Building Resilient Communities

Exploring how libraries and community-based organizations can work together to mitigate environmental and health-related concerns due to climate change

How A Health Narrative Can Enhance Communication Of Six Key Truths About Climate Change With Diverse Audiences

John E. Kotcher, PhD
Center for Climate Change Communication
George Mason University

Abstract

Climate change and the burning of fossil fuels represent a tremendous risk to public health. Effective communication is key to helping our society respond to this risk and protect our communities. This report addresses three key components of effective climate change communication: 1) It reviews six evidence-based messages about climate change that research shows can improve public engagement in a variety of ways; 2) It discusses the value of audience segmentation for targeting those messages to different parts of the population and selecting appropriate messengers; 3) It describes how framing these messages in terms of their relevance to public health can enhance their effectiveness.

This report was commissioned as part of the Building Resilient Communities Project and its 2024 Climate Action Symposium: Building Resilient Communities – STAR Library Network (starnetlibraries.org).
Published by STAR Library Network, August 16. 2024.

Introduction

Climate change poses one of the greatest threats to human health this century (Romanello et al., 2023). From reduced air and water quality to more frequent and severe heat waves and other extreme events, climate change is already having widespread impacts on our health. Deep reductions in greenhouse gas emissions as well as efforts to improve the resilience of our communities are needed in order to reduce the threat of climate change (Romanello et al., 2023). Yet, many Americans have a thin understanding of the health impacts associated with climate change and the urgency of action to address it (Maibach et al., 2015).

Helping people make more informed decisions about climate change is complicated by the fact that climate science is complex. For example, past research shows that commonly used terms like "mitigation" or "carbon-neutral" are difficult to understand and often misinterpreted by non-experts (Bruine de Bruin et al., 2021). Moreover, the issue has become politically polarized in the United States resulting in strong disagreements over the facts and what to do about them, thus posing another barrier to communication (Dunlap et al., 2016).

Given these challenges, many people and organizations may understandably wonder how they can effectively promote increased public engagement on a complex and polarized issue like climate change. A long history of social science research suggests that the following heuristic can help facilitate effective communication: *Simple clear messages repeated often by a variety of trusted sources* (Maibach et al., 2023). This evidence-based approach can be applied to communication and engagement efforts by a variety of organizations, including public libraries, regardless of whether the goal is to build support for climate policies, promote more sustainable behaviors, or motivate increased discussion about the issue.

The following sections provide a set of simple clear messages that can enhance public engagement with climate change, examine the role of audience segmentation research in determining which messengers to use and which messages to emphasize, and explain how these messages can be applied specifically to the issue of climate change and health communication.

Six Key Truths About Climate Change

With a complex issue like climate change, there are many different potential messages that may be important to communicate, and these will likely differ depending on the specific communication goals one has in mind. Social science research can be a powerful tool to help identify the most promising messages for strategic communication efforts (Maibach et al., 2023). One approach is to begin by identifying the strategic outcomes of interest and work backward to determine what key beliefs are likely to promote those outcomes (Hornik & Woolf, 1999). Understanding which beliefs are most relevant then helps guide the design of strategic messaging. For example, if one's goal is to decrease meat consumption as a way to reduce greenhouse gas emissions, research may reveal that exaggerated social expectations about how

much one's peers consume meat are highly influential in guiding behavior. In that case, a campaign designed around correcting misperceptions about the prevalence of meat consumption and the rising interest in plant-based diets may be a promising message strategy (Sparkman & Walton, 2017).

The goal in this section is not to provide an exhaustive list of messages that will be useful in every strategic communication effort on climate change. Instead, I will introduce a set of six key beliefs about climate change – which my colleagues and I refer to as the *Six Key Truths* because all of them are, in fact, true – that research has found to be particularly important to a wide variety of strategic communication outcomes. These are: *it's real, it's us, experts agree, it's bad, others care,* and *there's hope*. The *Six Key Truths* can be used in a variety of different communication formats, including mass media campaigns, public events focused on fostering dialogue, everyday conversation, and more.

It's Real

For people to support action on climate change, first and foremost they need to understand that climate change is happening. In the United States, about seven out of ten people (72%) believe that climate change is happening, and this figure has grown over the past ten years (Leiserowitz, Maibach, Rosenthal, Kotcher, Goddard, et al., 2023). Research has shown that the belief that climate change is happening is an important predictor of support for climate policy (Goldberg et al., 2020), engagement in climate advocacy (Roser-Renouf et al., 2014), and how often people discuss climate change with their friends and family(Goldberg et al., 2019).

It's Us

Understanding that human activity is the primary cause of climate change is important because it illustrates that if we have a role in causing it, we also can play a role in reducing it. Moreover, understanding which human activities are making the largest contribution to climate change helps convey what we need to do less of (i.e., burning fossil fuels). A majority of Americans (58%) believe climate change is mostly human-caused, and this figure has grown over the past ten years (Leiserowitz, Maibach, Rosenthal, Kotcher, Goddard, et al., 2023). Information about human contributions to climate change has been shown to increase concern about the issue and support for policies to address it (Bergquist et al., 2022).

Experts Agree

One way to increase people's awareness that climate change is happening and human-caused is to inform them of the scientific consensus around those two key facts. Studies on the extent of scientific agreement suggest that about 98% of climate scientists have, based on the evidence, concluded that human-caused climate change is happening (Myers et al., 2021). Although about half of Americans (53%) understand that most scientists agree that

human-caused climate change is happening, only about 1 in 5 (20%) understand almost all scientists (above 90%) have reached this conclusion (Leiserowitz, Maibach, Rosenthal, Kotcher, Goddard, et al., 2023; Leiserowitz, Maibach, Rosenthal, Kotcher, Lee, et al., 2023). This can be consequential, as studies suggest that higher levels of perceived scientific consensus are associated with greater support for policies to address climate change (Ding et al., 2011). Meta-analyses suggest that informing people about the scientific consensus on climate change can increase belief in climate change, worry about it, and support for policies to address it (Rode et al., 2023; van Stekelenburg et al., 2022). Importantly, these studies suggest that consensus messaging can be an effective way to engage audiences that are dismissive of climate change and reduce political polarization around the issue (Rode et al., 2023).

