

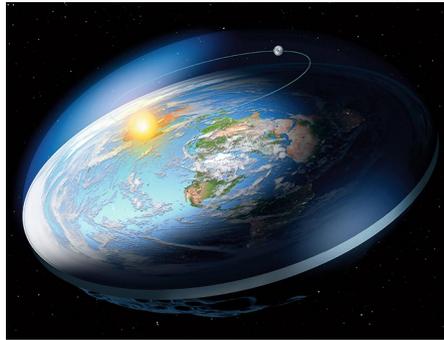
# Debunking science denialism

Science denialism causes greater harm when left unchallenged. An article in this issue provides evidence for effective rebuttal strategies.

**T**hambo Mbeki, South Africa's president between 1999 and 2008, became infamous for his denial of the link between HIV and AIDS. Despite overwhelming scientific consensus that HIV causes AIDS, he suggested instead that the causes of AIDS are poverty-related and due to poor nourishment and overall ill-health. He instituted policies that denied antiretroviral drugs to AIDS patients. Instead, his appointed health minister, Manto Tshabalala-Msimang, recommended garlic, beetroot, and lemon juice as treatments for AIDS. In a country with the highest HIV prevalence worldwide in absolute numbers, these policies had disastrous consequences: they are estimated to have led to more than 330,000 preventable deaths.

Science denialism, the rejection of empirically supported propositions despite scientific consensus and the effort to create the appearance of debate when there is none, is not a new phenomenon—think of the Galileo affair in the 17<sup>th</sup> century. Surprisingly for most, flat-earth beliefs persist well into the 21<sup>st</sup> century. Although flat-earthers may pose little risk to humanity and the environment, the denial of anthropogenic climate change, the refusal to accept the link between smoking and lung cancer or HIV and AIDS, vaccine hesitancy, and other denialist claims have had and continue to have devastating consequences. How to effectively respond to science denialism, however, is an issue that scientists and science advocates are still grappling with.

An article in this issue of *Nature Human Behaviour* by Schmid and Betsch examines



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the effectiveness of different strategies for rebutting science denialism in public discussions on vaccination and climate change (<https://www.nature.com/articles/s41562-019-0632-4>). The results of this work are engagingly described and put into context in an accompanying News & Views by van der Linden (<https://www.nature.com/articles/s41562-019-0631-5>). A key finding to emerge from this work is that not responding to denialism does more harm than good. The authors found that the negative effect of science denial on audiences was greater when there was no science advocate to rebut the claims. When a science advocate rebutted denialist arguments, either by presenting scientific facts or by exposing the logical flaws of the arguments, the effects of denialism were significantly reduced, even among audiences whose beliefs or ideologies are threatened by the science advocate.

The finding that leaving denialist arguments unchallenged has a negative impact on audiences is particularly important in the current socio-political environment. Although traditionally science denialism takes on a mantle of pseudoscience, we are witnessing a transformation of public discourse, where denialist claims may be entirely divorced from a semblance of logic or evidence. It is tempting not to engage rationally with outlandish denialist claims, for fear of legitimizing them or backfiring. In a much discussed example, Donald Trump tweeted in 2012, “The concept of global warming was created by and for the Chinese in order to make U.S. manufacturing non-competitive” (<https://twitter.com/realdonaldtrump/status/265895292191248385?>). The claim has been retweeted nearly 100 million times and generated thousands of responses. The vast majority of these responses were emotional, whereas fact-based rebuttals among those who responded were a slim minority.

However, allowing false scientific claims, no matter how absurd, to float unchallenged by evidence or logic, is worse than engaging with them, Schmid and Betsch's research suggests. Their work highlights how important it is to invest in the development of a strong body of science-advocacy strategies and to patiently persevere in exposing the factual and logical flaws of even the most absurd denialist claims. □

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