

# **The Use of the Information-Deficit Model in Newspaper Portrayals of Vaccine Hesitancy**

**Rie Futaki**

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School of Sociological and Anthropological Studies  
Faculty of Social Sciences  
University of Ottawa

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## Abstract

Popular media portrayals and promotion of vaccine hesitancy still rely heavily on the information-deficit model despite a push for non-information-based strategies from scholars such as increasing trust. In this study, newspaper portrayals of vaccine hesitancy during the COVID-19 pandemic were examined to determine the prevalence of the information-deficit model. Canadian newspaper articles from *The Globe & Mail* and the *National Post* published during a 14-month period between May 2020 and June 2021 were examined. A total of 56 unique articles were identified, and a coding frame was developed through both inductive and deductive methods. Data was collected using a qualitative content analysis. Through thematic analysis, three distinct portrayals of vaccine hesitancy were identified, and the use of the information-deficit model varied depending on the portrayal. Portrayals of vaccine hesitancy in the general population and vaccine hesitancy as “anti-vaxxers” used the most rhetoric based on the information-deficit model, whereas vaccine hesitancy portrayals focusing on specific marginalized subgroups included more non-information-based explanations and suggested solutions. Media portrayals of vaccine hesitancy show signs of shifting to a non-information-based rhetoric, but is still predominantly based on the information-deficit model. This reliance on the information-deficit model, as well as its possible effects on expert-lay relationships, are discussed.

# 1: Introduction: Vaccine Hesitancy

On December 14, 2020, the first vaccines for COVID-19 were administered in Canada, nine months after the start of a pandemic and after 1.6 million deaths worldwide. The start of the vaccine rollout was celebrated as “V-Day” by some, and media outlets celebrated that vaccines will now be available for all Canadians who wish to be vaccinated (Forani, 2020). As the COVID-19 pandemic has significant negative impacts on the economy, education (Nicola et al., 2020), and emotions of the public (Chou & Budenz, 2020; Lwin et al., 2020), increasing vaccine uptake to help stop the spread of the virus will be an important step to manage the pandemic and return to normal life. This is especially crucial in racialized communities which are more likely to be negatively affected by the pandemic (Beaman & Taylor, 2020; Nicola et al., 2020; Wiltshire & Peri, 2020). In the case of the current COVID-19 pandemic, it is estimated that 50 to 80% of the population must be immunized in order to achieve herd immunity (Frederiksen et al., 2020; Iboi et al., 2020; Negau, 2020). However, the vaccination rates of the seasonal influenza vaccine for adults in the U.S. and Canada are estimated to be around a third of the eligible population (Centers for Disease Control and Prevention, 2011; Meyer & Lum, 2017). As of April 2022, about 20% of the eligible people in Canada still has not received a COVID-19 vaccine (Government of Canada, 2022), and recent demonstrations such as the Freedom Convoy in downtown Ottawa suggest that a certain percentage of the population are unsure or unwilling to get vaccinated. In other words, vaccine hesitancy remains an issue in Canada, even during pandemic times.

Vaccine hesitancy is commonly described as the “delay in acceptance or refusal of vaccination despite availability of vaccine services” (MacDonald & The SAGE Working Group on Vaccine Hesitancy [SAGE], 2015, p. 4163). There is a distinction between vaccine refusal and vaccine hesitancy, where vaccine hesitancy refers to both the refusal of vaccines and a broader sense of concern or uncertainty over vaccines regardless of whether or not an individual refuses a specific vaccine. This distinction is important, as not all people who have vaccine-related concerns actively refuse getting vaccinated (MacDonald & SAGE, 2015). Using the term “vaccine hesitancy” instead of “vaccine refusal” will allow for an inclusion of a wider spectrum of feelings of uncertainty toward vaccines, not only those that manifest themselves as refusal of vaccines. In 2019, vaccine hesitancy was recognized as one of the top ten global health risks by the World Health Organization. However, vaccine hesitancy should not be thought of as a recent phenomenon. Historically, the public has been divided on their views on vaccines ever since the beginning of vaccination. When Edward Jenner began vaccinating people against smallpox by using pus obtained from cowpox patients in the eighteenth century, the practice was welcomed by some and feared by others. These fears included the risk of contracting a disease through cross-contaminated vaccines, or the belief that vaccines contained harmful ingredients. When vaccines became mandatory in mid-eighteenth century England, vaccines were seen as a threat to personal liberty by those who were threatened with imprisonment if they rejected a vaccine. These concerns—risk of disease, harmful ingredients, and decreased personal freedoms—are common reasons for vaccine hesitancy and rejection, even today (Biss, 2013; Boddice, 2016). Despite a general increasing trend worldwide in vaccine acceptance, vaccine-hesitant populations still remain (de Figueiredo et al., 2020). To manage the COVID pandemic, it is crucial to have as many people as possible vaccinated against COVID-19.

Various strategies have been suggested to increase vaccine acceptance, but there is a discrepancy between the strategies used in public messaging and the strategies thought to be most effective by researchers. The prevalent strategy of vaccine promotion seen in media today is heavily based on the information-deficit model (Goldenberg, 2016; McKinnon & Orthia, 2017; Murdoch & Caulfield, 2018). This model suggests that laypeople's concerns are directly linked to a "deficit", i.e., their lack of scientific knowledge and understanding. By assuming that the discrepancy between experts' and laypeople's views of science is a reflection of their level of knowledge, many science communication strategies follow a didactic approach with a focus on providing the right information to educate the public. The goal of these information-based campaigns is to lessen the expert-lay gap of scientific knowledge, with the hopes that the public will start to see the benefits of scientific innovations if they are provided with adequate information. However, current literature suggests that didactic strategies relying solely on information are not effective in changing attitudes and behaviours regarding vaccines, despite their success in correcting misinformation (Nyhan & Reifler, 2015). Furthermore, some concerns have been raised over their possible polarizing effects as they frame the public and the experts as two competing groups (Goldenberg, 2021). Alternative strategies with a focus on non-information-based factors, such as trust-building and respect, have been suggested as ways to increase the success of vaccine promotion (Goldenberg, 2021).

The aim of this project is to determine whether such findings are reflected in the current promotion of COVID-19 vaccines. Newspaper articles published during the pandemic will be examined to see whether pro-vaccine discourse has shifted to reflect the increasing support for incorporating non-information-based arguments as a more effective method of scientific communication. Understanding the current state of pro-vaccine discourse will help to identify

possible areas of change and improvement in vaccine promotion campaigns. It will also help to indicate which communities are viewed as the intended audience, by studying common themes and rhetoric used by pro-vaccine groups. This will identify potential gaps in communication, e.g., whose concerns are being addressed and whose concerns are being overlooked. If feelings of being unheard by mainstream health officials and policy makers are reinforced, this may make some groups more prone to creating and joining anti-vaccine movements (Reich, 2020). The COVID-19 vaccines are different from the seasonal flu vaccine or childhood vaccines, as they were developed much faster and are the first mRNA vaccines, which could raise different concerns in the public compared to previous vaccines. However, as vaccine hesitancy is not unique to the COVID-19 vaccines, research on vaccine hesitancy focusing on other types of vaccines can still be used to increase our understanding on COVID-19 vaccine promotion, as well as future vaccines.

This thesis is organized in the following chapters. First, the theoretical framework will be discussed. This will include a definition of the information-deficit model, which is the most common model used in current vaccine-promotional messages. I will begin by explaining the model, then separating it in two subtypes; the pure information-deficit model and the revised information-deficit model, based on modifications made to fit different views of vaccine hesitancy. Then, an alternative to the information-deficit model will be discussed, as seen in Goldenberg's (2021) views on improving vaccine hesitancy. This focuses on non-information-based communication, such as trust-building, with a goal of addressing the underlying issue of decreased trust between the public and the experts. In chapter 3, the specific approach of this paper will be discussed, followed by the methods used in chapter 4. These sections will cover the research question of this paper, type of sample and analytic techniques used, as well as a brief

summary of key descriptive statistics of the obtained sample. The results are presented in chapter 5, discussing the three portrayals of vaccine hesitancy in media, focusing on notable differences in perceived reasons for hesitancy, level of compassion in the portrayals, role of trust, and suggested solutions to the specific type of vaccine hesitancy. Finally, chapter 6 includes the discussion, in which I describe the phenomenon of “information drift” in pro-vaccine messaging, similar to “lifestyle drift” seen in public health messaging; as well as limitations of this project. I conclude the thesis with suggestions for future research to continue to examine the role of mistrust in vaccine hesitancy and improve the efficiency of pro-vaccine messaging by rigorously studying which messaging strategies are most successful.

## 2: Theoretical Framework: Beyond the Information-Deficit

Vaccine hesitancy has been discussed in a wide range of approaches. Some seek to quantify vaccine hesitancy and refusal (de Figueiredo et al., 2020), while others describe historical changes and similarities in vaccine hesitancy (Biss, 2013; Boddice, 2016) or in pro-vaccine messaging (McKinnon & Orthia, 2017). Others, such as Blume (2006), examine how the anti-vaccine sentiments have been framed as a “social movement” by some sociologists, and analyze the advantages and disadvantages of this interpretation. Studies by Hobson-West (2007) and Reich (2020) discuss the social stigma felt by vaccine-hesitant or vaccine-refusing people, and the importance of social support and solidarity that comes from joining vaccine-critical groups. This paper approaches this subject from a combination of these perspectives. Historical and contextual reasons for vaccine hesitancy will be examined to better understand how specific vaccine-promotion messages may affect vaccine-hesitant groups. From this understanding, the current promotion of COVID-19 vaccines will be examined to see whether it fits with suggestions on effective vaccine communication seen in the literature. The current literature shows that an information-deficit-model framing of public understanding is frequently used in vaccine promotion, including in media such as newspapers. This review of the literature follows the changes in vaccine promotion, as noted by Goldenberg (2021): First, it describes the main components of the information-deficit model as it was first used in science and health communication, which focuses on the public’s presumed lack of understanding and rationality in contrast to the experts’ knowledge and rational thinking. I will call this first stage the “pure information-deficit model”. Secondly, it outlines the “revised information-deficit model”, which was a response to the common critiques of the pure information-deficit model, such as its polarizing nature and concerns around its effectiveness. The third section focuses on alternative

strategies suggested by scholars: the non-information-based approach to vaccine promotion. In conclusion, I show that there is currently a gap between media portrayals of vaccine hesitancy—relying solely on the information-deficit model—and existing data which suggests that the information-deficit model is ineffective or even counterproductive to promote vaccine uptake.

## **2.1 The Pure Information-Deficit Model**

The information-deficit model is a concept used to explain public concerns and disinterest in scientific innovations, by hypothesizing that such disinterest stems from the public's lack of knowledge and/or understanding of science. In the late 1900's, the Royal Society's Bodmer report and similar reports proposed that "the public ignorance of science prevents citizens from making mature, rational decisions in support" of science and scientific innovations (Goldenberg, 2021, p. 21). These reports often encouraged scientists to communicate the benefits of science to the public, as it was the common belief that public interest in and support for science were on the decline. For this increased communication to be effective, it was suggested that the public needed to have a high degree of scientific literacy; in other words, it was assumed that "the more one knows about science, the more favorable one's attitude toward it will be" (Sturgis & Allum, 2004, p. 56). If the public holds any fear or ambivalence about scientific progress and innovations, it was believed to be due to their ignorance of how science worked. Without the experts' understanding of relevant theories and data, laypeople were prone to relying on "mystical beliefs and irrational fears" (Sturgis & Allum, 2004, p. 57), hence the need to increase the public's scientific understanding to combat misinformation and needless fears about scientific innovations. As this assumption is based on the idea that the public is deficient in scientific understanding and/or knowledge, it is commonly known as the

information-deficit model. An information-deficit-based solution to negative attitudes toward scientific innovations, e.g., vaccine hesitancy, would be to promote science through educational campaigns which would theoretically “remedy the public’s disenchantment with science” (Sturgis & Allum, 2004, p. 57). This initial model that assumes that the root cause of skepticism toward science is the public’s lack of knowledge will be referred to as the pure information-deficit model.

A related aspect of the pure information-deficit model focuses on expert-lay discrepancy in risk-perception. In other words, public anxieties toward science are due to a deficit in understanding risk-benefit calculations (Goldenberg, 2021; Hansen et al., 2003). For example, an expert-lay discrepancy of estimated risk may occur because experts base their risk on statistical results of scientific studies, whereas the public will use a more subjective measure of risk as they do not understand the statistical analysis behind the numbers presented or prefer to use a more subjective approach to measuring risks. When the discrepancy arises in a way where public fears are stronger than the risk presumed by the experts, there is a tendency for public unease to be described as excessive or unwarranted (Hansen et al., 2003). Again, this argument assumes that the experts are “right” or sufficient in their understanding and that the public is “wrong” or deficient in their understanding; that the public lacks the necessary expertise to make a rational risk-benefit assessment based on the available information (Hansen et al., 2003, p. 111).

