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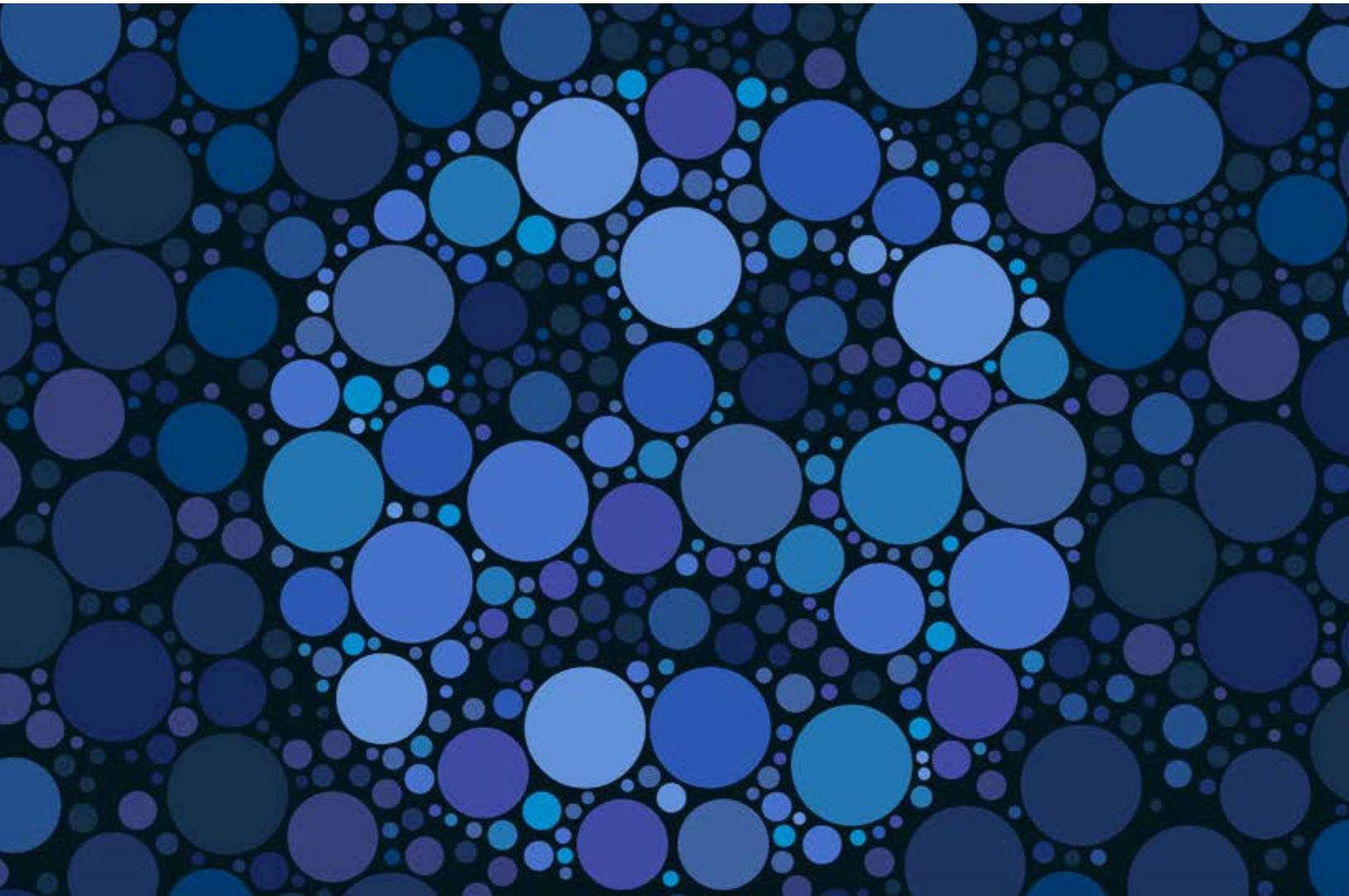

Inclusive Crisis Management by Governments: Using Digital Ethnography and Sentiment Analysis as a Sensing Function and Policy Tool

A Study of Perceptions Across 8 Countries During the First Wave of the Pandemic: January to July 2020

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Center for Inclusive Growth

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OMIDYAR NETWORK

Glossary

Artificial Intelligence (AI) - a branch of computer science developing technology that can think and act like a human being. The term is used to refer to machine learning (ML), computer vision (CV), natural language understanding (NLU) and natural language processing (NLP).

Digital Ethnography – starts with a recognition that digital technologies and social media are now integral to the way people experience the world. Those digital domains are appropriate spaces in which to immerse ourselves and study how people live, work, and interact.

Machine Learning (ML) – the use of data (numbers, photos, text) to train a computer model to recognize patterns and make predictions. Supervised ML uses labeled data sets whereas unsupervised ML uses unlabeled data. Reinforcement ML uses trial and error and reward systems to train the algorithm.

Natural Language Processing (NLP) - the field of AI that understands and generates human language. This is used to detect sentiment, identify people and places and translate languages.

Sentiment Analysis (SA) - uses natural language processing, lexicon-based or hybrid systems to identify and extract sentiment. This can be further divided into Opinion-mining (OM) and Emotion-mining (EM). In each case the opinion or emotion is detected, the polarity (positive, negative or neutral) classified, and then the emotion categorized.

Social Listening – the process of tracking mentions in digital media, analyzing them and extracting insights.

Executive Summary

This report demonstrates how real-time social analytics can provide a tool for inclusive policymaking and crisis management. Using a dataset of over **873 million online interactions** drawn from more than one hundred social and mainstream media channels, Equiception used **bespoke AI tools** to access, analyze and track trends in public sentiment and emotion in response to the pandemic management of eight governments between January and July 2020.

Our methodology provides policymakers with a gauge that offers a more representative and inclusive insight into public sentiment, allowing them to monitor levels of, and shifts in, trust and confidence across diverse communities, including those that may be under-represented in traditional voice channels.

The use of social media, sentiment and opinion mining in government is not new, but the application of such digitally enabled analytical techniques to gauge the impact of policy interventions and calibrating policy is novel. Our methodology enables policy makers to gain inputs and insights at unprecedented scale and speed that can be used at every stage of the policy making and execution cycle, from agenda setting to formulation, implementation and evaluation, and, most importantly, in engineering real-time interventions and course corrections.

The innovation in our approach is the use of digital ethnography to listen to all the voices and conversations around a pertinent theme, detect the sentiment and emotion, contextualize them, and discern the narratives. This approach of dynamic monitoring of the public discourse around COVID-19 can be critical in managing top-down actions by governments especially when they involve restrictions on individual liberties and freedoms during a crisis.

Our analyses of data from eight countries demonstrate how government leaders, policy makers, and administrators failed to appreciate the socially patterned impacts of the virus as well as the control measures taken to contain it. Even nations that were widely praised as being among the best responders to the first wave of the pandemic, such as Singapore and South Korea, overlooked the impacts on major high-risk groups (migrants and gig economy workers). Using a methodology similar to ours could have helped them identify the at-risk groups and their lived experiences and adjust the planning or implementation processes to include their voices and needs.

One notable, common feature in the data is the significant upswing in joy or satisfaction when the government announced the initial lockdown or equivalent. What is even more significant is that this phenomenon occurred in every country studied, i.e., the sentiments were uniform across different societies. There can be several explanations for this seemingly paradoxical behavior, a universal spike in expressions of joy during times of extreme uncertainty and potential anxiety about the future. A possible explanation is that there was a collective "rally round the flag" effect that has been documented in times of crises such as wars or terrorist attacks, when the perception of a threat leads citizens to seek the protection of, and certainty from their governments.[1]

While the spike in expressions of joy were more pronounced than the other emotions in most countries, in the USA sadness spiked to almost the same level and was reinforced by smaller spikes of disgust and anger. The combined effect of such "trust-negative" emotions outweighed the "trust-positive" impact of the spike in joy.

The rally round the flag effect was relatively short lived in the USA. Had President Trump emphasized the magnitude of the COVID-19 threat, as the leaders of New Zealand and South Korea did, he could have generated a greater rally effect, possibly even across party lines.[2] Instead, he chose to downplay and dispute the threat, thus robbing himself of the full potential of the rally effect and sparking controversies that provoked competing emotional responses.

One of the most common and effective strategies—adopted by President Donald Trump and Prime Ministers Boris Johnson of the UK, Narendra Modi of India, and Anders Tegnell of Sweden —was to gain and maintain in-group trust while fanning distrust among other groups. This worked despite their failures to adequately mitigate the impact of COVID-19. This decoupling of trust from performance and accountability is a troubling and increasingly widespread phenomenon that could undermine the global effort to contain COVID-19 and inclusive governance in times when it is needed the most. New Zealand, Sweden, and the USA saw greater contestation in the emotional reactions to government intervention, with multiple emotion trend lines rising and falling together, indicating high levels of extant disagreement and polarization within those countries.

There were only two countries in the study where sadness was the dominant emotion beyond the initial spike in March 2020: New Zealand and the USA. Closer examination of the emotional responses and their context showed that the sadness displayed by New Zealanders was trust-enhancing that in the USA was trust-eroding. This was a reflection of the fact that Prime Minister Ardern believed the public could be trusted with the truth whereas President Trump concealed the truth and offered no sympathy for the exponential increases in infection and fatality.[3]

The data collected in this study reveal a second notable feature across almost all the countries surveyed – systemic shortcomings in the representation and recognition of diverse voices, what we call the "voice deficit" – a marker of the absence of inclusive policymaking that resulted in blind spots, exclusion, and breakdowns in pandemic planning, management, and protection.

This voice deficit led to blind spots in the management of the unfolding crisis. These were evident in government responses in both hemispheres and at all levels of socio-economic development. Examples of groups affected by these blind spots include evangelical churches in South Africa, South Korea and the USA, contingent and gig economy workers in South Korea, the UK and the USA, residents of elderly care homes in Sweden, the UK and the USA, the informal sector and migrants in India and South Africa, and Black and Latino communities in the USA. The blind spots inevitably resulted in the exclusion of these groups from pandemic planning and protections, leading to their increased risk of exposure to the virus itself and its economic impact.

We think this voice deficit could have been avoided had our methodology been used to tap into the lived experiences of the aforementioned social groups and the probable or actual impacts of pandemic control measures on them. Social media data could also have served as a feedback loop and a public sentiment monitoring mechanism to assess and evaluate outcomes.

The value of our research, and the methodology we developed, lies in its ability to surface public perceptions from the mass of unstructured data in digital open-source media and then to measure and track the movement of those perceptions over time. This could provide decision shapers and makers with a tool to survey opinion and assess levels of public trust as they design, implement and evaluate interventions. It would also allow policymakers to understand the reach and socially patterned impacts of policy on a broader, more representative cross-section of society. This would expand voice and inclusion in the process of making and implementing policy, resulting in more inclusive, more informed and more insightful policy making and management.

Background and Context

The purpose of this report is to demonstrate the potential of social analytics as a tool for inclusive policymaking and crisis management. Our dataset consists of over **873 million online interactions** drawn from more than one hundred digital media sources spanning both social and mainstream media channels.

We used **social listening platforms and AI tools** such as machine learning (ML) and natural language processing (NLP) to access and analyze very large amounts of open-source data, and track trends in public sentiment and emotion in response to the pandemic management of eight governments between January and July 2020.The movements of trust-positive and trust-negative emotions are illustrative of how government institutions gained, maintained, lost, and occasionally regained public trust through their actions.

Why is this important? The efficacy of public policy making, management and review depends on the levels of public **inclusion, participation, and trust**. This is even more vital during periods of crisis management, when institutions require such public trust to take tough but necessary measures, whose socially patterned impacts and implications are less understood. Unfortunately, growing inequality is undermining public trust at a time when institutions and citizens need to work in conjunction to respond to a multitude of complex existential threats such as climate change and public health.[4] This gives governments all the more reason to tune into and appreciate the lived experiences of people, and factor them into public policy and management.

Our methodology provides policymakers with a gauge that offers a more representative and inclusive insight into public sentiment. By analyzing social and traditional media at scale, policymakers can **gather inputs at every stage in the policy cycle**, from agenda setting to formulation, implementation and evaluation. In addition, they can monitor levels of and shifts in trust and confidence across diverse communities, including those that may be under-represented in traditional voice channels. Those **deficits of voice and trust can then be addressed**, fueling more inclusive, responsive, and representative policymaking and implementation. This approach gives policy analysts data that allows them to assess how effective leaders and authorities have been in gaining and maintaining public trust in their handling of critical issues and situations. We find that there are several different ways that governments have sought to gain public trust; our analyses also help identify which approaches to gaining trust did better and which were less effective.

This report is not a comprehensive assessment of government handling of the COVID-19 crisis and corresponding public trust. It focuses instead on key trigger events in a seven-month timeframe to demonstrate the value of this methodology to policy makers and analysts. By examining the events and corresponding changes in sentiment and emotion, we hope to glean novel insights into the interplay between the lived experience of citizens and top-down policymaking.

Introduction

The Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2), more commonly called the COVID-19 pandemic raised key questions about what we know and what we don't. Our health, loved ones, jobs, education, small businesses, essential workers—things we relied on to structure our lives—were suddenly rendered uncertain. This uncertainty was debilitating, particularly because it offered glimpses of normality between the waves of infection.

The pandemic has tested our trust and confidence in institutions and society. Can we trust the government to take the right decisions and manage public health? Can we trust the mathematical models predicting the spread of the disease? Should we wear masks? Can we even buy them, or has another procurement problem thwarted the supply of Personal Protective Equipment (PPE)? Should we get tested? Can we get tested? What about travel? As populations and governments worldwide struggled to react, contradictory information, fake news, and rumors spread, adding to the uncertainty, and complicating responses. The unpredictability of every successive day forced us to reckon with the fundamental question of trust—in our surroundings, our institutions, and our actions.

In this report, we dissect public perceptions of the pandemic and their trust (or lack thereof) in institutions during the crucial period between January and July 2020. Most importantly, we show **how authorities could enhance democracy, inclusivity, and efficacy** by including the perceptions and stated concerns of citizens in the design and implementation of policy.

Understanding Trust Could Lead to Better Management of the COVID-19 Pandemic. The COVID-19 pandemic struck at a time of considerable churn in global politics. The success of authoritarian capitalism in China, the rise of populism and illiberal democracies, and the challenges to globalization and multilateralism had collectively unsettled the global order.[5] Unfortunately, global leadership failed to rise to the occasion and restore certainty. The credibility and efficacy of the WHO was questioned, while international forums such as the UN General Assembly and Security Council, the G8 and the G20 were passive or divided.[6] Most countries worldwide switched to crisis management mode, abruptly cutting global trade and travel links to tackle the pandemic within national borders. Inconsistent pandemic management within countries compounded the lack of coordination between countries. Nowhere was this more evident than in the failure to share vital information in the early days of the COVID-19 outbreak, and the zero-sum competition between countries for PPE. The same lack of solidarity and coordination complicated vaccine distribution many months later.

This lack of leadership, coordination, and cooperation is perilous because no country or region can defeat the COVID-19 virus on its own. The virus will continue to circulate until enough people are immune, and transmission chains are halted. The same failures were evident at the national level across several countries where the **socially patterned and unequal impacts of the pandemic were ignored or misunderstood.** COVID-19 hit the poor and the precarious harder, and exacerbated health and other inequalities. Worse, it interacted with existing non-communicable diseases to create a 'syndemic' in which **synergies emerged between social, economic, and health factors** that aggravated one another. Many countries failed to include vulnerable socio-economic groups in their pandemic planning. Authorities also failed to invest in building broad-based trust in the public institutions, science, and evidence guiding their actions. Our survey shows that it is very difficult for governments to achieve the levels of efficacy required to contain the virus without a foundation of trust and unity.

