

## Vaccine Hesitancy and Barriers to Vaccine Utilization in the Current COVID 19 Pandemic - Canadian Experience: A Narrative Review

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### Abstract

**Rationale:** Vaccination is an important public health intervention and basis for the prevention of highly infectious diseases. However, vaccine hesitancy is a growing trend propagated by a variety of factors. More so, the COVID-19 pandemic ranks among the greatest catastrophes in human history, with the increasing tally of deaths and economic devastations. Thus, health experts and policy makers have to work together to develop a vaccination mandate to address the COVID-19 pandemic.

**Objective:** To evaluate the status and underlying causes of COVID-19 vaccine hesitancy. This novel coronavirus is deadly and highly contagious; extensive use of preventative measures such as wearing of face masks, social distancing, and eventually, mass vaccination are needed to bring it under control. We would attempt to identify potential reasons for COVID-19 vaccine hesitancy and refusal, including possible solutions to eliminate vaccination barriers.

**Method:** A narrative review was conducted by a broad qualitative synthesis of previously published information. The original research articles were sourced from PubMed/Medline and Google Scholar in November 2020. Since the COVID-19 pandemic is an ongoing issue, we extended our search to include grey literature, editorials and expert opinions. A set of keywords which reflected the core concepts were used. Inclusion or exclusion criteria was not set. No time filter was applied. Only articles in English were evaluated.

**Results:** In Canada, a recent poll taken by 1001 citizens, found that 55% of respondents were more likely to receive a COVID-19 vaccine, 21% would not and 24% of respondents were undecided. This is far below the cut-off in order to achieve considerable herd immunity, as a vaccine with 100% efficacy would require at least 66.10% coverage. Barriers to vaccination include fear of side effects, beliefs concerning the effectiveness of vaccines, distrust of the motives and lack of recognition of the need to be vaccinated.

**Conclusion:** We explored the history of vaccine hesitancy, its causes by suggesting approaches for reducing vaccine hesitancy and strengthening vaccine acceptance. Sound governmental policies might be key to persuading citizens to vaccinate. Social media, electronic and print media can play a major role in the consistent sensitization on the importance of vaccination for covid-19.

**Keywords:** Vaccine Hesitancy; Social Media; Barriers; Vaccine Utilization; Vaccine Confidence; COVID 19; Pandemic

## **Introduction**

### **COVID-19 vaccine**

Several institutions worldwide are involved in the development of a COVID-19 vaccine, which many consider to be an effective prophylactic strategy for the control and prevention of the virus. The experiences and lessons from earlier SARS and MERS vaccine research, can be referenced in the development of COVID-19 vaccine [1]. Advances in areas such as, genomics and molecular biology, have ushered in a new era of vaccine development that could impact the rapid development of COVID-19 vaccines [2]. Greater than 100 COVID-19 vaccine candidates are in development since the COVID-19 genetic sequence was published in January 2020 [3]. The most advanced candidates have recently moved into clinical development, including mRNA-1273 from Moderna, BNT162b2 from Pfizer and BioNTech, Ad5-nCoV from CanSino Biologicals, INO-4800 from Inovio and LV-SMENP-DC and pathogen-specific aAPC from Shenzhen Geno-Immune Medical Institute [4].

### **Vaccine hesitancy**

Vaccine hesitancy is a potential threat to global health [5]. Although vaccines are ranked amongst some of the safest and most effective public health tools available for prevention and control of infectious diseases, they are victims of their own success [6]. Vaccine concern is as old as the vaccine itself, although, vaccines are safer than before; a recent review highlights discrepancy between scientific evidence and general perception [6]. No unique form of vaccine hesitancy has been identified, nor a single reason behind it; reasons are contextual (cultural, religious and geographical) and sometimes even vaccine specific [6]. Anti-vaccination movements are associated with lowered vaccine acceptance rates and an increase in vaccine-preventable disease outbreaks and epidemics [7]. The resurgence of vaccine-preventable illnesses have led the World Health Organization (WHO) to name vaccine hesitancy as an important threat to global health in 2019 [8].

