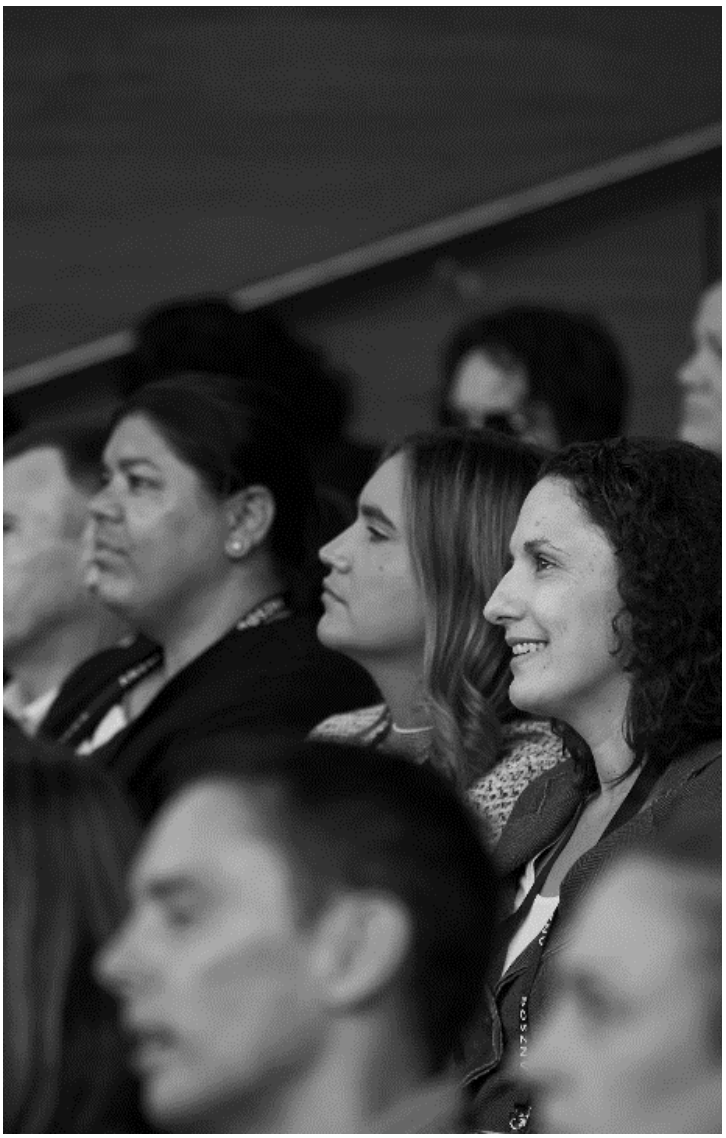
ANZSOG RESEARCH INSIGHTS

Use of public opinion data to inform COVID-19 policymaking

Australia & New Zealand School Of Government

USE OF PUBLIC OPINION DATA TO INFORM COVID-19 POLICYMAKING



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The **MSDI Evidence Review Service (ERS)** supports government, industry, and others to address pressing issues in sustainability, health, and other areas. The central aim of the ERS is to connect knowledge to power. We believe that research and other credible knowledge can add value to problem-solving by illuminating potential solutions as well as areas where investment may be wasted on strategies that have failed elsewhere. All ERS reviews are based on established principles of review science which we have applied across a broad array of disciplines and settings for over 10 years. Our reviews are tailored to our clients' timelines, which vary from as little as one day to several months. The ERS has a strong track record of supporting government, industry, and others to address pressing issues in health, sustainability, and other areas. Our recent clients include: *The Royal Commission into Victoria's Mental Health System, The Royal Australasian College of Physicians, The Paul Ramsay Foundation (a leading Australian philanthropic organisation focused on addressing disadvantage), The Global Buildings Performance Network (a global network of building practitioners committed to green building) and two major Australian banks.*

Declarations of Conflict of Interest
The authors have no conflicts to declare.

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Conflicts of interest
There are no known conflicts of interest. The research team is not affiliated with or involved in any health service delivery organisations relevant to the topic of this review.

Contents

Executive Summary

The use of public opinion data (POD) to inform policy has been researched for over 40 years. Anecdotally, community responses to policies addressing the global COVID-19 pandemic appeared influential in ascertaining their acceptability, feasibility, and effectiveness. However, while previous POD initiatives have been reviewed, less is known about research examining the role of POD in COVID-19 policy decision-making. Therefore, this review aimed to address the question: **How was public opinion data (POD) used to inform policy responses during the COVID-19 pandemic?**

A rapid review approach was employed based upon established methods. A search specialist developed and executed search strategies to identify relevant literature published since 2019 in the Scopus, Analysis and Policy Observatory (APO), and Overton academic databases and Google Scholar. Studies eligible for inclusion were those that focus on descriptions of how public opinion data was used to formulate COVID-19 policy. Public opinion data was defined as representative surveys examining attitudes, beliefs and / or self-reported behaviours associated with policy responses to COVID-19 conducted by serving governments.

From 2032 citations, only three relevant studies were identified – a large survey of over 30,000 people in the Netherlands focusing on relaxation of lockdown measures; a smaller survey by the same research group pertaining to ongoing COVID management scenarios; and a social media analysis of over 150,000 social media data points in Wuhan, China examining responses to a suite of transport / lockdown policies. The studies reported that their approaches were generally effective and acceptable for the purpose of gathering POD to inform policymaking. Importantly, there is also evidence from these studies that subsequent policy decisions were influenced by the POD collected.

Further insights into the role of POD in COVID-19 were gleaned from 18 additional studies in which POD pertaining to COVID-19 policy was connected, but not explicitly used in policy decision-making. Based on this analysis, the use of representative surveys enables a range of policy options and scenarios to be presented to citizens. Additionally, information about attitudes and beliefs can be gathered and analysed according to geographic location, demographic and other categories. The resulting insights from citizens have clear potential to inform policy deliberations. Social media analysis enables analysis of much larger datasets by employing machine learning and sentiment tracking technologies. These can be used to measure how much larger groups of citizens response to major announcements, policy implementation and other events. However although this data can be geolocated, mass social media approaches do not enable presentation of specific scenarios or options; analysis by demographic or other characteristics of interest to policymakers cannot be undertaken; and technical expertise and resource needs can be high.

The potential of POD to influence policymaking has been demonstrated across the three included studies connecting POD to policy actions; the 18 related POD studies that did not make this connection; and earlier literature on POD. Additionally, a strong rationale exists for collection of POD

in crisis situations such as COVID-19. Specifically, it is known that harnessing POD in crisis decision-making can improve the quality of policy decisions; policy responses to crises can have substantial impacts on citizens and therefore it is important that they have a voice in their formulation; and public participation can enhance acceptance of resulting policies as well as trust in government.

Therefore, whilst acknowledging that the nature of crises can limit opportunities to collect POD to inform policy decision-making, it is critical that practitioners and researchers make attempts to do so. Three key considerations that can guide POD efforts, within or outside of crisis contexts are discussed based on the review findings:

- **PURPOSE: What are the questions that need to be answered by collecting POD?**
- **PROCESS: How should POD be collected? And**
- **IMPACT: How can the link between POD and policymaking be described and measured?**

Careful consideration of these questions can help to guide future POD initiatives designed to optimise policy deliberation, formulation, implementation and refinement.

Background

The COVID-19 pandemic required rapid public health and other policy responses around the world. To stay ahead of the pandemic and avoid the most catastrophic scenarios from unfolding, the pace of these responses was rapid even by previous standards of policy making. Even at this pace – or perhaps because of it - involving the community in COVID responses was critical. In addition to communicating critical information to citizens about their role in preventing the spread of COVID-19, many governments around the world engaged citizens to gather their perspectives on the pandemic and how it could be managed through public policy.

