Between Objection and Injection: A Thematic Analysis of Ontarians' Perspectives on a COVID-19 Vaccine

by

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ABSTRACT

BETWEEN OBJECTION AND INJECTION: A THEMATIC ANALYSIS OF ONTARIANS' PERSPECTIVES ON A COVID-19 VACCINE

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To better understand opinions and concerns around COVID-19 vaccine development and uptake, forty Ontarians were interviewed about their perspectives on a potential COVID-19 vaccine. Participants described concerns about 1) the expedited development timeline of a COVID-19 vaccine, 2) the safety and efficacy of the vaccine itself, 3) the timing of personal vaccine uptake relative to other Canadians and 4) whom to trust for information when making personal vaccine decisions. These findings suggest that Ontarians are concerned about the shortened timeframe within which a COVID-19 vaccine was developed. Participants were particularly concerned that this shortened timeframe might result in decreased safety and efficacy standards, and perceived these decreased standards as a potential catalyst for severe detrimental side effects and/or ineffective vaccines. Participants described the timing of their personal vaccine decisions as well as the sources to whom they turned for information about the vaccine as means to mitigate potential harm.

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Soon after the novel coronavirus (SARS-CoV-2) was declared a Public Health Emergency of International Concern by the World Health Organization on January 30th, 2020 (World Health Organization, *situation reports*, 2020), global efforts and significant resources (namely research funding, private capital, and labor) have been allocated toward the timely development of a COVID-19 vaccine. Ongoing containment measures (i.e., physical distancing and self-isolation) have been deemed effective in containing the spread of the virus. However, these measures cannot be implemented indefinitely; such strategies are positioned by infectious disease experts as being appropriate to use until such a time that an effective COVID-19 vaccine becomes available and is widely taken up within societies (Wilder-Smith et al., 2020). While global COVID-19 vaccine research and development efforts are "unprecedented in terms of scale and speed" (Le et al., 2020, p.306), peoples' concerns about the vaccine must be addressed with the same fervor.

Research on existing vaccinations suggests that while only 2-3% of Canadian parents refused all vaccinations for their children (Dubé et al., 2016; Picard, 2017), a further 19-49% could be considered vaccine hesitant and may be skeptical of new and established vaccinations (Dubé et al., 2016; Dubé et al., 2018)[1]. When that skepticism translates into vaccine refusal behavior, a serious public health issue arises.

The Novel Coronavirus

In late December of 2019, a cluster of pneumonia cases of unknown etiology was detected in Wuhan, China. Unbeknownst to anyone at the time, this cluster of infection would soon spread with such speed and intensity that it would become a defining point in global history. By January 7th, 2020, Chinese authorities were able to attribute this outbreak of illness to a novel strain of

[1] Picard (2017) reports that only about 2% of parents refuse all vaccination for their children, while Dubé et al. (2016) report that 3% of Canadian parents refused all vaccines for their children, therefore we report "2-3%" here. Dubé et al. (2016) reported that 19% of parents considered themselves vaccine hesitant and Dubé et al. (2018) reported that 49% of parents have no, low, or moderate intent to vaccinate their children, therefore we report "19-49%" here.

coronavirus, which would later be named SARS-CoV-2 (Gorbalenya et al., 2020). By January 13th, Thailand was the first country to report a confirmed case of the novel coronavirus and resulting COVID-19 disease[2] outside of China. Within days, additional countries including Japan, Korea, and the United States had reported their first confirmed cases, and in only a matter of months the disease had spread to most countries in the world. As an increasing number of countries began reporting confirmed cases of COVID-19, the World Health Organization Director-General officially declared a Public Health Emergency of International Concern (PHEIC) on January 30th, 2020 (World Health Organization, *situation reports*, 2020).

COVID-19

While it is presumed that a percentage of the global population remain asymptomatic after becoming infected with SARS-CoV-2 (estimates of asymptomatic carriers range from 17.9%-78.3%; He et al., 2020), many who contract the virus also develop a disease called COVID-19 as a result. The symptoms of COVID-19 commonly include fever, cough, and fatigue (Huang et al., 2020), though patients worldwide have reported a host of additional symptoms, ranging from mild to severe (CDC, 2020). The virus can infect people of all ages; however (as with most viral infections), the risk of contracting COVID-19 is particularly worrisome for people living with pre-existing health conditions and the elderly, who face much bleaker prognoses than their younger or healthier counterparts (World Health Organization, "situation reports", 2020).

At present (May 14th, 2021), Canada is reporting over 1.3million confirmed cases of COVID-19, including over 1.2million recovered cases and 24,825 deaths across the country, representing a rate of 65 COVID-19 related deaths per 100,000 population (Government of Canada, *Outbreak Update,* 2021). Despite disparities in case and fatality rates by country, most world leaders have formally recognized COVID-19 as posing a serious threat to global health; soon after the World Health Organization declared COVID-19 to be a PHEIC (even before the worldwide effects of this virus and subsequent disease were well-known), a global race began to

[2] The term "coronavirus" is often used colloquially to refer to both the virus itself and the resulting disease. For clarity in this paper, we distinguish between the virus itself (SARS-CoV-2) and the resulting disease (COVID-19), with the understanding that participants might use these terms interchangeably to refer to the disease.

develop a vaccine. While three COVID-19 vaccines have been approved for use in Canada at the time of writing, doses are being made available to priority populations first. Vaccination is not yet available to all Canadians, thus publics are continuing to learn how best to mitigate the potential harms of COVID-19 in the meantime.

The COVID-19 Vaccine

Vaccines have long been one of the most important ways to protect people against infectious disease, both in preventing illness altogether as well as decreasing severity of symptoms, should infection occur. The majority of vaccines are designed to prevent initial infection, and are usually administered to people who are both susceptible to the illness and likely to transmit the disease. Vaccines help to protect individuals by providing personal immunity, but they also serve as a pro-social public health instrument by reducing the transmission of disease (especially to the most vulnerable community members), which contributes to an effect known as herd immunity.

The idea of herd immunity suggests that achieving high vaccination uptake[3] within a population will ensure that those who cannot be vaccinated (for medical reasons), and those who might not fully respond to immunization are still protected as a result of the overall reduced disease transmission within the population (Mallory et al., 2018). In the case of COVID-19, very little is known about the potential implications of herd immunity, how it might be achieved, and whether it might provide long term community protection. The goal of establishing herd immunity against SARS-CoV-2 hinges on an implicit assumption that being inoculated against the virus will provide adequate protection in the form of immunity. Due to the novel nature of the virus, it is unclear whether this assumption is well-founded and, further, how long immunity might last (Randolph & Barreiro, 2020). While it is plausible that herd immunity for COVID-19 could be reached in the absence of a vaccine (i.e., after sufficient natural exposure throughout the

[3] The vaccination uptake required for herd immunity varies greatly depending on the disease (and vaccine), but is said to vary between numbers as high as 90-95% for diseases like mumps, diphtheria, and measles (Rashid et al., 2012). In the case of COVID-19, researchers have yet to release formal estimates of required uptake, though early estimates include figures between 67-90% (D'Souza & Dowdy, 2020; Randolph & Barreiro, 2020).

population), this means of achieving herd immunity would also involve a very large number of casualties and preventable deaths (Randolph & Barreiro, 2020).

