Advancing and Integrating U.S. Climate and Health Policies:

INSIGHTS FROM NATIONAL POLICY STAKEHOLDERS

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Abstract

There is mounting evidence that government efforts to address climate change and improve public health can be complementary. To explore the current status and potential for further integration of climate policy and health policy in the U.S. federal government, we interviewed 65 stakeholders in Congress, the executive branch, federal agencies, academia, think tanks, and advocacy organizations who work on climate change, health, the climate-health intersection, and related areas. We found broad consensus among research participants that climate policy and health policy are still mostly separate but have become more linked in recent years. Most think further integration of climate and health policy would be beneficial because doing so has the potential to maximize the health benefits of climate policy and the climate benefits of health policy, and because a focus on health has the potential to increase support for climate policy. Barriers to further integration identified included: lack of funding; political polarization; low public awareness; lack of relevant data; silos between climate and health in federal agencies and professional communities; and other competing priorities. Strategies recommended to advance further integration included: enhancing communication and education efforts; conducting research on the health and health economic harms of climate change and on the health and health economic benefits of climate action; developing centralized leadership and collaboration to overcome silos; mobilizing existing funds and seeking additional funds; and advocating for changes to political structures. We explore potential implications for congressional and executive policymakers, federal agencies, the health sector, climate stakeholders, researchers, philanthropists, and advocates.

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1. Executive Summary

Policymakers, researchers, advocates and others are increasingly considering how national policy can best advance climate change solutions that protect health, and health solutions that protect the climate. They are grappling with important questions regarding to what extent, in what ways, and how climate policy and health policy should be integrated in U.S. federal policy—broadly construed to mean legislation, authorization, appropriations, and program implementation.

To support these deliberations, we investigated U.S. federal policy stakeholders' perspectives through in-depth interviews with 65 experts in congressional offices, federal agencies, think tanks, academic institutions, and advocacy organizations. The research participants worked either on climate policy, health policy, the climate-health nexus, or related areas such as agriculture, emergency response, housing and urban development, and transportation. The interviews were conducted from January 11th – April 24th, 2024. Our analysis was informed by feedback provided by some of our research participants and other U.S. climate and health policy stakeholders in response to a briefing on our preliminary findings.

This report is intended for a range of stakeholders aiming to understand and advance U.S. national policy on climate and health, including federal policymakers and other federal employees, health professionals and climate professionals working outside the federal government, research scientists, advocates, and philanthropists.

The findings below represent the participants' views on the current national status of climate and health policy, their ideals for advancing climate and health policy, reported barriers to these ideals, perceived opportunities, and their recommended strategies.

Current status of national climate and health policy

According to participants, national climate and health policies are not yet well integrated in the U.S. There is limited interaction between climate and health stakeholders and little climate-health legislation has been enacted. However, climate and health policy are becoming better integrated due to the efforts of the advocacy community and leadership by the Biden administration. Areas in which climate and health are increasingly linked include: initiatives within federal agencies, such as the Department of Health and Human Services establishing the Office of Climate Change and Health Equity; interagency working groups, such as the Interagency Working Group on Extreme Heat; and in work on specific issues such as air pollution, extreme weather, disaster response, and healthcare system resilience and decarbonization in some agencies.

Ideals for climate and health policy

Most participants believe that climate and health policies should be further integrated. They feel that integrating climate and health policy makes sense given the inherent interrelatedness of the issues. Furthermore, they believe that integration can help maximize the health benefits of climate policies and vice versa, and that a focus on health can build support for climate policy. Participants noted a number of areas especially ripe for integrating climate and health policy, including air pollution, agriculture, transportation, healthcare, housing, and urban development. Specific objectives for healthcare include increasing the resilience of healthcare systems and transitioning them to be powered by clean energy.

Some conservative participants noted a preference to have distinct climate policy and health policy instruments, particularly when addressing health harms that are indirectly linked to climate change (e.g. vector-borne disease).

Barriers to integrating climate and health policy

Funding for climate initiatives in general is limited due to the competing priorities of Members of Congress. Additionally, many conservative decision-makers are seen to be opposed to a focus on health equity in policy. With respect to climate-health initiatives, funding has likewise been scarce; for example, the Office of Climate Change and Health Equity has not yet been funded. Moreover, short-term policymaking pressures often impede the long-term thinking necessary to prioritize proactive climate and health solutions.

Another major barrier is limited understanding of climate-health links among policymakers, certain professional communities, and the public. Climate expertise and health expertise also tend to be siloed in both federal agencies and professional communities, which impedes policy development and implementation. Interagency collaboration is possible, but can be time-consuming and logistically difficult. Unsupportive presidential administrations pose another obstacle to federal agency involvement.

Additionally, there is insufficient data on (1) the health harms of climate change and associated economic costs, (2) the health benefits of climate solutions and associated cost savings, and (3) the outcomes of existing programs. Furthermore, there are pre-existing challenges for public health policy development, such as funding shortages and other health problems that are seen as higher priority, and for climate policy development, such as the opposition of the fossil fuel industry.

Opportunities to advance and integrate climate and health policy

There is growing awareness of and concern about climate change and its intersection with health among both policymakers and the public, and additional resources are emerging in the form of new data, technologies, and funding opportunities. Climate solutions themselves constitute an economic opportunity to reduce healthcare costs. Policy topics identified as especially feasible for advancing climate and health goals include the Farm Bill, carbon border adjustments, clean energy permitting, and changes to transportation infrastructure. Beyond legislation, participants saw opportunities for executive actions, including declaring a climate emergency and denying new fossil fuel exploration and infrastructure permits.

Strategies to advance and integrate climate and health policy

Participants recommended a range of strategies to effectively communicate about the benefits of addressing the climate-health intersection, such as framing climate change as a health issue to make it more personally relevant, discussing the economic implications of climate change and health policy, and activating health professionals as trusted advocacy messengers. To address the barrier of low public awareness, they recommended educating stakeholders about climate and health. To address the lack of data on climate-health impacts and solutions, they recommended accelerating research on these topics. To overcome silos in federal agencies, they recommended central coordination of inter- and intra-agency climate-health initiatives. To help create lasting progress, they suggested further institutionalizing climate and health initiatives in federal agencies and passing congressional policies. To advance policies despite political polarization, they recommended focusing on incentives and adaptation before regulations and mitigation, respectively, and disaggregating policies when needed. To address widespread funding shortages, they recommended tapping into existing funds (such as Inflation Reduction Act funds) and seeking more funding through creative financing mechanisms such as using health insurance to pay for climate adaptation measures. To overcome structural and societal barriers such as the influence of money in politics, they recommended using advocacy to build grassroots power and cultivate climate and health policy champions.

Potential implications

Congressional policymakers might consider strategies to sidestep the general partisan gridlock that impedes opportunities to advance comprehensive legislation at the climate-health nexus. One approach may be to integrate more limited (i.e., less comprehensive) climate-health policies piecemeal into other relevant proposed legislation. Conservative members of Congress may also be more open to considering health in climate policy and climate in health policy in cases where there is an especially clear and direct connection between the two (such as policies limiting air pollution from fossil fuel infrastructure). Encouraging and enabling interaction between climate staff and health staff, and hiring staff to focus specifically on the climate-health nexus, may increase opportunities to advance climate-health policies.

The President and their policy staff have the potential to be highly influential in advancing climate and health priorities, especially by coordinating initiatives across agencies (although this coordination is susceptible to presidential administration changes). The President, in particular, has opportunities to take executive actions including declaring a climate emergency and refusing fossil fuel exploration and infrastructure permits.

Federal agency employees are impeded by the siloing of climate versus health. Though interagency groups have made important strides at the climate-health intersection, their efficiency and effectiveness may benefit from increased central coordination. Central coordinators could include the Office of Climate Change and Health Equity in the Department of Health and Human Services, as well as the U.S. Global Change Research Program. Coordination can also be aided by standardizing metrics and terminology across agencies and disciplines. A more fulsome integration of climate and health policy initiatives into the cultures of relevant federal agencies—including but not limited to fuller implementation of existing policies—and developing public-private partnerships to support a focus on the climate-health nexus may help to maintain momentum long-term.

Health professionals and organizations are highly trusted and can be influential advocates for climate-health policy, especially with congressional policymakers, but they may find it challenging to make time for advocacy given the demands of their careers and the burdens currently on the healthcare system. Health professionals may benefit from increased opportunities to interact with climate experts, education on how climate change harms health, and training on climate-responsive patient care and advocacy skills; these resources must be created with sensitivity to the time constraints faced by most health professionals. Health professionals can also be influential advocates for efforts to decarbonize and enhance climate resilience in healthcare facilities and systems; funding opportunities through the Inflation Reduction Act can be an asset in these efforts.

Climate professionals and organizations may similarly benefit from opportunities to interact with health professionals and learn more about the health impacts of climate change and potential health benefits of climate solutions. In their advocacy and outreach efforts, climate stakeholders may find it helpful to use a health frame to make climate change feel more immediate, tangible, and personally relevant. Investigating and communicating the health and health economic dimensions of climate change may help build public and political will for climate solutions.

Members of the research community can help advance climate and health policy by further assessing the health harms of climate change and associated economic costs, as well as the health and health economic benefits of climate solutions. Research is also needed to: assess the outcomes of existing programs; examine the current and potential role of the judiciary system; assess whether and how to engage conservatives on the climate and health intersection; and determine how health professionals can maximize the impact of their climate advocacy efforts while maintaining their position of high public trust. Lastly, research that identifies climate-health policy opportunities at the regional, state, and local levels will be a helpful extension of this study.

Philanthropic foundations and other non-governmental funders can play important roles in advancing climate and health policy. In addition to the research needs identified above, other urgent funding needs include supporting research and development of model policies, policymaker education, collaborations between climate and health stakeholders, and developing and testing community-based climate-health initiatives. Though not directly mentioned by participants, the development of model policies may be an especially efficient mechanism to promote adoption of climate-health policies in that it reduces the workload of policymaker's staff members. Funding climate-health fellowships in Congress and other influential decision-making contexts can be an efficient mechanism to educate policymakers about the climate-health nexus. Community-based climate-health initiatives can be funded directly and/or supported through grants to assist communities in applying for existing governmental funding. Given that climate and health issues intersect with a multitude of policy areas, funders can identify many different ways to have impacts that align with their interests.

Advocates can enhance their impact by framing climate change as a health issue, including focusing on the health economic costs of inaction and the health economic benefits of policy at the climate-health nexus, and building relationships with highly influential actors such as congressional staff. Some policy influentials are eager to learn more about the climate-health nexus and would likely welcome advocacy. Broader strategic goals for climate and health advocacy include electing climate-health champions, criticizing the damaging actions of the fossil fuel industry, and addressing structural barriers such as the influence of vested interests and entrenched political opposition. Examples of recommended tactics to overcome opposition and build momentum for climate and health include social media activism, electoral organizing, and coalition-building.

2. Background

Climate change is harming human health in the U.S.

Climate change causes a multitude of health harms in the U.S. For instance, extreme heat can exacerbate cardiovascular disease, kidney disease, mental health conditions, and problems with pregnancy and childbirth; extreme storms can lead to injury and death from drowning and other causes; exposure to air pollution and wildfire smoke contributes to increases in emergency room visits, hospitalizations, and deaths, and can contribute to neurodevelopmental disorders in babies and children (e.g., ADHD, reduced IQ, autism) and neurodegenerative diseases among older adults (e.g., Parkinson's Disease, dementia); and the spread of mosquitoes, ticks, and bats to new areas can also spread diseases such as rabies, Valley Fever, and Lyme disease (Hayden et al., 2023).

Aside from climate change, U.S. residents already suffer more preventable disease than residents of many other high-income countries, and do not have access to universal healthcare, resulting in high costs to patients (Gunja et al., 2023). Moreover, there are pronounced race-, income-, and location-based health disparities in the U.S. (Doty et al., 2020; Nduggi et al., 2024; MacKinnon et al., 2023) that are compounded by the disproportionate harms of climate change on systemically disadvantaged populations (Berberian et al., 2022; Deivanayagam et al., 2023).

In addition, climate disasters profoundly disrupt delivery of healthcare services, often at times when they are most needed. Extreme storms and flooding, for example, can cause power outages and force hospital evacuations, while also increasing the need for urgent medical attention (Salas et al., 2020). Medical staff may themselves be affected by climate disasters, potentially including being unable to get to work, further hindering the delivery of healthcare (Gerwig, 2022).

Devastation in Asheville after Hurricane Helene. 2024. Photo by Bill McMannis. Source: Wikimedia Commons.

Decarbonization rapidly produces local and regional health benefits

Climate change mitigation actions—i.e., decarbonization through enhanced energy efficiency and by replacing fossil fuel energy with renewable energy such as wind, solar, and geothermal—rapidly produce both short-term and long-term health benefits in and around the communities that take the actions. For example, phasing out fossil fuels would substantially improve air pollution, saving over 550,000 lives in the U.S. by 2050 (Garcia-Menendez et al., 2015), and dramatically reducing healthcare costs (Balbus et al. 2014). In addition to preventing premature deaths, rapidly decarbonizing the U.S. economy will also prevent substantial amounts of avoidable illness including heart and respiratory diseases, cancer, and neurologic disorders, and metabolic disorders (NIEHS, 2022).

In addition to advocating for emissions reductions across sectors, many health professionals have called for decarbonizing the U.S. healthcare system (U.S. Department of Health and Human Services, 2022), which, according to a 2020 study, accounts for approximately 8.5% of U.S. emissions (Eckelman et al., 2020). Per capita, the amount of carbon pollution produced by the U.S. healthcare sector is higher than that of other industrialized countries; this excess level of greenhouse gas emissions is uncorrelated with better health outcomes (ibid.). In other words, the U.S. healthcare sector is less efficient than the healthcare sectors in other industrialized nations in terms of health enhancement per unit of climate pollution produced. This suggests an opportunity to reduce the carbon emissions of healthcare without compromising the quality of care.

