

ScienceUpFirst

Together Against Misinformation

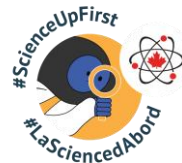


CANADIAN ASSOCIATION OF SCIENCE CENTRES
ASSOCIATION CANADIENNE DES CENTRES DE SCIENCES

An initiative by the **Canadian Association of Science Centres**. In partnership with:

COVID-19 Resources Canada

Health Law Institute, University of Alberta



An initiative of CASC / Une initiative de l'ACCS

**COVID-19
Resources
Canada**

 **UNIVERSITY OF ALBERTA**
FACULTY OF LAW
Health Law Institute

Land Acknowledgement

ScienceUpFirst, and our parent organization the Canadian Association of Science Centres or CASC for short, respects and affirms the inherent and Treaty Rights of all Indigenous Peoples and their relationships to these lands and will continue to honour the commitments to self-determination and sovereignty made to Indigenous Nations and Peoples. We acknowledge the historical and present day oppressions, including violence and genocide, of the original Peoples, their lands, and cultures.

Today, we recognize and respect the Kanien'kehà:ka as the traditional custodians of the lands and waters on which we meet today.

We encourage everyone here to take a moment and reflect on the traditional territories that you are located on and your relationship towards the land and its history.



Presenters



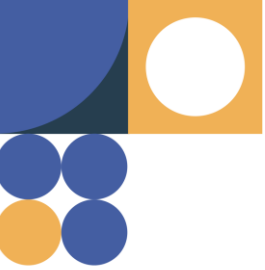
Krishana Sankar, PhD

Dr. Krishana Sankar is the Science Advisor and Community Partnerships Lead for ScienceUpFirst, an initiative of the Canadian Association of Science Centers. She is a molecular & cellular biologist who obtained her PhD at the University of Toronto in the Faculty of Medicine.



Elyas Aissia, MSc

Elyas Aissia is the French Content Lead at ScienceUpFirst. Elyas graduated from the Institut National de la Recherche Scientifique with a Masters in ecotoxicology. His research project assessed combined effects of climate change and heavy metals on aquatic organisms' metabolism.



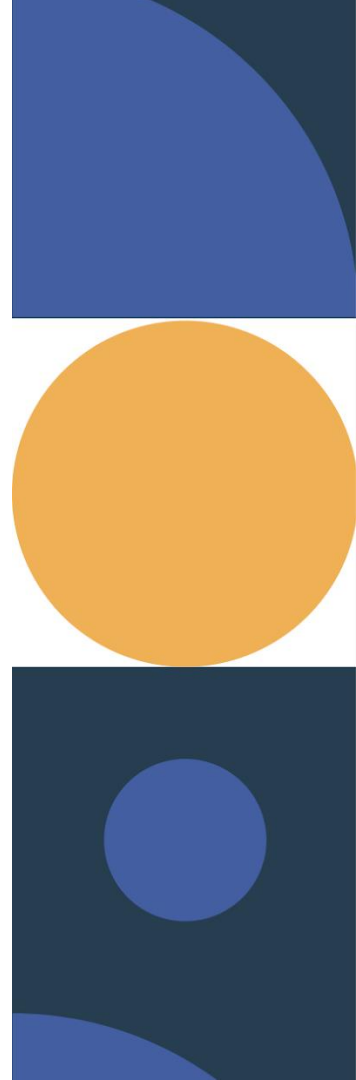


What is #ScienceUpFirst?

- A globally recognized anti-misinformation initiative of the Canadian Association of Science Centers, created to tackle misinformation online
- We share the best available science in creative ways to stop the spread of misinformation
- We use collective impact models to reach beyond social media into communities

Learning Objectives

1. Definition of misinformation and disinformation
2. The psychology behind misinformation
3. Misinformation red flags and misinformer tactics
4. Best practices for countering and debunking misinformation
5. What are some misconceptions in climate science





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Misinformation = false information that is created and disseminated regardless of the intent to mislead

Disinformation = false information that is created and disseminated with the intent to mislead



Why We Believe Misinformation



It takes **less mental energy and time** to accept new information than question it.



Information that **confirms our existing beliefs** is easier to accept as the truth.



Repeated exposure to information leads to familiarity and thinking it is true.



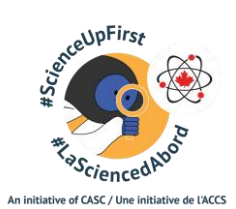
Everyone is vulnerable to misinformation.

Believing misinformation is NOT a reflection of someone's moral character or intelligence.