The SARS-CoV-2 virus has been transmitted so rapidly and so widely that huge efforts have been exerted to develop vaccines in as little time as possible. The first Phase 1 clinical trial (wherein an investigative vaccine was administered to a human participant) began on March 16th, 2020 (NIH, 2020), and Canada approved its first COVID-19 vaccine on December 9th, 2020 (Government of Canada, *Drug and Vaccine Authorizations*, 2021). Regardless of the disease for which vaccines are developed, all vaccines must be scientifically proven to be safe and highly effective (via stringent clinical testing) before they are permitted for population use. The standard development of a vaccine takes several years, but due to the severity of the COVID-19 pandemic, this process has been expedited to compress timelines to only months (Kamble & Dubhashi, 2020).

Vaccination Behavior

Vaccine effectiveness within a population depends on both coverage (the number of people vaccinated), and the efficacy of the vaccine within those individuals (Walkinshaw, 2011). Therefore, the ability of a COVID-19 vaccine to remedy the current situation within communities is significantly limited if a large number of members refuse to be vaccinated.

Due to the novel nature of the COVID-19 pandemic, predicting the uptake of a potential COVID-19 vaccine by extrapolating from previous vaccine behavior would be misguided. The COVID-19 pandemic represents an unprecedented and unpredictable time in global history and as such, vaccine uptake rates may also be unprecedented and unpredictable. However, existing literature on vaccine uptake in Canada can provide us with a frame of reference with which we can better understand (and later compare) Canadian vaccination behavior for a COVID-19 vaccine.

With respect to optional vaccine uptake, recent statistics suggest that over 50% of the Canadian population chose not to receive the optional influenza (“flu”) vaccine in 2018-2019 (Public Health Agency of Canada, 2019). One might speculate that due to the severity of a global

pandemic compared to seasonal influenza, Canadian vaccine uptake rates for a COVID-19 vaccine should be much higher compared to the flu shot. While this speculation might be comforting, it is not necessarily supported by historical data. The last pandemic that affected Canadians in a way even remotely similar to the current COVID-19 crisis was the H1N1 (or "Swine Flu") pandemic. A universal vaccination program was recognized as the best defense against a novel, virulent strain of H1N1 in the first wave (which peaked in June 2009) of this pandemic (Boerner et al., 2013). By the time the second wave hit (which peaked in early November 2009), a free universal vaccine had been made available to the Canadian public[4] (Public Health Agency of Canada, 2010). Not only did Canada begin administering the H1N1 vaccine remarkably swiftly (thanks in large part to 'mock' vaccine trials that had been initiated well before the pandemic in 2005), but the Canadian rate of immunization against H1N1 was one of the highest in the world, with an estimated 40-45% of Canadians receiving the vaccine (Public Health Agency of Canada, 2010, p.70). Despite Canada's success in uptake relative to other countries, the H1N1 vaccine program was still quite controversial, and vaccine behavior was influenced by factors such as trust in public health and government, trust in the media, and safety and effectiveness concerns (Maunula, 2018).

Vaccine Hesitancy

Vaccine hesitant beliefs and vaccine refusal behaviors are not new or surprising phenomena; in fact, it is a matter so pressing that the World Health Organization classified vaccine hesitancy among the top 10 threats to global health in 2019 (World Health Organization, 2019). In a national study, Dubé et al. (2016) found that vaccine experts and health professionals identified vaccine hesitancy as a growing concern in Canada. As such, a thorough understanding of publics' perceptions of and hesitancy toward an emergent COVID-19 vaccine is crucial.

[4] According to Quigley et al., (2016) the Canadian H1N1 vaccine demand was low from September to mid-October 2009, until late October when a surge in demand occurred after a highly publicized death. At the same time, a production problem caused a shortage in vaccine availability, so most provinces resorted to administering the vaccine only to priority groups (e.g., children and pregnant women) until early December, when it was available to the general public again.

While dominant approaches to understanding vaccine decision making generally center around cognitivist and individualistic assumptions (i.e., vaccine decisions are seen as the output of an input/output information process), additional perspectives including public health, risk communication, health psychology, and sociocultural perspectives should also be considered when trying to understand vaccine hesitancy and vaccine refusal (O'Doherty et al., 2017). Adopting these additional perspectives is necessary to protect against certain implicit assumptions about vaccine hesitancy (e.g., the assumption that all vaccine choices are made in the interest of optimizing public safety), and also to recognize the complexity and nuance that comes with vaccine decision making. It is also worth mentioning that one does not simply adopt a "stance" on vaccination and let that static belief guide all of their behaviors. Beliefs and behaviors around vaccine hesitancy are both established and changed for a variety of reasons, and an individual's level of vaccine hesitancy might differ depending on the vaccine (i.e., one might choose to be vaccinated against MMR but refrain from getting the annual flu shot).

Rejecting Common Assumptions about Vaccine Hesitancy

Many medical choices including vaccination have historically been tied to the "knowledge deficit model", first articulated by Wynne (1991). This model presumes that the general "lay" public reject sound scientific knowledge simply because they do not understand the science. Applied to vaccine decisions, the understanding from this model would posit that scientists have proven vaccines to be safe and effective, and those who refuse vaccines or are hesitant toward them feel so predominantly because of a misunderstanding of the science. Further, public attitudes and behavior are seen to be positively influenced by increased knowledge communication, positioning education as the main policy tool which might "solve" this misunderstanding and subsequent vaccine hesitancy or behavior (Hobson-West, 2003). It does not take much of a critical eye to point out the flaws in this framework of understanding; even highly educated or highly intelligent people can have hesitancies or uncertainties about vaccination(s) that cannot be chalked up to merely a "misunderstanding" of the science. Even if the problem was a lack of understanding amongst the public with respect to vaccine safety, attempting to remedy the situation by providing more information from public health agencies assumes that this information will be seen as trustworthy, which is an assumption that may no

longer hold, considering that messages are judged by source and not by content, and the concept of trust is so closely linked to the concept of risk (Hobson-West, 2003).

Vaccine hesitancy is not the result of members of the public being ignorant, ill-informed, or uneducated (Goldenberg, 2021). While it is true that misconceptions around the necessity of recommended immunizations (especially in underserved or marginalized communities) might be explained in part by a lack of awareness and/or knowledge about vaccines, an example of one additional perspective to consider is that low vaccination rates in such communities may be "better understood as a symptom of inequity as opposed to resistance" (O'Doherty et al., 2017, p. 71).One such example is evidenced in Black communities, which have historically faced (and in many ways, continue to face) health injustices that lead to feelings of distrust toward medical institutions. Thus, the success of COVID-19 vaccines in Black and other minority communities hinges on vaccine organizations urgently earning trustworthiness (Warren et al., 2020). Ultimately, hesitancy and uncertainty can be the result of a variety of complex reasons that express a mistrust in science and the vaccination industry. Misinformation about the science may or may not be an important factor in this.

