Testing Behaviourally-Informed Messaging in Response to Severe Adverse Events Following Immunization (AEFIs)

May 2021

Agence de la santé publique du Canada | Public Health Agency of Canada

Canada

impact canada

EXECUTIVE SUMMARY

BACKGROUND AND PURPOSE

- News reports of adverse events following immunization (AEFI) and the Government's response to them have strong potential to influence public confidence in vaccines and their safety.

- The current study proactively tested the impact of various behaviourally-informed *messaging* strategies delivered through different *messengers* in response to a hypothetical AEFI incident. Its intent was to help prepare the Government for response to potential AEFIs, by identify winning communications strategies to maximize public confidence in the Government's COVID regulatory regime; maximize public confidence in the safety of the COVID vaccine and further drive vaccination intentions.

EXECUTIVE SUMMARY

STUDY OVERVIEW

- Participants in this experiment were presented with a (fictitious) news report of an AEFI that described a recent death with a possible link to a recent COVID-19 vaccination. Using a randomized controlled trial design, participants were then shown 1 of 7 differently framed messages in response to the news report from 1 of 3 different sources.

- Message responses were stated to come from either the Government of Canada, a top Canadian Medical Professional or a spokesperson for the vaccine manufacturer. The messages were either unrelated to the event (Control I), current approved ML responses to serious AEFI events (Control II) or 1 of 5 different messages framed with a behavioural science lens.

- Two sets of messages were presented at different times in the experiment to simulate the lifecycle of an AEFI. 1) Immediately after the news report, conveying the message that the report has been flagged and will be investigated, but there is currently no confirmed link between the vaccine and the event yet. 2) Near the end of the experiment, conveying the message that the investigation has concluded there was no link between the AEFI and the vaccine

EXECUTIVE SUMMARY

KEY FINDINGS

- Responsive communication after an AEFI report makes a difference, and the way a message is framed - leveraging insights from the behavioural sciences - can further amplify its impact.

- Overall, the 'Kitchen Sink' message frame (i.e., incorporating multiple behavioural science principles simultaneously) was the most effective communications approach across measures. This message frame significantly **reduced concerns about vaccine safety and concerns about the news report by 17 percentage points** relative to the passive control (i.e., receiving no information) and by 10 percentage points relative to the active control (i.e., receiving currently approved media headlines prepared by PHAC/HC to respond to AEFIs). This effectiveness was evident in both contexts of uncertainty (i.e., AEFI is actively under investigation) and certainty (i.e., investigation has concluded).

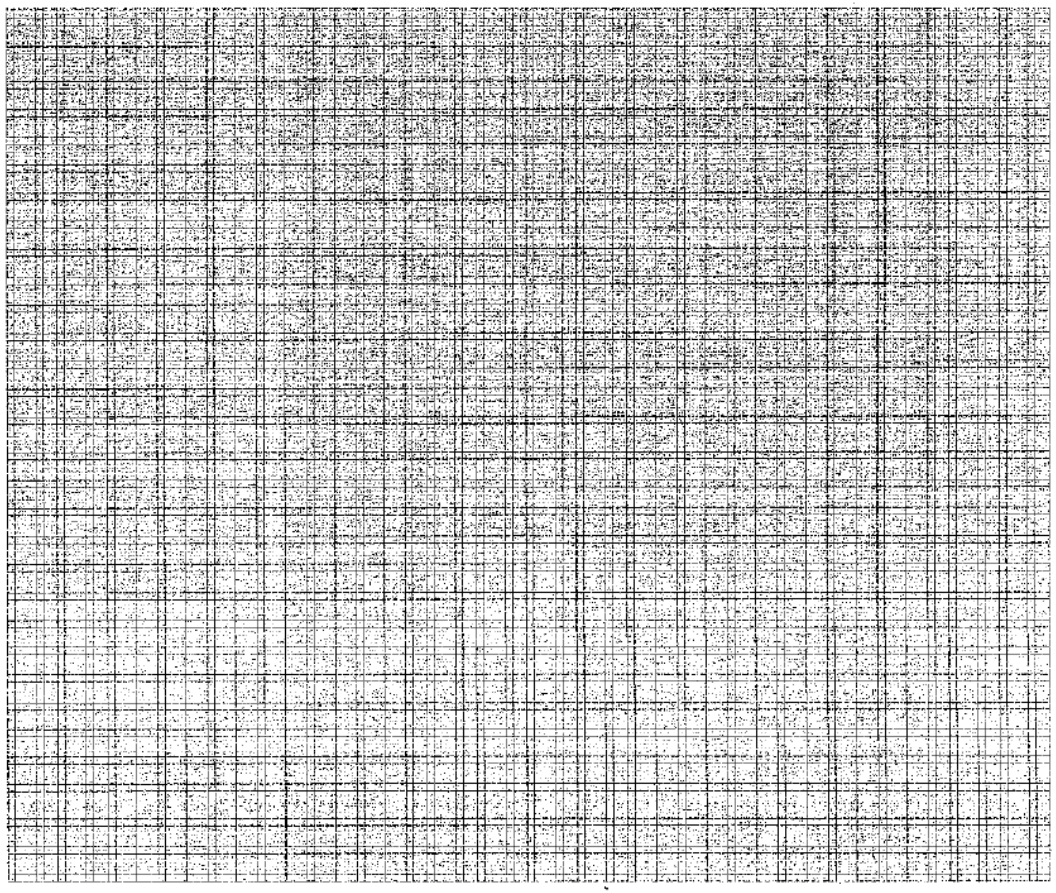
- Communications approaches do not work equally for everyone. Participants who endorsed misinformation statements about COVID-19 vaccines were unaffected by any messaging frame.
- Messenger source (e.g., whether the message was delivered from the Government of Canada, a top medical professional, or the vaccine manufacturer) had no effect on reducing concerns or perceived message quality.
- Overall, vaccine intentions and vaccine confidence were high across the sample, and largely unaffected by messaging approaches.

EXECUTIVE SUMMARY

KEY FINDINGS

EXECUTIVE SUMMARY

KEY RECOMMENDATIONS



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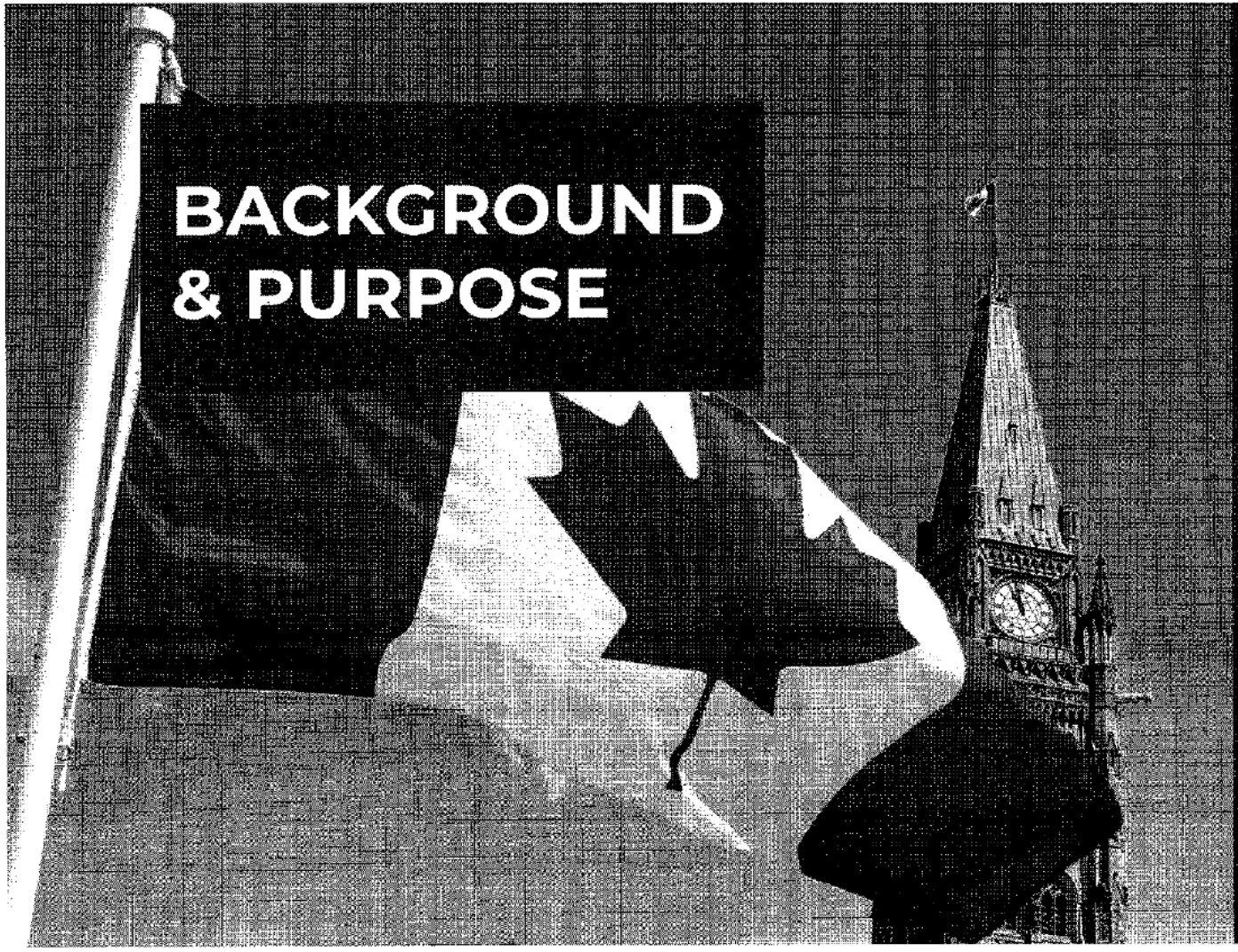

BACKGROUND & PURPOSE

Situating the present study within the context of the IIU's broader role in the Government's pandemic response effort.

Introducing the present study - including what AEFIs are, and the importance of effective Government messaging in response to them.

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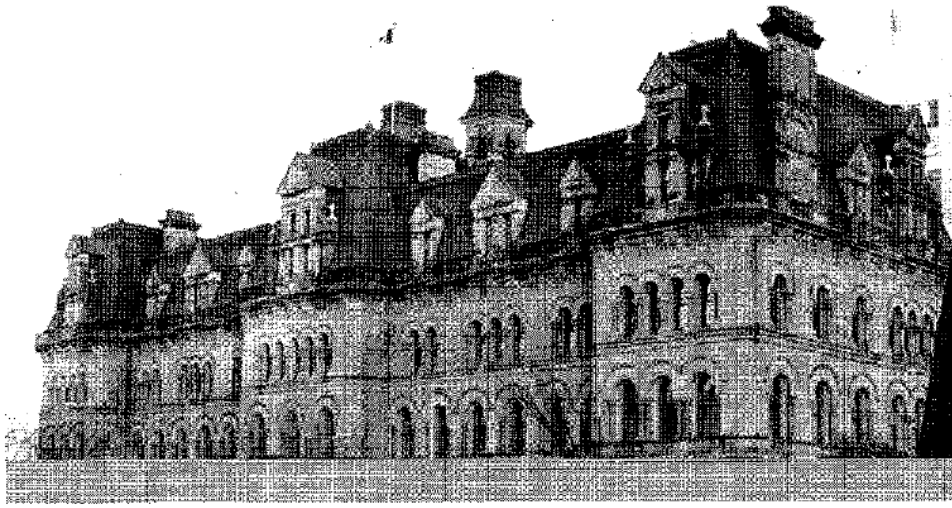


The Impact and Innovation Unit (IIU) was established in 2017 to implement the Impact Canada Initiative. In March 2020, the IIU quickly pivoted to support the Government's COVID-19 response with its centralized skills and resources.

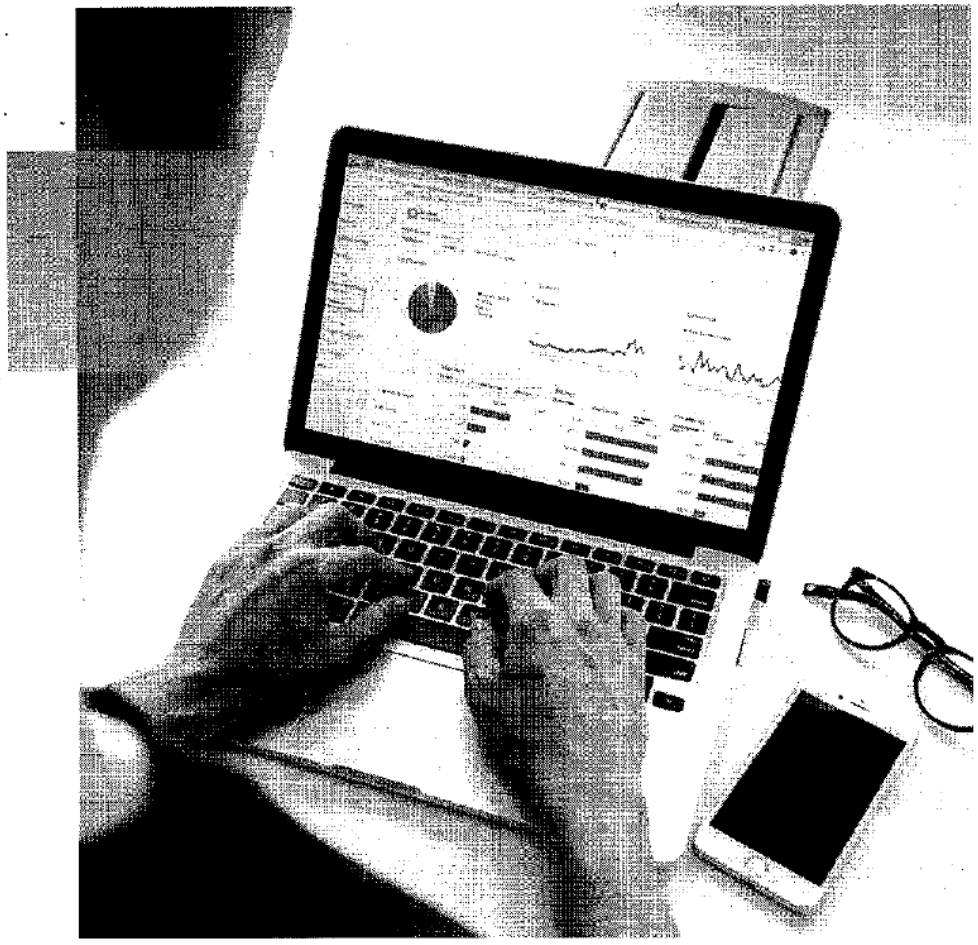
- Impact Canada is a whole of government framework for scaling up and mainstreaming "outcomes-based" policy/program methods, such as Challenges, pay for results and behavioral science; incentivizing new multisectoral partnership models; and, developing new impact measurement tools to demonstrate the effectiveness of policy and program interventions. Taken together, these actions are focused on bridging the gap between policy development and effective implementation.

- With a centre of expertise housed in Privy Council Office and subject-matter experts embedded cross-departmentally as Impact Canada Fellows, the IIU is a multidisciplinary, specialized team with extensive experience in the development and execution of these novel policy and program methods. Within the context of the unfolding COVID-19 global pandemic, the IIU refocused its efforts in March 2020 to augment the Government
of Canada response efforts, leveraging its skill sets in behavioural science, public engagement, and innovative public policy design and implementation.