Climate adaptation produces health benefits

In addition to mitigation, which is needed to reduce future global warming, adaptation is essential to alleviating the ongoing health harms of climate change in the U.S. Adaptation actions that can improve health outcomes include, for instance, early warning systems, evacuation plans, heat-, drought-, fire- and flood-resilient urban infrastructure, weatherproof energy grids, and health risk communication (NIEHS, 2024; Stone et al., 2014).

Adaptation is especially important within healthcare systems, as disruptions to healthcare delivery can compound the health harms of climate disasters (Sorensen 2020). Needed adaptations include improving risk assessments, making sure that the physical structures and energy sources of healthcare facilities are disaster-resilient, and modifying medical supply chains so they can function better in emergencies (Sherman et al. 2023). Some interventions, such as renewable energy in healthcare facilities, can simultaneously bolster resilience, lower emissions, and improve healthcare access and delivery (Karliner et al. 2023).

Some federal health agencies have begun to respond to climate change, although with limited resources

Over the past decades, several climate and health policy initiatives have been established within and across federal agencies, including the Climate and Health Program and the Building Resilience Against Climate Effects (BRACE) framework within the Center for Disease Control and Prevention (CDC), the Office of Climate Change and Health Equity within the Department of Health and Human Services, the Climate Change Initiative within the National Institutes of Health, and the Interagency Crosscutting Group on Climate Change and Human Health (CCHHG) through the U.S. Global Change Research Program. Furthermore, the Bipartisan Infrastructure Law of 2021 and the Inflation Reduction Act of 2022 included funding for many climate-health solutions, including electric school buses, active transport, and renewable, efficient energy sources in homes (U.S. Department of Transportation, 2022; Feiveson & Ashenfarb, 2024).

An especially important development within healthcare system decarbonization and resilience is the Department of Health and Human Services' voluntary Health Sector Pledge, which was introduced in 2022 and has been signed by over 15% of U.S. hospitals, as well as other industry, non-profit, and technical assistance organizations (U.S. Department of Health and Human Services, 2024). The pledge requires organizations to (1) halve their emissions by 2030 and reach net zero by 2050, with public yearly accounting of their progress; (2) assign an executive-level lead and conduct an inventory of supply-chain emissions; and (3) publish a climate resilience plan that anticipates the needs of community members who are disproportionately harmed.

However, significant challenges are impeding progress on climate and health solutions: funding for climate and health initiatives remains scarce, climate and health equity are subject to political polarization, collaborating across federal agencies is laborious, and the research that informs policy is siloed (Madrigano et al., 2021). As of yet, the health benefits of climate solutions are not typically considered in climate policy, and few policies have explicitly prioritized both climate and health (Sergi et al., 2020). Furthermore, the U.S. is the only country in the G20 that does not have a national climate adaptation plan (vonHedemann et al., 2023). According to the Global Climate and Health Alliance's Nationally Determined Contributions Scorecard, which rates the degree to which national climate commitments include health considerations, the U.S. receives only 6 out of a possible 15 points (Global Climate and Health Alliance, 2021).

Public perceptions and policy support

The dependence of human health on the health of the environment—which has long been understood in Traditional Ecological Knowledge (Isaac et al. 2018)—is increasingly being recognized by the health community in frameworks such as One Health, Planetary Health, and academic calls to focus on the "ecological determinants of health" (Howard et al, 2023). While the health relevance of climate change is not yet salient for most people, public awareness is growing (Campbell et al., 2023); 64% of Americans recognize climate change as a health issue (Leiserowitz et al., 2021). Health professionals in the U.S.—at least physicians and local health department directors—generally view climate change as a pressing health threat and support increased education and advocacy in the health sector (Hathaway & Maibach 2018).

Additionally, efforts to educate people about the links between climate and health boosts U.S. public support for climate policies (Kotcher et al., 2021; Myers et al., 2012; Stokes & Warshaw 2017), especially among moderate and moderately conservative people (Kotcher et al. 2018). However, it is unknown whether combining climate and health policies together is more popular than similar policies in isolation, though one study finds increased public support for climate policies that are combined with other social policies such as affordable housing (Bergquist, Mildenberger, & Stokes, 2020).

Research questions

In light of the need for climate and health policy advancement, and the lack of a clear roadmap of how to proceed, this report investigates U.S. climate and health stakeholders' perspectives on the following questions:

1. What is the perceived current state of integration (or lack thereof) of climate and health policy in the nation?
2. What do policymakers and other stakeholders see as the ideal relationship between health policy and climate policy, and climate-adjacent policy?
3. What barriers currently impede progress toward the ideals (as described in RQ 2)?
4. What opportunities have the potential to aid progress toward the ideal relationship between climate and health policy?
5. Which strategies are seen to be effective for influencing climate and health policy?

Methods

We interviewed 65 U.S. policy stakeholders in federal agencies, congressional offices, advocacy organizations, academic institutions, and think tanks from January 11th – April 24th, 2024. These stakeholders specialized in either climate policy, health policy, the climate-health intersection, or other related areas (agriculture, emergency response, housing and urban development, and transportation). We conceptualized "policy" to include legislation, authorization, appropriations, and implementation in the form of programs. We analyzed the data using qualitative content analysis. Additional details can be found in the methods section (page 61).

Multinational research context

This research is part of a multinational study funded by the Wellcome Trust. We partnered with researchers who conducted analogous studies in Brazil, the Caribbean, Germany, India, Kenya, and the U.K. The teams jointly workshopped the research design, including interview questions, sampling approach, and analysis methods. The research questions and analysis were also informed by input from stakeholders in the Global Climate and Health Alliance. The findings across all regions, including the U.S., were assimilated into a multinational synthesis report.

3. Findings

3.1. Current status of integration of climate and health policy

To understand the current interconnectedness of climate and health policymaking in the US, we asked participants to reflect on how connected or separate they felt policymaking on these two issues were, both in their own experiences and in the overall national policy ecosystem. Most participants perceived that climate and health were not yet strongly integrated in US national policymaking, but many noted promising developments under the Biden administration, such as the establishment of interagency working groups on extreme weather. Health sector participants reported signs of progress within health-focused government agencies, particularly the Office of Climate Change and Health Equity.

3.1.1. At the federal level, connections between climate policy and health policy are not yet viewed as strong, although they may be getting stronger

Overall, most participants believed that **climate change and health are not strongly linked at a national policy level** in the United States. Participants observed separations of climate and health throughout research, policymaking, and implementation. For example, they reported limited interaction between climate and health stakeholders and a lack of provisions for healthcare resilience in the Inflation Reduction Act:

> "With different [congressional] offices and their staffers … usually you get a climate staffer, or you get a health staffer … You're talking to one person who doesn't know that other side you're bridging to."
>
> *– Academic expert on climate and health*

> "I'd say that from a policy stance, they [climate and health] are not well intertwined. You can look to the Inflation Reduction Act as one example, where it's an extensive health policy bill, and it's an extensive climate policy bill, but there are no climate measures addressed to the Department of Health and Human Services, none of the hundreds of billions of dollars … I think that's emblematic of what has been a schism, especially in the legislative branch."
>
> *– HHS employee working on climate and health*

However, many participants mentioned that **climate change and health are becoming more integrated over time** due to years of advocacy by climate and health stakeholders, the leadership of the Biden administration, and increasing recognition of the connections between climate change, public health, racial justice, and other related issues:

> "I think that groups like ALA [American Lung Association] and the Medical Society Consortium and other medically related groups, along with the environmental groups, have succeeded … At least, the climate and health program at CDC has never been cut even though that has come up almost every year. I think part of that is because of its ability to have advocacy champions, especially the American Public Health Association as well."
>
> *– HHS employee working on climate and health*

> "I'm just happy the integration is starting to happen … The President [Joe Biden] has made a statement. That's huge. We have not had leadership as engaged at this intersection in the past … Now we're getting some direction, and I think we have a lot of the right minds at the table."
>
> *– Federal agency employee working on climate change and transportation policy*

> "There has been a further understanding among powers that be and decision-makers … that climate change is not just an existential crisis, but an intertwined crisis with our public health crisis, racial injustice, economic insecurity. And you have seen efforts to see them as intertwined issues, most notably with the administration creating climate offices in the HHS … and understanding that this is not something that we can just silo at the EPA and Interior."
>
> *– Climate advocate*

Several federal employees highlighted **promising climate-health initiatives** within the Department of Health and Human Services (HHS) and other federal agencies, though they said these efforts were still in their early stages:

> "There's a lot at CDC [Centers for Disease Control and Prevention]. There's everything from work on infectious disease forecasting, to management of tick-borne disease, to occupational risk from heat … [In] HHS more broadly, you've got all the work of OCCHE, which is working on decarbonizing the healthcare sector. You've got ASPR [Administration for Strategic Preparedness and Response] … engaged on disaster recoveries around climate shocks. FEMA [Federal Emergency Management Agency] is obviously heavily invested in the

disaster resilience and recovery space as well as providing insurance, and USDA [United States Department of Agriculture] has major investments in resilience."

– HHS employee

"At EPA [Environmental Protection Agency] … that's probably their main priority has to do with improving health … [and] the Department of Energy … I know that they are thinking about this quite a bit, and the idea of reducing emissions from the power sector has to do with improving health and environmental outcomes … It's definitely something that is top of mind for a lot of folks."

– Federal agency employee working on climate and transportation policy

"I think there is growing recognition of the need to address climate and health, and there are things that both USAID and CDC are doing in this space … but the amount being invested is small compared to the threat that is on the horizon."

– Federal employee working on health in a non-HHS agency

3.1.2. Climate and health policy are seen to be more integrated in some contexts than others

Participants noted that **climate and health tend to be considered together in specific contexts,** such as air pollution, extreme weather, and disaster response. They commented that climate-health work in these contexts occurs both within and across federal agencies. Examples of initiatives within agencies include the Office of Climate Change and Health Equity, the Environmental Protection Agency's work on pollution, and the One Health program within the National Oceanic and Atmospheric Administration. Examples of collaboration across agencies include the interagency working groups on climate and health issues formed under the Biden administration, such as the Interagency Working Group on Extreme Heat:

"Before this group started … it was a lot of agencies just going off and doing separate things on heat … The Biden administration started some interagency working groups on five different climate topics, and one of those was extreme heat. We have a White House liaison. Once a month, we get together with them … They helped bring in more agencies to that table."

– HHS employee working on climate and health

"The White House has done a really good job of setting a tone of collaboration … One example is around extreme heat. I'm very impressed by the President making a statement and issuing an executive order and forming an interagency working group around the topic. That has been a wonderful space for public

> health, engineers, architects, policy wonks working on all facets of this … to have more holistic conversations and start to set a national strategy."
>
> *– Federal agency employee working on climate and transportation policy*

Some of these contexts involve climate-informed health policies (e.g., increasing the climate resilience of healthcare systems), while others involve health-informed climate policies (e.g., quantifying projected health impacts to guide climate policies). Additionally, participants discussed certain contexts—such as transportation and housing—that cannot easily be dichotomized into climate or health policy, but have strong elements of both.

Climate policy spaces in which participants said health was mostly not integrated include the National Parks, the House Committee on Energy and Commerce, and the United Nations Climate Change Conference (COP). The health policy areas in which climate change was mostly not considered tended to be more general; they include healthcare systems (due to lack of funding), health insurance, and international negotiations.

3.2. Views about optimal integration

We asked participants whether they believed climate and health policies should be linked or separate, in what ways, and why. Overall, nearly all participants agreed that health should be considered in climate policy and vice versa. Although some conservative participants opposed the integration of climate and health into single policy instruments, they believed that climate policy should be informed by health impacts. Recommended climate-health initiatives included considering the health benefits of climate policy and improving the resilience and sustainability of healthcare, agriculture, transportation, and housing and urban development. Participants envisioned greater climate-health work both within and across federal agencies, and noted that a central climate-health organization could facilitate interagency collaboration.

3.2.1. Most stakeholders feel that climate and health policies should be further integrated

Most participants felt that climate and health should become more integrated in national policy. One common reason given was that **climate and health are inherently interrelated,** and so should be addressed together:

> "Just very practically, higher temperatures lead to higher heat-related illnesses. More climate change leading to natural disasters, that kills people. The changes in weather patterns leading to new vector-borne illnesses, that kills people. Every change you could think of in the climate affects people's health."
>
> *–Climate and health advocate*

> "I think it's very important to put them [climate and health policy] together … because I think that climate does directly impact people's health, so it's as much of a public health concern as toxins in groundwater, or anything else that we accept as a matter of public policy. I also think that it is a way to communicate what could happen if we don't address climate change."
>
> *– Federal agency employee working on climate policy*

Furthermore, participants said **integration ensures that climate is substantively considered in health policy, and vice versa:**

> "In the broader field of public health, environmental health is one small piece, and it's sidelined often. When we start off with an approach of climate and health together and not in separate areas, it really stems from making sure people are able to engage in similar language and therefore identify problems and build solutions together … Developing programs where health is not just frankly lip service, where it's a core tenet of how we're approaching climate change solutions, is really critical."
>
> *– HHS employee working on climate and health policy*

Some participants expressed the need to **make sure climate policy maximally benefits and minimally harms health and equity:**

> "If we are taking actions to address climate impacts, it's important to not do things that are maladaptive … Whenever we're taking actions in one space, it's important to consider how that affects all the other goals."
>
> *– Federal agency employee working on climate and health*

> "Something that's climate-positive could be health-neutral or not benefit health … I think that's a reason actually to think more critically about that intersection and how the solutions we are investing in are the ones that are the most beneficial on both fronts."
>
> *– Congressional staffer working on climate policy*

> "Putting them [climate and health] together helps us do things the right way more … and then you add in the equity piece of it. You need all components to make sure that you're doing the right thing … Like, you're changing to EV buses, which is cleaning the air, and you're making sure the bus stop that people use to get to the health system is still on that route."
>
> *– Climate and health policy advocate*

While participants called for careful attention to potential adverse health impacts, they overwhelmingly agreed that **climate solutions often benefit health.** Because of these health benefits, many participants believed that a health lens could strengthen public support for climate policy (see section 5.1.3).

