Communicating as scientific collectives to safeguard information integrity

Dawn Holford and the SciBeh team*



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SciBeh

Reconfiguring behavioral science for crisis knowledge management: We are creating the infrastructure necessary for rapid crisis knowledge management



https://scibeh.org

and many volunteers past and present...

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The Interface Between Science and Policy and Public

- Policy makers and public need scientific knowledge to be
  - accessible ➢ available, understandable
  - applicable ➢ problem-focused
  - actionable ➢ reliable

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Scientific (Expert) Consensus

- Consensus reflects status of scientific knowledge
- If there is no consensus, policy advice must be more nuanced than if there is a strong consensus
- Consensus exists for policy-relevant issues
  - tobacco and health ➢ smoking causes lung cancer
  - HIV-AIDS ➢ HIV causes AIDS
  - climate change ➢ CO_2 emissions alter climate
  - vaccination ➢ vaccines save lives

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Scientific (Expert) Consensus

- Perceived consensus is psychologically relevant
- Causally related to public acceptance of science:
  - Climate science (Lewandowsky et al., 2013; Cook & Lewandowsky; 2016; Deryugina & Shurchkov, 2016; van der Linden, 2021)
  - Vaccinations (van der Linden et al., 2015)

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How To Establish Consensus?

- In a static world, several solutions exist
  - bibliometrics (Shwed & Bearman, 2010)
  - literature analysis (Anderegg et al., 2010; Cook et al., 2013; Oreskes, 2004)
  - expert surveys (Cook et al., 2013; Doran & Zimmerman, 2009; Oberauer, Lewandowsky, et al., 2018)
  - expert panels (e.g., IPCC, WHO)

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Producing Scientific Consensus Documents



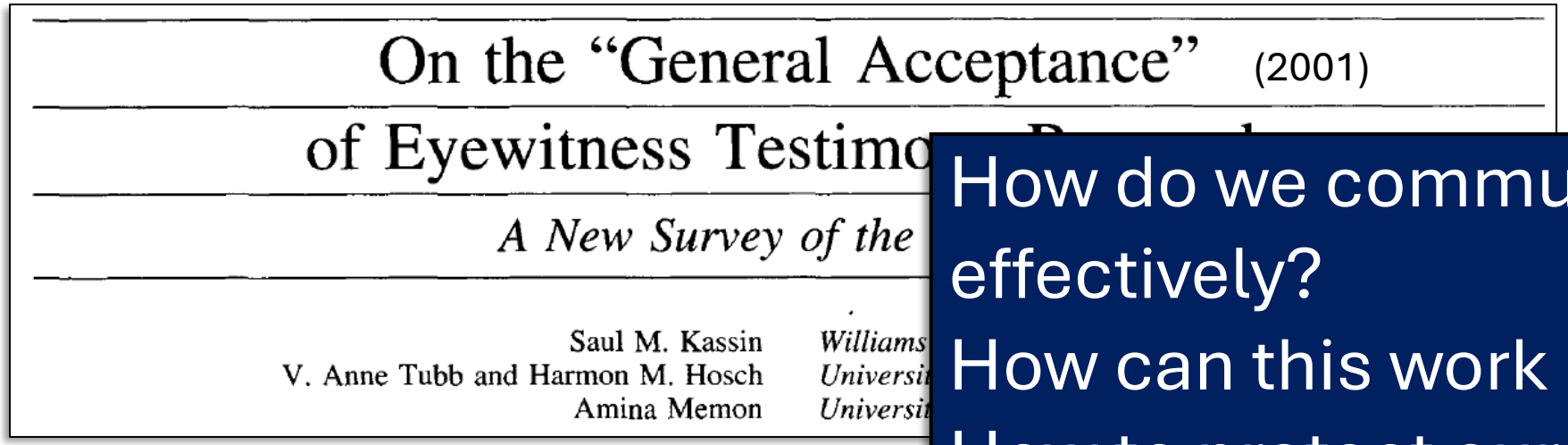
Supplement

Clinical Consensus Statement Development Manual

Richard M. Rosenfeld, MD, MPH[1], Lorraine C. Nnacheta, MPH[2], and Maureen D. Corrigan[2]

AMERICAN ACADEMY OF OTOLARYNGOLOGY–HEAD AND NECK SURGERY FOUNDATION

Otolaryngology–
Head and Neck Surgery
2015, Vol. 153(2S) S1–S14
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DOI: 10.1177/0194599815601394
http://otojournal.org
SAGE



On the "General Acceptance" (2001)

of Eyewitness Testimo

A New Survey of the

Saul M. Kassin *Williams*
V. Anne Tubb and Harmon M. Hosch *Universi*
Amina Memon *Universi*

How do we communicate it effectively?
How can this work in a crisis?
How to protect ourselves?

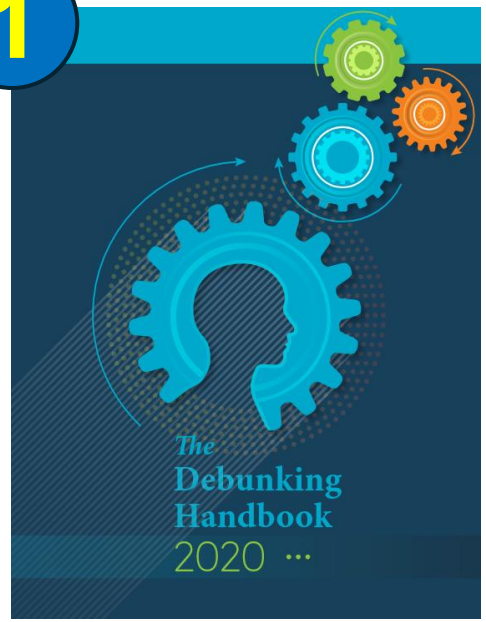
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Communicating as a collective: four case studies

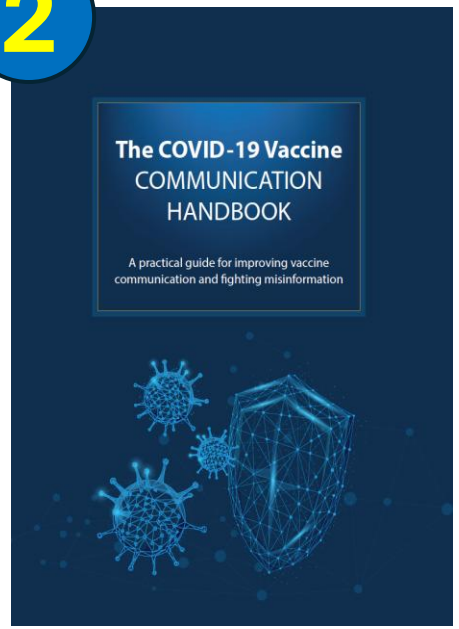
- Public-facing expert consensus documents
- Independent scientific collectives
- Resource-efficient: created with limited (or no) funding, harnessing free technology



1



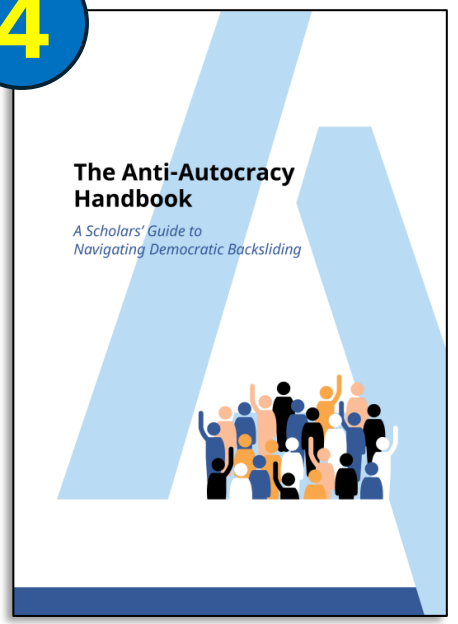
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3



