



Research article

Review of United States senators' website position statements on climate change and health

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ABSTRACT

Background: Climate change represents a threat to the health of all Americans. We wanted to know if federal representatives are informing their constituents about this risk.

Methods: To answer this question, we reviewed the official websites of all 100 United States senators to determine if they made statements about health, climate change, and the health and/or environmental justice relevance of climate change. We also determined their vote on the only climate change-related bill to come to a senator vote during the 116th Congress (S.J. Res 53).

Findings: We found 86% of senators' websites mentioned health, 51% climate change, 21% climate change and health, and 7% environmental justice and health. Among voting senators, 46% voted yes, including 76% of those with websites mentioning climate change, and 100% of those whose websites mentioned an interaction of climate change with health or environmental justice.

Interpretation: There is opportunity for senators to improve website messaging on climate change and health.

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Introduction

Climate change and air pollution from burning fossil fuels have major impacts on human health, and these impacts are projected to become more severe, especially in the absence of climate mitigation policies that promote a rapid global shift away from fossil fuel energy sources [1–3]. At present, nearly one in five premature deaths worldwide can be attributed to local particulate matter 2.5 (PM_{2.5}) pollution from the burning of fossil fuels [4]. Populations around the globe are already experiencing increased exposure to life-threatening extreme weather events amplified by climate change, including heat waves, floods, and wildfires. Extreme heat is currently responsible for approximately 300,000 annual deaths worldwide in people over age 65 [1], and climate models project that areas of the Earth's surface could soon experience heat exceeding the limits of human survival, even for healthy young people with access to shade and unlimited water [5].

In recent years, the health harms of climate change have received increasing attention from policymakers and the medical community. The United States (U.S.) Global Change Research Program, composed of 13 federal agencies involved in climate change research, released a

scientific assessment on climate and health in 2016 [6], followed by the Fourth National Climate Assessment in 2018 [7], both of which reported robust scientific evidence linking health harms to climate-related extreme weather events in the U.S., especially for vulnerable populations. Multiple medical societies representing more than 600,000 physicians (60% of U.S. doctors) have formed the Medical Society Consortium on Climate and Health, a national umbrella organization advocating for action on climate change and health equity [8].

Despite these efforts, many Americans have a limited appreciation of the health harms of climate change [9]—though this is beginning to shift in recent polling data [10]. Improving public understanding of the health impacts of climate change has the potential to be an effective strategy for increasing public support for climate mitigation and adaptation measures. Multiple studies have evaluated the public opinion impacts of framing climate change in terms of public health [11–14], with data in the U.S. consistently showing that individuals are more willing to support climate mitigation actions if they are given information on the health impacts of climate change and fossil fuel emissions [15]. This is particularly true for Americans in the middle of the political spectrum [15,16].

While health professionals have important roles in educating the public directly about the health impacts of climate change [17], research has shown that, currently, public understanding of climate change is more influenced by cues from political elites, including

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elected officials [18]. Given the important role of elected officials in communicating climate science to the public, we sought to review U.S. senators' communications with their constituents about the health risks of climate change, as demonstrated by statements on their official web pages. Our practical goal, as detailed in the discussion section of this paper, was to provide guidance to elected officials on how to better communicate the health threats of climate change to the public and provide guidance to medical professionals and professional organizations on how to collaborate with elected officials in communicating the health impacts of climate change. We also sought to understand whether elected officials who made efforts to educate their constituents about the health impacts of climate change were more likely to support legislation to advance climate objectives.

Methods

Inclusion criteria

All 100 members of the U.S. Senate as of February 2021 were included in the search.

Search strategy

Official websites of U.S. senators (<https://www.senate.gov/senators/index.htm>) were independently reviewed in February 2021 by two physicians—with a specific focus on three priority topics: the environment, health care, and environmental justice. When these priority topics were not specifically listed, the main page was reviewed for keywords pertinent to the search topic.

Data extraction

Each of the four focal topics—health, climate change, the health relevance of climate change, and the health relevance of environmental justice—were scored 1 if mentioned, and 0 if not (see appendix). All discrepancies between the coding assigned by the two coders were reviewed and reconciled through a collaborative second review of websites. Notable quotes were extracted and subsequently confirmed on websites on August 10, 2021 prior to submission. The number of health professional members of Congress was quantified.