3.2.2. Some conservative stakeholders prefer to have climate policy instruments kept separate from health policy instruments

In contrast to most participants' support for integrating climate and health policy**, several participants—especially those with a politically conservative background—preferred separate policy instruments** to address climate issues and health issues. One participant expressed skepticism as to how a single policy could optimally advance both climate and health goals:

> "I don't understand what policy instruments … optimize for both a health outcome and a greenhouse gas mitigation outcome. They seem to be pretty distinct instruments. Maybe health infrastructure or research should be informed by the fact that a bunch of old people living in Florida and Arizona are going to have a hundred days over a hundred degrees in the future, and therefore, there's a health infrastructure need … I mean, all these places in the Sun Belt are going to need cooling stations for like 6 months out of the year, because it's crazy how hot it gets … I feel like climate trends should inform long-term health investments and research, but I don't know what climate-health policymaking is. Certainly on the climate side, human health impacts should be part of the political tradeoffs that motivate different climate action … But I don't think the policy instruments to reduce emissions really change at all based on health impacts … You want to act on climate because climate change harms health in a number of ways, but other than understanding the cost curves of climate change, how is it relevant? … What the hell is climate and health policy?"
>
> *– Conservative climate strategist and advocate*

This participant narrowly interpreted the phrase "climate and health policy" to refer only to policy instruments that addressed both issues at once. They went on to say, however, that climate impacts should be considered in health infrastructure and research, illustrating this point with a mention of the dire health effects of extreme heat on elderly populations, and that health impacts should be taken into account as a motivation for climate policy.

Another participant, a congressional staffer working on climate policy, worried that the integration of climate change into certain areas of health policy would alienate conservatives. As mentioned in section 2.4, this staffer mentioned air quality as an area in which climate *does* belong because of the clear links between fossil fuel use and air pollution. In contrast, they saw

healthcare sector decarbonization as a case in which a climate focus would intrude on other, more pressing problems:

> "If you say, 'We should run every hospital on renewable energy to achieve ESG goals,' I'd be like, 'What? No. We want to make sure people don't die, and we have enough people without healthcare in this country, we don't need to be debating renewable energy as it relates to healthcare.'"
>
> *– Republican congressional staffer working on climate policy*

3.2.3. Enhancing the sustainability and resilience of healthcare systems is a top priority

Unlike the participant quoted above, several participants stressed a need to **reduce the carbon emissions of the healthcare sector** through mandates or other policy mechanisms:

> "I would certainly love to see hospitals and health systems be mandated to do sustainability and get to their path to net zero … Healthcare needs to be out front, because literally people are dying, and we can't be standing around not taking action."
>
> *– Climate and health policy advocate*

> "In an ideal world, we would have some mechanism to not just encourage but eventually drive down, within our own authorities, emissions at hospitals and other covered entities within the healthcare sector."
>
> *– HHS employee working on climate and health*

An even more prominent theme was the need to **make healthcare systems resilient to climate impacts:**

> "Major focuses that I'm hearing in working with agencies in this area is that they really want two things: to decarbonize the health sector, and then also to prepare healthcare systems. For example, this could be an early warning system where there's going to be flooding in a certain area after a hurricane. We need to prepare the hospitals, prepare our treatment plans for our patients … What's our evacuation plan? What are our plans for once all the sewage is flooding in everyone's home?"
>
> *– Academic expert on climate and health*

> "One way [in which climate should be integrated into health agency work] is making sure we have better facilities set up, that we're improving the resilience

> of health centers that are out there … Puerto Rico, for example, there was a health center there that got capital funding to install solar panels. They, of course, are very vulnerable because they're in a key hurricane path … A second way that we could be thinking more about climate impacts is by creating better early warning systems for clinicians. So, if we know that there's going to be an extreme heat event, putting out resources to better assist clinicians to recognize what heat stress might look like."
>
> *– HHS employee*

3.2.4. Additional areas for further integration of climate and health policy include air quality, agriculture, transportation, and housing and urban development

Other related policy areas in which participants thought climate and health should be linked include air quality, agriculture, emergency preparedness and disaster response, food and water governance, transportation, housing, and urban development:

> "If you talk about, 'We have bad air quality that's increasing asthma, it's increasing other things, how do we deal with that,' it would make sense to talk about them [climate and health] in the same way, because being a better environmental steward will allow people to live a healthier life and be in the area."
>
> *– Congressional staffer working on climate policy*

> "Building codes do matter a lot to human health, to injury and death in these situations. When we're rebuilding after a disaster has destroyed an area, are we looking to some of those public health and human health factors? Are we building places well, with more green space, in a way that can be both beneficial to the environment, prevent damage from future disasters like flooding, hurricanes, and also allow people to be able to increase their social capital and connect with each other?"
>
> *– Federal employee working on climate and health policy*

3.3. Barriers to optimal integration

We asked participants to describe any barriers impeding progress toward what they see as the ideal integration of climate and health policy. They identified many obstacles, including lack of funding, political polarization, low awareness of climate-health links, lack of needed data, government and professional silos, stresses on the health sector, communities' perceived economic reliance on fossil fuels, the short time horizons in policymaking, and the sometimes indirect connections between climate change and health impacts.

3.3.1. Funding for climate and health policy work is limited

One of the most commonly mentioned barriers to climate and health policy advancement was a **shortage of funding,** particularly for federal government initiatives:

> "Funding is probably the biggest [challenge], and at every scale … at the national scale, but also at local, state, tribal, territorial levels, too."
>
> *– Federal agency employee working on climate and health*

> "Any of these [interagency] working groups, especially wildfire and extreme heat, where we're dealing with some of the most substantial impacts to public health, are typically incredibly under-resourced, in my opinion."
>
> *– Federal agency employee working on climate and transportation policy*

> "The Office of Climate Change and Health Equity doesn't have any funding right now. So that's a big gap that needs to be filled."
>
> *– Climate and health advocate*

One participant also noted that most federal funding for health flows to the National Institutes of Health, which are primarily focused on fundamental, "bench science" research and do not have regulatory power. It was also mentioned that some stakeholders within NIH were concerned about the possibility of missing out on congressional funding due to a focus on climate change.

Several other participants likewise raised concerns about **Congress's unwillingness to fund projects related to climate change** (as well as health equity):

> "The HHS [Health and Human Services] office doesn't have any funding, and certain members of Congress aren't quite interested in supporting work on climate and health."
>
> *– Communications strategist working on climate and health*

> "[It] really is a funding issue, so that takes congressional action. It's tricky because the name of the office is the Office of Climate Change and Health Equity, and we hear that Republicans, when they see climate change, when they see health equity, cross it off. It's tough to build support when the very name of the office … raises suspicion or opposition at the federal level."
>
> *– Think tank employee working on health policy*

> "Congress has not given enough money to this … Discretionary budgets are constrained … [and] I think that there is a sizable chunk of the membership of Congress that 'control-fs' [searches] the word climate when they're looking at legislation and deletes it."
>
> *– Climate and health advocate*

3.3.2. Political polarization is widely seen as inhibiting advancement of climate policy, health equity policy, and their intersection

As in the above quotes, several participants suggested that **congressional opposition can be traced to political polarization of climate change,** as well as health equity. Political polarization reportedly made it difficult for federal employees to make lasting progress on these issues, since their efforts could be disrupted by an unsupportive administration:

> "[President Trump] pulled us back quite a bit in terms of accomplishments and progress we were making on climate … It's hard to make permanent change if there's a possibility of a complete switch in the way of doing business and the way people see the problem."
>
> *– Climate and health advocate*

> "How do you get your day-to-day work done when someone's trying to dismantle you? The climate change topic is one that's particularly vulnerable to that, because it's such a hot topic."
>
> *– Federal agency employee working on housing and public health policy*

Participants gave a broad range of explanations for conservatives' opposition to climate policy, including fossil fuel industry misinformation campaigns. One explanation of particular relevance for climate and health equity policy is that **conservatives see climate policy as a vehicle for a progressive "woke agenda":**

> "The more that the left morphs climate change into this giant Christmas tree of everything progressives have ever wanted or could think to want, the harder it is … It contributes to the vicious cycle of polarization."
>
> *– Conservative climate strategist and advocate*

> "I think one of the reasons climate has become so polarizing is because people feel like it's being injected in places it doesn't belong, and there's an alternative motive … I would say, do it [combine climate and health] when it's true. Don't do it for the sake of doing it, but if something's very legitimate, and there's causality, of course you would want to consider both things at once … It's not the climate issue, it's that they [progressives] have caused it to be baked into AOC [Alexandria Ocasio-Cortez] and the Green New Deal, and this woke agenda, and this big government."
>
> *– Republican congressional staffer working on climate policy*

Some participants felt that, through this lens, climate and health policies—and especially policies focused explicitly on equity—could be seen as illegitimate attempts to advance progressive agendas by combining unrelated issues.

3.3.3. The public and policymakers are thought to have a limited understanding of the links between climate change and human health

Low public awareness was frequently identified as a barrier to advancing climate and health policies:

> "If the public demands protections from the climate because it's hurting the health of them and their family, that will cause policymakers to act, but I don't think the crisis has evolved at that level … I just don't think the general public is quite there."
>
> *– Climate and health advocate*

> "When we were trying to pass a carbon tax here in [State] … we had terrible fires, and it created the smoke in the sky … and people were coughing [and it was] exacerbating people's asthma, we were warned by polling that suggests people wouldn't believe that this kind of public health issue is connected to this possible [legislative] initiative. There needs to be a further understanding of the issues being intertwined for us to move forward."
>
> *– Climate advocate*

Participants also noted **lack of awareness of climate issues among health experts and vice versa:**

> "The health sector is relatively late to considering these things. Awareness is relatively low. This is something our office is working very hard on."
>
> *– HHS employee working on climate and health*

> "My colleagues … haven't learned about climate change … Historically, there was not a connecting of dots as to why climate mattered to everything from your cholesterol, to your risk of MI [myocardial infarction], to heart disease in general."
>
> *– HHS employee*

> "There's definitely an information availability challenge for Hill staff. I've been surprised, since coming to the Hill, about how much of a bubble it is. As a Hill staffer, you only really read what's put in front of you … I know that there's a lot of research, and there's a lot of experts all around the country thinking about the environment and climate-health nexus, but that stuff doesn't really reach us."
>
> *– Congressional staffer working on climate policy*

As in the above quote, participants reported that **policymakers and staff are likewise unaware of climate-health links.** One participant commented that congressional staffers are incentivized to specialize in only climate or health, resulting in few staffers having expertise in the climate-health intersection:

> "It's built that way, frankly, with them [policymakers] having a healthcare legislative assistant and a healthcare legislative correspondent, and a climate legislative assistant and a climate legislative correspondent. The incentive structure, when working in those offices, is to mine down deep on your issue and not to learn more about other topics, because when the senator or rep comes to you and needs your advice, you need to be an expert on it."
>
> *– Climate advocate*

In addition, one participant suggested that **policymakers do not grasp the depth of their constituents' concern** about climate and health issues:

> "I think there are a lot of folks on Capitol Hill that are out of touch with their districts in that they don't think these things are priorities, whereas maybe the constituents do."
>
> *– Climate and health advocate*

3.3.4. There is a dearth of important information needed to support climate and health policy

Several participants mentioned that there was insufficient information available to inform climate and health policy. One such knowledge gap is the lack of **data about the health impacts of climate change** and their associated economic costs, which are said to be difficult to quantify:

> "The country is spending incredible amounts of money in responding to the increase in [climate] changes … just recovering from wildfires in every jurisdiction … I think the money needs to be brought into it, the economics of it. We still don't have a good handle on, what are the health impacts? What are the cost impacts to the nation? And being able to articulate that, having that data, and the transition to being able to be resilient."
>
> *– HHS employee working on climate and health*

> "Quantifying the public health impact of anything is really hard … It's really hard even knowing what do you attribute a hospital visit to, how much does a hospital visit cost, what do you do for people who are getting sick but aren't at hospitals. The data here are not very good. You might have the ability to do these macro-level impact estimates, [but] you're doing it with a whole bunch of error around it."
>
> *– Think tank and university faculty*

> "When you're looking at losses, it's easier to quantify damages or loss of building structures … There's a lot of health impacts beyond death, injuries, that aren't always quantified very well … There's sometimes health effects [that] just aren't tracked. People don't necessarily go to the hospital for them … That might be one historical reason for why … we, for our grant programs, have traditionally used various cost-benefit analyses, and the methodologies are really focused on quantifiable economic losses … That's something that people are trying to change."
>
> *–Federal agency employee working on climate policy*

Data about the health benefits of climate solutions was also reportedly lacking:

> "We're missing some information that we need to have. [We need] better research that would help us better document health benefits of various climate policies. That research probably needs to be collaborative research between the health world and the non-health, climate world—everything from earth science to ecology, to forestry, to agronomy."
>
> *– Academic expert on climate and health*

Furthermore, one participant mentioned **data accessibility barriers** between state- and federal-level government, which make it hard to comparatively assess program outcomes:

> "We have a responsibility to do better with data sharing and using the health data we have … We only get what the states will give us, and not every state wants to share, or they don't want their data reported publicly in certain ways, which is totally reasonable in many cases … How do you know that you're doing well when it comes to heat resilience? One way to know would be comparing yourself to others. Well, we can't really do that right now."
>
> *– HHS employee*

3.3.5. Silos in federal agencies and in professional communities inhibit climate and health policy integration

Participants stressed that **silos between federal agencies** impede the integration of climate and health policy. One problematic division is the separation of agencies' funding streams. Although agencies can combine their funding for joint projects, this is said to be a complex undertaking because of how Congress allocates budgets:

> "When we're thinking about these big projects, because the money is allocated from Congress out of these certain buckets that come out of certain committees … finding a way to braid that funding together is a little bit of a nightmare … It's not like we have a stockpile of money that we could dip into for a joint project."
>
> *– Federal agency employee working on housing and public health policy*