Behavioural Science (BeSci) combines insights and methods from psychology, neuroscience, and other social sciences to understand human behaviour and support positive choices. Pandemic response continues to require large-scale behaviour-change to slow down the transmission of the virus.

- As '*stay home*', '*wash your hands*', and '*wear a mask*' became recommended public health behaviours nationwide in Canada, the IIU launched into a program of applied research grounded in BeSci to support the Government's response effort in accurately and effectively promoting these actions. Now, nearly one year later, increasing the acceptance of COVID-19 vaccines and combating the rampant spread of misinformation are some of the most pressing aspects of the response effort with deep - and increasingly complex - behavioural roots.

- As priorities rapidly change, our contribution within the broader effort remains the same: integrating evidence-based, behaviourally-informed insights and recommendations to public communication materials, policy and programmatic considerations, and whole-of-government decision-making.



BeSci-COVID-19,
Research Portfolio

Three primary data sources

Our growing evidence-base is built upon three primary sources for data collection, and augmented by a series of key partners. Across these sources, our team has deployed an array of research methodologies and analytical techniques spanning from randomized controlled trials and growth curve modelling, to semi-structured interviews and grounded theory analysis.

Three primary data sources inform our program of research

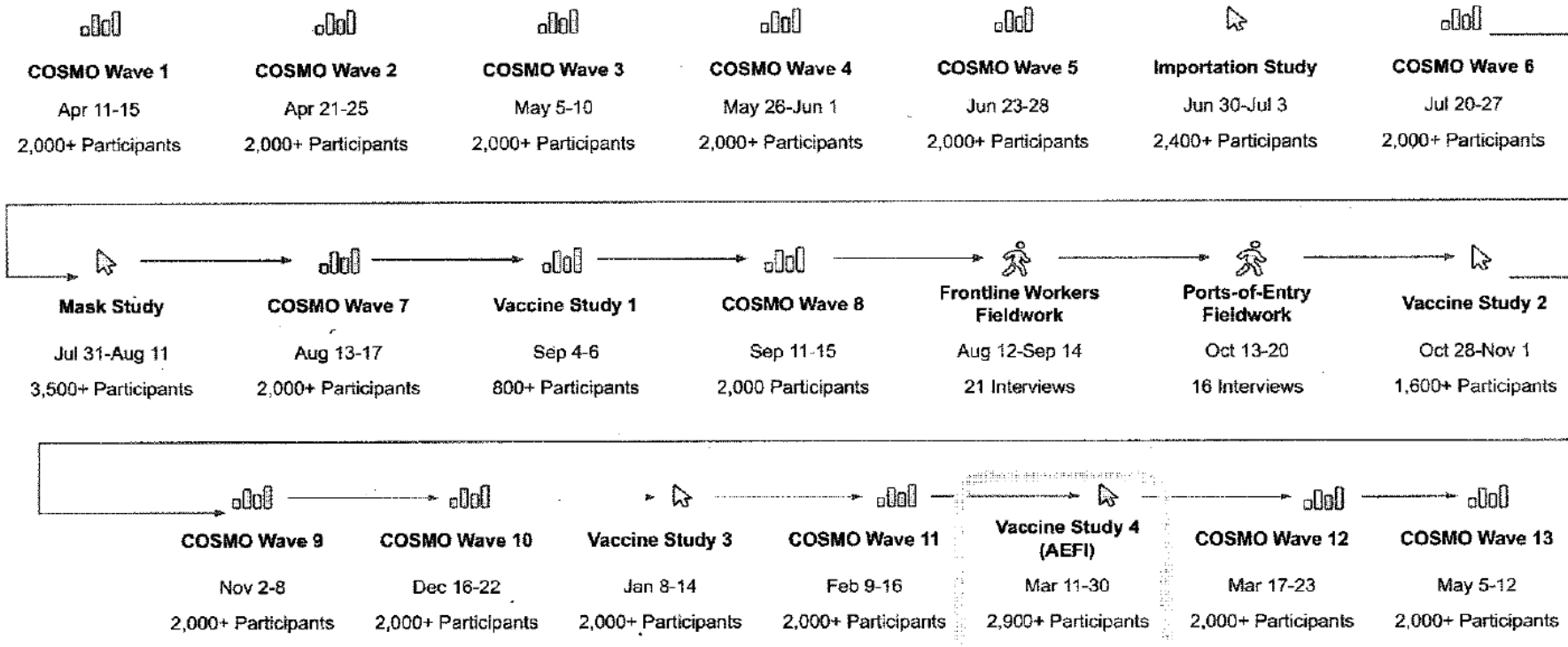
COVID-19 Snapshot Monitoring Study (COSMO Canada; Learn more in Annex B): COSMO Canada is a nationwide tracking study that monitors the evolving knowledge, risk perceptions, and behaviours related to COVID-19 across a 2,000+ cohort of Canadians. With eleven waves of data collection (and counting) implemented in tandem with the progression of the pandemic, the COSMO Canada dataset is the GC's most comprehensive longitudinal resource to inform the response to COVID-19.

Rapid Online Studies and Experiments: Our online experimentation platform enables 'deep-dive' explorations of critical public health behaviours, and testing public health messaging using experimental and quasi-experimental designs. Studies to date have collected data from tens of thousands of Canadians - identifying factors such as high-needs population segments, best-performing messaging strategies, and policy intervention opportunities to measurably drive intentions.

In-Field Research and Experiments: Partnerships with essential service providers enable the design, implementation, and evaluation of behaviourally-informed interventions that will encourage the adoption and maintenance of key health and safety behaviours (like physical distancing) in real-world contexts. These unique in-field testing opportunities will inform policies and programming to keep Canadian consumers, travellers, and frontline workers safer.

BeSci-COVID-19, Research Portfolio

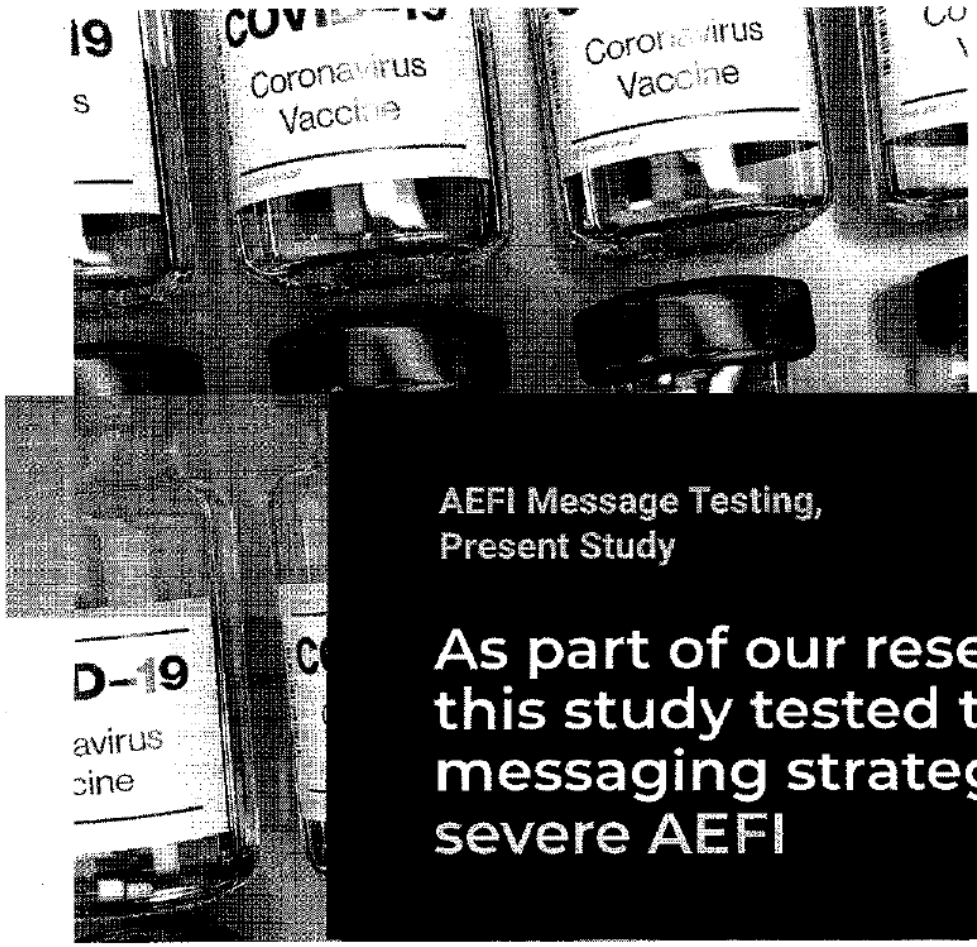
We have collected data from these sources for over one-year



BeSci-COVID-19,
Research Portfolio

In application, the insights garnered continue to inform four priority aspects of government pandemic response

Promoting adherence to protective behaviours	→ Monitoring trends in compliance with recommended public health measures and identifying attitudinal and behavioural barriers/facilitators to adherence → Applying a behavioural design lens to help maximize the accuracy and effectiveness of communications and public education efforts in promoting the desired actions, and testing public health messaging using randomized controlled trials
Reducing importation risk	→ Capturing and analyzing intentions and risk perceptions related to travel and border measures in advance of key temporal junctures for travel → Developing and testing interventions to increase uptake and use of digital tools for incoming travellers and promote compliance with self-isolation/quarantine mandates
Bolstering vaccine acceptance	→ Examining intentions to vaccinate and its associated factors with advanced segmentation and statistical modelling, and tracking the evolving concerns contributing to lower levels of vaccine acceptance → Designing and testing the efficacy of different behaviourally-informed strategies - spanning messaging and programmatic considerations - for driving confidence and acceptance
Combating mis/disinformation	→ Plugging into the global governmental effort coming together on misinformation, and generating robust data on the current challenges and knowledge gaps posed in the Canadian context → Exploring the individual-level and messaging-related factors that may influence the belief and spread of false COVID-19 claims online, as well as potential interventions to improve decision-making



AEFI Message Testing,
Present Study

As part of our research on vaccination, this study tested the impact of various messaging strategies in response to a severe AEFI

This study was carried out as a collaboration between the Vaccine Confidence Policy, Research Engagement Unit at the Public Health Agency of Canada, and the Impact and Innovation Unit at the Privy Council Office

What is an AEFI?	Adverse events following immunization (AEFIs), are defined as any untoward medical occurrence which follows immunization and which does not necessarily have a causal relationship with the usage of the vaccine (WHO, Module 3). **Events related to a COVID-19 vaccine may be minor or severe, likewise, reported events may be unrelated to the vaccine. Any such reported event has the potential to shake public confidence in the vaccine, particularly severe events. [see ANNEX A]**
What are the study objectives?	This study proactively tested the impact of various behaviourally-informed *messaging* strategies delivered through different *messengers* in response to a hypothetical AEFI incident. Its intent was to help prepare the Government for response to potential AEFIs, by identify winning communications strategies to: 1. Maximize public confidence in the government's COVID regulatory regime 2. Maximize public confidence in the safety of the COVID vaccine 3. Further drive vaccination intentions

It is important that the government tracks these AEFIs to ensure the health and safety of its citizens and of the vaccine. There is a delicate balance between ensuring the safety of the vaccine and promoting public awareness while also ensuring public confidence in the safety of the vaccine remains consistent with the government's.

Government messaging following an adverse event will be important to address this balance.

Experimental testing can help us strike this balance...

It's also important to test the effectiveness of message framing under these different levels of certainty

AEFI Message Testing,
Present Study

Communicating under degrees of uncertainty

Communications around AEFIs will also vary in ***the degree of certainty*** *around the link between the AEFI event and the vaccination and the cause.*

Initial responses to an AEFI report will likely carry a high degree of uncertainty as medical experts look into the report and conveys the message that the report has been identified and will be investigated.

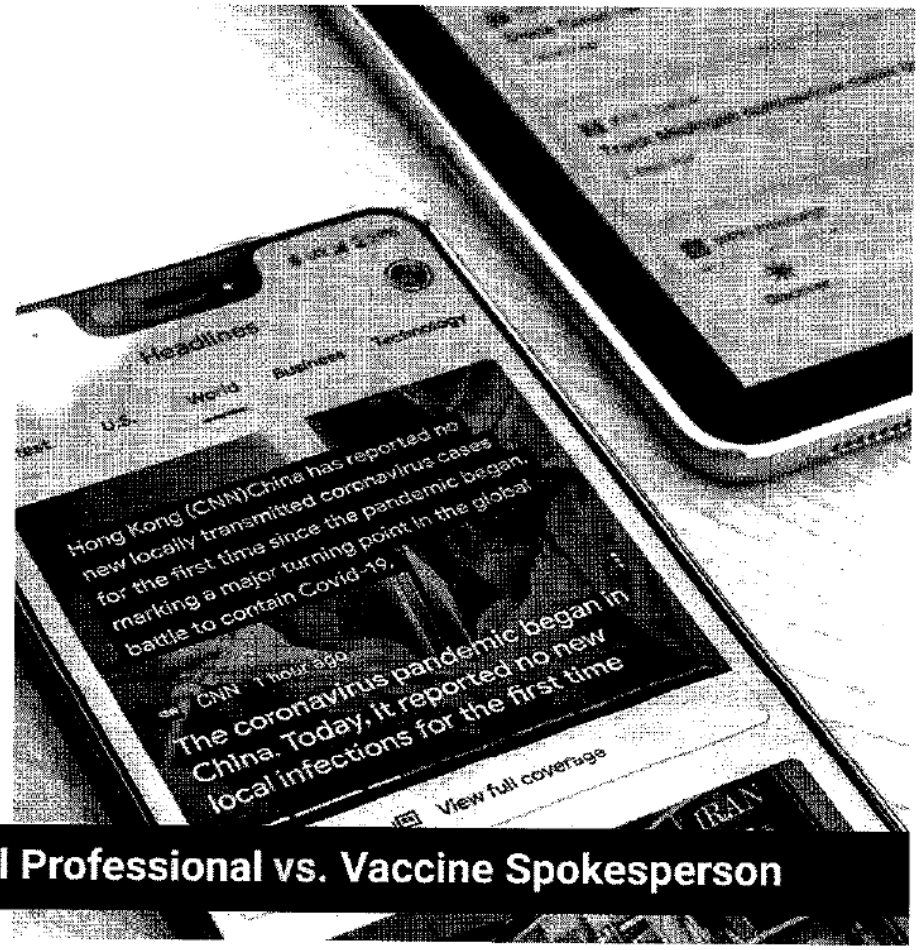
Follow-up messaging likely reflects more certainty as more evidence emerges and conveys information about the link or absence of a link between the AEFI and the vaccine.