The World Health Organization (WHO) is concerned about the growing trend of vaccine hesitancy and has defined it as the “delay in acceptance or refusal of vaccines despite availability of vaccine services” [9]. The model of vaccine hesitancy is wide-ranging, often shaped by several factors including personal, social and vaccine-related considerations [10]. It persists as a barrier to full population inoculation against highly infectious diseases [11]. Vaccine experts and other stakeholders are of the opinion that vaccine rates have been on the downward trend and consider vaccine hesitancy a key issue to address in Canada [12]. Adequate knowledge of the primary dynamics of vaccine acceptance, hesitancy and refusal in Canada, is central to keeping vaccination programs running and prevent epidemics of vaccine- preventable diseases [9].

Amongst the barriers to universal vaccination, misinformation regarding the benefits, medicinal composition and adverse effects of vaccination are limiting patient understanding and overall buy-in [8]. A common understanding of vaccine hesitancy among researchers, public health experts, policy-makers and health care providers, will better guide interventions suitable to address vaccine hesitancy within Canada [12]. Careful and logical diagnosis, tailored interventions and assessments of its impacts are critical for success [9]. While vaccine hesitancy is growing, hesitancy is not equivalent to refusal, for example, citizens who are vaccine hesitant do not entirely refuse vaccines [13]. Therefore, the novelty of a COVID-19 vaccine could play a major role in the willingness of Canadians to vaccinate [14].

### **Study Aim**

The aim of this study is to investigate the dynamics of COVID19 vaccine hesitancy in Canada, just as many professionals have proposed “interdisciplinary” approaches to address vaccine hesitancy [15]. We will also explore options for improving vaccine confidence in the current COVID19 crisis. Finally, we will discuss the role of media platforms in propagating vaccine hesitancy and how media can be harnessed to build public trust in COVID19 vaccines.

## Methods

We conducted a narrative review and extensive qualitative synthesis of previously published information [6]. The original research articles were sourced from PubMed/Medline and Google Scholar in November 2020. However, because COVID19 pandemic is an ongoing issue, we extended our search to include grey literatures, editorials and expert opinions. A set of keywords which reflect the core concepts were utilized. The keyword search terms were: vaccine hesitancy, barrier, vaccine utilization, vaccine confidence, COVID 19, pandemic. Nevertheless, a manual check of the reference lists of the retrieved studies was conducted, to further identify proper articles [6]. No inclusion or exclusion criteria was set. No time filter was applied. Only articles in English were evaluated.