Concerns about funding also reportedly lead agencies to hew closely to their mandated focus area, inhibiting consideration of intersecting issues:

> "The biggest challenge for us is our political mandate. Our goal is to address HIV … We don't want to move away from that agenda for fear that it might water down the impact of HIV-specific dollars."
>
> *– Federal employee working on health in a non-HHS agency*

One participant also noted **technical barriers to collaboration,** such as agencies' use of non-standardized operational metrics and data:

> "They [federal agencies] use very different reporting standards in terms of their units of measurement. . . you'll end up having to have some kind of bespoke model that estimates the relative impacts of different changes in the energy system to the health system. You can't directly tie those together. And I think there's a kind of a base data sharing, data collaboration perspective that you need between some of these different agencies."
>
> *– Think tank employee working on climate policy*

Despite these difficulties, participants named several interagency initiatives currently making strides at the intersection of climate and health, such as the Interagency Working Group on Extreme Heat. However, some participants said that **interagency groups are time-consuming** and challenging to juggle amid other work priorities:

> "If I have four work group meetings in a week, that's four hours of my time that's already gone … It can just feel like a lot … You're like, 'Didn't we just have this conversation last week?,' but the answer is, 'Yes, we did, but there are … one hundred and twenty people in this work group, so we have to keep saying it.'"
>
> *– Federal agency employee working on housing and public health policy*

> "Everyone is stretched thin with resources and time … Working in the interagency space … that's [on] a voluntary basis, and it's often seen as separate from someone's day job when it should be, like, 'No, this is also your job to know what this other federal agency is doing.'"
>
> *– Academic expert on climate and health*

Participants also observed **silos between health and climate communities** more generally, noting differences of perspective, training, communication, frameworks, and priorities:

> "When I was first venturing into this field, I think there was a little bit of distrust from both sides … People coming at it from the medical perspective, someone with an MD treating patients on the ground, have a very different perspective than someone coming at the problem from the climate side."
>
> *– Federal agency employee working on climate policy*

> "There's very little familiarity with the issues of climate on the health side and [a] passing acquaintance … with health issues on the climate side. Different

> people, different training, different languages, different policy frameworks that they work in, different priorities. They really are two very siloed worlds."
>
> *– Academic expert on climate and health*

> "[The coalition] that we build and work with … has a small universe of areas where they're in complete alignment, and that small universe of areas just simply doesn't include speaking often about the experiences of human health in climate change … It just doesn't rise to the level of place that we can get agreement between major manufacturers, consumer brands, environmental organizations, former secretaries … The common language that they share tends to be really high-level, econometric approaches rather than personal narrative."
>
> *– Think tank employee working on climate policy*

Moreover, a few participants commented that **health professionals are reluctant to advocate for climate action** because they worry it could erode trust in their profession or reduce bipartisan support for health policies:

> "There is a resistance in some of the health groups that I've worked with that doesn't necessarily exist in the same direction from climate folks, who maybe are used to thinking of things a little bit more intersectionally. Health folks are worried that climate will in some way dilute their respectability if they seem like they are seizing on a partisan issue or a leftist or movement issue."
>
> *– Congressional staffer working on climate and health policy*

> "There's this sense that food security is something for which there's bipartisan support … there's this sense that climate change is even more polarizing, and so they don't want to pollute the sanctity of their food security message. But it's unfortunate to me because these same representatives think that SNAP [Supplemental Nutrition Assistance Program] is a handout, and they are okay denying low-income families and children food, and so I would say we shouldn't be kowtowing to that point of view to begin with."
>
> *– Climate and health advocate*

3.3.6. The health sector is complex, under stress, and has other competing priorities

Other reported barriers facing the health sector included the **complexity of the health system,** the **prioritization of other public health issues,** and a **stressed health sector** struggling with limited resources:

> "People are shutting down because the health sector is so stressed right now. That's just a huge barrier. The legacy of Covid in a setting of already financially stressed health systems … There's a lot of health systems that are still in a financial crisis. And so it's very hard, even though this [decarbonization] makes financial sense in a medium-term, not even a long-term [sense], they're so at risk in the short term that it's hard for them to start to divert attention to this."
>
> *– HHS employee working on climate and health*

These barriers can make it difficult for health professionals to engage in advocacy, as well as healthcare facility sustainability efforts:

> "There are a lot of climate and health advocates in the healthcare world now. A growing number. But … [if] you're a hospital CEO, what are you taking a meeting on this hour? Is it on the sustainability plan, or is it on the fact that there are no nurses?"
>
> *– Climate and health policy advocate*

3.3.7. Climate policy, in general, faces major challenges, such as communities' perceived economic reliance on the fossil fuel industry

On the climate side, participants mentioned challenges such as the fossil fuel industry's influence on policy and public beliefs, climate change denial, the perception of climate change as a distant and abstract phenomenon, the unpopularity of taxes and regulations, and communities' concern about potential economic costs such as loss of fossil fuel jobs:

> "I think there's two types of personal experience in the frontline community mindset. One of them is, 'That facility is spewing pollution, and that's going to impact my health and my kids' health, and I'm worried about that.' And then the other one is, 'I work at that facility. That smell in the air is the smell of my paycheck.'"
>
> *– Think tank employee working on climate policy*

> "We have communities across the country that … rely on these [fossil fuel] industries for jobs and economic productivity, and to fund their schools. We don't have great credible strategies for the transition of these communities, either."
>
> *– Academic expert on climate policy*

Several participants also noted that **climate policy is often perceived as incurring local, tangible economic costs in exchange for global, abstract health benefits:**

> "Climate change is a really tricky issue because you need local actions to contribute to global benefits. It's very hard to convince people to do that."
>
> *– Federal agency employee working on climate and transportation policy*

> "It's very, very difficult to counter—even if it's not true—an argument that action will cost an individual money … with the abstract nature of the health benefits. We're not saying that **you** will save money, or that **you** will survive. We're saying, 'Oh, my gosh, millions of people somewhere … millions of dollars somewhere that someone's spending, but I don't know who's spending that.' I think that that's been a problem all along: using abstract, societal benefits to counter individual harms and costs."
>
> *– HHS employee working on climate and health*

However, participants pointed out that in many cases, the health benefits of climate action are in fact realized locally and immediately, suggesting—as in the above quote—that this is mainly a problem of perception and messaging.

3.3.8. Short-term pressures in policymaking undermine long-term thinking

In addition to the above barriers specific to the health and climate sectors, participants noted that in general, **rapid election cycles** deter policymakers from investing in policies with long-term benefits:

> "No matter the administration, the goal of the White House is to say, 'Look at all this stuff we're doing!' … Sometimes it feels like a checklist activity instead of, 'How are we doing this in a long-term, stable way?' … It's just the way our political system is built. Everything is always about the next election."
>
> *– Federal agency employee working on housing and public health policy*

For example, one participant explained how their state governor refused to fund a climate resilience policy with a small up-front cost that would enable access to much greater Inflation Reduction Act resources:

> "What our bill was asking for was 10 million dollars to help schools leverage billions of dollars in federal [Inflation Reduction Act] funding that isn't going to last forever, so we had hoped that Governor [Name] would be forward-thinking enough to say, "Okay, fine, yes, we are in a deficit year, but this is an investment we need to make now so that we can access those Inflation Reduction Act dollars" … To not have that kind of forward thinking is really disappointing."
>
> *– Climate and health advocate*

While participants underscored a need for stable, long-term planning, they suggested that certain health benefits of climate policies—such as reduced air pollution from shutting down fossil fuel operations—would manifest in the short term, making them more attractive to policymakers and the public (see section 5.1.3).

An additional reported barrier related to the pace of policymaking was that climate and health stakeholders' sense of urgency is in tension with the need for meaningful inclusion of frontline communities:

> "There's this tension … of moving with expediency and urgency, but also taking the time to meaningfully involve and partner and collaborate with … frontline communities experiencing the brunt of these issues and these burdens."
>
> *– HHS employee working on climate and health policy*

3.3.9. The links between climate change and health impacts are sometimes indirect, which can undermine policy support

Finally, several participants noted that the **indirect nature of some health harms of climate change** weakens support for climate and health policy. For instance, one participant remarked that indirect links between fossil fuel emissions and health harms makes it hard to build political will for reducing emissions:

> "I think it's just harder to sell emissions reduction benefits because there's so much noise in the cause-to-effect chain versus a near-highway or an airport community that's seeing increased asthma rates in children where it's really easy to demonstrate the causal relationship."
>
> *– Federal agency employee working on climate and transportation policy*

"Noise" could refer here to the cascading, domino-like nature of climate impacts. For instance, vector-borne diseases are reportedly challenging to study because they are not directly affected by fossil fuels, but by the climatic changes greenhouse gas emissions produce:

> "Vector-borne disease is complicated because the connection is so much more distant … Vectors are very responsive to their environment, but there are so many factors that sit between: temperatures and precipitation, those sorts of variables that we would look into."
>
> *– Federal agency employee working on climate and health*

Another type of indirectness that came up is the overlap of multiple fossil fuel pollution sources, which means that even if a given community succeeds in phasing out fossil fuels, they may not experience total resolution of local health problems. That is, local emissions reductions are

necessarily but not sufficient for alleviating the health harms of fossil fuels, and must be accompanied by regional, national, and international emissions reductions.

3.4. Opportunities to advance integration

We asked participants to describe possible opportunities for advancing climate and health policy. Their answers spanned advantageous situational factors, such as rising public awareness and new funding opportunities, promising policy opportunities, such as the upcoming Farm Bill (a package of national legislation passed every five years that has a major influence on the U.S. agricultural system), and policymaking procedures that could be harnessed, such as the power of the executive branch. They also highlighted the value of implementing and publicizing previously passed policies, especially the Inflation Reduction Act.

3.4.1. Awareness and support for climate and health policy is on the rise

Reflecting on the views of policymakers and the public, many participants observed **increasing awareness of, and concern about, the health harms of climate change.** Participants attributed this change to increased extreme weather and media coverage thereof, the priorities of the Biden administration, and the coronavirus pandemic:

> "I think recently there has been a lot more attention and interest … due to the [Biden] administration priorities, due to [climate change] showing up more and more in the news as we see more impacts."
>
> *– Federal agency employee working on climate and health*

> "There's been science [on the health impacts of climate change] for a long time, but I think there's been more and more awareness. Unfortunately, people are living it more and more. We don't have to do that much work anymore to connect the dots that climate change might lead to your kid having an asthma attack. Everyone in America breathed it last summer."
>
> *– Climate and health advocate*

> "Especially coming out of the pandemic, there's a lot more thinking in the public sphere about air quality and respiratory issues. I think if policymakers and stakeholders did a better job of communicating the negative impacts of … natural gas furnaces and natural gas plants … people would be more concerned, and maybe more receptive to clean energy technologies."
>
> *– Congressional staffer working on climate policy*

> "Health is … a key message of every single regional chapter [of the National Climate Assessment], which was not something we mandated to have happen, but happened on its own based on the feedback we received from the public … … I can think of one chapter in particular that they didn't even have an author on the team who was an expert in health, but … they brought on authors who were experts, and then revised their outline to better include health in their chapter, because it's of such interest to the people in their region."
>
> *– Federal agency employee working on climate policy*

Participants also observed **rising support for climate solutions, especially among young people:**

> "There's more younger voters who really are looking at their candidates through that lens … Look at President Biden's election. There's no question that a lot of young voters were motivated by his promises on climate, and there's no question this administration has done more about climate than any other administration by far."
>
> *– HHS employee*

> "I think the young people, particularly because they're not beholden to all of our baggage that older people are, are able to think in ways that we've stopped thinking … I was working with Zero H [Hour], and they sent over their first list of policy demands, and … I'm like, 'None of this is feasible,' and they were like, 'We don't care' … That's so refreshing, that attitude of, 'It doesn't really matter if it's feasible. This is what we need.'"
>
> *– Climate and health advocate*

Several participants also observed that **conservative support for climate action is rising,** both among young people and more generally**:**

> "Cultural change among young people has resulted in it being a value about climate action for both young progressives and young conservatives. It's not an issue position. It's a value."
>
> *– Conservative climate advocate*

> "There's an organic trend towards more conservatives caring about climate and doing so publicly. The second largest caucus in the United States Congress is the House Conservative Climate Caucus, with over 80 members that talk openly about climate. Over 80% of young Republicans take climate change seriously."
>
> *– Conservative climate strategist and advocate*

> "In my almost 17 years of working a lot on Capitol Hill, I've seen more and more Republicans understand that climate change is real … They still tend to think it's more of a future event than a current event, and that's why we're really talking about the health impacts and the cost right now."
>
> *– Climate and health advocate and faith leader*

Participants particularly mentioned conservatives' support for climate adaptation, care for the local environment, permitting reform, carbon border adjustments, and onshoring foreign industries.

One participant also stated that **policymakers are concerned about climate and health issues that directly affect their constituents,** even if they do not acknowledge the link to climate change:

> "We have had conversations with offices who are not known to be vocal supporters of climate action, but who acknowledge the impacts that their citizens are facing, whatever they attribute it to. People who have lots of wildfire smoke … might not be bearing the flag of, 'We need to address climate change because that's what's driving these fires,' but they care about the fires."
>
> *– Climate and health advocate*

Furthermore, a few participants felt that there was **growing interest in climate and health work in the Department of Health and Human Services,** particularly in conjunction with issues of health equity:

> "There's genuine interest in issues of health equity, and thinking about health-disparate populations much more strategically … This administration has been very energetic and proactive in trying to facilitate [it] … There's been an incredible amount of shifting to thinking about communities, and especially communities that have not had access to resources … I think there's a lot potentially happening in these spaces."
>
> *– HHS employee working on climate and health*

Participants also reported that **climate researchers are becoming increasingly interested in health, and vice versa.** One participant highlighted new academic journals dedicated specifically to climate and health.