The use of public opinion data (POD) to inform policy has been researched for over 40 years. Although scholars acknowledge that POD does exert some influence on policymaking, the nature and extent of this influence has been difficult to ascertain due to the complexity of the policymaking process; diverse theoretical approaches; and vague reporting of outcomes. To address this shortcoming, Burstein et al. (2003) analysed 30 studies quantifying the relationship between aggregate-level (i.e. randomly sampled) POD and public policy. These 30 studies collectively analysed 52 distinct relationships between a specific measure of public opinion and a policy impact. The relationships were grouped into categories representing various combinations of statistical significance (that is, a statistical test between the two variables yielded a positive finding) and substantive significance (the importance and impact of the relationship in the 'real world') as described by the study authors. The majority fell into the following categories:

- Statistically and substantively significant – 35%
- Statistically significant, substantive significance not discussed – 35%; and
- Not significantly different from zero – 25%

Based on this and analysis of the effect of issue salience and the influence of special interest groups, political parties and other collectives, the authors concluded that:

- "Public opinion affects policy three-quarters of the times its impact is gauged; its effect is of substantial policy importance at least a third of the time, and probably a fair amount more;
- Salience does affect the impact of public opinion on policy [specifically, the impact of public opinion is higher when the issue is more salient];
- The impact of opinion on policy remains substantial when the activities of interest organisations, political parties, and elites are taken into account; but the paucity of data on interest organisations and elites mandates great caution when interpreting the results;
- The hypothesis that government responsiveness to the public has changed over time cannot be definitively rejected, because so little evidence is available; but that evidence does not support the hypothesis;
- Our ability to generalise about the impact of opinion on policy is severely compromised by the narrow focus of available work, both geographically and in terms of issues" [p. 36]

The authors recommended more research on the influence of salience (only 11 of the 52 comparisons accounted for salience) and the influence of interest organisations, political parties, and elites. Additionally, the need for more research in jurisdictions outside of the USA and studies pertaining to issues of low salience was emphasised. (Burstein 2003)

These review findings provide a historical context to explorations of the relationship between POD and public policy. However, the specific context of COVID-19 - the most salient public policy issue globally this century - warrants fresh examination of the journey between POD and policy. Whilst it could be argued that the urgency of the COVID-19 response mitigated against use of POD, Mouter et al. (2021) present three established rationales for involvement of the public in crisis policymaking – *substantive, normative* and *instrumental*:

1. "The substantive rationale suggests that involving citizens will improve the quality of government decisions …
2. The normative rationale asserts that involving citizens in policymaking is 'the right thing to do' in a democracy, as citizens should have a say in (governmental) decisions that will deeply affect their lives and society …
3. … public participation exercises can be said to be motivated by an instrumental rationale when they aim to achieve a particular predefined end, such as increasing citizens' acceptance of COVID-19 policies or restoring public trust" (Mouter, Hernandez, and Itten 2021) [p. 3]

Therefore, the aim of this review was to address the question:

How was public opinion data (POD) used to inform policy responses during the COVID-19 pandemic?

Methods

This review was conducted using accepted methods of rapid desktop evidence synthesis. (Haby et al. 2023; Hamel et al. 2021; Speckemeier et al. 2022). A starting set of search terms was developed through and consultation with experts in the field and examination of associated resources including. These were used to formulate the inclusion and exclusion criteria for the desktop review (Table 1) and inform development of a search strategy by a specialist librarian (VD).

Table 1: Inclusion and exclusion criteria for desktop review

	Include	Exclude
Publication Type	• Reviews • Primary studies • Grey literature	• Book chapters • Theses • Conference presentations that are not full peer-reviewed papers • Expert or consensus opinion papers, commentaries
Language	• English	• Non-English
Population	• General public • Policymakers	
Study Focus	• Articles of interest will focus on descriptions of how public opinion data was used to formulate COVID-19 policy • Public opinion data will be defined as representative surveys examining attitudes, beliefs and / or self-reported behaviours associated with COVID-19 policy implemented by serving governments	• Studies evaluating an intervention as the focus of the review is observational • Focus groups are excluded as these are not representative data • Surveys examining political views only (especially from opposition political parties not serving) • Results of POD surveys without connection to policy making • Survey protocols and / or piloting studies without connection to policymaking
Date Range	• Research will be limited to 2019 onwards by default as COVID-19 is a focus	

Searching and screening

The Scopus, Analysis and Policy Observatory (APO), and Overton academic databases were searched. Additionally, a truncated search of Google Scholar was undertaken with the first 100 citations by relevance added to screening. Searches were limited to 2019 onwards as the focus was on POD in the context of the COVID-19 pandemic. Search strategies and yields are contained in Appendix 1. Titles / abstracts and full text articles were independently screened by two researchers drawn from

the research team (PB, PK, DT) using the Covidence platform. Disagreements were resolved through consensus discussion and / or reference to the non-screening reviewer.

Data Extraction and analysis

The following data were extracted from relevant studies:

- Citation details
- Setting: Country
- Aim of study
- Methodology
- Key findings
- Authors conclusions

Findings

Search and selection

Figure 1 presents the results of citation and full text screening.