4

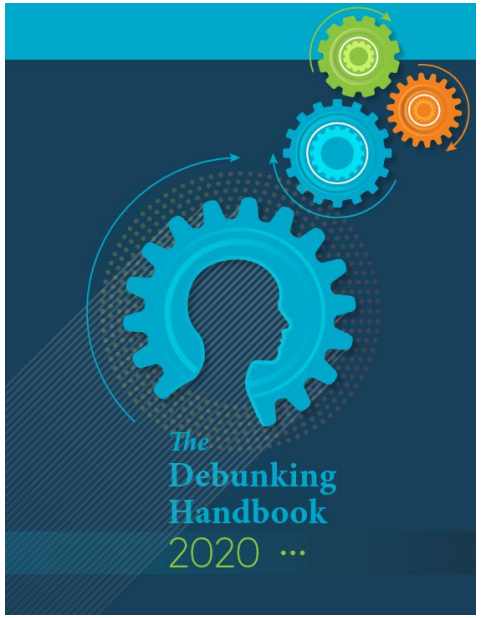


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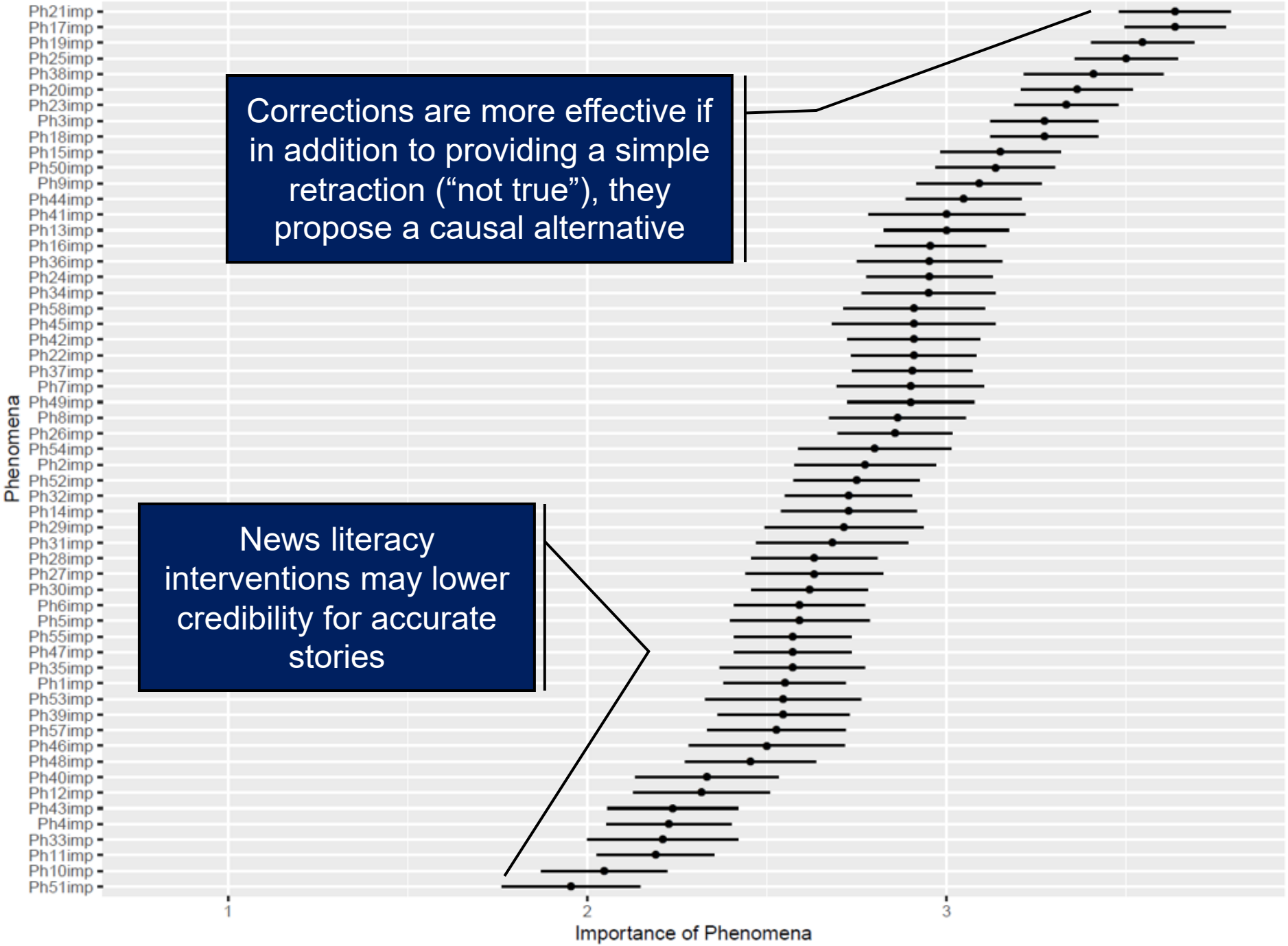
1

The Debunking Handbook 2020

- Establish consensus on addressing misinformation
- Pre-registration of process
- Contributing authors invited based on previous publications (19 authors).
- Iterative team nomination and rating process for issues to include (via online survey):
  - Confidence in evidence (how replicable)
  - Practical importance of evidence

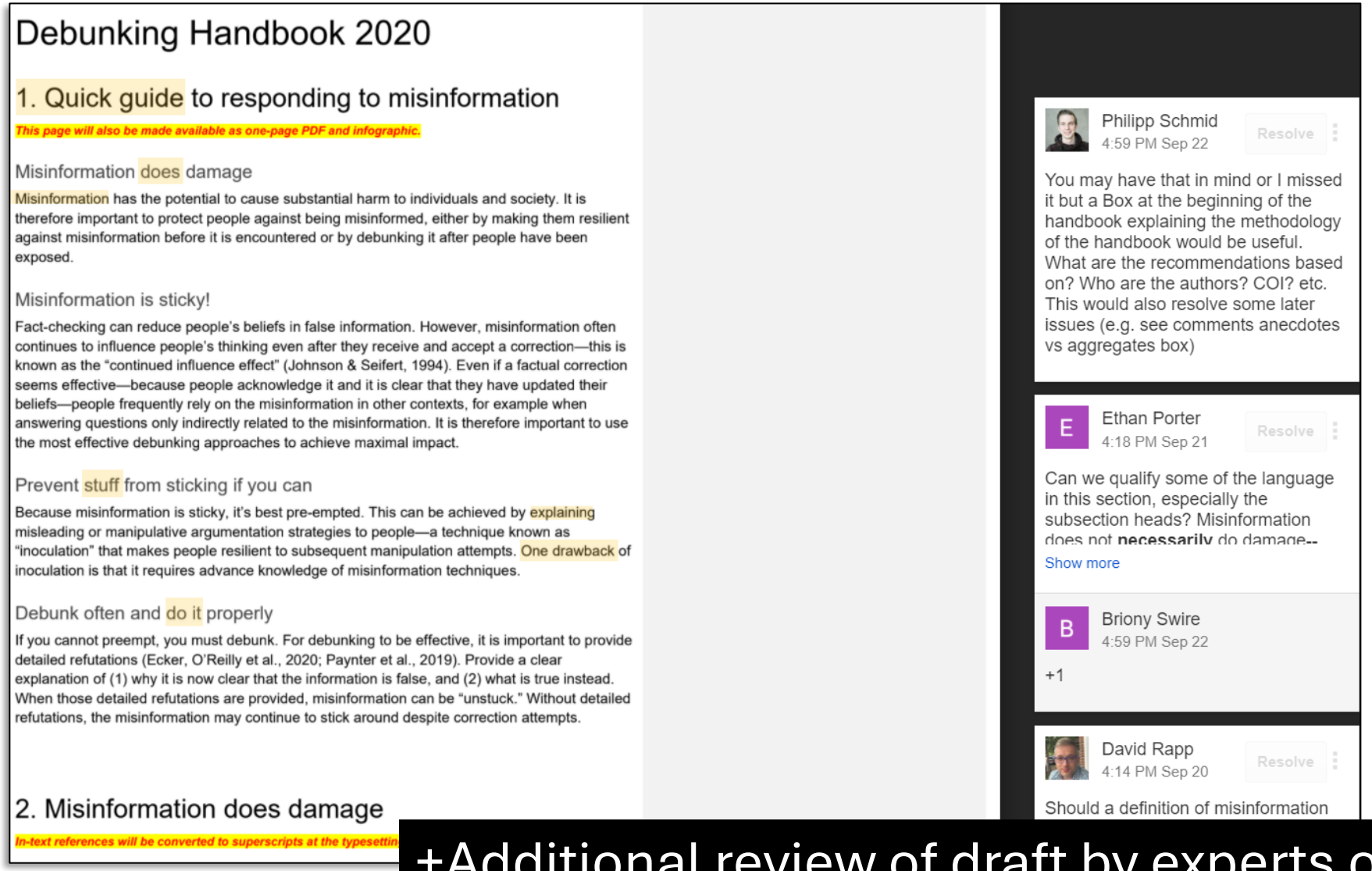


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Discussion of draft publicly available



Debunking Handbook 2020

1. Quick guide to responding to misinformation

This page will also be made available as one-page PDF and infographic.

Misinformation does damage

Misinformation has the potential to cause substantial harm to individuals and society. It is therefore important to protect people against being misinformed, either by making them resilient against misinformation before it is encountered or by debunking it after people have been exposed.

Misinformation is sticky!

Fact-checking can reduce people's beliefs in false information. However, misinformation often continues to influence people's thinking even after they receive and accept a correction—this is known as the "continued influence effect" (Johnson & Seifert, 1994). Even if a factual correction seems effective—because people acknowledge it and it is clear that they have updated their beliefs—people frequently rely on the misinformation in other contexts, for example when answering questions only indirectly related to the misinformation. It is therefore important to use the most effective debunking approaches to achieve maximal impact.

Prevent stuff from sticking if you can

Because misinformation is sticky, it's best pre-empted. This can be achieved by explaining misleading or manipulative argumentation strategies to people—a technique known as "inoculation" that makes people resilient to subsequent manipulation attempts. One drawback of inoculation is that it requires advance knowledge of misinformation techniques.

Debunk often and do it properly

If you cannot preempt, you must debunk. For debunking to be effective, it is important to provide detailed refutations (Ecker, O'Reilly et al., 2020; Paynter et al., 2019). Provide a clear explanation of (1) why it is now clear that the information is false, and (2) what is true instead. When those detailed refutations are provided, misinformation can be "unstuck." Without detailed refutations, the misinformation may continue to stick around despite correction attempts.

2. Misinformation does damage

In-text references will be converted to superscripts at the typesettin

Philipp Schmid
4:59 PM Sep 22
Resolve

You may have that in mind or I missed it but a Box at the beginning of the handbook explaining the methodology of the handbook would be useful. What are the recommendations based on? Who are the authors? COI? etc. This would also resolve some later issues (e.g. see comments anecdotes vs aggregates box)

E
Ethan Porter
4:18 PM Sep 21
Resolve

Can we qualify some of the language in this section, especially the subsection heads? Misinformation does not **necessarily** do damage--

Show more

B
Briony Swire
4:59 PM Sep 22

+1

David Rapp
4:14 PM Sep 20
Resolve

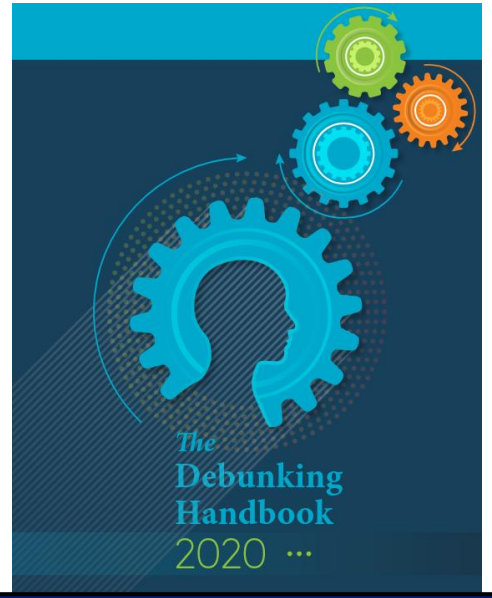
Should a definition of misinformation

+Additional review of draft by experts outside team.

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The Debunking Handbook 2020

- A consensus document of the science of debunking
- Fully documented, preregistered, transparent process
- Science of debunking did not change much during 3-4 months of production
- What if the situation is fluid?

