Comment

Large-scale behavioural data are key to climate policy

Mirjam A. Jenny & Cornelia Betsch

Check for updates

Applying behavioural science can support system-level change for climate protection. Behavioural scientists should provide reliable large-scale data that help in understanding public perceptions and behaviours. Governments should secure infrastructure for data collection and the implementation of evidence.

Addressing the planetary health crisis requires decisive global, local and individual actions built on scientific and societal consensus[1]. Entire industrial and economic systems must change rapidly. A misleading focus on individual-level solutions to the climate crisis has impeded system-level changes for too long[2]. Scientists and policy makers are becoming increasingly aware that aiming at individual behavioural changes by improving individual knowledge through better communication alone is insufficient. To ensure rapid system-level changes, strategies must instead target industries that are principal contributors to CO_2 emissions, including the fossil fuel, automobile, food, construction and (plastic) packaging industries. Politicians must make and follow through on far-reaching policy decisions[3] that enable societies to mitigate and adapt to the effects of climate change. Still, these system-level changes will require individual-level changes, as the change will affect the ways in which we live and consume[2]. In democratic societies, change needs to be supported by the public, which is why scientists and policy makers need to understand public concerns and opinions.

Behavioural science is needed for system-level change

It is apparent that behavioural insights can foster individual behavioural changes; however, it may be less apparent how behavioural science can also support system-level change. System-level change means targeting the systems and environments in which individuals and organizations operate. The systems can affect behaviour by regulating, punishing, nudging or incentivizing through rules, regulations, taxes, subsidies and other political, societal, economic and legal measures. System change can, if poorly designed and poorly understood, lead to rejection of the measures, loss of popularity of governments or worse outcomes. For example, although carbon taxes have been introduced successfully in some regions, the majority of voters in Switzerland and the state of Washington in the USA rejected carbon taxes[4], possibly due to information asymmetries[5]. Fuel taxes even triggered large protests across France in 2018. Thus, local public opinion and societal movements can hinder system-level change. To generate public support, the public must understand mitigation and adaptation strategies. Including the people's perspective in policy design can also help to ensure that people feel included, are equitably treated and are not discriminated against economically. Here, behavioural science approaches are necessary to support the process of policy design, science communication and misinformation management[4] (Box 1). Such evidence can be generated by large-scale data collection systems in local data observatories, as described in the next section.

Data observatories

Data observatories (Fig. 1) were partially triggered by the COVID-19 pandemic. Structures have been built to collect actionable behavioural data from various sources to inform COVID-19-related policy making and communication. These structures continuously collect large-scale data from the public through dialogue formats, social (media) listening methods and surveys[6]. Ideally, data observatories are set up within national research institutes or agencies at the intersection between science and policy making. They are equipped with a mixed toolbox of methods to collect a wide range of behavioural data. Policy makers and the public shape the research conducted in data observatories. Policy makers highlight knowledge gaps, report challenges and ask questions concerning policy making and communication to the observatories' scientists. Members of the general public, of specific target groups and of relevant professional groups participate in the various types of studies, panels and formats for dialogue. The observatories study and monitor aspects and determinants of individual and collective action to advance scientific understanding and improve policy making. The behavioural insights gained from this research informs policy making, the implementation of policies and accompanying communication campaigns. In this way, data observatories connect policy makers and the public via behavioural insights.

One task of data observatories is to conduct large longitudinal panel[7] or serial cross-sectional studies[6] on a regular basis to assess the acceptance of measures, the influencing factors and their potential changes over time. For example, during the COVID-19 pandemic, the World Health Organization (WHO)[6,8] recommended regular monitoring of risk perceptions, knowledge, attitudes, self-reported behaviours, levels of trust, psychological strain and misconceptions to identify relevant areas of intervention (for example, when knowledge about transmission modes is low, or when unvaccinated individuals did not trust the vaccines' safety) and relevant target groups (for example, identifying unvaccinated individuals, or those who are less compliant with health regulations)[9]. When policy decisions are to be made (for example, regarding a mask mandate or rapid testing regulations), experimental studies or conjoint analyses can be integrated into the surveys[10,11] to examine the social and behavioural consequences of such policies.

