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Journal of Health Communication
International Perspectives

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/uhcm20

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To cite this article: Daniel M. Walker, Christine M. Swoboda, Andrew N. Garman, MATTHEW J. DePUCCIO, Elizabeth Mayers, Anneliese Sinclair & ANN SCHECK McALEARNEY (2024) Does Climate Change Affect Health? Beliefs from the Health Information National Trends Survey, Journal of Health Communication, 29:sup1, 11-17, DOI: 10.1080/10810730.2024.2360023

To link to this article: https://doi.org/10.1080/10810730.2024.2360023

Published online: 29 May 2024.

Journal of Health Communication, 29: 11–17, 2024

ISSN: 1081-0730 print/1087-0415 online
DOI: https://doi.org/10.1080/10810730.2024.2360023

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Does Climate Change Affect Health? Beliefs from the Health Information National Trends Survey

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Climate change is currently and will continue impacting human health, however, beliefs about the level of threat vary by demographics, region, and ideology. The purpose of this study was to assess factors related to climate change and health beliefs using cross-sectional data from the Health Information National Trends Survey (HINTS). Data from 5,075 respondents in the 2022 iteration of HINTS was used for this study. Chi-square tests were used to evaluate demographic differences among those who believe climate change will harm health a lot compared to some, a little, or not at all. Generalized ordinal logistic regression models were used to examine the relationship between the belief that climate change will harm health and independent variables regarding trust in scientists, health recommendations from experts, and demographic characteristics. Female, Black, Hispanic, and college graduate respondents had higher odds and people in the Southern U.S. those aged 35–49, 50–64, and 75years or older had significantly lower odds of believing climate change would harm their health. Those who trust information about cancer from scientists and those that believe health recommendations from experts conflict or change had higher odds of believing climate change would harm health. Our analysis highlights factors that impact climate change and health beliefs, which may provide targets for tailoring public health messages to address this issue.

Worldwide, climate change is ongoing and the severity of its effects are increasing. The World Health Organization identifies climate change as the single biggest threat facing humanity (World Health Organization, 2023) and the United States' Fifth National Climate Assessment definitively declared that climate change harms human health (United States Global Change Research Program, 2023). Most climate change is driven by increasing greenhouse gasses in the atmosphere, and the increase of greenhouse gas is due almost exclusively to human activity (United States Environmental Protection Agency, 2023). Transportation, electricity, and industry account for the majority of greenhouse gas emissions (United States Environmental Protection Agency, 2023) and hospitals and health systems account for 4.4–4.6% worldwide and 8.5% in the United States (Eckelman et al., 2020).

Despite growing scientific evidence of the linkage between rising global temperatures and greenhouse gas emissions, in the United States the general public remains divided along ideological lines regarding whether climate change poses a serious threat and impacts health (Akerlof et al., 2010; Leiserowitz et al., 2018). Prior research demonstrates that perceptions about climate change differ on sociodemographic characteristics, such as gender, age, and education (Poortinga, Whitmarsh, Steg, Böhm, & Fisher, 2019; Weber, 2016). For instance, younger adults are relatively more likely to believe that global warming should be taken seriously, while older adults are more likely to be skeptical about climate change (Weber, 2016; Whitmarsh, 2011). Moreover, the effects of climate change are not evenly distributed across populations, likely contributing to different perceptions (Diffenbaugh & Burke, 2019). For instance, evidence demonstrates that climate change worsens the gap of existing health inequities in vulnerable populations and has negative

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impacts on living conditions, racism, and mental health both globally and within the U.S (Chisadza, Clance, Sheng, & Gupta, 2023).

Similar to the differences in perceptions about the threat of climate change across populations are differences in general public trust in science. Public trust in science has been waning in the wake of the COVID-19 pandemic (SteelFisher et al., 2023), and varies at the individual, group, and institutional levels (Contessa, 2023). Yet trust in science can influence both direct efforts to mitigate climate change actions as well as indirect support for organizational and/or policy choices. Trust acts as a measure that indicates whether the public will first, affirm science and second, adhere to scientific advice (Goldenberg, 2023). Race and ethnicity, age, education, and income correspond with levels of trust (Rainie, Keeter, & Perrin, 2019). The historical and consistent injustice and exploitation experienced by marginalized populations in the U.S. are reflected in the low levels of trust in science by those groups (Goldenberg, 2023). Thus, strengthening the public's trust in science is necessary to enact sustainable climate change action and support of efforts to improve and protect public health. Historically, there has been little consensus on the most effective methods of reducing individuals' greenhouse gas emissions (Capstick, Lorenzoni, Corner, & Whitmarsh, 2014) and even less understanding about how to implement these recommendations by the general public (Wynes & Nicholas, 2017).