Governments around the world mounted rapid responses to the COVID-19 pandemic that ranged in certainty, stringency, and efficacy. As governments rushed to deploy emergency powers, **concerns regarding transparency and efficiency rose, affecting public trust.**

Studies on crises and pandemics have shown that **public trust in institutions is critical to achieving the goals of any crisis management** measures taken.[7] Trust is even more important when leaders and institutions try to drive behavioral change and personal sacrifice for the public good. However, trust is harder to gain and maintain in a post-truth society where 'alternate' facts are as influential as verified ones. This competition between facts drives people to seek certainty in narratives they can trust. This is an evolutionary need and may lead people to re-base themselves on core values, often cultural or religious ones.

Reaffirming values, particularly the shared values of a community, is one-way leaders and authorities can gain, maintain, or restore trust and confidence, but as we observed in our study, this was often deployed as a divisive strategy to build in-group trust at the expense of inter-group trust. Another pathway to trust is through **perceived competency and performance.** Public and private institutions that demonstrate competence and deliver results create certainty and earn the trust and confidence of their constituents, but this can only be sustained if the results match the perception of competence. A third pathway to trust is through **the aura of integrity,** the unimpeachable representation of moral authority that people believe they can rely on. A fourth revolves around **legitimacy** – the perception that power and authority is being exercised based on previously agreed mandates and processes. All the countries in our study relied on legitimation processes to justify their actions, with mixed results.

How Social Analytics Could Increase Inclusion and Support Policy Outcomes

The number of social media interactions happening at any given time is massive in terms of volume and offers a significant source of information from which actionable insights can be drawn. The interactions range from friends and family sharing posts and photos on Facebook, to endless pop culture stories on Instagram, and "hot takes" on Twitter. Many of these conversations happen in the public domain without intermediation by interviewers or questionnaires. As such they often express the unfiltered and unvarnished views and sentiments of people and provide insights into their lived experiences. Collecting and analyzing these interactions at the macro- and micro levels allows us to identify and appreciate the sentiments, emotions, and narratives surrounding events. These narratives have discursive power and help shape public discourses, making them an important form of voice representation worthy of being factored into policymaking and implementation.

The collection of data from digital media can happen over a specified time period, within a specified geography or with respect to a specific topic. This enables us to conduct digital anthropology, providing a unique insight into the lived experience of people. All these digital expressions carry significant amounts of information that can be collected, analyzed, and interpreted to inform the policy making process, once technical obstacles are overcome. The obstacles are that the amount of data is enormous, and it is unstructured, making it very hard to capture, organize, process, and interpret without tools such as those we tested for this study. Finally, the data must be contextualized in order to draw meaningful conclusions from it. In our study, we used human analysts from the survey countries to ensure that we were able to appreciate the cultural and social context to the responses and narratives.

Advancements in machine learning (ML) have enabled natural language processing (NLP) to "read" and derive meaning from human language. This makes it possible to automate the processing of massive amounts of speech and text and to detect sentiment and emotion. The increasing amounts of data available, and the advances in the computational power to process it, are leading to improvements in the performance of NLP and its ability to detect tones of irony, sarcasm, and expressions, but there is still work to be done. Typos, context, and dialects may still pose problems for NLP, but the field is advancing rapidly, making this kind of research possible.

The techniques of sentiment analysis and opinion mining have been in development since the early 2000s.[8] They involve the use of NLP, computational linguistics, and text analytics to detect affective states and other subjective information, including whether the sentiment in a text is positive, negative, or neutral.

The detection of emotion is more challenging than sentiment. To begin with there is no generally accepted definition of the term "emotion". The Dictionary of Psychology defines it as "a complex reaction pattern, involving experiential, behavioral, and physiological elements, by which an individual attempts to deal with a personally significant matter or event".[9] Emotions inform, motivate and drive the mental operations and the actions we take to adapt to situations, making them an appropriate lens through which to understand responses to crisis management, for

example. Paul Ekman identified six basic emotions innate to all human beings—anger, disgust, fear, happiness, sadness, and surprise.[10] We use these six emotional categories as predictors of trust that can be detected in the text of digital media. The emotional categories should not, however, be interpreted narrowly. Happiness, for example, includes expressions of satisfaction or relief. Sadness could include expressions of dismay or disappointment, and if those are strongly held, they could be classified as anger or disgust. For this reason, it is essential to understand the context and the character of the conversation, using the judgement of human analysts who can sense context in ways that AI cannot yet.

Emotions influence intelligence and behavior at the level of the individual and the group. Aggregated, those emotions influence consumer and investor sentiment, drive markets, shape public discourse, and promote social cohesion or discord. The Internet has become a key medium through which people express their sentiments and emotions. News, events, and activities around the world are shared, discussed, posted, and commented upon on social media by billions of people. These responses allow us to study how people react to different situations and events. Identifying the emotional component or character of those expressions enriches our understanding of the conversations and narratives and allows us to draw deeper insights regarding the significance of actions and events.

The use of opinion mining and sentiment analysis in policy making is not new. Ceron and Negri (2016) have studied the role that social media analysis could play in enhancing interaction between policy makers and citizens. They used Supervised Aggregated Sentiment Analysis to show that meaningful information could be extracted from social media to support policymakers throughout the policy cycle of agenda-setting, formulation, adoption, implementation, and evaluation.[11]

The use of information technology and social networking sites by government has evolved over the last 25 years. Institutions and politicians have appealed to the public for ideas (crowdsourcing), sought public comment on specific policy proposals (citizen-sourcing or, more accurately, active citizen-sourcing) and expert input on particular initiatives (expert-sourcing). This initially took the form of government social media accounts and websites where information could be communicated outward, and citizens could comment or make submissions. Liu (2017) has studied the use of crowdsourcing to gather information from the public, co-produce services and solutions and make policy. Her research found that well-designed crowdsourcing platforms could empower citizens, legitimize government actions, and improve service delivery.[12] In spite of this, research by Prpic et al (2015) has shown that crowdsourcing is still underutilized as a policy making tool.[13]

Technology-enabled interactions between policy makers and administrators on the one hand, and the public on the other, expanded rapidly in scale and sophistication. This went beyond e-government and participatory democracy initiatives to include social analytics in support of policy design. New software enabled policy makers to extract relevant information from a wide range of social media, blogs and forums. However, this was still focused on the particular needs of the agency or the topic, and often targeted only specialized sites and voices.[14] Because of the volumes of information involved, government agencies narrowed their focus to specific influencers and specialized institutions, publications, and experts rather than the public at large.

The potential for using AI tools to expand meaningful participation in government is both exciting and challenging. The technology exists to harvest policy related content created by citizens in non-governmental digital media. NLP techniques can then be used to extract information and insights that can be used to address important social issues. This would lead to greater inclusion in the policy cycle, as well as better policy formulation and implementation. More research is needed on the role and performance of existing active and passive crowdsourcing, citizen-sourcing, and expert-sourcing initiatives, especially as new technologies like the internet of things and wearables add massive amounts of sensor data to the social analytics field.

The innovation in our approach is the use of digital ethnography to listen to all the voices and conversations around a pertinent theme, detect the sentiment and emotion, contextualize them and discern the narratives. This approach provides a dynamic monitoring of the public discourse around COVID-19 in qualitative and quantitative terms at an unprecedented scale. It goes beyond the instrumental push (information dissemination) and pull (information collection) of government agencies to propose an active listening system that is not confined to specific questions or requests. **It is a bottom-up, unsolicited, disintermediated source of input and feedback** that obtains results that could not be achieved using conventional research methods. We capture unprompted, unscripted testimony that traditional surveys, questionnaires, interviews, and focus groups are not capable of capturing in this raw form. The risk of socially acceptable or politically correct answers is reduced, and the expressions frequently explore controversial positions that would likely not be shared with an interviewer in a more formal market research or polling setting.

NLP is increasingly present in our lives. Voice-driven interfaces like Alexa and Siri use NLP to respond to instructions, as do online chat bots. NLP is progressively used in finance, healthcare, human resource management, insurance, marketing, and retail, and new applications are being developed all the time, including in government. The increase in the complexity, intensity and frequency of crises that compound each other makes the use of AI technologies all the more urgent. AI tools can enable the analysis of the socially patterned impacts of crisis and crisis management measures. Like radar, our tools and methodology allow policy makers and administrators to scan the horizon in real time for the emergent issues and then to design appropriate responses with insights into, and input from the most affected communities. Once the responses are operationalized, the impacts can be monitored in near real time and course adjustments made where necessary.

Methodology

For this study, we amassed one of the largest datasets of COVID-19 related conversations amounting to **873 million online interactions** from over a hundred media channels with a collective reach of **over 6 trillion views** across eight countries. These countries are New Zealand, South Korea, Singapore, India, South Africa, Sweden, the UK, and the US.

This study differs from others in three major ways:

1. Data-set volume: Most studies using social-media data operate with limited data sets ranging between 2,000-10,000 posts, often within a narrow geography. Our current data set comprises hundreds of millions of interactions.
2. Data Sources: Most existing studies track only Twitter conversations. We capture a wider range of voices, demographics, and geographies by including hundreds of websites, forums, and social media channels.
3. Analytic method: We have gone beyond the usual word-cloud and net sentiment analyses and have applied cutting-edge techniques to make sense of this mass of unstructured data to generate relevant insights.

Over the course of this study, our methodology for active listening and text analysis underwent significant development. Existing tools and algorithms were audited and new methods of analyzing the data were developed as needed. We expanded our data sources beyond the popular social media platforms to include hundreds of forums, blogs and news outlets. Our search term lexicon to track conversations was iterated upon every week and could readily generate millions of relevant and targeted data points for various sub-topics across multiple languages. We also developed the capability to analyze geographies and demographics beyond the eight countries in this study.

We invested considerable time and resources on the tools, technology, and know-how needed to tackle the vast, nebulous clouds of data generated by social media. Specifically, we:

- Reviewed various sentiment analysis algorithms, including AFINN and NRC emotion tagging, and identified multiple areas of improvement for these methods.
- Audited off-the-shelf NLP products from Google, Microsoft, Amazon and others.
- Studied native language sentiment analysis using Google APIs as well as Google Translation Services.
- Developed a unique “verb”, “noun”, and “adjective” analysis to better contextualize data and to identify “actions” and impact.
- Adopted an iterative approach to Boolean query and lexicon refinement.
- Introduced contextual filters to sift cultural specificity as well as historical legacy and sub-cultural anomalies.

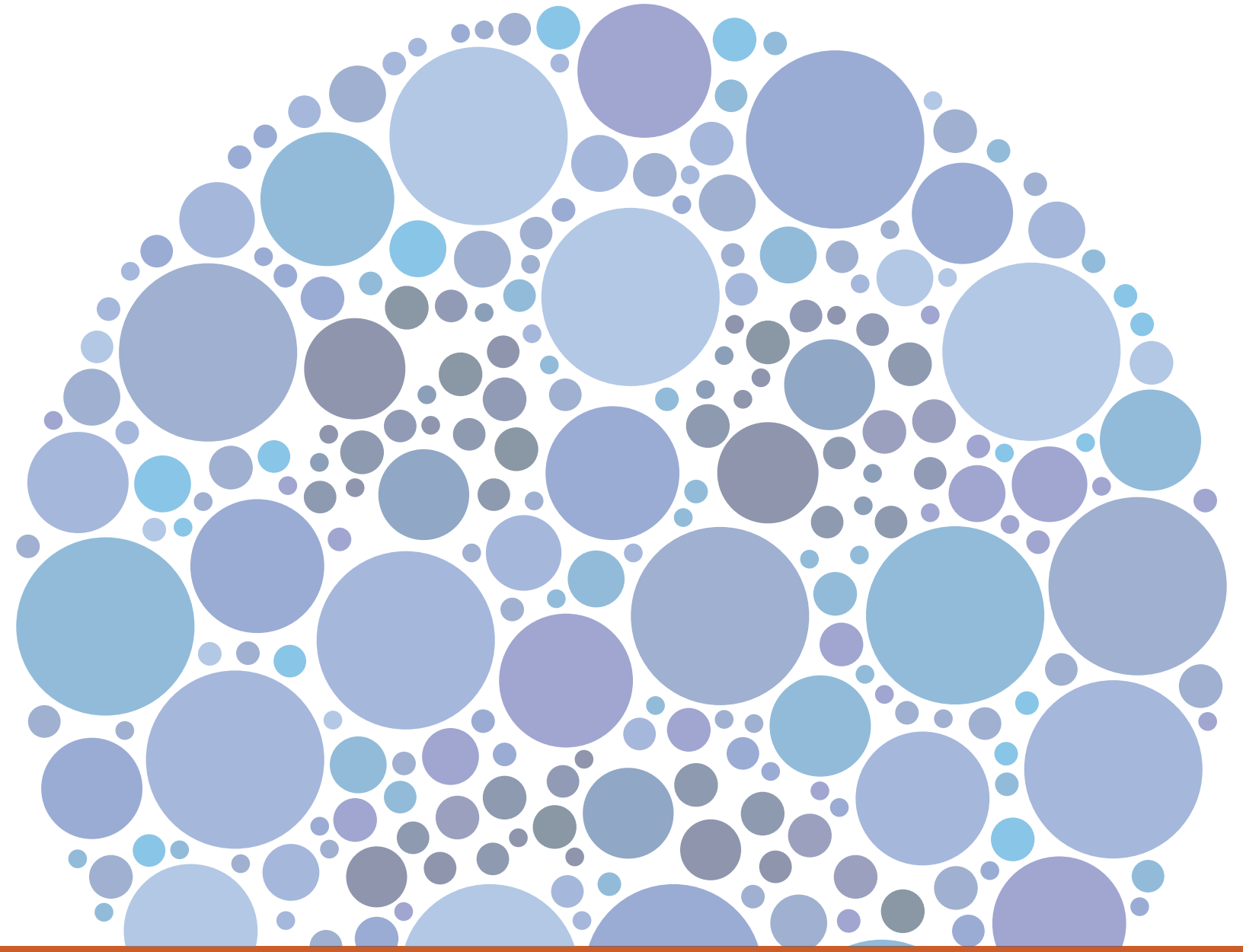
- Concluded that we needed to disregard widely used net sentiment values and instead calculate "positive" and "negative" sentiments separately.
- Developed a concept and method to identify "controversial" topics in large-scale data sets.
- Increased data processing efficiency from 6 hours to 1 hour.
- Improved upon other tools like trending topics, topic identification and tagging, and began researching image analysis tools and third-party products.

Using the technologies and tools described above we analyzed very large data sets related to the strategies employed by public authorities in eight countries to manage the COVID-19 pandemic over the seven-month period between January and July 2020. The data was extracted from open-source digital media including social networks, messaging services, blogs, micro-blogs, online forums, search engines and websites. The hundreds of millions of discrete messages collected were scored for sentiment and emotion and contextualized for narrative analysis. These messages show how citizens reacted to the pandemic crisis management measures taken by their leaders, and how levels of trust fluctuated as a result.

No discussion of big data, AI, and social analytics is complete without a warning about ethics and human rights. There are protections regarding ownership, privacy, and security that must be built in by design and by default, and issues of discrimination, inequality, and exclusion that must be considered. Data is never neutral, but with the right protocols it can be a powerful force for increased voice and inclusion. Digital Planet, Equiception, and all our technology service providers follow GDPR standards. In keeping with our code of ethics, for this study, we only accessed data that was intended for public.

Country Case Studies

The eight focus countries are analyzed in a series of vignettes consisting of a chart, and a discussion of what happened and why it matters. The Y axis in the charts shows the monthly volume of posts, and the colored trend lines track the fluctuation over time of emotions detected in the posts. Our tools allow us to drill down to the level of an individual message to better understand the nuance, context, and narrative.