## Conceptual framework

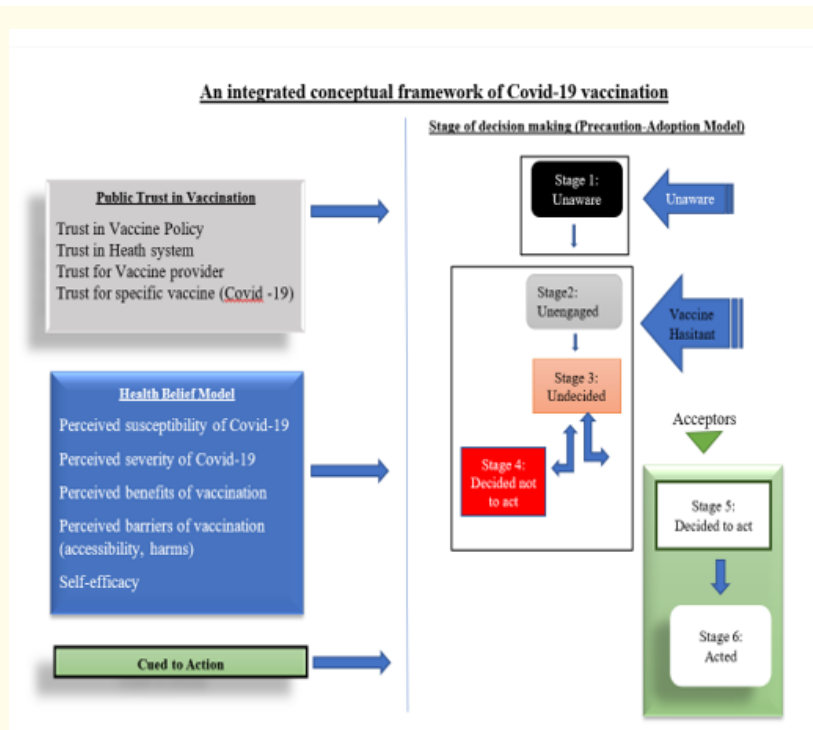


Figure 1

## Results

### Addressing COVID19 Vaccine Hesitancy

The problem of vaccine hesitancy is multifactorial hinging significantly on certain moral values. Perhaps, by considering these values, rather than relying solely on vaccine safety and efficacy data, we may be able to further effectively address vaccine hesitancy [16]. Anti-immunization sentiment is at an all-time high and the medical community has recognized the need to address it as a public health emergency; with research, action and advocacy [16]. Exposure to criticism of vaccination, misinformation and ‘antivax’ activists; often through social networks and the Internet; have played a major role in the crisis of trust in vaccination [17]. Adherence to conspiracy theories, to which a recent study in England, found among almost half the population promotes mistrust against a future COVID-19 vaccine [18]. Vac-

cine distrust is also enmeshed in social and political protest. Criticism of vaccines are opportunistic hobbyhorse of opposition parties and extremist [19].

A recent study conducted among the Israeli population implied that vaccination compliance relied on a personal risk-benefit perception, which may have influenced misinformation regarding vaccine safety [11]. Furthermore, positive predicting factors to accept the future COVID19 vaccine, were current influenza vaccination, self-perception of high-risk for severe COVID-19 infection and the male gender. On the contrary, age and parenting seemed to be negative predicting factors [11]. Similarly, individuals who lost their job during the pandemic, showed more willingness to receive the COVID-19 vaccine, compared to essential workers, who were never laid off coupled with, those who stayed home but were confident about returning to work when possible [11]. These results highlight the necessity of early educational campaigns by global or country-specific health institutions [11]. Because one of the main concerns described by the study participants was the speed at which the COVID-19 vaccine was being developed, educational campaigns should also focus on alleviating this apprehension in particular [11].

Attitudes towards a COVID-19 vaccine appear to be encouraging in Australia, which may be the result of a perceived greater confidence in the government [20]. In a sample of 4362 Australians, 4.9% of participants stated that they would not get a COVID-19 vaccine this year, 9.4% were indifferent, and 85.8% said they would get a COVID-19 vaccine if it became available. This is just as 14.4% of participants said they would not get the flu vaccine this year, 9.0% were indifferent and 76.5% stated they have or will get the flu vaccine this year [20]. Individuals who suggested they would refuse a potential COVID-19 vaccine tended to believe the threat of COVID-19 as being exaggerated; compared to those who were looking forward to a vaccine [20]. The study also found deficient education levels, especially in health literacy, to be major determinants of hesitancy towards influenza and COVID-19 vaccines [20].

On December 9<sup>th</sup> 2020, Health Canada gave the green light for the use of the Pfizer-BioNTech vaccine within the country. A study based on the Statistics Canada online questionnaire, conducted between May 26<sup>th</sup> and June 8<sup>th</sup> 2020, showed that just over 66% of participants were very likely to get a COVID-19 vaccine when one becomes available [14]. In another poll of 1001 citizens across Ontario, by Campaign Research, they found that 55% of respondents were more likely to receive a COVID19 vaccine, 21% would not and 24% of respondents were undecided [21]. This is despite the massive public awareness of COVID19 vaccines, as the same poll by the Toronto Star showed that 92% of respondents knew of at least one of the vaccines. In a separate interview with Campaign Research principal, Nick Kouvalis, he reinforced a long-held narrative that perhaps COVID19 vaccine acceptance rates within Canada might be higher among elites and individuals with higher education status [21]. However, it would be necessary to explore this belief further through in-depth studies.

As vaccine hesitancy persists, the debate about appropriate balance of action between coercive and persuasive measures is ongoing [17]. Mandatory vaccination does not deal with the causes of vaccine hesitancy but may instead favor it by triggering reactions by the public; if the freedom of choice is limited it may result in anger, followed with retaliation [17]. Another risk of mandatory vaccination is that it pushes healthcare professionals to disengage their efforts to motivate patients to vaccinate [17]. Educational measures are preferable from an ethical point of view and more politically acceptable [17]. Having an adequately federally funded surveillance program will permit analysis of contextual influences that promote and perpetuate reluctance at the local level [16]. Impact of misinformation about vaccines published on the Web and within social networks should be limited. These sources could also be viewed as opportunities to promote positive information about vaccination [17].