Despite the apparent overlaps, the relationship between perceptions of the threat of climate change and trust in science remains unclear. To address this gap, we use data from the 2022 Health Information National Trends Survey (HINTS) to examine individual perceptions of how climate change will impact health and the level of trust individuals have for scientists and health recommendations from experts. This information will be valuable in developing new or improving existing policies and procedures regarding sharing information about climate change. Of particular importance is how to communicate with members of the public who have low trust in science and scientific experts. It is essential to have buy-in from these individuals so that climate change progress can be made at all levels.

Methods

Study Sample

Cross-sectional data from the 2022 iteration of The Health Information National Trends Survey (HINTS) was used for this analysis. HINTS was created by the National Cancer Institute and has been fielded 16 times between 2003 and 2022 in the United States. HINTS is administered to random samples of non-institutionalized adults aged 18 or older residing in the U.S. to assess cancer attitudes, information seeking and use, healthcare use, and prevention behaviors. All HINTS administrations have been approved by the Westat Institutional Review Board and deemed exempt from approval or consent for subsequent analyses (Finney Rutten et al., 2020). HINTS data are de-identified before being made available for secondary data analysis. The HINTS survey is sent with a $2 incentive to encourage participant completion (Westat, 2023).

The 2022 administration of HINTS had 6,252 responses and a response rate of 28.1% [2]. Data were collected by mail and online. Mailed surveys were collected in two stages. The first stage randomly selected residential addresses from the United States Postal Service and the second stage selected the adult in the household with the nearest upcoming birthday (Westat, 2023). Data from only 2022 was used in this analysis because the climate change outcome question used was only asked this iteration. Those who did not answer or answered "Don't Know" for the dependent variable were excluded from analysis, for a sample of 5,075 respondents.

We analyzed the data using survey weighting to allow researchers to generalize the results to the U.S. population. Survey weights were designed based on population estimates from the American Community Survey to account for nonresponse and coverage error. Jackknife replicate weights were used to provide bias-corrected variance estimates (Moser et al., 2013). Replicate weights provided more precise variance estimates from a single sample while also accounting for sampling variation.

Independent and Dependent Variables

The dependent variable of interest in this study was assessed using the question: "How much do you think climate change will harm your health?" with the responses "A lot," "Some," "A little," and "Not at all." This variable was coded as an ordinal variable where "Not at all" had a value of 1, "A little" a value of 2, "Some" a value of 3, and "A lot" a value of 4.

Independent variables representative of opinions about science and health experts were used: trust in scientists, belief that health information from experts is contradictory, and belief that health information from experts change. Trust in scientists was assessed with the question, "In general, how much would you trust information about cancer from scientists?" with the responses "A lot," "Some," "A little," and "Not at all," turned into two groups for analysis: "A lot" and "Some, A little, or Not at all." Beliefs about health information from experts were assessed with the questions: "How often do health recommendations from experts seem to conflict or contradict one another?" and "How often do health recommendations from experts seem to change over time?" with the options "Very Often," "Often," "Rarely," and "Never." These were changed to 1 = "Often/Very Often" and 0 = "Rarely/Never" for analysis.

Sociodemographic factors were used as covariates in our analysis: gender (male/female), race (White/Black/Hispanic/Other), age (18–34/35–49/50–64/66–74/75+), education (high school diploma or less/some college/college graduate), income (less than $35,000/$35,000–$75,000/more than $75,000), cancer history (cancer survivor/never had cancer), and census region (Northeast, Midwest, South, West).