It's Bad

Helping people understand the risks and uncertainties associated with a threat like climate change is a bedrock of effective risk communication (Pidgeon & Fischhoff, 2011). Risk information can make an issue more salient and convey a sense of urgency about the need for action (Witte, 1992). With climate change, risk perceptions and worry about the issue are among the strongest predictors of support for policy action (Goldberg et al., 2020). As I will discuss in more detail later, communicating that climate change is bad not simply for the environment, but specifically for human health and wellbeing can be an effective way to increase engagement with the issue (Kotcher et al., 2018).

Others Care

Research has shown that perceptions of our social environment can have a powerful influence on our behavior (Cialdini & Goldstein, 2004). Unfortunately, people tend to systematically underestimate the extent to which others are concerned about climate change and support action to address it (Ballew et al., 2020; Sparkman et al., 2022). Thankfully, correcting these misperceptions by providing information about the true extent of concern and support for action can help promote more discussion about the issue and support for policies to address it (N. Geiger & Swim, 2016; Mildenberger & Tingley, 2019).

There's Hope

Lastly, people need to know that there are solutions that can address climate change and that the actions people take–both individually and collectively–make a difference. Studies show that hope and a sense of efficacy about our personal and collective ability to address climate change are important predictors of climate policy support, advocacy for increased government action, and intentions to engage in personal mitigation behaviors (Choi & Hart, 2021; Crosman et al., 2019; Doherty & Webler, 2016).

The Value of Audience Segmentation

Audience segmentation research is a powerful tool that can help communicators determine which messages to emphasize with different parts of the population based on their information needs and their psychological, cultural, and political background. It can also be useful in identifying which messengers will be most trusted and capable of delivering those messages.

Developed in 2008, the Global Warming's Six Americas framework is an audience segmentation created by the George Mason University Center for Climate Change Communication and the Yale Program on Climate Change Communication (Maibach et al., 2011). The framework groups Americans into six distinct segments based on their beliefs, attitudes, values, policy preferences, and behaviors with respect to climate change. The segments include the *Alarmed, Concerned, Cautious, Disengaged, Doubtful,* and *Dismissive* (Figure 1).

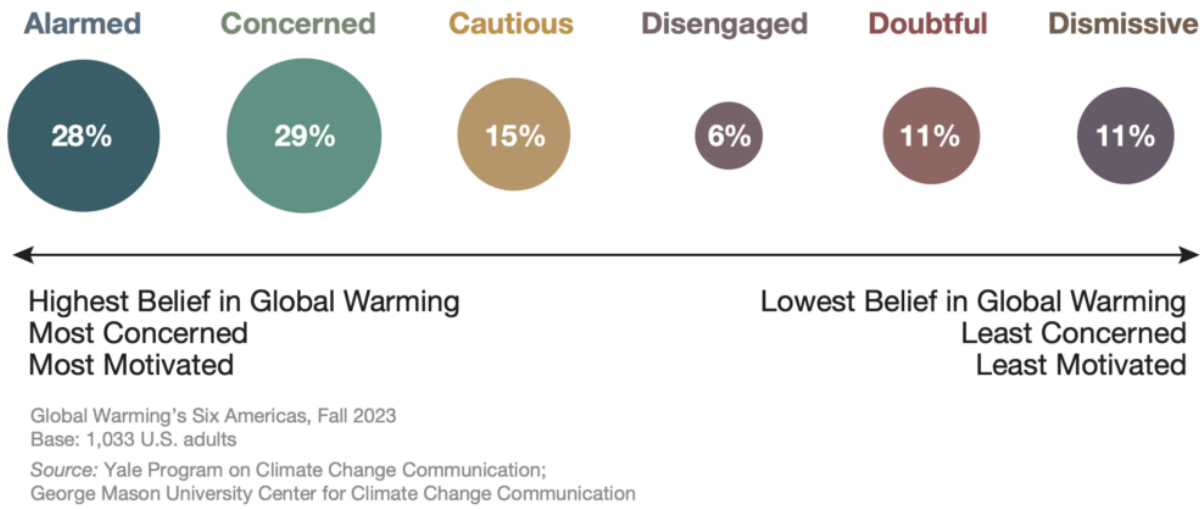

Figure 1. Distribution of global warming's Six Americas, Fall 2023

Two main properties differentiate the Six Americas: 1) their understanding of the *Six Key Truths* and 2) their issue involvement (for a detailed description of the characteristics of each segment, see Leiserowitz et al., 2021; Roser-Renouf et al., 2015). *Issue involvement* refers to how often people think about climate change and how certain they are of their views. Recognition of the *Six Key Truths* is highest among the *Alarmed* and declines linearly across the segments with the lowest levels among the *Dismissive*. The *Alarmed* and *Dismissive* have the highest levels of issue involvement. The key difference is that the *Alarmed* tend to accept messages and facts consistent with the science; in contrast, the Dismissive are likely to reject those messages and facts. The *Concerned, Cautious, Disengaged, and Doubtful* tend to have lower levels of issue involvement and less certainty about the science of climate change.