Data analysis

For each state, both senators scores on each of the four focal issues were mapped [19] as 0 (white), 1 (light color), or 2 (dark color). Two stratified analyses were done. The first assessed the web content of senators representing the one-third of states with highest vulnerability to the health impacts of climate change, and senators representing the one-third of states with the highest preparedness for the health impacts of climate change (based on a report by the Johns Hopkins University School of Public Health and Trust for America's Health) [20]. A Pearson's correlation coefficient was computed to assess the relationship between vulnerability and preparedness. The second assessed senators who voted on S.J. Res 53. S.J. Res 53 was a resolution that would have used the power of the Congressional Review Act to block the Trump administration's actions to overturn the Clean Power Plan. According to the non-partisan analysis from the website govtrack.us, this was the only climate change-related bill to come to a full Senate vote during the 116th Congress which failed in a 41–53 vote on October 17, 2019. We classified a “yes” vote on the bill, which would have maintained stricter carbon dioxide emissions standards at power plants, as a vote in favor of climate mitigation.

Role of the funding source

There was no involvement of funding for this work. All authors had full access to the data in the study and had final responsibility for the decision to submit for publication. The project was submitted to the Medical College of Wisconsin Institutional Review Board and approved as exempt from Human Subjects Research.

Results

The review included websites for all 100 United States senators representing the 116th Congress. Shown in Figure 1 are maps that represent the number of senators who listed health, climate change, a climate change and health interaction, and an environmental justice and health interaction as issues labeled a, b, c, and d, respectively. A complete data extraction matrix can be found in the appendix. States that had at least one senator list all four categories were as follows: Vermont, Massachusetts, Minnesota, California, Illinois, Maryland, and New Jersey. The two states that had no senators list any of the four categories were Wyoming and Georgia.

Among all senators, 48 identified as Democrats, 2 as independents caucusing with the Democrats, and 50 as Republicans. At the time of the review, four senators were physicians. In the review, 86% of senators' websites mentioned health and 51% climate change. Another 21% of senators' websites mentioned the health impacts of climate change or fossil fuel combustion and 7% environmental justice.

There were discrepancies between the websites of senators representing the states that are most vulnerable to climate change and the senators representing the states that are most prepared, as assessed by the “Climate Change and Health: Assessing State Preparedness” report [20]. Among the senators representing the one-third of states rated most vulnerable to the health impacts of climate change, 24% mentioned climate change and 6% mentioned the health impacts of climate change. Conversely, among the senators representing the one-third of states that were most prepared for the impacts of climate change, 75% mentioned climate change, 38% mentioned the health impacts of climate change, and 13% mentioned the disproportionate impacts of climate change on vulnerable populations. There was a significant negative association between vulnerability and preparedness. The most vulnerable states were less likely to be the most prepared $r(98) = -0.24, p < 0.02$.

There was also a strong positive association between senators mentioning climate change or climate and health concerns and voting in favor of climate mitigation. Among all senators present for the vote on S.J. Res 53 ($n = 94$), 43% voted yes. Among senators mentioning climate change on their websites, 76% voted yes. Among senators mentioning the health impacts of climate change, 100% voted yes, and among senators mentioning an environmental justice component on their websites, 100% voted yes.

Discussion

Despite robust consensus in national and international scientific reports [1,6,7,21–23] and nearly an eight-fold increase in research on climate change and health from 2007 to 2019 [22], there is significant opportunity for policymakers to improve evidence-based website messaging on climate change as a current public health emergency. We found no standard messaging and a siloed approach toward issues with separate sections for health care and the environment. Climate change uniquely intersects with the environment, health care, infrastructure, civil rights, immigration, veteran's affairs, education, and energy, among other issues; it was frequently not incorporated under multiple headings.

In our review, 51% of senators mentioned climate change and 21% connected climate change and health. This percentage is slightly lower than a recent review of state health department websites

where 36% of states explicitly linked climate change to health and 40% had a clear way to find climate change information [24]. These percentages may reflect opposition to climate mitigation actions among senators or simply highlight lack of awareness on the issue. One survey of health professionals found a strong commitment to addressing climate change yet several time and knowledge barriers were reported as limiting taking action [25]. Given numerous competing demands on their time and attention, U.S. senators and their staff likely face similar barriers to action. Other potential influences, such as campaign financing and fossil fuel connections, were not considered in this paper.