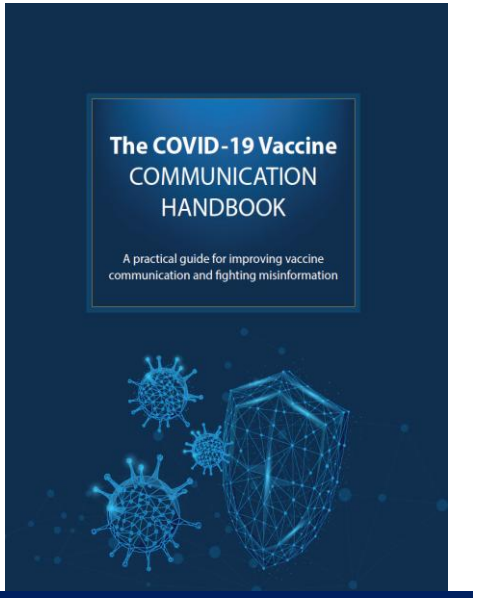


https://sks.to/db2020

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2 The COVID-19 Vaccine Communication Handbook

- Rapid response project: provided communication agenda for the COVID-19 vaccines + address COVID-19 vaccine misinformation
- Global collaboration (27 authors + ongoing contributions)
  - Commenced writing **6 December 2020**
  - Released to public **6 January 2021**
- Living document with underlying “wiki”*
  - State of science was fluid
  - Needed to keep up with changes

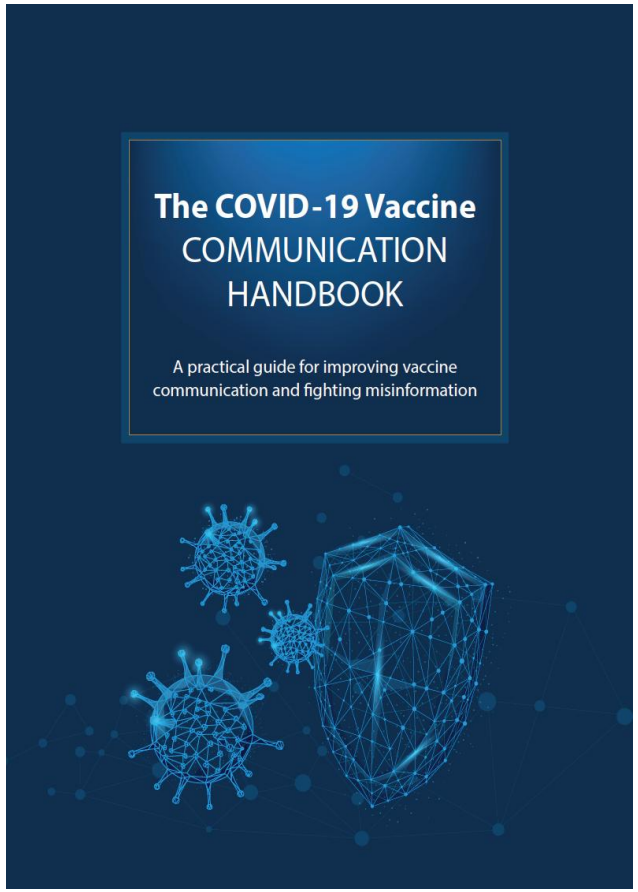


sks.to/c19vax

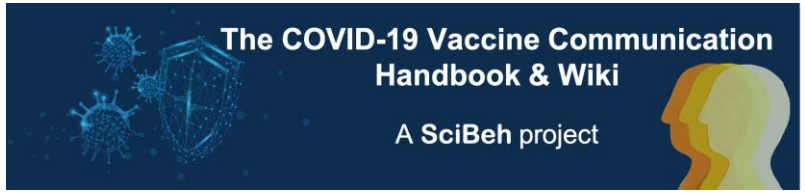
*Wiki was finally archived in 2023.

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Underlying Wiki



Click-through buttons



Trust in scientists increases:

Surveys in several countries have shown trust in scientists to increase. In Germany, the share of people who completely trust scientists doubled between 2019 and November 2020, and around 70% of the public trust scientists. In the U.K., 64% of respondents indicated in April 2020 that the pandemic had made them more likely to listen to scientists and researchers.

TRUST IN SCIENTISTS



Return to **COVID-19 Vaccine Communication Handbook & Wiki** entry page

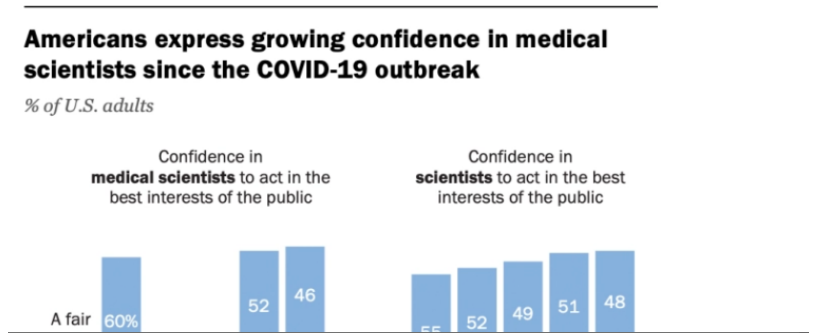
Note: text in green identifies latest update. (See last updated time stamp at top of page.)

Trust in scientists

The contextual and ephemeral nature of trust

Trust in scientists has in general increased during the pandemic in several countries, despite claims and concerns about decreasing trust. For example, according to a survey administered via the Corona Spezial Science Barometer, the share of Germans who completely trust scientists doubled between 2019 and November mid-2020, reaching 70% of the German public. Similarly, in the United Kingdom, the Open Knowledge Foundation found that 64% of poll respondents were more likely to listen to expert advice from qualified scientists and researchers.

However, in the United States, trust in scientists and medical experts has only risen among Democrats according to a Pew Research opinion poll conducted in May 2020.

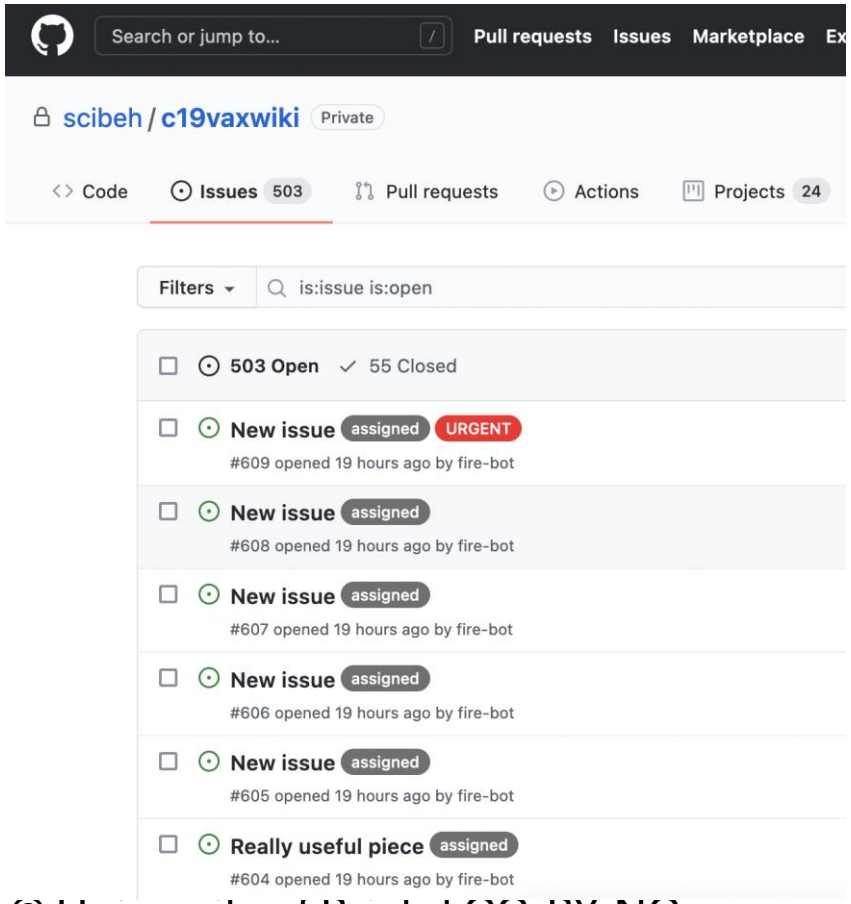


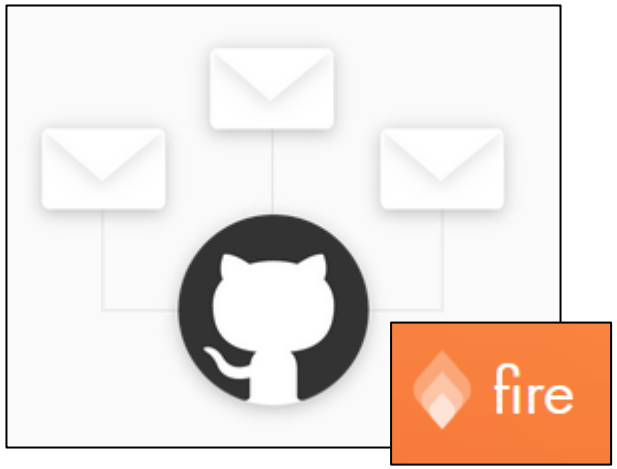
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Under the “hood” of the c19vax Wiki: technological support

c19vaxwiki@gmail.com

Github “issue”