The Six Americas also differ in terms of their information needs (Figure 2). A recent analysis asked Americans what questions they would most like to ask an expert on climate change if they had a chance to talk with one (Ballew et al., 2024). Participants were provided with a list of

13 different potential questions that can be categorized into the following topics that map onto four of the *Six Key Truths*: evidence (*it's real*), causes (*it's us*), impacts (*it's bad*), and solutions (*there's hope*).

Broadly speaking, audiences that tend to be more concerned about climate change (e.g., the *Alarmed* and *Concerned*) are more interested in information about solutions and what can be done to address it. In contrast, audiences less concerned about climate change (e.g., the *Doubtful* and *Dismissive*) would like more information about the evidence that climate change is happening and its causes.

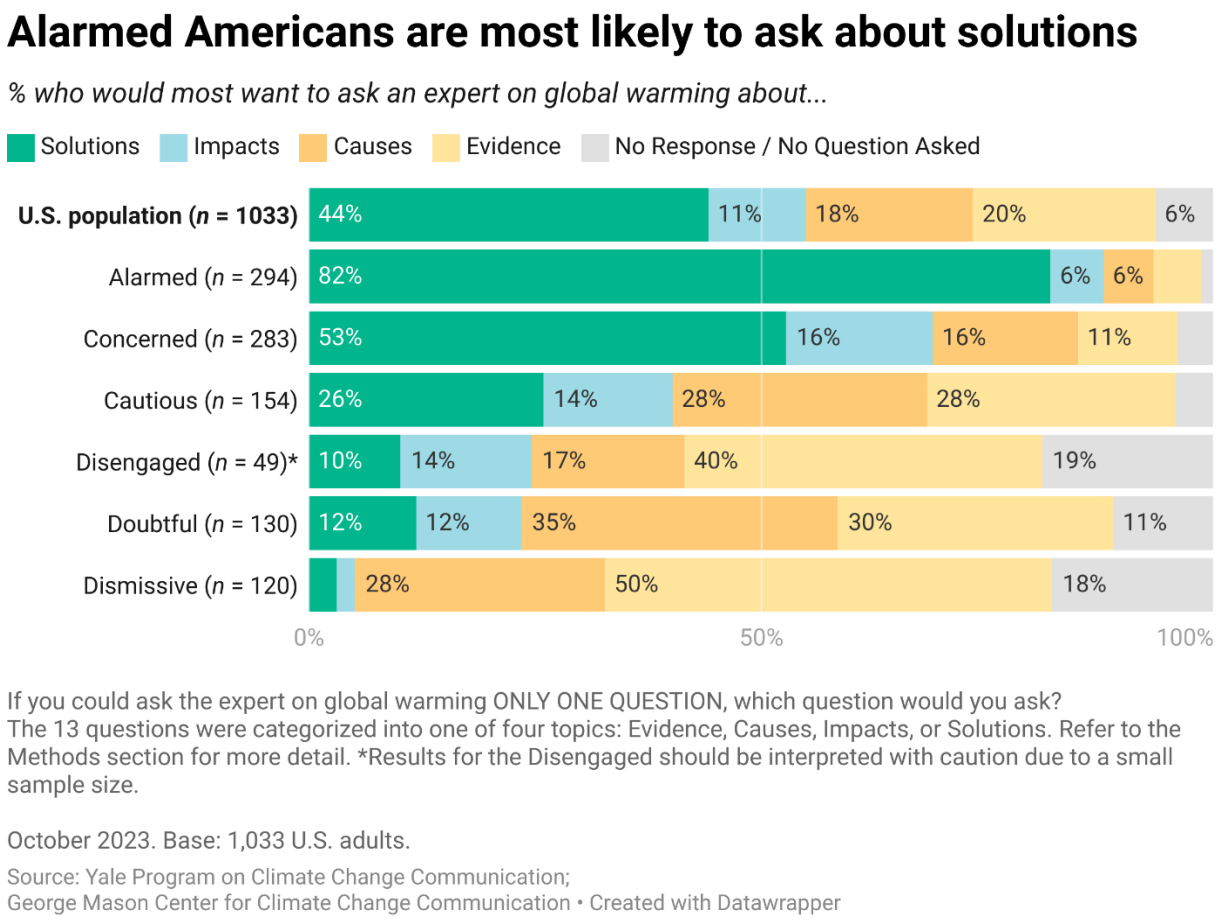

Figure 2. Information needs across the Six Americas

Although none of the audiences were likely to rate questions about impacts as their top question, some groups were more likely to ask about impacts relative to the average American (e.g., the *Concerned*). Providing information about how climate change is harmful is still important given that many Americans view climate change as a threat that is distant in time and place, i.e., that it is mainly a problem for people in future generations or faraway places (Leiserowitz, Maibach, Rosenthal, Kotcher, Goddard, et al., 2023).

Trust in different sources of information also varies across the Six Americas (Figure 3). Overall, the *Alarmed* and *Concerned* tend to be highly trusting of a wide range of different messengers, whereas the *Doubtful* and *Dismissive* tend to be distrustful of many different sources. In contrast, trust tends to be highly variable among the *Cautious* and *Disengaged*, depending on the source.