Goldenberg (2021) notes that a similar discrepancy between public and expert perceptions of vaccine risks exists, which is a contributing factor to the current issue of vaccine hesitancy. Similar to Hansen and colleagues’ (2013) observation, those who are hesitant of vaccines or refuse vaccines altogether are often thought to be irrational in their fears and ignorant of the science behind vaccines. The information-deficit assumption is clearly seen in today’s discourse

around the scientific consensus of the benefits of vaccines and the voices of the vaccine-hesitant groups. When the Wakefield study linking the MMR vaccine with autism was debunked, by the revelation that data had been fabricated as well as failure to reproduce similar links in later studies, the resulting scientific consensus only reinforced the perception that the public is ignorant (Goldenberg, 2021). Clearly, these data and studies show that there is no link between MMR vaccines and autism, and this was the conclusion held by many experts after careful consideration of the issue. The persistence of public misconceptions regarding MMR vaccines and autism, then, was blamed on the public's inability to correctly interpret the available data; again, as a result of a lack of expertise in the field. This follows the assumptions of the pure information-deficit model: The public fails to understand that vaccines are highly beneficial with little risk, because they lack the experts' understand of the methods and concepts behind scientific, epidemiological, and pharmaceutical research and testing, and if they could understand this, they would have no more reason to fear or antagonize vaccines (Goldenberg, 2021).

## **2.2 The Revised Information-Deficit Model**

Although widely used in media, the pure information-deficit model was critiqued by some for being polarizing and ineffective. These criticisms led to a revision of the model, which incorporated elements of cognitive bias and motivated reasoning, and will be called the revised information-deficit model for this paper.

The two main concerns of the pure information-deficit model were ethical concerns and concerns around its effectiveness. The pure information-deficit model can be seen as unethical, as it tends to downplay the need to listen to the concerns of the public by assuming that the public is ignorant of the scientific issues being discussed. This can be condescending as their

voices are not seriously taken into consideration by experts and policy-makers. The presumed gap between the irrational public and the rational experts is sometimes escalated into a “war on science” metaphor, where the issue is framed as an ignorant public “attacking” science. In the case of vaccine hesitancy, this metaphor depicts vaccine-hesitant people or vaccine-refusers as the “enemy”: something that is considered dangerous and openly antagonized. This further diminishes the opportunity to consider more “peaceful” or compassionate approaches that take into consideration the needs and concerns of the vaccine-hesitant public (Goldenberg, 2021).

The second concern is based around the effectiveness of the pure information-deficit model as a vaccine-promotion strategy. A study by Nyhan and Reifler (2015) showed that attempting to correct misinformation regarding vaccines by providing the correct information decreased the motivation to get vaccinated. The provision of accurate vaccine information *did* successfully correct vaccine misinformation, but decreased the motivation to get vaccinated, especially in groups who had more concerns about vaccines. This directly contradicts the main assumption of the information-deficit model, where an increase in understanding should lead to an increase in vaccine acceptance.

To explain the shortcomings of the pure information-deficit model in Nyhan and Reifler’s (2015) study, various factors have been considered from social, political, and emotional aspects. Providing statistics and risk calculations may not be effective, because lay people tend to consider not just the risk numbers, but a much wider range of factors when assessing risk. They may not trust the experts due to past experience, such as when experts reassure the public with a low risk numbers and later change their statement to a higher likelihood of risk, or they may have concerns that are not directly addressed by the science. These may include cultural, political, or social factors such as feeling excluded from political, science-based decision-making (Hansen et

al., 2003) while others may lack trust in health institutions due to historical and current injustices such as racism (Lin et al., 2022). In both cases, trust in the government and the mainstream health system may be compromised. For these groups, providing more information without addressing these underlying factors would be unlikely to change their minds as their main concerns are not about a lack of understanding the science. Moreover, vaccines and vaccine-preventable diseases may cause emotional reactions such as fear, anger, or anxiety, and emotional states are known to contribute to risk perception and judgement (Lerner & Dacher, 2001). Promotion of health-related behaviour may be unsuccessful when the emotional state of the recipient does not match the framing of the message; for example, fearful people are likely to become risk-averse while those experiencing anger may become more risk-tolerant (Gerend & Maner, 2011). In addition, vaccine-hesitant and vaccine-refusing groups report that those who hold vaccine-related concerns are often stigmatized, feeling that their concerns are unheard by friends, family, and mainstream health professionals, leading to alienation (Reich, 2020). It is only groups that are *critical* of vaccines that provide a safe place to discuss their concerns and ask questions without the fear of judgement, offering both emotional and informational support (Benin et al., 2006; Reich, 2020). The feelings of empowerment and connection formed by such groups (Hobson-West, 2007) are absent in current forms of vaccine promotion, where those who question or refuse vaccines are portrayed as ignorant, irrational and anti-science.

Despite the many possible factors that may have made the pure information-deficit approach ineffective, the main theme that was considered in the revised version was motivated reasoning, leading to only a partial change in the information-deficit model. The popular interpretation seen in media was not to question whether the current information-based approach was the problem, but rather to assume that the vaccine-skeptical public were using motivated

reasoning to continue rationalizing their vaccine-related concerns. In other words, it was assumed that information-based approaches are made ineffective because vaccine hesitators and refusers engaged in “irrational” reasoning that make them resistant to any information that was in contradiction to their firmly held cultural, social, and personal beliefs. This became what I call the revised information-deficit model. It was now assumed that the public was not only too ignorant, but too irrational to properly understand the scientific evidence provided to them. The information-deficit model was retained, but now with the added conclusion that nothing could be done to convince the ignorant and irrational vaccine skeptics to accept the vaccines. The core assumption of the information-deficit model—that it is the public’s ignorance that makes them skeptical of science—was never challenged.

### **2.3 Non-Information-Based Approaches to Vaccine Promotion**

Despite the continued prevalence of information-deficit-based approaches in media, scholars have suggested alternative strategies which rely less on an informational approach but rather look at the underlying non-information-based factors that contribute to people’s skepticism of vaccines or vaccine-promoting institutions. Goldenberg (2021) disagrees with the fatalistic conclusion of the revised information-deficit model, where all efforts are deemed futile because vaccine hesitators and refusers are immune to rational persuasion. Instead, she interprets the evidence from Nyhan and colleagues’ (2014) study to mean that the *current educational approach* is ineffective. Instead of a minor change in the interpretation of the information-deficit model, she suggests a complete reconsideration of “the dominant narrative of public misunderstanding of science and the knowledge deficit” as the cause of vaccine hesitancy (p. 52).

Goldenberg's (2021) suggestions focus on addressing the underlying negative attitudes such as apprehension and mistrust, instead of simply relying on providing correct information. These include affirming the individual's competence, character, or values; diversifying the "experts" who convey the message; and looking for shared values that can be used to show that there are some common grounds between those who promote vaccines and those who are hesitant. According to literature in motivated reasoning and confirmation bias, people are more likely to respond openly to information that is contradictory to their core values and self-conception when they feel that those values are understood. All of Goldenberg's suggestions work to assure vaccine-hesitant people that they are being respected despite the difference between the experts' beliefs and their own beliefs. The concepts of personal values and self-conception are of great importance in vaccine hesitancy and promotion, because the reasons for vaccine hesitancy tie into various other cultural or societal values and attitudes of the individual, such as freedom of choice, what is considered good parenting, or democracy in health. Strategies that focus on building rapport and creating an open, safe environment where people feel heard have been used successfully, such as debunking the myth that HPV vaccines will encourage permissive sexual behaviour in adolescents, or public outreach regarding climate change in certain religious communities (Goldenberg, 2021). These strategies all have a focus on building trust. There is a notable lack of focus on trust regarding vaccine hesitancy: distrust is often mentioned as one of the many causes of vaccine hesitancy and refusal, but rarely focused on as a major factor of vaccine concerns nor as a part of suggested strategies for increasing vaccine acceptance and uptake (Goldenberg, 2021). For a more effective vaccine communication strategy, it is suggested that more focus should be given to the role of trust, rather than the public's information-deficit.

Another type of non-information-based strategy includes mandates and incentives. These include rules and regulations, such as proof of vaccination being necessary for a child to be accepted into daycare or school, or “rewards” for receiving vaccination, such as the “vaccine lottos” popular during the COVID-19 pandemic. These strategies differ from the suggestions made by Goldenberg (2021) as they do not address the underlying mistrust of mainstream health experts and governments. Vaccine hesitancy is more than simple refusal of getting vaccinated, in that it describes an attitude of skepticism and wariness of vaccines, the health system, and the government that regulates them (Goldenberg, 2021; MacDonald & SAGE, 2015). Mandates and incentives may increase vaccine uptake, i.e., the desired behaviour, but their effectiveness in changing negative attitudes toward vaccines is still debated. A recent report by Castillo and colleagues (2022) suggests that mandates may have mixed outcomes. Mandates could increase the intention to vaccinate if the vaccines are believed to be effective and provided at a low cost; however, they can be seen as polarizing or controlling, which may exacerbate negative attitudes and resistance. Much like Nyhan and Reifler’s (2015) study, this effect is thought to be stronger in those who already held stronger negative views of vaccines. In addition, Goldenberg (2021) notes that Black parents in North America were more likely than White parents to be vaccine hesitant, but less likely to actually refuse a vaccine. Goldenberg suspects that these differences are due to the disempowerment people face, leading to more mistrust toward the healthcare system and a decreased sense of control. As this example illustrates, it is possible for people to be vaccine hesitant while still complying with vaccine recommendations.

As Goldenberg (2021) argues, the main issue in vaccine hesitancy is about a lack of trust. There is a need to address and change the underlying negative attitudes instead of focusing only on behaviours. Those who are skeptical of vaccines often feel bullied and stigmatized, feeling

unheard or ridiculed by health experts and policy-makers (Reich, 2020). Mandates and incentives may be unfair if they do not take into account how different groups may be affected: For example, if daycares make vaccines mandatory, this may have a bigger impact on low-income people who cannot afford to miss work to get their family vaccinated (Goldenberg, 2021; Meyer & Lum, 2017). If vaccine acceptance is increased through mandates and incentives *without* acknowledging the underlying mistrust, they can build more resentment as these strategies effectively reduce the amount of personal choice. This could lead to a further erosion of expert-lay trust and increase resistance when new regulations or vaccines are added, as seen in the “Freedom Convoy” protest in downtown Ottawa.

The belief that vaccine hesitancy stems from a lack of scientific understanding shapes the strategies used by various pro-vaccination groups, whether through newspapers or through online groups. The majority of current vaccine-promotion arguments are fact-based: scientific information about vaccines, vaccine-preventable diseases, and possible benefits and risks of vaccinating (Gandhi et al., 2020; McKinnon & Orthia, 2017; Murdoch & Caulfield, 2018). For example, in the study by McKinnon and Orthia (2017), 84% of the articles sampled from 2016 used fact-based arguments, in contrast to 75% of articles from the 1800s sample. Moreover, the percentage of articles using emotion-based arguments decreased from 61% to 42% within the same time period, showing a shift in pro-vaccine messaging where information-based rhetoric has become the predominant style over non-information styles (McKinnon & Orthia, 2016). However, current vaccine promotional strategies that rely heavily on the deficit model are not adequate to address the real underlying factor of mistrust, different values, and personal identities. Worse yet, information-deficit models could decrease trust even further, as it relies on a “polarizing us-versus-them mentality” which often labels the vaccine hesitant as ignorant,

irrational, and in the wrong (Goldenberg, 2021, p. 137). This is not to say that pro-vaccine groups should stop providing vaccine-related information altogether. Misinformation still plays a role in vaccine hesitancy and refusal, and efforts to correct misinformation are still needed. Persistent misinformation about vaccines and vaccine-preventable diseases does exist, and the public desires clear, specific, and non-sensationalized information regarding vaccines (Ames et al., 2017; Bhat-Schelbert et al., 2012; Meyer & Lum, 2017). Thus, using logic-based arguments and providing the public with vaccine-related information can still be useful in addressing vaccine hesitancy for some of the vaccine hesitant population. However, only using information-based strategies may not be effective for all vaccine-hesitant people, as the vaccine-hesitant population is a heterogenous group (MacDonald & SAGE, 2015). Even for those whose concerns are due to a lack of understanding, the moralizing and ridiculing tone of framing vaccine hesitancy as a problem of the “ignorant public” may make fact-based messages unappealing and ineffective.

Considering the literature, misinformation should be considered a sign of poor public relations between experts and the public, rather than the main cause of vaccine hesitancy. A lack of trust in the public health system, government health officials, or other health experts can make people more likely to seek other sources of information. Thus, although providing correct information should not be abandoned completely, the focus of vaccine promotion strategies should shift to encourage rebuilding trust between the public and the experts, instead of continuously pointing the finger at the supposedly ignorant public for their lack of enthusiasm toward vaccines (Goldenberg, 2021).