Trust in Times of Crisis

New Zealand

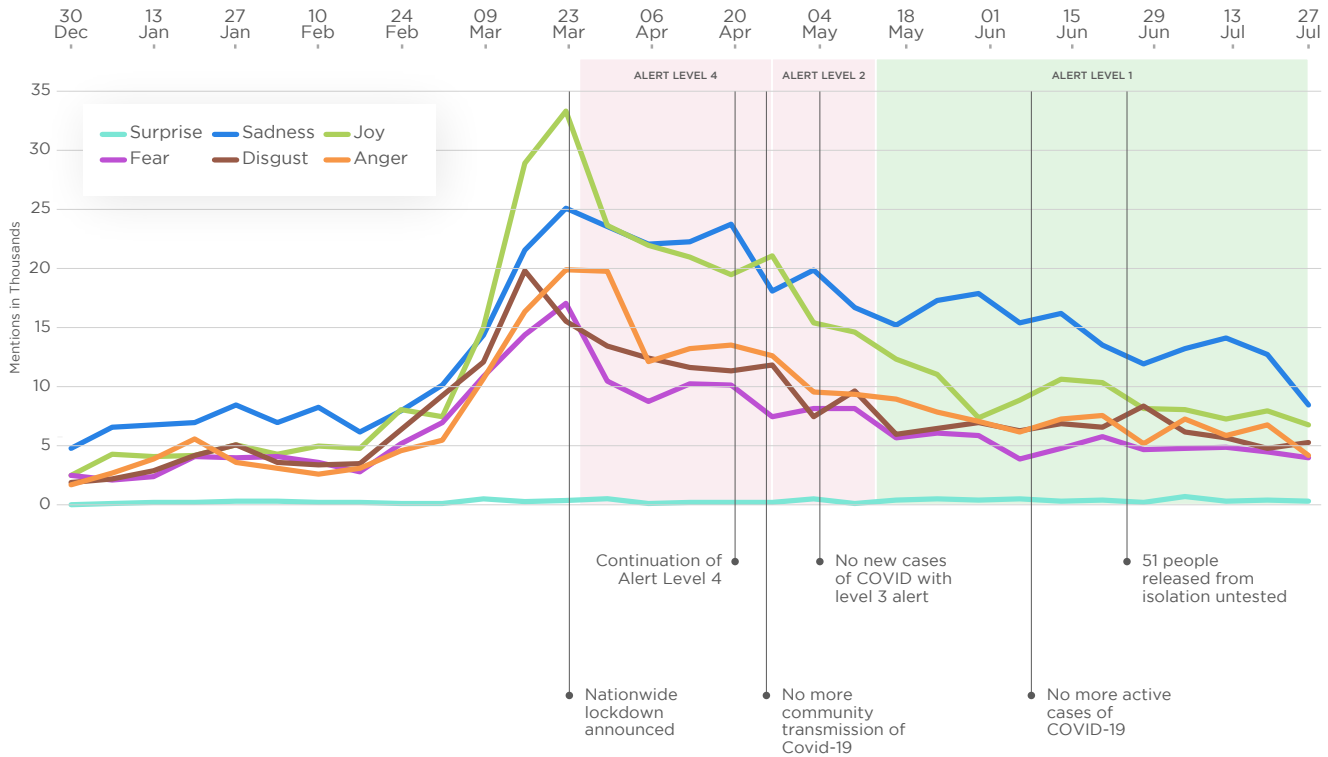
1 PM Ardern followed a ‘go hard and go early’ strategy, imposing travel restrictions and bans even before the first confirmed case was identified.

2 Even when the general lockdown was declared, it was not framed in the negative language of threats and war, but rather in positive and constructive terms such as collaboration, caring and cooperation.

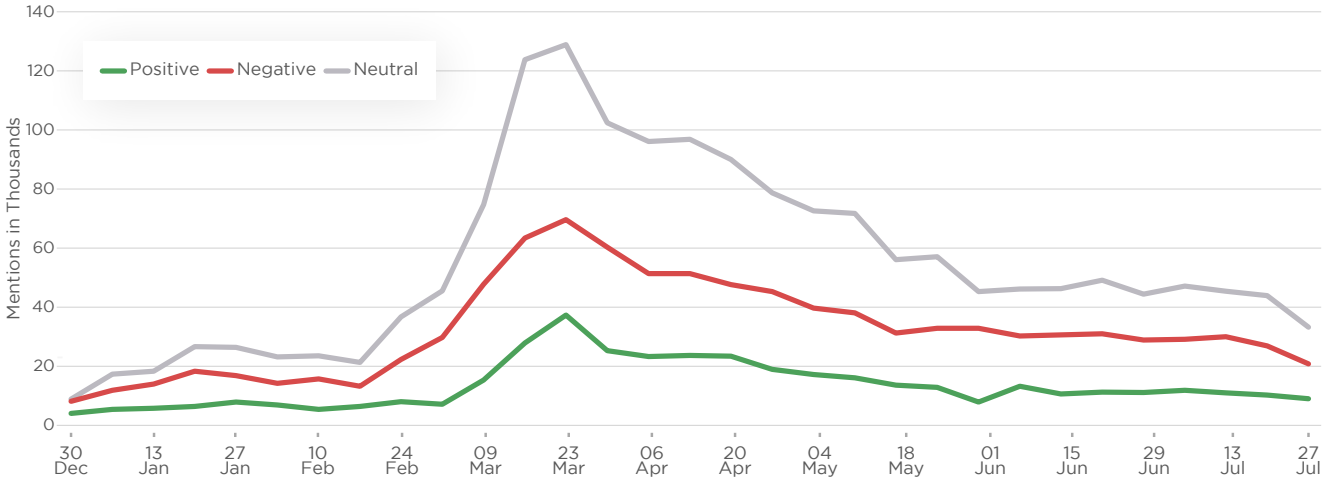
3 Despite high levels of unity, sadness was the dominant emotion. This was a normal, trust-positive reaction to PM Ardern’s candid and frank communications.

4 PM Ardern’s personal integrity was on full display and earned her the trust of citizens.

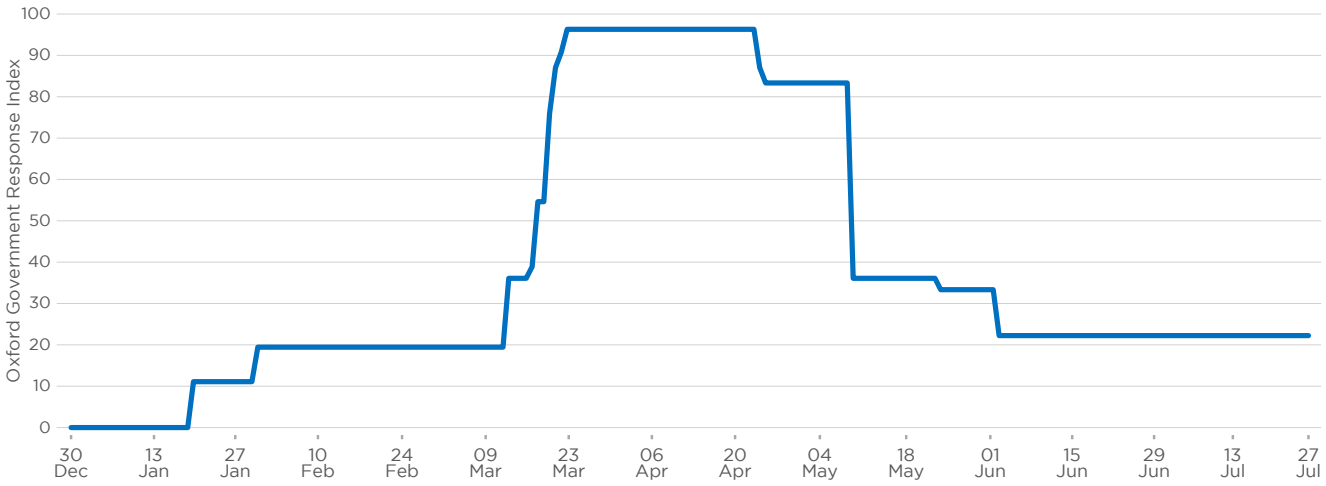
Emotion Over Time - January to July 2020



Sentiment Over Time - January to July 2020



Stringency of Policy - January to July 2020



What happened?

The initial reaction to the expanding pandemic was one of sadness, but this was overtaken by joy when PM Ardern started taking decisive action, culminating in the declaration of a general lockdown on March 25, 2020. Unlike most other countries, this was not framed in the negative language of threats and war, but rather in positive and constructive terms such as collaboration, caring, and cooperation.

What happened next?

New Zealand had one of the shortest honeymoon periods of all the countries in the survey (along with the USA). The graph for sadness overtook joy around April 6, 2020, and remained the dominant emotion for the rest of the survey period as numerous problems in the planning and implementation of the pandemic controls shook public trust. By April 27, 2020, Ardern was able to announce that they had won the battle against community transmission of COVID-19.[15] This produced a small spike in joy, and a corresponding dip in sadness, but the trends were soon reversed.

Sadness spiked again in early June 2020 when failings in the quarantine system for incoming travelers came to light, and remained the dominant sentiment through June 2020, except for a brief spike in joy on June 8, 2020, after the announcement that New Zealand was down to zero confirmed cases of COVID-19. There was one more spike in the trend line for sadness around June 16, 2020 after two women tested positive, undoing some of the euphoria surrounding the 'Zero COVID-19' announcement in June 2020. This was followed by another spike of sadness, disgust, and anger on July 7, 2020, in response to the leaking of COVID-19 patient data by an opposition Member of Parliament (who resigned as a result).

Why does this matter?

The overall reaction of New Zealanders was one of sadness, but this was not trust-negative. Rather it was a function of PM Ardern's highly personal communications that showed compassion and care. It was normal for people to feel sad and anxious, and she shared their concern. This candid and trusting posture earned her the reciprocal trust of citizens. Her approval rating slipped from 87% in April 2020 to 81% in June 2020[16] as she dealt with errant ministers and other failings, but the reservoir of trust was replenished by her displays of honesty, humility, and vulnerability. There were limits to that trust however, and she was not able to get enough people to download and use the government's contact tracing app, despite repeated appeals.

Trust in Times of Crisis

South Korea

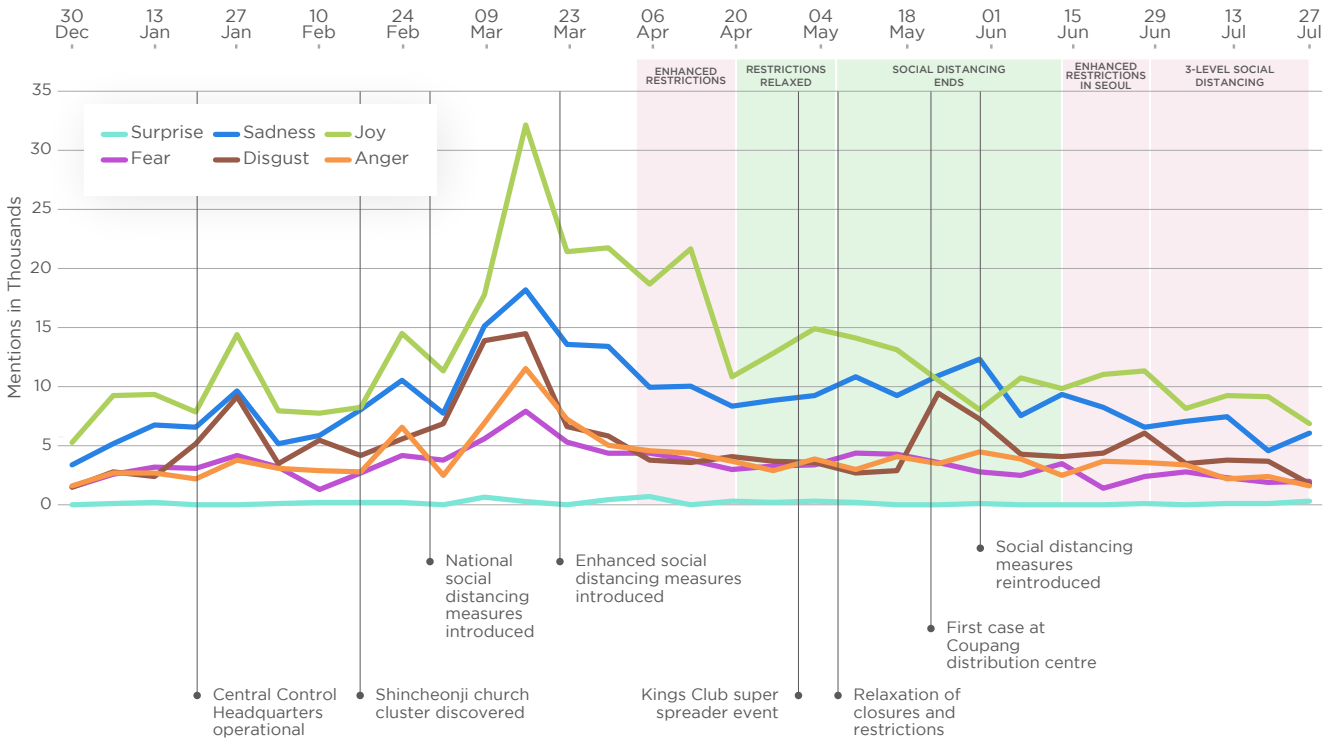
1 South Korea had learnt from the SARS and MERS epidemics and reacted quickly. A Central Control Headquarters (CCHQ) was operational by January 20, 2020 even before China declared the lockdown in Wuhan.

2 A world-leading test-trace-isolate scheme was established, with extensive monitoring via CCTV, ATMs, etc.

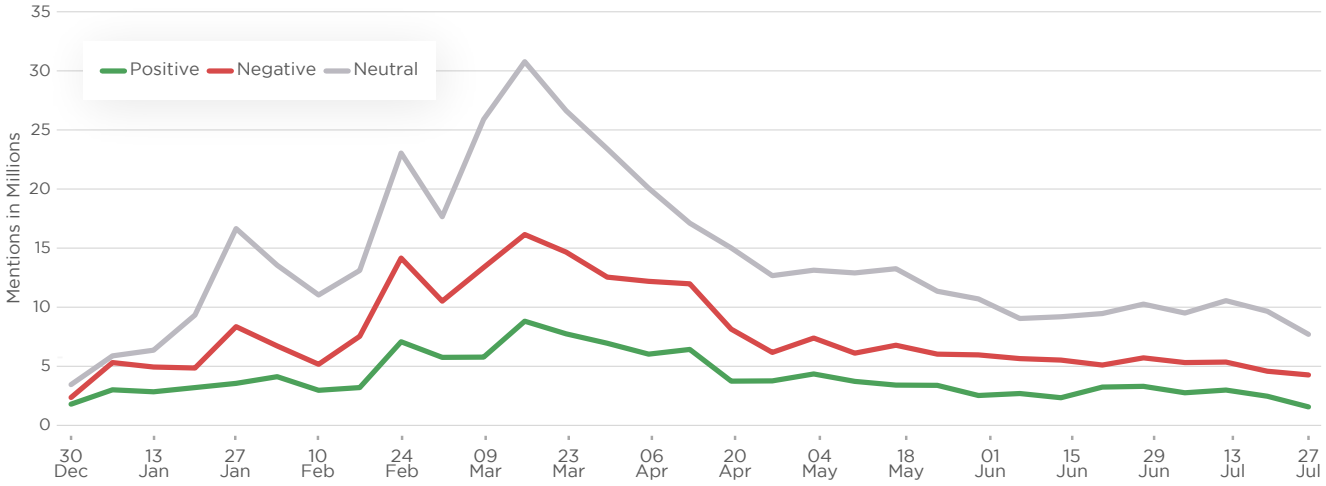
3 Public trust and confidence started to waver in late February 2020 when major clusters were discovered in churches who refused to comply with testing, tracing and social distancing measures.