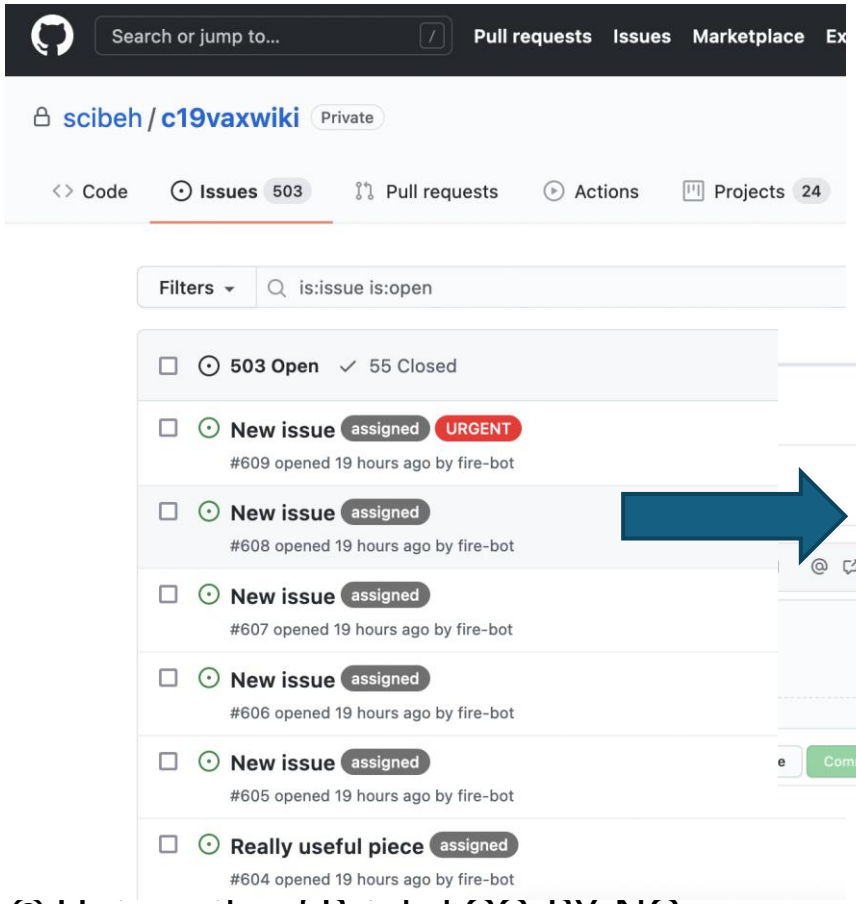


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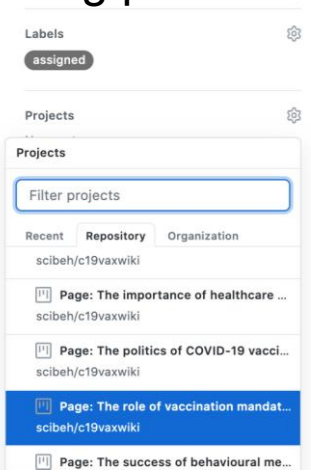
Under the “hood” of the c19vax Wiki: technological support

c19vaxwiki@gmail.com

Github “issue”



Sorting process

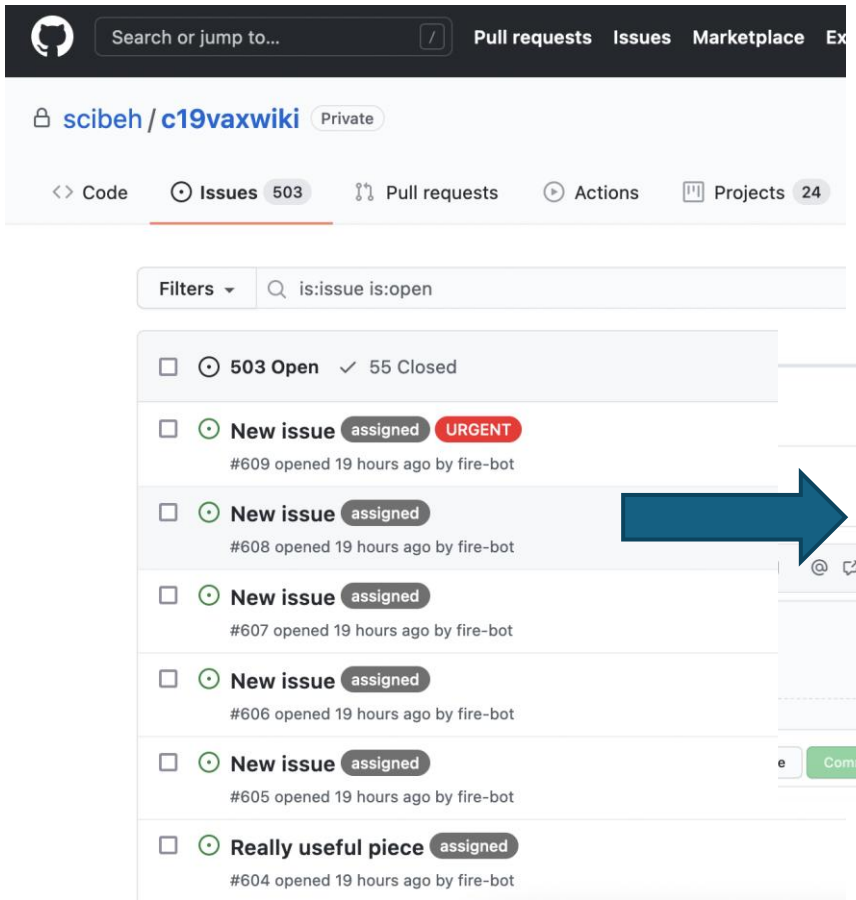


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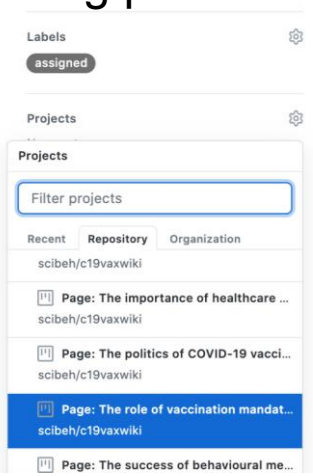
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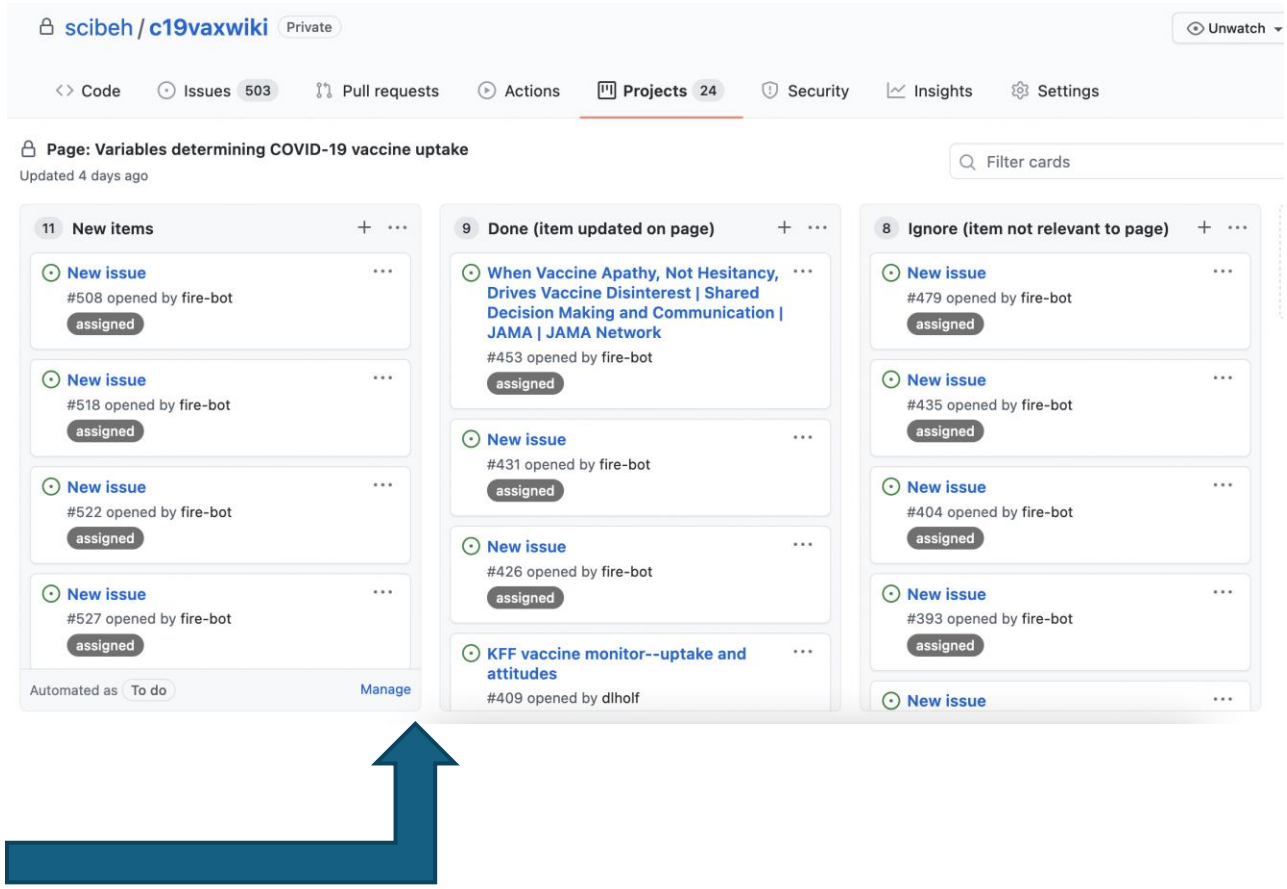
Github “issue”



