# Improving health through effective communication: Lessons from research on misinformation

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National Cancer Institute

AAHB

Savannah, GA, April, 2024

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Agenda

- Health communication challenges in an evolving media ecosystem

- Current research on health/science misinformation

- Lessons learned for communication practice and health behavior science

Information

Persuasion

Propaganda
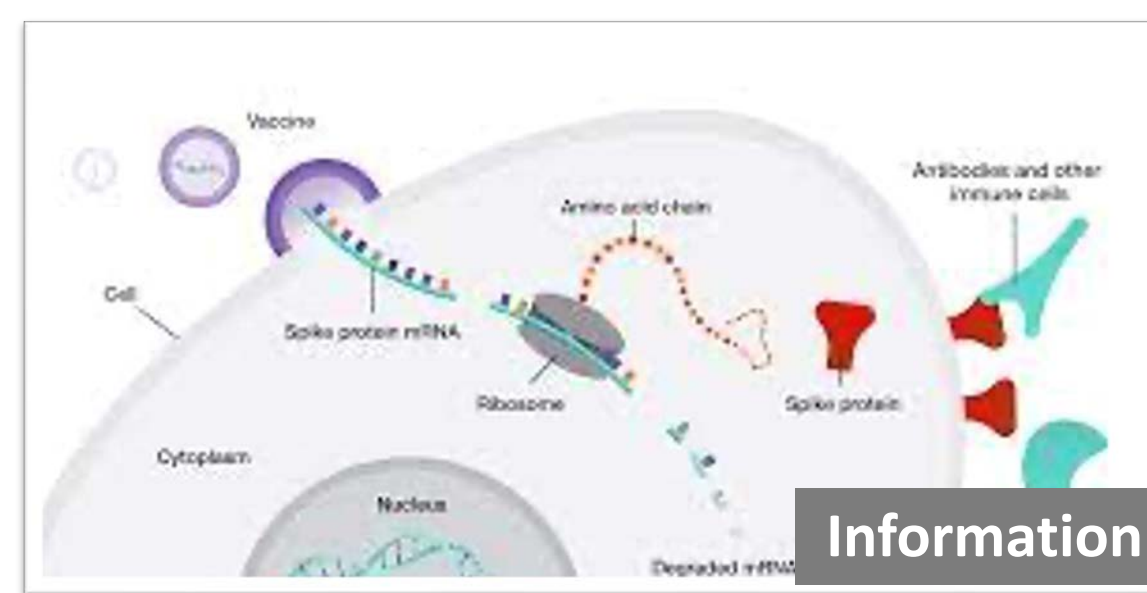
Challenges: Trust in science

- Measuring trust
- Causes of mistrust/distrust
- Trustworthiness: Building and sustaining trust
- Changes due to social polarization

Citizen attitudes toward science and technology, 1957–2020: measurement, stability, and the Trump challenge

Jon D Miller ✉, Belén Laspra, Carmelo Polino, Glenn Branch, Mark S Ackerman, Robert T Pennock

Trust in scientific expertise, 2016, 2020.

	Trust in Scientific Expertise		
Trust Index	**2016**	**2020**	**Change**
Very Low	1%	6%	+5
Low	2	9	+7
Moderate/DK/NA	74	42	−32
High	16	30	+14
Very High	7	13	+6
N =	2,108	2,736	–

The evolving social media landscape

- Regulatory efforts
  - Access (e.g., for minors)
  - Restrictions or bans on certain platforms
  - EU Digital Services Act (DSA) on content moderation, user privacy, and transparency
- Platforms practices
  - Content moderation rules and enforcements; algorithmic manipulation; account verification
  - Data access for researchers
- Ongoing litigation
- Use of AI tools
  - LLMs (e.g., ChatGPT)
  - Deep fake images/videos