Statistical Approach

Weighted descriptive statistics for each variable were analyzed. Chi-square tests were performed to assess significant differences between demographic variables and climate change opinion. Generalized ordered logit models were used to explore the

association between the dependent variable (beliefs about climate change's effect on health) and independent and sociodemographic variables. The generalized ordered logit model estimates partial proportional odds for ordinal responses and is appropriate when violations of the parallel lines assumption are present (Liu & Koirala, 2012). All models containing independent variables controlled for the sociodemographic variables (i.e., gender, race, age, education, income, cancer history, and region). Post hoc examination of marginal effects (ME) was performed to provide point estimates comparing the likelihood of each response option. We used complete case analysis to account for missing values. Results were considered significant for p-values less than 0.05. All analyses were conducted using Stata version 17 (2021, StataCorp LLC, College Station, Texas).

Results

Data from 5,075 survey respondents were used for the analyses (Table 1). There were 1,214 respondents who indicated they believed climate change will harm their health a lot, while 1,651 respondents said it would harm their health some, 1,103 said a little, and 1,107 said not at all. There were significant differences in proportions who said a lot, some, a little, or not at all by gender, age, race/ethnicity, education, and region of residence (Table 1). A higher proportion of women than men responded "A lot," a higher proportion of those of Hispanic ethnicity or Non-Hispanic Other races (including Asian, Native American, and Pacific Islander) said "A lot," college graduates compared to those with high school or less or some college education were more likely to say "A lot," and those residing in the Western United States had the highest proportion saying "A lot" by region.

Marginal effects for the association of believing climate change will harm health with demographic characteristics are presented in Table 2. Female compared to male respondents had higher odds, Black or Hispanic compared to White had higher odds, and college graduates compared to high school or less had higher odds of saying climate change would harm health (Table 2). Compared to 18–35 year-olds, 50–64 year-olds and those 75 or older and those living in the Southern U.S. compared to those in the Northeast had significantly lower odds of answering that climate change would harm health.

Those who said they trusted information about cancer from scientists "A lot" were significantly more likely to believe climate change would harm health compared to those who trusted scientists some, a little, or not at all (Table 3). When asked if health recommendations from experts are conflicting or contradictory or whether they change over time, those who felt they conflicted or changed were less likely to believe climate change harmed health not at all and more likely to believe climate change would harm health "Some."

Discussion

The increase in extreme weather and other climate-related events in recent years has brought issues pertaining to the impact of climate change on health to the forefront of public discourse. Yet, to date, research has not examined the relationship between beliefs about the impact of climate change on health and public trust in science – a key factor that may influence attitudes and actions related to climate change. Our analysis of a nationally representative survey found that individuals who trust scientists a lot were significantly more likely to believe that climate change will harm their health a lot. In addition, those who perceived that recommendations from experts were conflicting, contradictory, or changing over time were more likely to believe climate change could harm their health compared to those who did not think recommendations from experts were conflicting, contradictory, or changing over time. As a result, determining trusted sources for climate change information should be considered when planning and developing strategies for future climate change information sharing.

Furthermore, we found that women, individuals identifying as Black or Hispanic, and those with higher education levels were also significantly more likely to believe climate change will harm their health a lot. At the same time, older adults and those in the Southern U.S. were less likely to believe that climate change will harm their health a lot. Our findings contribute to a growing body of research showing that individuals' beliefs about climate change and the perceived health risks of climate change vary in systematic ways (Hathaway & Maibach, 2018). These results also highlight the range of beliefs about the linkage between climate change and health which may play an important role in improving understanding and subsequently building consensus about collective mitigation and adaptation actions needed to preserve human health.

The results from our study provide insight for opportunities to develop and improve existing strategies that scientists can use to communicate with the general public regarding the relationships between climate change and health-related outcomes. Specifically, our analysis suggests that the general public may benefit from more tailored communication approaches that will help individuals understand how climate change caused by greenhouse gas emissions increases the risks of certain health conditions for individuals such as those living in communities that are more susceptible to climate-related disasters (e.g., extreme heat waves, drought). Communication should be tailored to specific local or regional climate phenomena to increase awareness in regions like the South where individuals may not perceive climate change as a threat for them (Monroe, Plate, Oxarart, Bowers, & Chaves, 2019).