4 The highly organized pandemic response was undone by blind spots concerning gig economy workers who could not afford to stop working multiple jobs and LGBTQ+ community who feared public exposure if they tested positive.

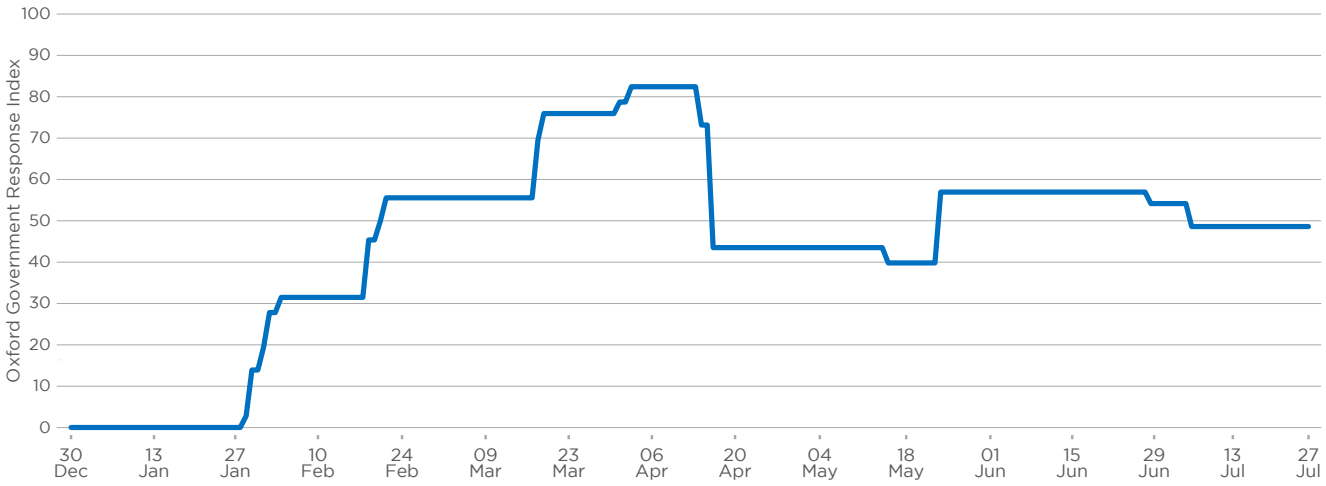
Emotion Over Time - January to July 2020



Sentiment Over Time - January to July 2020



Stringency of Policy - January to July 2020



What happened?

South Korea's proximity to China and its dependence on foreign trade rendered it especially vulnerable to the spread of the SARS-CoV-2 virus. The country had faced deadly viruses before and immediately raised the threat level when they were alerted to the outbreak of COVID-19 in Wuhan in early January. A Central Control Headquarters (CCHQ) was operational by January 20, 2020, even before China declared the first lockdown in Wuhan. The public reacted well to the rapid response of government, and the yellow line for joy spiked around January 27, 2020, with smaller peaks for sadness and disgust.

There was a second spike in joy in late February 2020 but drilling down to the message level reveals that this was not a sign of confidence in government's handling of the pandemic but rather a reaction to the much-anticipated release of Korean boy band BTS's comeback album MAP OF THE SOUL: 7.[17]

What happened next?

There were spikes in sadness, anger and disgust in late February 2020 following the discovery of the Shincheonji church cluster.[18] Given that it had almost 250,000 members who rejected official guidance on physical distancing, testing, and tracing, the church inevitably became a super-spreader. Other churches were similarly uncooperative. Public trust was shaken and the trend lines for the trust-negative emotions of sadness and disgust climbed in tandem until mid-March 2020.

The swift and comprehensive response of the Korean government powered the spike in joy until March 16, 2020, at which time the declaration of special disaster zones in Daegu and other cities, along with the continued closure of schools and other social distancing measures, led to a sharp drop in positive sentiment. The chart above also shows that anger and disgust were trending upwards in the first half of March 2020, but this was mostly directed at fellow citizens who were not observing physical distancing and mask-wearing recommendations, rather than at government.

Sadness and disgust spiked again in late May 2020. This was in reaction to two major outbreaks of infection that exposed serious breakdowns in inclusion and trust. The first concerned a gay club whose patrons avoided testing and tracing because the lack of privacy protections would have exposed them to homophobic backlash. The second involved clusters of infection in e-commerce distribution centers where contingent workers could simply not afford to stop working. Many of them had multiple gig economy jobs that involved extensive contact with co-workers and the public, but they evaded testing and tracing even when they felt ill. Contingent workers were not fully covered by social security, and they therefore acted in their zero-sum individual interest rather than the positive-sum mutual interests of society.

Why does this matter?

The technocratic, science-driven response of the South Korean administration had an Achilles heel—it was not sufficiently inclusive. Administrators failed to anticipate the socially patterned impacts of the pandemic and therefore failed to secure the trust of the LGBTQIA+ community and contingent workers. Had the Korean government used social media data, they could have appreciated the concerns of these and other communities and made the necessary adjustments to include them in the pandemic containment measures.

Trust in Times of Crisis

Singapore

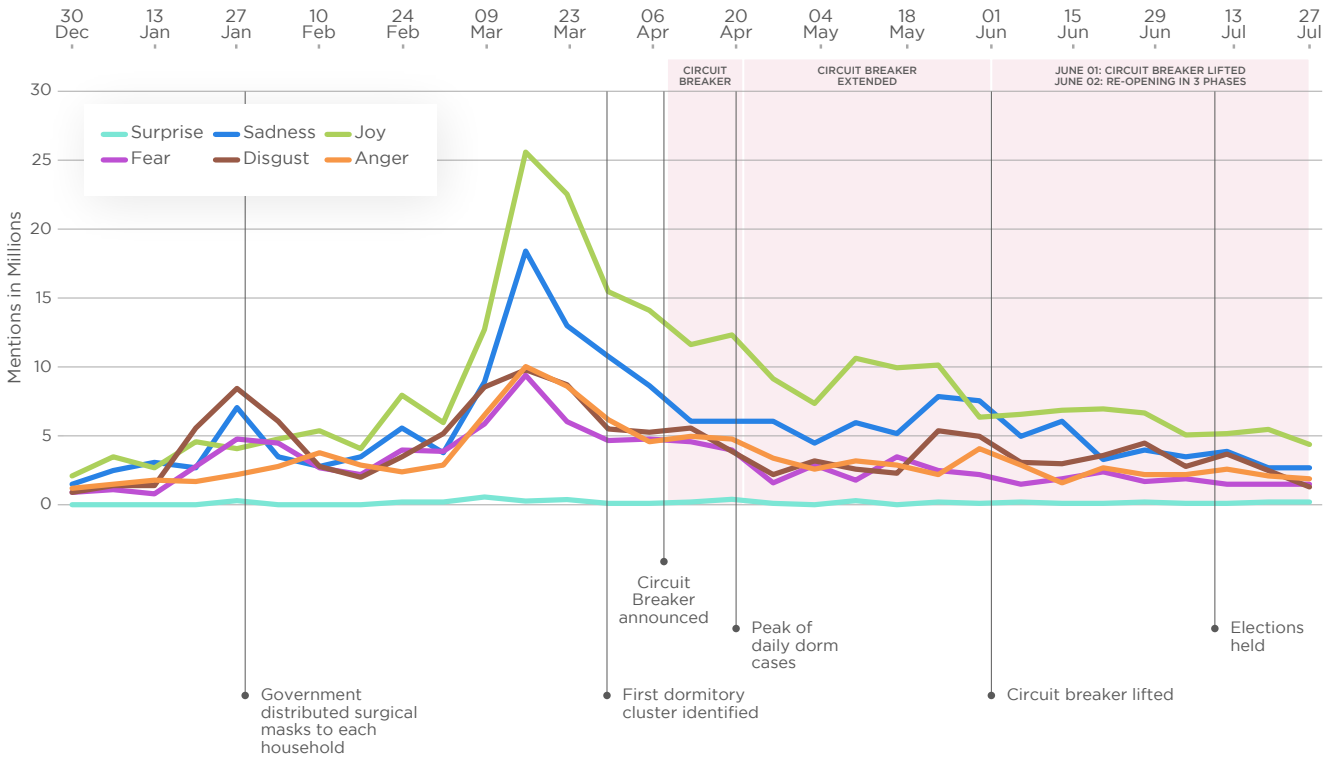
1 Singapore rapidly mobilized a whole-of-government response to the SARS-CoV-2 crisis, garnering considerable trust.

2 Trust declined relatively quickly however, as clusters were detected in migrant worker dormitories. Migrants soon accounted for 95% of infections.

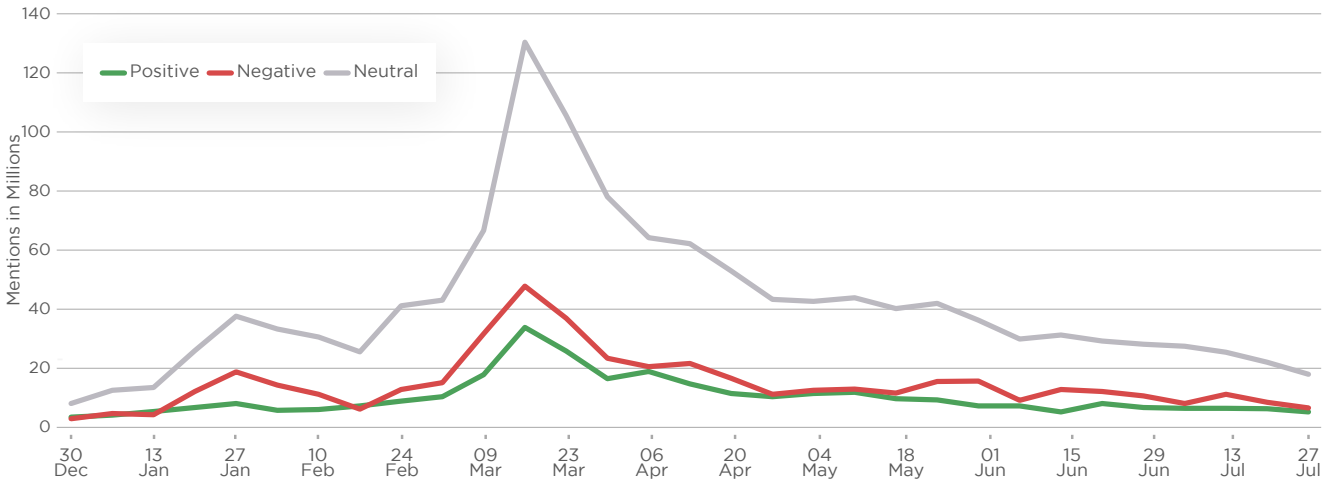
3 High density dormitories should have been flagged as high-risk but were overlooked. This blind spot placed the entire community in danger.

4 Social media analysis could have alerted the government to the plight of migrant workers.

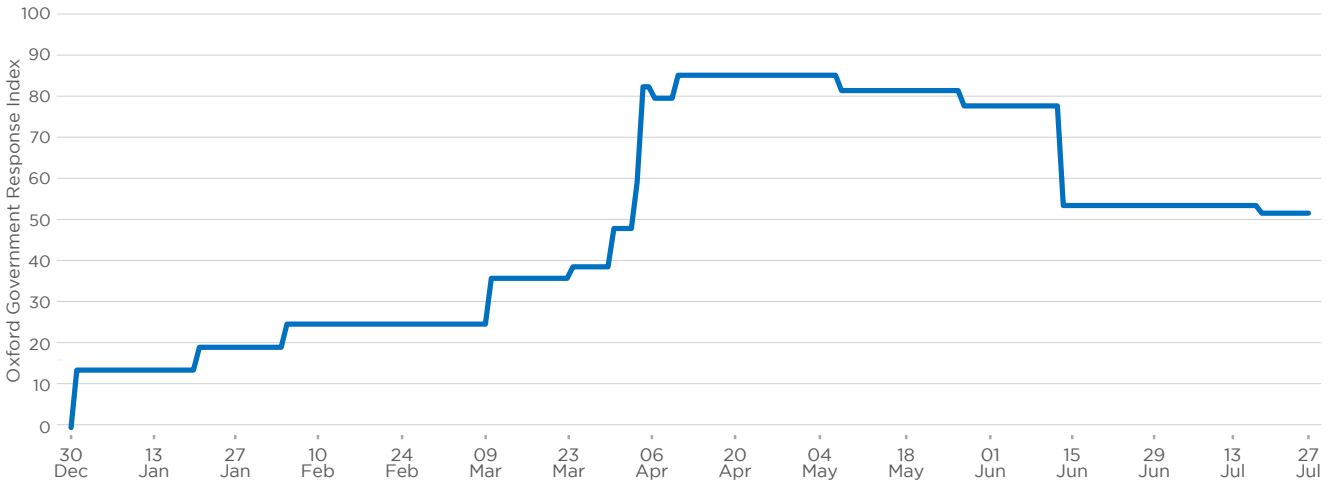
Emotion Over Time - January to July 2020



Sentiment Over Time - January to July 2020



Stringency of Policy - January to July 2020



What happened?

Singapore had learnt from the experience of SARS in 2003[19] and strengthened its capacities in anticipation of the next deadly virus. This allowed the country to quickly mobilize a whole-of-government response to the COVID-19 crisis. The initial reaction of the public to the arrival of the virus produced spikes in disgust and sadness at the end of January 2020. Joy then took over in mid-February 2020 and climbed steadily to peak in mid-March 2020 as citizens expressed their satisfaction with government's active response to the pandemic.

What happened next?

Satisfaction declined relatively quickly however, as clusters were detected in migrant worker dormitories in April 2020. Some 323,000 migrant workers live in high-density dormitories where physical distancing was impractical, yet the government failed to appreciate the risk of transmission in the dorms and even excluded migrant workers when they distributed facemasks to all Singapore residents in early February 2020. The result was that migrant workers soon made up 95% of infections in the country. The trend line for joy plateaued in May, tracked by sadness, anger, and disgust. Combined, these trust-negative emotions eclipse the trust-positive ones and indicate considerable loss of trust in the government's handling of the crisis.

Why does this matter?

Despite all the planning and preparation, the government's management of the crisis was undone by a major oversight—the failure to include migrant workers. Historically, the government of Singapore had garnered significant reservoirs of competency-based trust from citizens, but the failures in planning and implementation that led to the spike in COVID-19 infections amongst migrant workers shook that trust. Migrant workers should have been identified as a high-risk group because of their mobility and their high-density accommodation. This oversight placed the larger community in danger since migrants work in many service sector occupations where they come into contact with Singaporean citizens and permanent residents.[20] Prof. Jeremy Lim, co-director of global health at the National University of Singapore's Saw Swee Hock School of Public Health, said, "The dormitories and management of the migrant workers have been a cognitive blind spot".[21] He tweeted that migrant workers were vulnerable by design and that society had a moral duty to protect vulnerable populations.[22]

The "cognitive blind spot" could have been detected and adjustments made had the government of Singapore used social media data to monitor the evolution and impact of the pandemic. In this way the voices of voiceless communities could have been factored into the management of the crisis.