Rank by trust	All U.S. adults (n=1018)	Alarmed (n=280)	Concerned (n=266)	Cautious (n=180)	Disengaged (n=50)	Doubtful (n=146)	Dismissive (n=96)
1	Family and Friends (73%)	Environmental organizations (96%)	Climate scientists (87%)	Climate scientists (74%)	Your primary care doctor (58%)	Family and Friends (58%)	Family and Friends (68%)
2	NASA (73%)	Climate scientists (96%)	EPA (83%)	Family and Friends (73%)	NASA (58%)	Your primary care doctor (45%)	Your primary care doctor (53%)
3	Climate scientists (71%)	EPA (93%)	NASA (83%)	NASA (69%)	Environmental organizations (54%)	NASA (40%)	The Fox News Channel (51%)
4	Your primary care doctor (67%)	NASA (92%)	Environmental organizations (79%)	Your primary care doctor (65%)	Climate scientists (51%)	Leaders in your religious faith (33%)	NASA (45%)
5	EPA (66%)	Teachers (85%)	Television weather reporters (79%)	Television weather reporters (60%)	Family and Friends (50%)	The Fox News Channel (32%)	Oil, gas, and coal companies (38%)
6	Television weather reporters (64%)	National Public Radio - NPR (85%)	Your primary care doctor (76%)	EPA (59%)	Teachers (49%)	American Medical Association (29%)	Television weather reporters (34%)
7	Environmental organizations (64%)	Television weather reporters (84%)	Family and Friends (75%)	American Medical Association (53%)	American Medical Association (47%)	Teachers (27%)	U.S. military leaders (32%)
8	Teachers (62%)	Family & Friends (82%)	Teachers (74%)	Teachers (53%)	EPA (46%)	Climate scientists (27%)	Leaders in your religious faith (31%)
9	American Medical Association (61%)	President Biden (81%)	American Medical Association (73%)	Environmental organizations (51%)	Television weather reporters (43%)	Oil, gas, and coal companies (25%)	American Medical Association (27%)
10	Your local newspaper (56%)	American Medical Association (81%)	National Public Radio - NPR (68%)	Local TV news (48%)	National Public Radio - NPR (43%)	U.S. military leaders (25%)	Your Congressperson (26%)
11	National Public Radio - NPR (55%)	Your local newspaper (81%)	Your local newspaper (67%)	Your local newspaper (47%)	Your local newspaper (43%)	Television weather reporters (23%)	Teachers (24%)
12	Local TV news (53%)	National network news (77%)	Local TV news (67%)	U.S. military leaders (47%)	U.S. military leaders (43%)	EPA (21%)	Local TV news (24%)
13	National network news (50%)	Your primary care doctor (77%)	National network news (63%)	The Fox News Channel (43%)	Local TV news (42%)	Your local newspaper (20%)	Your local newspaper (19%)
14	President Biden (49%)	CNN (74%)	President Biden (62%)	National Public Radio - NPR (43%)	National network news (41%)	Your congressperson (16%)	EPA (18%)
15	U.S. military leaders (47%)	MSNBC (74%)	U.S. military leaders (54%)	Leaders in your religious faith (42%)	The Fox News Channel (35%)	Environmental organizations (16%)	Environmental organizations (15%)
16	CNN (44%)	Local TV news (73%)	CNN (52%)	National network news (41%)	President Biden (33%)	Local TV news (14%)	National Public Radio - NPR (14%)
17	MSNBC (43%)	Your Congressperson (58%)	MSNBC (51%)	Your Congressperson (34%)	MSNBC (31%)	National Public Radio - NPR (14%)	Climate scientists (13%)
18	Your Congressperson (40%)	U.S. military leaders (54%)	Your Congressperson (41%)	CNN (34%)	Oil, gas, and coal companies (31%)	National network news (9%)	National network news (13%)
19	Leaders in your religious faith (33%)	Leaders in your religious faith (34%)	Leaders in your religious faith (30%)	President Biden (32%)	Your Congressperson (29%)	President Biden (9%)	CNN (6%)
20	The Fox News Channel (31%)	The Fox News Channel (21%)	The Fox News Channel (25%)	MSNBC (31%)	CNN (28%)	CNN (7%)	President Biden (6%)
21	Oil, gas, and coal companies (24%)	Oil, gas, and coal companies (19%)	Oil, gas, and coal companies (20%)	Oil, gas, and coal companies (30%)	Leaders in your religious faith (20%)	MSNBC (6%)	MSNBC (4%)

"How much do you trust or distrust the following as a source of information about global warming?" Percentages represent those who say they "strongly" or "somewhat" trust that source of information about global warming. Average margins of error at the 95% confidence level are as follows: Full sample (+/- 3 percentage points); Alarmed (+/- 6 percentage points); Concerned (+/- 6 percentage points); Cautious (+/- 7 percentage points); Disengaged (+/- 14 percentage points); Doubtful (+/- 8 percentage points); Dismissive (+/- 10 percentage points). Data are from the Climate Change in the American Mind nationally representative survey (n=1018) conducted April 13–May 2, 2022. Source: Yale Program on Climate Change Communication and George Mason University Center for Climate Change Communication.

Figure 3. Trust in different sources of information about global warming across the Six Americas audience segments

Despite these differences in trust, there are several important consistencies across the Six Americas. Notably, fossil fuel companies are the least trusted source nationally, and only a small minority in each audience say they trust them as a source of information about climate change. In contrast, climate scientists are highly trusted among all the audiences, except for the *Doubtful* and *Dismissive*. Several other sources also enjoy relatively high levels of trust across the Six Americas, including family and friends, NASA, and people's primary care doctors. Although trust in public libraries as a source of information about climate change was not assessed in the study depicted in Figure 3, other data suggests they are one of the most trusted sources of information in the United States (Geiger, 2017). They act as a resource to many groups, including people of all races, ages, and socio-economic backgrounds and serve as life-long learning hubs for their communities.

This last finding is especially important because it underscores the potential for these messengers to reduce polarization around the issue of climate change. As I will discuss in the next section, health professionals are particularly well-positioned to play this role because discussing climate change as a health issue has been shown to be an effective way to increase public engagement (Maibach et al., 2010; Myers et al., 2012).