Tailored messaging could further target specific demographic groups that are less likely to believe climate change is a threat to health. Health experts may consider partnering with community organizations that cater to older adults, such as senior centers and retirement communities, to provide practical tips through in-person workshops and interactive webinars on how older adults and their caregivers can protect their health during extreme weather events (Frumkin, Hess, Luber, Malilay, & McGeehin, 2008). These strategies could emphasize the range of issues that may be particularly relevant to individuals experiencing respiratory challenges during extreme weather events. Also, messages can be framed to align with values

Table 1. Demographics of sample who answered climate change question on HINTS 6

	Total Sample (N = 5,075) n	Climate Change Will Harm Health A Lot (n = 1,214) n (weighted %)	Climate Change Will Harm Health Some (n = 1,651) n (weighted %)	Climate Change Will Harm Health A Little (n = 1,103) n (weighted %)	Climate Change Will Harm Health Not At All (n = 1,107) n (weighted %)	P-Value
Gender						**0.002**
Male	1,967	427 (18.7)	587 (30.4)	440 (22.1)	513 (28.8)	
Female	2,946	746 (24.8)	1,028 (33.0)	623 (23.5)	549 (18.7)	
Age						
18–34	762	230 (27.2)	266 (32.2)	162 (24.1)	104 (16.6)	**0.003**
35–49	1,024	251 (21.2)	335 (32.2)	245 (24.0)	193 (22.6)	
50–64	1,446	309 (18.0)	464 (30.8)	323 (22.8)	350 (28.5)	
65–74	1,126	275 (22.2)	363 (32.2)	224 (19.1)	264 (26.6)	
75 or older	655	133 (17.3)	210 (29.6)	134 (22.5)	178 (30.6)	
Race/Ethnicity						**0.002**
Non-Hispanic White	2,711	595 (19.4)	892 (32.3)	559 (21.3)	665 (27.1)	
Non-Hispanic Black	731	187 (23.7)	251 (34.3)	171 (24.6)	122 (17.4)	
Hispanic	854	245 (27.9)	288 (32.9)	182 (21.5)	139 (17.8)	
Non-Hispanic Other	420	108 (26.8)	136 (26.6)	100 (30.2)	76 (16.5)	
Education						**0.002**
High school graduate and below	1,132	234 (17.8)	315 (31.1)	296 (24.8)	287 (26.3)	
Some college	1,369	300 (22.4)	443 (27.9)	305 (23.2)	321 (26.6)	
College graduate	2,415	644 (25.0)	858 (36.8)	460 (19.4)	453 (18.8)	
Income						0.196
Less than $35,000	1,347	324 (23.5)	403 (29.5)	308 (21.2)	312 (25.8)	
$35,000–$75,000	1,395	334 (21.2)	487 (36.0)	318 (23.6)	256 (19.2)	
Greater than $75,000	1,911	466 (22.3)	646 (30.8)	391 (22.5)	408 (24.5)	
Cancer History						0.169
Cancer survivor	751	190 (22.4)	230 (28.6)	146 (20.2)	185 (28.7)	
Never had cancer	4,193	997 (21.9)	1,390 (31.8)	918 (23.1)	888 (23.3)	
Census Region						**0.010**
Northeast	757	196 (22.8)	262 (34.5)	158 (22.2)	141 (20.5)	
Midwest	866	185 (16.2)	294 (34.9)	191 (22.7)	196 (26.2)	
South	2,253	507 (21.1)	698 (29.4)	502 (22.4)	546 (27.1)	
West	1,199	326 (26.4)	397 (29.6)	252 (24.2)	224 (19.8)	

more commonly held by older adults and emphasize the role older generations play in shaping younger family members' beliefs about climate change and health (Ayalon, Roy, Aloni, Keating, & Heyn, 2023). Prior research indicates that education level is a predictor of climate change risk perceptions worldwide, as those with higher education levels are more likely to consider climate change a threat (Lee, Markowitz, Howe, Ko, & Leiserowitz, 2015). Addressing the topic of climate change earlier and more often during primary and secondary education may increase awareness among those with lower education levels and improve support for actions to prevent climate change.