Sorting process

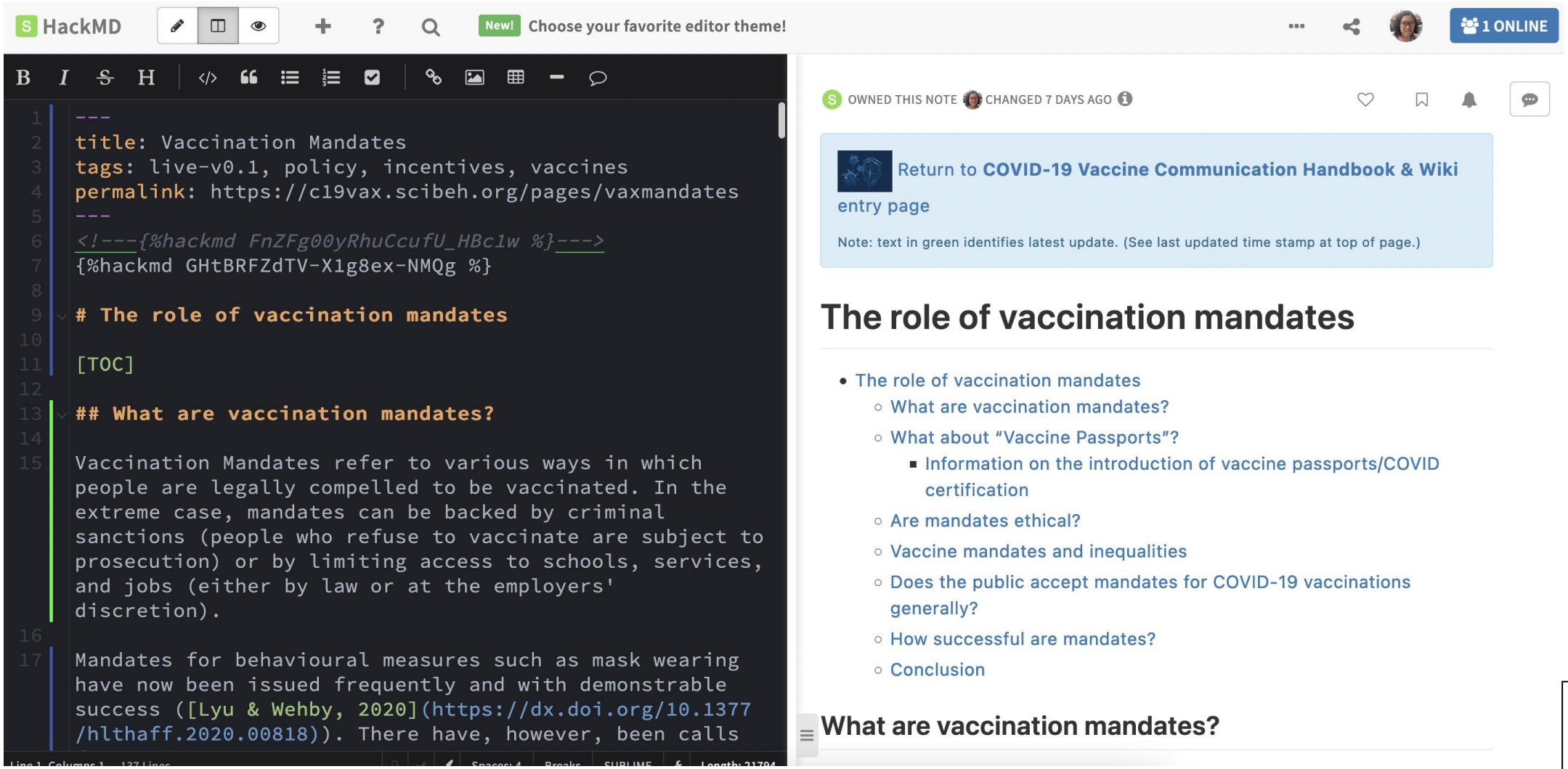


Each page gets its own “info board”:



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Under the “hood” of the c19vax Wiki: updating the Wiki

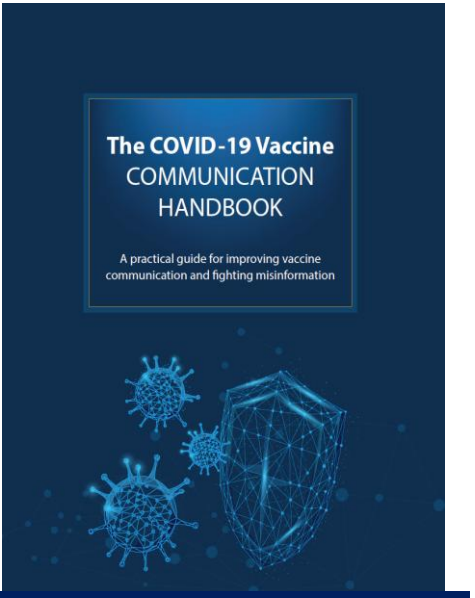


HackMD tool: Wiki “backend”

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The COVID-19 Vaccine Communication Handbook

- Project involved multiple disciplines (e.g., microbiology, cognitive science, medicine).
- Authors are leading experts in their field but selection not formalized, process not preregistered.
- Underlying wiki provides flexibility and opportunity for further exploration of issues.
- But high burden of sustaining it over a prolonged period.



sks.to/c19vax

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3 Manifesto for Science Communication as Collective Intelligence

- 2-day workshop November 2021: open invitation to all attendees (25 authors signed up)
- Workshop notes turned into 188 “propositions” that authors voted on for inclusion
- 6 groups of authors wrote independent sections based on votes
- Condensed combined paper into a list of brief statements

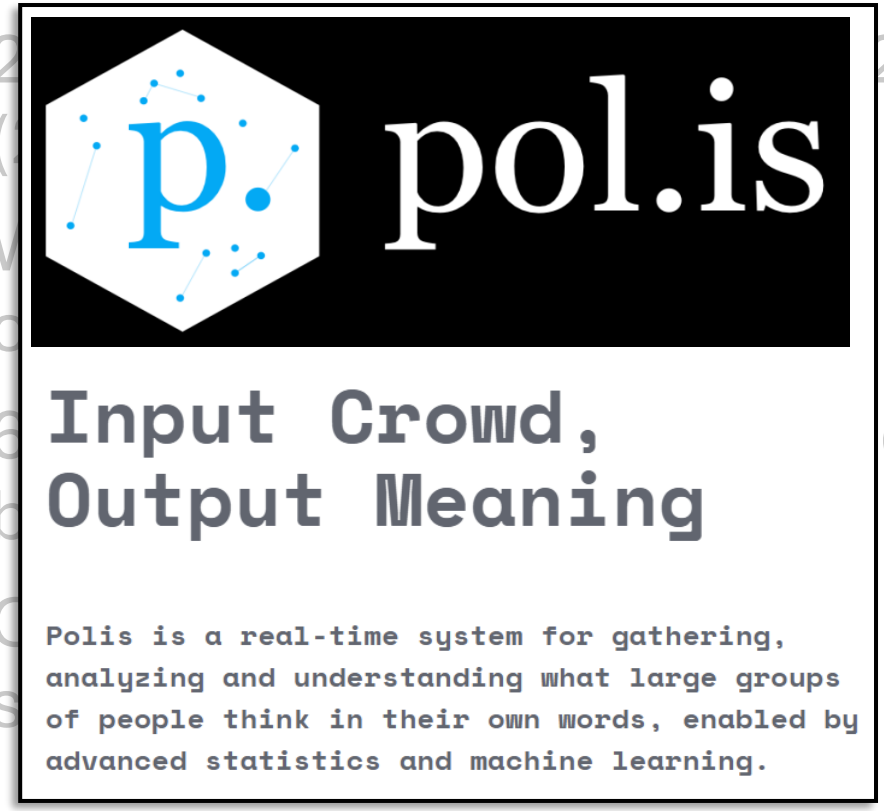


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https://www.scibeh.org/manifesto/

3 Manifesto for Science Communication as Collective Intelligence

- 2021: open invitation to all attendees
- 188 “propositions” that authors voted
- dependent sections
- r into a list of brief



https://www.scibeh.org/manifesto/

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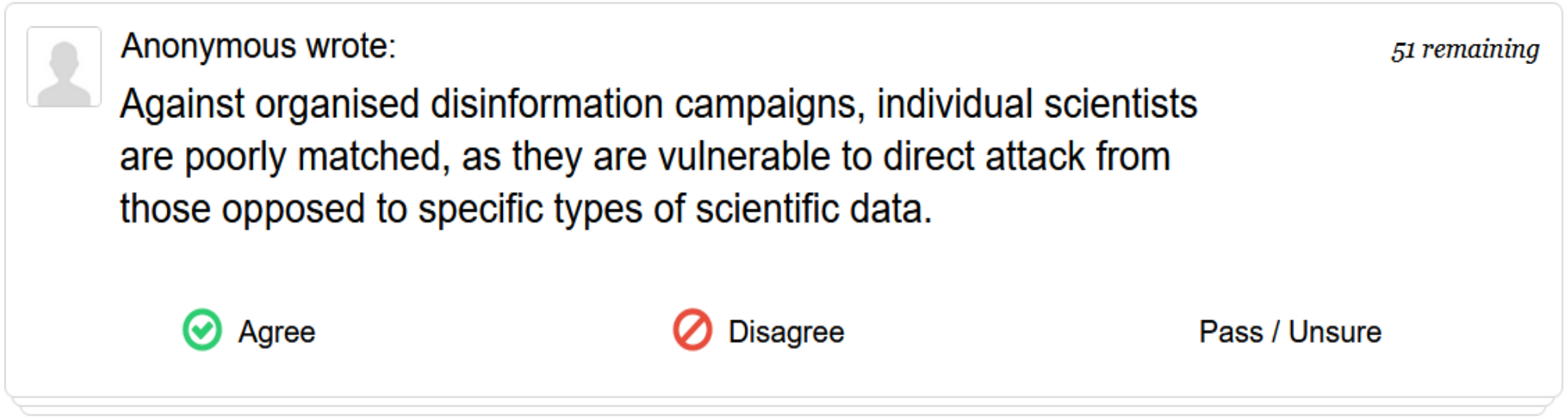
Pol.is voting procedure for manifesto propositions

Please decide for each statement whether that point should be made in the manifesto. (Note: please bear in mind the goal of a concise manifesto - voting against a statement does not mean dropping it from the paper, it simply means that statement is not a good candidate for a key manifesto proposition.)

View the complete draft of the full length paper here:

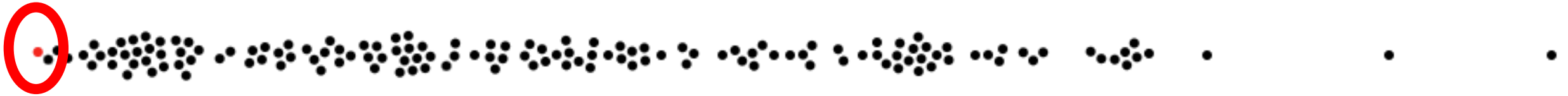
View the extracted set of propositions for potential inclusion in the manifesto here:

Welcome to a new kind of conversation - vote on other people's statements.