JAMA Oncology

Use of Artificial Intelligence Chatbots for Cancer Treatment Information

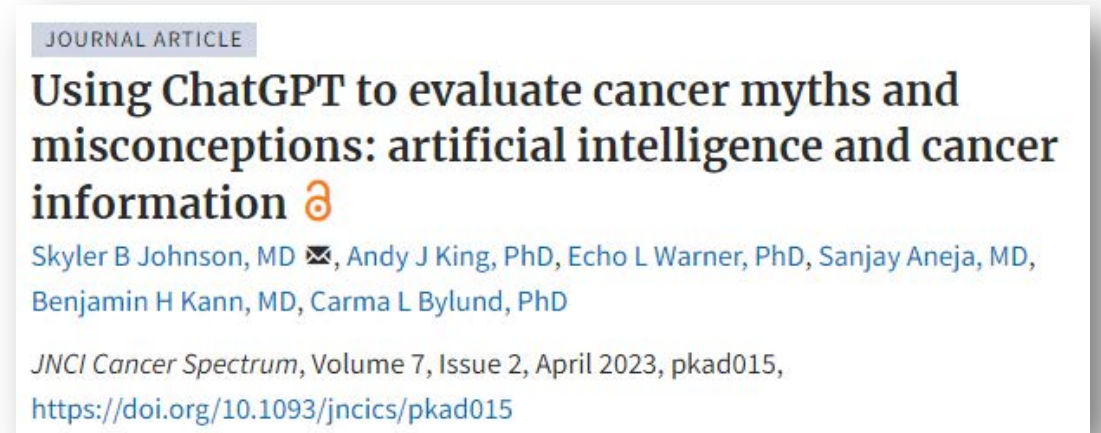Shan Chen, MS[1]; Benjamin H. Kann, MD[1]; Michael B. Foote, MD[2]; et al

WORLD ›

Fake photos of Pope Francis in a puffer jacket go viral, highlighting the power and peril of AI

Generative AI Tools for health communication

- Unclear impact on information environment

- LLMs: not ready for prime time
  - Generally accurate cancer information but inconsistent output and cannot handle complex questions
  - A promising tool for patient education

- Text-to-image tools:
  - Concerns related to bias, stereotypes, misinformation, and fraud
  - Current NCI study

JOURNAL ARTICLE
Using ChatGPT to evaluate cancer myths and misconceptions: artificial intelligence and cancer information 🔓

Skyler B Johnson, MD ✉, Andy J King, PhD, Echo L Warner, PhD, Sanjay Aneja, MD, Benjamin H Kann, MD, Carma L Bylund, PhD

JNCI Cancer Spectrum, Volume 7, Issue 2, April 2023, pkad015,
https://doi.org/10.1093/jncics/pkad015

MEDPAGETODAY®
Perspectives > Second Opinions

What Does AI Say About the Claims on Ivermectin for COVID?
— We put the technology to the test

by Daniel Teres, MD, Jane Oppenlander, PhD, and Martin A. Strosberg, MPH, PhD   February 4, 2024

"A cancer patient", generated by *Stable Diffusion*

"Misinfodemics": A perfect storm in health communication?

- Health and science content is **ubiquitous**

- **Information silos** and **echo chambers** on **social media**

- Falsehoods spread faster than truths and garner more **engagement** and **emotional** reactions

- Credible information is often **complex, nuanced, evolving, conflicting** and **uncertain**

- Disinformation campaigns **erode a sense of consensus** and **drive divisions**

- **Emotions, politics,** and **ideologies** all at play

What to measure, and how to do it?

- Hype and trends vs. reality across different information silos
- Methodological limitations of web panels, survey, focus groups, and interviews
- Perceptions and awareness vs. actual exposure
- Dynamic measures/information lifecycle/overtime
- What information do people say/think they need vs. what they actually need to make informed health decisions
- Impacts of health communication

Potential impact of misinformation

- **Prevention, screening, treatment and follow-up** (e.g., delays in care, unproven treatment)

- **Patient-provider relationship** (e.g., exposure to conspiracy theories reduces trust in medical system)

- **Frayed social fabric/damaged social cohesion**

- **Psychological and emotional effects** (e.g., anxiety, confusion)