Addressing individuals with lower trust in science may also require acknowledging and overcoming misconceptions about climate change and health (Treen, Williams, & O'Neill, 2020). Addressing issues such as misinformation may require that scientists take a more active role with community leaders to encourage dialogue and develop trust. Countering misinformation could be critical to overcome individuals' skepticism and doubts surrounding climate change, and to build trust between

Table 2. Differences in believing climate change will harm health by sociodemographic characteristics

	Not at all (Marginal effect, 95%CI)	A little (Marginal effect, 95%CI)	Some (Marginal effect, 95%CI)	A lot (Marginal effect, 95%CI)
Gender				
Male	Base outcome	Base outcome	Base outcome	Base outcome
Female	**-0.11 (−0.16 to −0.05)**	0.03 (−0.01 to 0.07)	0.03 (−0.02 to 0.07)	**0.05 (0.01 to 0.10)**
Age				
18–34	Base outcome	Base outcome	Base outcome	Base outcome
35–49	**0.05 (0.03 to 0.11)**	**0.03 (0.00 to 0.06)**	**-0.02 (−0.04 to −0.00)**	**-0.06 (−0.13 to −0.00)**
50–64	**0.09 (0.04 to 0.14)**	**0.04 (0.02 to 0.07)**	**-0.04 (−0.05 to −0.02)**	**- 0.10 (−0.15 to − 0.04)**
65–74	**0.08 (0.03 to 0.14)**	−0.02 (−0.07 to 0.03)	−0.01 (−0.07 to 0.06)	−0.05 (−0.12 to 0.01)
75 or older	**0.09 (0.02 to 0.15)**	**0.04 (0.01 to 0.07)**	**-0.04 (−0.07 to −0.01)**	**-0.09 (−0.16 to −0.03)**
Race/Ethnicity				
Non-Hispanic White	Base outcome	Base outcome	Base outcome	Base outcome
Non-Hispanic Black	**-0.06 (−0.11 to −0.01)**	**-0.03 (−0.05 to −0.00)**	**0.02 (0.01 to 0.04)**	**0.07 (0.01 to 0.12)**
Hispanic	**-0.06 (−0.11 to −0.01)**	**-0.03 (−0.05 to −0.00)**	**0.02 (0.01 to 0.04)**	**0.07 (0.01 to 0.12)**
Non-Hispanic Other	−0.03 (−0.10 to 0.05)	−0.01 (−0.04 to 0.02)	0.01 (−0.02 to 0.04)	0.02 (−0.05 to 0.10)
Education				
High school graduate and below	Base outcome	Base outcome	Base outcome	Base outcome
Some college	−0.00 (−0.06 to 0.06)	−0.02 (−0.07 to 0.03)	−0.04 (−0.09 to 0.02)	0.06 (−0.00 to 0.12)
College graduate	**-0.09 (−0.13 to −0.04)**	**-0.04 (−0.06 to −0.02)**	**0.04 (0.02 to 0.07)**	**0.09 (0.05 to 0.13)**
Income				
Less than $35,000	Base outcome	Base outcome	Base outcome	Base outcome
$35,000–$75,000	−0.05 (−0.11 to 0.01)	0.02 (−0.03 to 0.07)	**0.06 (0.00 to 0.12)**	−0.03 (−0.10 to 0.04)
Greater than $75,000	0.02 (−0.04 to 0.07)	0.01 (−0.01 to 0.03)	−0.01 (−0.03 to 0.01)	−0.02 (−0.07 to 0.04)
Cancer History				
Never had cancer	Base outcome	Base outcome	Base outcome	Base outcome
Cancer survivor	0.01 (−0.04 to 0.06)	0.00 (−0.02 to 0.02)	−0.00 (−0.02 to 0.02)	−0.01 (−0.05 to 0.04)
Census Region				
Northeast	Base outcome	Base outcome	Base outcome	Base outcome
Midwest	0.04 (−0.01 to 0.09)	0.02 (−0.01 to 0.04)	−0.01 (−0.04 to 0.01)	−0.04 (−0.09 to 0.01)
South	**0.05 (0.02 to 0.09)**	**0.02 (0.01 to 0.04)**	**-0.02 (−0.04 to −0.01)**	**-0.05 (−0.09 to −0.02)**
West	−0.02 (−0.06 to 0.03)	−0.01 (−0.03 to 0.01)	0.01 (−0.01 to 0.02)	0.02 (−0.03 to 0.08)