> Additionally, participants remarked on **increased support for climate and health at the international level**. Several participants mentioned the Health Day organized at the 28th session of the United Nations Framework Convention on Climate Change (COP28) in 2023 and expressed hope that this momentum would continue through future COP meetings and domestic policy:
> "More and more health folks are getting involved … I think we did see that at this year's COP, in terms of, we had the Climate and Health Day … I think there's definitely an opportunity through building off that momentum … to make next year stronger in terms of commitments or in terms of the negotiations and some of the text that comes out."
>
> *– Climate and health advocate*

> "We've had the first Health Day at COP, and I see that as super promising as long as the outcomes can be translated to a domestic level and not just in the international sphere."
>
> *– Academic expert on climate and health*

Notably, **participants themselves voiced interest in learning and thinking more about climate-health links:**

> "Now you've got me spinning, and I want to learn a whole lot … Please keep me informed as you're maturing this analysis … I appreciate when my blind spots are pointed out to me."
>
> *– Think tank employee working on climate policy*

> "I am grateful … Now I'm going to have this at the top of mind when I'm like, 'Oh, we need to be thinking about this.' I'm already thinking of ways we need to be thinking about it."
>
> *– Federal agency employee working on climate policy*

3.4.2. New resources are emerging in the forms of funding, information, and technologies

In addition to the promising attitude shifts mentioned above, which respond to the problem of low awareness, participants discussed opportunities to address the limited availability of funding and information. Several participants mentioned **underutilized funding opportunities for**

climate and health work under the Biden administration, especially in the Inflation Reduction Act and the Bipartisan Infrastructure Law.

> "The new tax credits that are available through the IRA [Inflation Reduction Act] for non-profit healthcare providers [are] a really great opportunity, but I don't think many healthcare providers know about it, or really even have the background or knowledge to know what to do with the resources. There's a lot to be done there in terms of making sure that people who are eligible, or communities or institutions that are eligible, know about it and have the technical support to apply."
>
> *– Think tank employee working on health policy*

> "No one knows about the Inflation Reduction Act. It's really quite stunning. It's one of the largest investments in public infrastructure since the nation was electrified, and to most people it's sort of a nothingburger … It's really quite breathtaking in the scope of actions that are possible."
>
> *– HHS employee*

They also noted the **growing availability of relevant data sources** and means of collecting additional data, for instance through federal agencies like the Center for Medicare and Medicaid Innovation that are permitted to gather data as part of their mandates. One participant proposed that artificial intelligence could be helpful in providing data and analytical support to communities.

Additionally, the increasing affordability and accessibility of renewable energy technology was seen as a boost to climate policy in general, and thus to climate and health policy as well.

3.4.3. The President can do more through executive action

A few participants commented on the **possibility for the executive branch to advance climate and health** through actions such as declaring a climate emergency, denying fossil fuel infrastructure and exploration permits, and allocating funding to climate-health initiatives:

> "There is ample legislative authority out there to do almost anything you want to do. What it takes is the will to exercise that authority … For example, the President has plenty of authority to regulate environmental challenges at one level or another, but he needs to have the political air cover to exercise that aggressively … What we're trying to do is not just affect Congress … It's about regulations and public demand."
>
> *– Health policy expert*

> "[I would love to see] strong executive actions. I would love to see [a declaration of] climate emergency or more ambitious denials of fossil fuel infrastructure permits, and more aggressive action at the federal level against the fossil fuel industry."
>
> *– Senate staffer working on climate policy*

> "We just need additional funding to mobilize around this issue. There could probably be some more coordinated efforts within the executive branch on putting things into the President's budget that we really need, and working with Congress to get things funded that are a priority for all agencies."
>
> *– Federal agency employee working on climate policy*

However, previous President's budgets under the Biden administration have proposed funding for CDC's Climate and Health Program and the Office of Climate Change and Health Equity, which were subsequently cut by Congress (Joselow, 2022; Krisberg, 2021; The White House, 2023). Similarly, some participants noted that **congressional legislation would have more permanence than executive orders:**

> "In President Biden's administration, when he came in, one of the first actions was for the Secretary of Health and Human Services to set up a climate office there … The executive branch does have some latitude in what they do, but it would be great to have Congress actually legislate something permanent."
>
> *– Senior government expert on climate policy*

> "I don't think he [President Biden] gets enough credit for the Bipartisan Infrastructure Law and the Inflation Reduction Act … There are congressional mandates now for this work to get done, so even if President Trump or somebody else comes in and wants to overhaul it, they can't … That's really significant for climate and health."
>
> *– Federal agency scientist working on climate and health*

3.4.4. Diverse policy areas, such as agriculture, transportation, and housing, hold feasible opportunities for climate and health

Participants highlighted an array of policy areas as feasible for addressing climate and health, including agriculture, transportation, and housing and urban development:

> "The next big climate legislation that people are thinking about is the Farm Bill and the ways to support farmers and more regenerative agriculture and land conservation policies—ways to protect water, protect our lands, protect food. I

> think those all have obviously a lot of connections to health … And then it's just continuing to double down on a lot of the work that's happening with transportation policies and building policies and power plants. EPA's about to finalize hopefully a number of rules and regulations on that front."
>
> *– Communications strategist working on climate and health*

> "Not building more highways would be a really big change that would positively support transportation decarbonization, and supporting more roadway pricing … parking and curb management and supporting more opportunities for loading zones which reduce risk to active transportation users … and then supporting housing … in a compact and smart growth manner, like infill development in particular, has really important transportation decarbonization impacts. Those are low-hanging fruit opportunities."
>
> *– Federal agency employee working on climate and transportation policy*

Participants also noted promising areas for advancing climate policy, which would in turn benefit health. These areas included renewable energy policy, including clean energy permitting reform, and trade policy, including carbon border adjustments.

3.4.5. The potential for healthcare cost savings is large and compelling

Several participants saw an opportunity to **assess and pursue the healthcare cost savings of climate policies,** which are predicted to be extensive:

> "If you ever look at NOAA's [National Oceanographic and Atmospheric Administration's] billion-dollar disasters, health is not included in those economic costs … You could put it into health costs. How many people went to the hospital? What was the cost of those people going to the hospital? What was the increased use of medications? … Those considerations have to be also at the table, and some of them are very concrete and explorable."
>
> *– HHS employee working on climate and health*

> "My group is looking at the health co-benefits of climate mitigation. We published a modeling study showing that if we could decarbonize across sectors, that would save 53,000 American lives every year, and over 600 billion dollars in avoided mortality and hospitalization costs."
>
> *– Academic expert on climate and health*

3.5. Strategies to advance integration

Lastly, we sought participants' views on how best to advance climate and health policy given the barriers and opportunities they described. We also asked for recommendations on how to communicate about climate and health, especially in advocacy to policymakers. The sections below begin with this question, then move on to strategies they raised related to education, research, policymaking, implementation, and activism.

3.5.1. Enhance communication

Participants had many suggestions about communication, both to policymakers and to the public. These include how to discuss climate change and health in relation to other issues, the choice of target audiences and messengers, the need to build relationships and set the right tone, and how to tailor communication to conservative audiences.

3.5.1.1. Communicate the links between climate change and health

Participants recommended **framing climate in terms of health** both to policymakers and the general public. The main rationale they gave was that, while climate change is oftentimes perceived as a distant "polar bears on melting ice caps" problem, health is an immediate, close-to-home priority for almost everyone:

> "The problem is, we start with climate. We say, 'Let's protect the future.' The future is a precious thing, but sadly, for too many people, it is a luxury beyond their grasp … Let's talk about, 'You want your child to grow up healthy. What does that take?'"
>
> *– Health and Human Services employee*

> "Across the board, wherever you are in the U.S., people care about their health and their health systems. Leaning in on that … is definitely a way to have [a] broader impact on climate resilience and community resilience."
>
> *– Academic expert on climate and health*

> "We've done a lot of polling over the years on so many issues, and nothing gets public support for a climate or clean energy issue faster than to talk about the health impacts. That shows up in poll after poll … If you frame it as a health issue, especially for vulnerable groups, you tend to get much more support than if you just talk about it in the abstract."
>
> *– Climate advocate*

To best leverage the immediacy and personal relevance of health, participants recommended that advocates **discuss specific, local, tangible, personal, and present or near-future health impacts of climate change.** One participant explained that this concrete and immediate focus was especially important when addressing healthcare providers:

> "Some of the language and messaging is so 100,000-foot view, like the gigatons and the kilowatts and the millions of gallons of water … all these numbers are important to folks who are in the space, but … it doesn't all get translated to, 'This is why it matters to this community health center. This is why it matters to this hospital's core mission of keeping these people alive today.'"
>
> *– Climate and health policy advocate*

Several participants also believed that **framing climate in terms of health can help depolarize climate policies,** either by emphasizing the personal relevance of climate change or by shifting policy frames away from climate:

> "My feeling is that there's much more common ground around the health issue. If you highlight the health part of climate change, and say, 'Hey, this is about our health, not just about polar bears,' there are many more moderates and people across the aisle that would come on board."
>
> *– Academic expert on climate and health*

> "The climate discussion has become so polarized and such a partisan issue, that if there are ways to move it out of that, that would be very helpful for climate policy. Five years ago, I would have said that human health would be a very easy sell, that it's much less controversial. Post-Covid, that probably is … a little different, but I do think if you can move it [climate] away from this [polarized] area where it is, that it would be beneficial … and I think health could provide those opportunities."
>
> *– Think tank employee working on climate policy*

However, it should be noted that multiple participants expressed concern that the depolarizing potential of health has been weakened following the politicization of the coronavirus pandemic response.

Some participants said that while messages about climate and health appeal to certain audiences, other audiences may be more receptive to other aspects of climate change, such as national security or economics. Still, health emerged as one of the most promising themes to emphasize:

> "I do think in some circles, the economic message might be a stronger one. So, do I always think that it [health] is the strongest message? No. But if you looked across all your various choices, and I only had to choose one, which one do I think will consistently get you the farthest regardless of audience, I would choose health."
>
> *– Climate and health advocate*

Participants suggested mentioning health impacts such as infectious disease and mental health, but also the health benefits of climate solutions, such as lives saved. They said it could be especially helpful to **highlight policy "win-wins"** that benefit both climate and health simultaneously. Several participants preferred a "win-win" message about mutual benefits to the term "co-benefits," which they saw as subordinating one issue to the other.

3.5.1.2. Highlight the health economic harms of climate change and the health economic benefits of climate solutions

In addition to a focus on health, many participants suggested **discussing economic costs and benefits,** both to policymakers and to the public. They especially recommended highlighting the economic costs of climate-driven health harms and lost labor hours, the affordability of renewable energy, opportunities for job creation, and the financial benefits of climate policies via reduced healthcare costs:

> "When we do briefings to Congress … we talk about 'Here's some data on health impacts … that over a thousand people on average die a year from heat-associated illnesses.' And then … 'Here's the amount that heat impacts outdoor workers and indoor workers and how that impacts the hours of labor lost and productivity.' Those are two big things to say that always help when talking about climate."
>
> *– Federal agency employee working on climate and health*

> "We have no trouble saying, 'You don't have to choose between a strong economy and a healthy environment. In fact, we're cleaning up pollution, and the environment's getting better. And oh, by the way, it's not great for your productivity if you're sick because the air outside is unhealthy, or you're home with a sick kid."
>
> *– Climate and health advocate*

> "Everybody likes efficiency in achieving multiple solutions … pointing out that we can tackle the climate crisis and improve health and cut costs and strengthen the social fabric … We have a ridiculous portion of the GDP that goes

> to healthcare. The more we can prevent illness and injury, the more appealing that is. Making the economic argument via avoided healthcare costs is a special opportunity in this country."
>
> *– Academic expert on climate and health*

A few participants believed that it is more effective to discuss climate change in terms of economic impacts rather than through a health lens. However, several participants recommended that advocates **discuss climate, health, and the economy all together,** as exemplified in the quotes above.

3.5.1.3. Strategically select target audiences and build relationships with them

Participants had varying opinions on which policymakers would be most strategic to approach with climate-health advocacy. A few participants recommended reaching out to policymakers already predisposed to favor climate and health action and encouraging them to take additional steps:

> "That's always the easiest thing to do, is to convince someone that's already on your side to move up the ladder of engagement. Even if it's not all that substantive, sometimes it's important for symbolism and progress just to ensure that there's legislation being introduced on the subject, that they're putting out a press release, that they're gathering co-sponsors for it."
>
> *– Climate advocate*

> "Be strategic. Identify what members have immediate interests in being the champion for the cause. Is there a home-state equity? Are they on the committee of jurisdiction for this item? Is it something they have a track record of working on? Maybe it's something they don't have a track record of working on, but there's something in their past career or in their family or overall life story that may tie them to this issue."
>
> *– Senate staffer working on climate policy*

One participant, however, considered it more useful to target policymakers who do not yet support climate action in order to change their perspective.

Participants also recommended **contacting policymakers on congressional committees related to health and/or climate change.** Whichever policymaker was chosen as the target audience, participants recommended **building long-term relationships** with them and their staff. To foster such relationships, participants suggested having informal conversations and using "soft touches" as opposed to overt demands.

In communication to the public, participants suggested reaching out to frontline communities, parents, faith communities, audiences who believe in climate change but do not view it as a high priority, and constituents who can pressure their legislators**.** Additionally, several participants said that intergenerational dialogues between youth and older adults could be particularly powerful.