As noted above, we found that senators from the most vulnerable one-third of states were three times less likely to mention climate change as a priority issue on their website than senators from the most prepared one-third of states (24% versus 75%), with only 6% of senators from the most vulnerable states mentioning the health threats posed by climate change. We believe that, as part of a broader suite of actions and policies to improve climate resilience, improved messaging by elected officials could help prepare constituents for the local health threats posed by climate change. This improved messaging could be particularly beneficial for low-income communities, people of color, people with disabilities, and other groups that are particularly vulnerable to the health harms of climate change.

Based on our review, we provide final recommendations targeted to members of Congress and health professionals. For both groups, we recommend the Climate Change Negotiations and Health module and certificate [26]. Other resources on messaging can be found at the Yale Program on Climate Change Communication, the George Mason Center for Climate Change Communication, ecoAmerica, and Climate Nexus.

Improve communication on climate and health for members of Congress

Key positives identified in messaging

We found that multiple U.S. senators explicitly acknowledge the health impacts of climate change on their websites. For example, the website of Senator Patrick Leahy states, “When many people talk about the climate change debate, they conjure images of melting ice caps and stranded polar bears. While extreme weather does degrade the environment, it also has negative impacts on human health.” The website of Senator Diane Feinstein identifies specific causal pathways for the health harms caused by climate change stating, “Climate change will impact the health of millions of people, leading to more deaths, disease and injury due to heat-waves, floods, storms, fires, droughts and declining air quality.”

We also found that several senators made explicit mention of environmental justice concerns. Senator Tammy Duckworth’s website states, “Every American has the right to breathe safe air, drink clean water and live on uncontaminated land regardless of their zip code, the size of their wallet and the color of their skin.” Senator Duckworth co-founded the Environmental Justice Caucus along with Senators Cory Booker and Tom Carper, both of whom have strong environmental justice language on their websites. Senator Bernard Sanders noted the Intergovernmental Panel on Climate Change and had a separate headline focused on climate justice. Senator Edward Markey mentioned the need to “counteract systemic injustices—all while addressing the existential challenge of climate change.” Senators Thom Tillis and Amy Klobuchar mentioned the Fourth National Climate Assessment. Senator Benjamin Cardin included a photograph from the United Nations Framework Convention on Climate Change 21st Conference of the Parties (COP21) under the foreign relations issues section. This recognition of the global health impact of climate change and opportunity to scale health solutions through reduction of greenhouse gas emissions and adaptation planning with international partners was notable.

Opportunities for improvement

One area in which senators could improve their websites is to be more explicit in linking climate change to disaster response and preparedness. Multiple senators, particularly those representing Midwest states in the Mississippi-Missouri river basins, mentioned flood prevention or federal disaster aid in response to flooding, without mentioning the role that climate change plays in increasing flood risks or essential infrastructure, such as health care facilities, that are at risk during flooding. For example, Senator John Hoeven’s website states, “Well-constructed, properly managed flood protection infrastructure can protect the lives, livelihoods and property of North Dakotans across our state.” This is a missed opportunity to discuss the role of climate change in changing the frequency and severity of flooding, in addition to other frequently compounding risks related to chemical exposures, waterborne diseases, drownings, and health care system disruptions [27–29].

To better address the current national threats to health, we recommend members of Congress take the following actions: make climate change a separate priority issue on their websites—including information about health impacts, have a congressional staff member dedicated to climate change and ensure this person understands the health relevance, and engage health professionals to make health impacts and opportunities locally relevant. As examples of local relevance, historical policies and redlining in cities disproportionately increase exposure of residents to dangerous heat [30] while other locations have oil and gas infrastructure that are linked to areas of high social vulnerability [31]. Targeted interventions to protect people, and particularly populations at greatest risk of poor health from any of these exposures, should be incorporated into policy development.