Table 3. Odds of believing climate change will harm health by opinions about scientists and expert recommendations

	Not at all (Marginal effect, 95%CI)	A little (Marginal effect, 95%CI)	Some (Marginal effect, 95%CI)	A lot (Marginal effect, 95%CI)
Trust information about cancer from scientists				
Some/A little/Not at all	Base outcome	Base outcome	Base outcome	Base outcome
A lot	**-0.14 (−0.19 to −0.10)**	**-0.05 (−0.07 to −0.04)**	**0.07 (0.04 to 0.09)**	**0.13 (0.09 to 0.16)**
Health recommendations from experts conflict				
Rarely/Never	Base outcome	Base outcome	Base outcome	Base outcome
Often/Very often	**-0.12 (−0.17 to −0.07)**	0.02 (−0.02 to 0.07)	**0.08 (0.03 to 0.13)**	0.02 (−0.03 to 0.06)
Health recommendations from experts change				
Rarely/Never	Base outcome	Base outcome	Base outcome	Base outcome
Often/Very often	**-0.08 (−0.13 to −0.04)**	0.02 (−0.04 to 0.08)	**0.06 (0.01 to 0.12)**	0.00 (−0.04 to 0.05)

community residents and scientists. For instance, educational materials about the impacts of climate change on health could help build the credibility of scientists while also acknowledging public concerns. Our results indicate that people who believe in the threat of climate change are both more likely to trust scientists and feel that health recommendations conflict and change, which may indicate that people are willing to change their perceptions based on new information. Community forums involving local health care professionals can feature scientists who clearly explain scientific findings in a way that easily illustrates the key climate-health connections supported by scientific evidence. These ongoing forums could also benefit from collaborations with trusted community members who could help ensure that the messaging around climate change is culturally appropriate and easy for individuals to understand (Jones & Song, 2014; Lewandowsky, 2021). Those who trust scientists less may still trust family and friends, social media sources, and news sources that align with their views, so hearing information about climate change from these sources may influence them more than hearing information from scientists directly (Maibach, Uppalapati, Orr, & Thaker, 2023).

Despite the key roles that scientists play in the private and public sectors to collect, analyze, and interpret data that can inform policy and practice, there are also opportunities for these individuals to be more accessible to and engage with community members. More focused training on the principles of community-based participatory research can equip scientists with the tools and strategies to increase the involvement of community members in setting research priorities (Fleming et al., 2023). Understanding the needs and concerns that are relevant to communities and sub-populations that are directly impacted by climate change can demonstrate a willingness by scientists to work directly with individuals and cultivate relationships that foster trust. Thus, a more inclusive and collaborative approach to research activities (e.g., study design, recruitment, data collection and analysis, and dissemination of results) could ultimately enhance community members' trust in scientists and their work.

Limitations

Our study has several important limitations. First, our data represent only a cross-section of public opinions regarding trust in scientists. Prior research, however, shows that these perceptions are malleable (Weber & Johnson, 2009), which suggests opportunities to identify interventions that will enhance the knowledge and attitudes of individuals toward scientists and their recommendations regarding climate change and health. Second, we were unable to examine and quantify how much exposure survey participants have had to health experts and scientists which may influence how much trust they have in these groups. Additional research is needed to clarify the antecedents as well as the mechanisms that could help explain why the level of trust in medical professionals and other scientists influences perceptions of climate change information. Third, our independent variables—trust in scientists and health recommendations from experts—are, at best, proxies for individuals' trust in climate scientists and experts because the survey questions do not ask explicitly about individuals' beliefs or attitudes toward these specific types of experts. Nonetheless, our analysis demonstrates that individuals' perceptions of trust toward health experts are associated with individuals' beliefs about climate change and health. Thus, our analysis offers evidence that the *source* of climate change information (Goldberg, Gustafson, Rosenthal, & Leiserowitz, 2021; Lewandowsky, 2021) may play just as important a role in educating the general public about the health-related risks of climate change as the *content* of recommendations to prevent and mitigate the negative effects of climate change on health.

