1 London School of Hygiene and Tropical Medicine, UK

2 Centre on Climate Change and Planetary Health, London School of Hygiene and Tropical Medicine, UK

3 Department of Infectious Disease Dynamics, London School of Hygiene and Tropical Medicine, UK

4 Institute for Health Metrics and Evaluation, University of Washington, Seattle, USA

We need to tackle the growing threat of mis- and disinformation about climate change and health

Simon J Piatek, [1] Andy Haines, [2] Heidi J Larson[3, 4]

As health narratives in the climate change discourse become more visible, the intersection of health and climate change will soon become a critical area vulnerable to misinformation and disinformation campaigns. Disinformation in this space will attempt to undermine evidence about the health effects of climate change and, most importantly, efforts to tackle these challenges.

Misinformation (inaccurate information spread without malicious intent) and disinformation (deliberately deceptive information) in health are not new, as starkly illustrated by the covid pandemic. The rapid spread of false information during the pandemic undermined public trust in science and public health interventions. In the UK, people's intent to "definitely" take the covid vaccine dropped by 6.2 percentage points, and in the US by 6.4 percentage points, after participants were exposed to misinformation—showing how misinformation can lead to vaccine hesitancy and impede efforts to control disease spread.[1]

False information also pervades the climate change debate, influencing public perception and policy. The World Health Organization has identified climate change as the greatest threat to global health in the 21st century, but the public's understanding of this threat is often clouded by conflicting narratives.[2]

A significant portion of climate related health misinformation focuses on the severity and causes of climate change. Common myths include the belief that climate change is a natural phenomenon, unaffected by human activity, or that the risks are exaggerated.[3 4] Disinformation activities, often supported by fossil fuel interests, propagate these myths, impeding efforts to mobilise public support for necessary policy changes.[4 5]

Downplaying urgency

Climate change poses numerous health risks, including higher incidence of heat related illnesses, respiratory disorders from deteriorating air quality, vectorborne diseases, and mental health problems arising from climate induced displacement and stress.[2] Vulnerable populations, particularly in low income regions, are disproportionately affected. However, misinformation can lead to inadequate preparation and response, as seen in the underestimation of risks associated with extreme weather events.[6 7]

Similarly, dis- and misinformation about the efficacy and safety of vaccines have hindered the fight against diseases such as dengue, which are projected to spread owing to changing climate conditions.[8 9]

Several specific misinformation narratives have gained traction in the context of climate change—for example, the suggestion that climate change is a hoax.[10] This narrative claims that climate change is a fabricated issue designed to push political agendas. It often dismisses scientific consensus and portrays climate action as unnecessary and economically damaging.[4 11]

Another example is the claim that the current changes in climate are simply part of natural environmental cycles and not a result of human activity. This downplays the urgent need for mitigation efforts.[12]

Some false narratives suggest that climate interventions, such as renewable energy projects or carbon reduction policies, are harmful or part of a broader conspiracy. Others provide inflated net costs for climate change mitigation by omitting the costs of failing to tackle dangerous climate change under business-as-usual projections—or by focusing on the costs, but not the benefits, of cutting emissions. These arguments can discourage public support for essential climate action.[12 13]

Social media platforms have become major conduits for health related climate disinformation. Their algorithms often prioritise sensational content, which can lead to the viral spread of falsehoods. The covid pandemic showed how quickly misinformation can escalate into a global health crisis. Similar dynamics are at play with climate change, where misinformation can lead to public apathy or resistance towards climate action. The amplification of such misinformation by influential figures and networks further entrenches these beliefs, making it difficult to shift public opinion.

Illusion of consensus

The advent of artificial intelligence (AI) has added a new dimension to the spread of false information. AI technologies can create highly realistic and persuasive fake content, including text, images, and videos. "Deepfakes," for example, are AI generated videos that can convincingly depict real people saying or doing things they never actually said or did. Menz and colleagues evaluated the effectiveness of safeguards in large language models such as GPT-4, PaLM 2, and Claude 2 in preventing the generation of health disinformation.[14] Their results showed that while some language models refused to generate disinformation, others still produced false health narratives, especially when "jailbreaking" techniques were used (using specific prompts to produce unintended outputs). It's evident that AI technologies can be used to spread false information about climate change and its health effects, further muddying the waters of public discourse.

AI driven bots can also amplify misinformation on social media by rapidly sharing and promoting false narratives, creating the illusion of widespread consensus or controversy where there is none. These bots can target specific demographics with tailored misinformation, exploiting existing biases and fears to sow doubt and division.

The medical community has a pivotal role in tackling the issue of misinformation on health and climate change. Dobson and colleagues recommended education and improved messaging as a possible solution, as well as regulation of social media platforms.[15] Lewandowsky recommends strategies that help to tackle misinformation before it's encountered, along with long established debunking techniques.[4] Building on their work, we recommend the following strategies to consider.

Tackling misinformation

First, we need to strengthen public health communication. Clear, accurate, and consistent messaging from trusted health professionals can counteract misinformation. Engaging with communities through various media, including social media, can help disseminate reliable information.

Second, we must collaborate with tech companies. Social media platforms must be held accountable for the spread of misinformation. Partnerships between public health agencies and tech companies can help develop algorithms that prioritise accurate information and flag false content—although such efforts aren't always effective, especially if implemented half heartedly.[16 17]

Third, we need to leverage AI for good purposes: it can also be a tool in the fight against misinformation. Machine learning algorithms can help to identify and flag false content, while AI driven analytics can track the spread of misinformation and inform targeted countermeasures. Recent evidence suggests that the use of large language models to create personalised, evidence based dialogues reduced people's belief in a specific conspiracy theory by 20%. This reduction was sustained over a two month follow-up and seemed to apply to such beliefs more generally.[18 19]

Fourth, public health curriculums should include education on climate change and its effects on health. Empowering people with critical thinking skills to discern credible information is crucial at all levels of education.