It is also important to note that many individuals feel some degree of vaccine hesitancy without ever demonstrating vaccine refusal. Vaccine hesitancy, in this sense, refers to an attitude about a vaccine, or vaccinations in general, whereas vaccine refusal is a behavior which is linked to but not fully or entirely determined by vaccine attitudes (Goldenberg, 2021). The purpose of this research is not to uncover easily remedied "misunderstandings" of the public that might lead to vaccine hesitancy or refusal. Contrary to the assumptions inherent to deficit models of understanding, Canadians hold valuable, non-expert opinions around vaccination that deserve serious consideration. Vaccine hesitancy should not necessarily be taken as evidence that members of the public misunderstand the science behind vaccines, rather it may be better understood a signal of poor public trust in scientific institutions (Goldenberg, 2021).

Scientific literature on publics' understandings of vaccines often positions vaccine decision making as a trichotomy: those who are "pro-vaccine" and thus decide to vaccinate, those who are "anti-vaccine" and thus refuse inoculations, and those who are "hesitant" and may or may not

decide to vaccinate. While vaccination behaviour itself might represent a dichotomy (i.e., one can either be vaccinated or unvaccinated), vaccination decisions exist within a complex and dynamic continuum of vaccine beliefs and behaviors (Dubé et al., 2016).

Not only does this popular trichotomy position fail to acknowledge the vast diversity in perspectives, it also positions vaccine decision making as a static belief or character trait. Instead, vaccine decision making in the context of COVID-19 may be better be understood as dependent on Ontarians' considerations of specific factors, including details about the virus itself (such as it's origin, virility, and drivers of transmission); perceived individual and population-level risks (such as short and long-term side effects, dose availability, and vulnerability status as it relates to vaccine access); and details about the vaccine itself (such as the expedited timeline of vaccine development, funding and regulatory bodies, and its safety and efficacy standards relative to other vaccines). Vaccine decisions are not made in a vacuum; external factors are bound to influence these choices. No better illustration of the complexities of vaccine decision making, (and the ways in which external factors influence vaccine opinions) can be found than in current discussions around a COVID-19 vaccine.

Method

The present study is a qualitative analysis of interviews with residents of Ontario about their perspectives on a potential COVID-19 vaccine. The goal of the research was to answer the following questions: "what concerns do Ontarians have with respect to a potential COVID-19 vaccine" and "how do Ontarians feel about a COVID-19 vaccine in relation to other vaccines?". It is important to note that these interviews took place between July and August of 2020, months before Canada had officially approved any COVID-19 vaccine for use. Thus, participants discussed potential COVID-19 vaccines and were not necessarily referencing any specific vaccine(s) which have been approved since the time of data collection.

A total of 40 participants were recruited using purposive sampling strategies to achieve demographic diversity along factors of age, ethnicity, and gender. All participants were Ontario residents who had previously responded to a larger national survey between March and April of

2020, and agreed to be contacted for future participation opportunities (see Kennedy et al., 2020). Eligibility criteria were: 18 years of age or older, English-speaking, Ontario resident[5]. This research was approved by the University of Guelph's research ethics board (REB#20-05-035).

Participants ranged in age from 23 to 73 years (mean age of 48), with 26 women and 14 men participating in the study[6]. I sought demographic diversity and the demographic variation of White and visible minority participant ethnicity in this study closely resembles national distributions, wherein roughly 22.3% of Canadians identify as visible minorities according to census data[7] (Statistics Canada, 2016). For further details about participant demographics, please see Table 1.

With assistance from a project manager, I recruited participants via email recruitment letter (see Appendix A), using email addresses of participants from the broader quantitative study who indicated interest in future research opportunities. Those who were interested in participating in the present study electronically signed and returned the consent portion of the recruitment letter, and appointments for interview were scheduled. In keeping with physical distancing recommendations (Public Health Agency of Canada, 2020), all participants were given the option of telephone or WebEx interview; all 40 participants opted for telephone. Prior to each interview, participants were given the opportunity to review the consent form with the interviewer (either VN or project manager) and ask any questions about the research. I conducted half (n=20) of the interviews and the project manager conducted half (n=20) of the interviews, assigned at random. Each semi-structured interview lasted between 25 and 60 minutes and was

[5] For the purpose of this study, "resident" of Ontario includes Canadian citizens, permanent residents, and citizens of other states or countries who are currently living in Ontario.

[6] Demographic data reported here was collected as part of the larger quantitative study. Participants reported their age by providing birth year, and gender was reported using "male" "female", or "other".

[7] participants were asked to report their ethnic background, from a list including "White", "Black", "Arab", "Chinese", "Filipino", "Japanese", "Korean", "Latin American", "Aboriginal (e.g., First Nations, Métis, or Inuk/Inuit)", "West Asian (e.g., Iranian, Afghan)", "South Asian (e.g., East Indian, Pakistani, Sri Lankan)", "Southeast Asian (e.g., Vietnamese, Cambodian, Laotian, Thai)", "Prefer not to say", and "Other (please specify)".

audio-recorded with the participant's permission. Participants were compensated with a $20 e-gift card to their choice of Amazon, Loblaws, or Starbucks.[8]

Interviews were semi-structured, using an interview guide created by the research team (see Appendix B), to generate discussion and ensure that all interviews covered key topics of interest. Participants were asked about various topics including: their experience of life throughout the COVID-19 pandemic, their decision making with respect to the optional annual flu shot, and their concerns about a potential COVID-19 vaccine. Given that this study is nestled within a larger body of research about Canadians' experiences of COVID-19 (see Kennedy et al., 2020), the interview guide was developed to include various topics of interest beyond perspectives on a potential COVID-19 vaccine. As such, the interview guide was designed to be broader than the scope of this work and not all topics of discussion are included in the present analysis which centers around potential vaccines.

All of the interviews were transcribed using Otter.AI software, and manually verified by members of the research team to ensure accuracy by correcting errors as required. I analyzed these interview excerpts using an iterative method with particular attention paid to excerpts that demonstrated concerns or opinions about a potential COVID-19 vaccine.

Interviews were coded and analyzed using an inductive thematic approach informed by Braun and Clarke (2013). The coding process adopted Braun and Clarke's (2006) reflexive six-step method in an iterative manner to allow for the construction of reoccurring themes from the data: 1) familiarization with the data; 2) generating codes; 3) constructing themes; 4) reviewing potential themes; 5) defining and naming themes and 6) producing the report. This analysis was informed by an inductive or "bottom up" approach (Braun & Clarke, 2006), such that most of the analysis was data-driven, with room for the exploration and expansion of theoretical topics.

[8] A handful of participants chose not to receive compensation, and instead a $20 donation to the Guelph Foodbank was made on their behalf.