- **Financial loss** (e.g., "miracle" products)

- **Distrust and shifting public discourse**

- **Exacerbation of health disparities**
  - Levels of susceptibility
  - Non-English media and content

Observational research on misinformation

- Science denialism
- Politicized topics and chilling effects on researchers and health care workforce

Debunking

- Correcting/debunking is generally effective, but less so when there is a prolonged "debate"

- Empathetic refutations in patient-provider encounters:
  - Elicit concerns -> affirm values -> refute -> provide facts

- When/how to correct—context matters

JOURNAL OF MEDICAL INTERNET RESEARCH

Mourali & Drake

Original Paper

The Challenge of Debunking Health Misinformation in Dynamic Social Media Conversations: Online Randomized Study of Public Masking During COVID-19

The Empathetic Refutational Interview to Tackle Vaccine Misconceptions: Four Randomized Experiments

Dawn Holford ✉, Philipp Schmid, Angelo Fasce, Stephan Lewandowsky

HEALTH EDUCATION & BEHAVIOR

Perspective

Health Education & Behavior
1–5
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The COVID-19 Misinfodemic: Moving Beyond Fact-Checking

Wen-Ying Sylvia Chou, PhD[1], Anna Gaysynsky, MPH[2], and Robin C. Vanderpool, DrPH[1]