AEFI Message Testing,
Present Study

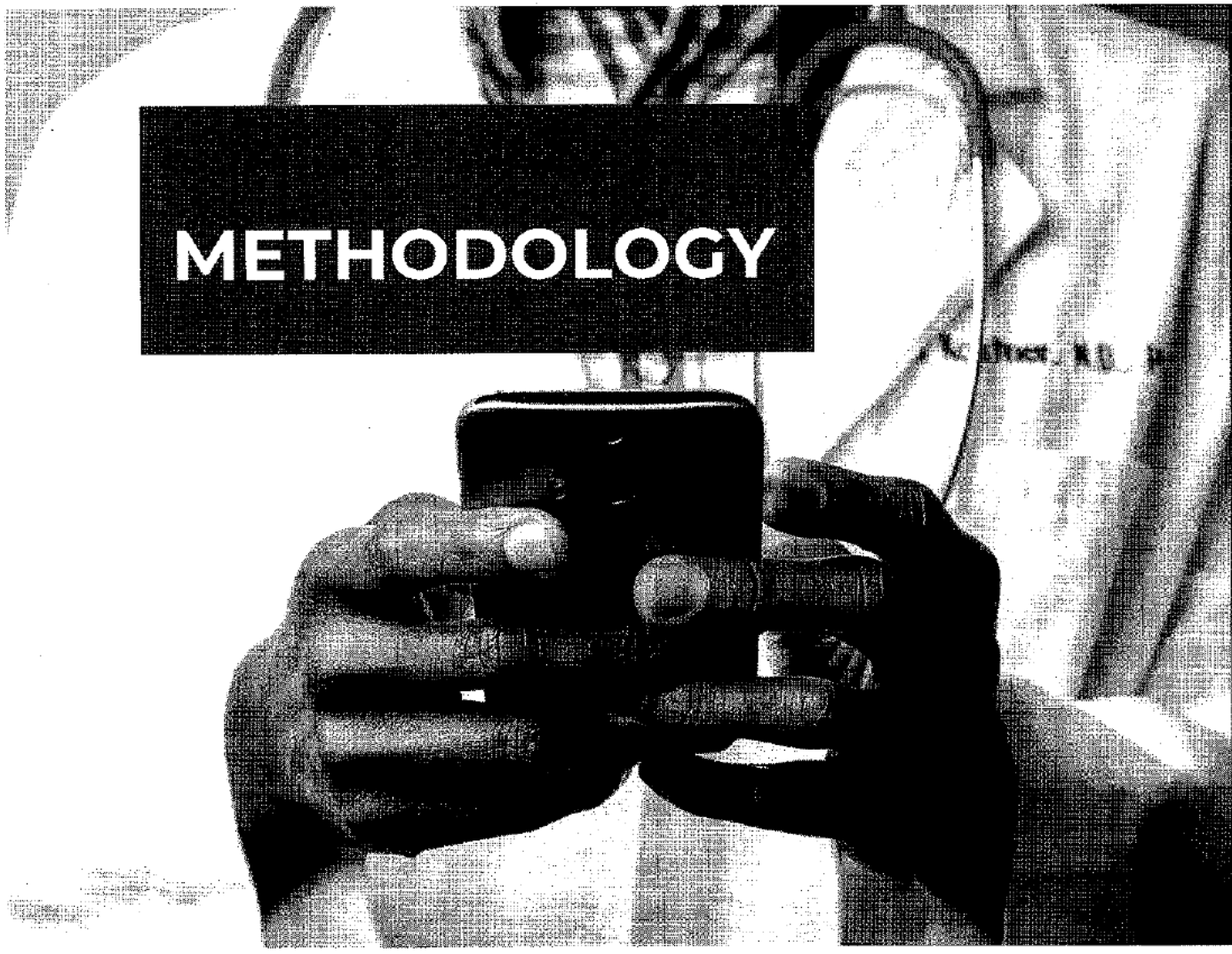
Changing the messenger of information

Typical news reports around AEFI events seek input from a number of different sources (e.g. medical expert, vaccine manufacturer).

Testing the effect of different messengers of the information could provide important insights.



Government of Canada vs. Top Medical Professional vs. Vaccine Spokesperson



METHODOLOGY

Providing an overview of the study design in the context of the IIU's multi-stage behavioural design process (Identify, Understand, Design, Test, Scale)

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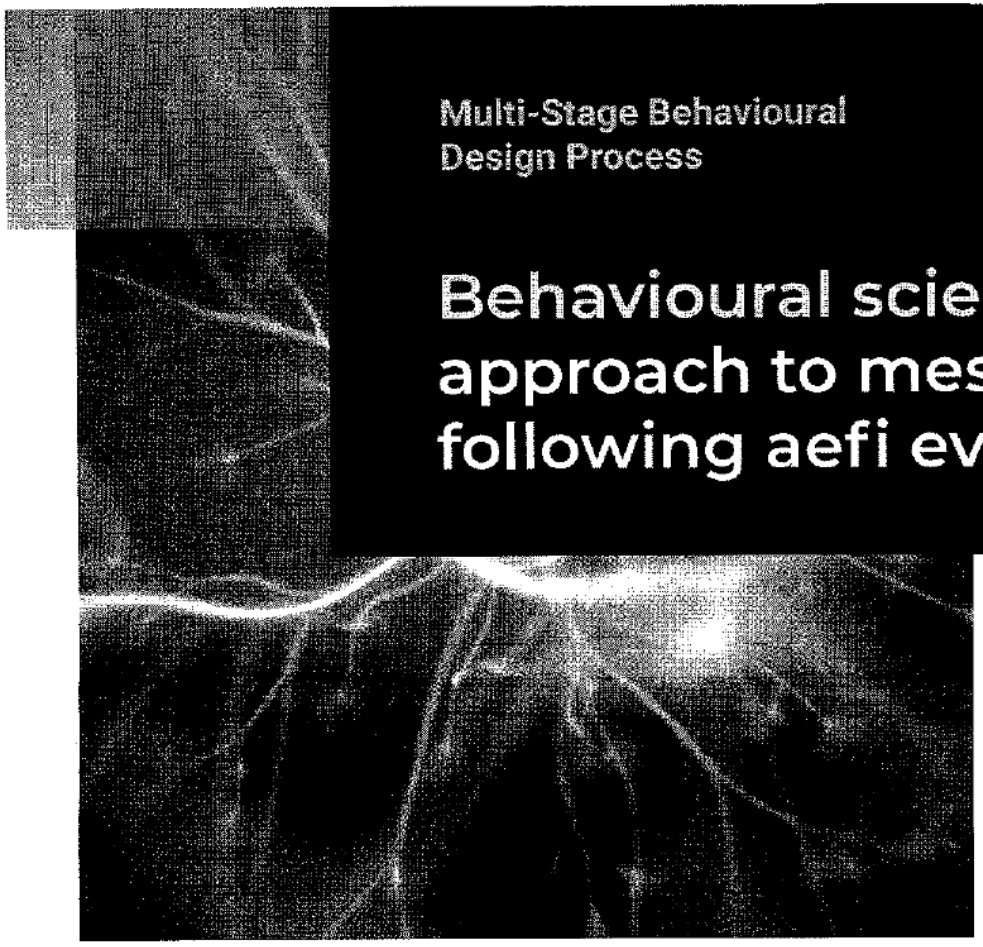


Multi-Stage Behavioural Design Process

Behavioural science approach to messages following aefi events

This study followed the IIU's multi-stage behavioural design process: identifying key barriers, developing evidence-based hypotheses to address them, and finally using an experimental approach to test effective solutions.

Identify

Various cognitive mechanisms can act as barriers to maintaining vaccine confidence in the face of a serious adverse event. The response to AEFIs and the messaging around them can also serve to further exacerbate these barriers or help diminish them.

Understand

Through exploratory research conducted in the Understand Phase (e.g., reviews of the academic and grey literature), several key barriers warranting further exploration were identified.

Design

Evidence-based hypotheses were developed to address the key barriers identified in the Understand Phase. We then designed distinct messaging frames built upon each hypothesis, allowing us to test the effects of different behaviorally-informed communications approaches for responding to a serious adverse event.

Test

An online panel experiment was conducted in the Qualtrics survey platform that included 2900+ Canadians. Using a randomized controlled trial design, participants were presented with a hypothetical news report of a severe AEFI event and then provided a message in response.

Scale

Spread and share insights to teams and departments working on messaging. Extract key insights to inform future message creation to new contexts and events.

Understand Phase

Identifying key barriers

Various cognitive and psychological mechanisms can act as barriers to maintaining vaccine confidence in the face of a serious adverse event. The response to AEFIs and the messaging around them can also serve to further exacerbate these barriers or help diminish them. Through exploratory research conducted in the *Understand Phase*, we identified **6 key barriers** warranting further exploration.

Identifying key barriers

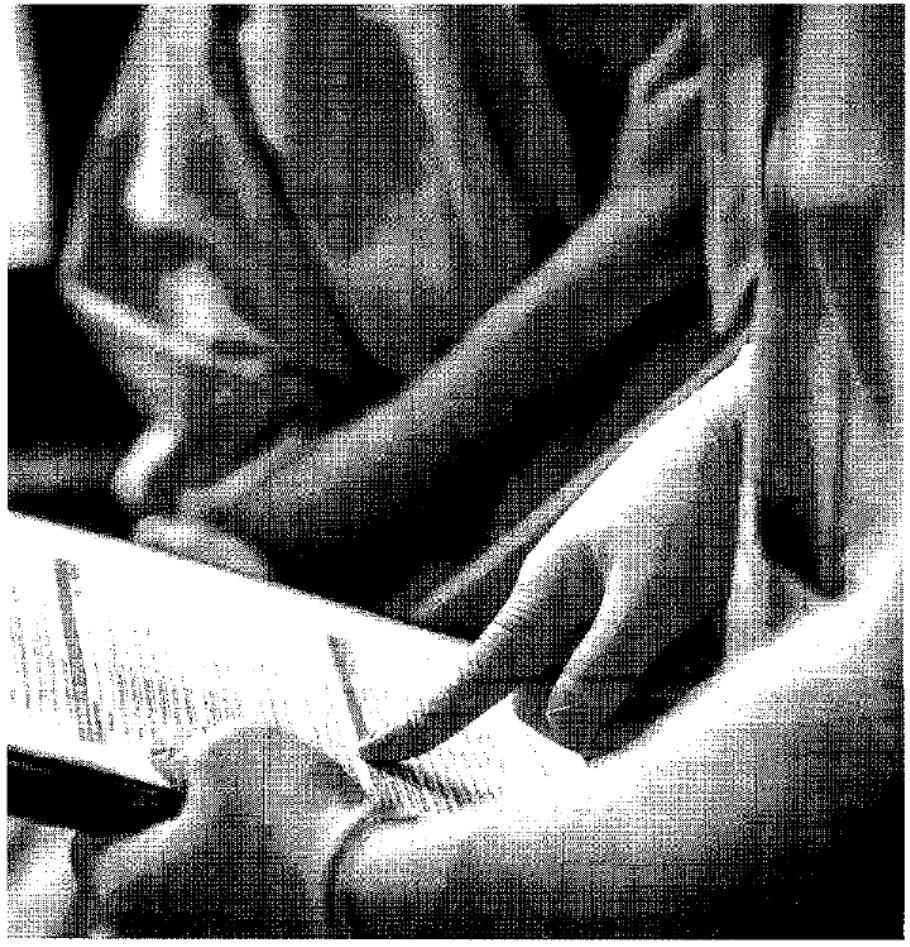
Barrier	Description
Understanding of probabilities (relative vs. absolute risks)	People are confused about quantities and often use frequency (e.g., it's happened 5 times) to guide decision-making when probability (e.g., chance of it happening to me is 1 in 1 million) is relevant. Research shows that two different framings of the exact same risk can drastically affect a person's decision and perception of risk (Berry et al., 2010).
Confirmation bias	People have the propensity to search for and interpret information that fits their current beliefs (Meppelink et al., 2019).
Salience / availability heuristic	People tend to pay attention to what is most salient and tend to rely on immediate examples that come to mind when evaluating a topic, decision or forming an opinion (availability heuristic) (Pachur et al., 2012).
Illusory pattern perception (post hoc fallacy)	Basic human psychology can cause people (to varying degrees) to make associations between an AEFI and the vaccine whether the vaccine had anything to do with the adverse event or not (Reyna, 2012).
Distrust in government / vaccine development	Those who have a general distrust in the government or the government's response to COVID, may have a distrust for the government led vaccine rollout.
Lack of understanding of vaccine technology	Those who do not understand how vaccines work, may not understand why we should expect AEFIs that are related to the vaccine and that some AEFI will not be related to the vaccine.

Design Phase

Generating evidence-based hypotheses

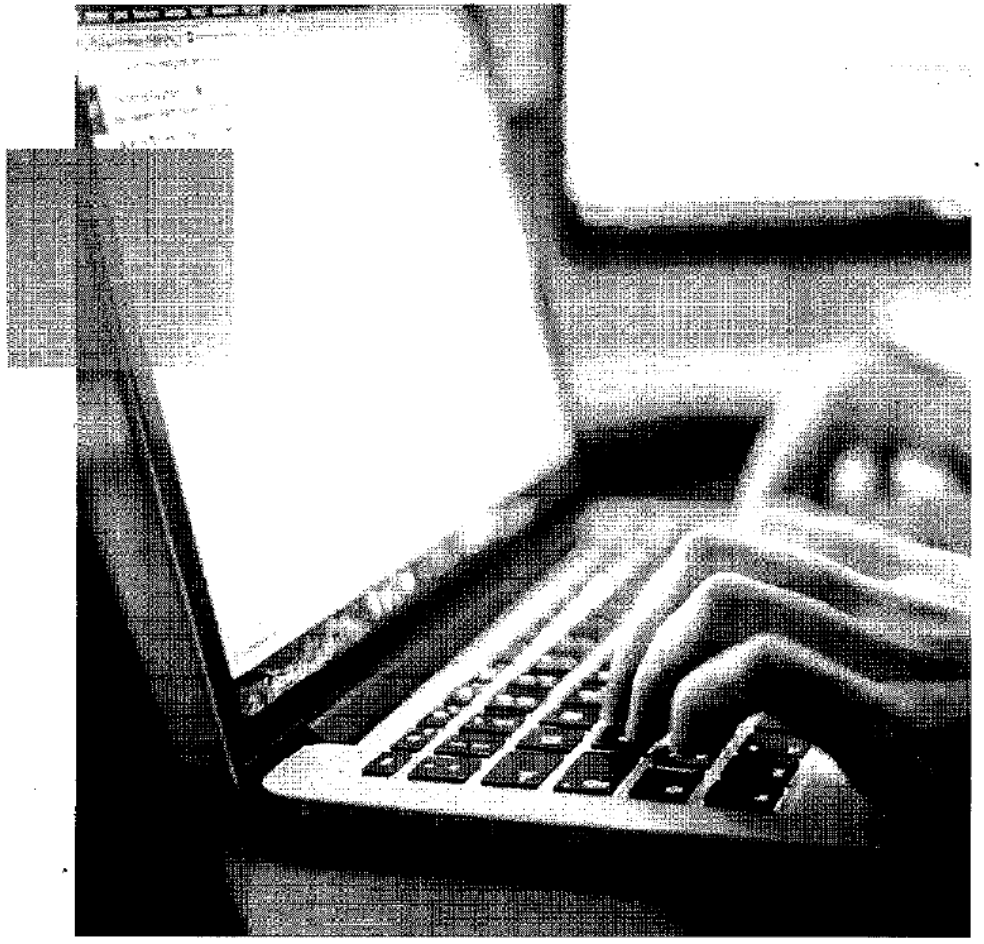
Informed by the academic and grey literature, **four** evidence-based hypotheses were developed to address the key barriers identified in the *Understand* Phase. We then designed distinct messaging frames built upon each hypothesis, allowing us to test the effects of different behaviorally-informed communications approaches for responding to a serious adverse event.