To help to facilitate climate action, it is crucial to collect this type of situation-specific, large-scale data. Data observatories should assess different facets of the public's readiness to act — that is, measure public support or rejection of mitigation and adaptation measures, individual willingness to act in a climate-friendly way and

Comment

How evidence from the behavioural sciences can inform climate policy making and communication

Fuel and carbon taxes are generally viewed as powerful policies for reducing carbon emissions. In recent years, a lack of public support in some regions has been one reason why carbon taxes have not been widely introduced[4]. To increase support for such taxes, a mechanism could be installed that distributes most or all the money raised through the tax back to the people in a way that reduces economic inequality: that is, people who emit less carbon, and therefore pay fewer carbon taxes (and who are typically poorer), receive relatively more money than high emitters who pay more carbon taxes (and who are typically wealthier). For people to be aware that they are receiving climate dividends, the money needs to be routed back to them in a way that catches their attention.

In Switzerland, parts of carbon tax revenues are redistributed as dividends, which are currently deducted from people's (mandatory) health insurance premiums. Considering that only 12% of the population was aware that they had been receiving climate dividends, this solution initially failed to capture people's attention. A nationwide public opinion survey used a large-scale experiment in which half of the participants received information on how the climate dividend works and on how much money they saved through the policy, and the other half received no information. The results indicated that informing the public about the climate dividend once it is installed could increase acceptance of a carbon tax[5]. Thus, large-scale data collection indicated that people need to be aware that they are receiving dividends and that they understand the policies. The mechanisms for reaching this goal will probably differ between countries, as other factors — such as political polarization and developments in average costs of living — also seem to have a role[5]. Research conducted at the national level can support local adoption of these strategies.

willingness to participate in political processes (for example, as done in the Planetary Health Action Survey (PACE)). Notably, by asking people about their concrete current and intended behaviour, their support for climate protection measures and their willingness to politically participate, as well as their reactance towards and current compliance with climate protection measures, PACE goes beyond the usually assessed 'intentions' for behavioural change as it targets concrete behaviours and attitudes. Knowing the level of the public's support for various measures can help policy makers to create bundles of measures that comprise highly accepted and less-accepted measures, along with effective explanations of why change is necessary. To be effective in complementary communication, it is vital to know what affects public support. Although many variables are more or less known from decades of research (for example, social norms,

self-efficacy and others), local contexts may vary and render one or the other aspect more important. This is especially important when we consider that over 70% of the research that (psychological) theories build upon is created in a very small number of Western countries. Likewise, it may also be necessary to assess the current distribution of variables of interest in different societal segments (for example, to identify relevant target groups or communities that are most affected by misinformation).

It is crucial that data observatories should first be theory based and theory testing. In this way, generalizable research findings are created and policy advice is built upon evidence as well as theory. Second, the observatories should collect data regularly at short time intervals to monitor changes over time. This enables stakeholders to identify relevant topics and tensions (for example, barriers and enablers of gas saving in the energy crises in Europe). Third, observatories should map the relationship between policy makers and society, for example, how trust in government bodies develops over time or how narratives from campaigns are picked up in public discussions. Fourth, studies conducted in the observatories should be rooted in the current scientific literature of relevant fields, including not only behavioural science such as psychology or economics but also climate science. Fifth, the research questions should be informed by current political and public (media) discussions. These features, in combination, distinguish data observatories from many representative surveys conducted by news outlets or single ministries or governments.

Once such a data collection system is in place, a research team can react quickly to dynamic changes in the situation — for example, when heatwaves are expected, the survey could place special emphasis on heat and assess knowledge gaps and relevant target groups regarding heat protection to improve and tailor health communication efforts. Data collected at various points in time can also be used to detect potential changes in knowledge, self-efficacy or trust (for example, after large education campaigns on television, posters in public spaces or messages on social media). Research designs that use a panel structure offer considerable advantages: within-person changes can be observed, and participants can be selected from certain geographical areas for follow-ups (for example, after floods hit certain areas). On the downside, panels require considerable financial, organizational and administrative resources. However, recent research has shown that using serial cross-sectional designs can also be a good proxy for relative changes over time[7].

Other data sources, such as social media or general media data, are also used to generate insights in the aforementioned areas and can fill gaps that cannot be closed by surveys or experiments alone. These allow researchers and governments to track broader narratives, misinformation, commonly discussed topics and widespread sentiments. Internationally, several platforms focus on social media data: a non-exhaustive overview can be found at https://www.parliament.scot/~/media/committt/3435#page=3. Qualitative research approaches are also valuable for examining the breadth of opinions and social consensus. Ideally, data observatories triangulate data from different sources and make them usable for policy advice and health and climate communication.