Can narratives change minds in the midst of a public health emergency?
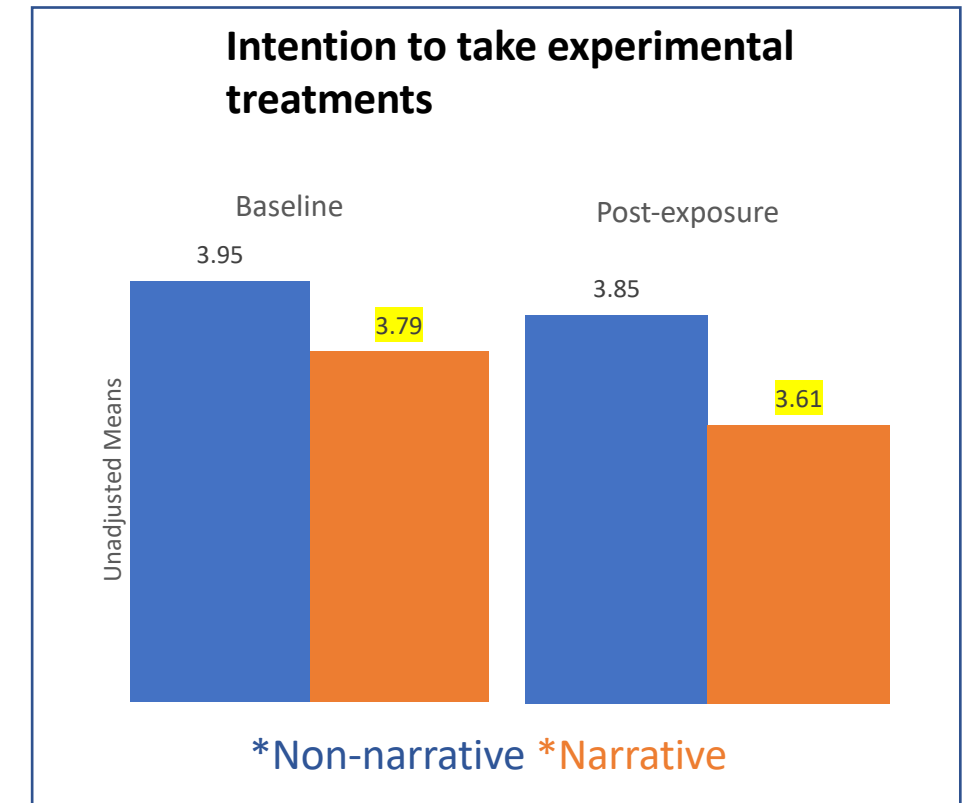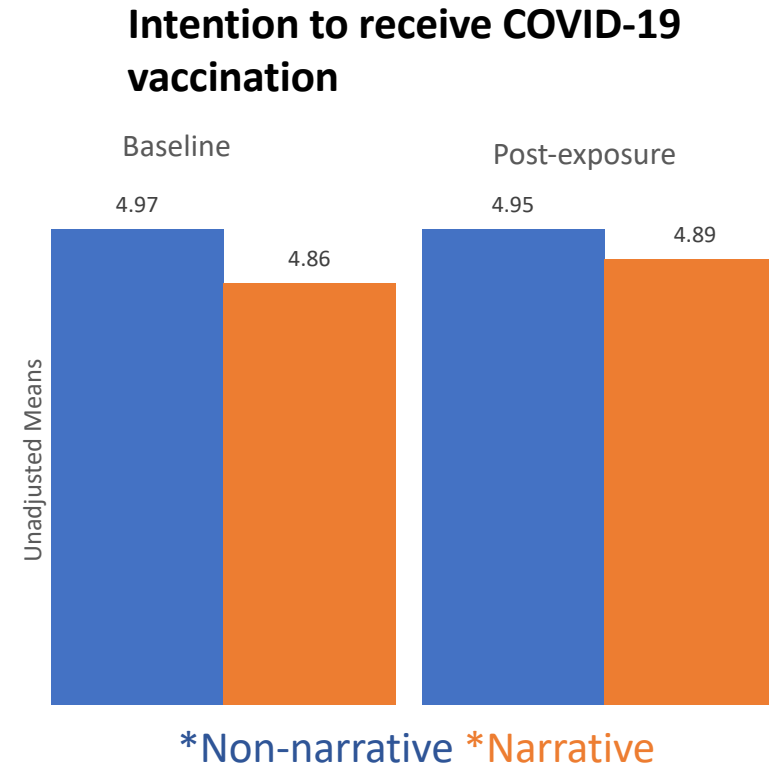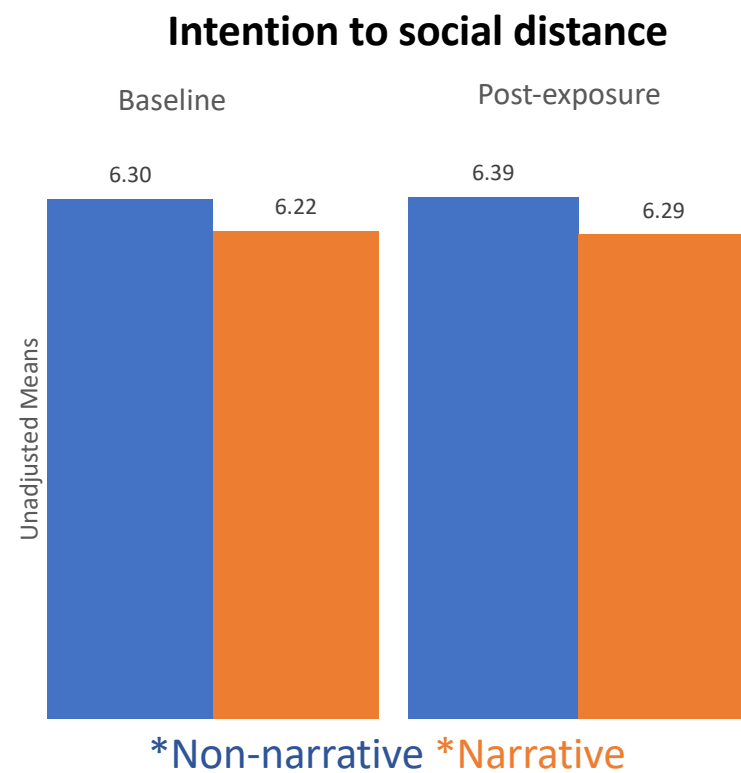
Intention to social distance