Singapore held elections in July 2020, that were widely seen as a referendum on the government's handling of the pandemic. The ruling PAP was returned to power but lost almost 10% of the vote it received in the previous elections.[23]

Trust in Times of Crisis

India

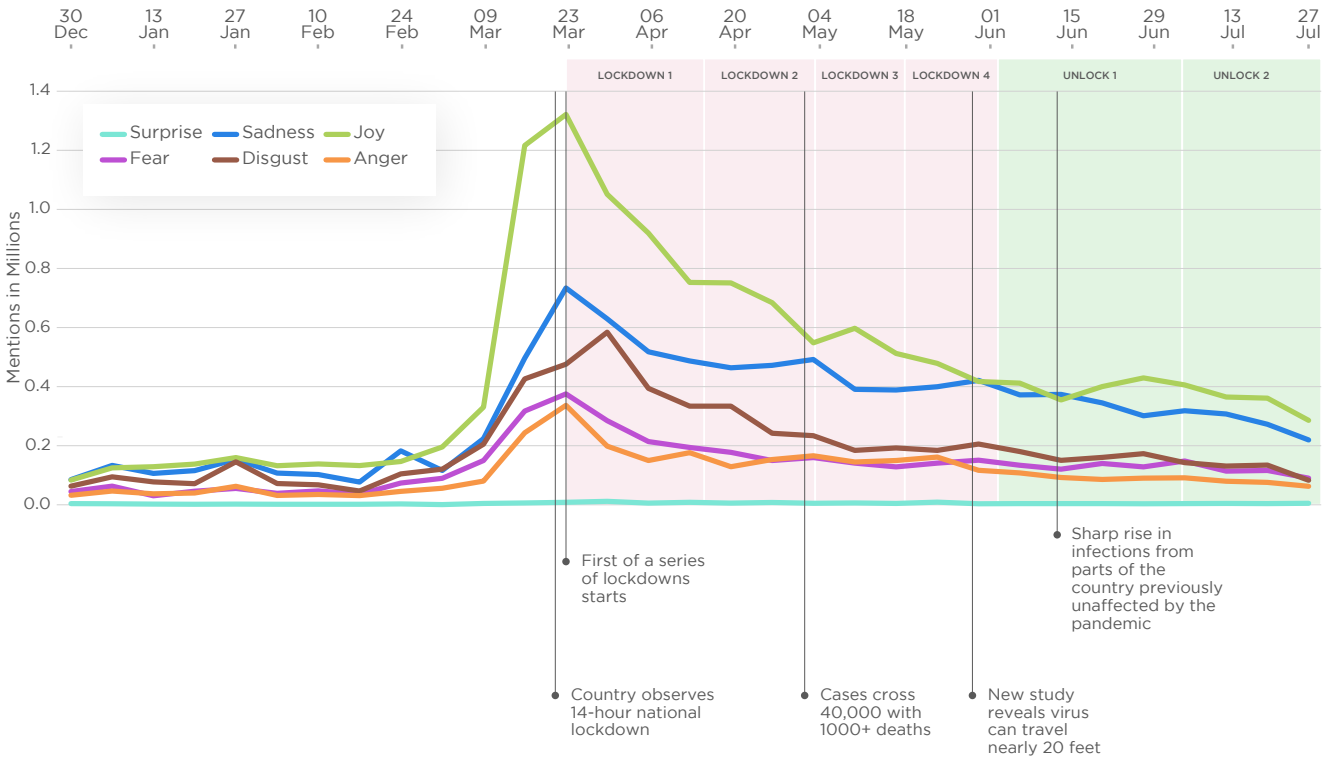
1. After a late start, PM Modi said, “Our aim is to win this war in 21 days”.

2. Lack of planning and preparation led to a mass exodus of migrant workers.

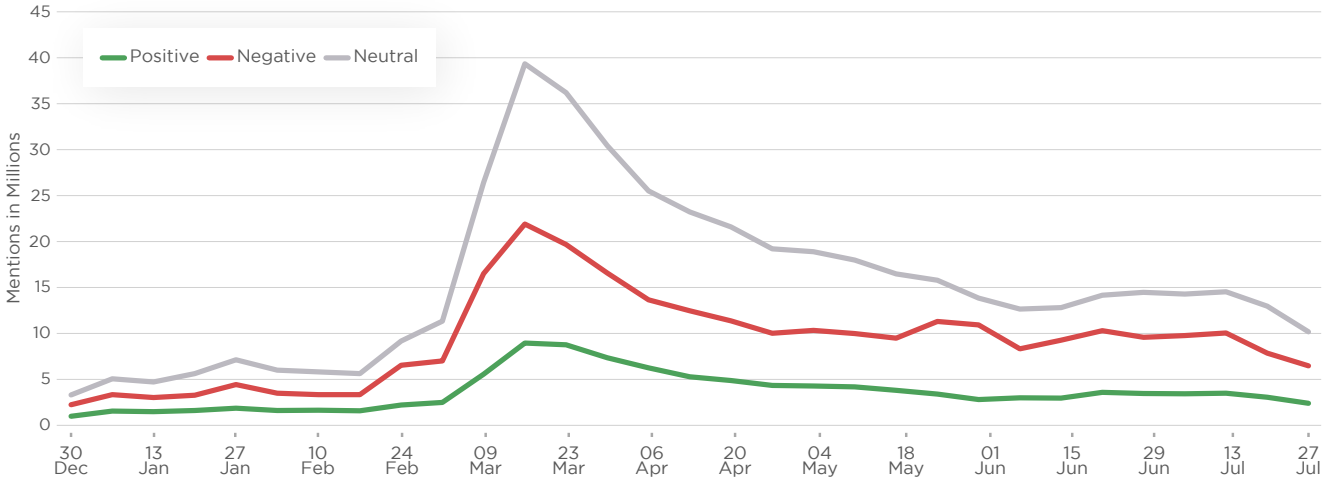
3. Faced with exponential growth in cases, the government was forced to extend the 21 day lockdowns three times.

4. The Modi administration leveraged the war against the virus as a campaign platform.

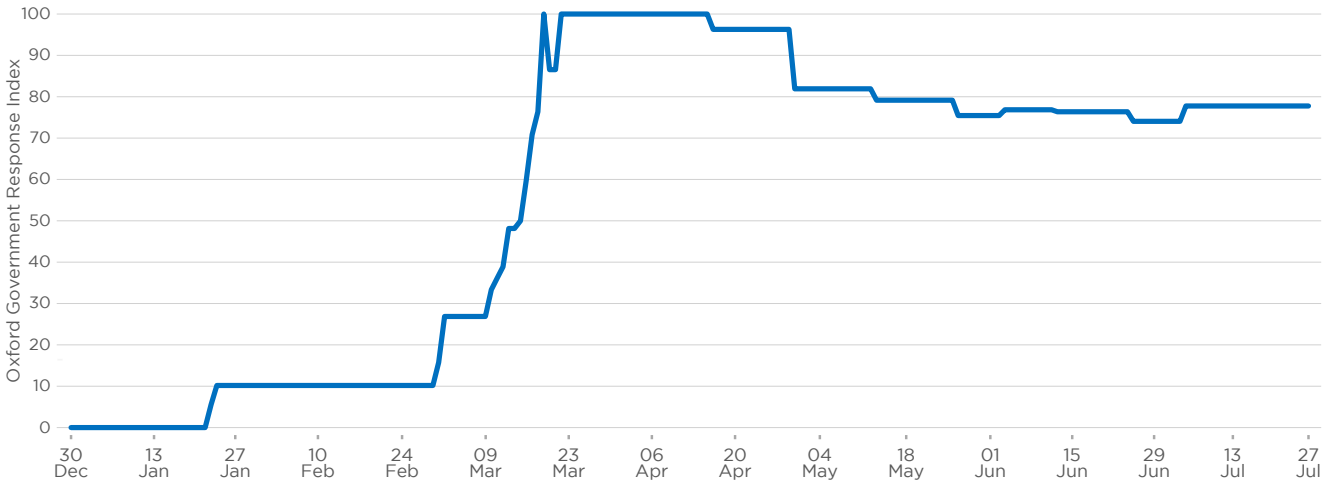
Emotion Over Time - January to July 2020



Sentiment Over Time - January to July 2020



Stringency of Policy - January to July 2020



What happened?

In India, the Modi administration did not respond to the pandemic until March 2020. Prime Minister Narendra Modi tweeted for the first time on March 3, 2020 and waited until March 22, 2020 before holding a 14-hour voluntary "Janata Curfew". In his address to the nation that day Modi announced a 21-day lockdown with a stark warning: "If the situation is not handled in these 21 days, the country and your family could go back 21 years."[24] On March 25, 2020 he added: "The Mahabharata war was won in 18 days. The war that the whole country is now fighting against COVID-19 will take 21 days. Our aim is to win this war in 21 days".[25] The response as reflected in digital media was overwhelmingly positive and there was a significant spike in joy on this date. A survey showed support for PM Modi's handling of the pandemic increasing from 76.8% at the start of the lockdown on March 25, 2020, to 93.5% by April 21, 2020.[26]

What happened next?

PM Modi developed a narrative of calm, tweeting somewhat incongruously using capital letters that: "there (was) no need to panic",[27] but the lack of planning and preparation for the lockdown led to millions of poor people undertaking an urgent and desperate exodus back to their villages. Faced with an exponential growth in cases, the government was forced to extend the curfew three times to May 31, 2020, making it one of the longest lockdowns in the world. By this time the trend line for sadness had overtaken joy, although the phased re-opening in early June 2020 saw joy climb back to become the dominant response.

Why does this matter?

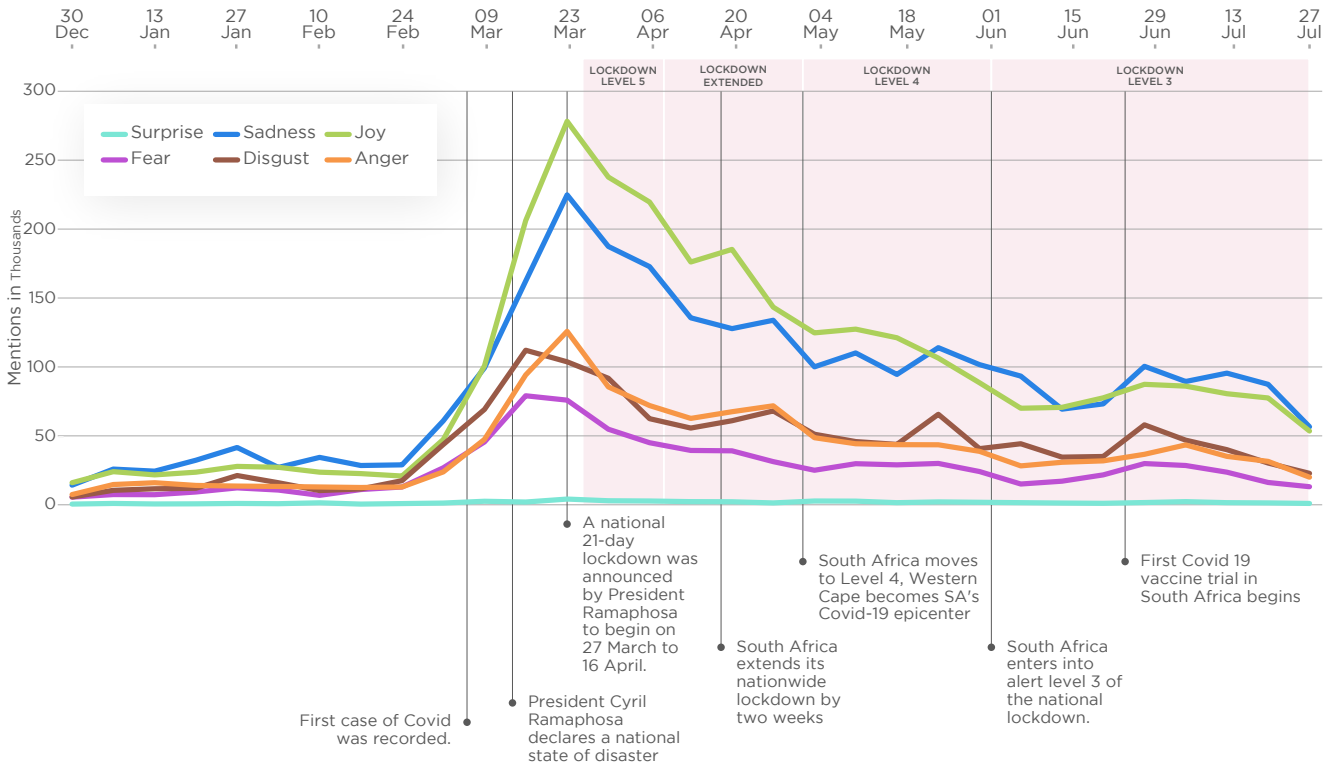
As in South Korea and Singapore, the Modi administration has a major blind spot: migrant workers in urban areas who could not comply with lockdown restrictions. Notwithstanding this major planning failure PM Modi leveraged the "war" against the virus as a campaign platform, and an opportunity to blame opposition parties for the crisis. This also helped to obscure accountability for missteps by the central government. Despite the well-documented failures of policy and implementation, Prime Minister Modi wrote a letter to the nation on May 30, 2020, highlighting Indian exceptionalism and resilience: "You have proved that your collective capability and capacity are unprecedented in comparison with other more resourceful and prosperous countries".[28] PM Modi avoided press conferences and instead used social media to frequently communicate directly to the public, allowing him to generate a negatively defined in-group trust that denied other realities and facts, making him impervious to criticism and accountability, at least in the short- to medium-term. Despite the government's failure to contain the spread of infection and the plight of millions of poor migrants, PM Modi's popularity rating rose to over 80% for the duration of the lockdown.[29] The border clashes with China, and PM Modi's tough stand against Chinese imports also helped rally people round the flag and extend his high popularity rating.

Trust in Times of Crisis

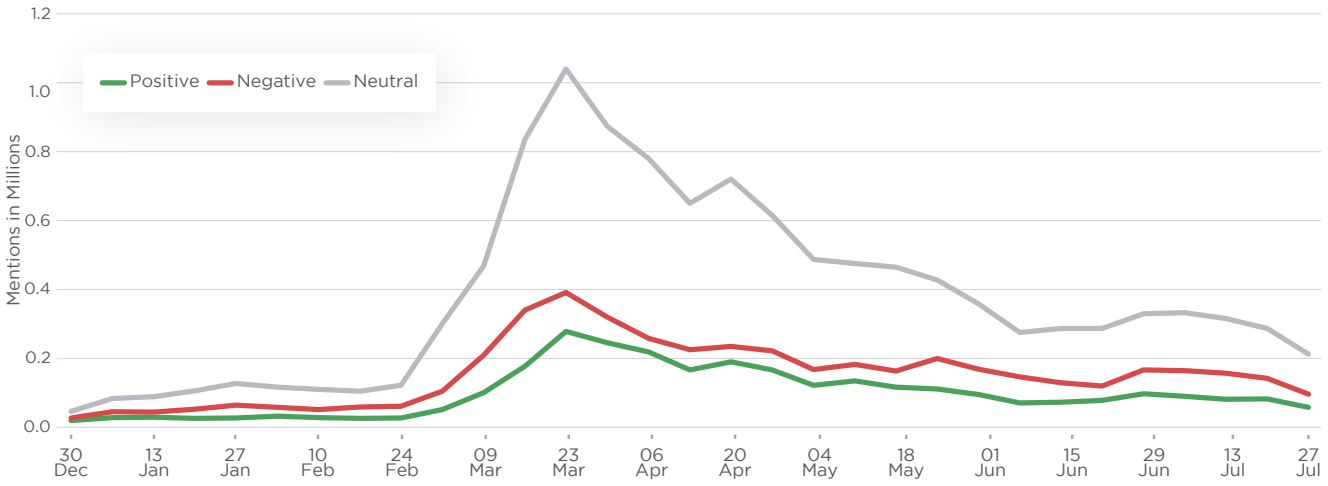
South Africa

1. Government gained initial trust by legislating pandemic control measures.
2. Public trust was quickly undermined by use of military to enforce lockdown restrictions.
3. Government failed to explain bans on alcohol and tobacco.
4. Government squandered public trust in two months as ineptitude, corruption and excessive use of force dismayed public.