Misinformation Red Flags



Author lacks qualifications and expertise to speak on the topic



Quoted sources are not credible and reputable



Examples and data are cherry-picked





Misinformation Red Flags



Tone is sensationalist rather than objective and factual



There is an alleged secret plot, where everything is “connected”



Sounds too good to be true



👤 Ban Dihydrogen Monoxide! 👤

👤 The Invisible Killer

Dihydrogen monoxide (DHMO) is a colorless, tasteless, and **kills** uncounted thousands of people every year. Many of these deaths are caused by accidental inhalation of DHMO. Symptoms of ingestion can include excessive sweating and urination, nausea, vomiting and body electrolyte imbalance.

👤 Contamination Is Reaching Epidemic Proportions!

Large quantities of DHMO have been found in almost every stream, lake, and water reservoir in Canada today. Companies dump waste DHMO into rivers and ocean, and nothing can be done because this practice is still *legal*.

👤 **Despite the danger, dihydrogen monoxide is often used** in nuclear power plants, as a fire retardant, in many forms of cruel animal research, and even as an additive certain “junk foods” and other food products.

Ban Dihydrogen Monoxide!

No credible author(s)


The **Invisible Killer**

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Highly emotional language

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 **Despite the danger** dihydrogen monoxide is often used in nuclear power plants, as a fire retardant, in many forms of cruel animal research, and even as an additive certain “junk foods” and other food products.

Tone is sensationalist

No sources

Pass the Easter Egg! New study reveals that eating chocolate doesn't affect your Body Mass Index ... and can even help you LOSE weight!

Chocolate accelerates weight loss: Research claims it lowers cholesterol and aids sleep

Excellent News: Chocolate Can Help You Lose Weight!

Scientists say eating chocolate can help you lose weight

WHY YOU MUST EAT CHOCOLATE DAILY

Doing so will accelerate your slim-down. When German researchers put dieters on a low-carb plan and gave some of them a daily dose of 1½ ounces of superdark chocolate, those who ate chocolate lost more

**Has the world gone coco?
Eating chocolate can help you LOSE weight**

Too good to be true

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Sensationalist headlines

Cherry-picking data

Has the world gone coco? Eating chocolate can help you LOSE weight

Misinformer Tactics





Misinformer Tactics

Astroturfing

Creating the illusion of widespread “grassroot” support or opposition for an issue, policy or candidate.





Early in the pandemic, nearly half of the Twitter accounts spreading misinformation about COVID-19 were bots.

About 25% of the links that bots were sharing on Twitter were low credibility sources. There was also a coordinated amplification of the misinformation posts among the bots.

[Yang et al. \(2020\)](#)



Misinformation Tactics

False Dichotomies

Presenting information or options as black or white, when there are many different shades of grey.





“Health mandates are ruining the economy.”

The public health vs. economy debate was often presented as two opposing black-and-white stances, while this is untrue. Economic and public health experts agreed that strategies to reduce the spread of the virus improved the health of both the people and the economy.

[Escandón et al. \(2021\)](#)





Misinformer Tactics

Red Herring

Distracting from the present conversation or argument with a misleading or distracting statement





ScienceUpFirst: The COVID-19 vaccines are safe and effective.

Misinformer: If you care about safety, you would recommend ivermectin.

Red herrings will distract from the point at hand (vaccine safety) and redirect the conversation (ivermectin)





Misinformer Tactics

Appeal to Nature

Appealing to our bias and of “natural” things seeming to be being better than “unnatural” things.





“My natural immunity will protect me from COVID-19, so I don’t need the vaccine.”

It is true the immune system can produce a strong antibody response. However, exposing yourself and others to an unpredictable virus may result in severe illnesses, lifelong health repercussions, or death. Vaccines provide a safe, predictable, and effective protection that natural immunity does not.





Misinformer Tactics

Causal Fallacy

Making the connection that a thing or event caused a specific effect or result, but this is not always the case.