Baseline — 6.30, 6.22
Post-exposure — 6.39, 6.29

*Non-narrative *Narrative

Intention to receive COVID-19 vaccination

Baseline — 4.97, 4.86
Post-exposure — 4.95, 4.89

*Non-narrative *Narrative

Intention to take experimental treatments

Baseline — 3.95, 3.79
Post-exposure — 3.85, 3.61

*Non-narrative *Narrative

Effects of narrative messages on key COVID-19 protective responses: Findings from a randomized online experiment

Irina A Iles [1], Anna Gaysynsky [1], Wen-Ying Sylvia Chou [2]

Inoculation ("Prebunking")

- Informing people about how they might be misled or manipulated may reduce susceptibility
  - Warning of attack -> preemptive refutation -> micro-dose of misinformation
- While promising, most studies are **online experiments**. How to deliver inoculation interventions in **real world settings, at scale**?
  - A field study of short prebunking videos as YouTube ads improve people's ability to identify manipulation techniques under real-world conditions
  - In 2022 Google showed prebunking video ads against false claims about Ukrainian refugees. Videos were seen 38 million times across platforms. Ad viewers were more able to identify misinformation techniques and less likely to spread false claims
- From text-based to **visual and multimodal** misinformation

RESEARCH ARTICLE | PSYCHOLOGICAL SCIENCE

Psychological inoculation improves resilience against misinformation on social media

JON ROOZENBEEK (iD), SANDER VAN DER LINDEN (iD), BETH GOLDBERG (iD), STEVE RATHJE (iD), AND STEPHAN LEWANDOWSKY (iD)   Authors Info & Affiliations

SCIENCE ADVANCES · 24 Aug 2022 · Vol 8, Issue 34 · DOI: 10.1126/sciadv.abo6254

AP

Google to expand misinformation 'prebunking' in Europe

By DAVID KLEPPER   February 13, 2023

*Ads shown in: Poland, the Czech Republic and Slovakia

Research priorities in health misinformation

Improve Surveillance

- Information poverty/communities most at risk
- Real-time monitoring of rumors and motivations behind their spread
- Understudied platforms; visual content; implied misinformation
- Dynamics (misinformation lifecycle and cross-platform movement)

Focus on Consequences

- Linking exposure to outcomes, including:
  o Attitudes (e.g., apathy, confusion, mistrust)
  o Behaviors
  o Relationships (e.g., patient-provider)
  o Decision-making

Understand and respond to psychological drivers

- Cognitive biases
- Emotions (e.g., anger, fear)
- Values, ideology, and identity
- Trust

Innovative Intervention Development

- Corrections and prebunking at scale
- Health/science/media literacy initiatives
- Multi-sector policies on content moderation
- Targeting the most vulnerable

Chou et al. 2018 *JAMA;* Southwell et al. 2019 *AJPM;* **Chou, Gaysynsky, Cappella, 2020 *AJPH***; Chou et al. 2021 *Health Edu Behavior.*

Mitigating Health and Science Misinformation: A Scoping Review of Literature from 2017 to 2022

Kathryn Heley, Wen-Ying Sylvia Chou ✉ iD, Heather D'Angelo, Nicole Senft Everson, Abigail Muro, Jacob A. Rohde & ...show all

Methods	
Search	Keyword search in 4 databases for English articles
Inclusion criteria	a) Empirical data b) Health- or science-related misinformation c) Tests a mitigation strategy d) Measures misinformation-related outcomes or effects
Final Sample	115 publications representing 148 studies

A scoping review on mitigation strategies: Results

Codes	Results
Common Topics	COVID-19 (k=48), vaccines (k=45), and climate change (k=25)
Study location	United States (k=71), Australia (k=9), United Kingdom (k=7), and Germany (k=7); few studies were focused on LMICs
Samples	Online panels or crowdsourcing platforms (k=91)
Populations of focus	Very few on susceptible populations [older adults (k=3), politically conservative (k=1), or individuals with low educational attainment (k=1)]
Strategies tested	• Correction (k=97/148; 65.5%) • Education/health literacy (k=39/148; 26.4%) • Prebunking (k=24/148; 16.2%) • Others
Outcomes	• 76 positive results • 17 null results • 68 reported mixed results