3.5.1.4. Use trusted messengers such as constituents and health professionals

Participants reflected that certain types of advocates are especially persuasive to policymakers. For climate and health advocacy specifically, various participants suggested choosing constituents, researchers, youth, and individuals from affected frontline communities. **Many participants singled out health professionals as especially influential messengers:**

> "If we use trusted messengers like doctors and nurses to talk to policymakers about the patients that they're seeing, and why this is such a problem for them, that's the kind of thing that politicians like and are more responsive to, because it sells in media. It's a nice story they can take home."
>
> *– Climate and health advocate*

> "A lot of the doctors that I worked with were so good at telling their stories of being ER doctors and the patients that they were seeing in their exam rooms. I think that was always really persuasive."
>
> *– Communications strategist working on climate and health*

> "It's so important to have public health experts on the Hill and talking to us in order to ensure that we understand these complicated issues and are able to translate them to our bosses."
>
> *– Congressional staffer working on climate policy*

3.5.1.5. Consider tailoring climate and health messaging strategies to conservative audiences

In response to the chilling effect of political polarization on climate and health policy, several participants noted a need to tailor messaging strategies—such as the choice of messengers, messages, etc.—to conservative audiences. They said that **healthcare providers and faith leaders are especially influential messengers to conservatives.** They underscored the benefits of aligning messages with conservative values such as purity, accountability, pro-life values, and love for the land. They also suggested emphasizing aspects of climate solutions that resonate with conservative political stances. As with other audiences, but especially for conservatives, participants recommended discussing immediate, specific, and personally relevant climate impacts, such as pollution. They also recommended listening and asking questions to understand conservatives' point of view. Participants advised against shaming conservative audiences, sounding patronizing or 'like a nanny,' and using apocalyptic language.

As mentioned previously, several participants advised against using terms like "environmental justice," "health equity," and even "climate change" when speaking with conservatives. Several participants recommended **discussing climate issues as health threats without using the term "climate":**

> "You can get a Republican county councilmember to pay attention when you say, 'Coal ash toxins are leaking into the groundwater in your district.' Now, 'We want to shut down the coal plant for climate reasons,' that Republican is not going to agree to do it for that reason. So, there could be some health reasons that motivate them to do the right thing."
>
> *– Climate advocate*

> "My goal is protecting communities' health from the impacts of climate, and if that's not saying climate, and instead saying, 'Hey, I'm sure you've noticed that the child that you have with asthma, it's grown worse as we've seen these extreme temperatures rise, and you live in an urban area…' Using health as the focal point, I think this is key here."
>
> *– Academic expert on climate and health*

Some participants, however, **advised against completely avoiding words such as "climate," "equity," and "justice."** One participant commented that using words such as "justice" can help normalize the underlying concepts, and another cautioned that by paraphrasing concepts like "justice," vital meaning could be lost in translation.

3.5.2. Educate stakeholders about the links between climate and health

In addition to the specific communication strategies discussed above, participants recommended teaching about climate and health in a variety of educational contexts, including high schools, universities, and businesses. Climate experts should be offered greater exposure to health information, they said, and vice versa for health stakeholders such as medical students, clinicians, and public health experts. They especially emphasized the value of debunking climate misinformation, increasing awareness of international health impacts, and offering trainings on specific skills, such as tabletop exercises for emergency preparedness. Furthermore, many participants advocated for collaborative sharing of knowledge and data across agencies and sectors.

3.5.3. Prioritize interdisciplinary research on climate and health

Participants also underscored the need to **gather more data.** To better diagnose the health problems caused by climate change, they recommended increasing efforts to quantify impacts (as mentioned in section 4.6) and pinpoint the issues faced by communities. To shed light on social problems impeding climate and health policy action, they recommended investigating the root causes of opposition to climate solutions.

Participants also suggested **further exploration of climate and health solutions.** They recommended conducting additional research on the benefits of climate solutions for health and economic well-being, evaluating current initiatives such as health-sector decarbonization interventions, identifying and celebrating small successes, and enacting state-level climate and health solutions to serve as evidence for federal policy. One participant suggested that it could also be useful to investigate effective strategies for communicating about climate and health issues.

To gather these kinds of information, participants recommended using participatory citizen science, providing incentives for a systems approach to science rather than narrow specialization, and developing a **national research framework on climate and health.** Towards this last aim, one participant had worked on a bill that would fund the U.S. Global Change Research Program's Interagency Crosscutting Group on Climate Change and Human Health to coordinate research on climate and health across federal agencies:

> "We came up with a bill which basically expressed the need for a better structure and coordination of research activities around this topic and proposed that the mechanism should be the U.S. Global Change Research Program, which already has an interagency crosscutting group on climate change and health … The bill would have directed this group to create a strategic plan and authorized money to do so."
>
> *– Senate staffer working on climate policy*

3.5.4. Integrate climate and health more effectively in the federal government through intra-agency initiatives, inter-agency collaboration, and centralized leadership

Many participants called for integration of climate and health across the federal government. One suggested strategy was to **embed healthcare and public health professionals in climate policymaking procedures,** which would benefit both the climate policymaking process and the health community:

> "Public health and medical community messengers are incredibly effective and valuable at talking to both policymakers and people about climate change impacts and policies. The more that we can find the time and take the space to bring healthcare professionals and public health professionals into both climate policy-making and talking [to policymakers and the public], I think is really valuable."
>
> *– Academic expert on climate policy*

> "With the National Climate Assessment that just came out, US-GCRP [Global Change Research Program] has some fellows … who are actual medical doctors …

> I think that was a great model … You're having people who are actually working with patients on a day-to-day basis embedded in this climate assessment process … My understanding is, a lot of healthcare providers, especially ones who were trained many many years ago, have not received any training on the impacts of climate change on public health. So it's nice to have some of these fellows work on policy or scientific assessments, and then they come back and informally train some of their peers on these issues."
>
> *– Federal agency employee working on climate policy*

Additionally, several participants suggested that federal agencies should **create permanent intra-agency and interagency climate and health initiatives,** especially among career staff, to maintain momentum in the long term:

> "There are ways that people can try to institutionalize it [climate change work] both within the agency through training, and really getting people to internalize it, so it's not just like, 'This administration is telling you that you should consider this,' but it's hopefully from a place of the rule-writers and the people who do engagement with the public, et cetera, internalizing that this change is happening on top of everything else that's in the baseline, and it really needs to be considered as well."
>
> *– Federal agency employee working on climate policy*

> "The U.S. government is so siloed … How do you, in a meaningful way, build cross-agency relationships? I see certain fields trying to do it right. I think the climate change space is trying to do it, particularly the extreme heat space … but they're building the plane as they fly it. This is not exactly an easy exercise … Let's say the White House is in charge of it. What happens when the administration changes? Everything falls apart. How do you build these processes at the career level?"
>
> *– Federal agency employee working on housing and public health policy*

Another recommendation was to **increase funding for interagency groups** so that climate- and health-focused agencies could more easily collaborate:

> "I would like to see more money funding interagency capacity, especially between NOAA and the National Ocean Service, the EPA, and HHS generally."
>
> *– Federal agency scientist working on climate and health*

> "I definitely would like to see increased collaboration across agencies that I don't think is necessarily there."
>
> *– Climate and health advocate*

Greater cross-agency coordination could reportedly also alleviate frontline communities' "stakeholder fatigue" from being contacted by too many different government programs. One participant, however, cautioned that health can be sidelined in environmentally-focused agencies, and recommended that the health community "carve out their own niche" to confront climate change. In practice, several federal employees observed that their agencies engage in both internal climate-health programs and interagency work, demonstrating that both approaches can be pursued in tandem.

Several participants suggested that **interagency collaboration should be facilitated by a central body:**

> "You can have too much of a good thing in terms of several different work groups … If you have too many of those different things that you're trying to send people to and send in deliverables for, and have people show up for meetings, it really becomes difficult. I personally think that we would benefit from a more concentrated effort that is clearly the lead on adaptation and resilience and the health impacts, but also the environmental impacts … a more coherent approach, as opposed to what feels like a bit of a piecemeal approach."
>
> *– Federal agency employee working on climate policy*

> "A promising practice is coordinating things across government. In an ideal world, you would have one office that's the lead, that spans across multiple agencies, that has both political and career people involved."
>
> *– Federal agency employee working on housing and public health policy*

As noted earlier, using the White House as an interagency coordinator can pose difficulties when the presidential administration changes, so it may be preferable to have a federal office serve as a coordinator. One participant suggested that **funding the Office of Climate Change and Health Equity could enable greater interagency collaboration** because the office already spans several agencies:

> "We've done a lot of work with CDC and their folks working on climate change and health. Since that's where it's been housed prior to the Biden Administration, I can see CDC taking a lead in terms of assisting agencies with interagency communication and making sure that there's not duplication of efforts and that there's more sharing of resources … but that would, of course, require more funding of the climate and health program. I also think OCCHE is a

> really great potential. It's just that they haven't been funded. I think funding them would help to increase that interagency collaboration, because they cross over a bunch of agencies."
>
> *– Climate and health advocate*

3.5.5. In a polarized political environment, focus first on incentives and adaptation, and disaggregate policies if necessary

A few participants mentioned the idea that, in a polarized political environment, it is optimal to first pass "carrots," or climate and health policy incentives that reward good behavior, and then work on passing the less popular "sticks," or policies that penalize bad behavior:

> "There's a theory that by spending a lot of money up front on the clean energy solutions and making those cheaper and better, that should make it easier to pass those sticks and regulations, because they'll be a whole lot less costly if solar and wind and electric vehicles are the cost-effective energy sources anyway."
>
> *– Academic expert on climate policy*

Similarly, a few participants believed that focusing on adaptation in policymaking could later increase support for mitigation as people realize the costliness of adaptation:

> "I think a focus on adaptation is necessary, and the cost associated with it will help the case for mitigation. Also, we have some things that we're going to have to adapt to, anyway."
>
> *– Think tank employee working on climate policy*

> "We've had too much focus on mitigation versus adaptation. If we were making a lot more noise about having to build sea walls around Manhattan or New Orleans or Charleston, South Carolina, then people would start looking at this and going, 'Hmm, what's going on here?'"
>
> *– Think tank employee working on climate policy*

Another strategy mentioned was to **integrate climate and health policies into available legislative vehicles,** which may be more feasible than passing them as policy packages in their own right:

> "[Congressional staffers] apply their own political savvy to see how we can actually push this policy forward in a way that has a good chance of getting bipartisan support … through whatever legislative vehicle is available to attach it to."
>
> *– Senate staffer working on climate policy*

However, participants also highlighted the value of proposing **ambitious climate and health policy packages** as a means of shifting perceptions of what is possible:

> "I think the Green New Deal really shifted the window in terms of what was possible. In 2016, I don't think that people would have expected a 500-billion-dollar bill focused on climate and clean energy."
>
> *– Congressional staffer working on climate policy*

3.5.6. Embrace participatory policymaking

Participants additionally suggested **participatory approaches to climate and health policymaking,** which they said would reassure communities that their unique situation was adequately taken into consideration:

> "People want to know that … policymakers and the powers that be understand that their community has unique facets to it that need to be considered when addressing the problems. The more we can be open to that kind of participatory policymaking approach, the better off we will be."
>
> *– Climate and health advocate*

> "A framework like participatory budget-making, where if you at least frame it and have some expectation of 'This is how your input's going to be used' and you stick with it, that helps a lot of times."
>
> *– HHS employee working on climate and health policy*

One participant acknowledged that participatory policymaking can unveil difficult truths, such as the fact that most policies have downsides for some groups. They recommended embracing "good-enough" policies while still making sure to thoroughly consider stakeholders' concerns:

> "If we are retooling all of society, there are unintended consequences … How do we bring everybody together in a way that you're able to air those concerns? And not all the concerns are going to be met … Not everybody's going to be happy about it. Somebody's going to have a windmill in their backyard that goes whir, and they hate it … I think we have to have an acknowledgment [that it is]

> not all black and white, there is gray, and this is the best we've got, and we've got to do it because of X Y and Z, and we recognize that there are drawbacks."
>
> *– Climate and health policy advocate*

3.5.7. Increase funding and mobilize existing funds

Participants suggested **leveraging funding from existing legislation** such as the Bipartisan Infrastructure Law and Inflation Reduction Act, as mentioned in section 4.2. Additionally, they suggested **raising funding through innovative financing mechanisms;** for instance, one participant mentioned that Medicare could pay for climate adaptation measures such as air conditioning.

If funding remains elusive, said one participant, it is best to find ways of making the most of scant resources. To deal with the uncertainty of future funding, another participant recommended looking at the President's budget to predict where funding will likely be allocated.

3.5.8. Elect and empower climate-health champions

Participants emphasized the value of **climate and health policy champions** in federal agencies, Congress, the White House, and non-government work:

> "Having health and climate ambassadors, or representatives or champions in each sector, that are able to communicate across sectors, is really really important."
>
> *– Academic expert on climate and health*

> "The attention of the executive branch, of the White House, has really made a big difference. We also have champions on heat and other climate-health impacts in Congress that are creating a lot of interest in doing more in the space."
>
> *– Federal employee working on climate and health*

Participants recommended **electing new climate and health leaders.** Other suggestions for placing climate and health champions in positions of power included providing university or non-profit funding for congressional staffer positions and staffing National Academies advisory committees with climate and health experts.

To drum up interest in climate and health among current members of Congress, one staffer recommended holding congressional hearings and other events, with a particular focus on reaching out to health subcommittees.

3.5.9. Use advocacy to overcome structural and political barriers

Finally, many participants recommended **using activism to address the structural and political problems** that impede progress on climate and health policy. Suggested tactics included coalition-building, grassroots organizing, protest, divestment, pressuring vested interests, and social media activism, which one participant noted had been used effectively by youth movements:

> "Full credit to them [the youth] and the awesome work they did to take down the LNG [liquid natural gas] projects, which President Biden acknowledged them for. They were very, very, very effective at organizing on TikTok and social media to raise attention for the issue and stop a huge contributor to climate change."
>
> *– Climate and health advocate*

Participants also suggested revoking the social license of the fossil fuel industry—that is, exposing the moral unacceptability of its actions—and instead normalizing renewable energy.