In its report on behavioural insights and public policy[12], the Organisation for Economic Co-operation and Development (OECD) concludes that behavioural insights can indeed improve public policy in many domains, including energy use and environmental protection. The report cites various large-scale online experiments that can improve public policy to mitigate climate change. One could argue that applying

Comment

Connecting policy makers and the public via behavioural insights
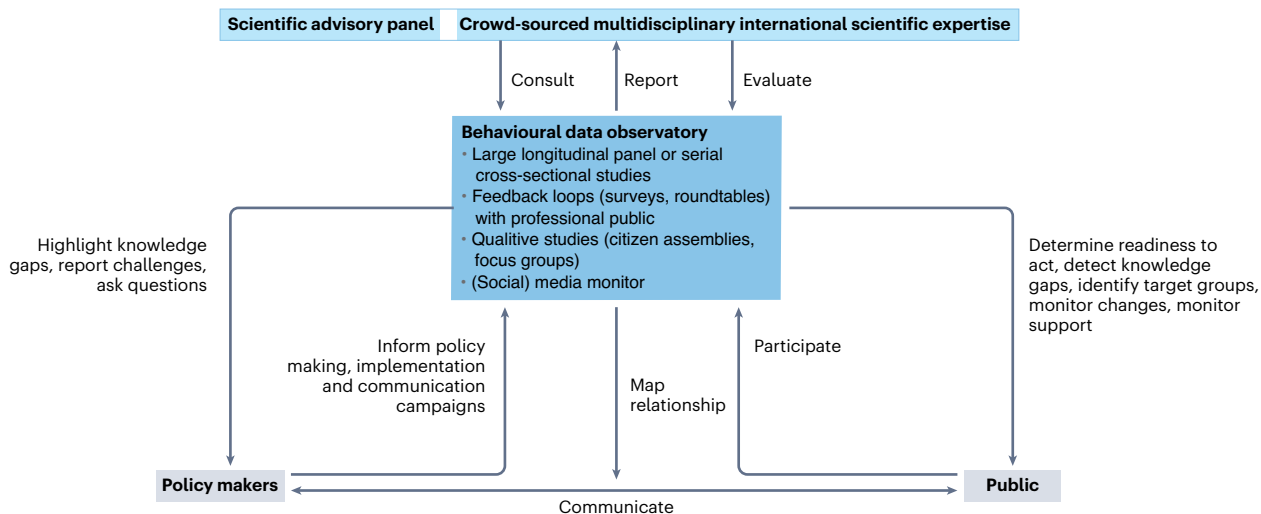
Fig. 1 | Data observatories. Data observatories connect policy makers and the public via behavioural insights, by visualizing how they operate and interface with both groups.

the science conducted in the ivory towers of the past few decades may be sufficient to inform policy making and communication activities. Yet, government-funded data observatories would allow for routine use of such tools, complement them with local and current data, and respond quickly to identified knowledge gaps; thus, scaling the effects of evidence-based and theory-informed behavioural public policy making in a timely and topical manner.

Challenges
Data observatories come with some challenges. Research needs to be informed by the needs of policy makers; however, it must be politically independent, which is important for scientific scrutiny and public trust in the data. Specifically, researchers working in data observatories have to be able to conduct their studies according to internationally agreed-upon scientific practices. They have the responsibility of publishing and sharing all data and insights, and the scientific freedom to ask and answer all scientific questions on topics that are within the observatory's scope. Moreover, setting up and running both cross-sectional and longitudinal representative panels is costly. However, the survey data will be insufficient. It is vital that robust findings from the rich literature complement the evidence. Behavioural science researchers have worked on the topic of individual behavioural changes for decades, and their findings also need to be harnessed for better climate action (for example, focusing on findings that have been replicated and summarized in meta-analyses)[13]. Building the necessary infrastructure must not become another roadblock that impedes fast and far-reaching political decisions. These decisions should be made by considering the 'best currently available evidence', while the quality of the evidence needs to be taken into account and steadily increased. In our view, the potential of data observatories to improve climate policy clearly outweighs potential costs – given that the challenges are resolved. Structures that facilitate exchanges between the stakeholders are crucial, but providing structures goes far beyond paying for data collections.