Takeaways for communication practice

Key Findings	Implications/Future Directions
Interventions promising for emerging health topics; "backfire effects" are minimal	• Scaling "low touch" interventions (e.g., brief videos, fact-checks) in limited resource settings • Disseminating tested intervention strategies through established infrastructure (hospitals, clinics, payors)
No panacea exists to mitigate misinformation and generate sustained change	• Exploring the impact of multilevel interventions (e.g., a combination of individual, interpersonal, organizational, community, societal level interventions) • Using multiprong strategies that address the individual and their information environment

Lessons learned from misinformation research

- Relationships matter (good messages are not enough)
  - Sources, messengers, echo chambers
- Research needs to be more useful for communication practice
  - Value of translational science
  - Collaboration outside silos and sustainable infrastructure
  - Ready-made practical tips

Establish/build relationships

- Better messaging alone is insufficient when challenged by polarization and 'outrage politics'

- Strategies to consider:
  - Make **personal connections** (e.g. being vulnerable, personal disclosure)
  - Recognize and value **lived experiences**
  - Acknowledge **power dynamics** and **historical injustices**
  - Hire **staff from community**
  - Facilitate the **formation of supportive relationships**
  - Leverage **existing trusted social relationships**
  - Support healthcare professionals in improving relationships with patients and increasing interpersonal trust (e.g., trauma-informed care)

- Assess relationship-related factors (e.g., trust, social capital) over time

A translational health communication research framework
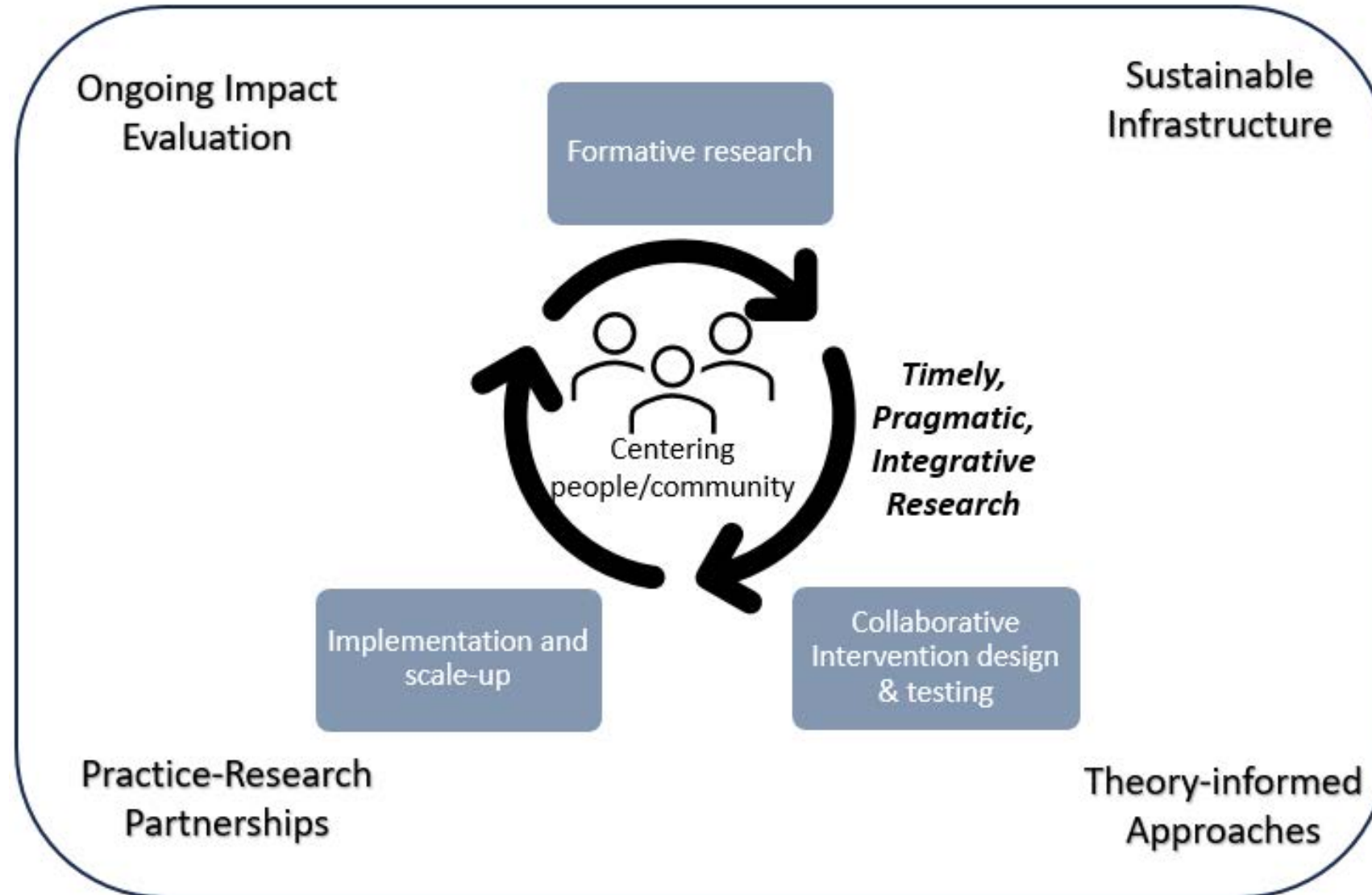
Chou, Gaysynsky, and Tan (2024)