This allows the hypotheses to be applied to different contexts and the messages themselves adaptable.



Generating evidence-based hypotheses

	Concept		Barrier Addressed
Operational Transparency Framing	Providing a view into the vaccine surveillance/monitoring process, and the investigative process that determines causality.	→	Lack of trust/confidence in government and safety
Mechanism Framing	Highlighting how vaccines work and providing the most likely cause of adverse events will provide a clearer background to view the event that can override the illusory pattern perception.	→ →	Illusory pattern recognition Poor understanding of vaccine technology
Risk Communication Framing	Communicating risk and benefit of the vaccine by using language that addresses difficulties in understanding probabilities and focuses on absolute vs. relative risk.	→	Difficulty understanding probabilities/risk assessment
Gist Framing	Reinforcing the often-coincidental nature of health events using language that communicates the gist of a statement.	→ →	Illusory pattern recognition Salience / availability heuristic



Test Phase

Testing messaging frames through an experimental approach

Messaging frames were tested through an online panel experiment of 2900+ Canadians from March 11-30, 2021. To attain a broadly, nationally representative sample, sampling quotas were applied for Age, Sex, and Region in line with Canadian Census data.

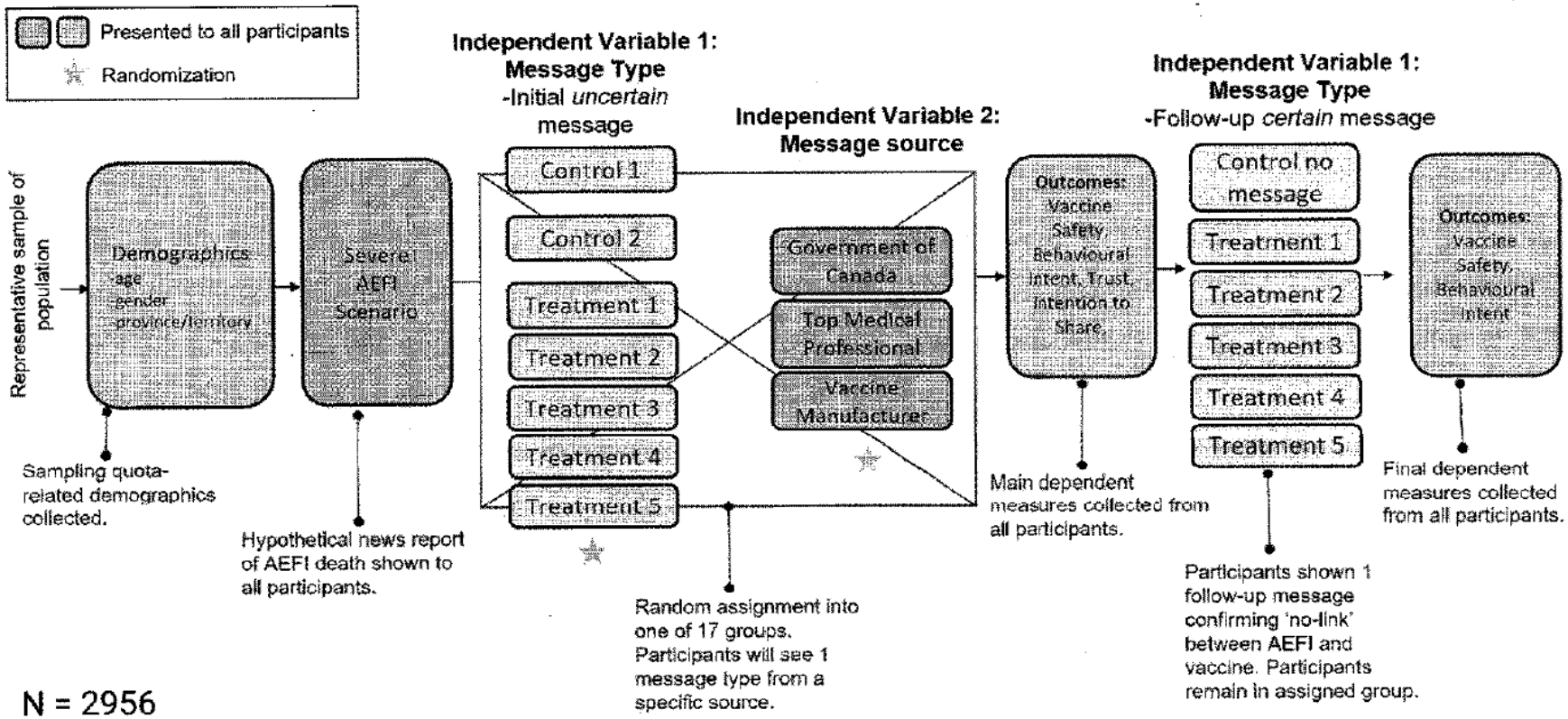
Testing messaging frames through an experimental approach

- Participants were randomly assigned to see a message response to an AEFI scenario provided by one of three different sources.
  - This allowed us to assess the effect of message framing and message source on key outcomes of interest (see slide 26 for more information on measured variables)

- The study incorporated key design elements to mirror a realistic setting:
  - **AEFI scenario**: All participants were shown a fictitious news report of a severe AEFI event
  - **Element of (un)certainty**: Participants saw two separate messages:
    - The first **initially after the news report** to reflect the "uncertain" time window as an event is being investigated, and
    - The **second as a follow-up** later in the experiment indicating that the investigation had concluded made a determination.

Test Phase

Overview of Study Design

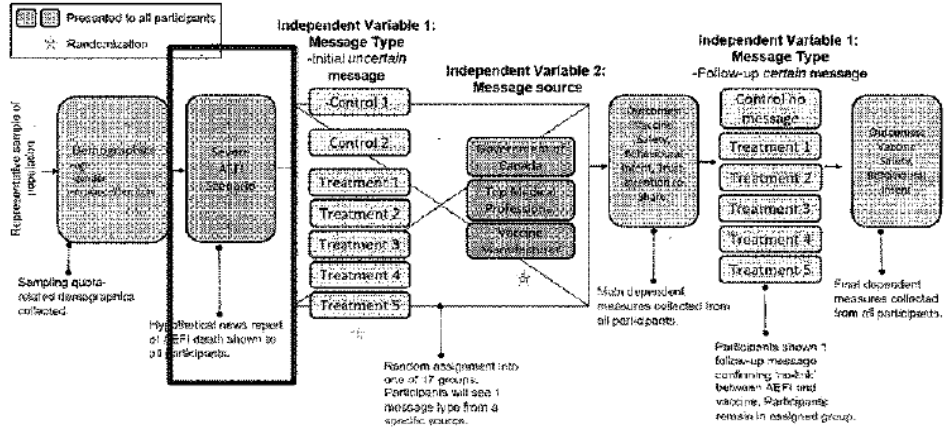


N = 2956

Test Phase

Participants were first presented with a fabricated news report of a severe AEFI

There are many elements of the reporting of an adverse event that can have an impact on the public perception of severity. To control for variations in perceived severity, we held several key elements constant in the news report.

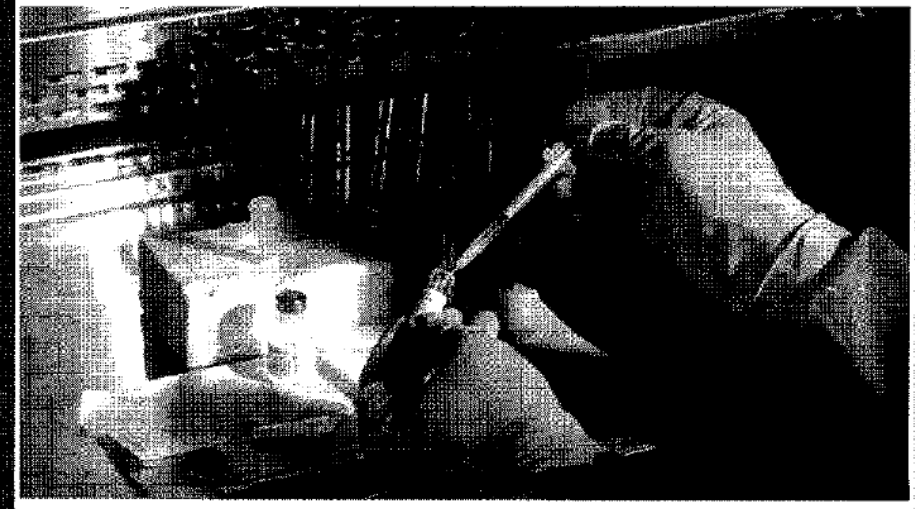


Elements we controlled that affect perceived severity:

Certainty of link to vaccine	This is an unexpected event
Vulnerability of patient	The patient was reported to be middle-aged and healthy
Severity of event	The event was reported to be fatal
Timing relative to vaccination	Event occurred 3 days following vaccination

The World Press
5h ·

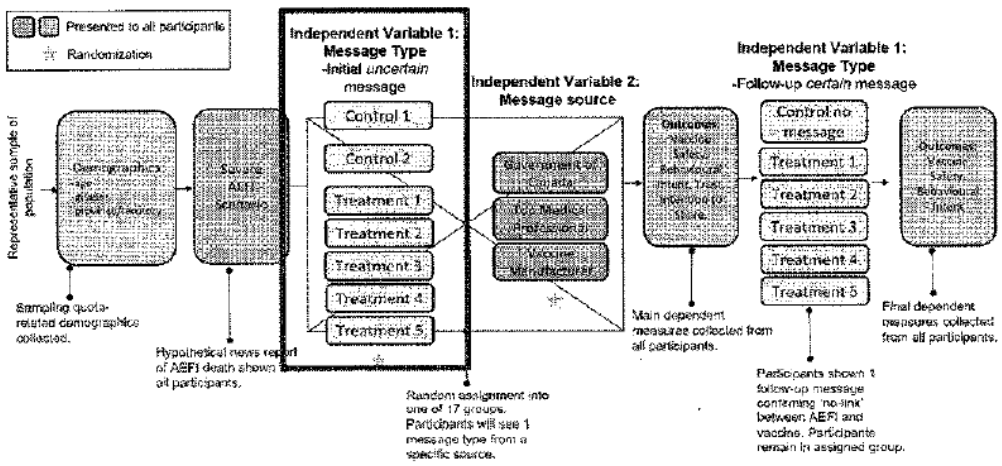
Three days after receiving a first dose of a COVID-19 vaccine, a 38-year-old 'healthy' Canadian woman suddenly died in her home from apparent heart-failure. Exact cause of death is still under investigation and Canadian health officials are investigating what role, if any, the vaccine played in the death. The victim's family say she was experiencing some minor side-effects after receiving the vaccine but had no underlying health conditions... See More



THEWORLDPRESS.COM

Heart failure following COVID-19 vaccination being investigated.

Like Comment Share



Test Phase

Participants were then randomly shown 1 of 7 messages in response – 'investigation underway'

"After seeing the report, imagine you come across the following content..."

Control I	No information, passage about COVID-alert app
Control II	Approved HC/PHAC media lines to respond to severe AEFI
Gist Framing	Reinforcing the often-coincidental nature of health events using language that communicates the gist of a statement may overcome the illusory pattern perception and increase vaccine confidence.
Operational Transparency Framing	Highlighting the event monitoring process, vaccine surveillance, and explaining what reported events related to the vaccine are may reduce the saliency of discrete events and increase confidence and trust in government.
Risk Communication Framing	Using language to best communicate the risk and probability of adverse vaccination events may reduce concern about side effects and increase vaccine confidence
Mechanism Framing	Highlighting how vaccines work and providing the most likely cause of adverse events will provide a clearer background to view the event that can override the illusory pattern perception.
Kitchen Sink Framing	Combining principles of all treatment conditions in one approach may help override key barriers to increase vaccine confidence, trust in confidence and override the illusory pattern perception.

Test Phase

Uncertainty Phase – 'Investigation Underway' Message Samples

Gist Framing

A "vaccine adverse event" is any health problem that occurs after vaccination, whether related to the vaccine or not. When considering the possibility that a serious health event is caused by a vaccine, it's also important to consider that as tragic as they are, such health events occur every day, whether or not people are vaccinated. When two events occur closely in time like this case, this creates a flag for investigation, which is currently underway.

Mechanism Framing

There is currently no known evidence or cause that would link the cardiac arrest to the vaccine. A rigorous investigation will determine the most likely cause of this tragic health event. The proximity to the vaccination is one factor that will be considered, however there are many other factors that need to be investigated, for example.

Operational Transparency Framing

Due to its proximity to vaccination this report is tracked. Initial evidence does not suggest that there is a link. Any medical event that follows immunization is reported as an adverse event and can have a number of causes related or unrelated to the vaccine. All serious events are reviewed to determine if there are any safety issues. Detecting safety concerns is the primary purpose of vaccine safety monitoring and there are currently no safety concerns for any approved COVID-19 vaccine.

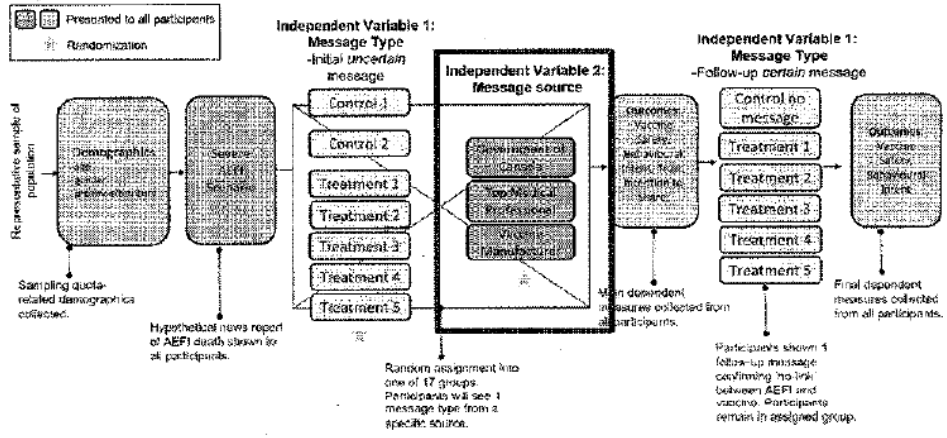
Risk Communication Framing

The report is being investigated. As of March 2021, the COVID-19 vaccines have been administered in 1,778,405 doses, a total of 194 serious adverse events occurred, none of which have resulted in death related to the vaccine a serious adverse event is expected to occur for 1 in every 9,167 people who are vaccinated. The chance of a Canadian being injured as a result of a car accident is 1 in every 240 Canadians, 9,991 out of every 10,000 doses have been administered without any accompanying adverse event.

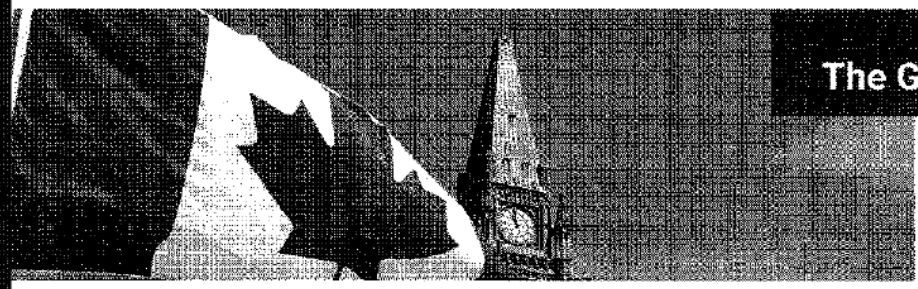
Test Phase

Messages were said to come from 1 of 3 sources

To assess the effect of the *messenger*, each message response was preceded with a statement about where the information came from. Participants were randomly assigned to one of three messenger conditions.