The goal of this project is to see whether the trend of using an information-deficit approach has changed in any way during the COVID-19 pandemic, where the need for high

vaccination rates increased dramatically due to the circulation of the novel coronavirus. Data showing that vaccine promotion strategies relying solely on an information-based strategy are ineffective or even detrimental to increasing vaccine acceptance and uptake has been available within the literature, starting with Nyhan and colleagues' 2014 study. It is of great importance and interest to examine whether these results have impacted the way vaccine hesitancy is discussed in media, especially newspapers, which would suggest that more effective alternatives are becoming more mainstream in science communication, at least specifically regarding vaccine hesitancy. Newspapers were chosen as the focus of analysis for a number of reasons. Newspaper articles are a form of media that is closely tied to the everyday lives of the public, especially in regards to being a source of vaccine information and shaping vaccine-related attitudes (Vivion & Dubé, 2019). In addition, as newspaper articles are not predominantly focused on public education, it may be easier to see a shift away from the information-deficit in newspaper articles rather than more formal sources of information, such as government websites.

### 3. This Study

As seen in the literature, there is a gap between researchers' understanding of effective pro-vaccine messaging and the vaccine-communication strategies currently being used in media. Namely, current vaccine promotion remains heavily based on the information-deficit model despite its criticisms. Whether alternative, non-information-based strategies are beginning to increase in vaccine promotion is unclear, with some noting an increase in non-information-based strategies that focus on empathy and trust (Goldenberg, 2021), while others note an increase in information-based, facts-and-data style of communication (McKinnon & Orthia, 2017). The main question of this study is: Has vaccine-promotion communication incorporated more non-information-based strategies during the development and promotion of the COVID-19 vaccines? Vaccine-promotion during the COVID-19 pandemic is of particular interest, as the need to quickly vaccinate the majority of the population is extremely high. In addition, the COVID-19 vaccines were developed more quickly than other vaccines, which raised unique concerns over its safety and efficacy. This added greater importance to deliver up-to-date vaccine information, and to answer questions and concerns to ensure that the majority of those eligible would be comfortable to accept the new vaccines once they are ready. This study will focus on the portrayals of vaccine hesitancy in news media, to see whether compassionate, non-information-based presentations focusing on the underlying mistrust have become more common. Specifically, this study will explore three aspects of newspaper articles on vaccine hesitancy: the perceived causes of and solutions offered to decrease vaccine hesitancy, the level of compassion in the portrayal of vaccine hesitancy, and how trust is used to describe vaccine hesitancy. The types of portrayals identified, as well as the three aspects of each portrayal, will be answered in detail in the results section (Section 5).

As my project is focused on vaccine hesitancy in newspaper content, these questions will be answered through a qualitative content analysis of newspaper articles. Media can impact social relations through choosing specific portrayals or views of groups and issues. The way certain groups, e.g., the vaccine hesitant, are portrayed in media can affect people's understanding and attitudes toward them, which in turn can affect how these groups are treated in social situations (Hodgetts & Chamberlain, 2013). Newspapers were chosen as they remain an important source of information for Canadians (Vivion & Dubé, 2019). On the other hand, they are not considered to be solely responsible for public persuasion and education on vaccine-related information, but rather, they choose certain aspects of vaccine-related news to relay to the public and offer commentary. Because of this more informal stance in regards to vaccine promotion, newspaper articles include a wider point of view including experts and laypeople, which will help to understand whose voices are given importance in terms of presentation. In other words, media such as newspapers can reflect existing intergroup relations in society, as well as either reject or encourage such assumptions (Hodgett & Chamberlain, 2013). Since the understanding of vaccine hesitancy is beginning to shift from an information-deficit-based one to a more non-information-based approach, it is of interest to see whether a similar shift would be seen in the media portrayals of vaccine hesitancy. The specifics of the qualitative analysis method and the methodology used in this study will be discussed in more detail in the methods section below (Section 4).

This study differs from previous studies on vaccine hesitancy in two ways: It uses a qualitative approach, and it focuses on portrayals of vaccine hesitancy from an outside perspective. Studies such as McKinnon and Orthia's (2017) also look at content in media; however, McKinnon and Orthia (2017) used a quantitative approach to compare the dominant

rhetoric in two different time periods. Their main categories of *logos* (logic- or fact-based), *pathos* (appeals to emotions), and *ethos* (appeals to authority) did influence the initial coding frame, in addition to Goldenberg's (2021) work, as discussed below in the following section. This study focuses on how vaccine-hesitant groups are portrayed from an outsider perspective, in contrast to studies where the vaccine-hesitant groups themselves were interviewed to provide their own portrayals (Reich, 2020). Gaps identified between newspaper portrayals and portrayals from vaccine-hesitant groups themselves will be discussed in Chapter 6.

## 4. Methods

A combination of qualitative content analysis and thematic analysis was chosen as the method of this project. Qualitative analysis is a method for describing the meaning of data. Parts of the data are assigned into categories, or codes, that make up a coding scheme which helps to systematically analyze and describe the meaning of data. By creating abstract categories that describe overall themes rather than specific, concrete passages from the data, the coding scheme helps to reduce the amount of material to analyze (Schreier, 2014). Unlike quantitative analysis, this method focuses on the context of the data rather than the frequencies of the categories. As the main goal of this method is to describe the selected material, it combines “concept-driven” and “data-driven” categories to ensure that categories reflect the data being analyzed. Concept-driven, or deductive categories are based on themes and characteristics identified through theories and previous research, whereas data-driven categories are inductive, and based on themes found in the sample. A pilot phase, or trial coding, is performed on a small subset of the sample to evaluate and revise the initial coding frame until it is able to categorize all relevant passages in the rest of the sample. The trial coding is an important aspect of this method, as the coding scheme cannot be modified once the coding of the entire sample has begun (Schreier, 2014). In the case of this study, the initial coding scheme used during the test trial was concept-driven, using the categories of *logos*, *pathos*, and *ethos* used in McKinnon & Orthia’s (2017) study, as well as Goldenberg’s (2021) book. McKinnon and Orthia’s (2017) three categories were modified into binary categories of information-based and non-information-based passages, reflecting the focus on the information-deficit model seen in Goldenberg’s (2021) work as well as the focus of this study. The initial coding scheme included information-based and non-information-based reasons for and solutions of vaccine hesitancy, and positive or negative

portrayals of vaccine-hesitant groups. Through trial coding, specific subcategories were added to these main categories to reflect the different themes found in the sample (discussed in more detail below, in Coding, Section 4.2). As a result of adding in data-driven categories to the analysis, the themes and findings of this study differ from both McKinnon and Orthia's (2017) and Goldenberg's (2021) works.

The second key aspect of this study is a focus on thematic media analysis. According to Hodgetts and Chamberlain (2013), media, and especially news media, has symbolic power. Symbolic power is defined as the power to name and define a group or issue, and is often linked to socially dominant groups. As such, when the dominant group's assumptions are reflected in media portrayals of minority groups, this can have a real-world impact on the lives of minority group members. However, news media can also work to support social inclusion and to promote understanding of other groups. The type of media portrayal—positive, negative, presented from the perspective of the minority group or from the dominant group—can be crucial to intergroup relations, as it can impact the way minority groups are viewed. As vaccine-hesitant people and vaccine-refusers are seen as a minority during a time of increased vaccine acceptance (de Figueiredo et al., 2020; Reich, 2020), the symbolic power of news media can impact the way they are seen by the majority, either through increasing understanding or further stigmatizing them as irrational and ignorant. If the dominant group's views, such as those of scientists and medical personnel, are prevalent in newspaper articles on vaccine hesitancy, and if these views align with the information-deficit model commonly seen in regards to vaccine-hesitant groups, this can reinforce the information-deficit portrayal of vaccine-hesitant people. This can hinder efforts to shift the discourse to focus on non-information-based factors of vaccine hesitancy. It could also be detrimental to expert-lay relations as vaccine-hesitant people would continue to be

portrayed negatively. A qualitative analysis of media content related to the portrayals of vaccine hesitancy is well-suited to help understand the current expert-lay relations, as well as the popular understanding of vaccine hesitancy.

#### **4.1 Sampling**

To analyze whether portrayals of vaccine hesitancy have moved away from an information-deficit-based approach, Canadian newspaper articles on vaccine hesitancy were examined. Although the importance of Internet sources such as social media in health messaging is increasing, traditional media, and especially print media, still play an important role in vaccine communication (Vivion & Dubé, 2019). Newspapers are “still a well-respected source of information”, with half of Canadian adults reading newspaper content daily (Vivion & Dubé, 2019, p. 4). A recent study also shows that almost 90% of Canadian adults read newspaper content at least once a week, showing a three percent increase from 2012 (News Media Canada, 2019). To collect articles that were read widely by the Canadian audience, the *National Post* and *The Globe & Mail* were chosen, as both *The Globe and Mail* and Postmedia, which owns the *National Post*, are included in the top 20 media companies in Canada (Canadian Media Concentration Research Project, 2019). Both are national papers, with *The Globe & Mail* having a wider readership, with 323,133 circulations compared to the *National Post*'s 186,343. However, both papers are among the top ten most popular papers in Canada, and the *National Post* is the second most popular nationally circulated paper after *The Globe & Mail* (Chepkemoui, 2019). Furthermore, as *The Globe and Mail* is a more liberal-leaning paper while the *National Post* is more conservative, using these two papers would allow for a wider variety of articles from each political orientation (“Canadian News and Media”, n.d.).

A systemic search was then conducted using Canadian Major Dailies from ProQuest. Search terms used were “COVID”, “vaccine”, and “hesita\*”. The asterisk in the last term was used to search for all matching words that began with “hesita-”, e.g., hesitancy, hesitant, or hesitation. Articles between May 2020 and June 2021 were examined, for a total of 236 articles with 161 of them published by *The Globe and Mail* and 75 of them in the *National Post*. From the 236 initially found, duplicates were excluded, as well as any articles that were not predominantly about vaccine hesitancy. This included articles that explain how COVID-19 vaccines work and/or are developed, or that focused on other topics on COVID-19 such as health guidelines (e.g., mask-wearing, social distancing) or a critique of various governments’ handling of the pandemic, with only a passing reference to vaccine hesitancy. After the exclusion, there were 40 articles from *The Globe and Mail* and 16 articles from the *National Post*, for a total of n = 56 articles. Many of the articles from the *National Post* were dropped due to being duplicates. Articles were downloaded in text; only text content was analyzed.

#### **4.2 Coding**

The NVivo software was used to organize and code articles. The coding frame was first developed using a concept-driven approach (Schreier, 2014), where theories and concepts from current literature were used to provide the basis for the initial coding frame. Based on McKinnon and Orthia’s (2017) categories of *logos, pathos and ethos*, as well as Goldenberg’s (2021) critiques of the current reliance on the deficit model, initial coding included information- and non-information-based solutions and reasons for vaccine hesitancy, and positive or negative portrayals of vaccine hesitant people. Codes were applied to specific sections or sentences within the article, and not to the article as a whole. Using this initial coding frame, a sample of 20

articles (10 from *The Globe and Mail*, 10 from the *National Post*) were coded, and the results were used to revise the coding frame. This involved adding specific codes based on the type of reasoning or arguments found in the paper, e.g., the “information-deficit as a reason for vaccine hesitancy” code became further split into “confusing or not enough information”, “belief in misinformation”, and “a lack of scientific understanding”. The finalized version of the coding frame was then used to code each of the  $n = 56$  articles.

### **4.3 Descriptive Statistics of the Sample**

The author of each article was recorded to consider the possibility of personal stylistic differences impacting the results. The newspaper with the most articles written by the same author was the *National Post*, with 6 out of the 16 articles being written by the same author. Authors writing multiple articles within the sample was not as evident in *The Globe and Mail* articles, where the greatest number of articles written by a single author was 4 out of 40. However, as authors writing more than one article were consistent in their specific portrayal of vaccine hesitancy, the differences in coding could be explained as differences between portrayals, not individual authors. Similarly, the number of coded segments between the *National Post* and *The Globe and Mail* were compared to see if there was any bias based on the newspaper. A Welch’s t-test, or the unequal variances t-test, was performed using Stata 16. The Welch’s t was chosen specifically as it is more reliable than a standard Student’s t-test when comparing samples with different sample sizes, in this case  $n = 16$  (the *National Post*) and  $n = 40$  (*The Globe and Mail*). The coding frequency from six main themes were chosen for the comparison; none of the t-tests results were significant at an  $\alpha = 0.05$  level (see Table 1). Positive portrayals included phrasing that normalized vaccine hesitancy, or mentioned that vaccine

hesitancy was caused by contextual and/or historical factors, or emphasizing that it was not caused by a deficit in scientific understanding. Negative portrayals included phrases that invalidated or stigmatized the views of vaccine-hesitant people or provided extreme examples (e.g., caricatures of hesitant people as ignorant and selfish, or real-life examples of vaccine refusers breaking public health laws during the pandemic). Phrases that suggested that vaccine hesitancy was largely due to deficit of scientific information—namely, confusing information and guidelines, belief in misinformation, and/or a general lack of scientific understanding—were coded as deficit causes. Similarly, suggestions that focused on non-deficit reasons, such as contextual factors, personal health and/or religious beliefs, a lack of trust, and feeling unheard, were coded as non-deficit causes. Likewise, suggested solutions that focused on increasing public understanding and availability of information were coded as deficit solutions, whereas solutions that focused on contextual factors, empathic responses to the hesitant, and building trust using trusted community figures (e.g., religious leaders, people who share the same religious/ethnic background), were coded as non-deficit solutions.