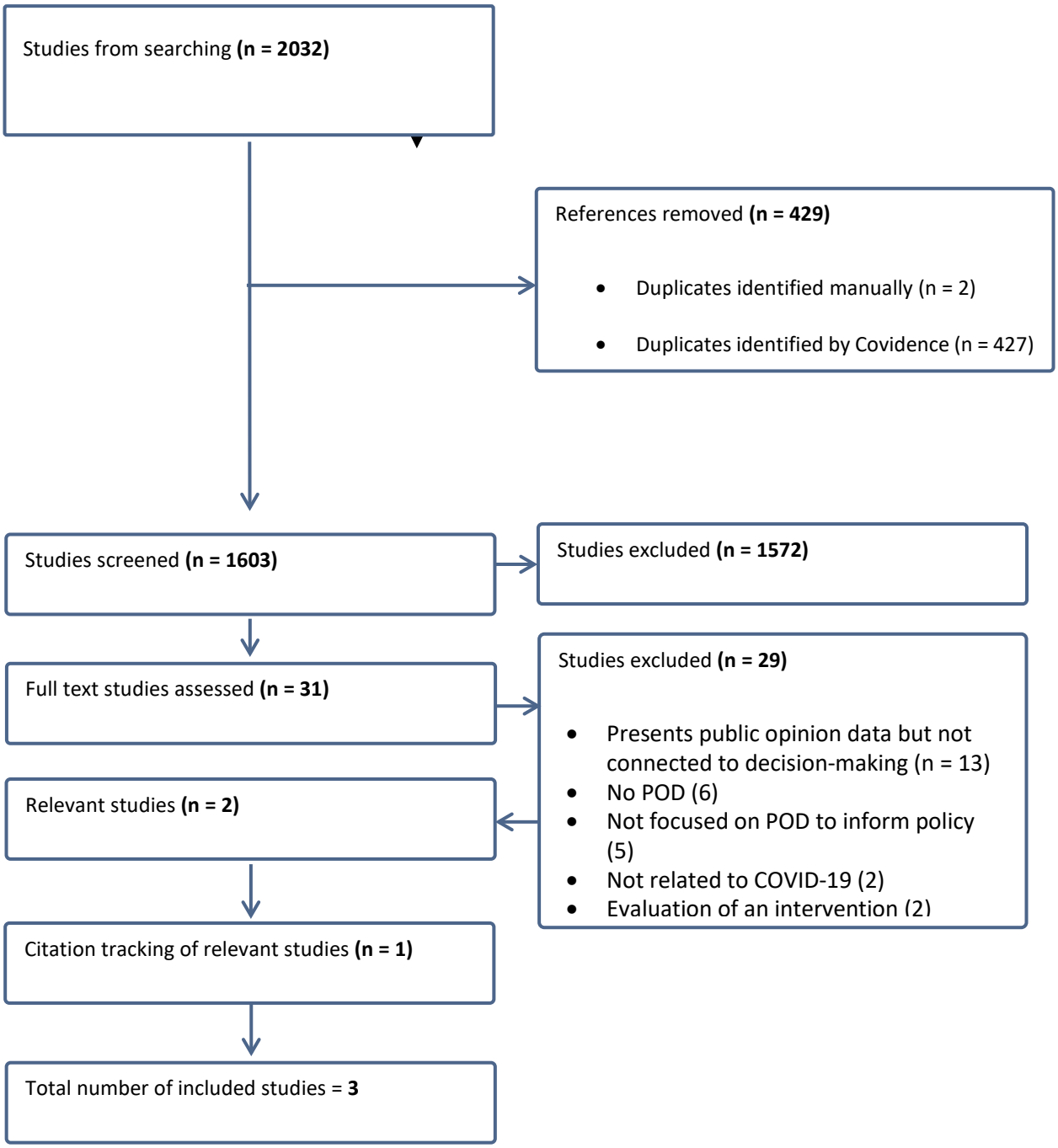


Figure 1 – Study selection

Characteristics of included studies

Mouter, Niek, Karen Trujillo Jara, Jose Ignacio Hernandez, Maarten Kroesen, Martijn de Vries, Tom Geijsen, Floor Kroese, Ellen Uiters, and Marijn de Bruin. "Stepping into the Shoes of the Policy Maker: Results of a Participatory Value Evaluation for the Dutch Long Term COVID-19 Strategy." Social Science & Medicine 314 (December 1, 2022): 115430. https://doi.org/10.1016/j.socscimed.2022.115430 (Mouter et al. 2022)

Setting: the Netherlands

Aim of study: To examine citizens' preferences towards imposing four long-term COVID-19 policy measures.

Sample size: 4,969 across two surveys

Methodology:

Study 1 (n = 2011) Participatory Value Evaluation (PVE), with participants presented with

Four scenarios:

1. Spring/summer scenario with few hospitalisations
2. Autumn/ winter scenario with many hospitalisations
3. A new contagious variant, the impact on hospitalisations is unclear; and
4. A new contagious variant, hospitalisations will substantially increase

Estimates (from expert modelling) of the risk of overload in healthcare provision:

- Green, 0 – 35% probability of overload in healthcare provision;
- Orange, 35 – 70% probability of overload (i.e. busy hospitals, small operations postponed, possibility of large operations postponed); and
- Red, 70 – 100% probability of overload (i.e. very busy hospitals, too many needing COVID-19 care, small and large operations postponed) – participants could not continue if the indicator was red

Study 2 (n = 2,95) involved a separate group of participants evaluating the acceptability of each of the measures identified in Study 1

Key findings:

- Scenario 1: hygiene measures such as not shaking hands and staying at home in case of COVID-19 symptoms should remain
- Scenarios 2 and 3: In both scenarios, citizens prefer the obligation to wear a face mask in public transport, shops and restaurants, starting a booster campaign, strict advice to work from home and encouraging self-testing
- Scenario 4: measures that severely restrict people's freedom, such as closing schools, bars and restaurants, are not supported by a majority of the population
- COVID-19 measures were ranked similarly in Study 1 and Study 2

Authors conclusions:

- "The results suggest that policies that focus on prevention … and early response to moderate threats … can count on substantial support …
- There is low support for lockdown measures even under high-risk conditions, which further emphasises the importance of prevention in a low-risk scenario and a timely response to new threats …
- When the government decides to implement (a range of) COVID-19 measures in a particular scenario … results can assist to identify which subgroups in the population will particularly resist this decision
- … our results show that low-educated people, people out of work due to the pandemic and people who have run into financial problems due to the crisis are overrepresented in the extreme clusters that either reject COVID-19 measures or favour very strict COVID-19 policies … This can urge the government to particularly target communication strategies and mitigation measures towards these groups, which is of even more importance in the case of imposing stricter measures"

Mouter, Niek, Jose Ignacio Hernandez, and Anatol Valerian Itten. "Public Participation in Crisis Policymaking. How 30,000 Dutch Citizens Advised Their Government on Relaxing COVID-19 Lockdown Measures," 2020. https://doi.org/10.1101/2020.11.09.20228718. (Mouter, Hernandez, and Itten 2020)

Setting: the Netherlands

Aim of study: To gather public views and preferences regarding eight policy options for relaxing lockdown measures in the Netherlands

Sample size: 29, 358 [random sample of 3,358 Dutch adults + 26,000 from general public]

Methodology: Participatory Value Evaluation (PVE), with participants presented with:

Eight policy options for relaxing restrictions (randomly presented):

1. Nursing and care homes allow visitors
2. Re-open businesses (other than contact professions and hospitality industry)
3. Re-open contact professions
4. Young people may come together in small groups
5. All restrictions lifted for people with immunity
6. All restrictions lifted in Northern provinces
7. Direct family members from other households can have social contact
8. Re-open hospitality and entertainment industry

Information about the following impacts for each option:

- Increase of deaths among people younger than 70 years and older than 70 years;
- Increase in the number of people with permanent physical injury;
- Decrease in the number of people with permanent mental injury; and
- Decrease in the number of households with long-term loss of income

A constraint - maximum capacity of the healthcare system

Bundle of relaxation options could not cause > 50% increase in pressure on the healthcare system. [0% - 25% increase in pressure could be handled; 26 – 40% would overstretch; and 41 – 50% would seriously overstretch the system]

Key findings:

- Most participants advised the government to relax lockdown measures, but not to the point at which the healthcare system becomes heavily overloaded; the optimal portfolio of relaxation policies comprised re-opening of contact professions, re-opening of businesses (except hospitality) and allow social contact between direct family members
- There was little support for relaxing restrictions for one specific group of citizens as they found it important that decisions lead to "unity" and not to "division". This contradicted previous scientific advice advocating this option prior to the PVE years.
- 71% of the respondents who recommended "Nursing and care homes allow visitors" reported that would not be directly impacted by this option, suggesting that PVE may increase empathy between individuals and foster an exchange of perspectives regarding ethical trade-offs
- Citizens considered a reduction of 100 deaths of persons < 70 years to equally attractive as a reduction of 168 deaths of citizens > 70 years.
- 5% of the participants thought that advice given by citizens in the PVE should have a heavier weighting in the government's decision-making; 69% of participants opined that the expert advice should weigh heavier
- PVE was found to be an acceptable and beneficial method. Participants felt that they could express a nuanced opinion, communicate arguments, and appreciated the opportunity to evaluate relaxation options in comparison to each other while being informed about the consequences of each option. This increased their awareness of the dilemmas the government faces.