"After seeing the report, imagine you come across the following content ***that was shared with you by..."***

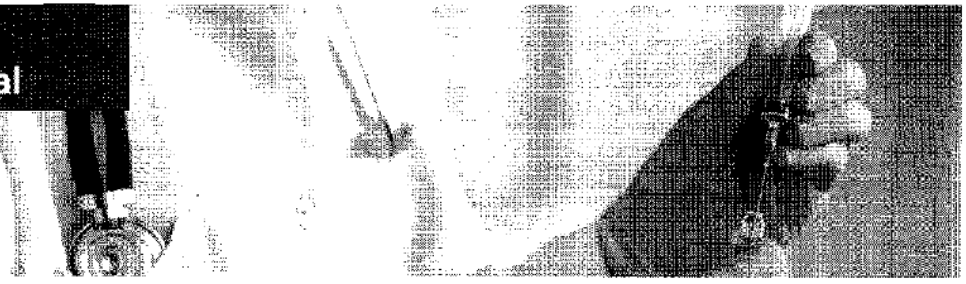


The Government of Canada

01

A top Canadian Medical Professional

02



A spokesperson for the vaccine manufacturer

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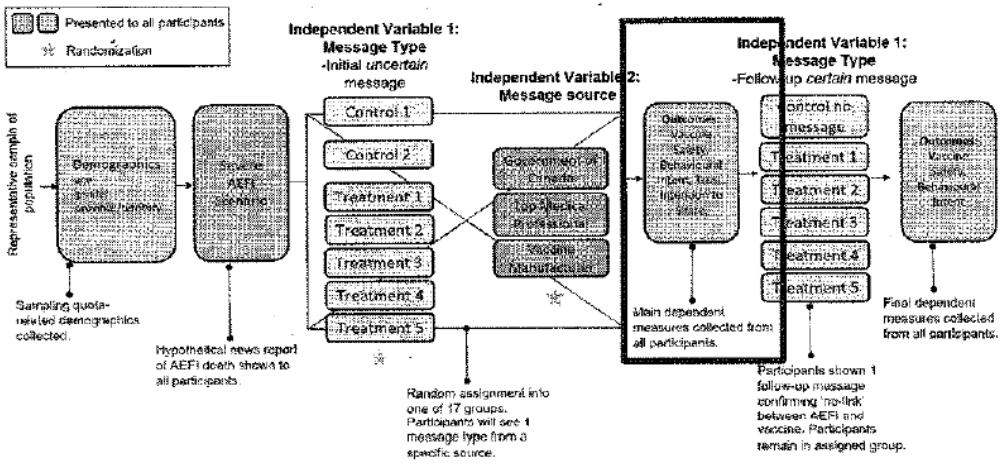


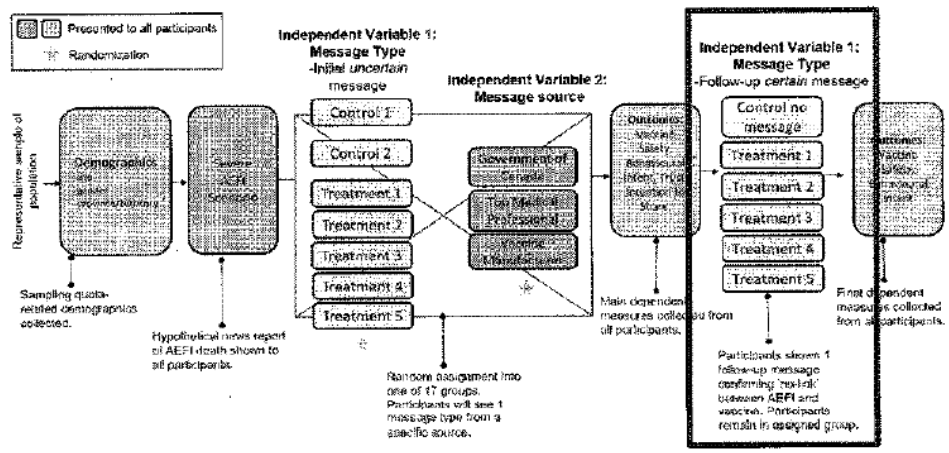
Test Phase

Key variables measured

Variable	Measurement
AEFI Concerns	2 items assessed on 5-point agree/disagree Likert scale; statements included "The message reduced concerns I had about the safety of COVID-19 vaccines" / "The message reduced any concerns I had about the news report".
Message Quality	6 items assessed on 5-point agree/disagree Likert scale; statements included topics relating to how much information was in the message, if the message was insensitive and having a better understanding of AEIFs.
Vaccine Confidence	3 items assessed on 4-point agree/disagree Likert scale; statements included "I think the COVID-19 vaccines are safe" / "I think the COVID-19 vaccines are important to get" / "I think the COVID-19 vaccines are effective".
Vaccination Intentions	2 items assessed on 5-point will not/will Likert scale; statements included "When a COVID-19 vaccine becomes available to you, will you accept the vaccine if it meant protecting friends, family, or at-risk groups?" / "When a COVID-19 vaccine becomes available to you, will you accept the vaccine for yourself?"
Vaccine Monitoring Confidence	5 items assessed on 5-point agree/disagree Likert scale; statements included topics relating to confidence the Government would take action if necessary around vaccine safety, Canada having an effective regulatory system and tracking vaccine safety.
Belief in Misinformation	8 items assessed on 5-point true/false Likert scale; statements included common statements of misinformation around COVID-19 vaccines.

Test Phase

Participants in main treatment conditions were shown a follow-up message – 'investigation completed'

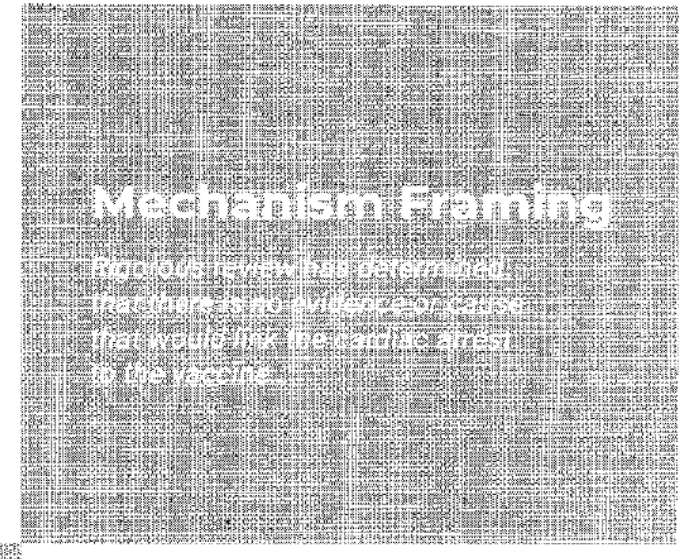


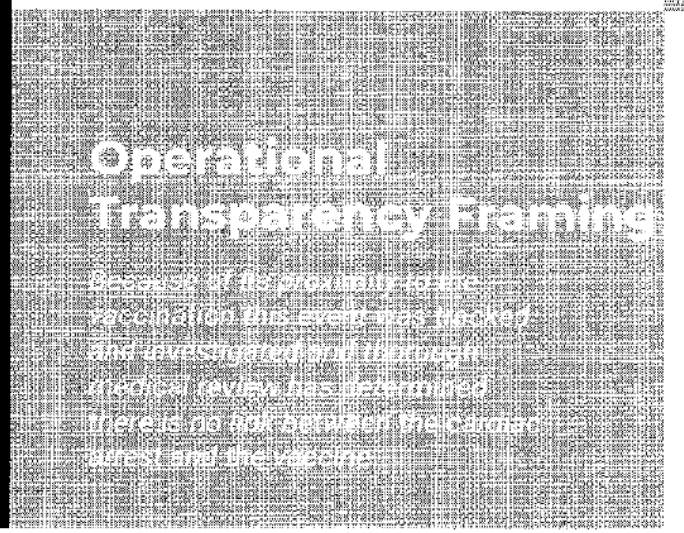
Participants in the main treatment conditions (Gist, Operational Transparency, Risk Communication, Mechanism & Kitchen Sink) were asked to imagine that several days had now passed after reading the initial news report and were then exposed to a follow up message frames indicating that the investigation was complete and it was determined that there was no link between the AEFI and the vaccine. [see ANNEX A for full wording].

Key Measures of Concerns, Effectiveness, Confidence and Intentions were then recollected.

Gist Framing

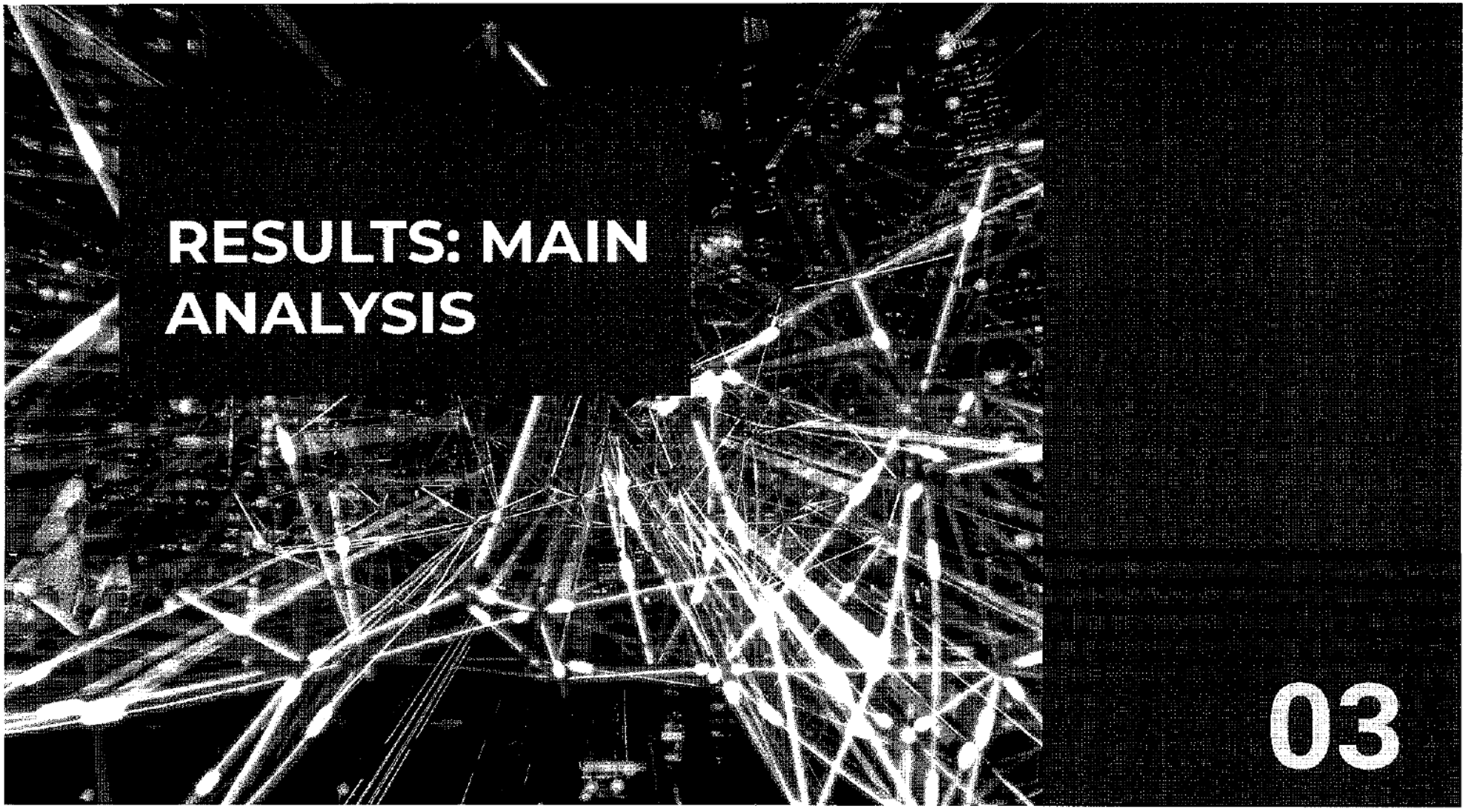
...Even though these two events occurred close in time, a thorough review has concluded that they are not related...





Risk Communication Framing

The event was thoroughly investigated and medical review has determined there was no link between the vaccination and the report.

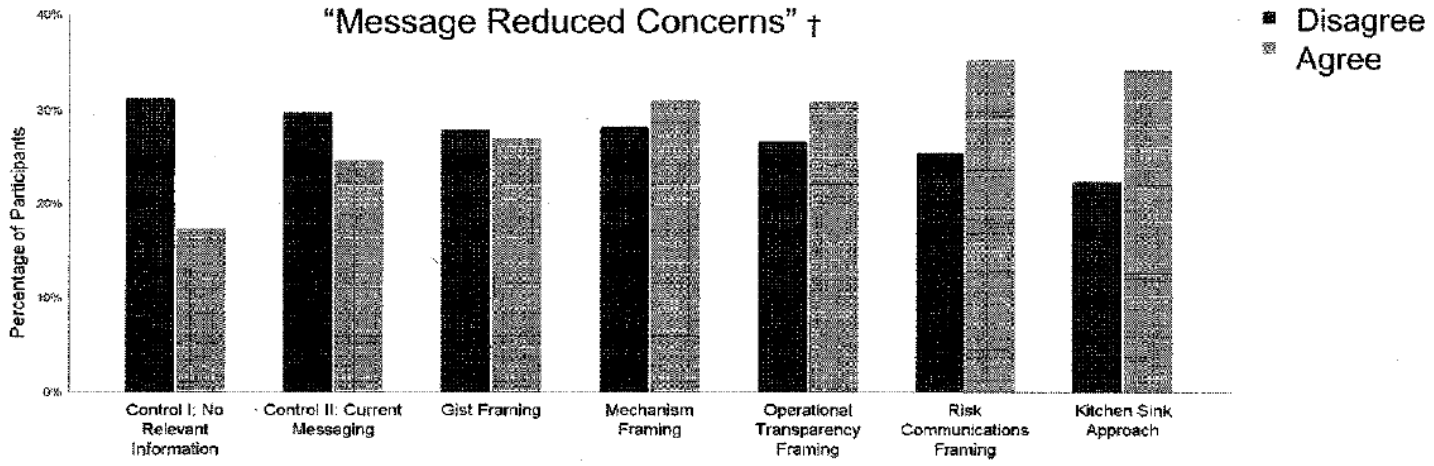

RESULTS: MAIN
ANALYSIS
03

TAKE-HOME UPFRONT:

Responsive communication after an AEFI report makes a difference

Preliminary findings indicate that the *'kitchen sink'* message frame significantly reduced concerns about vaccine safety and concerns about the news report by **17 percentage points** relative to the passive control (i.e., no information) and by 10 percentage points relative to the active control (i.e., currently approved media headlines prepared by PHAC/HC to respond to AEFIs). Three other behaviourally-informed message frames - risk communications, operational transparency, and mechanism - also significantly reduced concerns relative to the passive control.