(correlation \neq causation)





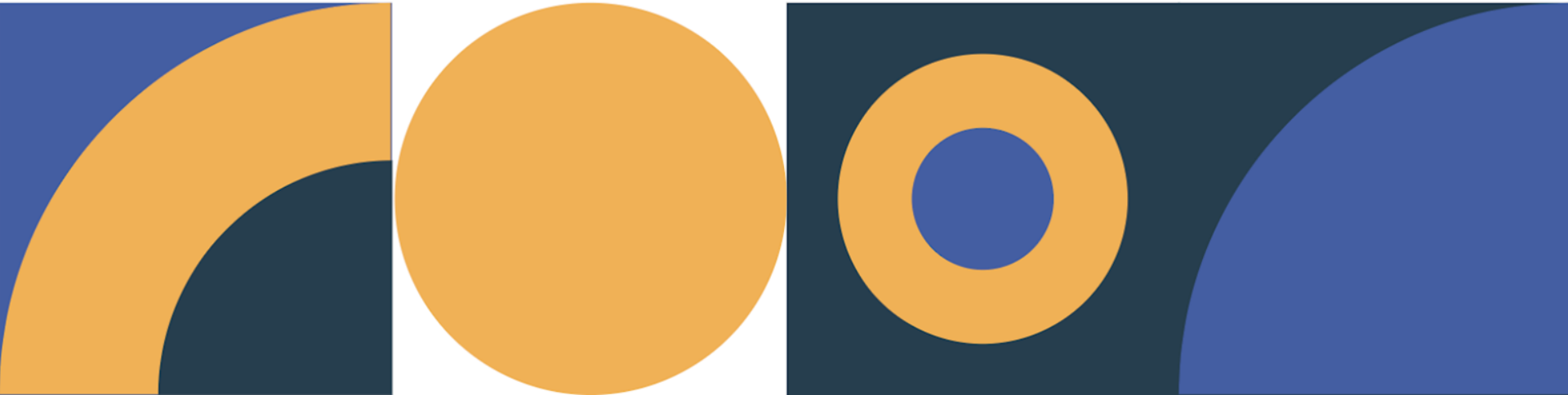
“My cousin got the vaccine and had a heart attack one month later. The vaccine caused this.”

The COVID-19 vaccine is not a known cause of heart attacks. Every hour, approximately 12 Canadian adults diagnosed with heart disease die. With 80.4% of Canadians fully vaccinated, the changes of having a heart disease and being vaccinated are high. The two may correlate, but the vaccination is not the cause.

[Heart Disease in Canada](#) (2022)
[COVID-19 vaccination in Canada](#) (2022)

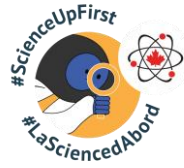


Best Practices for Countering and Debunking Misinformation





Strategy #1: Inoculation



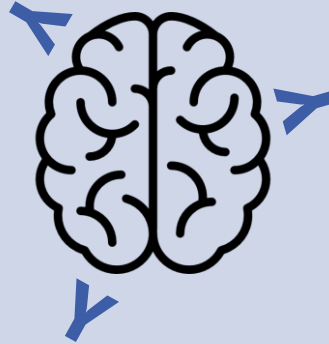
An Initiative of CASC / Une initiative de l'ACCSS

Step #1



Present a weakened version of misinformation or the misinformation technique.

Step #2



Develop cognitive antibodies to the misinformation.

Step #3



Build resistance to future similar misinformation and become more receptive to corrections.

[Cook et al. \(2017\)](#)





Strategy #1: Inoculation

Step #1



Present a weakened version of misinformation or the misinformation technique.

Inoculation content needs to:

1. **Warn about the dangers** are being misled by misinformation
1. **Provide counterarguments** explaining the flaws of the misinformation





Strategy #2: Debunking



We have limited resources and time. It's important to be strategic about which misinformation we tackle and debunk.