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Pol.is voting procedure for manifesto propositions



Consensus statements — Divisive statements

	STATEMENT	OVERALL	A 10	B 4	C 6
1	Organised efforts to misinform, sow public confusion, or advance conspiracy theories threaten informed public debate and therefore prevent citizens from implementing scientifically-grounded solutions.	94% 5% 0% (19)	100% 0% 0% (9)	75% 25% 0% (4)	100% 0% 0% (6)

Consensus generation process made transparent

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Pol.is voting procedure for manifesto propositions



Consensus statements — Divisive statements

	STATEMENT	OVERALL	A 10	B 4	C 6
94	In an infodemic management infrastructure, both individual experts and the collective can each play their own role in contributing to the decision-making process and collective narrative through risk communication and community engagement.	29% 58% 11% (17)	71% 0% 28% (7)	0% 100% 0% (4)	0% 100% 0% (6)

Consensus generation process made transparent

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Pol.is voting procedure for manifesto propositions

	STATEMENT	OVERALL 20	A 10	B 4	C 6
88	A collectively intelligent science communication system needs to give the opportunity for evidence-backed dissent.	100% 0% 0% (17)	100% 0% 0% (7)	100% 0% 0% (4)	100% 0% 0% (6)
4	Lone voices can distort public perceptions of consensus and present a false balance or create a misleading picture of controversy on issues at hand.	94% 5% 0% (17)	100% 0% 0% (7)	100% 0% 0% (4)	83% 16% 0% (6)
1	Organised efforts to misinform, sow public confusion, or advance conspiracy theories threaten informed public debate and therefore prevent citizens from implementing scientifically-grounded solutions.	94% 5% 0% (19)	100% 0% 0% (9)	75% 25% 0% (4)	100% 0% 0% (6)
5	A collective intelligence approach to science communication weights information by the strength of evidence in a debate, enabling evidence that is supported by consensus to be more decisive.	88% 5% 5% (17)	85% 0% 14% (7)	100% 0% 0% (4)	83% 16% 0% (6)
111	Communicating scientific consensus can increase audience agreement with scientific results.	88% 11% 0% (17)	100% 0% 0% (7)	100% 0% 0% (4)	66% 33% 0% (6)
137	Building trust in science should be a priority for future emergencies.	88% 5% 5% (17)	100% 0% 0% (7)	100% 0% 0% (4)	66% 16% 16% (6)
0	It is only when public beliefs are built on reliable knowledge, rather than poorly informed opinions, that we can successfully address pressing societal challenges.	88% 11% 0% (17)	100% 0% 0% (7)	100% 0% 0% (4)	66% 33% 0% (6)
84	Communicating as a collective presents an advantage in itself, in that it can showcase the level of expert consensus and thus highlight the strength of the evidence for a given position.	88% 11% 0% (17)	85% 14% 0% (7)	75% 25% 0% (4)	100% 0% 0% (6)

- Statements that received at least 60% support formed basis of manifesto
- *Quillbot.com* was used to create first draft from statements

©

Manifesto for Science Communication as Collective Intelligence

- Outlined why we need collective science communication.
- Was itself a collective intelligence process.
- Introduced new tools to augment consensus process.
- Final draft submitted for formal peer-review and publication.

Science Communication
Volume 45, Issue 4, August 2023, Pages 539-554
© The Author(s) 2023, Article Reuse Guidelines
https://doi.org/10.1177/10755470231162634

SAGE journals

Commentaries

Science Communication as a Collective Intelligence Endeavor: A Manifesto and Examples for Implementation



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https://www.scibeh.org/manifesto/

**Funding of disinformation, personal attacks—
None of this is new!**

A Dangerous Paradox: Tory MPs and their Media Allies Attack Chris Whitty for Simply Doing his Job

CHAPTER

10 In Whose Hands the Future?

Stephan Lewandowsky

https://doi.org/10.1093/oso/9780190844073.003.0010 Pages 149–177

Published: 20 December 2018

se

Science fact-checks the Fox host's rant against "Saint Tony," who announced his retirement on Monday

25 AUG 2022 · 6:10 PM ET · BY JON COHEN

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AAAS Board: Attacks on Climate Researchers Inhibit Free Exchange of Scientific Ideas

29 June 2011

by: Earl Lane

Reports of personal attacks on climate scientists, including harassment, legal challenges, and even death threats, have created a hostile environment that inhibits the free exchange of scientific findings and makes it difficult for factual information to reach policymakers and the public, the AAAS Board of Directors said in a statement of concern.

**Funding of disinformation, personal attacks—
None of this is new!**

SCIENCE · 17 Apr 1987 · Vol 236, Issue 4799 · pp. 250-251 · DOI: 10.1126/science.3563501

10 6

Tobacco Science Wars

The industry has been bullying scientists, according to researchers who lead the campaign against environmental tobacco smoke

News | Published: 05 March 1949

The Crisis in Soviet Science

Nature **163**, 354 (1949) | Cite this article

Save article

254 Accesses | **1** Altmetric | Metrics

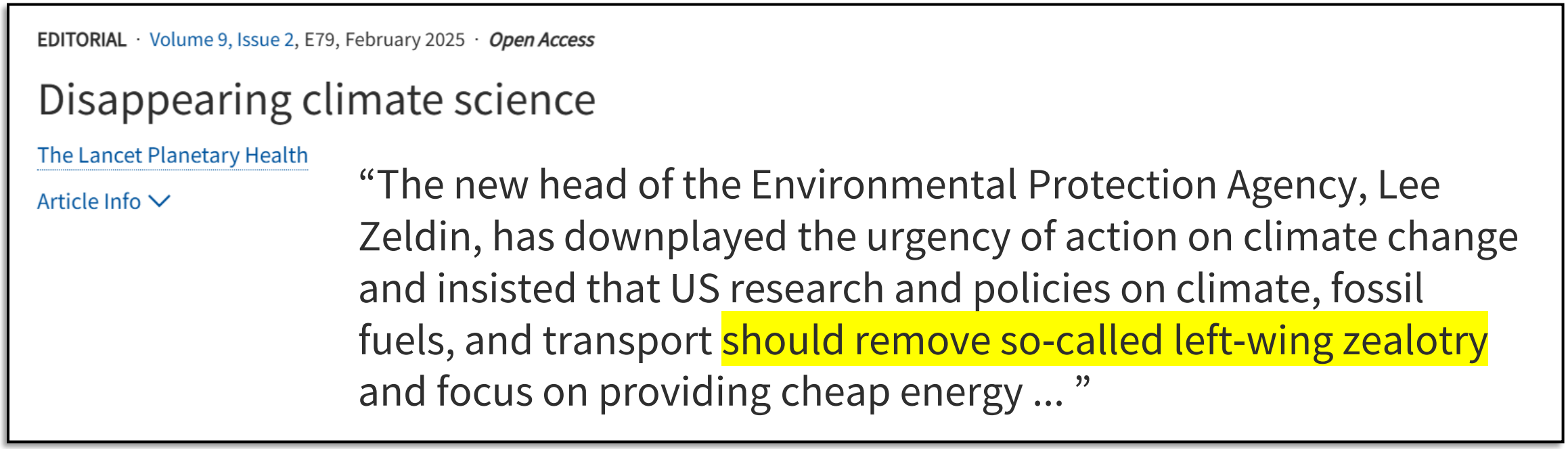
Abstract

LAST August scientific workers all over the world heard with deep disappointment that the Soviet Union had officially adopted an isolat irst time in the U.S.S.R. thefe was establish en there has been speculation as to whet s, and a recent broadcast from Moscow give philosopher Alexander Alexandrovitc Academy of Sciences, and who belong dcast on the Moscow Radio Home Service. The theme of his talk was the correct Bolshevik attitude to natural science. He attacks those foreign physicists who "regard as synonymous the philosophical

Autocracies are particularly bad for science

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Science in an Emerging Autocracy



EDITORIAL · Volume 9, Issue 2, E79, February 2025 · *Open Access*

Disappearing climate science

The Lancet Planetary Health

Article Info

"The new head of the Environmental Protection Agency, Lee Zeldin, has downplayed the urgency of action on climate change and insisted that US research and policies on climate, fossil fuels, and transport should remove so-called left-wing zealotry and focus on providing cheap energy … "

- US Secretary of Health and Human Services, Robert F. Kennedy, Jr.:
  - AIDS is not caused by HIV
  - COVID-19 was ethnically targeted to spare Ashkenazi Jews and Chinese people
  - Wi-Fi causes cancer and a leaky brain

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Emerging Autocracy

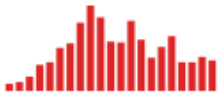
https://www.trumpactiontracker.info

Actions by domain

Undermining democracy
Violating democrating norms or undermining rule of law
1144



Suppressing dissent
Suppressing dissent or weaponising state against 'enemies'
992



Nationalism
Anti-immigration or militarised nationalism
850



Foreign policy
Aggressive foreign policy and global destabilisation
694



Attacking science
Politicisation of science and health
636



Weakening civil rights
Dismantling social protections and civil rights
629



Controlling information
Controlling information, including spreading misinformation and propoganda
571



Corruption
Corruption and enrichment
345



Attacking education
Attacking universities, schools, museums and culture
277



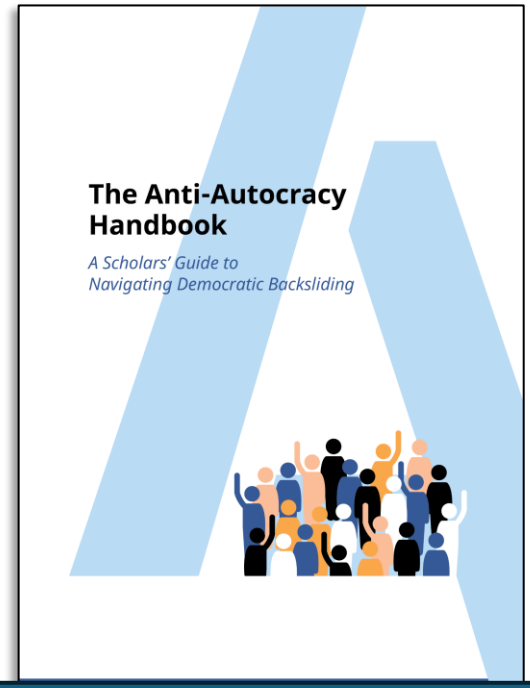
Hollowing state
Hollowing state or weakening federal institutions
233



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4 The Anti-Autocracy Handbook

- Building on experience from creating earlier consensus documents
- Responding to crisis, reaching out to scholars
- Communicating the threat
- How do we respond to the threat of autocracy?
- Framework to assess personal risk