Conclusion

Our analysis of the 2022 HINTS data indicates that those who trust scientists a lot are more concerned about the health impacts of climate change than their counterparts. These results highlight important potential differences in audiences for public health messaging, and the value of tailoring messages accordingly. In the future, the need for climate change research, its impacts on individual health, and best practices for sharing information about climate change and its impacts will need to be further explored.

Disclosure Statement

No potential conflict of interest was reported by the author(s).

Funding

The author(s) reported there is no funding associated with the work featured in this article.

Data Availability Statement

All data used in this study was from the publicly available Health Information National Trends Survey. Data and information about this survey can be found at https://hints.cancer.gov.

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References

Akerlof, K., DeBono, R., Berry, P., Leiserowitz, A., Roser-Renouf, C. Clarke, K.L. … Maibach, E. W. (2010). Public perceptions of climate change as a human health risk: Surveys of the United States, Canada and Malta. *International Journal of Environmental Research and Public Health*, *7*(6), 2559–2606. doi:10.3390/ijerph7062559

Ayalon, L., Roy, S., Aloni, O., Keating, N., & Heyn, P. C. (2023). A scoping review of research on older people and intergenerational relations in the context of climate change. *The Gerontologist*, *63*(5), 945–958. doi:10.1093/geront/gnac028

Capstick, S., Lorenzoni, I., Corner, A., & Whitmarsh, L. (2014). Prospects for radical emissions reduction through behavior and lifestyle change. *Carbon Management*, *5*(4), 429–445. doi:10.1080/17583004.2015.1020011

Chisadza, C., Clance, M., Sheng, X., & Gupta, R. (2023). Climate change and inequality: evidence from the United States. *Sustainability*, *15*(6), 5322. doi:10.3390/su15065322

Contessa, G. (2023). It takes a village to trust science: towards a (thoroughly) social approach to public trust in science. *Erkenntnis*, *88*(7), 2941–2966. doi:10.1007/s10670-021-00485-8

Diffenbaugh, N. S., & Burke, M. (2019). Global warming has increased global economic inequality. *Proceedings of the National Academy of Sciences*, *116*(20), 9808–9813. doi:10.1073/pnas.1816020116

Eckelman, M. J., Huang, K., Lagasse, R., Senay, E., Dubrow, R., & Sherman, J. D. (2020). Health care pollution and public health damage in the United States: An update. *Health Affairs*, *39*(12), 2071–2079. doi:10.1377/hlthaff.2020.01247

Finney Rutten, L. J., Blake, K. D., Skolnick, V. G., Davis, T., Moser, R. P., & Hesse, B. W. (2020). Data resource profile: the national cancer institute's health information national trends survey (HINTS). *International Journal of Epidemiology*, *49*(1), 17–17j. doi:10.1093/ije/dyz083

Fleming, P. J., Stone, L. C., Creary, M. S., Greene-Moton, E., Israel, B. A. Key, K.D. … Schulz, A. J. (2023). Antiracism and community-based participatory research: Synergies, challenges, and opportunities. *American Journal of Public Health*, *113*(1), 70–78. doi:10.2105/AJPH.2022.307114

Frumkin, H., Hess, J., Luber, G., Malilay, J., & McGeehin, M. (2008). Climate change: The public health response. *American Journal of Public Health*, *98*(3), 435–445. doi:10.2105/AJPH.2007.119362

Goldberg, M. H., Gustafson, A., Rosenthal, S. A., & Leiserowitz, A. (2021). Shifting republican views on climate change through targeted advertising. *Nature Climate Change*, *11*(7), 573–577. doi:10.1038/s41558-021-01070-1

Goldenberg, M. J. (2023). Public trust in science. *Interdisciplinary Science Reviews*, *48*(2), 366–378. doi:10.1080/03080188.2022.2152243

Hathaway, J., & Maibach, E. W. (2018). Health implications of climate change: A review of the literature about the perception of the public and health professionals. *Current Environmental Health Reports*, *5*(1), 197–204. doi:10.1007/s40572-018-0190-3

Jones, M. D., & Song, G. (2014). Making sense of climate change: How story frames shape cognition. *Political Psychology*, *35*(4), 447–476. doi:10.1111/pops.12057

Lee, T. M., Markowitz, E. M., Howe, P. D., Ko, C.-Y., & Leiserowitz, A. A. (2015). Predictors of public climate change awareness and risk perception around the world. *Nature Climate Change*, *5*(11), 1014–1020. doi:10.1038/nclimate2728

Leiserowitz, A., Maibach, E., Rosenthal, S., Kotcher, J., Ballew, M., Goldberg, M., & Gustafson, A. (2018). *Climate change in the American mind*: *December 2018*.