Results

Applying Braun and Clarke's (2006) reflexive thematic analysis, I sought to answer my research questions about Ontarians' concerns with respect to a potential COVID-19 vaccine. Contrary to the aforementioned trichotomy of "pro-vaccine" "vaccine hesitant" and "anti-vaxx", participants in this study had much more nuanced ideas about the COVID-19 vaccine, and perceived their decision making to be influenced by contextual factors rather than pure ideology or a pre-determined stance on vaccinations as a whole. These interviews made salient just how complex vaccine decision making is. Participants articulated the myriad ways in which their decision making might be affected by various issues, including characteristics of the vaccine and its development, the vaccine rollout schedule, and perceived trustworthiness of vaccine information sources.

In discussing COVID-19 vaccine development, participants expressed concerns about the accelerated timeline along which a COVID-19 vaccine was developed. Not only did the accelerated timeline represent an inherent concern in and of itself, it also served as a catalyst for more specific concerns about the safety and efficacy of a potential vaccine being developed at an expedited pace. Participants also expressed concerns around their perceived personal uptake timing relative to other Canadians. In addressing the potential solution to these concerns, participants identified sources from whom they could gather information to help make personal vaccine uptake decisions, as well as sources who were deemed untrustworthy.

Importantly, even though some participants reported optimistic attitudes toward a potential COVID-19 vaccine, no participant reported being completely unconcerned or worry-free. That is to say that no participants in this sample were willing to blindly accept a vaccine. Even the participants who were most eager and optimistic for a potential COVID-19 vaccine wanted certain standards and criteria to be met before deciding to vaccinate.

Rushing Vaccine Development

Due to the expedited nature of the COVID-19 vaccine development, participants indicated concerns about potential consequences that might arise from developing a vaccine on an accelerated timeline. Irrespective of whether people identified as pro-vaccine for established vaccinations, participants identified the expedited timeline of the COVID-19 vaccine as a unique concern that would make this vaccine distinct from established ones.

On one end of this spectrum, participants felt that the expedited timeline might be concerning, but would ultimately have little impact on their own vaccine decisions. For most of these participants, concerns about an unusually sped up timeline were mitigated by the belief that additional resources allocated to COVID-19 vaccine development could make up for the condensed timeframe, and the belief that a "normal" level of scientific rigour would still be maintained. For example, Esther described the unprecedented timeline in relation to the allocation of resources for vaccine development:

> "This is going to be done between everybody says 12 to 18 months, which is just unheard of and unprecedented. But on the other hand, there's enormous amounts of resources, money and brainpower being thrown at this and humans are very, very capable of meeting huge challenges. So I think on the one hand, yeah, it's kind of scary, but then I think no, I mean, people, people do incredible things all the time. So this is one of those and everybody is trying to do it. And they're piggybacking on all kinds of incredible developments and breakthroughs that have been made for existing vaccines and people who are studying molecular biology and virology and all of those different disciplines. They're pooling all their resources. I think it's actually a really wonderful thing that's going on."

In this example, the timeline of vaccine development is a source of tension that Esther weighs against the perceived increase in allocation of resources. In thinking about whether or not she wishes to receive a vaccine that has been developed on a shortened timeline, Esther says she recognizes that the people behind vaccine development are rising to the occasion and are well

resourced. In doing so, Esther expresses a belief in the potential of humankind as being capable of “meeting huge challenges”. In ordinary circumstances, resources with which to develop a vaccine on such a quick timeline would be hard to come by. In a global pandemic, the notion that “everybody is trying to do it” is making the impossible (i.e. development of a vaccine on an expedited timeline) possible.

Unlike Esther, another group of participants reported feeling that their concerns about the expedited vaccine development would ultimately influence their own vaccine decision making. Some of these participants who claimed to feel comfortable with traditional vaccines suggested that the accelerated development of the COVID-19 vaccine is what sets it apart from the rest. One such participant, Ngozi, explained that despite generally supporting vaccines, the COVID vaccine made her nervous because both the vaccine and the virus it is intended to supress are so new:

> “It's funny cause I am someone who does support vaccines, but for some reason, it's the COVID vaccine that I'm very nervous about, because it's like the vaccines that we've had, you know, like, up ‘til now, like they've been rigorously tested and researched and they've been used over a long period of time, but because this one is so new, for a virus that is again, like so, so new (.)
> . . . It's like, how, like, Health Canada could say that, you know, they're very confident in this. But again, like, I'm looking at it in terms of the timeframe. Like if it's something that they released, like at the end of this year, like I absolutely would not take it, because I think it's too soon. But if it's something if COVID is still with us, maybe like, you know, four or five years from now, and it's a vaccine that they developed and it's come out at that time, then I would be more likely to just because more time has passed, so that's like they've had more time to study.”

In this case, Ngozi stated that the timeframe of vaccine release will directly impact her likelihood to receive the vaccine. If the vaccine was developed over a matter of years, Ngozi said she expects that Health Canada will have had more time to study it, thus making her more likely to receive the potential COVID-19 vaccine. When participants like Ngozi commented on their

worries about the expedited timeline of vaccine development, they weren't raising the issue as a matter of principal. Instead, participants perceived that the rushed timeline of vaccine development might lead to decreased scientific rigour, ultimately resulting in a less trustworthy vaccine.

What's In the Vial?

When discussing their perspectives on a potential COVID-19 vaccine, participants expressed concern with respect to the vaccine itself, and the science behind it. Participants raised two issues in particular, the safety of a potential COVID-19 vaccine as it pertains to short and long term side effects, and how effective a potential COVID-19 vaccine would be at providing individual and population level protection from the disease. Participants reported both of these concerns as having the potential to shape their future vaccination behavior.

Safety

When discussing safety concerns, participants considered a trade-off between potential side effects of a COVID-19 vaccine and the symptoms of contracting the disease itself.

As with existing vaccines, most participants expected that a potential COVID-19 vaccine would come with the possibility of some side effects. While participants were troubled by the risk of suffering these potential side effects, most were unbothered by the potential for mild and immediate side effects such as swelling, pain on injection site, or low grade fever within a few days. Although participants described these potential side effects as something they wanted to be made aware of prior to being vaccinated, most felt that some degree of risk was acceptable. For example, Harmony felt comfortable with the degree of risk associated with traditional vaccine side effects, however she wanted to ensure that a large enough sample size had been tested to accurately predict the likelihood of suffering these side effects:

> "The side effects you'd expect with a normal vaccine, you know, some swelling, some mild flu-like symptoms. That's acceptable. All vaccines pose some sort of side effects for some individuals, but I wouldn't be comfortable until it was just a minimal

like result, maybe only 5% of people experienced a negative reaction. Like it'd have to be really (.) really tested to not have major side effects as well."

Assuming the risk for potential side effects of a potential COVID-19 vaccine were known and made available to publics, many participants considered the potential side effects of a COVID-19 vaccine relative to the symptoms of COVID-19 itself. For this reason, Deborah expressed sympathy toward people who are more anxious about vaccine side effects than she is. Deborah's perspective suggests that, just as the decision to vaccinate can be associated with a degree of control over one's personal health, so too can the decision not to vaccinate:

"It's like, there's side effects of vaccines, but there's also side effects with COVID. And (.) I guess they're picking and choosing exactly what they'd like to suffer."