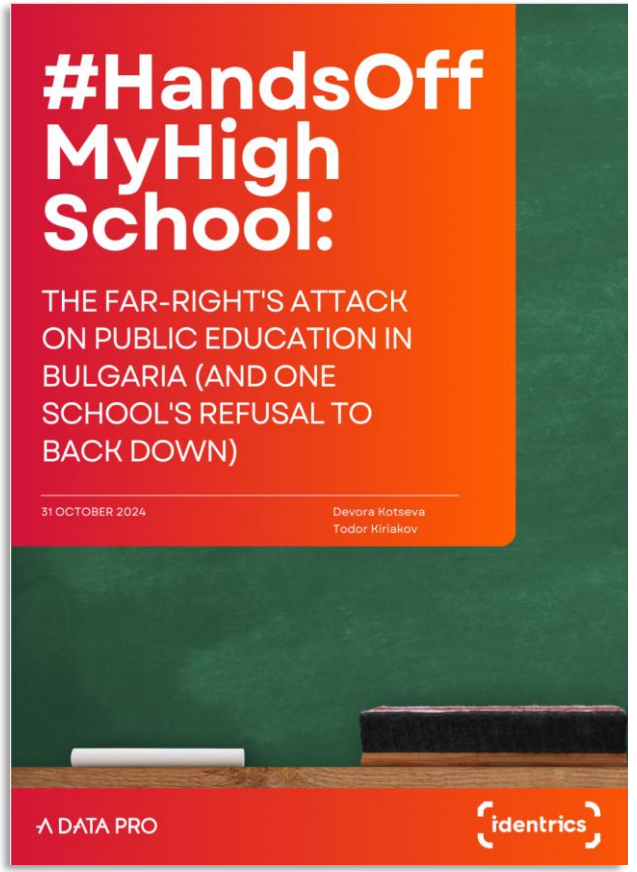
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“Resistance is Futile”

- Autocrats require obedience to exercise power
- To obtain obedience they project power

But resistance can work



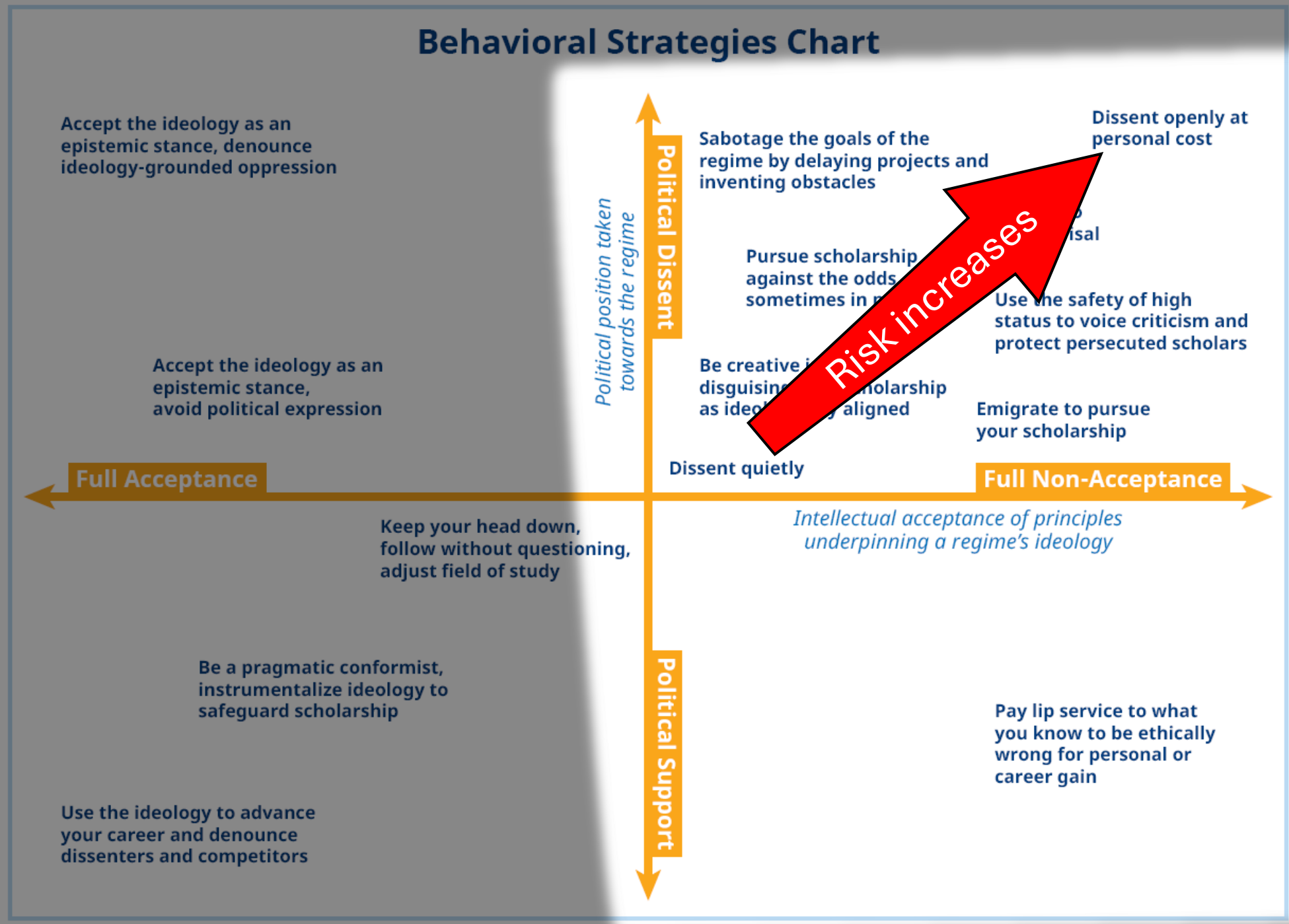
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Reluctance to be “Political”

- Academics are reluctant to be seen as “political”
  - sometimes for good reason
- Advocacy does not diminish credibility of scientists in the public’s eye (Kotcher et al., 2017)
  - with some rare exceptions
- There are situations when *not being political is itself a political act*
  - supports status quo and pluralistic ignorance
  - supports powerful actors

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Behavioral Strategies Chart



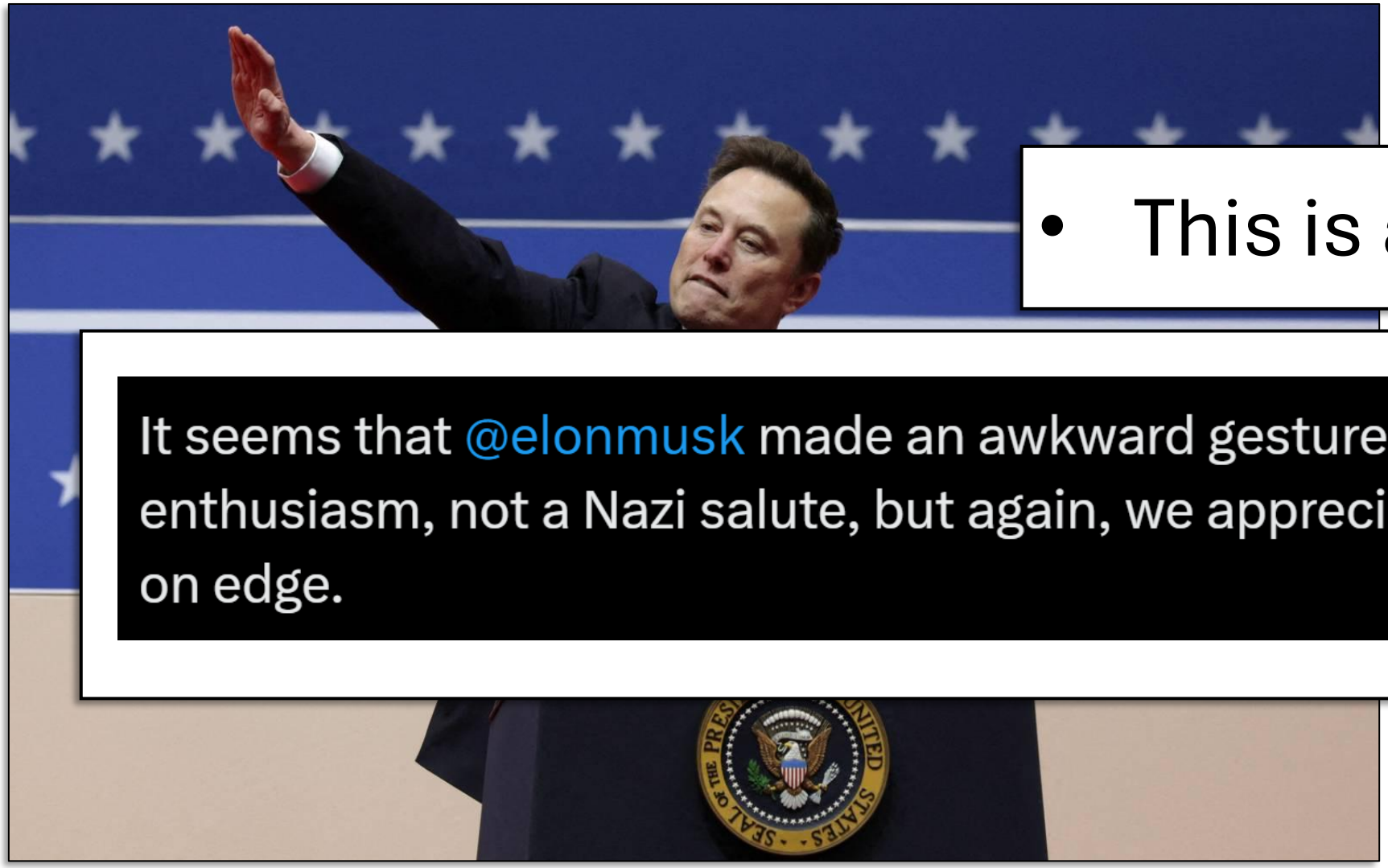
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Rejecting autocratic principles

What we need to be aware of and hold on to as a scientific collective

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Realism and Precision in Language



- This is a Hitler salute

It seems that @elonmusk made an awkward gesture in a moment of enthusiasm, not a Nazi salute, but again, we appreciate that people are on edge.

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Identify Double Speak



- The order seeks to “to ensure that federally funded research is transparent, rigorous, and impactful, and that Federal decisions are informed by the most credible, reliable, and impartial scientific evidence available,”

Who could object?

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Identify Double Speak



- "… despite it being cloaked in language that most of the scientific community would enthusiastically support, …
- "The introduction of a chimerical 'gold standard' is thus best understood as yet another of at least 318 actions against science [since January 2025]."