### **Improvement of vaccine confidence**

Vaccine confidence is crucial in sustaining vaccination coverage rates and health promotion within our communities. It is important to strengthen public trust in vaccines. Vaccine confidence highlights the trust in vaccines by patients, care-givers and vaccine administrators; the processes and policies pave the way towards acceptance and confidence of vaccines [22]. Vaccine confidence is one of the mechanisms

and underlying considerations that breed vaccine hesitancy. In 2019, the CDC projected that 50% of the US population did not receive a seasonal influenza vaccine [23]. The WHO listed “vaccine hesitancy” as one of the top threats to global health in the same year [24]. The impact of the COVID-19 pandemic including economic and healthcare devastation, have left the global public health sector, uncertain if vaccine refusal will ever be eradicated [15].

**Canadian perspective**

The development of a COVID-19 vaccine has been identified as a key factor in ending the pandemic and returning to normal activities [25]. In a study by Statistics Canada, 57.5% of Canadians indicated that they are willing to take a COVID-19 vaccine when it becomes available and an additional 19.0% reported that they are “somewhat likely” to get vaccinated. About 14.1% of Canadians are either “unlikely” (5.1%) or “very unlikely” (9.0%) to take a COVID-19 vaccine when it becomes available. Fewer than 9.4% were undecided about the vaccine. Canadians who were hesitant about a potential COVID-19 vaccine had pointed out two dominant hesitancies; their lack of confidence in the safety of the vaccine (54.2%) and concerns about adverse effects (51.7%). About 34.8% of Canadians unlikely to receive a COVID-19 vaccine would rather wait till a safer time to do so, compared with 25.9% who did not consider a COVID-19 vaccine necessary [14].

In addition, data from Nanos Research showed that 16.7% of Canadians are confident in the federal government’s capabilities to rollout a potential COVID-19 vaccine. In the survey which sampled 1,096 Canadians on how confident they were about the government’s commitment to deliver COVID-19 vaccines urgently, resulted in 16% of respondents as “confident,” while 40% were “somewhat confident”. The different regions of the country like, the Quebec residents were most confident at 73% of respondents, while Canadians from the Prairies showed the least confidence at 29% in the vaccine rollout program [14].

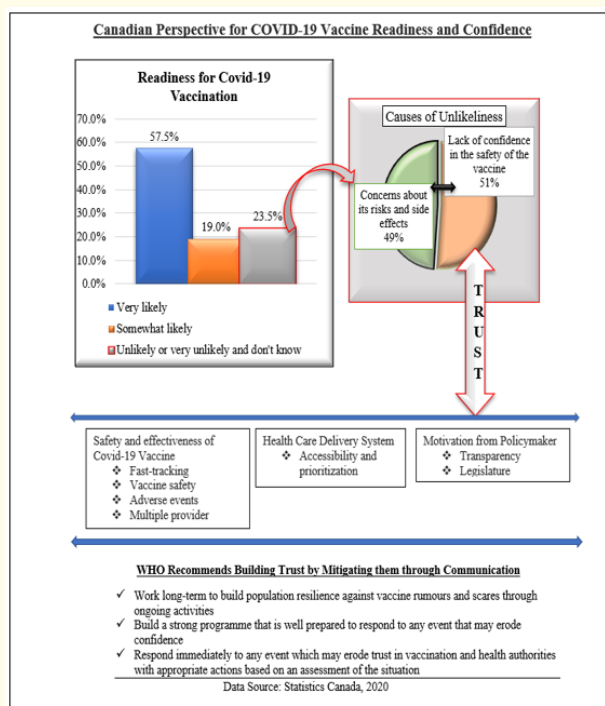


Figure 1

## **Media and vaccine hesitancy**

Some studies have shown success in the use of text messaging, web-based patient portals and online promotion of immunization campaigns; however, there is still a paucity of evidence on use of social media in ramping up vaccination efforts [26]. Vaccine hesitancy is not a new phenomenon but the proliferation of anti-vaccination misinformation, through social media, has given it new urgency, especially in light of the coronavirus pandemic and in hopes of rapid development and deployment of the vaccine [27]. Due to the increasing number of Smartphone users globally, there is a corresponding daily increase in the number of new users of popular platforms like, The Facebook, Twitter, Instagram and more recently, Tik-Tok. If put to good use, these could help in the fight against vaccine hesitancy and vaccine refusal. Some potential strategies include fostering public health campaigns within different platforms, increasing the use of social-media specific emotive language and imagery; advocating for increased moderation and fact-checking in attempts to tighten content standards [8]. Popular celebrities and politicians are known to be instrumental in spreading both pro and anti- vaccination news, and often do so via narrative appeals [8].