	<i>The Globe and Mail</i>	95% Confidence Interval	<i>National Post</i>	95% Confidence Interval
Positive Portrayals	1.38	1.31, 2.39	1.5	0.57, 2.43
Negative Portrayals	2.58	1.38, 3.77	4.44	0.12, 8.76
Deficit Causes	1.85	1.36, 2.39	2.25	0.98, 3.52
Non-deficit Causes	3.13	2.12, 4.13	4.69	3.21, 6.17
Deficit Solutions	0.93	0.55, 1.30	0.69	0.12, 1.26
Non-deficit Solutions	1.95	1.07, 2.83	0.37	0.15, 1.73

**Table 1. Average Frequency of Codes by/per Newspaper Article**

Table 1 shows the average number of codes found in either *The Globe and Mail* or *National Post* articles, with the ranges of frequencies including 95% of the variance. For

example, articles from *The Globe and Mail* included, on average, 1.38 sections as positive portrayals, with 95% confidence that the true mean falls between 1.31 and 2.39 positive portrayals per article. A Welch's t test comparing the average code frequencies between the two papers did not produce any significant results at  $\alpha = 0.05$ , indicating that differences in code frequencies between *The Globe and Mail* and the *National Post* articles could be attributed to chance rather than fundamental differences between the two papers. Because none of the main codes were significantly different between the two newspapers, all articles were treated as a single collection instead of comparing articles from *The Globe and Mail* with articles from the *National Post*. A thematic analysis of codes and themes was performed using NVivo. Table 2 shows the coding frequency for important codes across all articles.

<b>Code</b>	<b>Frequency of Codes</b>
<b>Positive Portrayals</b>	<b>79</b>
Contextual factors	27
Denying deficit model	10
Normalizing language	42
<b>Negative Portrayals</b>	<b>154</b>
Anti-vax	16
Invalidating language	56
Extreme views	22
Stigmatizing language	60
<b>Causes: Information-deficit</b>	<b>110</b>
Confusing messages	39
Belief in misinformation	50
Lack of understanding	21
<b>Non-Informational Causes</b>	<b>176</b>
Fear and anxiety	58
Religious or health beliefs	20
Feeling unheard	8
Trust	90
<b>Information-based Solutions</b>	<b>47</b>
<b>Non-informational Solutions</b>	<b>93</b>
Contextual solutions	28
Empathic responses	34
Trusted figures	31

**Table 2. *Frequencies of Main Codes***

The initial quantitative coding of the articles created important insights to understand what themes and codes were present in the overall sample. The frequencies of most codes were evenly distributed within the sample. Most average code frequencies for both papers were greater than one and had relatively narrow confidence intervals, e.g., positive portrayals having a mean of 1.38 with a 95% confidence interval of 1.31 and 2.39 for *The Globe and Mail*, and a mean of 1.5 with a 95% confidence interval of 0.57 and 2.43 for the *National Post* (see Table 1). That is, individual articles typically included many different and contradictory codes (positive and negative portrayals, multiple causes and suggested solutions), with most articles having at least one example of each code. Exceptions were negative portrayals frequencies as well as the non-deficit causes and solutions. The variance of these scores were higher, as seen by the wider 95% confidence intervals, due to some articles containing a much higher number of these codes compared to others. This is especially clear in the negative portrayals found in the *National Post* articles: The average number of negative portrayals per article was 4.44, but the 95% confidence interval covered a range of 0.12 to 8.76, suggesting that some articles had no negative portrayals while others had close to 9 negative portrayals. Similarly, deficit solutions appeared on average 0.93 times per *The Globe and Mail* with a 95% confidence interval of 0.55 and 1.30, and an average of 0.69 times per article in the *National Post*, with a confidence interval range of 0.2 to 1.26, suggesting these solutions were never suggested in some, but mentioned once or more in other articles. Similar trends of higher variance were found in other causes and solutions, both deficit-based and non-deficit-based, i.e., some suggested causes and solutions were mentioned more often in some articles, and never mentioned in others. An initial quantitative analysis of code frequencies, such as correlations and multiple regression, did not yield insightful results of how different codes *related* to each other within thematic groups, clusters or portrayals. A further

close reading of the collection of articles revealed that the presence or absence of specific codes varied based on the *type* of vaccine hesitancy that was discussed. Through a thematic analysis of the narrative content found *within* articles, three main portrayals, or groups, of vaccine hesitant people were identifiable: a general view of vaccine hesitancy, where hesitancy is portrayed as reasonable and caused by a lack of reliable information; a number of specific subgroups, where hesitancy is portrayed as reasonable and caused by external factors; and the “anti-vaxxers”, where hesitancy is portrayed as unreasonable and caused by individual characteristics. Further analysis of codes and themes was performed based on this framework of three groups, to identify more specific characteristics and differences among the groups using a qualitative thematic analysis.

## 5. Results

Certain vaccine hesitant groups, i.e., those whose hesitancy is perceived to be caused by contextual and/or historical factors, were portrayed more positively than others. The amount of information-deficit-based rhetoric differed substantially among the three identified groups. Articles focusing on specific subgroups placed emphasis on the need for non-information-based approaches (e.g., trust, compassion) most often and had the most positive, personal portrayals, while articles focusing on the anti-vaxxer portrayal included the least amount of non-information-based and personal portrayals. Further analysis of themes and portrayals showed that articles were more likely to use an information-deficit-based approach to discuss vaccine hesitancy when the perceived cause(s) of hesitancy were thought to be unreasonable and/or rooted in individual characteristics.

The portrayals of the public as either irrational, ignorant, and antagonistic or simply confused and misinformed mirror the representation of the public in information-deficit model approaches of vaccine hesitancy. The portrayals of vaccine hesitancy found in the sampled articles all fit into one of the three stages of the information-deficit model: the pure information-deficit model, the revised information-deficit model, and the alternative, non-information-based approaches to vaccine hesitancy. Firstly, there was a general view of vaccine hesitancy which was based on the pure information-deficit model. This portrayal did not identify a specific social or demographic group, but described vaccine hesitancy as a phenomenon found in the general public. Here, vaccine hesitancy was thought to be caused by a lack of reliable public communication and concerns around the newness of the vaccines. The second portrayal identified specific subgroups of vaccine-hesitant people, and focused on social and contextual

factors that contribute to a mistrust of experts and vaccines. This was the only portrayal that was based on the alternative, non-information-based strategies. Thirdly, a portrayal based on the revised information-deficit model was the “anti-vaxxers” framing, where skepticism toward vaccines were thought to be caused by internal, personal factors, and that such beliefs could not be changed.

### **5.1 How is Vaccine Hesitancy Described in Newspapers?**

To better understand how vaccine hesitancy is portrayed in newspapers, the use of the term “vaccine hesitancy” must be analyzed. This is to identify any differences between how experts and non-experts, e.g., researchers and journalists, understand and use the term. The SAGE Working Group on Vaccine Hesitancy (2015) defines vaccine hesitancy as the “delay in acceptance or refusal of vaccination despite availability of vaccine services” (p. 4163).

Goldenberg (2021) expands on this definition, by explaining that it is “an attitude of ambivalence regarding vaccines” which is “distinct from vaccine refusal, which is a behavior” (p. 3). This distinction is important, as one may accept taking a vaccine but may delay beyond the recommended schedule or feel uncertain about their decision in doing so. Such individuals would be considered vaccine hesitant, despite having accepted the vaccine (Goldenberg, 2021; MacDonald & SAGE, 2015). It is crucial to understand that those who are uncertain about vaccines may still decide to get vaccinated while others with similar uncertainties may not, to acknowledge the full complexity of underlying causes, which would benefit “public health to understand what efforts can be made to tip the scale in favor of vaccine acceptance” (Goldenberg, 2021, p. 5). The SAGE definition of hesitancy also “captures the numerous levels of concern surrounding vaccines” (Goldenberg, 2021, p. 6), without pointing to a single issue as the cause of all hesitancy.

So, how do journalists define “vaccine hesitancy” within their articles? While not every article included a definition, most seemed to follow the SAGE definition of refusing and delaying vaccines. Phrases such as “people who may refuse or delay certain vaccines” (Anderssen, 2020, p. A1) and “people who are undecided” (Vohra-Miller et al., 2021, p. O7) were commonly used. However, unlike the SAGE definition that does not identify a specific causal factor, the definitions in the articles tend to name one or two main issues or supposed causes for vaccine hesitancy: For example, the article from Vohra-Miller and others (2021) continued to explain that such uncertainty arise when people are “anxious about safety or fearful because of the constant bombardment of misinformation online” (p. O7). Here, two possible causes are mentioned—concerns over safety of vaccines and online misinformation—which both seem to indicate information, or lack thereof, to be the cause of vaccine hesitancy. In addition, article definitions of vaccine hesitancy were often defined as a negation, that they were somehow different from some comparison group. Assurances such as “not everyone who is vaccine-hesitant is a conspiracy theorist” (Renzetti, 2020, p. O2), “hesitancy is not the same as opposition” (Picard, 2021, p. A11), and asking “who are the people dead-set against COVID-19 vaccination, and who are the hesitant?” (Kirkey, 2021c, p. A6) were all common ways of describing vaccine hesitancy by differentiating those who are simply unsure from those who refuse vaccines or are hostile toward them. Other articles distinguished between what is and is not considered “hesitancy” by stating that “being hesitant or undecided in the face of a possible safety risk is not being anti-vaccine” (Kirkey, 2021a, p. A1) or that Canadians’ refusal to take the AstraZeneca vaccine after hearing contradictory recommendations from the NACI and Health Canada “wouldn’t be because they were vaccine hesitant”, but rather due to a mishandling of

“the delicate process of proving safety and efficacy of shots destined to be put into a billion arms” (“AstraZeneca, vaccines and the trust issue”, 2021, p. A14).

## **5.2 The Three Portrayals of Vaccine Hesitancy**

How vaccine hesitancy is described, and specifically, what differentiates the hesitant from the “conspiracy theorists” and “anti-vaxxers”, then, is implied to be a matter of legitimacy and reasonableness of the concerns: Is there a legitimate safety risk identified by the scientific community that would make such anxieties appropriate? Has there been adequate, clear communication about vaccines, which would “prove” their safety and efficacy to the masses? It is here where the differentiation based on a hierarchy of perceived reasonableness begins to emerge. As the perceived reasonableness of a groups’ vaccine-related concerns decrease, information-deficit-based language and arguments which put the blame on the public for being irrational, selfish, or stubborn become increasingly apparent. This is a clear contrast from the SAGE definition, which identifies various possible factors that may contribute to hesitancy but does not suggest that any of the contributors should be perceived as more or less reasonable or important. Furthermore, articles often offered speculations about the cause(s) of hesitancy, which could be identified as either external (e.g., a lack of reliable information, historical and/or cultural trauma leading to decreased trust in healthcare and/or the government) or internal (e.g., being paranoid, selfish, irrational) to the person. In other words, the three portrayals of vaccine hesitancy can be identified and differentiated based on two factors: the perceived level of reasonableness of their concerns, and whether the causes are internal or external. The level of empathy seen in the portrayals also differed based on the two criteria. Groups (i.e., the general portrayal of vaccine hesitancy and the specific subgroups) whose hesitancy were portrayed as

reasonable and caused by external factors—a lack of reliable information and historical and/or cultural factors, respectively—were portrayed much more positively and personally than the “anti-vaxxer” group, whose concerns were deemed unreasonable and a reflection of a variety of negative personal traits. In the following sections, each of the three groups will be discussed in more detail, focusing on the perceived reasons for their hesitancy, the level of compassion, the role of trust, and suggested solutions found in the articles.

### **5.2.1. General View of Hesitancy: Reasonable and Caused by Lack of Reliable Information**

The first portrayal of vaccine hesitancy, and by far the most common, is the generalized view of hesitancy. Described as “average citizens” (Urback, 2020, p. O11), people who “may require a nudge” (Andersson, 2020, p. A1), or even simply “Canadians” (Gee, 2020, p. A18), this portrayal covered a vast range of people who were unsure or skeptical of the COVID-19 vaccines, but not entirely against them.

**Reasons for Hesitancy.** Speed of development and the new mRNA technology causing concern for safety were often given as explanations for the public’s anxiety (Gee, 2021; Kirkey, 2021c; Urback, 2021a). Another common explanation was that the “experts”—public health leaders, doctors and epidemiologists, and government officials—were not properly communicating with the public about the science behind vaccines. This concern over whether the public was receiving “good” information was clearly seen in articles regarding health officials’ handling of the AstraZeneca vaccine. When the post-vaccine blood clots were linked to the AstraZeneca vaccines, a potentially lethal side effect was added to the list of public concerns. Throughout the vaccine rollout, both Health Canada and the National Advisory Committee on Immunization (NACI) changed their recommendations regarding the AstraZeneca vaccine in

response to the evolving data. However, the “contradictory statements made by public health leaders” were criticized as being confusing despite their good intentions (Urback, 2021a, p. O11), or even chastised as “pointlessly [casting] doubt on a highly valuable vaccine” (“Not exactly the wisest advice”, 2021, p. A10). Some articles suggested, much like Goldenberg (2021), that the key issue was trust: “Low trust in scientists, the health-care system and the state; distrust of political leaders and ‘Big Pharma’” may all contribute to decrease confidence in vaccines (Kirkey, 2021c, p. A6).