Communicating About Climate Change as a Health Issue

From a strategic communication perspective, it can be beneficial to frame messages in specific ways that increase their relevance for the intended audience. Framing is a concept from the social sciences that refers to messages that can be designed to emphasize certain aspects of an issue over others. Framing provides people with an understanding of why an issue might be a problem, who or what is responsible for it, and what can be done to address it (Nisbet, 2009). Research suggests that framing climate change as a health issue (as opposed to an environmental or national security issue, for example) can enhance public engagement (Myers et al., 2012; Uppalapati et al., 2023). In this section, I will briefly summarize research on public understanding of the health relevance of climate change in the United States, discuss how the *Six Key Truths* can be framed around health considerations, and review how people respond to those messages.

Research suggests that although many Americans recognize that climate change and burning fossil fuels are bad for human health in the abstract, they have a very limited understanding of the specific mechanisms of how these harm health (Kotcher, Adebayo, et al., 2019; Maibach et al., 2015). For example, although 64% of Americans think climate change threatens health, only 27% can accurately name one or more concrete ways it causes harm. (Maibach et al., 2015). A similar pattern is true of public understanding of the health effects of air pollution from burning fossil fuels. While 73% of Americans think air pollution from burning fossil fuels harms health, only 55% can name one or more specific health impacts.

Thankfully, providing people with information about the myriad ways in which climate change harms health (*it's bad*) can increase cognitive and emotional engagement with the issue, support for clean energy, and willingness to engage in advocacy (Kotcher et al., 2018, 2021; Kotcher, Maibach, et al., 2019). After reading brief narratives about eight pathways through which climate change harms health (e.g., extreme heat, poor air quality, extreme weather, vector-borne illness, hunger and malnutrition, and mental health) people viewed climate change as more important, more harmful to themselves personally, and to future generations (Kotcher et al., 2018). The same risk information can also increase people's willingness to contact their elected officials to advocate for increased action on climate change (Kotcher et al., 2021). Information about the direct health harms associated with air pollution from burning fossil fuels, especially neurological harm to babies and young children, increases support for a transition to clean energy (Kotcher, Maibach, et al., 2019). See the Case Study at the end of this report by Abby Novinska-Lois. It tells the story about a public health campaign in Wisconsin that advocated for stronger EPA air pollution standards.

Several studies also suggest there is value in communicating the potential health benefits of climate change solutions (*there's hope*). For example, information about the health benefits of solutions may be perceived as clearer and more useful than information about the risks (Maibach et al., 2010). Communicating about the health benefits of climate solutions can also increase support for climate policies (Dasandi et al., 2022), and engagement in advocacy to support those policies (Levine & Kline, 2019). One study suggests that solution information may be more influential than risk information in prompting increased advocacy to support climate action. However, the most effective messages combine both types of information (Kotcher et al., 2021).

Less research has explored the potential to leverage information about popular support for climate action (*others care*) in the context of climate change and health messaging. However, one study suggests that providing a call-to-action that emphasizes that health is a universal value and that many other people are taking action to support climate and health solutions further enhances messages about risk (*it's bad*) and solution (*there's hope*) information (Kotcher et al., 2021).

As reviewed above, information about the role of fossil fuels in causing climate change (*it's us*) can be a helpful way to engage audiences (Bergquist et al., 2022). Recent work suggests that extending this strategy to talk about how fossil fuel executives are lobbying elected officials to oppose action to address climate change can enhance climate and health messaging (Kotcher et al., 2023). When health professionals call attention to efforts to oppose action to address climate change, it increases public support for climate policies and intentions to advocate for them (Kotcher et al., 2023). Furthermore, speaking truth to power in this manner increased trust in health professionals as a source of information about climate change (Kotcher et al., 2023).

Lastly, one of the most promising advantages of communicating about the health relevance of climate change is that it can reduce political polarization around the issue and tends to resonate with people across the political spectrum (Kotcher et al., 2021; Kotcher, Maibach, et al., 2019; Myers et al., 2012). In some cases, this framing is most compelling among groups that tend to be less concerned about climate change (Dasandi et al., 2022; Kotcher et al., 2018, 2023; Maibach et al., 2010). Thus, not only are health professionals especially well-trusted among audiences that tend to be less worried about climate change, they are also naturally positioned to convey an effective health-focused messaging strategy.

Conclusion

Climate change represents a profound threat to public health. Effective communication–via *simple clear messages repeated often by a variety of trusted sources*–is key to helping our society respond to this challenge and protect our communities. In this report, I have outlined six evidence-based messages about climate change–referred to as the *Six Key Truths* – that can help increase public engagement with the issue. The *Six Key Truths – it's real, it's us, experts agree, it's bad, others care, there's hope* – are important because they help to promote several

constructive attitudinal and behavioral responses to climate change, including information-seeking, discussion, policy support, and advocacy.

The Six Americas framework provides insights about how to target these messages to different segments of the US population, and which messengers are most capable of delivering them to those audiences. Audiences that tend to be more worried about climate change (e.g., *Alarmed* and *Concerned*) are most interested in information about solutions (*there's hope*), whereas audiences that tend to be less worried (e.g., *Doubtful* and *Dismissive*) are more interested in evidence that climate change is happening and human-caused (*it's real*, *it's us*). Although information about the impacts of climate change (*it's bad*) is less likely to be the first topic of interest to Americans, it complements other types of information by providing a sense of urgency around the issue. Many trusted messengers are well-positioned to share the *Six Key Truths* with audiences across the Six Americas, including climate scientists, NASA, family and friends, and importantly, health professionals. Expanding trusted messengers to include public libraries and their staff is critical. As places that offer their services for free, public libraries have become the “public square” by providing a place where members of a community can gather for information, educational programming, and policy discussions.