As part of these advocacy efforts, one participant recommended involving communities in citizen science (as mentioned in section 5.3), which could attract beneficial media attention and provoke policymaker interest:

> "Extreme heat, historically, has not been very tangible. It was the silent killer … I think what made it so tangible is media attention … Citizen science activities have done a lot to bring [attention] … It's definitely always going to be a small subset of the population of a particular community, but those kinds of activities are of interest to a lot of journalists and policymakers and legislators."
>
> *– Federal agency employee working on climate and health*

Several participants further called for **broad systemic changes** such as reforming election systems, opposing the influence of the military-industrial complex, and getting money out of politics:

> "Our government puts a lot of funding into defense and military, at the expense of money into our social and economic determinants of health … Those are the priorities that have been set … It just gets back to where all the lobbying dollars are … These industries are wildly wealthy … They pay politicians to continue funding the projects and keep this as a top priority. Same with fossil fuels. Fossil fuels outspend renewable energy something like 13 to 1 … When we don't have money, and we don't have that same kind of power, where do we get our power? … What we're left with in terms of power is our voice."
>
> *– Climate and health advocate*

> "Money is a huge driver of our country … Removing the money aspect of it can be huge, and really focusing on what the people need. And when I say money, I mean, I'm not afraid to vote or to put a bill out on climate … because—I'm going to make up something—the chicken plant that produces lots of pollution is my number one supporter."
>
> *– Congressional staffer working on health policy*

3.5.10. Be persistent, determined, and courageous

To achieve ambitious goals, participants recommended being persistent, resisting false choices between climate and health priorities, and refusing to make concessions earlier than necessary:

> "This awareness takes time and effort to build … We need to be willing to invest in these efforts over the course of years, which is alarming, because I'm painfully aware that we don't have too many years left."
>
> *– Climate and health advocate*

> "That's what our ask is, is to tell our lawmakers to stand strong and say we shouldn't have to choose between whether to eat or whether to breathe clean air. That's a false choice. And even that, some of our societies feel hesitant, because they're so worried that SNAP [Supplemental Nutrition Assistance Program] is going to go. But the dialogue hasn't even started yet, so to just bow your head before we've even begun feels like a bad chess move."
>
> *– Climate and health advocate*

4. Summary and potential implications

A strong majority of participants felt that climate and health should be linked to a greater extent in U.S. federal policy. They noted a range of promising trends and opportunities that may lead to greater integration, including: rising awareness of climate-health links; new intra- and interagency programs; emergent funding, data, and technologies; potentially large healthcare cost savings of acting on climate and health risks; and upcoming policy opportunities such as the Farm Bill.

However, they described many barriers that stand in the way of climate and health integration, some of which are mutually reinforcing, including: limited funding; limited understanding of the climate-health nexus; siloes between federal agencies and across disciplines; competing priorities; the slow pace of research, policymaking, and implementation, along with lack of long-term thinking; and structural barriers in politics such as polarization.

The participants suggested a wide range of strategies to overcome these barriers. Recommendations focused on: educating stakeholders about climate-health links; accelerating research on impacts and solutions; strengthening initiatives within and across federal agencies; leveraging existing funding opportunities; empowering climate and health policy champions; and overcoming structural barriers through activism and advocacy. Additionally, many recommendations centered on effective communication strategies related to the choice of target audiences, messengers, and framing. Specifically, participants suggested using health professionals as trusted advocates and framing climate change as a health issue.

Potential implications for congressional policymakers

Participants identified congressional partisan gridlock as a major barrier to advancing policies that address climate and health, mostly due to conservative opposition to climate policy more generally. Nevertheless, some participants suggested that it is valuable to draft climate and health legislation such as the Green New Deal for Health, which is not politically viable as a whole but can be integrated piecemeal into other policies in areas such as agriculture, energy, housing and urban development, trade, and transportation.

To lay the foundation for future congressional policymaking on climate and health, participants recommended enhancing Congressmembers' and staff members' understanding of climate-health issues. Their reflections also suggest that it could be beneficial to increase interaction

between climate and health staffers and/or hire staff who focus specifically on the climate-health intersection, for instance through fellowships funded by non-profits and academia.

While reversing the entrenched politicization of climate change is unlikely anytime soon, our findings suggest that conservatives' aversion to climate and health policy integration, specifically, may be a less intractable barrier. Conservatives' opposition seems to stem in part from having a different working definition of "climate and health policy": they tend to interpret this phrase narrowly—i.e., to refer to combining climate and health policies into a single instrument—and while they prefer to have separate climate policy and health policy instruments, they are not necessarily opposed to considering health issues in the climate policy-making process. Additionally, conservatives in our sample were supportive of combining climate and health policy in certain instances where health harms are directly tied to climate change, such as when regulating air pollution resulting from local fossil fuel operations. Specifying clear policy goals and explaining climate-health links may at least clarify partisan disagreements, if not overcome them. It remains to be seen whether there are other ways of combining climate and health policies that would increase conservative support.

Potential implications for the President and their policy staff

Participants repeatedly underscored the importance of leadership from the top (i.e., the President and their administration). For instance, they suggested that the president could take influential executive actions such as declaring a climate emergency and denying permits to new fossil fuel exploration and infrastructure. They also commented that White House liaisons can help coordinate climate and health initiatives across federal agencies, though this coordination could be disrupted by presidential administration changes.

Potential implications for federal agency employees

Participants noted the need to undo the siloing of climate and health in federal agencies. They suggested strengthening climate-health initiatives both within and across federal agencies, perhaps with central coordination by a body such as the Office of Climate Change and Health Equity. Agencies themselves can pursue climate-health initiatives even without further funding, if their congressional authorization permits it. Such initiatives will likely accomplish more if facilitated by standardization of metrics and the development of an overarching national research program.

Overall, participants felt that the more deeply climate and health is integrated into the culture, programs, and structure of federal agencies—particularly among career-level staff rather than political appointees—the better the chance for lasting progress. Participants also highlighted the need to make the most of current opportunities when further progress is not possible, for instance, by making it easier for under-resourced community-based organizations to access

existing grant funds. Public-private partnerships could provide additional support for climate and health work when federal funds are inaccessible.

Potential implications for health professionals and organizations

For the health sector, participants called for more interaction and knowledge-sharing with climate experts, more education on the health harms of climate change, and more training on how to respond to climate change through advocacy and patient care. In particular, they called on health professionals to draw on their power as trusted authorities by advocating for climate-health solutions to federal policymakers. Participants emphasized the need to mobilize a wide spectrum of health voices, including nurses, physicians' assistants, community health workers, and public health experts as well as physicians.

Another key implication is the widespread support in the health sector to reduce the carbon emissions of healthcare systems. In committing to and visibly pursuing this end, health professionals can demonstrate leadership on climate solutions. Certain forms of local renewable energy production, such as solar panels, can also help to increase healthcare facilities' disaster resilience and lower their utility bills. However, our results did not speak to ongoing debates about whether it is most strategic for health advocates to pursue decarbonization of the healthcare system or decarbonization across sectors. Because most healthcare emissions come from supply-chain emissions rather than the direct emissions of healthcare facilities (Eckelman et al., 2020), it is possible that all-sector decarbonization may be a more strategic advocacy goal.

Another ongoing challenge is how to pursue advocacy and sustainability programs within a complex and overburdened health sector struggling with other urgent priorities. As a partial solution, participants suggest building greater awareness of existing funding opportunities for health sector work on climate.

Potential implications for climate professionals and organizations

Many of the implications for health stakeholders also apply to climate stakeholders. Climate stakeholders were advised to increase their understanding of the health impacts of climate change and ramp up their engagement with health stakeholders, which will facilitate translation between different communication styles and technical languages. Efforts to include health viewpoints in climate policy work are likely to help advance climate policy more generally. For instance, according to participants, integrating health into climate messaging serves to counter public perceptions of climate change as a distant problem and highlight local, immediate benefits of climate action.

As in the health sector, climate stakeholders face severe challenges to their work more generally, such as communities' perceived economic dependence on fossil fuels. This challenge could be addressed in part by assessing and communicating the health, health economic, and broader economic benefits of climate action. Another key challenge, as mentioned previously, is conservative opposition to many forms of climate action. Some participants report that certain communication strategies, such as framing climate change as a health issue and using healthcare providers as messengers, can sway conservatives to support climate solutions. Other participants, however, feel that it is most strategic to target non-conservative audiences, such as low-propensity progressive voters.

Potential implications for members of the research community

Participants reported growing interest in climate and health among researchers across disciplines, as well as new publication outlets focused on this intersection. They saw a crucial need for further quantification of the health harms of climate change and the economic costs associated with those harms (i.e., the costs of inaction), which are challenging to measure. There is also a need for more research on the health benefits of climate solutions and the associated cost savings. Research to measure the outcomes of existing programs can be used to amend and/or justify future policies. However, it remains unknown to what extent a greater understanding of climate-health risks and solutions will enable more policy action; some participants felt that there is already ample information to justify action.

Participants gave sometimes conflicting advice on communication strategies, which underscores the importance of social science research on the root causes of opposition to climate-health solutions, how health professionals' climate advocacy impacts public trust in them (and how COVID-19 impacted this trust), whether and how to engage conservatives about climate justice and health equity, and what combinations of climate and health policy, if any, appeal to conservatives. As for how climate-health research should be conducted, participants suggested adopting multidisciplinary research frameworks and using participatory research methods such as citizen science.

To build on this study, additional research could examine climate and health policy opportunities at regional, state, and local levels—each of which may have important opportunities to advance policy at the nexus of climate and health—and use quantitative methods such as surveys and experiments with larger, representative samples. Further research could also explore important topics that did not arise in these interviews, such as the role of the judicial system in shaping national policies. This particular topic is of particular relevance due to the Supreme Court's striking down of the Chevron decision in June 2024, which threatens to severely hamper federal agencies' regulatory abilities (Agrawal, Ross, & Ramachandran, 2024). Judicial power is also timely in light of an increasing climate litigation around the world (Wilson, 2023). Finally, further research could more deeply investigate how the above-mentioned barriers, opportunities, and strategies affect one another at a systems level, identifying vicious cycles that could be transformed into virtuous ones (Meadows, 2008).

Potential implications for philanthropic foundations and other non-governmental funders

The philanthropy sector has a crucial role to play in enabling climate and health policies. As mentioned, there is an urgent need for research that quantifies the health harms of climate change and the health benefits of climate solutions, as well as social science research on effective strategies for communication and advocacy at the climate-health nexus; such research requires funding. Funders can also fund initiatives to increase the integration of climate and health policy, e.g. by offering congressional fellowships focused on climate and health and funding programs that educate policymakers about climate-health links and encourage collaboration between climate and health stakeholders. Public-private partnerships can better support underserved communities and aid their efforts to access existing grant funds; for example, non-government funders can collaborate with government programs such as the EPA's Environmental Justice Thriving Communities Technical Assistance Centers Program. Finally, funders can support the development of model policies at the climate-health nexus, which can be useful for policymakers; this theme did not come up directly in the interviews, but one participant noted the value of state policies as models for federal ones. Because climate and health issues are omnipresent, intersecting with nearly every other policy area, it should be possible to find topics that align with funders' priorities and interests.

Potential implications for advocates

Advocacy recommendations arising from this report include linking climate change and health, and also tying in messages around the economic costs of climate change on the health system and the economic benefits of climate and health action; choosing trusted, effective messengers such as health professionals; and choosing optimal target audiences, building relationships with them, and tailoring their messaging approach to audience interests and values. One key audience for advocacy is congressional staff, one of whom said they do not receive enough information on climate and health. Moreover, advocates may benefit from not only building policy support but also fostering a stronger grasp of climate-health links among a wide range of stakeholders. The enthusiasm of several participants to learn more about climate and health suggests an opportunity to engage policy influentials.

An outstanding question for advocacy communication is whether and how to target conservative audiences with messages about the equity implications of climate and health. While some participants cautioned against using terms like 'justice' and 'equity' in communication to conservative audiences, who often find these terms objectionable, other participants recommended using these terms in order to normalize them and clearly convey their meanings.

At a structural level, our findings suggest that some central strategic goals for climate and health advocates include electing leaders who support climate and health policies, calling out the harmful actions of the fossil fuel industry, and overcoming key political barriers such as conservative opposition and the influence of vested interests. Examples of recommended tactics include social media activism, electoral organizing and coalition-building.

5. Limitations

First, although we made an effort to speak to diverse climate and health policy stakeholders, the interview pool may have missed important perspectives. In particular, the participants who agreed to be interviewed were likely more supportive of climate and health policy than those who declined; this is especially likely for conservative participants given that most conservative stakeholders we contacted declined to participate. Additionally, our findings may be biased towards a rule-making rather than legislative focus because we interviewed so many federal agency employees.

Secondly, social desirability bias is always a possibility in interview-based research. Some and perhaps many of the participants knew of our team's previous research on climate and health messaging which may have influenced them to take more favorable stances on climate-health policy integration than they otherwise would have in order to align with their perceptions of our stance.

Thirdly, our methods allowed us to surface participant's views, but not to assess the validity or completeness of those views. It is possible that there are gaps or inaccuracies in participants' collective understanding, which can be addressed in part by comparing the U.S. findings to those listed in the multinational synthesis.

Fourthly, there was sometimes ambiguity as to whether participants were referring to public health, healthcare systems, or both. We therefore only made this distinction when it was clearly present in a given excerpt.

Fifth, our focus was limited to federal policymaking. State, local, and tribal policymaking is also crucial for addressing climate and health challenges in the United States. Future research could examine opportunities for collaboration at these levels and across scales.

Finally, the U.S. policy landscape is currently volatile due to the upcoming presidential election, which will have sweeping repercussions on both climate policy (Mallapaty et al. 2024) and health policy (Gostin & Wetter 2024). It is likely that some of the ideals, opportunities, and strategies reported here would no longer apply under an unsupportive presidential administration. Equally, supportive presidential leadership could open up new possibilities not anticipated in this research.

6. Conclusion

A broad range of climate, health, and climate-health policy stakeholders think that climate and health are not yet sufficiently integrated in U.S. national policies, and feel there is much to be gained by more fulsome integration—including maximizing both the health benefits of climate policy and the climate benefits of health policy, as well as highlighting the immediate and personal relevance of climate change and climate solutions through their influence on the heath of all Americans. Although our research participants identified a range of formidable barriers to further integration, they also identified many opportunities and strategies by which to harness the opportunities. We believe these findings have relevant implications for the various communities of practice that are interested in advancing and integrating climate and health policy in the U.S.—including federal policymakers, the health community, the climate community, the research community, the advocacy community, and the philanthropic community—and hope that stakeholders within those communities will consider them carefully.