Participants were responsive to messaging about the AEFI news report



†2 items assessed on 5-point agree/disagree Likert scale; statements included "The message reduced concerns I had about the safety of COVID-19 vaccines" / "The message reduced any concerns I had about the news report".[see ANNEX C]

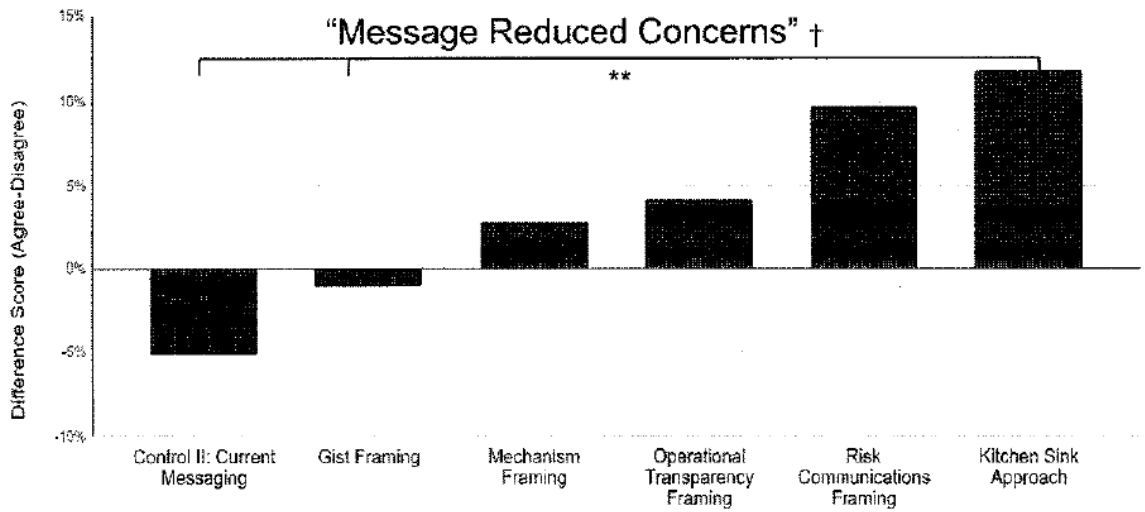
TAKE-HOME UPFRONT:

The way a message is framed – leveraging insights from the behavioural sciences can amplify its impact

The way the message is framed can amplify its impact. Behaviourally-informed frames can significantly improve upon the current state approach.

'Kitchen Sink' message frame significantly reduced AEFI-related concerns, relative to the control messages..

During the period of uncertainty, Risk Communication and Operational Transparency framing appear to be driving the effectiveness of the Kitchen Sink Approach.



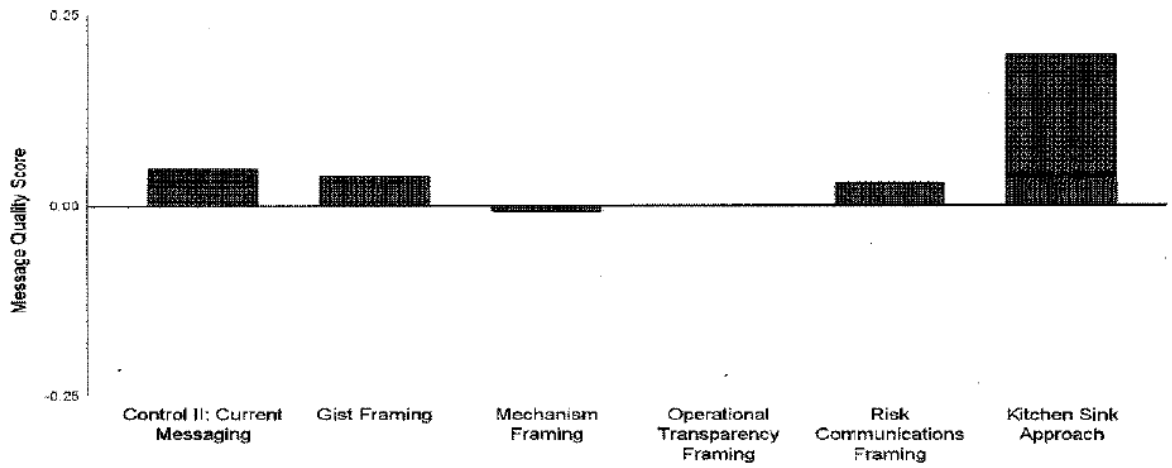
*$p < 0.1$ **$p < 0.05$ ***$p < 0.01$

†2 items assessed on 5-point agree/disagree Likert scale; statements included "The message reduced concerns I had about the safety of COVID-19 vaccines" / "The message reduced any concerns I had about the news report". (see ANNEX C)

"Kitchen sink" framing was the best received across measures of message quality (e.g., items assessing volume, simplicity and sensitivity of information presented.

Across measures of message quality, the 'Kitchen Sink' message was also the most effective communications strategy.

Message Quality †



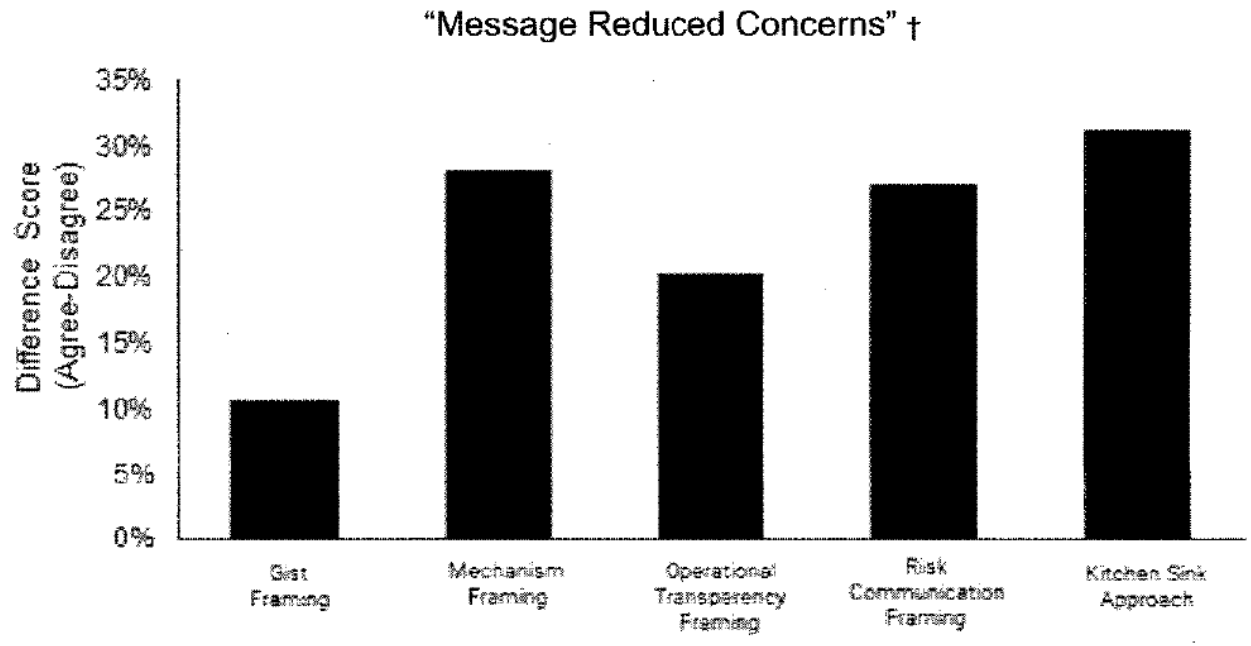
[see ANNEX D for description of PCA analysis]

†6 items assessed on 5-point agree/disagree Likert scale

Participants in treatment conditions were shown a follow-up message which confirmed no link between adverse event and vaccine in the same frame as the first message. Participants were then asked again about concerns of the vaccine's safety and concerns about the news report. Here we find that the Kitchen Sink message performed better than the Gist and Operational Transparency framing, but was similar to Mechanism and Risk Communications.

'Kitchen Sink' message frame remained the best performing communications strategy after investigation concluded.

During the period of ***certainty, Risk Communication and Mechanism framing*** *appear to be driving the effectiveness of the Kitchen Sink Approach*



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TAKE-HOME UPFRONT:

Messaging doesn't work equally for everyone

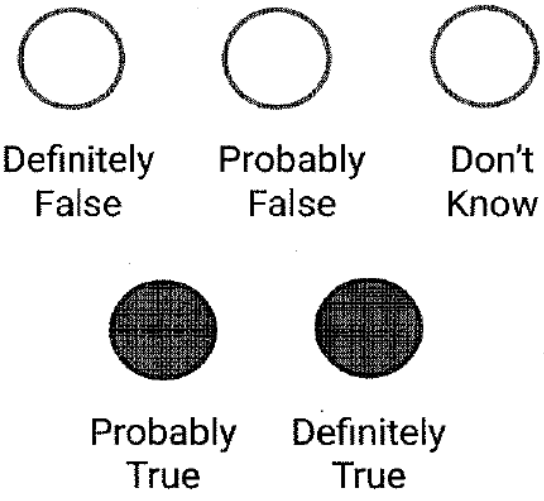
The impact of messaging frames differed depending on the respondent's stated belief in misinformation about COVID-19 vaccines.

Dividing participants into those who displayed belief in COVID-19 vaccine misinformation vs. those who do not

Participants were presented a list of false statements about COVID-19 vaccines, those who labeled at least 1 as true were separated from those who did not label any as true.

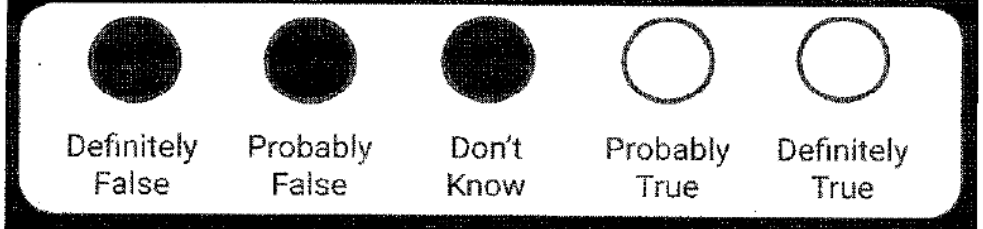
"Getting a COVID-19 vaccine can cause people to develop COVID-19."

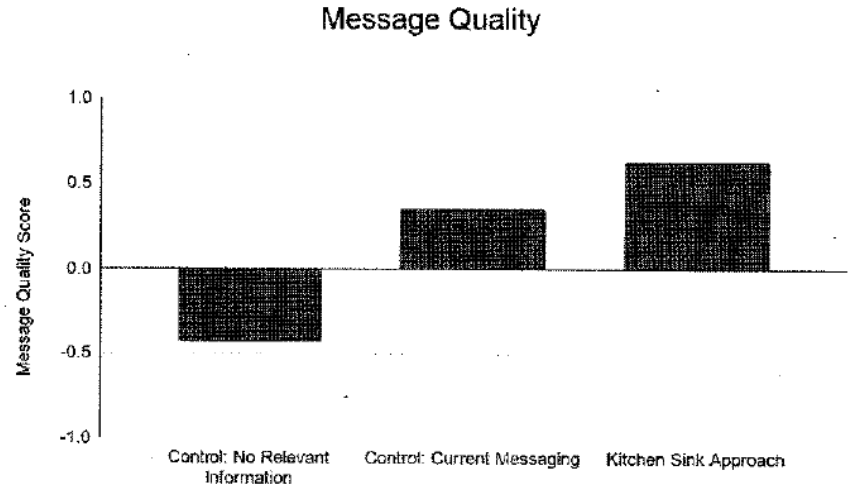
"Individuals that have experienced negative reactions to a COVID-19 vaccine in Canada have been silenced by government officials."

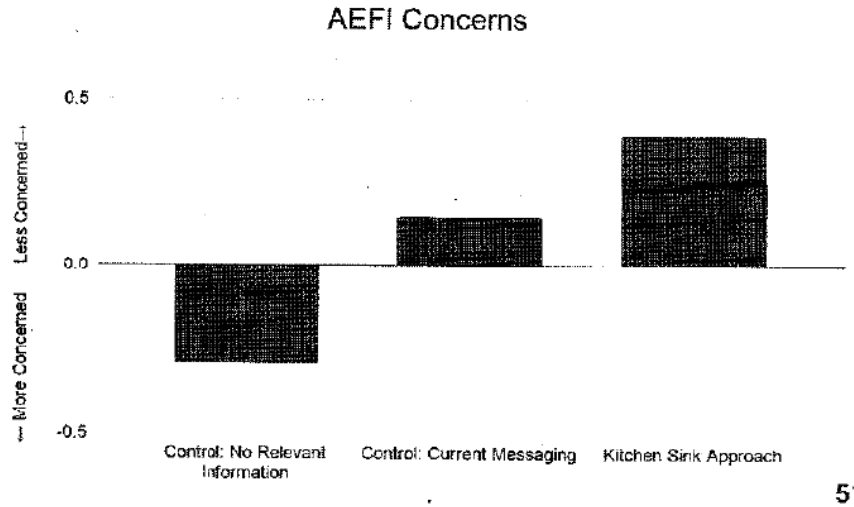


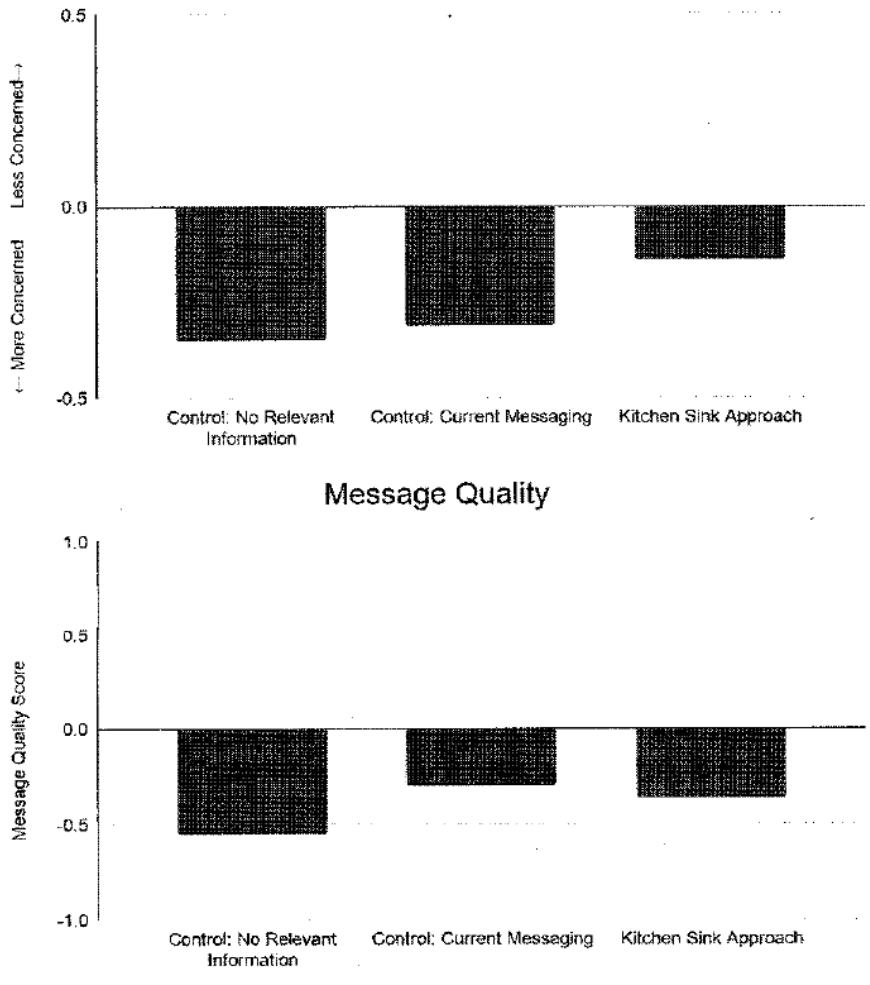
Message framing effect was prominent among misinformation *non-believers*

Message framing was highly effective at reducing concerns among participants who did not label any misinformation statements as true.