**Level of Compassion.** Concerns over the newness of the vaccines and potential side effects, and confusion over the changing recommendations from Health Canada and NACI were mentioned in an understanding tone, as something normal, understandable, and “very human” (“Why vaccine branding is bad”, 2021, p. A10). However, this normalizing of concerns was juxtaposed with reminders that the anxieties of the average citizen were, although understandable, ultimately unscientific and thus unfounded. Examples of common concerns were described as “vaccine safety scares [that] aren’t supported by scientific evidence” (Kirkey, 2020b, p. A1), safety fears “without evidence” (Gee, 2020, p. A18), “not justified by the facts” (Gee, 2021, p. A6), and in one case, as “overblown concerns” (Loewen quoted by Kirkey, 2021b, p. A6). Readers were encouraged to weigh the risks and benefits of taking a vaccine, with a focus on understanding the facts and putting the risks in perspective (Gee, 2021).

At the beginning of the pandemic, doctors, scientists, and journalists themselves would often use “we” or “us” when discussing possible concerns that might arise, giving a sense that everyone, experts and non-experts alike, had a reasonable cause for concern. Phrases such as “we might be less confident of [a vaccine developed quickly] than we would be with a vaccine that took four years to develop and test” (Guyatt quoted by Kirkey, 2020c, p. A1), “it would be

unwise to say, ‘...There won’t be any side effects.’ We don’t know that.... We just don’t know the answer to that question until we do the Phase III trials.” (Bernstein quoted by Kirkey, 2020b, p. A1), and “I want to see the data. Everyone should want to see the data” (Offit quoted by Kirkey, 2020a, p. A7) all reassure anyone with vaccine concerns that their wariness is shared by the experts. Articles often made a clear distinction between the “very legitimate concerns the average citizen might have” with “wackadoo claims” made by anti-vaccination groups (Urback, 2020, p. O11), defining common public concerns as “the reasonable level of skepticism that anybody should have before putting something in their body” (Offit quoted in Kirkey, 2020a, p. A7).

However, as data on vaccine side effects and efficiency became easily available and therefore dissolving uncertainty within the scientific and medical community, vaccine hesitancy started to be described as people refusing “to receive a potentially lifesaving vaccine for no good reason” (Ibbitson, 2021, p. A4), and those who chose not to vaccinate were “doing a disservice to the whole country” (Gee, 2021, p. A6). As public opinions of the COVID-19 vaccines diverged from those of the scientific community, they were perceived as illogical fears which were often described using shaming or mocking language. In clear contrast to the “us” language used earlier in the pandemic, now the vaccine-hesitant public was described as “they”. “They should get over their fears and line up for their shots” (Gee, 2021, p. A6), one article urged, as another admonished those who have not gotten their shot as “stupid—so stupid that they are putting their own health and the health of others at risk” (Ibbitson, 2021, p. A4). Instead of considering non-information-based reasons for hesitancy such as mistrust in the government or the health care system, vaccine hesitancy was framed as a simple risk-benefit calculation with little focus on

understanding and compassion. This change in tone and rhetoric suggests that the vaccine-hesitant public's concerns are only taken seriously when they align with those of experts.

**Role of Trust.** Despite identifying trust as a key element in explaining hesitancy, the idea of trust and vaccine hesitancy was not discussed in depth for this group. Many articles only included trust near the end, after discussing other possible causes in depth, and did not expand on why or how trust can contribute to hesitancy, or how trust could be increased to build confidence in vaccines. The need for tailored messaging from trusted sources and trust in the many aspects of a vaccination project, e.g., regulatory processes, the government, manufacturers of the vaccines, and the people who test and deliver them (Kirkey, 2020b; Renzetti, 2020; Rossant & Larson, 2021), were often mentioned. For example, it was explained in a quote from a family physician that information received from “a trusted friend or trusted family member” may be more convincing than the information written on “any government website”, and thus doctors must “[leverage] trust and relationships” when speaking to vaccine-hesitant patients (Grant, 2021, p. A11). Unfortunately, comments that raise awareness about the importance of trust in vaccine hesitancy rarely gave any detail about how or why trust plays such a key role in vaccine communication. Vague phrases such as “a vaccine communications strategy is needed” (Bernstein quoted by Kirkey, 2020b, p. A1), “trust is the most important currency we have in battling the pandemic” (Picard, 2020, p. A11), and “so long as we do a good job communicating with those people who are hesitant, then we should be able to achieve a level of immunity that gives us a herd effect” (Miller quoted by Kirkey, 2020c, p. A1) were often included as a closing statement of the article, without any explanation as to what “good” vaccine communications strategies might look like.

The role trust plays in explaining this group's hesitancy varied depending on the perceived reasonableness of the group's concerns. The concerns of the general public were described as simultaneously reasonable and unscientific by journalists and doctors alike, especially during the early stages of the pandemic and vaccine development. As seen in the shift in the level of compassion shown, vaccine concerns were addressed in a way that acknowledged the public as having similar concerns as the experts when vaccines were still in development. The mistrust of vaccines was viewed as reasonable, as scientists and experts themselves lacked the data to predict possible side effects and effectiveness. Unsurprisingly, the public's concerns were no longer framed as an issue of trust once data on vaccine efficacy and safety became available through clinical trials and real-world data. After the AstraZeneca blood clot side effect was estimated to be very rare, hesitancy within the general public was no longer seen as reasonable. "Vaccine hesitancy once made sense", when there were questions about whether development was rushed, or potential side effects remained unknown (Ibbitson, 2021, p. A4). However, they argued that "with 160 million doses delivered in the U.S. alone, the risks have been proven minimal" (Ibbitson, 2021, p. A4), and as scientists and experts were no longer concerned about safety and efficacy, getting vaccinated became an issue of "whether people use common sense or not" (Loewen quoted by Kirkey, 2021b, p. A6) about a decision that should be "blindingly obvious" (Cryderman, 2021a, p. A8). As shown by the quote from Stone and Curry (2020) that "it will be up to public health officials and Health Canada to explain why vaccines are safe" (p. A3), there is an implicit message that certain groups and institutions are intrinsically trustworthy, and therefore should automatically be seen as such by the general public. Phrases such as "the trusted scientific literature uniformly supports vaccination" and "trusted resources such as the CDC, the WHO or Health Canada websites" (Kalla, 2021, p. O8) assume that the

reader would agree with the author that these sources are indeed trustworthy. For the general portrayal of vaccine hesitancy, then, the issue is that these “trusted” sources are not doing their job of educating the public in an effective way; that there is a lack of good information, not a lack of trust.

**Suggested Solutions.** The issue was framed based on the information-deficit model, where vaccine hesitancy is assumed to be caused by a lack of reliable, easy-to-understand information. In one article, authors suggest that “building public trust around the safety and effectiveness of vaccines will be crucial to fight against the coronavirus pandemic”, and that public health officials must provide information regarding the vaccines and vaccination programs (Stone & Curry, 2020, p. A3). The general view of vaccine hesitancy portrays those who are hesitant as simply confused or ignorant, and in need of “rational, science-based messaging about the vaccine” (Anderssen, 2020, p. A1) which would help health officials in “winning them over to the side of science and reason” (Kalla, 2021, p. O8). This portrayal is the most similar to the pure information-deficit model, which portrays the public as needing basic scientific information to help them understand the benefits of science and technology: They can still be convinced to see the benefits of vaccination, as long as “trustworthy [and] scientifically credible” information is readily available (Rossant & Larson, p. A11).

### **5.2.2 Specific Subgroups: Reasonable and Caused by Contextual Factors**

The second most common portrayal of vaccine hesitancy was focused on specific subgroups: various groups that were identified within the vaccine hesitant population. This included racialized minorities and Indigenous communities (Bascaramurty, 2021a; Renzetti, 2020; Vohra-Miller et al., 2021), long-term care home workers and frontline health workers

(Hunter, 2021; Martell, 2021; Picard, 2021), youths and young adults (Jivani, 2021; Kirkey, 2021a), and people living with homelessness or those with low socioeconomic status (SES) (Leung & Hager, 2021; Rossant & Larson, 2021). This portrayal covered a broad range of different groups, yet they were all characterized with the same perceived reasonableness for their lack of trust, as well as a focus on non-information-based approaches specifically tailored to each group as suggested solutions. Portrayals of vaccine hesitancy which focused on a specific subgroup were also the most empathic and positive portrayals of vaccine hesitancy found in this sample.

Vaccine hesitancy in these subgroups is understood to be caused by external, societal factors, and as such, vaccine-hesitant subgroups are portrayed as the most reasonable in their hesitancy. Portrayals of subgroups emphasized that vaccine hesitancy is “determined by multiple levers of vaccine confidence: in the product, the provider, and the policy” (Goldenberg, 2021, p. 7), and not just by the amount of scientific understanding about vaccines. This is in contrast to the oversimplified view of vaccine hesitancy seen in the other two types of portrayals, where the deficit of scientific knowledge is depicted as the cause of hesitancy, and an increase in scientific knowledge is suggested to be the solution. In other words, the portrayal of specific subgroups was the furthest from the information-deficit views of vaccine hesitancy.

**Reasons for Hesitancy.** Group-specific reasons were suggested for each identified subgroup. For racialized minorities and Indigenous communities, a lack of trust in the government and/or public health officials due to past and present experiences of racism was frequently discussed (Bascaramurty, 2021a; Fleguel, 2021; Renzetti, 2020; Vohra-Miller et al., 2021). For health care workers, common topics were feelings of exhaustion, confusion, and being unheard, as well as the issue of racism for those who are also racialized minorities or

immigrant workers (Hunter, 2021; Picard, 2021). The younger population had to consider that their risk of experiencing complications after receiving the AstraZeneca shot may be higher than the risk of COVID-19 itself, a concern that was not shared by the older population whose risk of contracting COVID clearly outweighed the risk of AstraZeneca complications (Kirkey, 2021a; Watson, 2021). Finally, for people with low SES, vaccine hesitancy was explained as a lack of access (Leung & Hager, 2021; Rossant & Larson, 2021), with a discussion of the ethical considerations of using incentives to increase vaccine uptake in these populations (Leung & Hager, 2021). Some articles mentioned misinformation as a cause of vaccine hesitancy (Bascaramurty, 2021b; Jivani, 2021; Urback, 2021b), but those portrayals differ from those of other groups due to their focus on non-information-based reasons for hesitancy and a much more compassionate tone with less stigmatizing language used.

As their vaccine hesitancy can be more directly linked to a specific problem or challenge rather than individual flaws in understanding science, these specific groups are seen as having the most rational reasons for their hesitancy, which is reflected by a much more compassionate, understanding tone when in the articles. Compared to the other two portrayals of vaccine hesitancy, the individual is rarely blamed, with more emphasis being placed on contextual, historical, or cultural factors that lead to a decrease in trust, and thus a decrease in vaccine confidence.

**Level of Compassion.** Articles that focused on specific subgroups often included interviews with the hesitant people themselves. These interviews, combined with the more in-depth discussion of non-deficit-based issues that provide a more personal view of vaccine-hesitant people, were in direct contrast to the statistics and vague definitions provided in the general view. These interviews helped to explain why people from specific demographics may

be more hesitant of vaccines and/or the information provided by mainstream medical experts, as well as hinted at underlying historical and contextual factors. As a former NBA coach explained in one article, “I was still thinking as an African-American kid that grew up in a neighbourhood that was fearful of doctors in a lot of ways” (Jivani, 2021, p. A10). The focus is not on the coach’s lack of scientific understanding or difficulty accessing the most up-to-date medical trial data, but rather, it is on the societal issues that he has been facing prior to the start of the coronavirus pandemic. This combination of personal portrayals of the vaccine hesitant individuals and a focus on external factors as the causes of vaccine hesitancy was unique to the portrayal of vaccine-hesitant subgroups.

The tone used for describing specific concerns and vaccine-related rumours also differed from the other portrayals. For example, one article (Bascaramurty, 2021b) discussed the vaccine misinformation circulating within Black communities. In it, a community influencer by the name of Ms. McIntosh is introduced as “the sort of person who can’t walk a block without stopping to say hi to a neighbour” who is “always...helping people” (Bascaramurty, 2021b, p. A1). This personal, empathic portrayal continued as the author described Ms. McIntosh’s concerns:

In the weeks since the vaccine’s approval, some conspiracy theories had become so prevalent and anxiety-inducing, she had to immediately delete them when such messages appeared on her phone. “The vaccine[s]...have a microchip that are being put into people’s arms to keep track of them,” she recounted, relaying a common concern as her voice trembled with nerves. “And the other one is [that] both vaccines are here to kill people of colour in low-income areas.” (Bascaramurty, 2021b, p. A1)

These concerns mentioned by Ms. McIntosh are the same concerns deemed especially illogical or silly in other articles (Meek, 2021; Renzetti, 2020), yet Ms. McIntosh is not portrayed

negatively for believing in them. Rather, her concerns, which are explained to be rooted in a general mistrust of the government and medical experts which have not met the needs of Black communities, are shown to be understandable (Bascaramurty, 2021b). Again, this is in clear contrast to the views of ignorant or selfish vaccine-hesitant people spreading misinformation as “propaganda” (“The politics of a piece of cloth”, 2020; Urback, 2020).