Framing the *Six Key Truths* about climate change in terms of their relevance to public health can enhance their effectiveness and reduce political polarization around the issue. Providing information about the health risks of climate change (*it's bad*) as well as the health benefits of climate solutions (*there's hope*) can make the issue more concrete and increase support for efforts to address it. Helping people understand how burning fossil fuels contributes to air pollution and climate change (*it's us*), and specifically who among "us" is most responsible for opposing efforts to reduce emissions (e.g., fossil fuel CEOs) increases emotional engagement and clarifies the role that citizens can play in advocating for change. Lastly, reminding people of the fact that we all care about our health and the health of our loved ones (*others care*), and that many others are already taking action, emphasizes our shared values and reduces divisiveness around the issue.

The principles outlined in this report can provide a helpful foundation for evidence-based initiatives to increase public engagement with climate change and help society respond to this extraordinary threat to public health. Ultimately, for any such effort to be successful, the specific messages, how they are framed, and the messengers recruited to deliver them should be driven by careful consideration of the strategic communication objectives and rigorous audience research.

Case Study: Healthy Climate Wisconsin's Messaging Campaign for Strong EPA Air Pollution Safeguards

Abby Novinska-Lois, MPH
Executive Director
Healthy Climate Wisconsin

Introduction Healthy Climate Wisconsin (HCW), an organization of public health and healthcare professionals, advocated for stronger EPA air pollution standards from January 2023 to January 2024. The targeted standards included the first-ever carbon safeguard for power plants, particulate matter, the Good Neighbor Rule, ozone, tailpipe emission limits for cars and light trucks, heavy-duty vehicle safeguards, mercury air toxics, and coal ash disposal limits.

Campaign Messaging and Strategies Our campaign aimed to expose fossil fuel executives' efforts to lower air pollution standards, encouraging expert testimony and public support. Messaging featured healthcare professionals connecting fossil fuels to climate change and the disproportionate health impacts on marginalized communities. Key messages included:

- "Black, Brown, Native, or newcomer, all Wisconsinites deserve clean air. Together we are advancing our nation's bedrock environmental laws, such as the Clean Air Act, to protect public health and build a future where all can thrive."

- "The EPA is currently seeking public input on several safeguards. Fossil fuel corporations are launching lobbying and media campaigns against these protections, so it is important that they hear from real Wisconsinites and health professionals. We all have a story to tell - click on the safeguard to learn more and share your concerns about health equity and climate."

- "The fossil fuel industry is making record profits at the expense of our health and we refuse to bankroll it. We are ready for a brighter future for our families and climate."

Media Engagement and Public Outreach Primary care doctors and nurses disseminated our messages via radio shows and drew parallels between the fossil fuel industry and Big Tobacco. Statements included:

- "We should not be confused about where the responsibility lies for climate change, and it is largely with the fossil fuel industry actively pushing against safeguards for pollution that will help us transition to a clean energy economy that will benefit everyone."

- "But just as Big Tobacco blocked progress on addressing the harms of smoking, fossil fuel executives and the politicians they own are standing in the way of this opportunity, keeping us stuck using dirty, expensive fossil fuels that make us sick and destabilize the world."

Figure 4. Healthy Climate Wisconsin and partner organizations call upon the EPA to cut climate pollution from powerplants outside the Oak Creek Coal plant on May 17, 2023. Credit Healthy Climate Wisconsin

Outcomes and Impact The campaign achieved significant media presence: 36 newspaper articles, 4 op-eds, 2 letters to the editor, and numerous radio and TV interviews. Those stations continue to reach out to our organization with additional earned media opportunities for follow-up stories. For example, 4 months after the campaign concluded, one of our public health nurses was called in for an interview on EPA clean car standards that was picked up by over 35 outlets and reached over 99,648 people. Health professionals submitted over 360 comments and testimonies to the EPA. Several medical societies and health non-profits, previously inactive on climate issues, supported the safeguards.

Except for Ozone, all supported safeguards became the strongest EPA pollution limits by April 2024. The rapid policymaking reflected the advocacy of environmental justice, health, and community groups. In February 2024, HCW was invited to meet with the EPA and the White House Council on Environmental Quality, highlighting the importance of public health voices in the policymaking process.

Conclusion Our campaign highlighted the power of coordinated messaging and public engagement in influencing environmental and public health policy. By combining hope, solutions, and a clear narrative, we motivated action and fostered a sense of collective resilience.

Acknowledgment

This work is supported by the National Science Foundation under grant number 2314180 to the Space Science Institute. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

References

Ballew, M., Rosenthal, S. A., Goldberg, M. H., Gustafson, A., Kotcher, J. E., Maibach, E. W., & Leiserowitz, A. (2020). Beliefs about others' global warming beliefs: The role of party affiliation and opinion deviance. *Journal of Environmental Psychology*, *70*, 101466. https://doi.org/10.1016/j.jenvp.2020.101466

Ballew, M., Verner, M., Carman, J., Myers, T., Rosenthal, S., Kotcher, J., Maibach, E., & Leiserowitz, A. (2024). *What do Americans want to know about climate change?* Yale University and George Mason University.