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8. Methods

8.1. Recruitment

In order to create a purposive sample of interview participants central to the health and climate policymaking ecosystem, we recruited individuals who met both of the following criteria:

1) Currently working or has recently worked on federal climate policies, health policies, or climate and health policies in the United States. This includes work on policy implementation.

2) Currently working or has recently worked in academia; as a policy advocate; for the United States federal government; as legislative staff in the United States Congress; or at a think tank.

We also recruited individuals working on policies strongly relevant to climate and health such as agriculture and transportation.

We recruited potential participants by sending email invitations to personal contacts of the research team; through snowball sampling with participants (i.e., asking participants for recommendations of other individuals we could potentially interview); and by identifying individuals with relevant expertise through Google search and on Linkedin.com.

We conducted a total of 65 semi-structured interviews during the period of January 2024 to April 2024. Though our sample was non-representative, we recruited participants across a range of sectors (Figure 1), areas of expertise (Figure 2), and political beliefs (Figure 1).

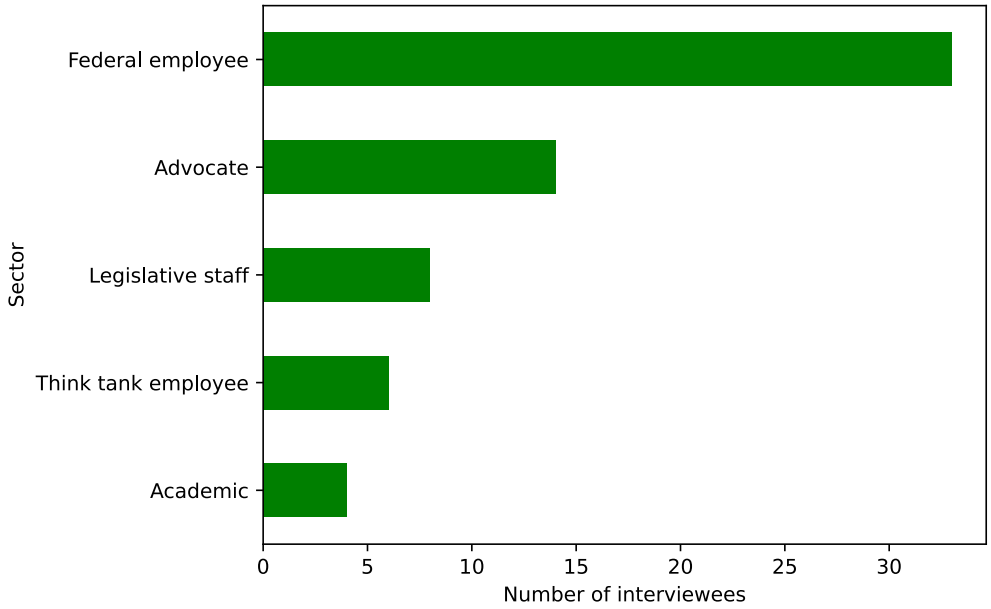

Figure 1: Interviewees' sectors

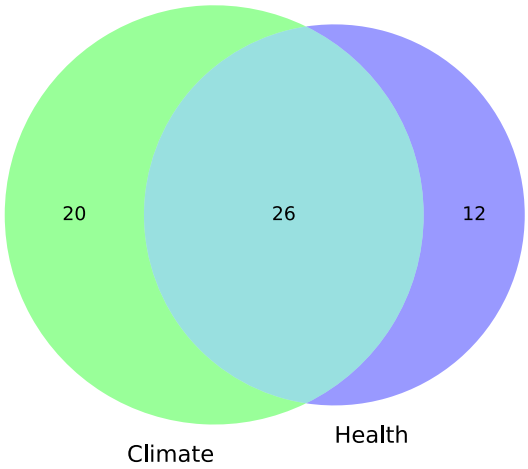

Figure 2: Interviewees' focus areas. Seven participants worked on other, related issues: transportation (n = 3), emergency preparedness (n = 2), housing and urban development (n = 1), agriculture (n = 1).

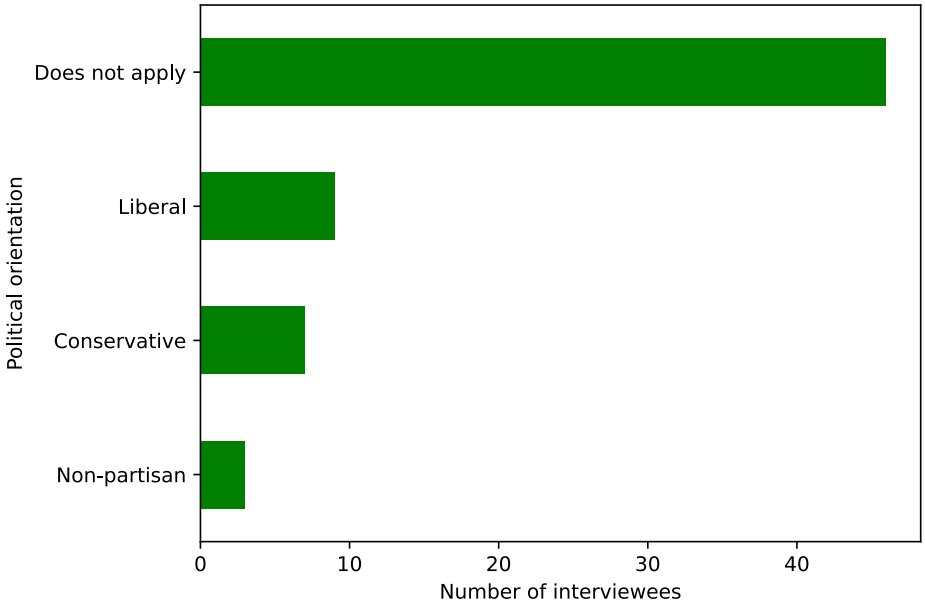

Figure 3: Interviewees' political affiliations

8.2. Interviews

The interviews were semi-structured insofar that we created a pre-established list of interview questions, but maintained flexibility to ask additional questions and to ask participants to further elaborate their responses. The list of prepared questions is available in the appendix (see page 67). The questions were divided into categories based on our research questions. They sought to elicit participants' views and experiences related to the current national status of climate and health policies; ideals for the climate and health policy relationship; barriers to advancing and integrating climate and health; and opportunities and strategies for overcoming barriers.

The interviews ranged from 11 to 55 minutes, with an average time of 34 minutes. They were conducted over Zoom by either one or two members of the research team. The interviews were recorded and automatically transcribed using Zoom, with subsequent manual cleaning up of transcripts to correct occasional transcription errors, organize the text into a more readable format, and anonymize identifiable information.

To obtain informed consent, participants were sent a participant information sheet prior to their interviews. After joining on Zoom and before starting the interview, they were asked to verbally approve the participant information sheet. They were given the option to use video and audio, or just audio, depending on their preference. They were also asked to provide their preferred anonymous identifier for the report (e.g., "congressional staffer working on climate policy").

The study was approved by the George Mason University Institutional Review Board (FP00001847).

8.3. Analysis

The transcripts were coded in ATLAS.ti using mixed deductive and inductive manual qualitative content analysis (Fereday & Muir-Cochrane, 2006). The six deductive codes were created based on the interview questions prior to starting the coding process:

1) Experiences related to climate/health policy [participant describes how climate and/or health comes up in their work, whether on a daily basis or over a longer period of time]

2) National status of climate/health policy [participant describes the current relationship of climate and health policy at a national level in their country]

3) Ideals for climate/health policy [participant describes what the relationship between climate and health policy should look like, in their opinion]

4) Barriers to climate/health policy [participant describes challenges for advancing climate and health policies]

5) Opportunities for climate/health policy [participant describes promising ways to advance climate and health policies]

6) Strategies for climate/health research, policymaking, and implementation [participant describes methods for advancing climate and health policies, such as communication strategies, political strategies, and any other approaches]

Inductive codes within these deductive categories were created during the coding process.

Two members of the research team conducted the coding. We coded three transcripts independently and then discussed any differences after each one to help ensure a similar coding approach. We then separately coded the full corpus of transcripts with regular meetings to discuss and iteratively update the codebook.

After the transcripts were fully coded, we used a list of pre-established analysis queries to guide the analysis of the coded data. The list of queries is also available in the appendix (page 69).

8.4. Engagement with Global Climate and Health Alliance stakeholders

We solicited feedback on our research questions via a survey administered to stakeholders on the mailing list of the Global Climate and Health Alliance in November 2023 (n = 264). We invited these stakeholders, along with our research participants, to a briefing on our preliminary results in July 2024. We specifically asked them the following discussion questions:

1) How do these findings align or conflict with your experiences?

2) Are we missing any crucial insights or perspectives?

3) Is there one main takeaway that you see as most important? What is it and why?

We integrated their feedback into the potential implications section. We then solicited their feedback on our draft report via an online form in September 2024.

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10. Declaration of competing interests

The authors have no competing interests to declare.

11. Appendix

Interview questions

The following list shows the interview questions asked to participants working on climate policy. The questions were adapted for participants working on health policy, both climate and health policy, and adjacent areas.

1. How much do human health impacts or benefits feature in your work?
    a. Could you briefly give me an example of a recent time when health issues came up in your work on climate policies?
    b. Can you think of a time in the past when health issues came up in your work on climate policies?
        i. What kinds of people or organizations were involved, and what positions were they advocating?
        ii. What were the outcomes?
        iii. How typical was this example of how health issues generally come up in your work?
        iv. What about it was typical or atypical?
2. To what extent are health and climate policies linked, or not, in [their country/region]?
    a. *(If links are mentioned)* In what ways are they linked?
3. Should they be more closely linked than they currently are in [their country/region], or more separated?
    a. *(If they think climate and health policy should be linked in any way)* What are the benefits of linking climate and health policy?
    b. Do you think incorporating health considerations can build support for climate policies?
        i. Why or why not?

4. How could climate policy or policymaking procedures be improved in [their country/region] to more fully incorporate health considerations?
    a. *(If they don't mention specific policies or policymaking procedures)* Are there specific climate policies or policymaking procedures that could be created, improved, or removed to more fully incorporate health considerations?
5. Do any specific success stories come to mind?
6. Are there models from other countries that you have used, or are considering using, in your work?
7. What do you think is the biggest barrier to achieving the types of policy changes that you described?
    a. What would it take to overcome this barrier? *(such as communication approaches, resources, and other strategies)*
    b. Are there any other important barriers? *(If so, ask how to overcome them)*
8. What opportunities do you see to achieve the types of policy changes that you described earlier in our conversation?
    a. Are there any other opportunities you see?
    b. What would it take to move forward with these opportunities?
9. *(If relevant to participant's background)* In your experience, what (if anything) has worked to influence policymakers to support climate policies?
10. *(If relevant to participant's background)* How, if at all, have health considerations influenced your country's positions in international climate negotiations? *(such as COP28, for example)*
11. Is there anything else that didn't come up in our conversation that you want to share before we end?

Analysis questions

For each question, we compared responses across different groups of interviewees (e.g. climate experts versus health experts; progressives versus conservatives; federal agency employees versus legislators, etc.)

Experiences

- To what extent, and in what ways, do health experts experience links between climate change and their work?
- To what extent, and in what ways, do climate experts experience links between health and their work?
- How often, in what contexts, and in what ways do climate and health experts interact? In what contexts are they siloed?

Current national situation

- To what extent, and in what ways, do participants feel that climate and health are linked or separate in national policymaking?
- To what extent and in what ways did participants perceive that health considerations were influencing their nation's stance in international climate negotiations?

Ideals

- To what extent, and in what ways, do participants feel that climate and health policymaking should be more integrated or separate in their country?
- Integrated or separate in which respects?
- Behind-the-scenes policy planning
- Policy instruments
- How policies are communicated about
- What success stories or models did participants mention, if any?
- Where did these success stories come from?
- How did they recommend building on these successes?

Barriers

- What are the reported barriers to climate and health integration?
- Which barriers were most commonly mentioned, and by whom?
- Which were rarely mentioned, but potentially important?
- What are the reported barriers to climate and/or health policy advancement (not necessarily integrated)?
- Which barriers were most commonly mentioned?
- Which were rarely mentioned, but potentially important?

Opportunities

- What are the reported opportunities (i.e., existing and/or developing conditions in the policy environment) for climate and health integration?
- Which opportunities were most commonly mentioned?
- Which were less commonly mentioned but particularly compelling?
- What are the reported opportunities (i.e., existing and/or developing conditions in the policy environment) for advancing climate and/or health policy (not necessarily integrated)?
- Which opportunities were most commonly mentioned?
- Which were less commonly mentioned but particularly compelling?

Strategies

- What strategies and tactics did participants suggest for advancing climate and health policymaking?
- Communication strategies/tactics for engaging policymakers
- Communication strategies/tactics for engaging the public
- Non–communications strategies
- To what extent, and in what ways, did participants feel that a health frame could increase or decrease support for climate policy?
- To what extent, and in what ways, did participants feel that a climate frame could increase or decrease support for health policy?

Other relevant issues

- To what extent, and in what ways, does climate justice/equity come up in the participants' responses?
- To what extent, and in what ways, do economic impacts and benefits come up in the participants' responses?
- What kinds of climate impacts were discussed?
- Which specific policies were discussed?

Overall synthesis

- Distribution of knowledge
- Which climate and health policy topics did interviewees know the most about?
- Which climate and health policy topics did interviewees know the least about?
- Policymaking themes
- Were there any themes across the participants' experiences of policymaking processes not covered by the above questions? For instance, what were some of the positive/rewarding aspects and what kinds of frustrations/difficulties did they experience?
- Good quotes
- Were there any statements or stories that particularly stuck out? What makes these instances unique and important?

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