



Impact of strategies to mitigate health-related misinformation in diverse settings and populations: Findings from a living evidence synthesis

CAHSPR Conference - Battling the bunk: Strategies to mitigate health-related misinformation in diverse settings and populations
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Project funding and collaborators and publications

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- First version published on McMaster Health Forum website (<https://www.mcmasterforum.org/find-global-evidence/les-spotlight/addressing-misinformation>)
 - *****Note that all findings included in the slides are based on the first version published on this page**
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Background

- Increasing digitalization and use of social media
 - Creates opportunities to rapidly communicate and disseminate information to address social challenges
 - Has the potential of introducing misinformation to citizens
- Misinformation has now been ranked as the top risk in the next two years in the Global Risks Report 2024 and 5th highest risk over the next 10 years

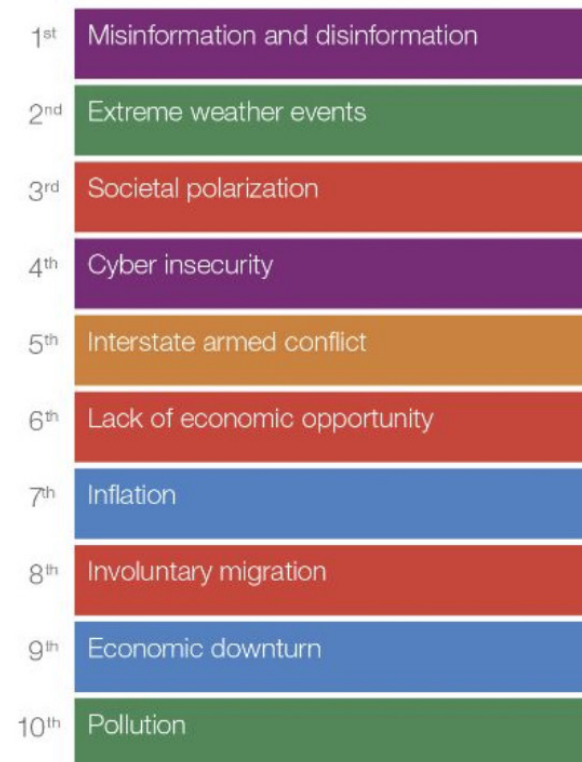
Global Risks Report 2024

Top 10 risks

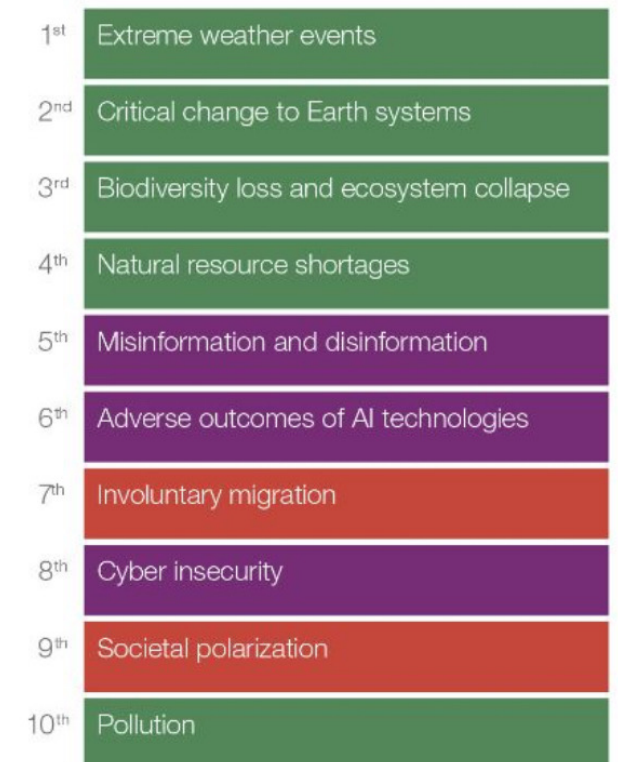


"Please estimate the likely impact (severity) of the following risks over a 2-year and 10-year period."