Authors conclusions:

"PVE is probably a cheaper and more efficient alternative to live experimentation—that is, imposing policies on citizens and seeing what sticks" [p. 36]

Zha, Wenbin, Qian Ye, Jian Li, and Kaan Ozbay. "A Social Media Data-Driven Analysis for Transport Policy Response to the COVID-19 Pandemic (Zha et al. 2023)Outbreak in Wuhan, China." ***Transportation Research Part A: Policy and Practice*** **172 (June 2023): 103669. https://doi.org/10.1016/j.tra.2023.103669.** (Zha et al. 2023)

Setting: Wuhan, China

Aim of study: "to develop a social media-based approach to support urban transportation policymaking in the context of a pandemic, especially from the policy response perspective" [p. 2]

Sample size: 154,474 data rows pertaining to a suite of COVID transport policy measures were collected from the Chinese social media platform Weibo ("Chinese Twitter")

Methodology: Specific policies analysed (listed by order of implementation between late January and early April 2020) were:

1. Citywide lockdown, suspension of public transport (except for taxis)
2. Online ride-hailing suspended; cruising taxi services restricted
3. Cross-river tunnels closed
4. 6000 taxis recruited and allocated across communities for imperative travel
5. Private car trips for personal activities banned
6. Quarantine measures implemented
7. People stranded in Wuhan could leave and re-enter after a temperature check
8. Policy 7 rescinded with strict management of mobility continuing
9. Travel in and out of Wuhan enabled; registration for public transport to enable return to work
10. Lockdown lifted with gradual resumption of train and bus services
11. Movement in and out of the community strictly controlled on a continuous basis

Briefly, the analysis approach was:

- textual tweets, retweets, and comments related to the transport anti-epidemic policy were extracted using a 'web scraping tool' (Selenium)
- data was cleaned to remove whitespace, repetitive content, HTML tags, and nonsensical special characters
- a pre-trained language model (SKEP) was used for sentiment analysis to evaluate the level of public acceptance or satisfaction towards the policy
- further modelling and analysis techniques were used to derive topics and associated sentiment

Key findings:

- In general, the average percentage of people's negative attitudes toward Wuhan's COVID-19 policies was 50.1 %, with neutral attitudes approximately 33.6 % and positive attitudes 16.3 %.
- Policies 4 (75%) and 6 (66%) had the highest negative sentiment
- Policy 1 had the highest number of posts, but comparatively low negative sentiment (35%)
- Negative sentiment toward Policies 7 (rescinded and replaced by 8 after 3 hours) and 8 remained relatively high at 57.7 %, possibly due to questioning of inconsistent government decision making
- Public concerns about COVID-19 transport policies focused on commuting of anti-epidemic related staff, necessary travel for vulnerable groups, information and communication mechanisms, disinfection of available travel tools, logistics and courier services, the safety of resuming production, unstable policy decisions
- Analysis also explored relationship between policies – for example, "The Wuhan COVID-19 Working Group released Policy 2 to reduce the supply of taxis in the early days of the outbreak, followed by Policy 4, which announced the recruitment of an additional 6,000 taxis, namely 3–5 per community to offer travel services for essential travel demands. Thus, Policy 4 can be considered as a complement and improvement to Policy 2" [p. 13]

Authors conclusions: " the proposed policy-making support approach is effective to evaluate the acceptance of anti-pandemic policies from the public's perspective, to assess the balance between policies and people's demands, and to conduct the response analysis of a series of policy adjustments based on people's feedback. The case study suggests that the Wuhan COVID-19 transport anti-epidemic policies did not adequately consider the roles and interests of various segments of the public early before the effective vaccine and medical aid was distributed" [p. 14]

Commentary on Review Findings

Only two relevant studies were identified from a search yield of over 2000 citations gathered from specialist searching of policy-related databases including those that contained 'grey literature' (i.e. reports and other studies not peer-reviewed and published in academic journals). Analysis of both the articles that cited the two included studies (using Google Scholar) and the reference lists of the included studies identified one further article.

As the search encompassed grey literature and included all eligible years, it is unlikely that relevant studies were missed. This is underlined by observations from the included studies themselves:

> *"government driven public participation in COVID-19 policymaking has been notably absent … This is all the more remarkable after acknowledging that public participation is repeatedly recommended in health disaster response literature"* (Mouter, Hernandez, and Itten 2020) [p. 3]

However, another corpus of 18 studies was identified that collected POD regarding COVID policy but did not explicitly use this data to inform COVID policymaking. (Angelou et al. 2023; Behal, Davis, and Doering 2023; Fatihin et al. 2022; Fitriansyah et al. 2021; Hu et al. 2021; Ifdil et al. 2023; Kemper et al. 2023; Kobayashi et al. 2022; Loría-Rebolledo et al. 2022; McCormick et al. 2023; Morita et al. 2023; Ntale and Ngoma 2021; Shakeel et al. 2023; Sukhwal and Kankanhalli 2022; Suratnoaji, Nurhadi, and Arianto 2020; Veldwijk et al. 2023; Yanuar Fahmi Pamungkas et al. 2021; Yigitcanlar et al. 2020)

We therefore present commentary in two parts – first, analysis of the three studies meeting the review inclusion criteria; second, analysis of the 18 studies not explicitly connecting POD to policymaking. The rationale for including analysis of these 18 studies is to provide further practical insights on methods of POD data collection, given that very little research explicitly examined the influence of POD on public policymaking. A summary of these 18 studies is provided in Appendix 2.

Analysis of included studies (n = 3)

The three included articles comprised:

- two linked surveys examining citizens' preferences towards imposing four long-term COVID-19 policy measures in the Netherlands (n = 4,969); (Mouter et al. 2022)
- a large-scale survey from the same research team gathering public views and preferences regarding eight policy options for relaxing lockdown measures in the Netherlands (n = 29,358); (Mouter, Hernandez, and Itten 2020) (Mouter 2020); and
- examination of over 150,000 data rows from the Chinese social media platform Weibo with a focus on transport / lockdown policies. (Zha et al. 2023)

All studies reported that their approaches were generally effective and acceptable for the purpose of gathering POD to inform policymaking. However there were also considerable differences in study settings (the Netherlands, Wuhan China) and data collection methods. The two studies in the

Netherlands employed surveys using Participatory Value Evaluation, a method designed to 'put citizens in policymakers' shoes by presenting policy scenarios alongside associated trade-offs or constraints associated with policy combinations. The Chinese study employed automated analysis of a much larger dataset of unstructured social media content.

When examining the nature of the link between the POD collected and subsequent policy actions, the exact nature of this link varied across the three studies. The smaller survey of Mouter (2022) was the most explicit:

> *"We secured consequentiality, by (truthfully) informing respondents that the outcomes of this study would be shared with high-ranking policy makers at relevant Ministries. A Dutch language report of our study was cited in the long term COVID-19 strategy of the Dutch government"* (Mouter et al. 2022) [p. 4]

In the other two studies, the description was either vague or limited. Mouter et al. (2020) stated that *"We do not know whether and how our results affected political decisions on the relaxation of lockdown measures, but it is noteworthy that the Dutch government decided on 6 May to start with the relaxation of lockdown measures for contact professions which was in line with our result that reopening contact professions would have broad support in society"* (Mouter, Hernandez, and Itten 2020) [p. 28].

In Zha et al.'s study the 'Jaccard distance' - a measure of how dissimilar word sets are, was used to analyse policy adjustments. Essentially, this involved analysing the similarity between the topics and word sets for two related policies to generate a Jaccard coefficient. However only one example of application of this technique was presented – responsiveness to concerns about policy 2 (reduction of taxi supply) with policy 4 (recruitment of an additional 6,000 taxis). Their analysis revealed that concerns expressed about commuting travel for medical staff who did not own private cars in policy 2 were not adequately addressed by policy 4. Similarly, concerns pertaining to the service quality of cruising taxis remained following policy 4.

> *"In summary, the analysis indicates that Policy 4 of the adjustments to Policy 2 requires further improvement"* (Zha et al. 2023) [p. 18]

Analysis of studies that collected POD regarding COVID policy but did not explicitly use this data to inform COVID policymaking (n = 18)

Reflecting the three included studies, the studies that did not link POD to policymaking were broadly divided into those using representative surveys (n = 12) and those analysing large unstructured datasets from social media platforms (n = 6). The 18 studies spanned numerous countries and settings including Australia (n = 3), Indonesia (3), the United Kingdom (2) and the United States of America (2).