Deborah's remark reminds us that when it comes to vaccine decision making, there is no risk-free decision. The perspective that Deborah articulates suggests that people who choose not to vaccinate might be doing so in a way that is more exacting than flippant; people who choose not to vaccinate might be choosing the potential symptoms of COVID-19 over the potential side effects of a vaccine. While this perspective hinges on the assumption that one can know all of the potential ramifications of either option, it does serve as a reminder that some people (like Deborah) understand people who choose not to vaccinate as choosing exactly what they do and do not want to suffer.

Efficacy

Distinct from discussion around the safety of a potential vaccine, participants raised concerns about whether or not a potential COVID-19 vaccine would work as well as it ought to.

Some participants, like Alistair, were concerned about the level of protection a potential COVID-19 vaccine could provide for different bodies or groups of people. Alistair was particularly concerned about the effectiveness of a potential vaccine for people within his age group:

> “My one concern normally I would have no hesitation. My one concern is they seem to think that this vaccine may not work very well for older people because their immune response may not be strong enough to make it work. I'd like to know that. Now once they've done phase three trials, they should know this pretty well. But yes, I'm not really terribly worried about reaction, I'm worried that it won't actually work. And then if you think you're protected, and you go off and do the normal things of things, pre lockdown that you did, then you're going to catch it, that's when it's going to get you.”

Alistair’s concern reflects an interest in receiving a vaccine that is effective enough to provide him with personal protection despite his understanding that a potential vaccine might not be as effective for older people. Participants raised concerns about different age groups and body types; some participants were primarily concerned about vaccine efficacy in older populations, others were specifically concerned about younger populations. While concerns like Alistair’s address the downstream effects of vaccine efficacy in older populations, another participant, Hannah, was concerned about the possibility of ineffective vaccines leading to “needless” vaccination in children:

> “This whole like thing about, you know, the flu vaccine and then I get the flu afterwards like, I don't think that that's going to be like a potential harm, but it's more just like are we subjecting kids needlessly to a vaccine that may not always be 100% effective?”

Implicit in Hannah’s concern is the belief that vaccinating children should not be done heedlessly. Hannah expresses a desire to know the efficacy of a potential COVID-19 vaccine so that we can know that there’s a purpose behind “subjecting” children to vaccination.

From concerns about giving people a false sense of protection to needlessly subjecting populations to vaccines, the efficacy component of a potential COVID-19 vaccine was one that participants wanted to see addressed prior to making personal vaccine choices.

"Not First In Line"

Overall, considerations about *when* one might decide to receive a potential COVID-19 vaccination was an issue that participants grappled with. Participants spoke about their potential COVID-19 vaccine decisions along a perceived timeline from vaccine availability to (eventual) personal uptake or refusal. Some participants indicated that they would likely feel comfortable in "going first" to be vaccinated towards the beginning of the vaccine's availability. Of the participants who expressed this desire, reasons varied from feeling like they were the healthiest, most appropriate candidate to test a vaccine with unknown side effects on, to perceiving relative vulnerability or susceptibility to COVID-19 and therefore having the most to gain from a COVID-19 vaccine.

In contrast to this willingness to go first, a notable majority of participants expressed that while the rollout of a COVID-19 vaccine might be important to themselves and their communities, they didn't want to be the first ones vaccinated. This concern about going first is largely explained by issues examined in previous themes of this section. Participants had concerns about the accelerated timeline of a potential COVID-19 vaccine development (and ensuing worries around safety and efficacy) and sought to address these concerns by delaying getting the vaccine, so as to allow more time for data on safety and efficacy to be collected.

Some participants clarified that they might be comfortable being first-in-line to receive *established* vaccines, but due to the newness of COVID-19, they might delay uptake. One example of this perspective comes from Aria, who said:

> "I'm a strong supporter of vaccines, and I get all of my vaccines, but I think that when it's brand new I want to wait. But I don't know even how long is, wait, like, like what I'm talking about would be years for me to really know if there's any long term side effects. So I don't know how long I'd be willing to wait, because I do want to see like my parents, for example that are elderly. So I want to, you know, maybe get the vaccine sooner rather than later, just so I can interact with them. But, I just know I wouldn't be the first wave to go and get it."

Aria described wanting to get a COVID-19 vaccine so that she can feel safe in visiting her elderly parents. However, because the vaccine will be so much newer than other vaccines she has gotten in the past, she wants to hold off on receiving it. Like other participants, Aria did not point to any objective parameter that will be satisfied by holding off on the vaccine, but she said the idea of letting fellow Canadians receive the vaccine first before making the personal decision on inoculation will bring her a sense of comfort. Some participants reported that the idea of allowing others to get vaccinated first ameliorated concerns around a condensed vaccine development timeline. Participants described the expectation that they would be able to make up for their discomfort around shortened development timelines by noticing how the community rollout goes before deciding to vaccinate themselves. Jordan, one participant who envisioned the period between vaccine availability and personal decision making as an extension of the vaccine trial phase, said the following:

> "So if it's released, I'm not going to get it immediately, until a large enough sample size of the population has taken it and has been proven not to have any problems."

Like Jordan, some participants mentioned that a certain number of people getting vaccinated before them might affect their perception about a COVID-19 vaccine, whereas for other participants, the timeframe (in terms of weeks, months, or years from vaccine trials to availability) was perceived to be a more important deciding factor.

Who To Trust?

Participants expressed concerns about the teams of people who are developing, administering, and regulating a COVID-19 vaccine. Participants identified certain people and institutions whom they felt were untrustworthy, or whose information they would not consider when making vaccine decisions. However, participants also reflected on the trustworthy people and institutions who might significantly influence their personal vaccine decision making. Some participants reported that their trust in a vaccine could be credited to the people and organizations behind its development. Others reported that the type of authority (e.g., scientists

versus politicians) from which the information came would greatly affect the way vaccine information was taken up.

With respect to trust of these actors, participants ranged from reporting explicit trust in the people who are involved in vaccine development, to implicit trust in the system or system(s) they perceive to be contributing to vaccine rollout. David expressed his reasoning for trusting these people and institutions by saying:

> "If a vaccine is produced, I trust that it's going to be the same standards that all other vaccines are out there, and I would hope that every school makes it mandatory to put that vaccine in place for a return to school or I guess after a grace period."

Without identifying precisely in whom or what he trusts, David suggests that he imagines there to be some sort of failsafe in place which will ensure a COVID-19 vaccine is held to the same standards as established vaccines, which David perceives to be safe. He indicates implicit trust in both the unseen producers of a potential vaccine, as well as more local regulators such as school policy developers.

In contrast to these implicit assertions of trust, some participants explicitly identified the specific people, bodies, or institutions in whom they trust, like Leanne who said:

> "I really trust the public health authorities of Canada. And so I think if a vaccine came on the market that wasn't trustworthy enough we would know like, I don't think the Government of Canada or the various health units in the Government of Canada would recommend vaccines that weren't, you know, like rigorously tested and proven to be safe."