2 years



10 years



Definitions and objective



Misinformation refers to “information that is false, inaccurate, or misleading according to the best available evidence at the time”¹



Disinformation or malinformation are other common terms, but refer to instances “...when misinformation is used to serve a malicious purpose, such as to trick people into believing something for financial gain or political advantage.”¹



Misinformation can delay or prevent effective care, affect mental health, lead to misallocation of health resources, and create or exacerbate public health crises.



Our objective was to synthesize and routinely update the best-available evidence to assess the impact of strategies to mitigate health-related misinformation in diverse settings, and across diverse populations.

1) Confronting Health Misinformation: The U.S. Surgeon General’s Advisory on Building a Healthy Information Environment (<https://www.hhs.gov/sites/default/files/surgeon-general-misinformation-advisory.pdf>)

Methods

- Living evidence synthesis (LES) in the format of a systematic review of effects with semi-annually updates
- We searched MEDLINE®, Embase®, CINAHL, PsycINFO, COVID-END, Epistemonikos, and pre-print servers (MedRxiv) on 4 May 2023 (updated searches planned for June 2024)
- We searched for original articles evaluating one or more of the potential responses to health-related misinformation
 - **Population of interest:** General population (stratified by age, gender and sex, users of different social media and platforms)
 - **Intervention/comparator:** Different strategies including, monitoring and fact-checking, counter-misinformation campaigns, credibility labelling, educational, curatorial, narrative, technical and algorithmic, economic, legislative and other policy, and investigative
 - **Outcomes:** Change in attitudes/behaviour, health benefits, harms, costs
- Findings were narratively synthesized according to the outcomes and interventions addressed

Framework of strategies to address misinformation used to organize findings

Response/ strategy	Description	Purpose of the strategy
Monitoring and fact-checking	Ongoing monitoring and timely exposing of misinformation (e.g., debunked claims) and fact-checking new claims (by humans or by automation)	Mitigating dissemination of disinformation, false information, and misinformation
Counter-misinformation campaigns	Specialized units to develop counter-narratives to challenge misinformation and mobilizing online communities to spread high-quality evidence	
Credibility labelling	Content-verification tools, web-content indicators, signposting to credible evidence sources, and website-credibility labelling	Disseminating and increasing access to accurate information
Educational	Develop citizens' media/information literacy for critical-thinking and digital-verification, and journalists' information literacy	
Curatorial	Point users to credible evidence sources, which can be used by news media, social media, messaging and search platforms	
Narrative	Public condemnations of misinformation and recommendations to address it, often by political and societal leaders	Restricting access to inaccurate information
Technical and algorithmic	Ranges from human learning to machine learning and other artificial-intelligence approaches to identify misinformation, provide additional context, and limit spread	
Economic	Advertising bans, demonetizing specific content (e.g., for COVID-19) and approaches to remove misinformation incentives	Addressing commercial fraud
Legislative and other policy	Criminalize acts of misinformation, directing Internet communication companies to take down content, and providing material support for credible information sources	Criminalizing expressions of disinformation
Investigative	Examine instigators, degree and means of spread, money involved, and affected communities	

Results – Evidence identified

- We identified 60 studies, most of which were published in the last four years
 - 41 randomized controlled trials
 - Six quasi-experimental studies
 - Six used machine learning-based approaches
 - Three implementation research studies
 - Two cross-sectional studies
 - One other type of observational study.
- The included studies were conducted
 - Online not limited to any geographic region (n=9)
 - In more than one country (n=3) (one in Kyrgyzstan, India, and the U.S.; a second in Germany, Mexico, Spain, the U.K. and the U.S.; and the third in Australia, Canada and the U.S.)
 - In Australia (n=2), Brazil (n=2), Canada (n=1), China (n=3), France (n=1), Ghana (n=1), Guatemala (n=1), Hong Kong (n=3), Israel (n=1), Italy (n=2), Korea (n=1), Nigeria (n=1), Sierra Leone (n=1), the Netherlands (n=2), U.S. (n=25), U.K. (n=1) and Zimbabwe (n=1)

Strategies that have supporting evidence about their effectiveness in addressing misinformation

Educational

26 studies

Eight randomized controlled trials from the US

- Changing the beliefs of people exposed to misinformation (but not for stimulating intentions to take protective action)