The POD collected across the included studies encompassed key COVID-19 policy decision-making challenges encountered in numerous jurisdictions across the world including vaccines (Behal 2023,

Hu 2021, Kobayashi 2022, Yanuar Fahmi Pamungkas 2021), COVID-19 certificates, lockdowns (Loria-Rebolledo 2022) and travel behaviours. In addition to providing perspectives on policy options, some studies focused on other topics including public perspectives on the role of public engagement (Kemper 2023) and experts (Angelou 2023) in COVID-19 policymaking; evaluation of education and awareness-raising efforts; (Fatihin 2022) and how businesses and households adapted to the pandemic. (Fitriansyah 2021)

These studies broadly supported the findings of the three included studies regarding feasibility and / or usefulness of both social media analytics (Sukhwal 2022, Suratnoaji 2020, Yigitcanlar 2020) and survey-based methodologies (Behal 2023). The merits of each approach are reflected by the key policy messages and implications reported by the study authors.

Representative surveys provide prompted insights that can be localised and calibrated to specific audiences and objectives. For example, Behal (2023) employed a 'hyperlocal' approach to a telephone survey in Nigeria, concluding that substantial geographic heterogeneity existed regarding the determinants of COVID-19 vaccine hesitancy. This has clear implications for local policy implementation and communication strategies. Another advantage of surveys is their ability to gather nuanced information on citizen perspectives through the use of techniques such as discrete choice experiments (Loria-Rebolledo 2022), conjoint analysis (Morita 2023) and structural equation modelling (Shakeel 2023). Loria-Rebolledo's 2022 study of over 4,000 citizens in the UK revealed that the majority of adults were willing to accept higher excess deaths in exchange for less strict and shorter lockdowns; Morita (2023) generated monetary values pertaining to policy options as consumption tax rates, enabling options to be 'priced' nationally. Shakeel's survey of over 9,000 citizens across nine countries revealed an association between perceived risk of contracting COVID-19 and planned public transport and car travel which varied across countries.

Social media analysis of much larger datasets sacrifices the depth possible through carefully constructed surveys for real time monitoring of broad public sentiment which can be mapped against major policy decisions and / or events. This enabled Hu (2021) to analyse the impact of social or international events or announcements on public opinion towards vaccines. The ability to geo-locate social media content also enables identification of differences in opinion across geographical areas. Similarly, Kobayashi (2022) was able to identify how COVID-19 vaccine-related discussions was affected by social events through analysis of over 100 million tweets from 8 million Japanese citizens – 6% of the population. However, while population-wide sentiment tracking can evaluate impacts and therefore inform potential shifts in policy there are drawbacks – sample characteristics beyond geography are unknown; there is no opportunity to float specific policy options for feedback; and there are a range of technical support needs (for example research support facilities, experts in machine learning and sentiment tracking, internet bandwidth). Furthermore because of the nature of sentiment tracking, some results can be unhelpful. For example, Suratnoaji (2020) analysed almost 400,000 words from Twitter posts to find 14.8% positive sentiment, 17.5% negative, and 67.67% non-categorized words, concluding that *"Indonesian people do not show an attitude of*

supporting or rejecting the lockdown policy. Only 32.3% of Indonesians expressed positive or negative attitudes towards the lockdown policy." This type of finding has no immediate value in refining policy settings.

Finally, the study by Kemper (2023) provides food for thought on the wider idea of the extent to which the public desires to have policymaking influence. The survey of almost 5,000 citizens in the Netherlands found that while 25% expressed a desire for involvement in decision-making, 25% of citizens did not want to engage. Respondents agreed that experts and policymakers should have the main responsibility for decision-making.

Discussion

This rapid review of studies describing how public opinion data (POD) was used to formulate COVID-19 policy identified three eligible studies. The three studies demonstrated feasible, acceptable approaches to gathering relevant POD and described subsequent policy decisions with at least some connection to the POD gathered. Based on the included studies and a related review (Burstein et al. 2003) there is evidence that (i) POD can have substantial impacts on policymaking based on historical exploration of this topic; (ii) there is a strong rationale to collect POD in crisis situations such as COVID-19; (iii) large scale surveys and harvesting of social media posts are viable sources of data collection for the purpose of using POD to inform policymaking.

However, due to the paucity of relevant empirical research, a number of questions arise for policymakers examining the future potential of POD in both crisis and 'business-as-usual' contexts. To facilitate exploration of these questions, further analysis of 18 studies that collected POD regarding COVID policy but did not explicitly use this data to inform COVID policymaking was undertaken.

This discussion harnesses both the three included studies and these 18 related studies to briefly examine implications for policymakers with the knowledge that this review will be informing a series of deliberative and other stakeholder engagement activities.

PURPOSE: What are the questions that need to be answered by collecting POD?
A good starting point to any research exploration is careful consideration of the question to be answered. Numerous policy-making challenges were encountered during the COVID pandemic. Many required very rapid responses to mitigate risk of catastrophic loss of life and/or overload of health systems. Opportunities to engage in opinion polling or other 'business as usual' techniques for assessing the public mood were limited. However where there is time and space to consider gathering POD, careful consideration of the specific purpose of gathering POD is warranted. This could include exploring if the required questions have already been answered, either by other governments facing the same challenge or organisations outside of government such as media and polling companies. This can build efficiencies into data collection efforts by reducing duplication and building bigger, more robust datasets through combined efforts.

PROCESS: How should POD be collected?
Identification of the questions that need to be answered by POD can inform data collection approaches. Questions of citizens' preferences on a known set of policy options – for example varying levels of lockdown or in which settings vaccination certificates should be mandated – tended to be addressed by representative surveys in the studies analysed in this review. Use of surveys enabled trade-offs and constraints associated with the options to be presented, giving rich insights into the acceptability of specific options or combinations of options. On the other hand, where the question pertains more to examining community-wide sentiment to develop more specific options

or refine a policy after implementation, large-scale analysis of social media datasets appeared to have more utility. Mapping policy questions to POD data collection options can foster an understanding of the relative merits and drawbacks of various data collection approaches prior to investing sometimes considerable resources into data collection and analysis.

Interactive websites offer a bridge between surveys and social media, as exemplified by this initiative of the government of Scotland: https://www.ideas.gov.scot/covid-19-a-framework-for-decision-making/?sort_order=most_comments. Furthermore, several other methods exist for gathering POD including opinion polls; mini-publics, in which a small, representative sample of 15 – 100 citizens engage in deliberation on a topic or policy issue (also known as citizen assemblies / juries, deliberative dialogues and consensus conferences); and referendums (in which citizens / populations vote on a specific proposal). These were out of scope of the present review as they did not focus on representative data or would be unfeasible in public health emergencies such as COVID-19. Mouter (2022) reviews these other approaches in detail.

IMPACT: How can the link between POD and policymaking be measured?

With few studies included in the review it is critical to consider and carefully document the approach to measuring the influence of POD on policymaking. This ensures that the approach can be consistently reproduced by the same agency and enables knowledge and insights to be shared with the wider policy and academic community. In this respect, the included articles both demonstrated shortcomings. The brief descriptive reflection of Mouter et al. (2020) reported an association between the timing of the release of their survey findings and subsequent policymaking decisions. Whilst it may be reasonable to surmise that the POD policy gathered was influential this cannot be established as fact. Furthermore, although the authors refer to conversations they had with the government and project funding was from government agencies, it is not clear how these were instigated. Finally, even if the assumption that the POD influenced policy is accepted, the *level and impact* of the POD has not been quantified. The use of a statistical / modelling technique in the other study (Zha et al. 2023) did enable quantification of the relationship between POD and policy responses. However in this study only a limited example was provided and although there is reference to government research funding the origin and instigation of the project is not described.