Improve engagement and advocacy of health professionals for policymakers

Need for stories

Senators frequently shared values and personal stories related to health experiences. Senator Tammy Duckworth became a double amputee from her time serving in the Iraq War. Senator Tammy Baldwin shared her story of meningitis as a nine-year-old child and spending three months in the hospital. Partnering with health care professionals could aid policymakers on expanding stories and linking to local climate-related health impacts for themselves and constituents. One example is for older adults with chronic medical conditions who have been shown to have more hospitalizations during times of increased temperature [32]. This has potential implications for health care costs with an aging U.S. population, increasing demands on health care professionals, and federal health care spending. Also imperative is explaining the compounding health effects for public health crises, such as that with air pollution and death from covid-19 [33].

Potential influence for voting

We found a strong positive association between acknowledging the health impacts of climate change and voting in favor of climate mitigation and adaptation measures. Advocacy by health professionals that seeks to increase policymakers’ awareness of the health and equity impacts of climate change and fossil fuel pollution may increase their willingness to take policy action on climate. Such action may help scale sustainable changes that protect populations for years to come and reduce health burdens now. A recent study found that targeted advertising was effective at shifting views on climate change [34]. Another study on climate change and use of social media by policymakers found frequency of communication was driven by level of concern by constituents [35]. Surveys have shown that nearly 80% of Americans are concerned about climate change [36]. As trusted messengers and content experts, health professionals

have a unique role in shaping dialogue and prioritizing climate change as a nonpartisan health issue. While structural racism and health disparities may be perceived as a partisan issue [37], health professionals could be a unique voice in guiding evidence-based decisions and action.

To better address the current national threats to health, we recommend health professionals facilitate communication with legislators especially in states with more vulnerable populations and lower levels of preparedness and recognize and articulate climate solutions as opportunities to improve health and health equity. Fossil fuel pollution disproportionately impacts low-income communities and Black, Indigenous, and People of Color (BIPOC) [23,38]. The most recent State of the Air Report found more than 135 million Americans are living in areas with unhealthy air, and POC were more than three times more likely to live in polluted neighborhoods [23]. These are patients who then require costly inhalers, medications, and emergency department visits and hospitalizations for respiratory diseases.

Strengths and limitations

The strength of this study is that we were able to assess climate and health content on the websites of all currently sitting U.S. senators and compare the content on websites to their most relevant vote during that congressional term. A few limitations remain. Web content is constantly changing; our review was limited to a single cross-section in time during a particularly tumultuous moment in the nation's political history. As an example, Georgia senators did not have any content on websites that aligned with our search. However, both Georgia senators were newly elected in 2021 and may not have had websites updated yet in February. Lastly, we relied on a previously published assessment to identify the vulnerability and preparedness of states; the assessment appears to be scientifically rigorous, but like all scientific research has limitations.

Conclusion

Although the serious health harms associated with climate change are well-understood by experts in medicine and public health, more work appears to be needed to share this information with policymakers so that they can use it to guide their decision-making. A closer partnership between health professionals and policymakers to address the climate emergency will help communities, states, and the nation develop more effective responses to protect our planet and the health of our people—averting harms now and for years to come.

Research in context

Evidence before this study

Anthropogenic climate change has widespread impacts on human health that have been well documented in the literature. Nearly one in five premature deaths worldwide can be attributed to local particulate matter pollution from the burning of fossil fuels. Extreme heat causes heat-related illness and indirectly makes many other health conditions worse. Pollution and wildfire smoke cause inflammation of the lungs and contribute to asthma and chronic obstructive pulmonary disease exacerbations, and infections. Elected officials have been shown to influence public perceptions on issues. Websites are common ways for policymakers to communicate issues with the public. However, whether climate change and health are included as part of website position statements has not been previously determined nor the relationship with voting behavior.

Added value of this study

This study highlights an opportunity for policymakers to incorporate the health impacts of climate change on their websites based on local health threats. We hope our work inspires policymakers to have dedicated online spaces to address climate change and improves climate action and preparedness to health threats posed by climate change.

Implications of all available evidence

Authors use the results of the review to provide recommendations for increased partnership, communication, and engagement between health professionals and policymakers to better mitigate and adapt to the effects of climate change as a public health crisis.

Data sharing

All data are available in the paper and appendix.

Declaration of competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.joclim.2021.100104.

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