Bergquist, P., Marlon, J. R., Goldberg, M. H., Gustafson, A., Rosenthal, S. A., & Leiserowitz, A. (2022). Information about the human causes of global warming influences causal attribution, concern, and policy support related to global warming. *Thinking & Reasoning*, *28*(3), 465–486. https://doi.org/10.1080/13546783.2022.2030407

Bruine de Bruin, W., Rabinovich, L., Weber, K., Babboni, M., Dean, M., & Ignon, L. (2021). Public understanding of climate change terminology. *Climatic Change*, *167*(3), 37. https://doi.org/10.1007/s10584-021-03183-0

Choi, S., & Hart, P. S. (2021). The influence of different efficacy constructs on energy conservation intentions and climate change policy support. *Journal of Environmental Psychology*, *75*, 101618. https://doi.org/10.1016/j.jenvp.2021.101618

Cialdini, R. B., & Goldstein, N. J. (2004). Social Influence: Compliance and Conformity. *Annual Review of Psychology*, *55*(1), 591–621. https://doi.org/10.1146/annurev.psych.55.090902.142015

Crosman, K. M., Bostrom, A., & Hayes, A. L. (2019). Efficacy Foundations for Risk Communication: How People Think About Reducing the Risks of Climate Change. *Risk Analysis*, *39*(10), 2329–2347. https://doi.org/10.1111/risa.13334

Dasandi, N., Graham, H., Hudson, D., Jankin, S., vanHeerde-Hudson, J., & Watts, N. (2022). Positive, global, and health or environment framing bolsters public support for climate policies. *Communications Earth & Environment*, *3*(1), Article 1. https://doi.org/10.1038/s43247-022-00571-x

Ding, D., Maibach, E. W., Zhao, X., Roser-Renouf, C., & Leiserowitz, A. (2011). Support for climate policy and societal action are linked to perceptions about scientific agreement. *Nature Climate Change*, *1*(9), 462–466. https://doi.org/10.1038/nclimate1295

Doherty, K. L., & Webler, T. N. (2016). Social norms and efficacy beliefs drive the Alarmed segment's public-sphere climate actions. *Nature Climate Change*. https://doi.org/10.1038/nclimate3025

Dunlap, R. E., McCright, A. M., & Yarosh, J. H. (2016). The Political Divide on Climate Change: Partisan Polarization Widens in the U.S. *Environment: Science and Policy for Sustainable Development*, *58*(5), 4–23. https://doi.org/10.1080/00139157.2016.1208995

Geiger, A. W. (2017, August 30). Most Americans – especially Millennials – say libraries can help them find reliable, trustworthy information. *Pew Research Center*. https://www.pewresearch.org/short-reads/2017/08/30/most-americans-especially-millennials-say-libraries-can-help-them-find-reliable-trustworthy-information/

Geiger, N., & Swim, J. K. (2016). Climate of silence: Pluralistic ignorance as a barrier to climate change discussion. *Journal of Environmental Psychology*, *47*, 79–90. https://doi.org/10.1016/j.jenvp.2016.05.002

Goldberg, M. H., Gustafson, A., Ballew, M. T., Rosenthal, S. A., & Leiserowitz, A. (2020). Identifying the most important predictors of support for climate policy in the United States. *Behavioural Public Policy*, 1–23. https://doi.org/10.1017/bpp.2020.39

Goldberg, M. H., van der Linden, S., Maibach, E., & Leiserowitz, A. (2019). Discussing global warming leads to greater acceptance of climate science. *Proceedings of the National Academy of Sciences*, *116*(30), 14804–14805. https://doi.org/10.1073/pnas.1906589116

Hornik, R., & Woolf, K. D. (1999). Using Cross-Sectional Surveys to Plan Message Strategies. *Social Marketing Quarterly*, *5*(2), 34–41. https://doi.org/10.1080/15245004.1999.9961044

Kotcher, J., Adebayo, A., Nelson, A., Borth, A., Maibach, E., Rosenthal, S., & Leiserowitz, A. (2019). *Do Americans understand how air pollution from fossil fuels harms health?* Yale University and George Mason University. https://climatecommunication.yale.edu/publications/do-americans-understand-how-air-pollution-from-fossil-fuels-harms-health/

Kotcher, J., Feldman, L., Luong, K. T., Wyatt, J., & Maibach, E. (2021). Advocacy messages about climate and health are more effective when they include information about risks, solutions, and a normative appeal: Evidence from a conjoint experiment. *The Journal of Climate Change and Health*, *3*, 100030. https://doi.org/10.1016/j.joclim.2021.100030

Kotcher, J., Luong, K., Charles, J., Gould, R., & Maibach, E. (2023). Calling attention to opponents of climate action in climate and health messaging. *The Lancet Planetary Health*, *7*(11), e938–e946. https://doi.org/10.1016/S2542-5196(23)00217-6

Kotcher, J., Maibach, E., & Choi, W.-T. (2019). Fossil fuels are harming our brains: Identifying key messages about the health effects of air pollution from fossil fuels. *BMC Public Health*, *19*(1), 1079. https://doi.org/10.1186/s12889-019-7373-1

Kotcher, J., Maibach, E., Montoro, M., & Hassol, S. J. (2018). How Americans Respond to Information About Global Warming's Health Impacts: Evidence From a National Survey Experiment. *GeoHealth*, *2*(9), 262–275. https://doi.org/10.1029/2018GH000154

Leiserowitz, A., Maibach, E., Rosenthal, S., Kotcher, J., Goddard, E., Carman, J., Ballew, M., Verner, M., Marlon, J., Lee, S., Myers, T., Goldberg, M., Badullovich, N., & Thier, K. (2023). *Climate Change in the American Mind: Beliefs & Attitudes, Fall 2023*. Yale University and George Mason University.

Leiserowitz, A., Maibach, E., Rosenthal, S., Kotcher, J., Lee, S., Verner, M., Ballew, M., Carman, J., Myers, T., Goldberg, M., Badullovich, N., & Marlon, J. (2023). *Climate Change in the American Mind: Beliefs & Attitudes, Spring 2023*. Yale University and George Mason University.