There are a range of methods that can be used to ascertain the influence of POD on policy including survey-based before-and-after comparisons, economic evaluations, and case study evaluations. (Zha et al. 2023) The review of Burstein et al. (2003) further distinguished between statistical and real-world measures of POD influence. Exploration of the relative merits of these approaches and their underlying theories is beyond the scope of this review. However, based on the findings of this review, policymakers and researchers exploring links between POD and policy outcomes should carefully consider how the influence of POD will be measured. Additionally, detailed description of project origins (for example whether the project was instigated by government, researchers and / or other groups, the nature and extent of project co-design including relevant conflicts of interest, and

the specifics of the issue being addressed) would enhance understanding of context of POD use and facilitate efforts to build upon knowledge in this field.

What is the potential influence of AI on future POD planning?

Research and research methods have been profoundly influenced by the evolution of the internet in the 1990s and the rise of social media and smartphones in the 2000s. AI represents another significant disruption which should be factored into POD research and practice. This review identified a range of methods and approaches to semantic analysis of large datasets and demonstrated their ability to analyse millions of citizen-generated comments. This area is continuing to evolve and more sophisticated techniques are therefore emerging (Belkahla Driss et al. 2019, van der Meer 2022). In determining approaches to POD data collection and analysis, practitioners should determine if and how AI could be deployed to optimise POD initiatives. Due to the array and easily accessible nature of AI tools, expert input into this aspect is critical to understand risks and benefits and ascertain the reliability, validity, and effectiveness of various approaches.

Strengths and limitations of the review warrant mention. The review was conducted using robust approaches to rapid reviews including comprehensive database searching and dual appraisal of citations. Both citations and reference lists of included studies were also screened (by one researcher). Quality appraisal of included articles was not conducted and this may have influenced interpretation of findings. However, quality appraisal has more utility in larger document sets as it enables identification of relatively higher (and lower) quality studies and analysis of how quality influences aggregate study findings. Given the small number of included studies in this review it is therefore unlikely that quality appraisal would yield useful additional insights. Additionally, the review scope was limited to exploration of the link between POD and policymaking. This limitation was offset by examining a separate collection of 18 studies that collected POD pertaining to COVID-19 policy but did not explicitly connect this to policy decision-making. Finally, a major global initiative distilling lessons learned in evidence-based practice from COVID reinforced previous policy literature describing numerous inputs into policymaking beyond POD. These include research on the nature of the issue; modelling on the effect of policy options and political considerations. All of these inputs need to be balanced to formulate well-informed policy decisions. (Global Commission on Evidence to Address Societal Challenges 2022) However, the scope of this review did not enable examination of inputs into policymaking other than POD.

Below is a further set of proposed questions specifically designed to foster deliberation in planning future POD initiatives within and beyond the present project:

1. Reflecting on the experience of COVID-19 in Australia, what were the key benefits, risks, and unexpected outcomes of gathering POD?
2. In what ways did POD influence policymaking and how was this influence measured?
3. Based on these reflections, is there an appetite at Federal, State and or Local Gov levels to plan POD data collection (i) in future crisis situations such as COVID; and / or (ii) in other areas of ‘business as usual’ public policy?

4. How could different levels of government work together to standardise data collection whilst also enabling individual jurisdictions to pursue more specific POD initiatives?

Appendix 1: Search Strategies and Yields

Database: Scopus
Date searched: 24 October, 2023
Yield: 1,220

((((TITLE-ABS ("influence*" OR "trust*" OR "capacit*" OR "collaborat*" OR "empower*" OR "impact*" OR "involv*" OR "engag*" OR "inform*" OR "consult*" OR "participat*"))
AND
(TITLE-ABS ("public opinion data" OR "communit*" OR "public opinion poll*" OR "popular opinion" OR "public sentiment*" OR "public attitude*" OR “self reported behaviour*” OR self reported behavior*” OR “self-reported behaviour*” OR “self-reported behavior*”)))
AND
(TITLE-ABS ("policymak*" OR "policy mak" OR "public polic*" OR "policy develop*" OR "policy decision*" OR "government polic*")))
AND (TITLE-ABS ("sars-cov-2" OR "coronavirus*" OR "corona virus*" OR "covid-19" OR "covid 19" OR "covid19")))
AND (LIMIT-TO (LANGUAGE , "english"))

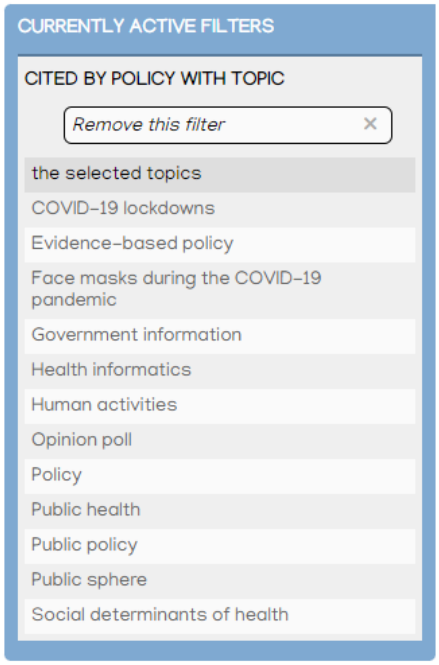
Database: APO
Date searched: 23 October, 2023
Yield: 76

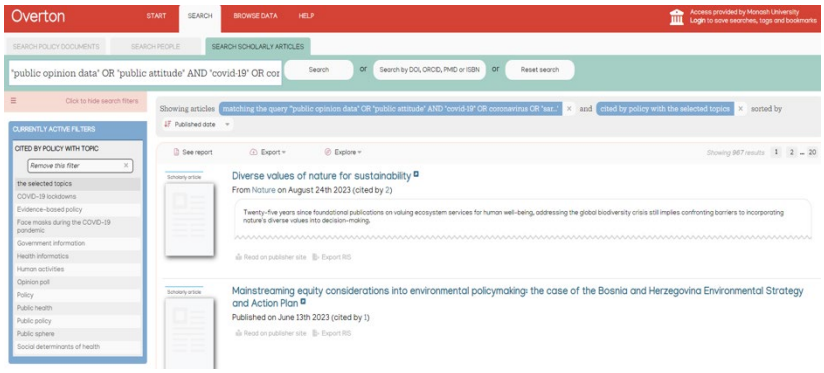
Search: public opinion>filter to Subject: COVID-19 = 22 results
https://apo.org.au/search-apo/public%20opinion?apo-facets%5B0%5D=subject%3A99218
Search: public sentiment>filter to Subject: COVID-19 = 3 results
https://apo.org.au/search-apo/public%20sentiment?apo-facets%5B0%5D=subject%3A99218
Search: covid>filter to Subject: Public opinion = 26 results
https://apo.org.au/search-apo/covid?apo-facets%5B0%5D=subject%3A20251
Search: covid>filter to Subject: Public trust = 25 results
https://apo.org.au/search-apo/covid?apo-facets%5B0%5D=subject%3A61346

Database: Overton
Date searched: 23 October, 2023
Yield: 1118 / 967 with filters

"public opinion data" OR "public attitude" AND "covid-19" OR coronavirus OR "sars-cov-2" AND "policy making" OR "policymaking"