Strategy #2: Debunking



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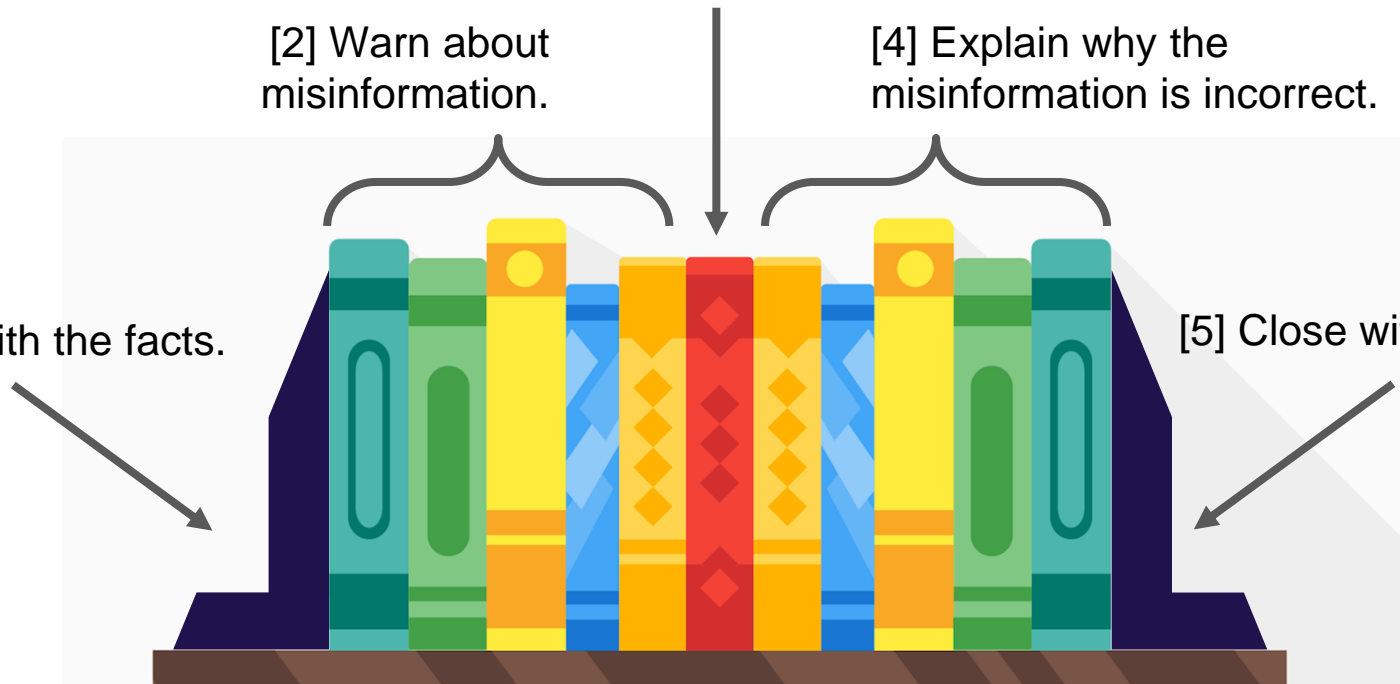
[3] Share the misinformation.

[2] Warn about misinformation.

[4] Explain why the misinformation is incorrect.

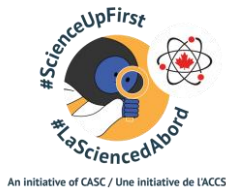
[1] Lead with the facts.

[5] Close with the facts.

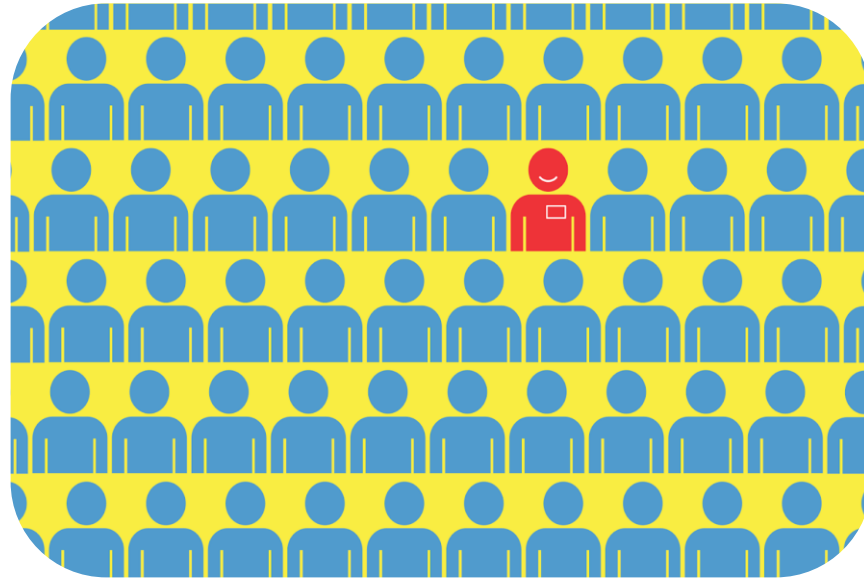




Choosing the Right Communicator



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It is important to select a **trusted communicator** for your target audience.