Social media offers a distinctive setting for epidemiological studies into vaccine misinformation, determinants of vaccine hesitancy, communicable disease spread, and participant recruitments for various studies. It could also be channeled towards positive engagement of the public towards vaccine uptake [8]. For example, a survey commissioned by the Centre for Countering Digital Hate (CCDH), which polled 1,663 citizens in Britain, found that individuals who relied on social media for information on the COVID-19 pandemic were more hesitant about a potential vaccine [28]. Similarly, a survey by the Royal Society for Public Health found that 50% of British parents of children younger than the age of 5, regularly encountered negative messages about vaccination on social media [29]. A paper published in Nature earlier this year mapped online views on vaccination. According to reports, anti-vaccination clusters tend to be highly entangled with undecided clusters in the leading online networks; whereas, pro-vaccination clusters are more sidelined. This poses a significant challenge towards future COVID-19 vaccination efforts and beyond [28].

## **Discussion**

The COVID-19 pandemic is forcing countries worldwide to come together and combat the spread of SARS-CoV-2. While the World Health Organization (WHO) is currently orchestrating a global campaign of prevention, early diagnosis and medical treatment, the development of a COVID-19 vaccine represents the Holy Grail for global health organizations [11]. However, vaccine hesitancy remains a persistent global threat as we are just beginning to gain more insights into the concept. We wonder if the COVID-19 pandemic will alter judgements regarding immunization as a whole [16]. There may be a ray of hope, as previous studies seem to display encouragement with regards to the COVID-19 vaccine hesitancy and confidence.

As portrayed among 4236 Australians that were surveyed in a recent study, 85.8% indicated they would get the COVID-19 vaccine when it became available. From this same study, 76.5% of the participants also said they have or will get the flu vaccine this year (2020) [20]. This offers an interesting perspective as a similar study conducted in Israel highlighted current influenza vaccination, self-perception of high-risk for severe COVID-19 infection and the male gender as positive predicting factors for future COVID-19 vaccination. In Canada, a recent poll of 1001 people across Ontario by the Toronto Star found that 55% of respondents were more likely to receive a COVID-19 vaccine, 21% would not and 24% of respondents were undecided [21]. This may not be encouraging news as it is known that a vaccine with 70% efficacy would contain COVID-19 outbreak but at a very high vaccination coverage of 94.44%, while a vaccine with 100% efficacy would require at least 66.10% vaccine coverage [30]. Newer research efforts in Canada could also seek to explore relationships in attitudes of the population to the seasonal flu and potential COVID-19 vaccines.

Numerous barriers to vaccinate have been identified: fear of side effects, beliefs regarding the efficacy and usefulness of vaccines, distrust of the motives, lack of recognition in the need to vaccinate... etc. Often, these barriers are presented as quantitative variables, without considering the socio-cultural context that heavily influences the public [7]. Though vaccine confidence is mandatory for impactful vac-

ination coverage; according to Statistics Canada, 23.5% population still are unlikely to take vaccines for Covid-19 and among them 51% lack confidence in the safety of the vaccine and 49% are concerned about the risk factors and side effects of the vaccine [14]. Building trust is identified as key to improvement of vaccine confidence. The WHO recommends building trust by mitigating causative factors through communication; working to build population resilience against vaccine rumors and fears, building a strong program that is well prepared to respond to any event that may erode confidence, while responding immediately to any event which may erode trust in vaccination and health authorities [31].

## Conclusion

Despite the impossibilities in precisely quantifying the proportion of the population that are vaccine-hesitant, experts worldwide recognize the growing trend toward vaccine hesitancy [7]. It is not a new phenomenon that individuals seem hesitant or unsure about vaccines. However, throughout this review we have worked to show how vaccine hesitancy can be amplified by the current changing scientific, cultural, ethical and media prospects [7].

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