Working together

- Individuals
- Communities (e.g., faith leaders, community-based organizations, libraries)
- Educators
- Health professionals and organizations
- Journalists and media organizations
- **Researchers**
- Technology platforms
- Governments (local, state, federal)
- Policy makers
- Foundations / non-profits
- Influencers / opinion leaders

CONFRONTING HEALTH MISINFORMATION

The U.S. Surgeon General's Advisory on Building a Healthy Information Environment

2021
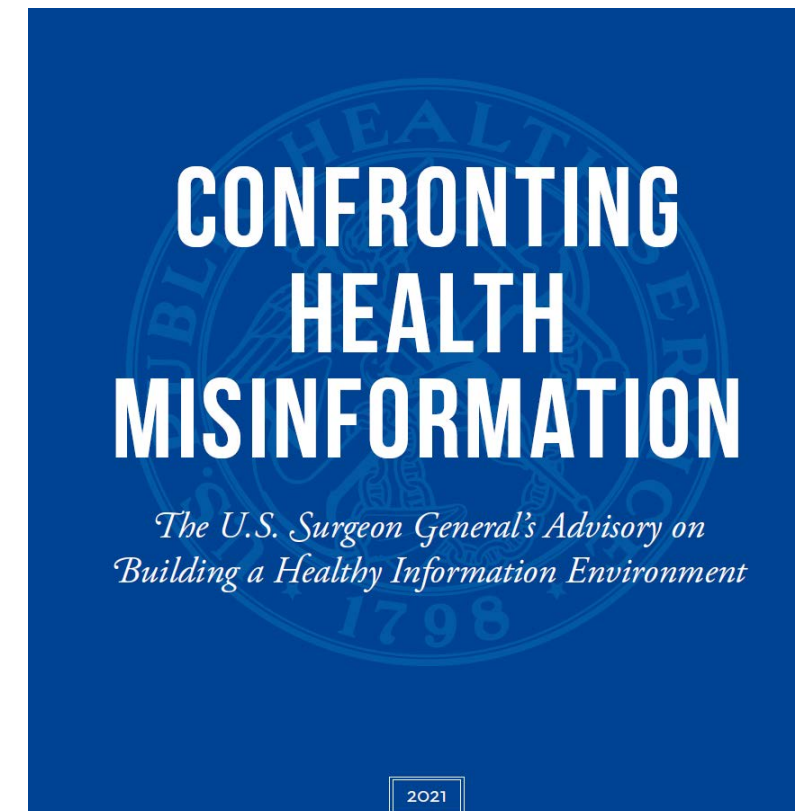
Health communication research to meet the current moment

Science Communication informs the public about scientific findings (may or may not have direct application to their lives)
- E.g., Cancer genetics experts share research results in an engaging way

vs.