**Role of Trust.** Articles that focused on specific subgroups of vaccine-hesitant people were more likely to explicitly deny the lack of information or the presence of misinformation as a cause of vaccine hesitancy, and more likely to mention trust as a main factor in hesitancy. Phrases such as “hesitancy can be driven by a mistrust of the public-health institutions rather than scientific illiteracy” (Hunter, 2021, p. A6) or “it needs to be understood...that hesitancy among health workers often has little to do with vaccines themselves. It’s more about empowerment and agency, about doubt and burnout, than the needle itself” (Picard, 2021, p. A11) all help to shift the discourse away from the information-deficit model. Compared to trust-related passages found in the general portrayal of vaccine hesitancy, authors that focused on specific groups mentioned trust as a factor earlier in the article, and with more detail as to why trust was important. Mistrust of governments or public health officials were discussed in detail, suggesting that people in these groups have good reason for their wariness. For example, people living in “marginalized communities already poorly served by health care” tend to have “experience in having their mistrust of ‘the system’ justified” (“One year later”, 2021, p. A4).

In addition, trust in experts was treated as something that must be earned. As these articles acknowledged that there has been a loss of trust in medical professionals and government officials within certain demographics, they suggest that the main challenge to increasing vaccine confidence is regaining that trust. After all, the fact that “Health Canada has reviewed the

efficacy and safety of a vaccine and considers it safe is almost meaningless to a community that has lost trust in health care professionals, medical research and government” (Vohra-Miller et al., 2021, p. O7). Unlike in the general portrayal of vaccine hesitancy, these articles acknowledge that the experts, including Health Canada, are not seen as trustworthy by all groups. When misinformation is mentioned as a factor, it was often paired with explaining that certain populations already “had a general mistrust of a medical system that had made them feel their pain was not real, had underfunded the mental-health supports for marginalized communities and treated their ancestors as science experiments” (Bascaramurty, 2021b, p. A1). Here again, the emphasis is on the loss of trust due to historical and societal issues, and not on the presence of misinformation itself. This is in contrast with how information deficit and trust were discussed in a more general portrayal of vaccine hesitancy, where deficit-based issues such as confusion caused by poor vaccine communications strategies by public health officials were treated as a more direct cause, and the role trust plays was rarely examined, often leaving the impression that some people are simply more mistrusting.

**Suggested Solutions.** Across all subgroups, common suggestions included the use of trusted figures or community leaders to help communicate about vaccines (Fleguel, 2021; Leung & Hager, 2021) and listening to concerns without criticizing (Bascaramurty, 2021b; Picard, 2021). The use of incentives, especially in vulnerable groups, was discussed as potentially harmful as they may undermine trust (Leung & Hager, 2021). For all subgroups identified, a need for a more compassionate response where individuals’ concerns and anxieties are taken seriously was suggested (Bascaramurty, 2021b; Hunter, 2021; Kirkey, 2021b; Picard, 2021).

Because of focusing on factors that are external to the vaccine-hesitant individuals, the vaccine hesitancy of specific subgroups was portrayed as being able to change. In one article, an

immigrant community influencer by the name of Ms. Ibrahim was described as skeptical of vaccines, and was “receiving and circulating” vaccine misinformation to others in her community (Bascaramurty, 2021a, p. A8). However, after learning from “a Zoom workshop...led by a scientist in [her] community” who explained that “these ‘facts’ were...unsubstantiated, backed by people interested in selling books”, Ms. Ibrahim “stopped forwarding that information, [and] has asked a friend...to not share any vaccine myths either” (Bascaramurty, 2021a, p. A8). It is important to note that although educational approaches such as these were often suggested and described as highly successful (Bascaramurty, 2021a; Fleguel, 2021; Leung & Hager, 2021), the focus seems to be on the use of such educational meetings as a means of developing connections and building trust. For example, for racialized or Indigenous communities, it was emphasized that these meetings took place in a trusted location, such as a community church (Mercer & Smith, 2021), involved trusted figures in the community (Bascaramurty, 2021b; Fleguel, 2021), or paired with culture-specific solutions, such as prayer (Fleguel, 2021; Mercer & Smith, 2021). For health workers, their need for an opportunity to ask questions outside of their workplace was discussed as a means of protecting them from the stigma that is associated with being vaccine hesitant (Hunter, 2021). The need for trusted figures, such as peer advisors in the case of people living with homelessness or other transient situations (Leung & Hager, 2021) or a plan to ensure that “concerns of young Canadians on the ground will be heard by the bureaucrats at the top of ivory towers” (Jivani, 2021, p. A10) all suggest the importance of safe opportunities for communication.

In other words, this portrayal does not frame educational approaches as successful because they remedy the problem of poor scientific understanding by the public. Ultimately, vaccine hesitancy is portrayed as something more complex than a simple lack of information.

“After the information session,” what encouraged the neighbourhood influencer to receive the COVID-19 vaccine was not because she now understood that her concerns had no scientific evidence to support them; she admitted to being “still nervous” about having received the shot (Bascaramurty, 2021b, p. A1). What changed was that now she had “thought about a beloved neighbour who had recently died from COVID-19”, and her mother, who “might not survive if she got COVID-19” (Bascaramurty, 2021b, p. A1). Clearly, the information session is considered successful, but it is also clear that her decision to get vaccinated was not simply a result of a newfound understanding of vaccines and the science behind them. This is similar to Goldenberg’s (2021) views, as she also acknowledges that “misinformation should still be corrected” but in a way that focuses on “building and maintaining” trust, while simultaneously understanding that “misinformation...should be understood to be a ‘downstream’ symptom of poor public relations” caused by poor trust (p. 170).

### **5.2.3 The “Anti-Vaxxers”: Unreasonable and Caused by Individual Characteristics**

The third type of portrayal of vaccine hesitancy found in the articles was the “anti-vaxxers”, or those who are the most skeptical of vaccines. They were almost always described negatively, as “a small but significant group that believes in COVID-19 conspiracy theories” (Renzetti, 2020, p. O2), “the minority of people uttering all manner of unscientific nonsense” who “get altogether too much attention” (Picard, 2020, p. A11), or dismissed as the “anti-vaxxers and tinfoil-hat demographics” (Kline, 2021, p. A11). This portrayal paints vaccine hesitancy as unscientific, illogical, and “actively hostile to vaccines” (“Let’s shoot for 90-per-cent”, 2021, p. A10).

**Reasons for Hesitancy.** Articles which focused on the “anti-vaxxer” portrayal framed the issue of vaccine hesitancy as a lack of scientific understanding and a belief in misinformation, often linked to social media and celebrity figures (Kline, 2021; Meek, 2021; Renzetti, 2020). One article offered some correlations of personality traits associated with higher levels of vaccine hesitancy, including “higher levels of paranoia, higher levels of social dominance, higher levels of neuroticism...primarily concerned by their own safety rather than the safety of others”, and “they tend to be more impulsive in their thinking” (Kirkey, 2021c, p. A8). This group was the only group where internal factors such as personality traits were discussed as possible causes of vaccine hesitancy instead of external factors, such as confusing public health messaging, misinformation, or mistrust due to historical and/or contextual problems. In this third group, then, vaccine hesitancy and refusal are thought to arise from certain individual characteristics and dispositions that make them less likely to conform to public health guidelines or to trust scientific experts. Because of this particular framing of vaccine hesitancy and refusal as a personal issue of scientific illiteracy, selfishness, or belief in misinformation and conspiracy theories, this third portrayal was the most negative in terms of tone.

**Level of Compassion.** As mentioned earlier, articles focused on the portrayal of vaccine hesitancy as anti-vaxxers had the most negative tone, using shaming language or war metaphors and “they” instead of “us” or “we” to stress that the vaccine hesitant and refusers are a sort of “other”; a potentially harmful minority that is inherently different from the rest of the population.

For example, some of their concerns were listed as fears that the COVID-19 vaccines will be used for “mind control, birth control, or other nefarious schemes, often with anti-Semitic angles focused on George Soros” (“The politics of a piece of cloth”, 2020, p. A1). Celebrities voicing skepticism toward vaccines were referred to as “the screechiest of these voices”

(Renzetti, 2020, p. O2), and a television host was accused of sacrificing “journalistic integrity on the altar of higher ratings” (Kline, 2021, p. A11). The contrast in tone is clear when compared to the other two portrayals: vaccine hesitancy in the general public and vaccine hesitancy in specific subgroups. For vaccine hesitancy in the general public, concerns were perceived as somewhat illogical or overblown yet still understandable due to the changing and confusing public health guidelines, whereas articles that focused on specific subgroups explained why people may be vulnerable to such misinformation, as well as taking care to show that those who spread misinformation are not always doing so with malicious intent. The concern around “birth control” was one of the legitimate concerns heard in some racialized communities due to an association with racist medical experiments (Bascaramurty, 2021b), but no such links were explained for the anti-vaxxer portrayal. For this third group, their concerns are portrayed as irrational, absurd, and morally questionable (e.g., anti-Semitic). No other portrayal included such blatant antagonizing of vaccine hesitancy.

This antagonism can be seen in the war metaphors, found only in the “anti-vaxxer” framing of vaccine hesitancy. “Anti-vaccination forces are already marshalling” to spread misinformation (Kirkey, 2020a, p. A1), misinformation is described as “propaganda” (“The politics of a piece of cloth”, 2020, p. A1; Urback, 2020, p. O11), and an article warned that “schools could be the next battleground between majority pro-vax Canadians and the minority who are opting out” as in-person classes start (Nanos, 2021, p. O3). Another characteristic of this portrayal is the use of “they” instead of “we” when referring to vaccine hesitant people. Phrases such as “it may seem that...the conspiracy theorists are floating off in their own reality, untethered to the rest of us” (Renzetti, 2020, p. O2) clearly establish the vaccine hesitant as different from the rest of the population. The problem with portraying the vaccine hesitant as the

“other”, either through the use of war metaphors or “they” instead of “we”, is that it frames “the issue as us versus them” and “minimizes the need to understand the perspective of the other, or to find compromise” (Goldenberg, 2021, p. 12). The lack of suggested solutions found in articles that focus on the “anti-vaxxers” seems to reflect this.

The final major difference between this group and the others was the level of personal portrayals. The portrayal of specific subgroups used positive, personal descriptions of real vaccine hesitant people, and portrayal of the general public used inclusive language (i.e., “we” instead of “they”) and would often assure readers that while some concerns may be overexaggerated, they were still an understandable reaction to the pandemic. However, instead of such personal or compassionate portrayals, the portrayal of vaccine hesitancy as irrational anti-vaxxers describe those who are hesitant by using caricatures: “Your quirky neighbour Ashley who won’t eat anything that touches plastic and feeds her kids celery root to stave off measles” (Urback, 2020, p. O11) or “that cute French neighbour who has forsaken all national pride coming from the land of Louis Pasteur to embrace a somewhat baffling anti-vaccination sense of patriotism” (Gill, 2021, p. A8). When real people were mentioned, it was to ridicule or to blame them, as seen in an article titled ““Just asking questions?”; Road map to immunity; No Tucker Carlson, vaccines aren’t killing people by the thousands” (Kline, 2021), which ended with the author sarcastically asking:

So why is Carlson attributing every post-vaccination death to vaccines? Is he some sort of simpleton? Is he deliberately deceiving his viewers to attract the anti-vaxxers and tinfoil-hat demographics? Is he purposefully trying to kill people by railing against both infection-control measures and vaccines? (p. A11)

Clearly, then, the actual vaccine hesitant population was not portrayed to help understand underlying causes of vaccine hesitancy as was in the case with the specific subgroups, nor was it to reassure the public that vaccine hesitancy was, while detrimental to public health, normal given the sometimes-confusing public health guidelines. Similar to the war metaphors, caricatures and personal attacks contribute to an “us versus them” framing by blaming or shaming certain individuals and dismissing their concerns as irrational, instead of attempting to understand the underlying causes of hesitancy.

**Role of Trust.** As mentioned earlier, trust was not discussed as often as in other portrayals, because suggested causes and solutions were not mentioned often in the “anti-vaxxer” articles. Instead, they were depicted as the cause of vaccine hesitancy, as they were spreading misinformation and conspiratorial beliefs to people with less skepticism about vaccines (Kirkey, 2020a; Meek, 2021; “The politics of a piece of cloth”, 2020). The “anti-vaxxers” are seen as the enemy forces that prevent health experts from reaching out to those who need the information. The language used in this portrayal of vaccine hesitancy is much more aggressive, to reflect this sentiment that vaccine misinformation is harmful, and based on negative personal traits such as selfishness, bigotry, and stupidity. Social media sites are “swamps” where “coronavirus vaccine lies grow and proliferate”, and misinformation is described as “a vicious brew of racism and anti-Semitism” (Renzetti, 2020, p. O2).