Lewandowsky, S. (2021). Climate change disinformation and how to combat it. *Annual Review of Public Health*, *42*(1), 1–21. doi:10.1146/annurev-publhealth-090419-102409

Liu, X., & Koirala, H. (2012). Ordinal regression analysis: Using generalized ordinal logistic regression models to estimate educational data. *Journal of Modern Applied Statistical Methods*, *11*(1), 242–254. doi:10.22237/jmasm/1335846000

Maibach, E. W., Uppalapati, S. S., Orr, M., & Thaker, J. (2023). Harnessing the power of communication and behavior science to enhance society's response to climate change. *Annual Review of Earth and Planetary Sciences*, *51*(1), 53–77. doi:10.1146/annurev-earth-031621-114417

Monroe, M. C., Plate, R. R., Oxarart, A., Bowers, A., & Chaves, W. A. (2019). Identifying effective climate change education strategies: A systematic review of the research. *Environmental Education Research*, *25*(6), 791–812. doi:10.1080/13504622.2017.1360842

Moser, R. P., Naveed, S., Cantor, D., Blake, K. D., Rutten, L. J. F., Ramírez, A. S., … Yu, M. (2013). Integrative analytic methods using population-level cross-sectional data. *Journal of Huntington's Disease*, *2*(1), 41–45. doi:10.3233/JHD-130053

Poortinga, W., Whitmarsh, L., Steg, L., Böhm, G., & Fisher, S. (2019). Climate change perceptions and their individual-level determinants: A cross-European analysis. *Global Environmental Change*, *55*, 25–35. doi:10.1016/j.gloenvcha.2019.01.007

Rainie, L., Keeter, S., & Perrin, A. (2019, July 22). *Trust and distrust in America*. Retrieved from https://www.pewresearch.org/politics/2019/07/22/trust-and-distrust-in-america/

SteelFisher, G. K., Findling, M. G., Caporello, H. L., Lubell, K. M., Vidoloff Melville, K. G. … Ben-Porath, E. N. (2023). Trust in US Federal, State, and local public health agencies during covid-19: responses and policy Implications. *Health Affairs*, *42*(3), 328–337. doi:10.1377/hlthaff.2022.01204

Treen, K. M. D., Williams, H. T. P., & O'Neill, S. J. (2020). Online misinformation about climate change. *WIREs Climate Change*, *11*(5). doi:10.1002/wcc.665

U.S. Environmental Protection Agency. (2023, October 10). *Overview of greenhouse gases*. Retrieved from https://www.epa.gov/ghgemissions/overview-greenhouse-gases

U.S. Global Change Research Program. (2023). Fifth national climate assessment. doi:10.7930/NCA5.2023

Weber, E. U. (2016). What shapes perceptions of climate change? New research since 2010. *WIREs Climate Change*, *7*(1), 125–134. doi:10.1002/wcc.377

Weber, E. U., & Johnson, E. J. (2009). Mindful judgment and decision making. *Annual Review of Psychology*, *60*(1), 53–85. doi:10.1146/annurev.psych.60.110707.163633

Westat. (2023). Health information national trends survey 6 (hints 6) methodology report. Retrieved from https://hints.cancer.gov/docs/methodologyreports/HINTS_6_MethodologyReport.pdf

Whitmarsh, L. (2011). Scepticism and uncertainty about climate change: Dimensions, determinants and change over time. *Global Environmental Change*, *21*(2), 690–700. doi:10.1016/j.gloenvcha.2011.01.016

World Health Organization. (2023). *Climate change*. Retrieved from https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health

Wynes, S., & Nicholas, K. A. (2017). The climate mitigation gap: Education and government recommendations miss the most effective individual actions. *Environmental Research Letters*, *12*(7), 074024. doi:10.1088/1748-9326/aa7541