Limited to 12 filters (below) reduces to 967 results





Database: Google Scholar
Date searched: 24 October, 2023
Yield: First 100 results by relevance screened (6,790 results)

"public opinion data"|"public opinion poll"|"popular opinion"|"public sentiment"|"public attitude"|"self-reported behavior" influence|trust|capacity|collaboration "policy making"|"policymaking"|"public policy" "sars-cov-2"|"coronavirus"|covid-19"

Appendix 2: Summary of studies that collected COVID-19 POD but did not explicitly connect this with policymaking

Citation	POD focus	Sample size	Setting	Data collection / analysis method	Headline finding (as reported)	Policy take-out (as reported)
Angelou 2023	Public opinion trends regarding expert involvement in the management of the first wave of the COVID-19 pandemic	4,848	Germany, Greece, Sweden, UK	Public Opinion Survey	"experts remained the citizens' preferred source of crisis management policies even when the government's application of experts' advice delivered results that seemed suboptimal in comparison to other countries"	"consulting experts may have the potential to foster greater compliance with policy measures governments may be able to reap substantial trust benefits by emphasizing the role and contribution of experts in the crisis management effort"
Behal 2023	'hyperlocal' data on vaccine hesitancy using the WHO endorsed 3Cs framework of vaccine hesitancy (confidence, complacency, convenience)	4,922	Nigeria	Public Opinion Survey (Computer Assisted Telephonic Interview)	"there is significant geographic heterogeneity across the determinants of COVID-19 vaccine hesitancy that is not captured by nationally representative survey data"	"Recurring large, nationally representative, geotagged household surveys … can be used to reliably produce hyperlocal estimates of attitudinal data"
Fatihin 2022	user reviews about a public COVID-19 information and feedback app (PIKOBAR) to facilitate sentiment analysis	371 comments from app users	West Java	'Web scratching' (scraper module on Google Chrome)	positive sentiments (approx. 200) were more frequent than negative (approx. 100) and neutral (approx. 60)	"It is hoped that the classification and analysis of this review can make PIKOBAR according to user needs so that it can be of maximum benefit for handling the Covid-19 pandemic"

Citation	POD focus	Sample size	Setting	Data collection / analysis method	Headline finding (as reported)	Policy take-out (as reported)
Fitriansyah 2021	COVID-19 mitigation strategies carried out by fishing households in Sungai Kayu Ara Village	48 households	Indonesia (Sungai Kayu Village)	Survey ("observation, in-depth interviews, documentation, literature studies, and online searching of data and information")	mitigation strategies were selling fish online; receiving social assistance, owning a plantation business (alternative business); receiving protection funds and empowerment of fishermen; and compliance with health protocols	"The results of the study can be taken into consideration as input in policy making during the Covid-19 pandemic for fishing households"
Hu 2021	public opinion and perception on COVID-19 vaccines in the United States	308,755 geotagged tweets	USA	Twitter (sentiment analysis, emotion analysis, topic modeling, word cloud mapping)	"the public trusts and anticipates the vaccine. Critical social or international events or announcements by political leaders and authorities may have potential impacts on public opinion towards vaccines"	"The popularity of social media platforms coupled with the advent of digital detection strategies benefit public health authorities by enabling the monitoring of public sentiment towards vaccine-relevant information in a geo-aware, (near) real-time manner"
Ifdil 2023	mental health condition of the community during the second wave of the Covid-19 pandemic	311	Indonesia (Bali)	Cross-sectional survey	"Cultural and religious values are the key to people's resilience … resilience is an important factor in maintaining psychological happiness"	The results of this study are very important information in policy-making for the government and other institutions that play a role in handling public health in developing intervention programs to support mental health management"

Citation	POD focus	Sample size	Setting	Data collection / analysis method	Headline finding (as reported)	Policy take-out (as reported)
Kemper 2023	Public perspectives on whether and how public engagement can contribute to future COVID decision making	4,981	The Netherlands	Online survey	"25% expressed a desire to engage in decision-making … respondents agreed that the main responsibility in decision-making should stay with experts and policy-makers … 50% of respondents did not want to engage"	"informing the public, being more transparent regarding the decision-making process, and maybe having more active modes of engagement, could have benefited COVID-19 management. In addition, our study provides guidance regarding when and how it may be preferable for the public to engage during epidemics. Understanding these preferences may help decision-makers to develop better engagement practices for specific groups in the population, which may ultimately enhance their ability to improve the control of COVID-19 and possible future crises"
Kobayashi 2022	Main themes in COVID-19 vaccine-related discussions	> 100 million tweets from 8 million users (6% of population)	Japan	Automated topic modeling of tweet text during the vaccination campaign	"4 themes: (1) personal issue, (2) breaking news, (3) politics, and (4) conspiracy and humor … Public opinion about politics was significantly affected by various social events, positively shifting attention in the early stages of the vaccination campaign and negatively shifting attention later"	The methodology developed here allowed us to monitor the evolution of public opinion and evaluate the impact of social events on public opinion, using large-scale Twitter data

Citation	POD focus	Sample size	Setting	Data collection / analysis method	Headline finding (as reported)	Policy take-out (as reported)
Loria-Rebolledo 2022	Adult's preferences for, and trade-offs between, type of lockdown restrictions, length of lockdown, postponement of routine healthcare, excess deaths, impact on the ability to buy things and unemployment	4,120 (1112 in England, 848 in Northern Ireland, 1143 in Scotland and 1098 in Wales)	UK	Survey (discrete choice experiment)	"The majority of adults are willing to accept higher excess deaths if this means lockdowns that are less strict, shorter and do not postpone routine healthcare. In all four countries, one out of five respondents were willing to reduce excess deaths at all costs"	"The elicitation of public values and trade-offs for different lockdown features can help guide government policies during a pandemic … Our model can also be used to estimate the reduction in excess deaths required to justify increasing lockdown restrictions … trade-offs could also be estimated in terms of acceptable changes in spending power and job losses, as well as combinations of these features. Such analysis will help identify which levers best support lockdown strategies while maintaining public confidence and maximising compliance"
McCormick 2023	development and validation an instrument to measure the impact of the COVID-19 pandemic in Australia, the COVID-19 Impact Scale (CIS)	563	Australia	"the first version of the CIS was incorporated into the National Dental Telephone Interview Survey (NDTIS) 2021 Follow-up Questionnaire, a health survey conducted at a national level in Australia"	The ongoing COVID-19 pandemic impacted the health and well-being of the general Australian population. The current study developed and validated a comprehensive instrument to measure several domains regarding the impact of the COVID-19 pandemic on Australian adults, such as fear of COVID-19, attitudes towards vaccination and how psychological ill-being was affected by lockdowns.	"The CIS instrument validated by this study may be employed, either in its entirety or by utilizing individual subscales, to (1) measure changes in attitudes toward COVID-19 vaccination (or indeed new vaccines developed in response to a new pandemic), levels of fear of COVID-19, and levels of wellbeing due to (past) lockdowns within target populations, (2) compare levels of these impacts between groups (e.g. sex, age, employment status), who's members may have been affected differently due to socioeconomic, demographic, or geographic factors, and/or (3) assess changes in overall COVID-19 impacts"