Misinformation believers were not affected by message framing

Among participants who labeled any misinformation statements as true, messages were not effective and not well received.

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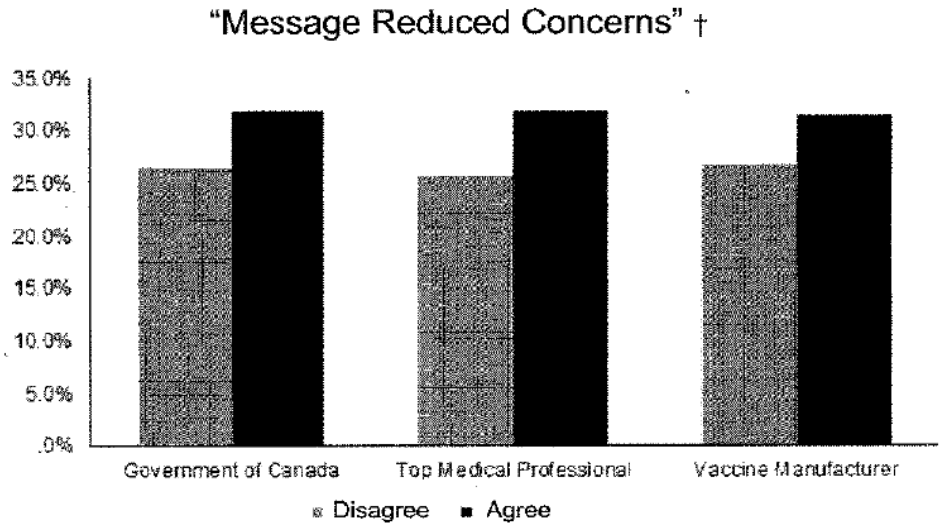
TAKE-HOME UPFRONT:

Who delivered the message did not matter

Messenger Source had no effect on concerns or confidence

Changing the messenger source had no effect on concerns or effectiveness

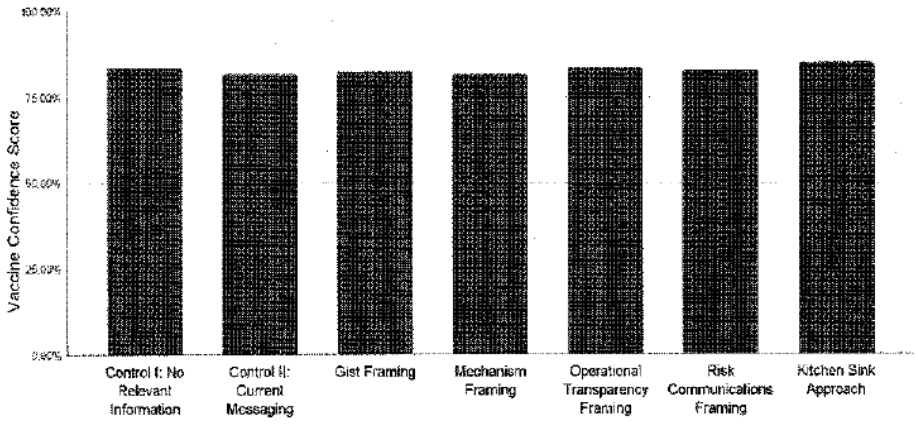
Whether participants were told the message they saw came from the Government of Canada, a Top Canadian Medical Professional or a spokesperson for the Vaccine Manufacturer did not influence any key measures of the message effect.

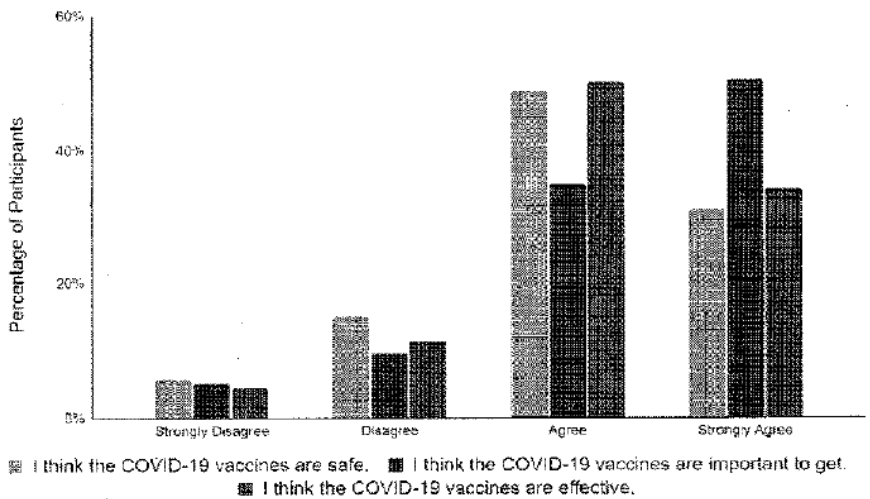


†2 items assessed on 5-point agree/disagree Likert scale; statements included "The message reduced concerns I had about the safety of COVID-19 vaccines" / "The message reduced any concerns I had about the news report".

TAKE-HOME UPFRONT:

Vaccine confidence and vaccination intentions were unaffected by message framing





Vaccine confidence was not affected by message frames

Measures of vaccine confidence were high across participants and did not differ between conditions. Overall participants agree vaccines are important, but less confident in their safety and effectiveness.

Generally, participants expressed stronger beliefs that the vaccine's were **important** rather than being **safe** and **effective.**

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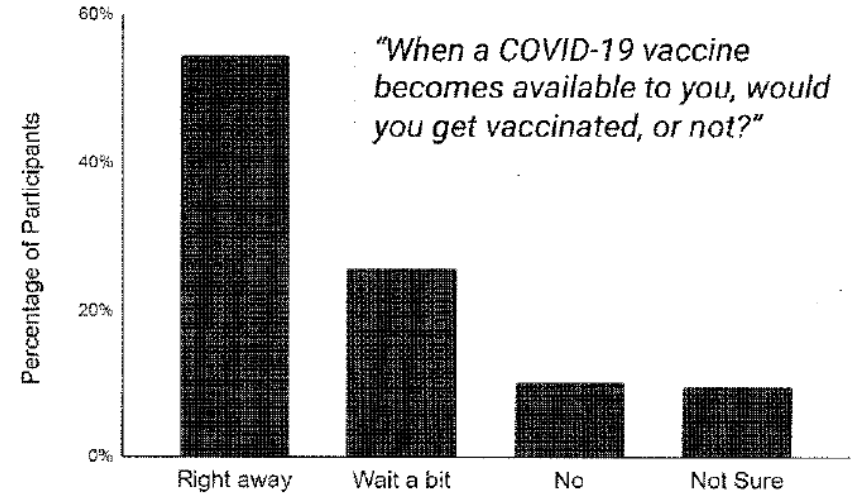
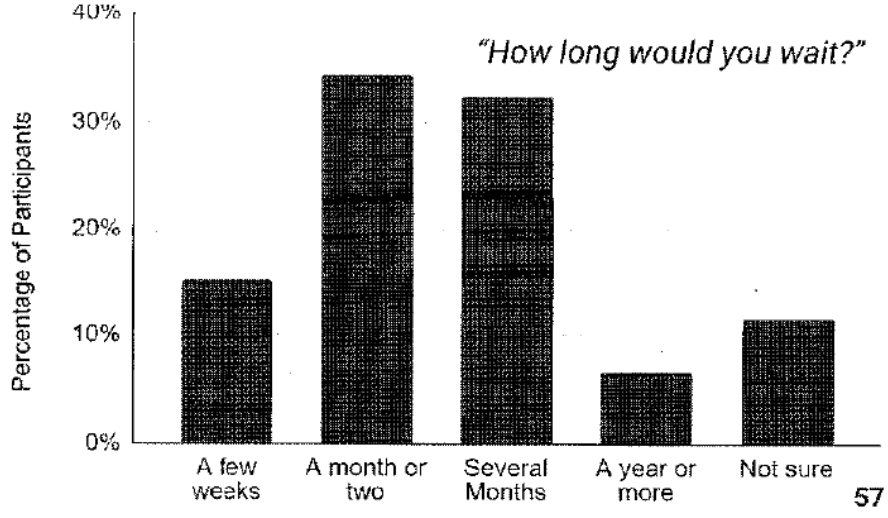
Vaccination intentions were not affected by Message or Source

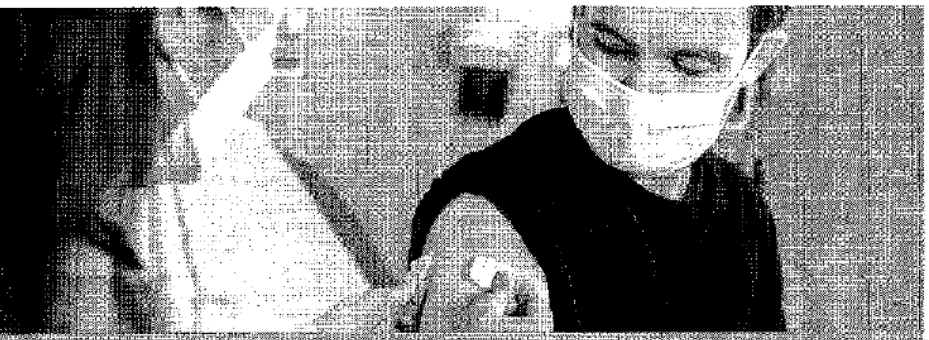
There were no differences between groups in intentions to receive the vaccine. Generally, intentions were in-line with other POR at the time. Lack of effect also suggests that an AEFI with one-particular COVID-19 vaccine does not affect confidence or intentions for other COVID-19 vaccines.





Scale

Key Takeaways



AEFI news reports and the government's response to them have the potential to shake public confidence in the COVID-19 vaccine rollout. In this study we demonstrate that a news report of a severe AEFI with an unconfirmed link to a COVID-19 vaccine did not affect overall confidence in the COVID-19 vaccines or in intentions to receive one.

Behavioural Science messaging decreased concerns about the AEFI news report: Messaging in response to the news report lead to significant decreases in concerns about the report and in concerns about the safety of the vaccine depending on the framing.

Belief in misinformation diminished any effect of messaging: Those who claimed to believe pieces of misinformation about COVID-19 vaccines did not respond to any of the message frames.

Level of certainty alters key message framing: The combined message approach (kitchen sink) and the Risk Communication message frame were effective both during uncertainty and certainty around the link between the AEFI and the vaccine. When the link between the AEFI and the vaccine was unclear, transparency into the vaccine surveillance and the AEFI investigation was a positive contributor and when the link between the AEFI and the vaccine was clear, providing a mechanistic framing to the message was a positive contributor to a reduction in concerns.

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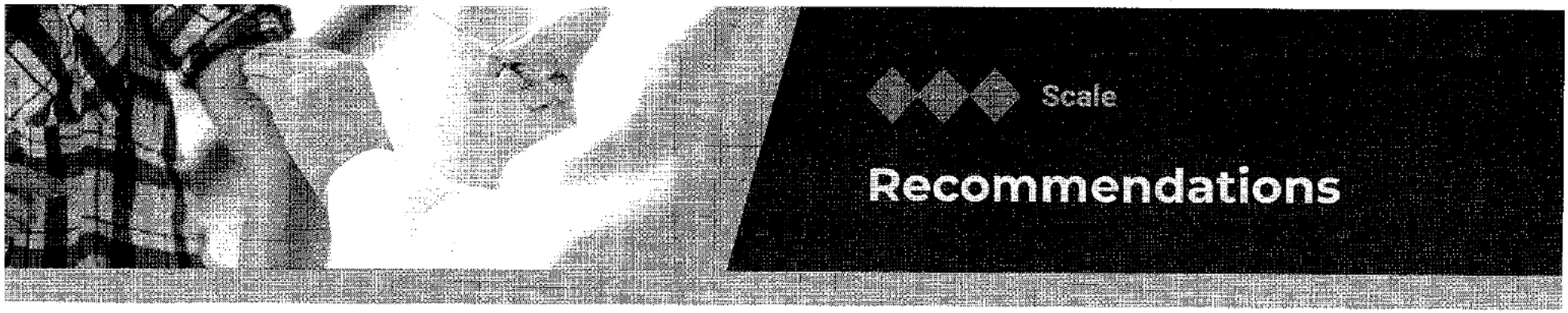


Scale

Recommendations

[redacted]

Questions?

Dr. Mark Morrissey
Behavioural Science Fellow
Vaccine Confidence Policy, Research and Engagement, Public Health Agency of Canada
Impact and Innovation Unit, Privy Council Office
Mark.Morrissey@pco-bcp.gc.ca

Dr. Andrew Abela
Behavioural Science Fellow
Office of Chief Public Health Officer, Public Health Agency of Canada
Impact and Innovation Unit, Privy Council Office
Andrew.Abela@pco-bcp.gc.ca

Dr. Lauryn Conway
Senior Lead, Behavioural Science
Impact and Innovation Unit, Privy Council Office
Lauryn.Conway@pco-bcp.gc.ca

Annexed

- **Annex A:** AEFI Causes
- **Annex B:** Message Samples
- **Annex C:** Key Measures
- **Annex D:** PCA Overview
- **Annex E:** MIDI Additional Analysis
- **Annex F:** MIDI Additional Analysis
- **Annex G:** MIDI Additional Analysis
- **Annex H:** MIDI Additional Analysis

Annex A: AEFIs can have a number of causes

There are many very different underlying causes of an AEFI which may or may not have anything to do with the actual vaccine product. All of these still have the potential to affect confidence and perceptions of safety.

World Health Organization Classification of AEFI by cause

- **Anxiety Related Reactions-** Those related to a psychological reaction to the stress of receiving the vaccine
- **Product-related reactions-** Those related to one or more of the inherent properties of the vaccine
- **Immunization Error Related Reactions-** Reactions to inappropriate handling or administration of the vaccine
- **Quality Defect-related Reactions-** Those related to due to one or more quality defects of the vaccine product
- **Coincidental Events-** The AEFI caused by something entirely unrelated to the vaccine except for its temporal proximity to receiving immunization

Annex B:Certainty Phase- 'Investigation Completed' Message Samples

Gist Framing

...Even though these two events occurred close in time, a thorough review has concluded that they are not related... Sometimes, adverse events are in response to the vaccine, but other times they are caused by something entirely unrelated. When two events occur closely in time, this creates a flag for investigation...After vaccination, some people will suffer health problems, some will get a promotion, and other people will fall in love. None of these events will be necessarily attributable to the vaccine...