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Identify Double Speak



- "... despite it being cloaked in language that most of the scientific community would enthusiastically support, ...
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Identify Double Speak



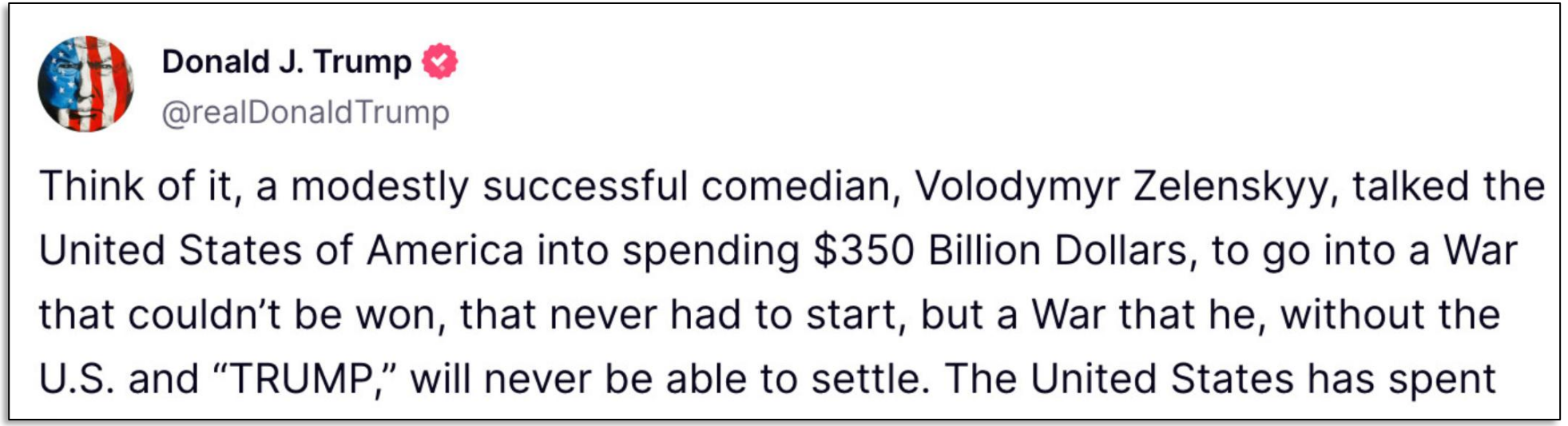
- All data and source code must be made available for all *cited* papers.
- Climate models have up to 800,000 lines of code
- Political appointees can label any research finding as scientific misconduct and then penalize the researchers involved, without any possibility of appeal

They were known as commissars in the Soviet Union

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A Commitment to the Existence of Facts

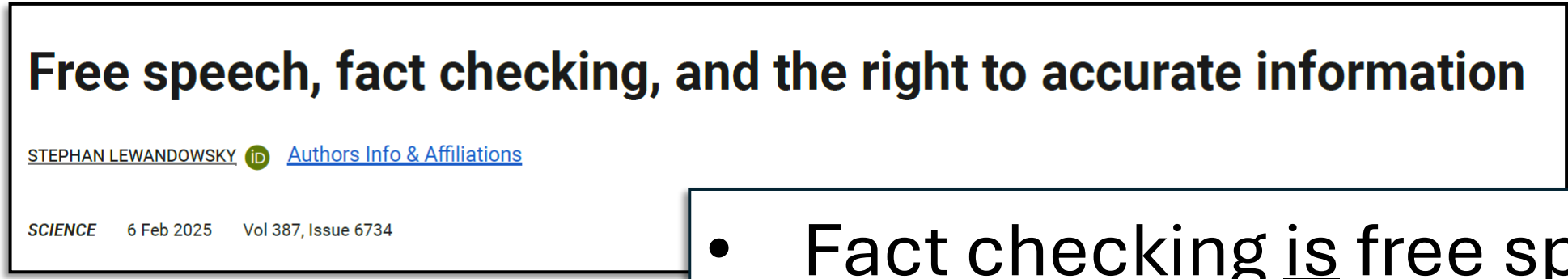
- Belgium did not invade Germany in 1914
- Poland did not invade Germany in 1939
- Ukraine did not invade Russia in 2022



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A Commitment to the Existence of Facts





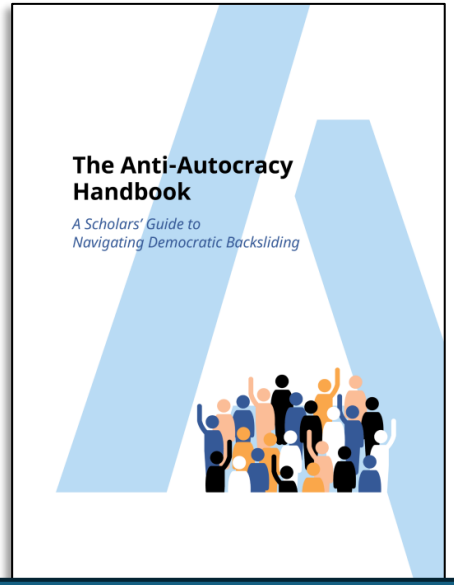
- Fact checking <u>is</u> free speech

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The Anti-Autocracy Handbook

- Autocracies threaten science (and scientists)
- Dissent comes with risk – but we're stronger as a collective
- Principles that we need to hold on to in the face of autocracy
- If scientists turn away from these principles, it compromises the collective endeavour of producing scientific knowledge

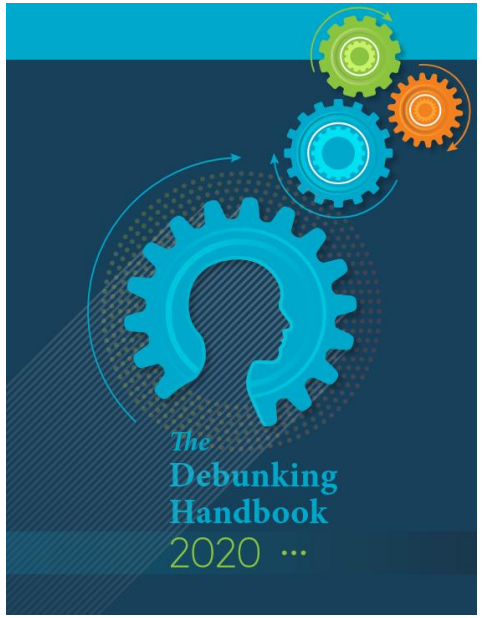
(especially that is **accessible, applicable & actionable)**

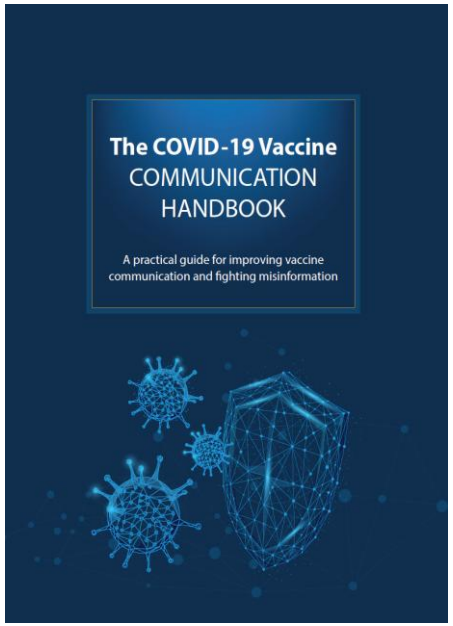


https://sks.to/autocracy

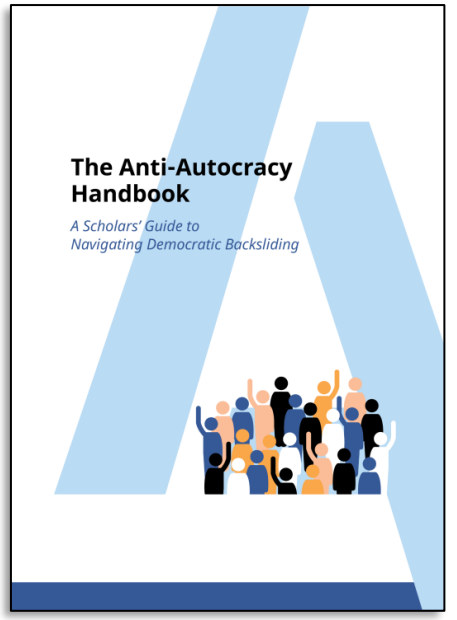
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Collective communication is powerful…









All open access documents

+ Wiki (continually updated)

+ journal article

20 languages 542 citations 42 media articles	14 languages 185 citations 71 media articles 21K downloads	29 citations 4 media articles 394 downloads	1 translation (so far) 13 citations 98K views 42K downloads

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Take home messages…

- Individual experts face multiple challenges in science communication ecosystem (especially in a crisis, especially under autocracy)
- Distribute load through **collective intelligence** endeavour
- Consider new approaches and processes:
  - What knowledge could we aggregate? (Beyond data…)
  - Who can contribute, what resources do they have?
  - How to gather and effectively showcase consensus?
  - Does information need updating?
  - What tools are available?
- Collectives are resource efficient (distributed manpower)
  - Potential to scale bigger with targeted funding

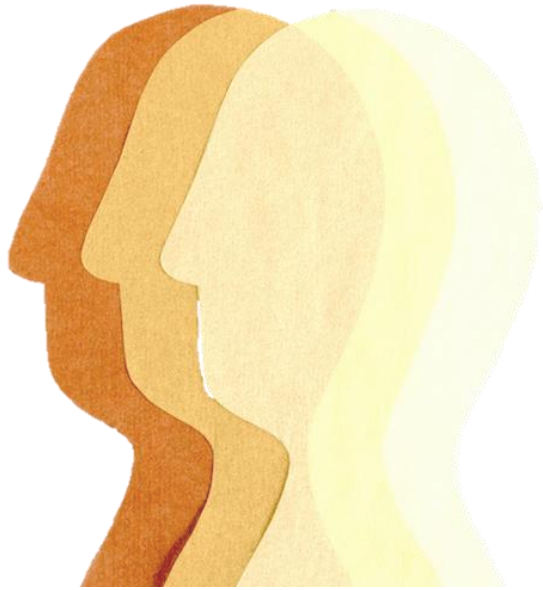
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and many volunteers past and present...

Thank you!

contact@savescience.eu



https://scibeh.org

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