Credibility of a Communicator

Credibility

=

Trustworthiness

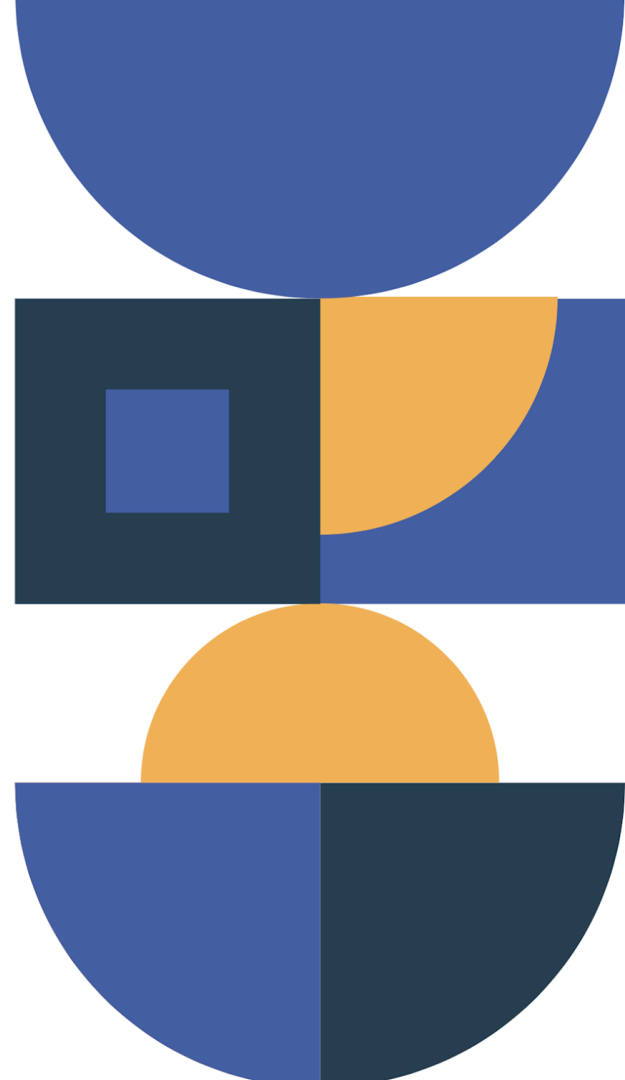


and

Expertise

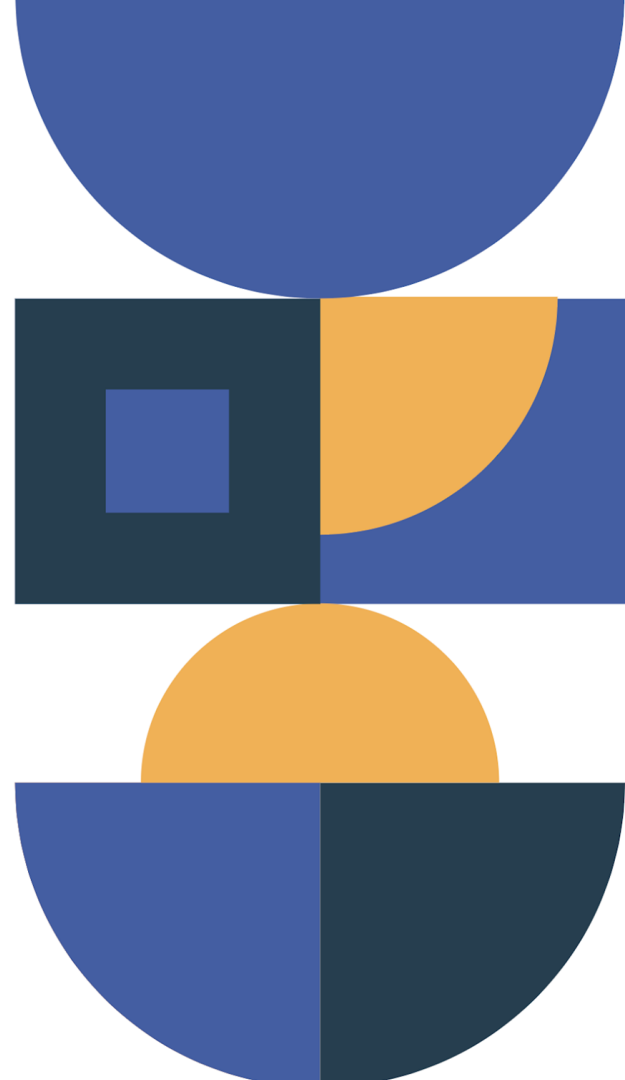
Tip #1:

Avoid jargon and patronizing the group that holds an incorrect belief.