Mechanism Framing

Rigorous review has determined that there is no evidence or cause that would link the cardiac arrest to the vaccine...Cardiac events like this case have not been previously observed as a reaction to the vaccine and there is no known relationship between them...Through their immunity building effects, approved COVID-19 vaccines are highly effective at preventing illness from COVID-19, and no side effects have been reported that would indicate that the COVID-19 vaccine is unsafe.

Operational Transparency Framing

Because of its proximity to the vaccination this event was tracked and investigated and thorough medical review has determined there is no link between the cardiac arrest and the vaccine...Adverse events following vaccination can have a number of causes...Health Canada monitors and tracks any adverse events after immunization, this rigorous work ensures all vaccines available to the public are safe and effective, that authorities and the public know of any safety concerns...

Risk Communication Framing

The event was thoroughly investigated and medical review has determined there was no link between the vaccination and the report. Tragically these types of cardiac events take place every day among Canadians as an estimated 35,000 cardiac arrest events occur in Canada each year.
As of March 2021, 9,991 out of every 10,000 doses of Health-Canada approved COVID-19 vaccines have been administered without any accompanying adverse event. In perspective, the COVID-19 virus has claimed 22,239 Canadian lives to date...

description of measures

- Measures of the effect of messaging frames were calculated looking at **reduction in concerns about the safety of the vaccine** & **reduction in concerns about the news report.**
- General message perception was assessed with a number of questions about the content of the message they saw.

Concerns

- "The message reduced concerns I had about the safety of COVID-19 vaccines"
- "The message reduced any concerns I had about the news report"

Message Perception

- "I have a better understanding of adverse events following immunization"
- "The message was insensitive" (reversed)
- "The message included an overwhelming amount of information" (reversed)
- "The message was too simplistic to be helpful" (reversed)
- "The message was missing important information" (reversed)
- "The message included just the right amount of information"

Annex D: Identifying significant features through Principal Component Analyses

Principal component analysis (PCA) is a statistical modelling technique used to identify patterns of correlations in a large dataset. It allows for a large number of variables – many of which correlate with one another – to be reduced to a smaller number of distinct groups of variables, or "**significant features**", which can be used for more targeted analyses.

- For example, participants are asked 6 questions about their perceptions of the message they read, inputting these variables into a PCA analysis reduces the 6 variables into 1 significant feature: Message Quality

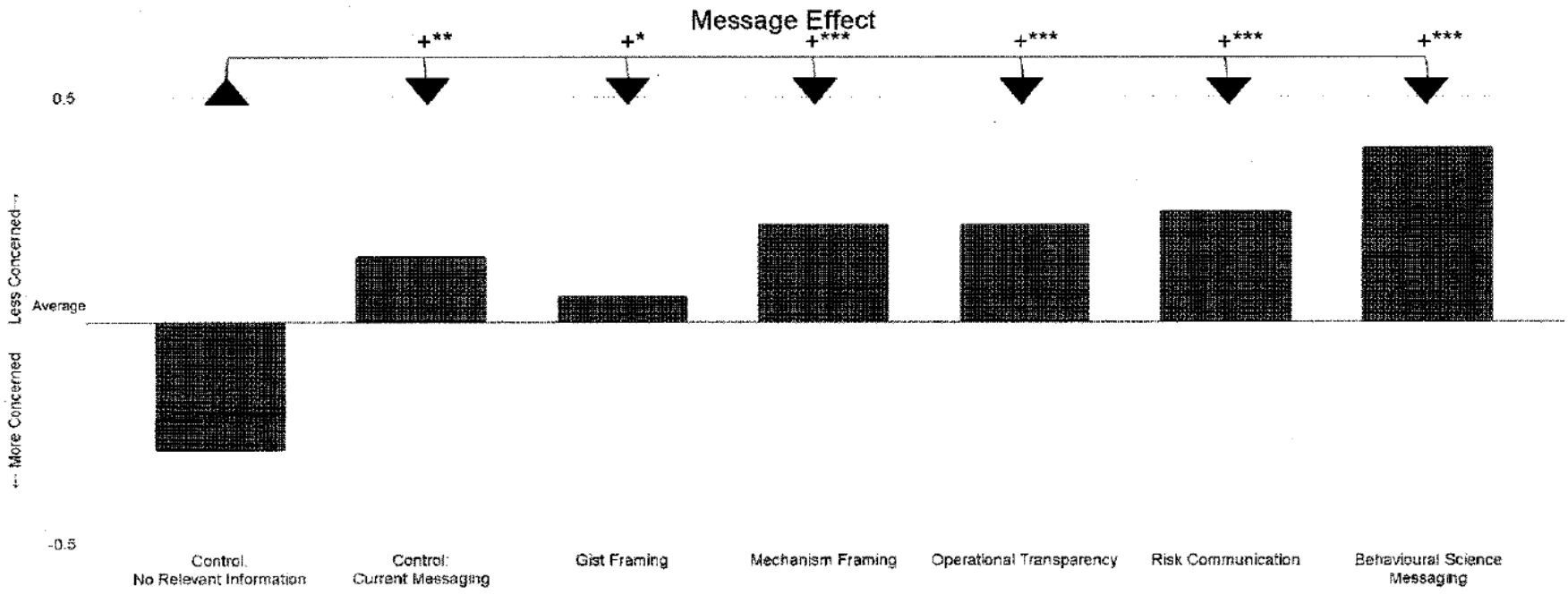
Significant features are **more reliable and robust than individual variables**. Once identified and validated, they can be used to answer important research questions, such as:

- *How do significant features differ by treatment condition?*

Significant features can also be used as a basis for more targeted analyses of interest. For example:

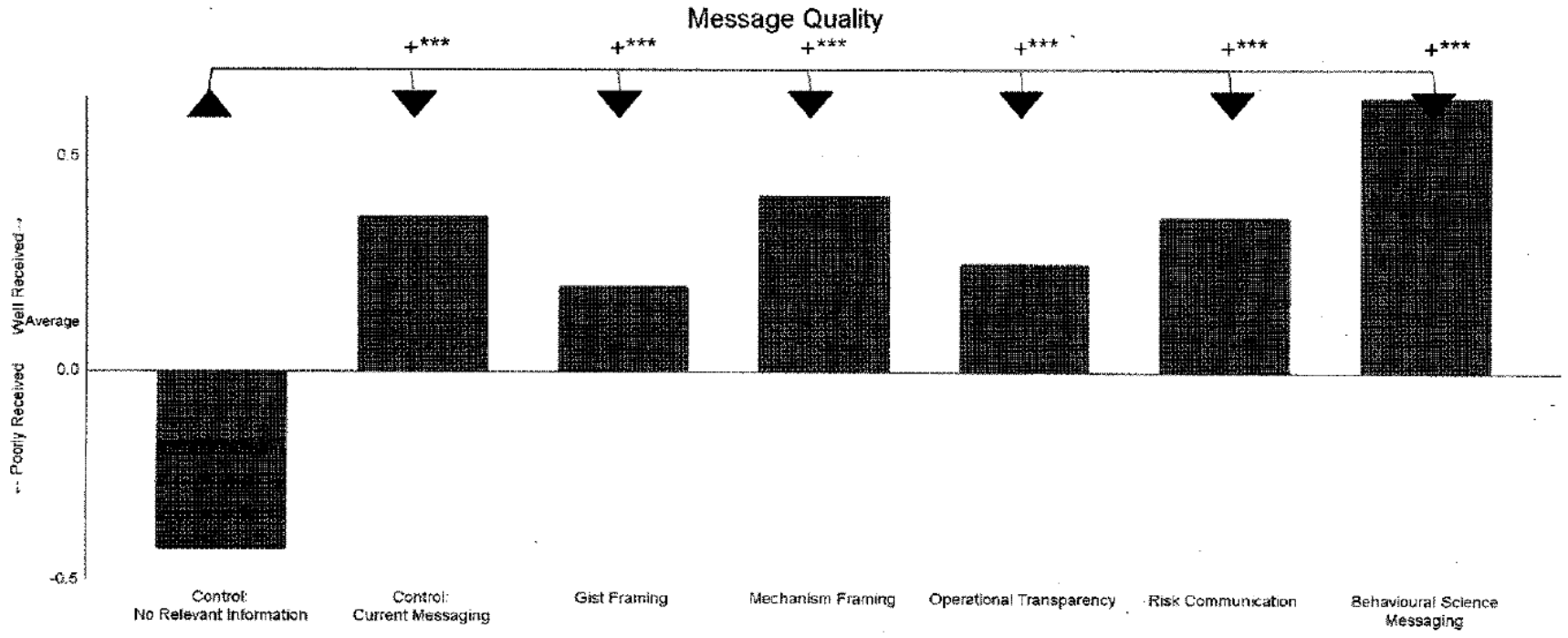
- *How does belief in misinformation impact the effect of the treatment on message quality.*

Annex E:
Additional Analysis - Those Not Susceptible to Misinformation



* = p < 0.1 ** = p < 0.05 *** = p < 0.01

Annex F:
Additional Analysis - Those Not Susceptible to Misinformation



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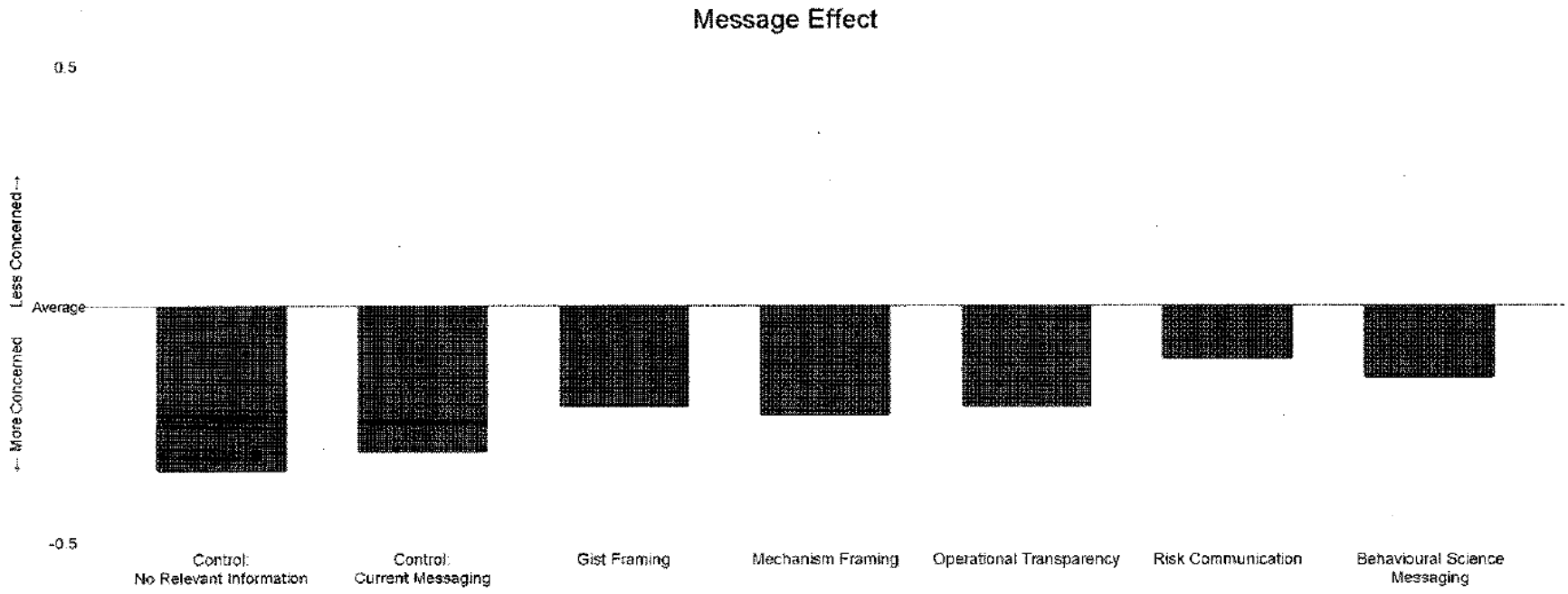
Annex G:
Additional Analysis - Those Susceptible to Misinformation



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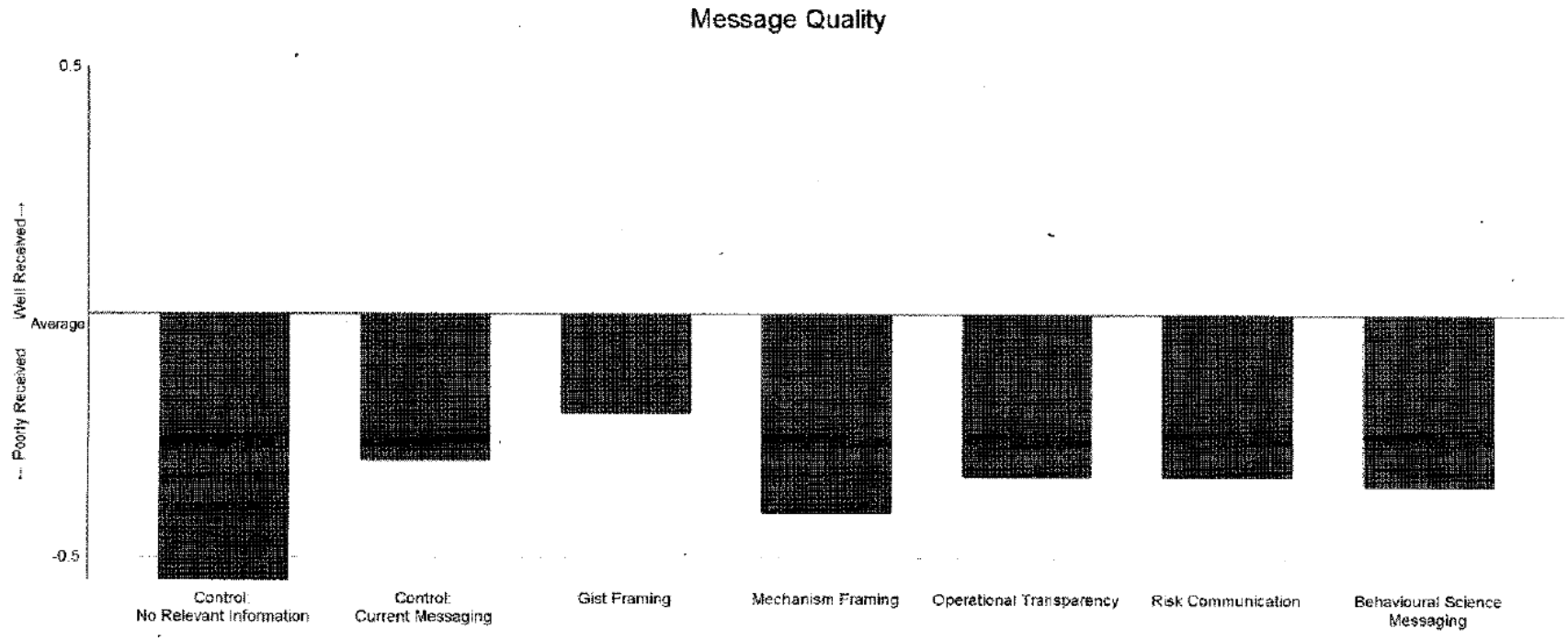
Annex H:
Additional Analysis - Those Susceptible to Misinformation



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