstede, G. J., & Minkov, M. (2010). *Cultures and organisations: Software of the mind : Intercultural cooperation and its importance for survival* (3rd ed.). McGraw-Hill.

Inglehart, R. (2018). *Cultural evolution: People's motivations are changing, and reshaping the world, American political thought*. Cambridge University Press.

Inglehart, R., & Welzel, C. (2009). How development leads to democracy: What we know about modernization. *Foreign Affairs, 88*(2), 33–48.

Jasanoff, S., & Kim, S.-H. (2015). *Dreamscapes of modernity: Sociotechnical imaginaries and the fabrication of power*. The University of Chicago Press.

Kauffman, C. M. (2021). Democratization. In *Encyclopedia britannica*. https://www.britannica.com/topic/democratization

Lampert, M., Inglehart, R., Metaal, S., Schoemaker, H., & Papadongonas, P. (2021). Two faces of Covid-19 impact: The pandemic ignites fear, but boosts progressive ideals and calls for inclusive economic growth. *Measuring the pandemic's impact on social values, emotions and priorities in 24 countries*. Retrieved from https://glocalities.com/latest/reports/valuestrends: Glocalities.

Liscio, E., van der Meer, M., Jonker, C. M., & Murukannaiah, P. K. (2021). *Axies: Identifying and evaluating context-specific values*. Proceedings of the 20th International Conference on Autonomous Agents and MultiAgent Systems, Virtual Event, United Kingdom.

Liscio, E., Dondera, A., Geadau, A., Jonker, C., & Murukannaiah, P. (2022). *Cross-domain classification of moral values*. Findings of the Association for Computational Linguistics: NAACL 2022.

Lopez, L., Hart, L. H., & Katz, M. H. (2021). Racial and ethnic health disparities related to COVID-19. *JAMA, 325*(8), 719–720. https://doi.org/10.1001/jama.2020.26443

Mouter, N., Hernandez, J. I., & Itten, A. V. (2021). Public participation in crisis policymaking. How 30,000 Dutch citizens advised their government on relaxing COVID-19 lockdown measures. *PLoS One, 16*(5), e0250614. https://doi.org/10.1371/journal.pone.0250614

Perry, B. L., Aronson, B., & Pescosolido, B. A. (2021). Pandemic precarity: COVID-19 is exposing and exacerbating inequalities in the American heartland. *Proceedings of the National Academy of Sciences, 118*(8), e2020685118. https://doi.org/10.1073/pnas.2020685118

Rawls, J. (1999 [1971]). *A theory of justice* (Revised Edition ed.). The Belknap Press of Harvard University Press.

Reeskens, T., Muis, Q., Sieben, I., Vandecasteele, L., Luijkx, R., & Halman, L. (2021). Stability or change of public opinion and values during the coronavirus crisis? Exploring Dutch longitudinal panel data. *European Societies, 23*(sup1), S153–S171. https://doi.org/10.1080/14616696.2020.1821075

Reicher, S., & Stott, C. (2020). On order and disorder during the COVID-19 pandemic. *British Journal of Social Psychology, 59*(3), 694–702. https://doi.org/10.1111/bjso.12398

Repucci, S., & Slipowitz, A. (2020). *Democracy under lockdown: The impact of COVID-19 on the global struggle for freedom*. Freedom House. Retrieved from https://freedomhouse.org/report/special-report/2020/democracy-under-lockdown

Ritchie, H., Mathieu, E., Rodés-Guirao, L., Appel, C., Giattino, C., Ortiz-Ospina, E., ... & Roser, M. (2020). Coronavirus pandemic (COVID-19). *Our World in Data* 2021. Published online at OurWorldInData.org. Accessed 16 June 2021.

Rokeach, M. (1973). *The nature of human values*. The Free Press.

Rume, T., & Didar-Ul Islam, S. M. (2020). Environmental effects of COVID-19 pandemic and potential strategies of sustainability. *Heliyon, 6*(9), e04965. https://doi.org/10.1016/j.heliyon.2020.e04965

Rupani, P. F., Nilashi, M., Abumalloh, R. A., Asadi, S., Samad, S., & Wang, S. (2020). Coronavirus pandemic (COVID-19) and its natural environmental impacts. *International Journal of Environmental Science and Technology, 17*, 4655–4666. https://doi.org/10.1007/s13762-020-02910-x

Schwartz, S. H. (1992). Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (pp. 1–65). Academic.

Sharma, G. D., & Mahendru, M. (2020). Lives or livelihood: Insights from locked-down India due to COVID19. *Social Sciences & Humanities Open, 2*(1), 100036. https://doi.org/10.1016/j.ssaho.2020.100036

Steg, L., & De Groot, J. I. M. (2012). Environmental values. In S. Clayton (Ed.), *The Oxford handbook of environmental and conservation psychology* (pp. 81–92). Oxford University Press.

Steinert, S. (2020). Corona and value change. The role of social media and emotional contagion. *Ethics and Information Technology, 23*(1), 59–68. https://doi.org/10.1007/s10676-020-09545-z

Sun, M., Zhang, H., Zhao, Y., & Shang, J. (2014). From post to values: Mining Schwartz values of individuals from social media. *Communications in Computer and Information Science, 489*, 206–219. https://doi.org/10.1007/978-3-662-45558-6

Szmigiera, M. (2021). *Impact of the coronavirus pandemic on the global economy – Statistics & facts*. Last Modified 7–5, Accessed 22–5. https://www.statista.com/topics/6139/covid-19-impact-on-the-global-economy/#dossierSummary

Thompson, A. (2020). 2.7 million news articles and essays. *Reuters*. https://components.one/datasets/all-the-news-2-news-articles-dataset

World Health Organization. (2006). *Constitution of the world health organization – Basic documents, supplement*.