Leiserowitz, A., Roser-Renouf, C., Marlon, J., & Maibach, E. (2021). Global Warming's Six Americas: A review and recommendations for climate change communication. *Current Opinion in Behavioral Sciences*, *42*, 97–103. https://doi.org/10.1016/j.cobeha.2021.04.007

Maibach, E. W., Kreslake, J. M., Roser-Renouf, C., Rosenthal, S., Feinberg, G., & Leiserowitz, A. A. (2015). Do Americans Understand That Global Warming Is Harmful to Human Health? Evidence From a National Survey. *Annals of Global Health*, *81*(3), 396–409. https://doi.org/10.1016/j.aogh.2015.08.010

Maibach, E. W., Leiserowitz, A., Roser-Renouf, C., & Mertz, C. K. (2011). Identifying Like-Minded Audiences for Global Warming Public Engagement Campaigns: An Audience Segmentation Analysis and Tool Development. *PLoS ONE*, *6*(3), e17571. https://doi.org/10.1371/journal.pone.0017571

Maibach, E. W., Nisbet, M., Baldwin, P., Akerlof, K., & Diao, G. (2010). Reframing climate change as a public health issue: An exploratory study of public reactions. *BMC Public Health*, *10*(1), 299. https://doi.org/10.1186/1471-2458-10-299

Maibach, E. W., Uppalapati, S. S., Orr, M., & Thaker, J. (2023). Harnessing the Power of Communication and Behavior Science to Enhance Society's Response to Climate Change. *Annual Review of Earth and Planetary Sciences*, *51*(1), 53–77. https://doi.org/10.1146/annurev-earth-031621-114417

Mildenberger, M., & Tingley, D. (2019). Beliefs about Climate Beliefs: The Importance of Second-Order Opinions for Climate Politics. *British Journal of Political Science*, *49*(4), 1279–1307. https://doi.org/10.1017/S0007123417000321

Myers, K., Doran, P. T., Cook, J., Kotcher, J. E., & Myers, T. A. (2021). Consensus revisited: Quantifying scientific agreement on climate change and climate expertise among Earth scientists 10 years later. *Environmental Research Letters*, *16*(10), 104030. https://doi.org/10.1088/1748-9326/ac2774

Myers, T., Nisbet, M., Maibach, E., & Leiserowitz, A. (2012). A public health frame arouses hopeful emotions about climate change. *Climatic Change*, *113*(3), 1105–1112. https://doi.org/10.1007/s10584-012-0513-6

Nisbet, M. C. (2009). Communicating Climate Change: Why Frames Matter for Public Engagement. *Environment: Science and Policy for Sustainable Development*, *51*(2), 12–23. https://doi.org/10.3200/ENVT.51.2.12-23

Pidgeon, N., & Fischhoff, B. (2011). The role of social and decision sciences in communicating uncertain climate risks. *Nature Climate Change*, *1*(1), 35–41. https://doi.org/10.1038/nclimate1080

Rode, J. B., Dent, A. L., & Ditto, P. H. (2023). Climate Change Consensus Messages May Cause Reactance in Conservatives, But There is No Meta-Analytic Evidence That They Backfire. *Environmental Communication*, *17*(1), 60–66. https://doi.org/10.1080/17524032.2022.2101501

Romanello, M., Napoli, C. di, Green, C., Kennard, H., Lampard, P., Scamman, D., Walawender, M., Ali, Z., Ameli, N., Ayeb-Karlsson, S., Beggs, P. J., Belesova, K., Ford, L. B., Bowen, K., Cai, W., Callaghan, M., Campbell-Lendrum, D., Chambers, J., Cross, T. J., … Costello, A. (2023). The 2023 report of the Lancet Countdown on health and climate change: The imperative for a health-centred response in a world facing irreversible harms. *The Lancet*, *402*(10419), 2346–2394. https://doi.org/10.1016/S0140-6736(23)01859-7

Roser-Renouf, C., Maibach, E. W., Leiserowitz, A., & Zhao, X. (2014). The genesis of climate change activism: From key beliefs to political action. *Climatic Change*, *125*(2), 163–178. https://doi.org/10.1007/s10584-014-1173-5

Roser-Renouf, C., Stenhouse, N., Rolfe-Redding, J., Maibach, E. W., & Leiserowitz, A. A. (2015). Engaging Diverse Audiences with Climate Change: Message Strategies for Global Warming's Six Americas. In A. Hanson & R. Cox (Eds.), *Routledge Handbook of Environment and Communication* (pp. 368–386). Routledge.

Sparkman, G., Geiger, N., & Weber, E. U. (2022). Americans experience a false social reality by underestimating popular climate policy support by nearly half. *Nature Communications*, *13*(1), Article 1. https://doi.org/10.1038/s41467-022-32412-y

Sparkman, G., & Walton, G. M. (2017). Dynamic Norms Promote Sustainable Behavior, Even if It Is Counternormative. *Psychological Science*, *28*(11), 1663–1674. https://doi.org/10.1177/0956797617719950

Uppalapati, S., Ansah, P., Campbell, E., Gour, N., Thier, K., Kotcher, J., & Maibach, E. (2023). *A global review of research on effective advocacy and communication strategies at the intersection of climate change and health*. George Mason University. https://doi.org/10.31219/osf.io/6w3qh

van Stekelenburg, A., Schaap, G., Veling, H., van 't Riet, J., & Buijzen, M. (2022). Scientific-Consensus Communication About Contested Science: A Preregistered Meta-Analysis. *Psychological Science*, *33*(12), 1989–2008. https://doi.org/10.1177/09567976221083219

Witte, K. (1992). Putting the fear back into fear appeals: The extended parallel process model. *Communication Monographs*, *59*(4), 329–349. https://doi.org/10.1080/03637759209376276