Although the role of trust was indirectly mentioned, this portrayal of vaccine hesitancy seems to rely heavily on the information-deficit model. By insisting that it was the job of experts “who [know] the science” to “communicate effectively and...act as a liaison between the country’s various health care bodies and the public” to promote vaccines (Urback, 2021c, p. A13) or to fulfil an “obligation as medical experts to spread sound medical knowledge and facts

to...non-medical friends and family” (Passaperuma quoted by Huang, 2021, p. A12), the importance placed on experts and scientific information is clear. In other words, these portrayals follow the information-deficit model’s assumption that the key to overcoming vaccine hesitancy is educating the public by providing more vaccine facts; that the general public will automatically trust the information given by experts, as long as it is available and easily understood. The “anti-vaxxers” are actively antagonized for preventing experts from efficiently reaching the public, and thus making it more difficult for the already-confused public to trust the experts.

Although rare, some articles did mention non-information-based factors of vaccine hesitancy, such as fear, mistrust, and feelings of being unheard (“A lotto won’t get our vax to the max”, 2021; Meek, 2021; “One year later”, 2021). However, these are often mentioned at the very end of the article, much like in the general view of vaccine hesitancy. In the case of the “anti-vaxxers”, the non-information-based factors were downplayed, or portrayed as unreasonable reasons for their hesitancy. One article acknowledged that online misinformation may be attractive because “conspiracy theories...give people a sense of accomplishment and of the democratization of information” (Meek, 2021, p. A18). This sense of empowerment from actively searching vaccine information and questioning authority is mentioned to create a powerful motivation to join vaccine-critical groups online (Hobson-West, 2007; Reich, 2020). However, instead of attempting to understand such motivations, the article ridiculed those who believe in vaccine myths as naively believing “that they are important enough for the government to track with a microchip” (Meek, 2021, p. A18), dismissing concerns over the sense of a lack of personal control over health-related decisions and the democratization of information. The article ended by asserting that “science deals in facts, in things that can be

predicted and observed”, and that when any information or theory is “noticeably light on facts, it’s likely that [it has] no business in the scientific discourse at all” (Meek, 2021, p. A18). Again, this view is similar to the main claim of the information-deficit model, where intervention and discussion focus solely on providing scientific facts while non-information-based factors and concerns are often ignored as they are deemed unscientific.

**Suggested Solutions.** A striking difference between the other two groups and the “anti-vaxxer” portrayal was the belief that negative views about vaccines could not be changed. Vaccine hesitant people and refusers were described as “so entrenched in opposition to vaccines that they won’t change their minds” (Gill, 2021, p. A8) or “a bunch of people who are never going to take the vaccination...no matter what they learn about it” (Hillier quoted by Stone & Curry, 2020, p. A3). There was hope that the COVID pandemic would “make antivaxxers wake up and see that vaccines are important. ...But it’s actually done the opposite” (Larson quoted by Renzetti, 2020, p. O2), because “no amount of data will ever convince anti-vaccine conspiracy theorists” (Offit quoted by Kirkey, 2020a, p. A7). Possible solutions were rarely offered, as journalists and experts alike seemed to have adopted a “nothing can be done” approach toward this particular group. Making the COVID-19 vaccines mandatory was not mentioned in the articles; instead, articles offered thoughts on incentives. Suggestions for incentives included rewards for getting vaccinated or consequences for refusing the vaccine. The question of whether vaccines should be mandatory in certain work settings was discussed, with articles voicing concerns over the legality of demanding workers to accept the vaccine (Hunter, 2021; Yu, 2021). Vaccine lotteries were mentioned, often with concerns that such strategies “could exploit peoples’ financial vulnerabilities” (Cryderman, 2021b, p. A6), create an unwanted precedent for future vaccines to require incentives, or increasing mistrust by suggesting that vaccines were

unsafe and people must be bribed to accept them. Other articles mentioned incentives as a possible way to increase vaccine uptake, while simultaneously admitting that “some will steadfastly refuse” (Woo et al., 2021, p. A8). Overall, articles often mention incentives as a short-term solution: Incentives such as vaccine lotteries or access to restaurants may increase the motivation to get the COVID-19 vaccines, yet it can be exploitative and do little to change people’s attitudes toward vaccines (Mason, 2021; Passafiume & Woo, 2021). As the reason for hesitancy was often associated with individual personality trait instead of some external issue that can be solved, and because the traditional approach of providing scientific information has been ineffective, it is concluded that there is nothing experts can do to ameliorate the situation. This sentiment can be seen in sarcastic or dismissive comments in response to vaccine fears, and a suggestion to “do ourselves a favour and ignore them, at least for now” (Picard, 2020, p. A11) when discussing vaccine refusers during the early stages of the pandemic. This belief that nothing can be done to change negative vaccine opinions is problematic, as it leads to actual, underlying concerns of vaccine hesitant people or vaccine refusers becoming dismissed (Goldenberg, 2021), as seen in the above quotes. If the underlying causes of vaccine hesitancy and refusal remain ignored, there will be less discussion of possible solutions, or worse yet, a commitment to misdirected solutions and ineffective communication strategies that often increase vaccine-skeptical views (Goldenberg, 2021).

### **5.3 Main Findings of the Three Portrayals**

All three portrayals of vaccine hesitancy found in the sample —vaccine hesitancy in the general population, in specific subgroups, and as “anti-vaxxers”—categorize various vaccine concerns as reasonable or unreasonable, and as external or internal. Portrayals of concerns as

reasonable were seen in group 1 (hesitancy in the general population) during the early stages of vaccine development, and group 2 (hesitancy in specific subgroups). Concerns were portrayed as unreasonable for group 1 during the later phases of vaccine development, and for group 3 (“anti-vaxxers”). This was closely tied to the tone of the articles. Concerns portrayed as reasonable were treated with the most empathy and understanding, whereas concerns deemed unreasonable were portrayed more negatively. This link between the perceived reasonableness of concerns and the tone used can be seen clearly in the shift in tone in group 1. During the early stages of vaccine development, the concerns of the general public were treated as reasonable as it was presumed that the lack of (or confusing) information from health experts gave them reason to be cautious, and therefore the concerns were addressed in an understanding tone. Later, as more information became available, thus reducing the perceived cause of their hesitancy (the lack of information), the concerns were no longer seen as reasonable, and the tone shifted to a more critical one similar to the tone used for the “irrational and dangerous” group 3.

External factors were suggested as the main factors of vaccine hesitancy in group 1 and group 2, with a focus on confusing public health messaging and historical and/or societal factors, respectively. Internal factors, such as personal faults, were discussed only in group 3, where vaccine hesitancy was described not just as a lack of understanding due to lack of information, but due to individual characteristics that make understanding impossible. Similar to the distinction between reasonable and unreasonable concerns, the portrayal of group 1, the general public, shifted to match the portrayal of group 3, the anti-vaxxers, as the pandemic progressed. This could be due to a perceived lessening of external factors. The main external factor associated with group 1 was the lack of or confusing information; as the pandemic progressed and information became more readily available, the main barrier to vaccine acceptance for the

general public was thought to be solved. When vaccine hesitancy persisted, explanations of vaccine hesitancy began to include more internal factors, as in group 3.

Trust was most often mentioned in group 2, the specific subgroups. This was the only group where the main focus was placed on the issue of trust, and emphasis was placed on stating that simple educational approaches, such as providing more information or countering misinformation, are not sufficient in increasing trust in vaccines. However, in group 1 and group 3 (general public and anti-vaxxers), trust was not given such attention. When trust was mentioned as an important underlying factor of vaccine hesitancy, it was often at the end of the article and only explained vaguely. This difference in how the issue of trust is handled is also reflected in the suggested solutions. In group 2, the specific subgroups, the emphasis on increasing trust was evident in the solutions. This included involving trusted individuals in the community (community influencers, religious leaders, or people who share the same ethnic and/or racial background) in vaccine promotion or listening and understanding historical and/or societal issues that may cause skepticism in vaccines or institutions (such as the public health system or the government). Even when educational approaches are suggested, articles with a focus on specific subgroups highlighted the importance of using educational sessions as an opportunity to build trust, which closely follows Goldenberg's (2021) suggestion of prioritizing the maintenance of trust in addition to providing vaccine information. In groups 1 and 3, where trust was not mentioned as often, suggestions that focused on the importance of trust building were extremely rare. In the general public portrayal of vaccine hesitancy, the most common suggestion was purely educational; as vaccine hesitancy was perceived to stem from a lack of understanding of vaccine information and not a lack of trust. In the anti-vaxxer portrayal, a lack of trust was rarely mentioned as a cause of vaccine hesitancy, as hesitancy was thought to be a

personal issue. Suggestions were rarely offered, as some people were simply believed to have personal characteristics that made them less trusting of experts or scientific data, and thus they were thought to be unchangeable through public education.

These differences in suggested solutions are interesting; namely, how it shifts from a purely educational approach, a mix of an educational approach and a trust-building approach, and a seemingly fatalistic conclusion that nothing can be done to change people who are hesitant or refuse vaccines. This reflects the changes seen in how the deficit model has been applied to vaccine hesitancy. Initially, the deficit model simply stated that vaccine hesitancy was a result of the public's lack of scientific understanding, and suggested an increase in educational efforts to provide more information. This was the view most commonly found in group 1, or articles focusing on vaccine hesitancy in the general population. After studies such as Nyhan and Reifler's (2015) showed that simply providing vaccine-hesitant people with facts and data does not increase their intent to get vaccinated, some experts as well as the media hastily concluded that negative opinions about vaccines could not be changed, instead of interpreting the results of the study as a sign that this specific method of vaccine promotion was ineffective (Goldenberg, 2021). This assumption that nothing can be done to change negative vaccine beliefs were clearly seen in group 3, the "anti-vaxxer" portrayal. Finally, some, such as Goldenberg (2021), have taken the results from Nyhan and Reifler's (2015) work to mean that there is a need to go beyond providing information; in other words, that there is a need for non-information-based approaches to counter vaccine hesitancy, such as increasing trust. This framing, seen in group 2 (the specific subgroups), allows for consideration of solutions that were overlooked by the information-deficit model. Overall, most of the articles analyzed contained some element of the information-deficit model, except for those found in group 2 which would often actively refute its assumptions such

as the belief that vaccine hesitancy is an issue of scientific illiteracy. Even though trust was mentioned as a possible factor of vaccine hesitancy, it was often poorly defined. Furthermore, there was a contrast between the suggested causes and solutions; specifically, trust was not mentioned as part of the solutions even when it was mentioned as a possible factor. This issue is noted by Goldenberg (2021), that the importance of trust “does not get carried into strategies for addressing the problem, which are still largely fact-based interventions aimed at addressing perceived knowledge deficits” (p. 111). So, while the issue of trust is included in the discussion of potential underlying factors of vaccine hesitancy, suggested solutions would often shift or “drift” toward a more traditionally deficit-based approach (i.e., focused solely on information-based information). This phenomenon of “deficit drift”, similar to the “lifestyle drift” seen in public health messaging, will be discussed in more detail below.

## 6. Discussion & Conclusion

The purpose of this study was to examine discourse about COVID-19 vaccine promotion; specifically, which vaccine promotion strategies are used in Canadian newspapers during the COVID-19 pandemic. The main research question was whether vaccine promotion in media has changed to include more non-information-based strategies to reflect the criticisms of strategies relying heavily on the information-deficit-model. The discussion of the main findings is organized in three sections, all focusing on how the information-deficit model was used in the newspaper articles. The first section focuses on the information-deficit model seen in the portrayals of the causes of vaccine hesitancy, where groups whose vaccine hesitancy was portrayed as deficit-based received more negative portrayals in the media. The second section focuses on the preference for information-based suggestions despite increasing acknowledgement of non-information-based causes of vaccine hesitancy. This shift from non-information-based causes to information-based strategies will be called “information drift”, in reference to the “lifestyle drift” seen in public health messaging, as explained later. Thirdly, the shift in the use of traditionally information-based strategies such as information sessions or online Q&A meetings will be discussed. This is an important shift as it shows that non-information-based strategies such as increasing trust and building relationships are beginning to be incorporated into purely information-based strategies, possibly creating a new style of vaccine promotion that mixes information- and non-information-based strategies for a better outcome.

### **6.1 Information-Deficit in Vaccine-Related Articles**

The results showed that vaccine hesitancy in newspapers is still portrayed using a predominantly information-deficit approach. Most articles sampled were based on the pure

information-deficit model or the revised information-deficit model, as seen in their suggestions for providing the public with more information. This reflects the findings in previous literature which also found a predominance of information-deficit based strategies in pro-vaccine media despite criticisms (Goldenberg, 2021; McKinnon & Orthia, 2016; Murdoch & Caulfield, 2018). The similarity in vaccine discourse found in previous studies and the current project suggests that criticisms of the information-deficit model and suggestions of alternative, non-information-based strategies have yet to be widely implemented in pro-vaccine media.