Citation	POD focus	Sample size	Setting	Data collection / analysis method	Headline finding (as reported)	Policy take-out (as reported)
Morita 2023	Preferences of the Japanese population for government policies expected to address infectious disease outbreaks and epidemics	2,185	Japan	Survey (conjoint analysis) Respondents presented with 20 combinations of 2 cards from a total pool of 32 representing attributes (e.g. tests, vaccines, therapeutic drugs) and availability (e.g. not available, available under some conditions, widely available). Preferences were converted to monetary values as consumption tax rates.	"Among the policy options, the preference for accessibility of therapeutic drugs to anyone at any medical facility was the highest, with a monetary value of 4.80% as a consumption tax rate, which is equivalent to JPY 10.5 trillion. The value was higher for accessibility of tests, vaccines, and drugs than that for implementation of behaviour and entry restrictions. In particular, the subgroups highly affected by COVID-19 showed higher monetary values for these options"	"We believe that the results of this study provide information for considering what kind of measures can be agreed upon by the public for future infectious disease outbreaks and epidemics, as well as for evaluating responses to the COVID-19 pandemic in Japan"

Citation	POD focus	Sample size	Setting	Data collection / analysis method	Headline finding (as reported)	Policy take-out (as reported)
Ntale 2021	Readiness of Ugandans to accept electronic voting under the restrictive conditions of the COVID-19 pandemic	252	Uganda	Survey (5-point Likert scale)	"attitude towards adoption was found to explain the greatest variation in readiness to adopt e-voting when compared to the rest of the variables (perceived ease of use, perceived usefulness, trust propensity) … given the inadequate investment in electronic voting systems that would guarantee transparency, trust, auditability and accountability to the citizenry, it is quite evident that peoples' attitudes and perceptions towards electronic voting will be negatively evaluated, a consequence that affects political involvement, and therefore curtailing electoral democracy"	"Shaping and strengthening stakeholders' perceptions and attitudes require that substantial amounts of effort intended to positively change stakeholders towards the proposed technology systems be implemented and sustained … greater effort should be put to creating a competitive environment in which all stakeholders participate freely in political and civil activities without constraint from the state. This is the foundation upon which electoral democracy is built"
Shakeel 2023	Impact of perceptions regarding the severity of COVID-19 and mitigation measures to restrict its spread on travel behaviour	9,394	Australia, Brazil, China, Ghana, India, Italy, Norway, South Africa, and the United States of America	Survey across 9 countries examining mobility patterns, perceived risk of infection, perceived effectiveness of travel restrictions followed by structural equation modelling (SEM)	"Overall, individuals tend to travel less by trains and buses if they perceive the risk of contracting the disease is higher in public transport modes … For some countries, even if the disease restriction policies are considered effective for both private and public transport, survey participants travel less frequently across all travel modes. Active travel or travelling alone is not influenced significantly by an individual's perceptions of the disease.	The structural equation modelling in this paper provides valuable insights for transport planning practitioners in aligning behavioural perceptions with pandemic mitigation policies. Future policy development can leverage the findings from this research and extensions to create environments with a more positive perception across the community leading to better outcomes in disease management of transport infrastructure.

Citation	POD focus	Sample size	Setting	Data collection / analysis method	Headline finding (as reported)	Policy take-out (as reported)
Sukhwal 2022	Effects of pandemic containment policies on public sentiment	~240,000 posts from highly followed public Facebook groups gathered over 11 months (Jan – Nov 2020)	Singapore	Econometric / Machine learning techniques to estimate causal relationships between containment policy changes and public sentiment; Natural Language Processing to identify overarching public concerns and their trends	"An increase in the average public sentiment immediately after the lockdown was related to people's desire for containment measures … Another rise in average public sentiment upon the partial lifting of lockdown indicated that people, on average, were positive about the relaxation of some restrictions. Subsequently, the average sentiment decreased with the further easing of restrictions … (which) can be understood by observing the on-going concerns about jobs, masking, dining out, and depression"	"This work is of direct relevance to policymakers because it presents a robust, scalable way to use social media data to study policy impacts and thereby implement evidence-based policies for pandemic management … This approach provides key benefits of using a data-driven approach to identify public concerns and provides near real-time assessment of policy impacts by computing daily public sentiment based on postings on social media"
Suratnoaji 2020	Public opinion on the lockdown policy in overcoming the COVID-19 pandemic	Sentiment analysis of 392,256 words from Twitter posts sampled in Apr – May 2020	Indonesia	NodeXL software was used to download, process, analyse and visualise data	Twitter volume correlated with key events in implementation of lockdown policy. Word analysis showed 14.8% positive sentiment, 17.5% negative, and 67.67% non-categorized words. "Indonesian people do not show an attitude of supporting or rejecting the lockdown policy. Only 32.3% of Indonesians expressed positive or negative attitudes towards the lockdown policy" Influencers identified included the Indonesian President, other policial leaders and media organisations	"Public opinion research based on Twitter data provides research opportunities when survey research is difficult. However there are three challenges: 1) The selection of keywords in downloading data. 2) The process of categorizing public opinion sentiment variables 3) Determining the sample is also a challenge because the amount of data on Twitter is very large … it requires the assistance of adequate research support facilities such as Twitter API support, servers, and Internet bandwidth"

Citation	POD focus	Sample size	Setting	Data collection / analysis method	Headline finding (as reported)	Policy take-out (as reported)
Veldwijk 2023	Public preferences for coronavirus disease 2019 (COVID-19) certificates	1,309	The Netherlands	Survey including a discrete choice measurement based on seven certificate attributes (e.g. start date, what community activities the certificate allowed) followed by latent class models (LCMs) analysis	"This study showed three groups in the population with different opinions on the desirability of a COVID-19 certificate; approximately 1/3 was generally against, 1/3 was generally in favour and for 1/3 desirability depended on the characteristics of the certificate Being allowed to shop without appointment and to visit bars and restaurants was most important to all respondents Demographic characteristics impacted preferences [e.g. elderly citizens were more likely to favour, while respondents who did not (plan to) get vaccinated were more likely to oppose]"	"If the government introduced a COVID-19 certificate, public support could significantly increase when holders of the certificate are allowed to shop without appointment and visit bars and restaurants it might be of particular interest to repeat studies like these in subgroups of the population that deny the importance of COVID-19 as a public health crisis or do not get vaccinated preferences of respondents for a certificate might depend on the policy measures in place and the upcoming vaccination campaign"
Yanuar Fahmi Pamungkas 2021	Relationship between the Banyuwangi Mal Orang Sehat regional policy (health education) and public trust in the COVID 19 vaccine	200 people who had received health education about vaccines	Indonesia	Survey using descriptive and statistical analysis	"The results of this study indicate that there is a relationship between MOS policy innovation and patient's willingness to be vaccinated"	With this health education based (Healthy People Mall), it is proven to be able to influence the public in knowing the effects and impacts of COVID-19 so that people are willing to be vaccinated.

Citation	POD focus	Sample size	Setting	Data collection / analysis method	Headline finding (as reported)	Policy take-out (as reported)
Yigitcanlar 2020	how social media analytics can assist authorities in pandemic-related policy decisions (feasibility study focus)	35,969 geotagged tweets collected between Jan and May 2020	Australia	Sentiment analysis based (WEKA open access software for machine learning and data mining)	(example of findings) "Australian public was not happy at the early stage of the pandemic curve … as they seemed to believe that the Australian government was not responding to this global disaster appropriately Accordingly, people were in a panic mode, and tried to prepare to face the pandemic at their capacity. The words, toilet/paper were very common in Twitter in all states/territories … From February 2020 onwards, the Australian government started to add travel restrictions to combat COVID-19. This made people started to build trust in the government"	"The findings disclose that: (a) Social media analytics is an efficient approach to capture the attitudes and perceptions of the public during a pandemic; (b) Crowdsourced social media data can guide interventions and decisions of the authorities during a pandemic, and; (c) Effective use of government social media channels can help the public to follow the introduced measures/restrictions … The findings are invaluable for authorities to understand community perceptions and identify communities in needs and demands in a pandemic situation, where authorities are not in a position to conduct direct and lengthy public consultations"

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