Fifth, medical professionals should advocate for policies that tackle both climate change and misinformation. This includes supporting regulations that limit the spread of false information and promoting transparency in climate related health research.

Finally, we must focus on community engagement. Building trust within communities is essential. Localised health campaigns that consider cultural contexts can be effective in conveying the realities of climate change and its health impact.

The intersection of climate change and health is likely to become a critical battleground for misinformation and disinformation. Medical professionals, as trusted voices, have a responsibility to lead the fight against these falsehoods. By adopting a multifaceted approach—including robust communication, collaboration with tech companies, education, policy advocacy, and community engagement—the impact of misinformation can be mitigated to ensure that the public is well informed about the health risks posed by climate change.

1   Loomba S, de Figueiredo A, Piatek SJ, de Graaf K, Larson HJ. Measuring the impact of COVID-19 vaccine misinformation on vaccination intent in the UK and USA. Nat Hum Behav 2021;5:-48. doi: 10.1038/s41562-021-01056-1 pmid: 33547453

2   World Health Organization. WHO review of IPCC evidence 2022: Climate change, health, and well-being. 2022. https://cdn.who.int/media/docs/default-source/climate-change/who-review-of-ipcc-evidence-2022-adv-version.pdf

3   Hornsey MJ, Lewandowsky S. A toolkit for understanding and addressing climate scepticism. Nat Hum Behav 2022;6:-64. doi: 10.1038/s41562-022-01463-y. pmid: 36385174

4   World Wide Fund for Nature. 10 myths about climate change. https://www.wwf.org.uk/updates/here-are-10-myths-about-climate-change

5   Lewandowsky S. Climate change disinformation and how to combat it. Annu Rev Public Health 2021;42:-21. doi: 10.1146/annurev-publhealth-090419-102409 pmid: 33355475

6   Daume S. Online misinformation during extreme weather emergencies: short-term information hazard or long-term influence on climate change perceptions? Environ Res Commun 2024;6:022001. doi: 10.1088/2515-7620/ad1b67 .

7   Center for Climate Integrity. ExxonKnews: A heat dome killed their residents. Now they're suing Big Oil. 23 Jun 2023. https://climateintegrity.org/news/view/a-heat-dome-killed-their-residents-now-theyre-suing-big-oil

8   Larson HJ, Hartigan-Go K, de Figueiredo A. Vaccine confidence plummets in the Philippines following dengue vaccine scare: why it matters to pandemic preparedness[Erratum in: Hum Vaccin Immunother2020;16:. doi: 10.1080/21645515.2019.1628510]. Hum Vaccin Immunother 2019;15:-7. pmid: 30309284

9   Africa Infodemic Response Alliance. AIRA Infodemic trends report: 5-12 July 2023. 2023. https://www.afro.who.int/sites/default/files/2023-07/AIRA%20Infodemic%20Trends%20Report%205-12%20July%202023.pdf

10   Gulev SK, Thorne PW, Ahn J, etal. Changing state of the climate system. In: Masson-Delmotte V, Zhai P, Pirani A, etal, eds. Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change. Cambridge University Press, 2023: -422, doi: 10.1017/9781009157896.004

11   Intergovernmental Panel on Climate Change. Sixth assessment report, Working Group 1: Climate change 2021: the physical science basis (ch 2). 2021. Available at: https://www.ipcc.ch/report/ar6/wg1/

12   European Digital Media Observatory. Disinformation about climate change—main narratives in June at the European level. 21 Jul 2022. https://edmo.eu/publications/disinformation-about-climate-change-main-narratives-in-june-at-the-european-level/

13   Factcheck: How "scary-sounding numbers" are being used to mislead the UK about net-zero. Carbon Brief. 27 Jun 2024. https://www.carbonbrief.org/factcheck-how-scary-sounding-numbers-are-being-used-to-mislead-the-uk-about-net-zero/

14   Menz BD, Kuderer NM, Bacchi S, etal. Current safeguards, risk mitigation, and transparency measures of large language models against the generation of health disinformation: repeated cross sectional analysis. BMJ 2024;384:e078538. . doi: 10.1136/bmj-2023-078538 pmid: 38508682

15   Dobson GP. Wired to doubt: why people fear vaccines and climate change and mistrust science. Front Med (Lausanne) 2022;8:809395. doi: 10.3389/fmed.2021.809395 pmid: 35186977

16   Turrentine J. Climate misinformation on social media is undermining climate action. NRDC 19 Apr 2022. https://www.nrdc.org/stories/climate-misinformation-social-media-undermining-climate-action

17   Center for Countering Digital Hate. Facebook failing to flag harmful climate misinformation, new research finds. 23 Feb 2022. https://counterhate.com/blog/facebook-failing-to-flag-harmful-climate-misinformation-new-research-finds/

18   Costello TH, Pennycook G, Rand DG. Durably reducing conspiracy beliefs through dialogues with AI. Science 2024;385:eadq1814

19   Feuerriegel S, DiResta R, Goldstein JA, etal. Research can help to tackle AI-generated disinformation. Nat Hum Behav 2023;7:-21. . doi: 10.1038/s41562-023-01726-2 pmid: 37985906