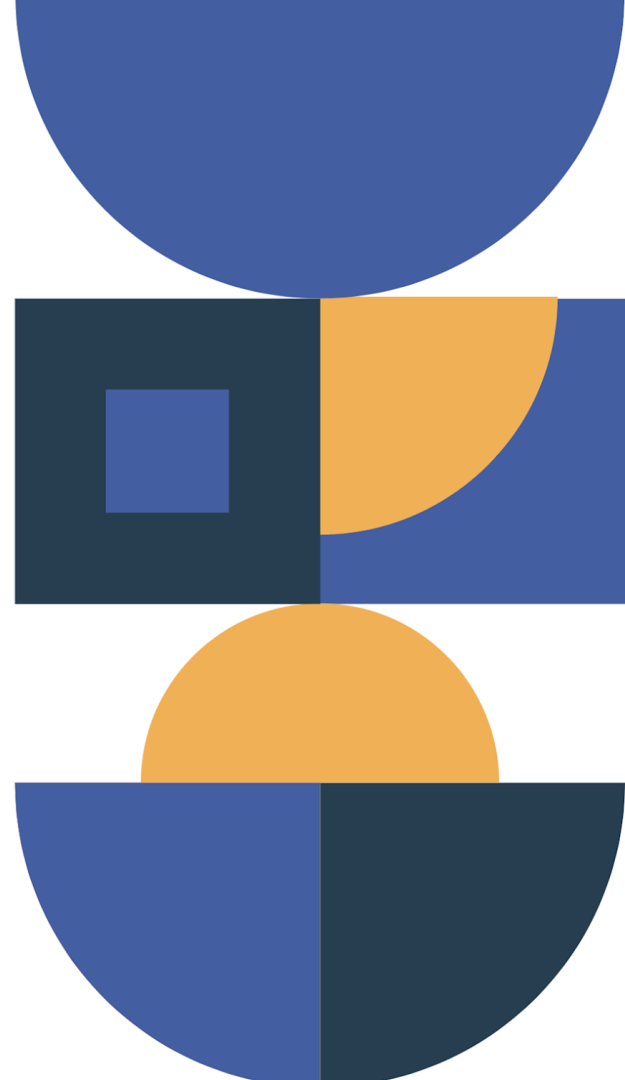
Tip #2:

Encourage people to be critical of the information they come across and whether they should share it.



Tip #3:

Seeing correction online can nudge audiences who see that conversation closer to accurate information.





Further Readings & Resources

[The psychology of misinformation: Why we're vulnerable](#)
(First Draft - Tommy Shane)

[Global Warming's Six Americas](#)
(Yale Program on Climate Change Communication)

[Why do people believe health misinformation and who is at risk? A systematic review of individual differences in susceptibility to health misinformation](#) (Nan et al., 2022)

[The Debunking Handbook 2020](#) (Lewandowsky et al., 2020)

[Neutralizing misinformation through inoculation: Exposing misleading argumentation techniques reduces their influence](#)
(Cook et al., 2017)

Further Readings & Resources

[Inoculation theory: Using misinformation to fight misinformation](#) (Cook et al., 2017)

[A history of FLICC: the 5 techniques of science denial](#) (Cranky Uncle - Dr. John Cook)

[Winning Arguments: Interaction Dynamics and Persuasion Strategies in Good-faith Online Discussions](#)
(Tan et al., 2016)

[Combining interventions to reduce the spread of viral misinformation](#) (Bak-Coleman et al., 2022)

What's Next?

The testing ground was COVID, and **we nailed it!**

With the **support from the real people** we've connected with online, our **dedicated and well resourced team**, and **community and funding partners**, we're making a **wide turn** into new topics of interest, such as:

ENVIRONMENTAL SCIENCE & CLIMATE CHANGE among others.

Now, we need **YOUR HELP!** What are some myths/misconceptions in the environmental, climate change, biodiversity space?

Connect with us!

Marianne Mader, CEO, CASC
mader@casc-accs.com

Magda Byma, Director of ScienceUpFirst, CASC
magda@scienceupfirst.com

Find us here:

www.scienceupfirst.com

www.canadiansciencecenters.ca



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@ScienceUpFirst



Appendix



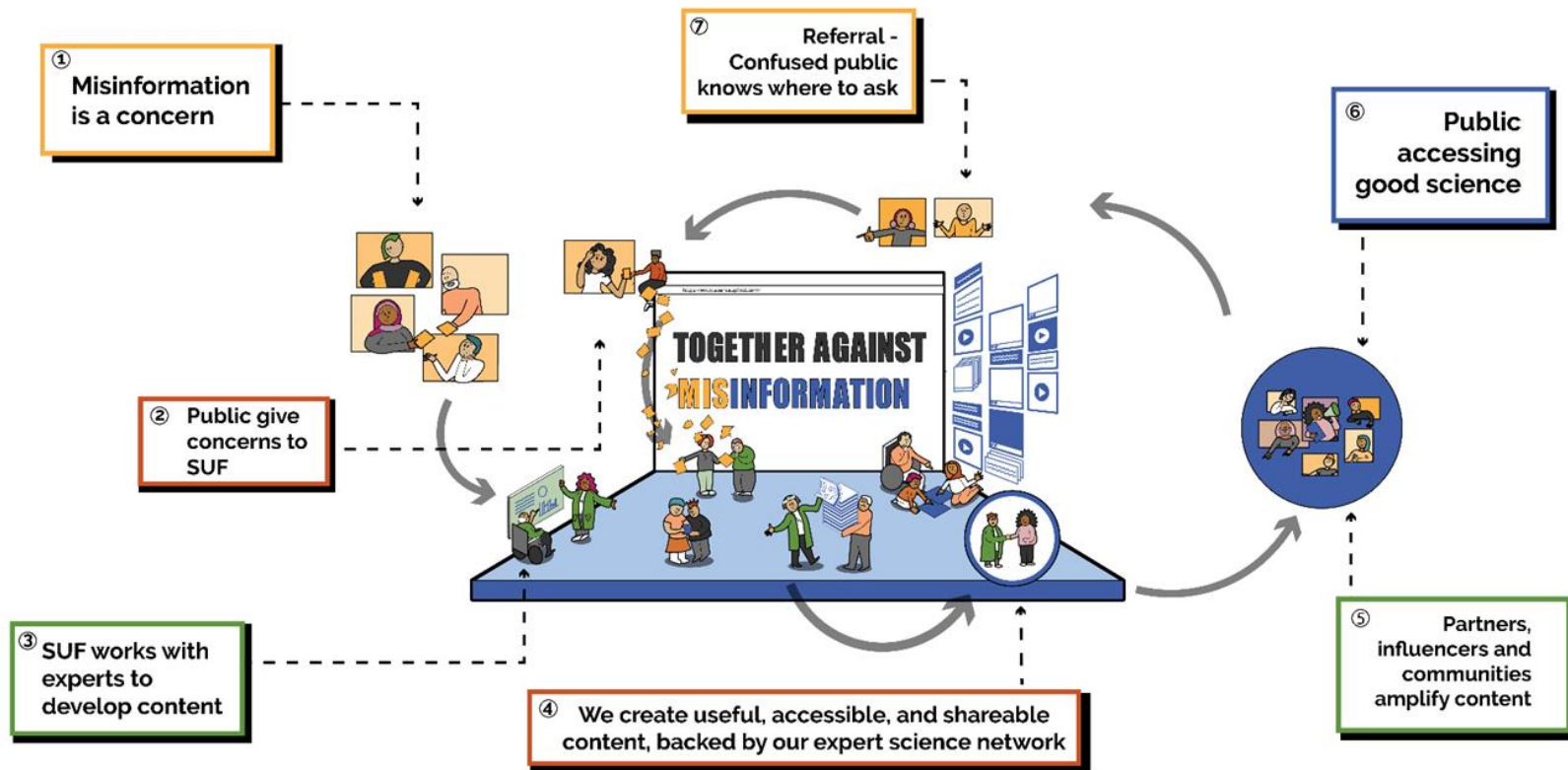
Using the theory of change to debunk...

Misinformation

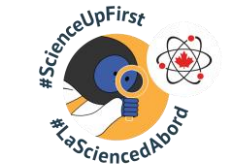


ScienceUpFirst: Together Against Misinformation

We share the best available science in creative ways to stop the spread of misinformation.

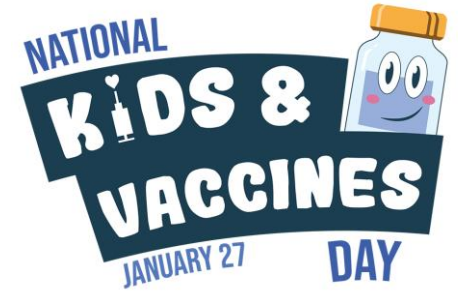


ScienceUpFirst Output



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- Social Media Posts
- Public Events
- Community Engagements
- Social Behavior Data



MA MAWI WI CHI ITATA CENTRE
We all work together to help one another.

#ScienceUpFirst have been shared to a combined audience of **665 million.**

Over 792,000 engagements.



Our **57,000+** followers are:

Engaged Canadians..

..sharing on and offline..



..seeking the best available science.

Our hashtag has been used **109,206** times.



Our content has been viewed **27 million** times.



We created over **250 pieces** of original content.



More than just numbers, these metrics represent

real people

who are becoming champions for science in their own communities

This is the best thing I have seen in a long time 🙌🙌🙌

Thank you for all of your hard (& masterfully created) work! I, for one, am very grateful (& entertained) 🙌❤️🙌

This is amazing. I wish every parent could see this.