Structures to facilitate implementation
In some countries, governments or governmental agencies already provide infrastructure for and expertise in creating and synthesizing interdisciplinary evidence (for example, the Public Engagement Observatory of the UK Energy Research Centre (UKERC)). These units help to collect new data, synthesize existing and new data and evaluate data quality to make the evidence ready for policy making. Such structures and networks also exist outside of governments, in which groups aim to identify and condense policy-relevant evidence and work collectively in a transparent, interdisciplinary, diverse and internationally connected way (for example, indie_SAGE, an independent scientific advisory panel that consults policy makers about the COVID-19 pandemic, and the SciBeh initiative, which creates infrastructure for rapid crowd-sourced crisis knowledge management). It is necessary to install such structures to facilitate the implementation of the findings. This will ensure that policy briefs reach the relevant policy makers from trusted sources, scientists are able to capture the relevant questions through exchange with policy makers and communication rapidly takes up the available evidence.

Behavioural science paves the way forward
It is remarkable that in 2022, for the first time, the Intergovernmental Panel on Climate Change (IPCC) explicitly addressed behavioural, social and cultural dynamics in climate change mitigation. The panel concludes that behavioural interventions can increase the efficacy of pricing strategies, mandates, subsidies and taxes[3]. Moreover, the G7–National Academies of Sciences' recommendations on decarbonization urge governments "to strengthen climate literacy and citizen involvement" and "to promote social and behaviour-oriented science in order to support transformative social innovations to increase support for technologies, policies and routines for carbon neutral lifestyles"[14]. The recommendations highlight the need for rapid and far-reaching system-level changes[14] supported by behavioural science. As in other sciences, the time elapsed between the 'bench' and 'bedside' (that

Comment

is, between the laboratory and the field) needs to be shortened and critically evaluated. Behavioural science can and must now deliver on what others are rightfully expecting. Governments need to support this by providing funds to create large-scale data observatories to build bridges between the laboratories and the fields. We urge governments to install large-scale observatories to use behavioural insights for effective system-level change. These structures' costs are small compared with the costs of less-effective or slow system-level changes. In addition to the structures that allow data collection, we urge governments to install structures that foster exchanges between scientists, politicians and the administrations to finally facilitate the actual use of behavioural evidence.

Mirjam A. Jenny [1,2,3,4,5] ✉ **& Cornelia Betsch** [1,2,3]

[1]Health Communication Research Group (Implementation Science), Bernhard Nocht Institute for Tropical Medicine, Hamburg, Germany. [2]Media and Communication Science, University of Erfurt, Erfurt, Germany. [3]Center for Empirical Research in Economics and Behavioural Sciences, University of Erfurt, Erfurt, Germany. [4]Center for Adaptive Rationality, Max Planck Institute for Human Development, Berlin, Germany. [5]Harding Center for Risk Literacy, University of Potsdam, Potsdam, Germany.
✉e-mail: mirjam.jenny@uni-erfurt.de

References

1. UN Sustainable Development Solutions Network. Lessons from COVID-19 for climate change. *unsdsn.org*, https://resources.unsdsn.org/science-for-a-sustainable-future (12 May 2022).
2. Chater, N. & Loewenstein, G. F. *SSRN J.* https://doi.org/10.2139/ssrn.4046264 (2022).
3. Intergovernmental Panel on Climate Change. *Climate Change 2022: Mitigation of Climate Change* (IPCC, 2022).
4. Carattini, S., Kallbekken, S. & Orlov, A. *Nature* **565**, 289–291 (2019).
5. Mildenberger, M., Lachapelle, E., Harrison, K. & Stadelmann-Steffen, I. *Nat. Clim. Chang.* **12**, 141–147 (2022).
6. Betsch, C., Wieler, L. H. & Habersaat, K. *Lancet* **395**, 1255–1256 (2020).
7. Zettler, I., Lilleholt, L., Böhm, R. & Gondan, M. *Psychol. Assess.* **33**, 691–704 (2021).
8. World Health Organization. *Survey Tool and Guidance: Rapid, Simple, Flexible Behavioural Insights on COVID-19* (WHO, 2020).
9. Betsch, C. et al. *Euro Surveill.* **26**, pii=2001900 (2021).
10. Betsch, C. et al. *Proc. Natl Acad. Sci. USA* **118**, e2107179118 (2021).
11. Betsch, C. et al. *Proc. Natl Acad. Sci. USA* **117**, 21851–21853 (2020).
12. OECD. *Behavioural Insights and Public Policy: Lessons from Around the World* (OECD, 2017).
13. IJzerman, H. et al. *Nat. Hum. Behav.* **4**, 1092–1094 (2020).
14. Deutsche Akademie Der Naturforscher Leopoldina. Decarbonisation: the case for urgent international action (2022). *leopoldina.org*, https://www.leopoldina.org/en/publications/detailview/publication/decarbonisation-the-case-for-urgent-international-action-2022/ (2022).