The articles that included more non-information-based strategies were from group two, which focused on specific, often marginalized subgroups of vaccine-hesitant people. In contrast, the information-deficit model was retained in groups one and three, using the pure information-deficit model and the revised information-deficit model, respectively. The sampled articles showed that some groups were more likely to be associated with a certain strategy or tone more than others: Articles on specific subgroups were much more compassionate in tone and focused on non-information-based causes and suggestions, whereas articles with a focus on “anti-vaxxers” were extremely antagonistic and often had no suggested solutions as it was assumed that nothing can be done to convince these vaccine refusers. Similarly, for the general view of vaccine hesitancy, the tone used shifted from a sympathetic non-information-based tone to a more information-based framing closer to that used for the “anti-vaxxers”. This shift seemed to be associated with the perceived (in)effectiveness of the experts’ communication with the public; in other words, views on the handling of vaccine-related information by health officials and the government. When experts were criticized for poor communication about the new vaccines, the general public’s concerns were presumed to be partially caused by information-deficit and partially due to non-information-based factors such as a lack of trust caused by confusing

messaging. The link between external causes of hesitancy and a more compassionate tone implies that some groups receive more positive portrayals. The most non-information-based portrayals were used to describe a generalized view of vaccine hesitancy during the early stages of vaccine availability, and the specific subgroups of vaccine hesitant people. In both of cases, vaccine hesitancy was explained as caused by an external factor assumed to impact the entire group: For the first group, the external cause was confusing messaging from health institutions and the government; for the ‘specific subgroups’ the external cause was social injustices such as historical and ongoing racism in the medical system. The third “anti-vaxxer” group, whose vaccine hesitancy was assumed to stem from personal convictions, ignorance, or irrationality, received information-based solutions that relied heavily on the information-deficit model. Thus, the groups whose portrayals and suggestions were non-information-based were those who are thought to have external factors that contribute to their hesitancy.

Furthermore, there are differences between the media portrayals of vaccine hesitancy and how some vaccine-hesitant people view themselves. For example, Reich’s (2020) interviews with vaccine-hesitant mothers and Hobson-West’s (2007) study on vaccine-hesitant organizations both show that vaccine-hesitant people view themselves as more critical of available information, concerned with empowerment and choice in healthcare, and often feel stigmatized for being skeptical of vaccines. These issues were not mentioned in newspaper articles, which rarely included interviews from vaccine-hesitant individuals. Interviews were only seen in articles focusing on racial minorities and the historical contexts (e.g., medical racism) as factors of vaccine hesitancy. However, Reich’s (2020) study used a predominantly white sample, suggesting that people who are not part of a racial minority can feel stigmatized for reasons unrelated to their racial/cultural background. Factors that are specific to some groups,

such as medical racism, should not be downplayed. On the other hand, reserving empathetic portrayals to only those with historical/cultural contexts while painting the others as ignorant and/or irrational is much too simplistic.

Although it is encouraging to see that non-information-based factors and suggestions are being considered for some groups, the level of reliance on information-based rhetoric used in regards to the most extreme vaccine-hesitant or vaccine-refusing people is concerning. We know that framing vaccine promotion around the information-deficit model is not only ineffective, but may strengthen vaccine skepticism, especially in people with more concerns (Nyhan & Reifler, 2015). The fact that articles that focused on the “anti-vaxxers”—those presumed to hold the strongest attitudes against vaccines—used the assumptions of the information-deficit model to explain their concerns, and proposed information-based solutions or none at all, is extremely concerning. This is the target group which studies such as Nyhan and Reifler’s (2015) suggest the information-deficit approach is the most the ineffective, and yet it is the group most strongly portrayed based on the information-deficit model, and commonly included negative, stigmatizing portrayals. This may further polarize vaccine-accepting and vaccine-skeptical people as the latter continues to be portrayed negatively, making them feel even more dismissed and alienated for their views. This could lead to decreased trust in the experts as well as to more disdain toward vaccines and pro-vaccine groups.

## **6.2 Information Drift and the Information-Deficit Used in Solutions**

Another concern is that non-information-based vaccine-promotion strategies were mentioned, but not given as much focus as information-based strategies. Some articles mentioned the importance of non-information-based factors such as trust as part of a closing statement with little to no detail on how trust is linked to vaccine hesitancy or how trust can be

increased in vaccine-hesitant individuals. Others mentioned non-information-based issues as explanatory factors, but only mentioned information-based suggestions as solutions. This shift from non-information-based causes to information-based solutions can be referred to as “information drift”, in reference to the “lifestyle drift” seen in other health promotional messages. Much of the public health discourse acknowledges external and structural causes to poor health outcomes (such as social and economic disadvantage), in addition to individual and personal factors, i.e., lifestyle changes. However, despite the acknowledgement of these external *causal* factors, any proposed *solution* tend to ignore any solutions to address external causes such as poverty and instead “drift” toward lifestyle interventions suggesting personal changes to diet or amount of exercise (Marmot & Allen, 2014). Like “lifestyle drift” in public health messages, the “information drift” seen in the pro-vaccine articles acknowledges the importance of factors external to the individual when discussing causes, but ignore them in favour of individual-level factors—such as ignorance or irrationality—when suggesting potential solutions. The obvious issue with this tendency to “drift” is that the suspected structural causes and the suggested individual-level interventions are not compatible. If the evidence suggests that these external factors play a significant role in causing a problem, these external factors should not be ignored in the interventions and solutions. In the case of vaccine hesitancy, evidence strongly suggests that a deficit of information is not the root cause of hesitancy, so if an information-based approach is the only strategy, this is unlikely to make the vaccine hesitant less concerned (Goldenberg, 2021; Nyhan & Reifler, 2015; Reich, 2015). Acknowledging that non-information-based factors such as burn-out in health care workers and medical racism are a major contributor to vaccine hesitancy is an important step in moving away from a purely information-based, deficit-model view of vaccine hesitancy. However, simply acknowledging non-information-

based factors as causes is not enough for successfully addressing these external causes. An “information drift” approach lists non-information factors as potential causes but ignores them when suggesting solutions, thus ignoring the true underlying causes of vaccine hesitancy in their interventions. This tendency shows how prevalent the information-deficit model is in current pro-vaccine discourse despite the criticisms against the model, and that pro-vaccine messaging still need to shift to fully incorporate the findings in the literature in their solutions. Individuals may have negative experiences in the healthcare setting (Meyer & Lum, 2017), leading to a general apprehension and mistrust of the medical system. Issues such as medical racism affecting vaccine hesitancy should not be ignored, as racism in health care is not limited to historical injustices, but is an everyday reality in Canada (Garfield, 2020; Mohair et al., 2021). Moreover, (perceived) mistreatment in the medical system can be experienced by anyone, and mistrust of experts and the medical system likely plays a role in most, if not all, instances of vaccine-hesitancy (Goldenberg, 2021). Both Reich (2020) and Blume (2016) mention that vaccine-hesitant and vaccine-refusing people feel stigmatized in the health care system, either by having no opportunities to voice their concerns or feeling pressured into accepting the vaccine despite having doubts. Those who have stronger vaccine-related concerns often do not have an opportunity to voice these concerns for fear of being questioned or stigmatized for their choice, which can lead to feelings of alienation from mainstream medicine (Reich, 2015). Newspaper articles should avoid needlessly antagonizing vaccine-hesitant people by assuming they are ignorant and irrational, as this is unlikely to make them change their minds but rather make them less willing to consider viewpoints from sources that openly antagonize and belittle them. Given the literature on the ineffectiveness and the polarizing nature of purely information-based strategies, current vaccine promotion strategies will remain ineffective if they do not consider

non-antagonizing strategies for a broader audience. Providing reliable information is important, but it is meaningless if the source of the information is not trusted or if the information-provider uses a polarizing “us versus them” framing. These issues were identified in the articles focused on the specific subgroups and the “anti-vaxxer” group, respectively.

### **6.3 Non-Information-Based Strategies Mixed into Information-Based Strategies**

An interesting observation was that the use of information was different depending on the portrayal of vaccine hesitant groups. For the general view of vaccine hesitancy, information was seen as the main focus of interventions, as seen in the suggestions that more information would directly decrease the amount of hesitancy. In contrast, for the specific subgroups, information-based solutions were portrayed as opportunities to build positive relationships between experts and the hesitant community. These suggestions included information-providing Zoom meetings with experts who share a similar ethnic and/or cultural background to the target group, or Q&A sessions with a focus on providing a safe, respectful environment where concerns can be raised. These strategies address not only the information-based factors of vaccine hesitancy, but more importantly, the underlying non-information-based factors such as mistrust in the experts or a lack of opportunities to have their concerns heard. This is an encouraging push toward non-information-based solutions. The strongly held belief that information-deficit is the cause of vaccine hesitancy has limited the development of alternative, non-information-based strategies to increase vaccine acceptance. Because of this, the “best” solutions for increasing vaccine acceptance are still debated. Some non-information-based strategies, namely mandates and incentives, may increase vaccine uptake. However, they may worsen vaccine hesitancy and resentment if interpreted as controlling, dismissing concerns, or as “bribes” meant to distract

people from unpleasant consequences (Castillo et al., 2022; Mason, 2021; Reich, 2020).

Presumably, a mix of information-based and non-information-based strategies that aims to build trusting relationships between experts and the vaccine hesitant, similar to the Zoom calls mentioned in the newspaper articles, would be a good prototypical strategy to study the effectiveness of alternative strategies.

#### **6.4 Limitations and Suggestions for Future Research**

The limitations of this paper include the limited range of articles that were used in the analysis. Only English articles were included, which excluded articles written in French from the analysis. Similarly, this paper examined vaccine discourse in newspapers, excluding other sources of vaccine communication such as public health websites or social media platforms. This study examined the portrayals of vaccine-hesitant people, the causes of vaccine hesitancy, and suggested solutions. As such, the findings of this study should not be seen as an accurate assessment of the actual causes of vaccine hesitancy nor the effectiveness of various solutions. One goal for future research is to compare these implied causes and solutions with what are deemed the actual causes or effective solutions, especially by vaccine-hesitant people themselves. On a similar note, how well the identified portrayals reflect actual vaccine-hesitant groups and their experiences should be examined in more detail. This is especially true for the specific subgroups portrayal, which included racial minorities: Goldenberg (2021) notes a gap in research on vaccine hesitancy in marginalized populations in North America. Examining how well media portrayals of vaccine hesitancy represent the views of actual vaccine-hesitant people is crucial to understand whose perspectives are portrayed accurately and whose voices are misrepresented or absent from the discourse. This will help to identify areas where vaccine

hesitant people are most likely to feel unheard or misunderstood, a factor that can affect their attitudes toward the healthcare system or policy-makers.

## 6.5 Conclusion

Portrayals of vaccine hesitancy in Canadian newspapers remain heavily based on the information-deficit model. However, it is important to note that some efforts to move away from a purely information-based approach have been made. This was especially true for groups that were closely associated with non-information-based issues such as medical racism or social and economic disadvantage. Results indicate that vaccine discourse in newspapers are beginning to acknowledge non-information-based factors such as trust as key concepts in vaccine hesitancy, as suggested by scholars. Although it is encouraging to see portrayals moving away from the information-deficit model, the prevalence of the information-deficit model in articles focused on the most hesitant groups raises concerns. As seen by the recent Freedom Convoy in downtown Ottawa, vaccine hesitancy continues to receive significant media attention. Journalists are careful to differentiate between those simply concerned over vaccine mandates with people promoting anti-government, racist, or otherwise dangerous views. But some still refer to the protest as “disgruntled anti-vaxxers stirring up trouble” (Ibbitson, 2022, A4), with their memorandums mocked as “utter lunacy” that is “not worthy of serious comment” (“Trucker convoy has evolved”, 2022, p. A9). The protesters’ understanding of vaccines and the pandemic is said to be “mistaken and misguided” (“The virus is the enemy”, 2022, p. A10), again suggesting that vaccine hesitancy is a matter of information and understanding, or the lack thereof. How media *portrays* vaccine hesitant and refusing groups can influence the actual future social relationships of trust or dismissal between experts and the concerned public. Mistrust in mainstream

healthcare or the government is a complex issue with multiple causes and no simple solution. Mandates, although effective in increasing vaccine uptake, may worsen vaccine hesitancy as they do not address the underlying issue of mistrust (Castillo et al., 2022). Continuing to rely solely on the information-deficit model that portrays vaccine hesitant as ignorant and irrational will result in further alienation of those who are skeptical of vaccines. The choice of vaccine-promotion messages used by experts, government and media during the COVID-19 pandemic provides opportunities for analyzing and developing better pro-vaccine messaging that are more effective, and avoid polarization within vaccine discourse.

When comparing the real causes of vaccine hesitancy and what is considered effective strategies with media portrayals of causes and solutions, it is clear to see that an information-deficit-based, “war on science” framing is still present. This can be said for other forms of mainstream science communication, such as public health promotion, where statistical data and FAQ-style infographics are common. These strategies all rely on the assumption that misinformation, or a lack of information, is at the root of skepticism. Science communication must aim to understand its target audience. Causes and public opinions must be portrayed with accuracy, without needlessly antagonizing or polarizing the public for their views. This includes understanding that information alone is not the main factor in changing someone’s opinion about science, and that mainstream sources of information, such as public health organizations, doctors, and government officials, are not trusted equally by different groups. As the findings of this study show, vaccine promotion, and science communication as a whole, must continue to search for alternative strategies that mix together information- and non-information-based aspects to answer public concerns.

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