Health communication advances the health and well-being of individuals/populations (may or may not explain the research)
- E.g., campaign to educate parents about risk of SIDS and promote safe sleep practices

1. Involve HC science early on in design and program planning
2. Include communication practitioners
3. Assess how and where people share and receive health information
4. Address information people encounter in daily lives and manage uncertainty
5. Attend to disparities in ability to access, process, and act on information
6. Overcome challenges in social and technologic environment (e.g., social media data access)

Practical tips

- Leverage a **broad range of** credible and trusted **sources**
- Clear and accurate **topline message**
  - Public's tendency to focus on the headline or visuals

- Target **techniques and motivations** of manipulation instead of content
- Plan to deal with **unintended consequences**
  - Cherry-picking, findings being called into question, lost nuances and caveats
- **Healthy skepticism vs. cynicism**
  - Among science deniers
- Avoid leaving an **information vacuum** or ceding the information environment to others
- Discuss the **scientific process: context, source** and **meaning** of data
- Avoid **false balance** and avoid giving falsehoods more oxygen
- More information is <u>not</u> the solution
- **Counter themes & tropes**, rather than fact-checking individual anecdotes
- **Science and health literacy** initiatives
- **Uncertainty** communication

Extra: Definitions, boundaries

Health misinformation: any health-related claim of fact that is false, inaccurate, or misleading according to the best available evidence at the time (Chou et al. 2020, OSG 2021, Kington et al. 2021)

Disinformation: a coordinated or deliberate effort to spread misinformation in order to gain money, power, or reputation.

Additional considerations:
- **Intent** of sharing
- **Impact of exposure**
- **Medium** & **format** of communication
- **A business model for financial and political gains**

"Trust and Misinformation in the Age of Social Media"

An invitation-only working group meeting on August 23-24, 2018, at the NCI Shady Grove Campus leveraged scientific expertise from diverse disciplines and sectors (e.g., journalism, computer science, and health communication) to develop a research agenda for **understanding and addressing cancer-related misinformation on social media** platforms.

This Issue | Views **14,873** | Citations

JAMA Network™

Viewpoint

December 18, 2018

Addressing Health-Related Misinformation on Social Media

Wen-Ying Sylvia Chou, PhD, MPH[1]; April Oh, PhD[1]; William M. P. Klein, PhD[2]

> Author Affiliations

JAMA. 2018;320(23):2417-2418. doi:10.1001/jama.2018.16865

American Journal of
Preventive Medicine

CURRENT ISSUES

Misinformation as a Misunderstood Challenge to Public Health

Brian G. Southwell, PhD,[1,2,3] Jeff Niederdeppe, PhD,[4] Joseph N. Cappella, PhD,[5] Anna Gaysynsky, MPH,[6] Dannielle E. Kelley, PhD,[6] April Oh, PhD,[6] Emily B. Peterson, PhD,[6] Wen-Ying Sylvia Chou, PhD[6]

AJPH

HEALTH MISINFORMATION ON SOCIAL MEDIA

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CONFRONTING HEALTH MISINFORMATION

The U.S. Surgeon General's Advisory on Building a Healthy Information Environment

NATIONAL ACADEMY OF MEDICINE

Identifying Credible Sources of Health Information in Social Media: Principles and Attributes

Raynard S. Kington, MD, PhD, MBA, Phillips Academy in Andover; **Stacey Arnesen, MS,** National Library of Medicine; **Wen-Ying Sylvia Chou, PhD, MPH,** National Cancer Institute; **Susan J. Curry, PhD,** The University of Iowa; **David Lazer, PhD,** Northeastern University; and **Antonia M. Villarruel, PhD, RN, FAAN,** University of Pennsylvania