Here, Leanne explicitly attributes her trust in the vaccine to public health authorities of Canada and the Government of Canada who would be administering and regulating the vaccine. She says she thinks that we would be made aware of any issue with a vaccine that was developed, and also expresses the belief that a vaccine wouldn't be recommended if it wasn't proven to be safe.

Other participants contrasted their trust in medical and scientific professionals against other entities. Barbara explained:

> "I tend to put very little store on people like Trump or politicians in terms of (.) information that they're generating. I try to stick pretty much to the scientific community if at all possible."

In comparing scientific experts to members of government, Barbra described paying little mind to information disseminated by non-scientific agents. Ultimately, participants expressed their trust in the potential COVID-19 vaccine as proxied by the various institutions or stakeholders who are working on development, rollout, and regulation.

Discussion

The aim of this study was to deepen our understanding of how Ontarians envisage themselves making COVID-19 vaccine decisions. The present research adopts Maya Goldenberg's (2021) thesis on the conceptualization of vaccine hesitancy. Rather than a product of a "war on science" or public misunderstanding and ignorance, Goldenberg's work recasts vaccine hesitancy as a "sign of poor public trust of medical and scientific institutions" (p. 26).

Given that vaccines are generally designed to prevent future illness rather than treat present illness, they are usually administered to healthy people and thus require a greater level of trust than other medical interventions which treat imminent, tangible, or visible need (May, 2017). Working under the assumption that all vaccines have some potential for adverse effects, we must recognize that there is inherent risk in vaccinating populations (noting that this does not detract from the successful mitigation of the risk of disease that the vaccination achieves). Further, vaccination issues like needle fear and pain caused by needles have the potential for proximal and distal consequences such as noncompliance toward healthcare behaviors (McMurtry et al., 2015). This means that vaccinating publics with an unsafe or ineffective vaccine could represent an unnecessary health risk with undue consequences.

This analysis sought to move beyond identifying whether Ontarians are generally “pro” or “anti” COVID-19 vaccine, and instead gave participants an opportunity to articulate which factors might play into their attitudes and behaviors (including voicing their concerns) around a COVID-19 vaccine. Across all of the interviews, a salient element was participants’ reference to the complexities of COVID-19 vaccine decision making. Each participant identified a set of considerations that they felt were important to their individual vaccine decisions, even when they self-identified as being “pro-vaccine”.

Almost all participants explicitly expressed concerns about the potential side effects that might accompany a COVID-19 vaccine. It is not uncommon for conversations around vaccines to include discussion of potential side effects, but the difference in the way side effects are understood and talked about by experts and lay publics is important. While public health communication often lists mild symptoms of vaccination (i.e. low-grade fever, chills, pain on injection site) as "side effects", participants in this study used the term "side effects" to refer to more detrimental, life-threatening consequences from a novel vaccine. Participants in this study were largely unbothered by the potential for mild side effects. Some scholars argue that these mild symptoms of inoculation are not “side” effects at all, rather they are the intended effects which signal that one’s body is responding appropriately to the vaccine (e.g., see Collins, 2021). Instead, participants raised concerns about the (albeit rare) potential for significant, life-changing side effects from the vaccine, as well as those effects which might not be presently known. Future research should aim to better understand the discrepancies between the way publics and experts define “side effects” when talking about vaccines.

While vaccine decisions are made at an individual level, community spread is an issue that people consider when making vaccine decisions, and even the most personal decisions about vaccine uptake are made on the bases of more than just risk versus reward. The risk of side effects of a potential COVID-19 vaccine would only be taken up by the person choosing to be inoculated, however the risk of contracting COVID-19 itself comes with the potential risk of infecting others through transmission. Thus, it becomes increasingly complex for people to weigh the perceived dangers of side effects from a COVID-19 vaccine against the perceived possibility of contracting – and potentially spreading – the disease itself. In this way, participants

demonstrate that decisions around vaccination are not made by merely measuring potential risk against potential reward and using the sum of this mental equation to dictate vaccine acceptance or refusal.

While it is easy to blame vaccine hesitancy on uneducated or misinformed publics, participants in this study demonstrated an interest in the science and development behind a potential COVID-19 vaccine. This interest and valuing of scientific or medical evidence heavily factored into participants' considerations about whether or not they would be vaccinated. Participants commented on the trustworthiness of vaccine researchers and scientists as opposed to politicians or elected health officials, and thus considered the source of scientific knowledge to be an important factor in their vaccine decision making. Specifically, several participants addressed the ways in which they perceive COVID-19 researchers to be trustworthy in their communication of findings, while politicians and elected officials might have a vested interest in perpetuating particular narratives about a potential vaccine. This perceived trustworthiness of researchers allowed participants to evaluate the science behind a potential vaccine in earnest, whereas distrust toward others (most notably politicians) lead participants to feel just as skeptical about any information they receive as the source from which it comes. Given these findings, it seems important that such details about a potential COVID-19 vaccine are clearly communicated prior to asking publics for vaccine buy-in.

In addition to scientific developments, participants identified the timeline of vaccine rollout as an important consideration for when they might decide whether or not to receive a potential COVID-19 vaccine. Participants understood a potential COVID-19 vaccine to be developed on an expedited timeline, relative to previous vaccine development. For some participants, this shortened development timeline was treated as an inherent risk of the novel vaccine, whereas other participants were only concerned with the downstream effects of the faster paced development (i.e., decreased safety and efficacy standards).

To mitigate concerns about an expedited vaccine timeline, participants envisaged their own vaccine decision making at various points along a timeline from availability to uptake, with particular attention paid to factors that might influence their decisions during this "extended

trial" period. Generally, participants identified some parameter(s) that, once met, would allow them to decide whether they wanted to be vaccinated. For some participants, this parameter was the amount of time (in days, weeks, months, or years) that the vaccine was on the market without being recalled. For others, this parameter was more closely linked to the number of people vaccinated before them.

Generally, participants perceived this "extended trial" time as a period within which they could notice possible effects (both good and bad) of the vaccine on others before deciding whether they would be inoculated themselves. Some participants indicated that they would be comfortable "going first" due largely to their trust in vaccine producers as well as regulatory bodies. This finding can be taken up by Canadian public health planners in guiding the information and messaging released during vaccine rollout. Understanding that Canadians have different parameters to consider before making vaccine decisions could help to inform how and when public health decision makers release news and statistics pertaining to vaccine rollout.

Based on findings from the present study, knowledge around the number of people vaccinated and the incidence of side effects (if any) will help to inform the vaccine decisions of Canadians, thus accurate and timely reporting of such figures seems imperative to a successful implementation of the potential COVID-19 vaccine.

In line with existing arguments (namely Goldenberg, 2021), the present study highlights the ways in which vaccine decisions are significantly impacted by trust and mistrust of the people, bodies, and institutions involved in the development, distribution, and regulation of a potential COVID-19 vaccination. Participants communicated their trust and distrust of these agents in a variety of ways, ranging from implicit signalling of trust in unseen regulatory systems or governing bodies which will protect Canadians from a harmful vaccine, to the explicit articulation of those deemed "trustworthy". Participants considered details about the origin of the vaccine, the funding bodies which allowed for its development, and the mechanisms which might promote or prevent vaccine rollout in the Canadian context. Understanding which people or institutions are involved in the development and distribution of a COVID-19 vaccine allows

Canadians to carefully evaluate the trustworthiness of the vaccine itself, and is therefore a crucial detail that should be explained transparently to all Canadians.