Twelve trials from a broad range of countries

- Changing the beliefs of people exposed to misinformation
- Stimulating intentions to take protective actions
- Improving knowledge about a topic
- Changing the willingness to share misinformation
- Enhancing the ability to discriminate misinformation

Monitoring and fact-checking

24 studies

- Stimulating intentions to take protective actions
- Changing the beliefs of people exposed to misinformation
- Changing willingness to share misinformation

Technical and algorithmic

7 studies

Six machine-learning studies

- Identifying misinformation
- One trial and one machine-learning study
- Changing the beliefs of people exposed to misinformation

Credibility labelling

6 studies

- Improving the ability to evaluate a given message critically
- Identifying reliable information

Counter-misinformation campaigns

5 studies

- Stimulating intentions to take protective actions
- Improving knowledge about a health topic
- Reducing beliefs in misinformation

Strategies that have little or no available evidence

Narrative 2 studies

- Changing the willingness to share misinformation

Legislative and policy* 2 studies

- Changing the willingness to share misinformation

Economic 2 studies**

- Changing the willingness to share misinformation

Curational

No studies identified

Investigative

No studies identified

*Legislative and policy strategies

- 1) One experimental randomized study conducted in China found a mediating or suppressing effect of follower count (in social media) in the relationship between a debunker's identity (celebrity, media, or government) and sharing behaviour.
- 2) Another experimental randomized study that was conducted in the U.S. found that ads featuring peer modelling with psychological inoculation yielded a significantly higher rate of positive responses than the Center for Disease Control ads.

**Economic strategies

- 1) An experimental randomized study in Hong Kong found that legislation may deter the sharing of healthcare information that users perceive as true but cannot deter them from sharing the healthcare misinformation they perceive as fake.
- 2) An interrupted time series study found that a Facebook policy to restrict anti-vaccine posting had a small effect in reducing the number of posts, which remained steady after the policy.

Possible tactical approaches (based on insights from included studies)

'Truth sandwich': A forewarning, a refutational pre-emption, and a microdose of the misleading message is superior to simpler supportive messages

Source: Evidence-based approaches are superior to corrections that use informal information provision (i.e., superficial or conversational) + effect stronger if source is provided

Direct or indirect: Both effective - better if direct

Multiple attempts: Multiple corrections from different sources can establish a social norm (but credibility reduced after exposure to several instances of misinformation + debunking from same source)

Framing: Refutation or debunking of conspiracy and uncertainty-framed approaches to addressing misinformation (e.g., detailed counter-message with factual elaboration) are both effective

Perspective: Negative emotional content (e.g., concern about health risk) and information about susceptibility of others are effective.

Chat bot: Interactions of few minutes significantly increased people's vaccine intentions and their attitudes toward COVID-19 vaccination

Fact-checking labels: Improve vaccine attitudes more positive, especially when the labelling was performed by universities and health institutions

Text, images, or text + images: Combinations best for promoting thinking, reduces correction believability

Statistical evidence: Uncertainty about benefit in corrections

Myth or fact first: Format not found to make a considerable difference if other key ingredients are present

Perspective: Positive emotional content (e.g., positive experiences) weakens effects and anger (as compared to concern) leads to less constructive engagement with addressing misinformation (instead leads to intentions to condemn others and call for punishment about engaging in misinformation)

Familiarity backfire effect: Not a concern - Exposure to novel misinformation through corrections does not lead to stronger misconceptions

Humour: Might produce more attention to the misinformation text than non-humorous corrections, but not improve the credibility of the correction (i.e., need to be cautious in using humour)

Videos for news literacy: Do not inoculate against misinformation

Next steps with the living evidence synthesis

- Risk of bias assessments for included studies
- GRADE profiles to document the strength of evidence for each strategy
- Plain-language summary
- Engagement of citizen partners
- Conduct complementary living evidence synthesis focused on political institutions, building on a previously completed [rapid evidence profile](#)
- All updates will be posted here (and hopefully eventually in a journal publication):
<https://www.mcmasterforum.org/find-global-evidence/les-spotlight/addressing-misinformation>