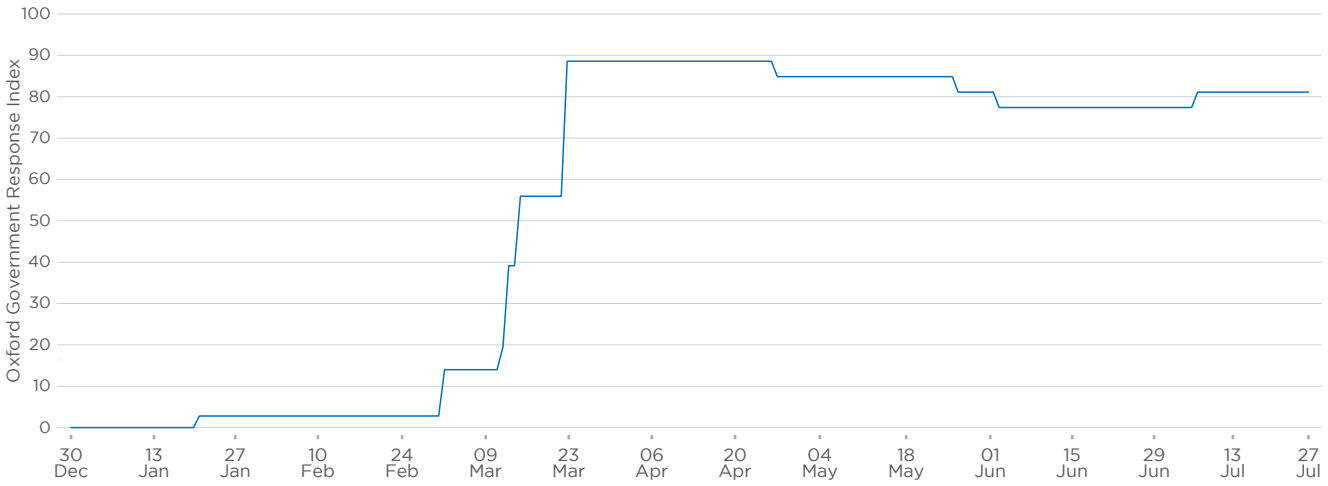
Emotion Over Time - January to July 2020



Sentiment Over Time - January to July 2020



Stringency of Policy - January to July 2020



What happened?

In the chart above the graph, sadness rose on January 25, 2020, as the news of the lockdown in Wuhan began to sink in. It continued to rise as COVID-related deaths mounted and peaked on March 22, 2020, when a moving tweet by the son of a victim was re-tweeted over 150,000 times. The announcement of the national lockdown on March 23, 2020, however, sees the trend line for joy spiked as citizens expressed satisfaction and relief at the decisive government action.

What happened next?

After peaking on March 23, 2020, the trend lines for sadness and joy tracked closely until May 25, 2020, when sadness spiked, followed by disgust. This was driven by two controversies. One concerned the Minister of Basic Education, Angie Motshekga, who bungled both the consultations and preparations for the reopening of schools, resulting in a huge outpouring of dissatisfaction. One tweet with the hashtag #angiemustfall reached almost 2.5 million people. The second controversy was sparked by a Defense Force report clearing the soldiers involved in the killing of alleged curfew breaker Collins Khosa. A tweet protesting the decision was seen by almost 15 million people. From this point onwards, sadness was the dominant emotion, with occasional spikes in disgust.

Why does this matter?

The government effectively squandered public trust in two months when they chose to use the military to enforce lockdown restrictions that residents of informal housing and working-class communities could not comply with. Instead of engaging in confidence-building measures to restore trust in their handling of the pandemic the government doubled down on the highly unpopular measures. Although joy remained the predominant emotion for two months, deeper analysis at the message level reveals that many of the posts were humorous attempts to lift spirits and dispel the gloom of lockdown, rather than expressions of confidence in government. The input legitimacy of the pandemic control measures evaporated quickly, and the lack of output legitimacy meant that there was not enough trust and confidence for the social contract to hold. This depletion of trust fueled the skeptical perception of citizens towards risk and risk managers and led them to opt for zero-sum individual benefits over positive sum mutual benefits. Had the South African government monitored social media data, they might have understood the lived experience of people in low-income housing and the emerging narratives of doubt, dismay, and distrust. This would have equipped them to adjust implementation measures to accommodate residents and restore the trust garnered in March 2020.

Trust in Times of Crisis

Sweden

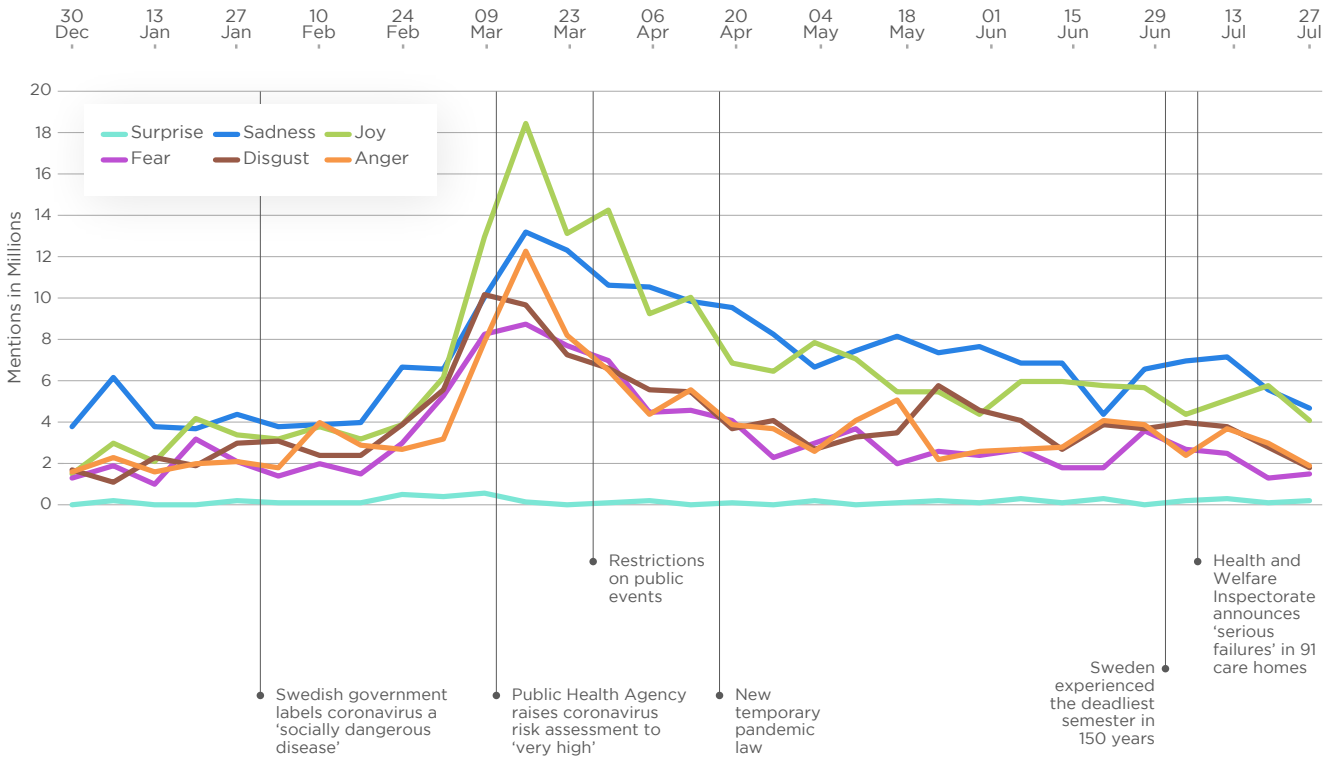
1 Sweden is a high-trust society with strong levels of institutional and inter-personal trust.

2 State Epidemiologist Anders Tegnell advocated against face masks and lockdowns and in favor of personal responsibility but was able to garner significant trust.

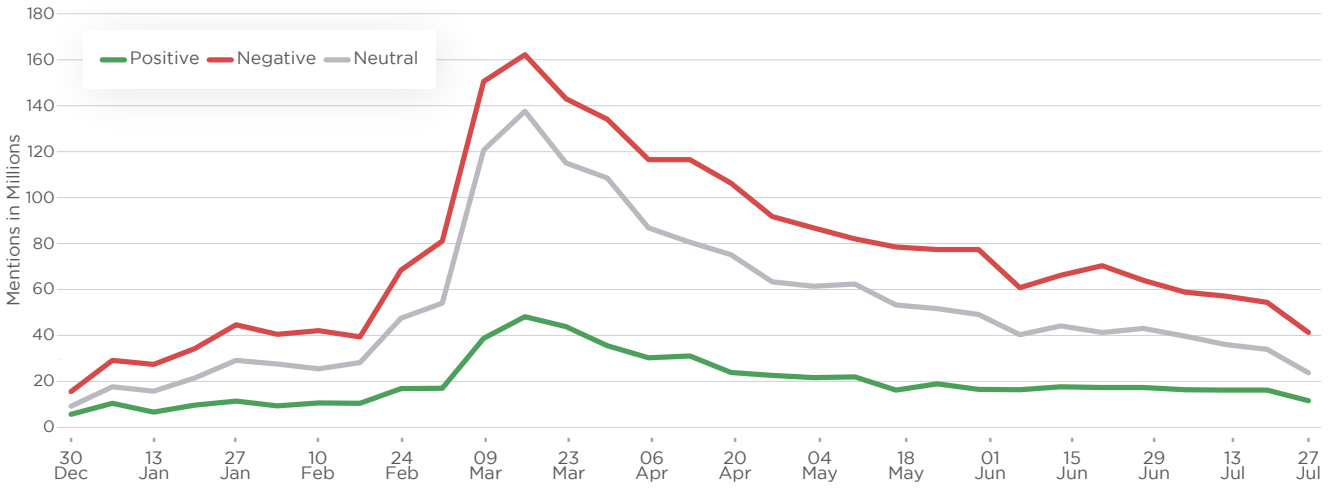
3 Early support waned as Sweden suffered exceptionally high rates of mortality, especially amongst the elderly that they had sworn to protect.

4 The polarizing government policies provoked high rates of public anger, disgust and fear in the latter stages of the survey period. Only the USA had similar reactions.

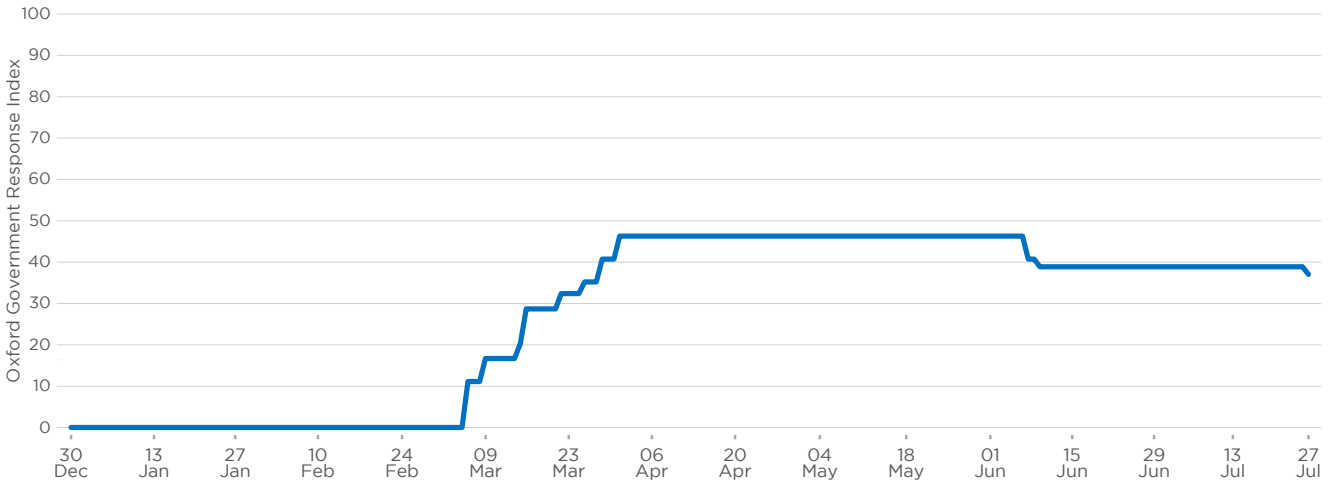
Emotion Over Time - January to July 2020



Sentiment Over Time - January to July 2020



Stringency of Policy - January to July 2020



What happened?

Sweden is a high-trust society[30] with high levels of institutional and inter-personal trust, so it was not unexpected when Anders Tegnell, the State Epidemiologist who advocated an idiosyncratic approach to the crisis, was able to garner significant support. Tegnell differed from his counterparts in other countries, stressing that Sweden would take a unique approach to combatting COVID-19.[31] Together with other Swedish leaders he argued against face masks and lockdowns, emphasizing that personal responsibility was the strategy best suited to Sweden. Tegnell's approach played well with the Swedish public and the trend line for joy rose strongly to peak in mid-March 2020 before beginning a steady decline to join the blue line for sadness in early-April 2020. Support for Tegnell was by no means universal however, and the trend lines for sadness, disgust and anger rose sharply in early March as well, reflecting a relatively high degree of polarization. In March 2020 for example, mathematician Marcus Carlsson made an influential YouTube video seen by over 57,000 people in which said that Anders Tegnell and Prime Minister Löfven were "playing Russian roulette with the Swedish population", and that Swedes were "being herded like a flock of sheep towards disaster".[32]

What happened next?

By early-April 2020, sadness was the dominant sentiment and disgust overshadowed joy from May 25, 2020. This was partly a response to the fact that Sweden recorded the highest number of COVID-19 deaths per capita in Europe over a seven-day-period at the end of May 2020. Prime Minister Löfven even admitted that their strategy had failed to protect the elderly, despite the stated intention of ring-fencing them from harm.[33]

Why does it matter?

The COVID-19 pandemic severely tested the limits of reciprocal trust in Sweden, and the reservoir of institutional and interpersonal trust was drained by the high death rate. The confident libertarian approach adopted at the start of the pandemic resonated with the personal independence generally favored by Swedes, and foreign criticism of the governments atypical strategy only served to rally citizens round the flag. Dissention surfaced quickly however, and Tegnell's theories split the scientific community. This polarizing stance provoked rates of anger, disgust, and fear in the later stages of the survey period at levels only seen in the USA.