Given the magnitude of the COVID-19 pandemic, and the marked impact it has had on our national and local economies, it seems imperative that the questions and concerns Canadians have about the COVID-19 vaccine be addressed in a timely manner. The present research concludes that Ontarians 1) report concerns about the shortened timeframe within which a COVID-19 was developed, 2) imagine that their concerns about the vaccine's safety and efficacy (sometimes understood as a by-product of quicker vaccine development) will affect their willingness to vaccinate, 3) understand the timing of personal vaccination uptake relative to other Canadians as a tool with which to mitigate vaccine concerns, and 4) report that they will turn toward or away from a COVID-19 vaccine depending on who supports it.

This research demonstrates that people are experiencing tension in negotiating potential vaccine decisions on an individual basis while considering publics and individuals with needs different from their own. These findings highlight important considerations which should be accounted for in the potential rollout of a COVID-19 vaccine. Understandings gleaned from this research not only demonstrate those factors which Canadians are considering when thinking about COVID-19 vaccine decisions, they can also help to inform and guide Canadian policymakers and public health toward the successful implementation of a COVID-19 vaccine.

Future Directions

One consideration for future research (though it was not the aim of this study) is to give voice to members of marginalized communities typically underserved by health research will be important when conducting similar COVID-19 vaccine related studies. Additionally, our study did not require participants to identify as having concerns about a COVID-19 vaccine prior to participation. Future work might seek to recruit those Ontarians who are more vocal in their hesitancy toward a potential COVID-19 vaccine, so as to delve deeper into the specific concerns Ontarians have about vaccination.

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TABLE 1

Table 1

Participant Demographics

Demographic Variable	No. (%)
Age (Years)	
21-30	6(15)
31-40	10(25)
41-50	6(15)
51-60	6(15)
61-70	10(25)
71-80	2(5)
Gender	
Female	26(65)
Male	14(35)
Income	
$100,000 to $149,999	8(20)
$80,000 to $99,999	7(17.5)
$150,000 or more	4(10)
Prefer not to say	3(7.5)
$50,000 to $59,999	3(7.5)
$60,000 to $79,999	2(5)
$40,000 to $49,999	1(2.5)
$15,000 to $19,999	1(2.5)
Skipped question	11(27.5)
Ethnicity	
White	30(75)
Chinese	2(5)
Aboriginal	1(2.5)
Arab	1(2.5)
Black	1(2.5)
Korean	1(2.5)
Mix-Anglo Indian	1(2.5)
South Asian	1(2.5)
Prefer Not to Say	2(5)
Level of Education	
University certificate, diploma, degree above the bachelor's level	12(30)
Bachelor's degree (e.g. B.A., B.Sc., LL.B.)	11(27.5)
College, CEGEP or other non-university certificate or diploma	3(7.5)
High school diploma or a high school equivalency certificate	3(7.5)
Skipped question	11(27.5)

APPENDIX A

Interview Guide

General COVID-19

- How is COVID-19 affecting your life?
- What are currently your biggest concerns about COVID-19?

Vaccine (population/policy)

- Some people think that a COVID vaccine is the best or only way to end the pandemic. What do you think about that?
- Some vaccinations are required for children to attend school unless they have valid exemptions. What would you think about adding a COVID-19 vaccine to the required immunizations?

Vaccine (personal)

- Every year, Ontarians have the option to receive a seasonal flu shot. How do you make the decision about whether or not to get a flu shot?
- Imagine that a COVID-19 vaccine became available in the next 12 months. How would you go about deciding whether or not to get the vaccine? What factors might play into this choice?
- Vaccines can be a contentious issue for lots of reasons. Have you ever felt hesitant about getting a vaccine? Why?
    - Which factors most affect your choice in choosing whether or not to receive a vaccination?
- [For respondents who reported living with children in the survey]
    - Are you a parent or guardian for a child/children?
        - How do you feel about your child/children getting a COVID-19 vaccine?

Vaccine (media)

- What types of messages have you seen in the media about vaccines?
- Sometimes people share messages about vaccinations on their personal social media platforms (Facebook, Twitter, Reddit). In what ways have these messages shaped your view toward vaccines?

Wrap-Up

- Is there anything else you'd like to mention about your perceptions on a COVID-19 vaccine that you don't think were covered during this interview?

APPENDIX B

Recruitment Letter and Consent Form

Hello,

You are receiving this email because you completed a survey about COVID-19 earlier this Spring and indicated interest in participating in future surveys or interviews. You are invited to participate in a research study about people's views on a potential vaccine for COVID-19. This information letter is to help you decide if you want to be involved. If, after reading through this information letter, you decide to participate, please sign the consent form (last page) and return this document via email. Upon receipt of a signed consent form, the researchers (either Vivian Nelson or Jenna Vikse) will contact you to schedule your interview.

Purpose of the research:

Researchers in many parts of the world are currently trying to develop a vaccine against COVID-19. The goal of this research is to learn more about what people think about the possibility of receiving a COVID-19 vaccination, if such a vaccine is developed.

Who is conducting this research study?

This research study is being conducted by Vivian Nelson, MA student (nelsonv@uoguelph.ca), and Jenna Vikse, Project Manager (jvikse@uoguelph.ca) in the Department of Psychology at the University of Guelph in Guelph, Ontario. The project is supervised by Dr. Kieran O'Doherty, Associate Professor, Department of Psychology, University of Guelph, odohertk@uoguelph.ca, 519-824-4120 x 58919. After the interviews have taken place, undergraduate student Cheau Yuan Foo (cfoo@uoguelph.ca) will assist in transcribing and/or analyzing the results of the data. Dr. Eric B. Kennedy, Assistant Professor, Department of Disaster & Emergency Management at York University (eric.kennedy@yorku.ca), and Dr. Claudia Chaufan, Associate Professor, Department of Health Studies at York University (cchaufan@yorku.ca) will not be transcribing the data, but may be involved in analyzing the results of the data, using de-identified transcripts.

Why am I being invited to participate in this research study?

You are being invited to take part in this study because:

- You are an adult aged 18 years or older
- You live in Ontario
- You understand and speak English
- You have previously completed a survey about COVID-19 and indicated interest in participating in future research

What will I be asked to do?

You are invited to be interviewed on your thoughts and opinions about a potential COVID-19 vaccine (e.g., "How do you feel about the possibility of receiving a COVID-19 vaccine, if one becomes available?", "What concerns do you have about a potential COVID-19 vaccine?", etc.). You are invited to answer in your own way, using your own words and drawing on your own experiences. There are no "right" or "wrong" answers, we are just looking for input from people like you.

During the interview, you will be asked to provide your full name and email address for compensation purposes. No further demographic information (age, occupation, etc.) will be collected during this interview, as you already provided that information when you completed the initial survey about COVID-19 earlier this Spring.