Awesome! Thank you so much. Thanks for all you are doing to educate the public!!!

Thank you for all your work to provide clear and accurate scientific info about COVID19. It is SO APPRECIATED!!

For me (non science person), it was super clear. Loved this post and very helpful for understanding.



What's Next?

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But First...



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Our Audience

Twitter



23.2k followers
(+1091/mo Jan-Mar)

24k eng/mo Jan-Mar

**Most common age
is 25-34 (31.9%)**

Instagram



17.8k followers
(+1506/mo Jan-Mar)

12.2k eng/mo Jan-Mar

**Most common age is
25-34 (36%)**

Facebook



13.5k followers
(+309/mo Jan-Mar)

13.6k eng/mo Jan-Mar

**Most common age is
45-54 (27%)**



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Our Audience

Twitter



Top cities (#):

- **Edmonton, AB**
- **Calgary, AB**
- **Toronto, ON**
- **Ottawa, ON**
- Vancouver, BC
- Hamilton, ON
- Quebec, QC
- Halifax, NS
- Winnipeg, MB

Instagram



Top cities:

- **Toronto, ON**
- **Edmonton, AB**
- **Calgary, AB**
- **Ottawa, ON**
- Montreal, QC
- Vancouver, BC
- Hamilton, ON
- Winnipeg, MB
- London, ON

Facebook



Top cities:

- **Montreal, QC**
- **Edmonton, AB**
- **Calgary, AB**
- **Toronto, ON**
- Ottawa, ON
- Quebec, QC
- Winnipeg, MB
- Gatineau, QC
- Saskatoon, SK



Key Metrics Report

We are creating a movement against misinformation. The #ScienceUpFirst and #LaScienceDabord hashtags have been used **98,288** times by **33,139** people with a combined following of **600,407,079**. The ScienceUpFirst message is spreading.

We create timely, shareable, and accessible content that resonates. We have built an engaged community of **55,831** people who follow our pages or have signed up for emails. Since January 24, 2021, we have created **205** pieces of content (infographics, shareable messages and videos) and posted **2,881** times across Twitter, Instagram, Facebook, YouTube and TikTok. This led to over **26,052,328** views and **717,990** engagements (likes, clicks, shares, etc) with our content.

Nous sommes en train de créer un mouvement contre la désinformation. Les hashtags #ScienceUpFirst et #LaScienceDabord ont été utilisés **98,288** fois, par **33,139** personnes avec un nombre combiné de **600,407,079** personnes qui les suivent. Le message LaScienceDabord se répand.

Nous créons du contenu pertinent, partageable et accessible, qui résonne chez les gens. Nous avons mis sur pied une communauté engagée de **55,831** personnes qui suivent nos pages ou se sont inscrites à notre infolettre. Depuis le 24 janvier 2021, nous avons créé **205** publications (infographies, vidéos et annonces) et posté **2,881** fois à travers Twitter, Instagram, Facebook, YouTube et TikTok. Cela a abouti à plus de **26,052,328** vues et **717,990** réactions (mentions « J'aime », clics, partages, etc.)

The Output: Social Media Posts



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Don't fall into **FALSE DICHOTOMY TRAPS!**
the world is more complicated than

THIS OR THAT

Swipe to learn more →

#ScienceUpFirst

MISINFORMER TACTIC :

DOUBT MONGERING

#ScienceUpFirst

TO BOOST NOW OR TO BOOST LATER THAT IS THE QUESTION

#ScienceUpFirst

START HERE

Has it been **6 months or more** since your last dose or infection?

YES → **Get boosted soon**
Fall means more indoor gatherings and with it increased community transmission. Plus, it's flu season! You want to have maximal protection when that time comes (1).

NO → Has it been **at least 3 months** since your last dose or infection?

YES → []

NO → []

Sources: tinyurl.com/SUFBoosterDecisionTree

HOW LIES SPREAD

LEARN TO SPOT THESE 6 MISINFORMER TACTICS →

#SCIENCEUPFIRST

#ScienceUpFirst

What is **Ramsay Hunt Syndrome?**

#ScienceUpFirst

LET'S TALK ABOUT: **MENTAL HEALTH & the pandemic**

THERE'S A LOT OF **NUANCE** →

#ScienceUpFirst

Dr. Rebecca Pillai Riddell:

BABY VACCINATIONS: HOW TO SOOTHE THE PAIN

#ScienceUpFirst

WHAT'S UP WITH **RATs?**

8 questions about **Rapid Antigen Tests, answered.**

#ScienceUpFirst