Trust in Times of Crisis

The United Kingdom

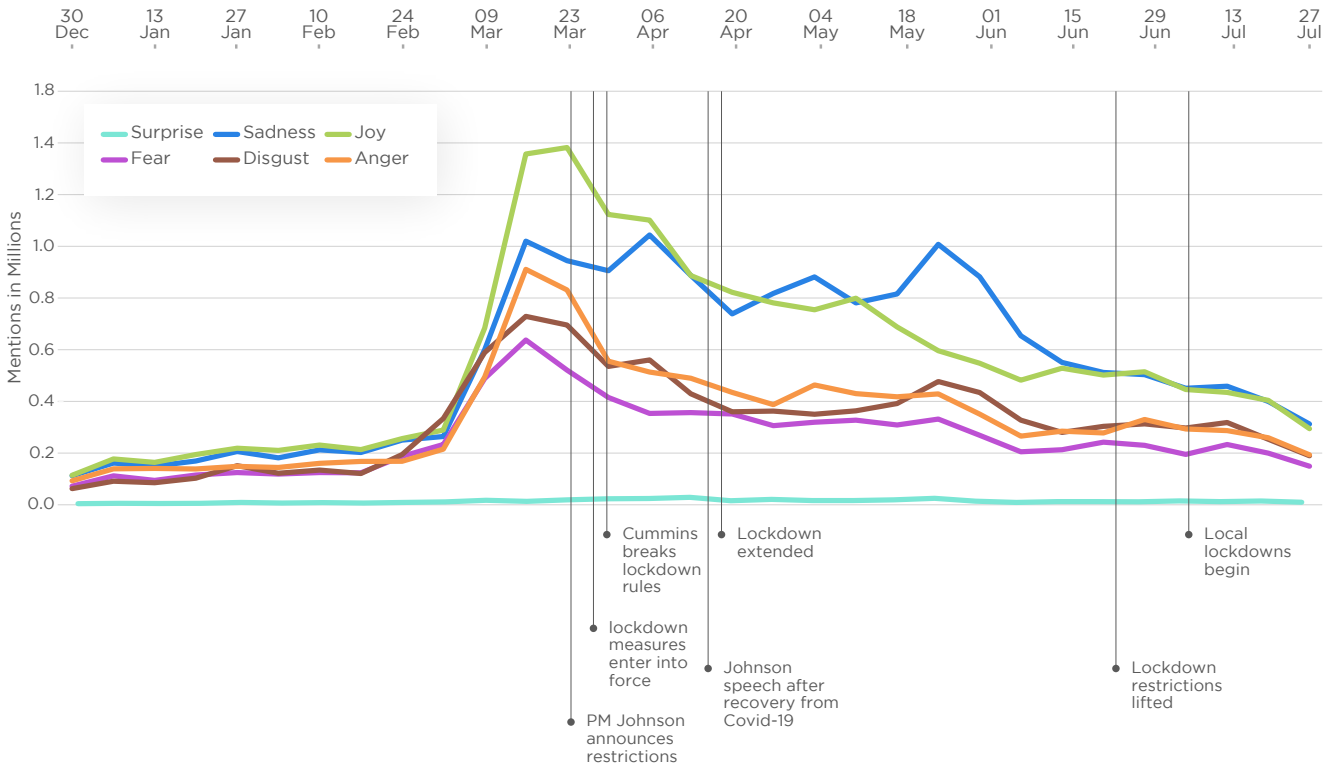
1 After initially downplaying the threat of the virus, PM Johnson garnered trust by portraying the NHS as a national treasure to be defended at all costs.

2 In April, Johnson himself contracted COVID-19 and was transferred to ICU, gaining even more support.

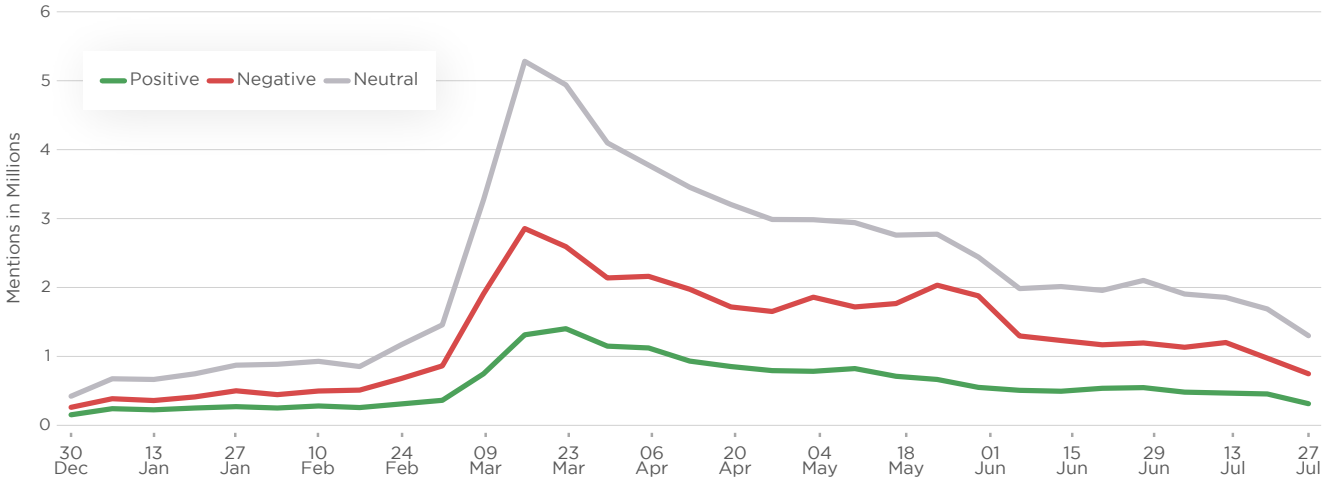
3 Johnson could not sustain the narrative however, since the Conservative Party had been cutting funding to the NHS for years and the two nurses who saved his life were foreigners.

4 Johnson depleted the reservoirs of trust in six weeks due to his hypocrisy and support for unethical behavior.

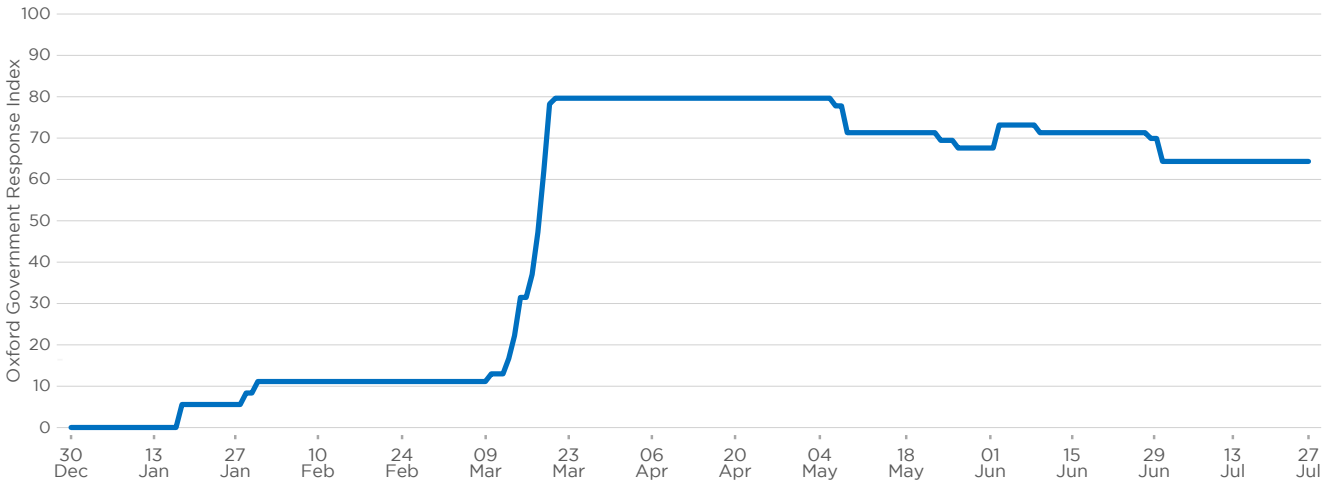
Emotion Over Time - January to July 2020



Sentiment Over Time - January to July 2020



Stringency of Policy - January to July 2020



What happened?

British PM Boris Johnson used military metaphors and drew parallels between the COVID-19 and the Second World War to evoke the historic spirit displayed in the Blitz. After initially downplaying the threat of the virus, Johnson portrayed the NHS as a "national treasure" and the envy of the world to be defended at all costs. His positioning was controversial, and the trend lines for disgust, sadness, and joy rose in tandem in early March 2020. Despite chronic underfunding of the NHS, PM Johnson was able to unite and rally the nation behind a positively framed narrative, regardless of the actual performance of his administration. This is reflected in the dominance of the graph for joy in March and early April 2020.

What happened next?

Things started to change mid-April 2020. There was a spike in sadness in early April 2020 in reaction to the news that PM Johnson had contracted COVID-19 himself and been transferred to intensive care. Drilling down to the level of individual messages shows that this is a trust-positive wave of sympathy and concern, but it declines sharply. Even Pm Johnson's recovery speech on April 13, 2020, in which he referred to the NHS as the country's "greatest asset" failed to reverse the decline in both the yellow trend line for joy, and the sympathy wave of sadness. Many commentators highlighted the irony of his narrative, given that the Conservative Party had been cutting funding to the NHS for years, and that the two nurses who saved PM Johnson's life were foreigners—a group squarely targeted during the Brexit campaign.[34] There was a sharp increase in trust-negative conversations expressing sadness at the end of May 2020. This was largely due to the actions of Dominic Cummings, the Prime Minister's Chief Advisor who broke lockdown restrictions to visit his family and then lied to cover his actions.[35] The yellow trend line for joy was then tracked by the trust-negative emotions of sadness, anger, and disgust for the rest of the survey period.

Why does it matter?

? The data show that the emotive references and imagery deployed by PM Johnson had a very short-lived effect. Not even the drama of his own hospitalization and recovery could efface the trust-negative reactions to the behavior of his Conservative administration. The blatant hypocrisy of Johnson's actions and his support for Cummings sparked national outrage, and Johnson was never able to regain the trust-positive support that he enjoyed in March-April 2020. PM Johnson depleted the reservoirs of trust in the space of six weeks.

Trust in Times of Crisis

The USA

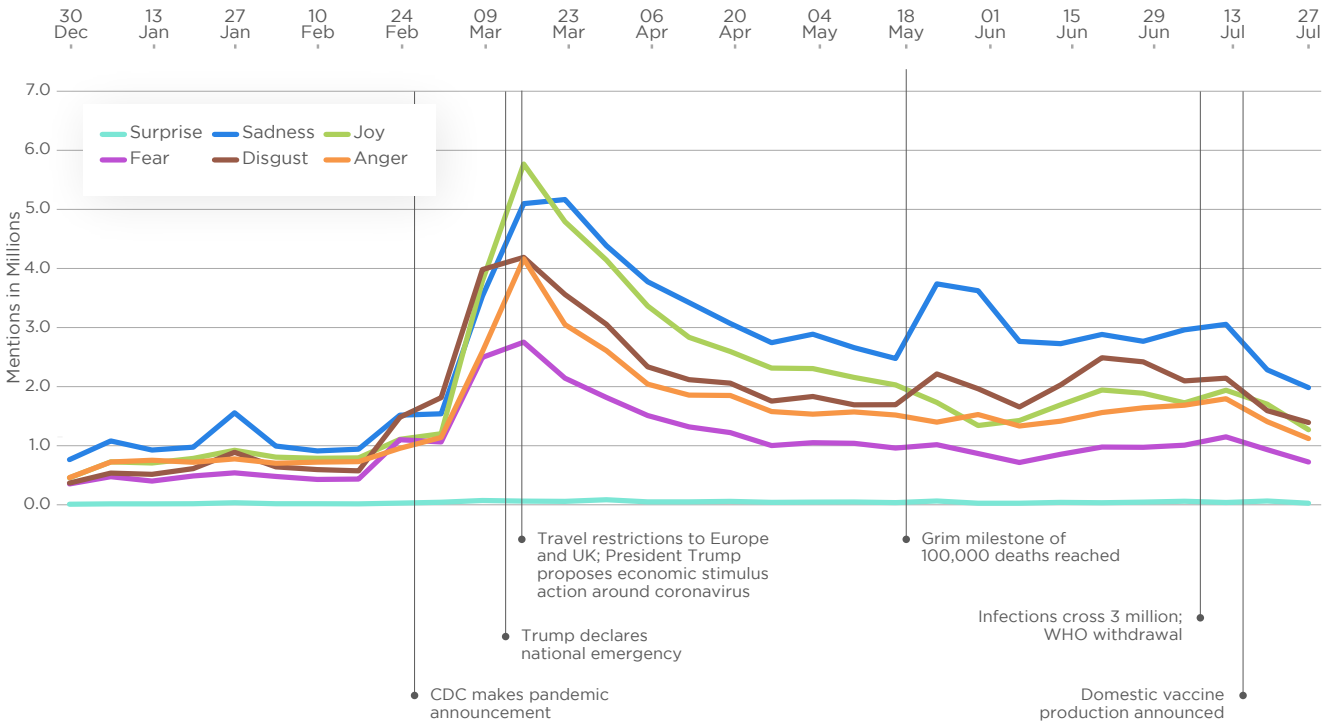
1. President Trump plays a key role in polarizing sentiment by consistently downplaying the seriousness of the pandemic and frequently posting misleading statements.

2. Sadness overshadows joy despite the Congress voting a $2 trillion rescue package.

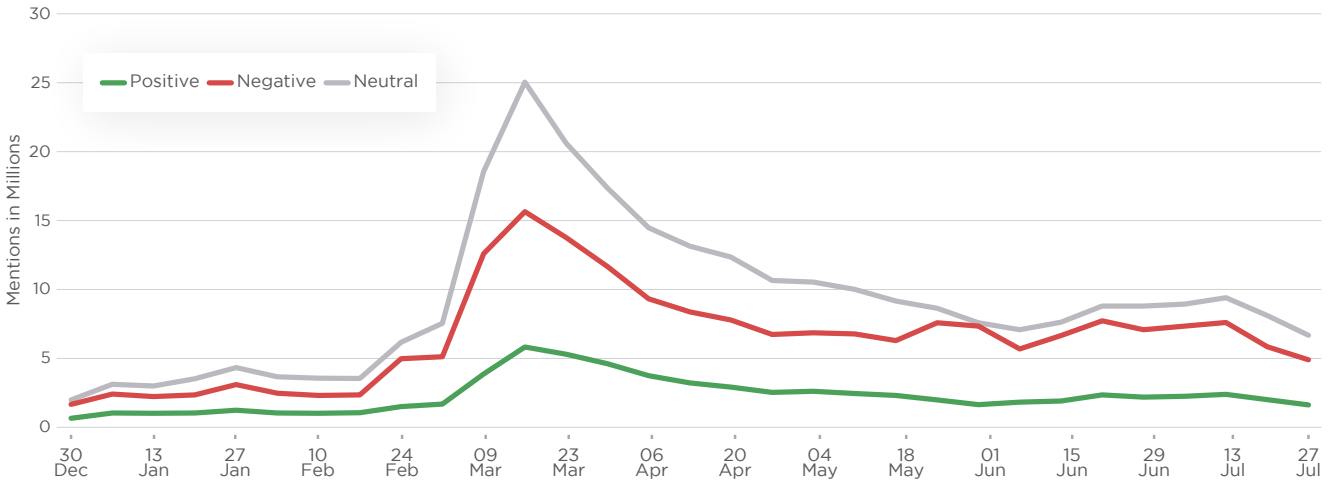
3. Social trust was sacrificed by the Trump administration in favor of partisan politics.

4. Overall experience of the pandemic was trust-negative with disgust becoming the second most prominent reaction.

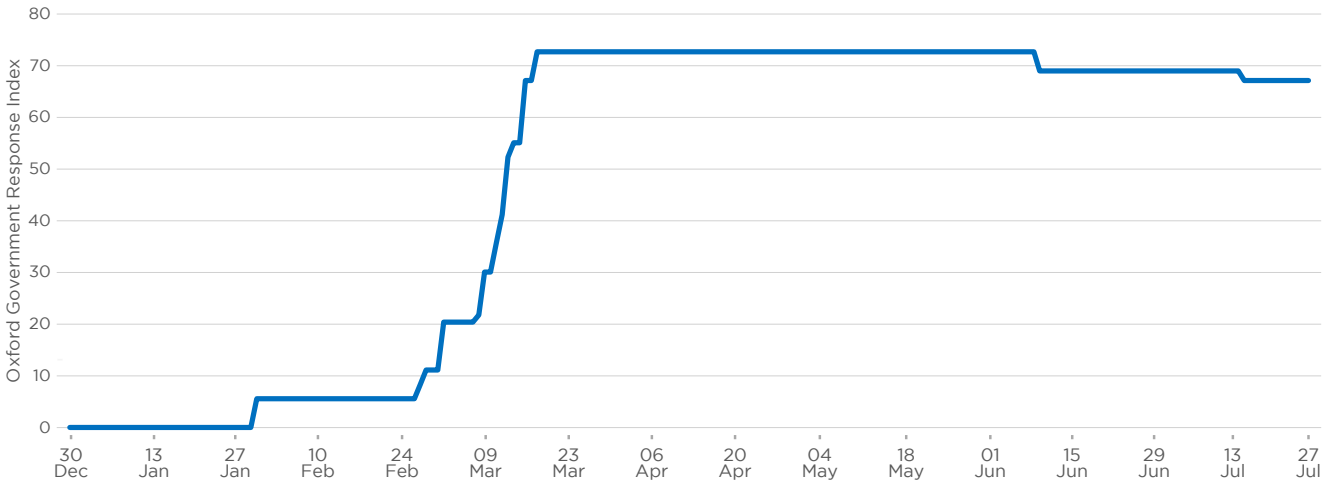
Emotion Over Time - January to July 2020



Sentiment Over Time - January to July 2020



Stringency of Policy - January to July 2020



What happened?