- Because of physical distancing requirements, you may choose to be interviewed virtually using WebEx (a free videoconferencing service), or through telephone interview. The interview can be scheduled at a date and time that is convenient for you. The interview should take approximately 30-60 minutes, though the exact duration of your interview may vary.

Are there any risks or possible negative outcomes for me if I participate?

There is no foreseeable risk or harm related to participating in this study. However, there is the possibility that while answering some of the questions you might feel upset or uncomfortable as COVID-19 and vaccines may be a stressful or sensitive topic for some. If you feel distressed at any point during the interview, please notify your interviewer. Your interviewer will discuss these feelings and provide you with contact information for resources if you would like to talk to someone about your distress. At any point during the interview you can choose to take a break, skip questions, or end the interview.

A list of resources for counselling and other support services will be distributed to all participants before the interviews take place, for you to reference in the event you would like to talk to someone in the days or weeks after our discussion. If you experience any discomfort during the study, you are encouraged to contact your family doctor, a mental health professional in your area, or the researchers (contact information is provided above). If you feel significantly upset at any point during the interview, you are encouraged to contact a local crisis line, or call emergency services.

To find help in your area, please visit:

- The Ontario Psychological Association to find a psychologist in Ontario https://www.psych.on.ca/Utilities/Find-a-psychologist.aspx.
- The Canadian Mental Health Association to find resources and tips for getting help in your area www.cmha.ca.
- Call 211 to find other helplines, crisis services, distress centres, and support groups.

What are the benefits of the research project?

Participation in this research project yields are no direct benefits to participants. However, the results of this study will help policymakers, scientists, health care workers, and other researchers understand the issues that Ontarians are concerned with when it comes to a possible COVID-19 vaccine. It will help to make sure that science and policy can account for the opinions of Ontario residents. Your participation can help shape the COVID-19 response.

After I agree to participate and sign the consent form, can I change my mind?

Your participation in the research is completely voluntary and participants may choose to stop participating at any time without any consequence or penalty. Your decision to discontinue will not influence the nature of your relationship with the researchers or with staff at the University of Guelph either now or in the future. Furthermore, you are not obligated to answer any questions that you do not want to, and your participation in the study will not be affected if you choose not to discuss certain topics with the interviewer or ask to move on to another topic during the interview.

If you choose to withdraw during the interview, all data collected up to that point will be destroyed and not used as part of this project.

If you change your mind about participating after your interview concludes, you can contact the researcher up to 14 days after your interview date and request to have your interview data destroyed. Your honorarium eligibility will not be affected by this action. After that point in time, the data from your interview will be de-identified and integrated into the overall data set and it will no longer be possible to remove it.

Prior to your interview, I will review this information letter with you, remind you of the procedures to be carried out, and confirm that you still wish to participate in the research.

Who will know what I said or did in the study?

The interview will be recorded with a either a digital audio recorder or WebEx's record feature, and may be supplemented by field notes made during our discussion. Field notes will be taken electronically, and will be stored on an encrypted computer, within a password protected

document. After recording the interview, the dialogue will be transcribed with all names replaced with pseudonyms to ensure confidentiality.

All data will be stored and archived securely on encrypted computers using a password-protected drive space, which can be accessed only by qualified laboratory personnel under the supervision of the faculty supervisor. The York University faculty collaborators (Dr. Eric Kennedy and Dr. Claudia Chaufan) will not have access to raw audio or audio-visual files, and only the de-identified transcript data will be shared with them (via institutional email). Please note that confidentiality cannot be guaranteed while data are in transit over the internet .Your name will not be released, nor will it appear in any other forms of dissemination. We will take precautions to not use any information that may allow you to be identified when writing future publications resulting from this research (e.g., inadvertent data linkage through identifiers like occupation, ethnicity, or hometown). However, please be aware that we are sometimes identifiable through the stories we tell – this should be kept in mind when deciding what to share in your interview.

How will you protect the information I provide? How will my data be stored?

The interview will be recorded on a password protected audio recording device, or using WebEx's audiovisual recording feature. Once the interview concludes, the recording will be uploaded within 24 hours to a secure University of Guelph lab drive, accessible only from an encrypted laptop. The lab drive is only be accessible by faculty and graduate students associated with Dr. O'Doherty's research laboratory. The transcripts from this study will reside in a password protected file accessible only by the research team named above.

Transcription of the interview will be completed within 60 days of your interview. While transcribing interviews, direct identifiers (e.g., name, work place, etc.) are removed and replaced with a pseudonym or code. The original raw audio or audiovisual files will be permanently deleted from the audio recording device and/or WebEx as soon as copies of these files have been uploaded to Dr. O'Doherty's secure research lab drive. These audio and audiovisual files will be stored in the lab drive for one year (365 days) from the date of the interview, to reference in the event of discrepancy or error within the de-identified transcript. Only the research team at the University of Guelph (Dr. Kieran O'Doherty, Vivian Nelson, Jenna Vikse, and Cheau Yuan Foo) will ever have access to the audio and audiovisual files, as well as the list of codes that link participants' real names or other identifiers. This information will be contained in a password-protected file on Dr. O'Doherty's research lab's drive, and only the University of Guelph research team will have the password. After one year from the date of interview, these audio and audiovisual files as well as the master file will be permanently deleted from the lab drive. The de-identified transcript data will be stored indefinitely, as it may be pertinent to a future research topic on vaccine perceptions, and may be used for future research projects.

How will you use the information you collect?

The analysis of this de-identified data will appear in Vivian Nelson's Master's thesis and may be published elsewhere through peer-reviewed journals. The analysis of de-identified data might also be presented at international conferences by members of the research team.

Will I receive any incentives for my participation?

Participants will receive a $20 e-gift card to their choice of: Starbucks, Amazon, or Loblaws. You will need to provide a preferred email address to receive your incentive. Your email address will be collected separately from the rest of the study data and will not be linked to your responses to any questions in the study. If you consent to take part in this project, you will receive an e-gift card through email within 14 days of your interview. E-gift cards to Starbucks, Amazon, or Loblaws never expire. The file containing email addresses provided for compensation will be deleted after the incentives are disbursed.

Will I receive information about the results of this research?

If you would like a copy of an executive summary of the results of this project, please provide your email address and a copy will be emailed to you at the end of the research project.

What are my rights as a research participant?

You do not waive any legal rights by agreeing to take part in this study.

Information you provide will be available only to the researchers, to the extent allowed by law.

The researchers may remove you from this study at any time.

This project has been reviewed by the Research Ethics Board for compliance with federal guidelines for research involving human participants. If you have questions regarding your rights and welfare as a research participant in this study (REB#…), please contact: Manager, Research Ethics; University of Guelph; reb@uoguelph.ca; (519) 824-4120 (ext. 56606).

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Conflicts of Interest:

There are no conflicts of interest to report

Commercialization:

This research will not be commercialized.

Consent with signature:

I have read the Information Letter and have had an opportunity to have my research questions about the project answered. I freely consent to participate in this research.

_____

Participant Name (please print or type)

_____ _____

Participant Signature Date