The US recorded its first death from COVID-19 on February 29, 2020, and the chart above shows a sharp spike in the graphs for sadness, joy, disgust, and anger at the beginning of March 2020. The close grouping of all those emotions reflect the highly polarized nature of the debate in America. Every pandemic-related announcement and intervention sparked almost equal amounts of positive and negative reactions. President Trump played a key role in this polarization by consistently downplaying the seriousness of the COVID-19 pandemic, and frequently posting misleading statements that divided opinion. On March 9, 2020, for example, he tweeted: "So last year 37,000 Americans died from the common Flu. It averages between 27,000 and 70,000 per year. Nothing is shut down, life & the economy go on. At this moment there are 546 confirmed cases of COVID-19, with 22 deaths. Think about that! (sic)"

What happened next?

The trend lines all peaked in mid-March 2020, after the US declared a national emergency and made $50 billion in federal funds available to tackle COVID-19. The peak of joy in the US was very short-lived however, and sadness took over as the dominant response just one week later. Even the announcement on March 25, 2020, that Congress had voted a $2 trillion COVID-19 rescue package failed to boost the trust-positive emotional responses. The blue trend line for sadness spiked again around the end of May 2020, when the USA passed the grim milestone of 100,000 official deaths from COVID-19, followed by a rise in disgust as infections spread across the country. President Trump continued to misinform and mislead people throughout the survey period, falsely claiming on July 6, 2020, that the mortality rate "...for the China virus in the US is just about THE LOWEST IN THE WORLD! (sic)"

Why does this matter?

Broad social trust is a crucial component of any crisis management strategy but was sacrificed by the Trump administration in favor of partisan politics and in-group trust. The data show that the responses to the management of the crisis were highly polarized. Trust-positive and trust-negative emotions trended in tandem and cancelled each other out. This was clear after President Trump's announcement of a national emergency on March 13, 2020 generated spikes in anger, sadness, disgust, and joy at the same time. This was in stark contrast to other countries in the study that all saw a dominant wave of joy or satisfaction in reaction to the seminal intervention of a declaration of a state of emergency or a lockdown. The US is the only country where joy was almost overshadowed by sadness at this moment. The combined effect of the trend lines for sadness, disgust, anger, and fear show that the overall experience of the pandemic was trust-negative. The USA was the only country in this study where disgust rose to become the second most prominent emotion, further undermining any possibility for decisive action to contain the pandemic.

Cross-country Convergence, Divergence, and Emerging Insights

The data gathered on the eight countries track the interplay between government action and public reaction in the critical first semester of the COVID-19 pandemic. The emotions displayed in those public reactions reflect changing levels of trust and confidence in the management of the crisis. Every country had a certain store or reservoir of trust going into the pandemic in January 2020, and the national governments had to gain, maintain, or restore trust in order to manage the crisis effectively.

There are several notable trends visible in the data for the eight countries.

The rally round the flag effect: One notable common feature is that every country in the survey experienced a significant upswing in the graph for joy or satisfaction when the government announced the initial lockdown or equivalent. Even South Korea and Sweden, who never went into strict lockdown saw a surge in joy in the first phase of the crisis. This reaction seems counter-intuitive given that lockdowns imposed restrictions on civil liberties and economic activity that brought hardships to many, but it is in fact consistent with previous periods of crisis. The positive reaction is a function of threat perception and the need to counter uncertainty. The "rally round the flag" effect has been documented in times of crises such as wars or terrorist attacks when the perception of a threat leads citizens to seek protection and certainty in political parties or movements, even anti-democratic or illiberal ones.[36] The greater the perceived threat, the greater the tendency of people to rally to a leader or party to defend them against it. This may even bridge partisan political divisions, as was the case after 9/11. In the language of disaster sociology, the social disruption that flows from a crisis causes a coordination deficit in society, and citizens therefore want to see their government demonstrating competence and confidence by taking decisive action. The perception of competence may even be more important than the caliber of the action taken, and of the outcomes.[37] The rally effect declines over time however, and this can be seen in the declining trend line for joy in every country in the survey. Monitoring the lived experience of people would have given leaders the actionable insights they needed to know where and when to intervene, to rouse, or reinvigorate support and restore trust.

Contested Certainty in the USA: The lockdown lifts in all the countries we studied reflected a popular sigh of relief at decisive government action that brought some certainty to an otherwise uncertain situation. The spike in the trend line for joy was much more pronounced than the other emotions, except in the USA where sadness spiked to almost the same level, reinforced by smaller spikes of disgust and anger. The combined effect of these trust-negative emotions outweighed the trust-positive impact of the spike in joy. This can be explained with reference to the perception of threat and the rally to the flag effect. Had President Trump emphasized the magnitude of the COVID-19 threat, he could have generated a greater rally effect, possibly even across party lines. Instead, he chose to downplay and dispute the threat, thus robbing himself of the full potential of the rally effect and sparking controversies that provoked competing emotional responses. The USA was also the only country in the study where the trend line for joy declined to third place (lower than sadness and disgust) by mid-May 2020 and was overtaken by anger on June 1, 2020 making the Trump administration the worst performer in terms of sustained trust and

confidence.

Rally to a divided flag: one of the most common and effective strategies—adopted by the UK PM Boris Johnson, Indian PM Narendra Modi, Swedish State Epidemiologist Anders Tegnell, and US President Donald Trump—was to rally supporters to an exclusive and divisive flag. This is a worrying development for two reasons. First, the cultivation of in-group trust heightens distrust towards other groups and leads to division, conflict, and exclusion, especially if the in-group is negatively defined. Second, the values or beliefs on which in-groups are based can be nourished through narratives that are unrelated to performance or outcomes, thus frustrating the normal democratic accountability processes. PM Johnson, PM Modi, Tegnell and President Trump were all able to gain and maintain in-group trust despite their failure to adequately mitigate the impact of COVID-19. This decoupling of trust from performance and accountability is a troubling and increasingly widespread phenomenon that could undermine democracy, inclusion, and the global effort to contain COVID-19.

Policy Polarization: New Zealand, Sweden, and the USA saw greater contestation in the emotional reactions to government intervention, with multiple emotion trend lines rising and falling together, indicating high levels of disagreement and polarization. New Zealand, Sweden, and the USA saw similar declines in joy later in the survey period, and higher levels of anger and disgust. In the other countries joy and sadness were the dominant emotions, with disgust, anger, and fear trending at lower levels.

It's OK to not be OK: There were only two countries in the survey where sadness was the dominant emotion, namely New Zealand and the USA. At first glance this is contradictory since the two leaders exhibited radically different styles of crisis management. PM Jacinda Ardern was inclusive, open, and honest about the threat whereas President Donald Trump consistently disputed it. Upon closer examination of the emotional responses and their context it emerges that the sadness displayed by New Zealanders was trust-positive while that in the USA was trust negative. Unlike many of the other leaders in this survey, PM Ardern did not try to rally her supporters round the flag by appealing to emotional symbols or values, and instead presented a rational, common-sense assessment of the situation. This was a risky decision on her part because it meant that the initial joy at the decisive actions of the government was quickly replaced by sadness. In many ways this was the appropriate re-action to the pandemic, and reflected the fact that PM Ardern believed the public could be trusted with the truth. President Trump however, concealed the truth and offered no sympathy for the exponential increases in infection and fatality.

The data collected in this study reveal a **second notable feature in almost all the survey countries - shortcomings in the systems of voice** that resulted in blind spots and breakdowns in pandemic planning, management, and protection. Our democratic system depends fundamentally on equal access to voice. It is the critical mechanism of inclusion in the policy making cycle, from agenda setting to formulation, adoption, implementation, and evaluation.

Voice Deficit: This refers to the failure of governments to include a sufficiently broad base of interest groups in the planning and management of the pandemic control measures, with the result that even large groups were left vulnerable to the socially patterned impacts of the virus. Government agencies managing pandemic response failed to appreciate the social, cultural, and economic realities of many social groups, leaving them excluded and ex-posed. This could have been avoided had social media data been used to understand the lived experiences of those social

groups and the probable or actual impacts of pandemic control measures on them. Social media data could also have served as a feedback loop or monitoring mechanism to assess and evaluate outcomes.

In the **UK** and the **USA**, the **voice deficit** expressed itself in the **de-legitimization of critical and expert voices.** This took the form of withering attacks by leaders on the credibility of scientists, journalists, and even senior public servants, thus undermining their legitimate voice. Prime Minister Johnson and President Trump both relied on a strategy of building trust based on shared values and then "othering" groups that held opposing views or values. Transparent and accountable government and democratic voice suffered in the process.

The voice deficit led to blind spots in crisis planning and management. These were evident in government responses in both hemispheres and all levels of development. Examples of these blind spots include evangelical churches in South Africa, South Korea and the USA, contingent and gig economy workers in South Korea, the UK and the USA, residents of elderly care homes in Sweden, the UK and the USA, the informal sector and migrants in India and South Africa, and Black and Latino communities in the USA. The blind spots inevitably resulted in the exclusion of these groups from pandemic planning and protection and their greater exposure to infection of these groups from pandemic planning and protection and their greater exposure to infection.

The Case for Real Time Social Analytics as a Tool for Making Better Policy, Increasing Accountability and Building Trust

The World Social Report published in 2020 showed that over 70% of the global population was experiencing increased inequality.[38] This meant that the pandemic (and other crises) would inevitably have a differential impact on the population. Our study demonstrates how government leaders, policy makers and administrators failed to appreciate the socially patterned impacts of the virus and the control measures taken to contain it. Even two of the best-prepared nations, Singapore and South Korea,[39] overlooked the impacts on major high-risk groups (migrants and gig economy workers), and other less prepared nations had major blind spots as well. Had the policy makers used social analytics they could have identified the at-risk groups and their lived experience and adjusted the planning or implementation processes to include them.

The pandemic is not over, and the world is facing other interlocking crises fueled by climate change, zoonotic viruses, inequality, displacement and migration. Any one of these crises would constitute a major global challenge in and of itself, but combined they compound each other, gaining in complexity, frequency, and intensity as they do. Crisis managers will need new AI technologies and tools for the early detection of threats and evaluation of the potential impact on different social groups, as well as an ongoing appreciation of the perceptions and responses of those groups.

The methodology developed in this project provides a set of tools for near real time monitoring that could and should inform public policy and management. The amount of data available is increasing exponentially and makes possible even more representative digital participation and feedback. New sensor data is flowing though the Industrial Internet of Things (IIoT) and adding to the data generated by all the other connected devices, appliances and machines used in everyday life. Advances in NLP and computing power mean that these data streams can increasingly be "read" and contextualized to generate insights into the way our societies function. Health care, both public and individual, provides an example of how this data, and the AI tools used to process it, can benefit society. Similarly, there is enormous potential for leaders and organizations in other fields to incorporate social analytics into their work and in so doing expand the inclusion and participation of constituents in their decision-making and operations, building accountability and trust in the process.

The value of our research, and the methodology we developed, lies in its ability to surface public perceptions from the mass of unstructured data in digital open-source media and then to measure and track the movement of those perceptions over time. This can be done at the granularity of individual messages and the panorama of overall trends and narratives. This could provide decision shapers and makers with a tool to survey opinion and assess levels of public trust as they design, implement and evaluate interventions. It would also allow policymakers to understand the reach and socially patterned impacts of policy on a broader, more representative cross-section of society. This would expand voice and inclusion in the process of making and implementing policy.

The increase in digital means of expression has opened the public space to large numbers of people who could not previously publicize their views. This should increase participation in democratic processes, but it has been complicated by the business models of the media platforms that use recommendation algorithms to optimize engagement, resulting in information bubbles, polarization and harassment. There is more expression than ever before, but less dialogue and persuasion, making it hard for a policy maker or manager to capture and engage with public opinion. This is why some government agencies prefer to focus their social listening on a sliver of specialized voices rather than the general public. We propose an alternative, namely that leaders and policy makers use our methodology to conduct very large-scale surveys or scans of opinion, unbounded by bubbles and polarity, organize the unstructured data, filter out the noise and discern the narratives in the digital public space. Such a tool will enable policy and decision makers to gain a clear view into the shifts in sentiments and emotions in any society around any particular topic, especially in situations and circumstances with great unpredictability such as the current moment we are living through. Using such a tool will foster more inclusive, more informed, and more insightful policy making and management.

Epilogue

Since we started work on this project in Q1 2020 there have been several interesting examples of the application of social listening analytics to public policy making and management.

First, the pandemic highlighted the importance of public communication in crisis management. Government agencies understandably took to social media to get their vital public health messages across to the maximum number of people. However, those same agencies soon realized that they were facing an "infodemic" that complicated the management of the pandemic. This meant that they had to listen in to grasp the spread of misinformation before trying to counter it with scientifically valid information That demanded a more sophisticated, two-way, social media strategy.

The World Health Organization (WHO) soon realized that effective responses to both the pandemic and the infodemic depended on early knowledge of where they originate and how they spread. They therefore turned to AI tools and launched a program known as EARS - the Early AI-supported Response with Social Listening Tool. This allowed them to detect trends in real time, and at scale. Any health authority can use the EARS social listening platform to monitor online COVID-19 conversation threads and use those insights to better respond to the evolution of the infodemic and the pandemic.

"Rather than conducting surveys and polls, which can be expensive and offer feedback about past trends and attitudes, policymakers can get access to real-time feedback from local contexts about constituent concerns in the moment." WHO[40]

The CDC recommends that organizations use social listening to monitor online discussions, track trends and appreciate sentiment to understand the concerns and attitudes of relevant communities.[41]

Secondly the pandemic restricted movement and meeting, forcing many public services to move online. Data from Cloudflare showed that visits to federal, state, and local government websites almost doubled from January 12 to April 3, 2020, especially after the declaration of the emergency in March 2020.[42] This presented government agencies with a major challenge, particularly as far as budget and skills were concerned: not only did they have to communicate and provide their services online, they also had to understand the needs of their constituents who were facing unprecedented threats from the pandemic and extreme weather events. Social listening was the answer, and many cities added this function to their 311 services, for example.

More recently, the outbreak of eight days of violence and looting in South Africa in July 2021 caught political leaders by surprise because the intelligence services issued no warnings. KwaZulu-Natal Premier Sihle Zikalala was quoted as saying "As leaders of government we too relied on social media and mainstream media reports for updates and through a pamphlet that called for a planned shutdown."[43] Had the administration used social listening they could have tracked the buildup and organization of the unrest and mobilized services to protect infrastructure, businesses, and lives.

The conclusions of this study go beyond passive listening and transactional engagement to propose a form of digital anthropology in which AI tools are used to appreciate the lived experience of constituents at every stage in the policy cycle, from agenda setting through formulation, implementation, and evaluation. This would remove blind spots and ensure more inclusive and responsive policy and management, particularly in times of crisis.

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