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## Commentary

# Between persuasion and compulsion: The case of COVID-19 vaccination in Canada



Eve Dubé<sup>a,b,\*</sup>, Dominique Gagnon<sup>a</sup>, Noni MacDonald<sup>c</sup>

<sup>a</sup> Institut national de santé publique du Québec, Québec, Canada

<sup>b</sup> Centre de recherche du CHU de Québec – Université Laval, Québec, Canada

<sup>c</sup> Dalhousie University, Nova Scotia, Canada

## 1. Introduction

COVID-19 vaccination remains one of the most effective tools to prevent complications and deaths from SARS-CoV-2 infection [1–3]. Despite the availability of vaccine doses, lack of vaccine acceptance represents a major problem in the global efforts to control the current COVID-19 pandemic. Even prior to the pandemic, lack of vaccine acceptance due to social and behavioral influences [4,5] was identified as a global health threat [6], and this concern has increased with COVID-19 vaccination [7]. In Canada, during the summer of 2021 while vaccine doses were widely available, the goal was to reach and vaccinate most of the population in order to create community immunity and prevent further wave of contamination, which was still considered to be possible at that time [8]. In this context, novel approaches to increase vaccine uptake rates and to combat vaccine hesitancy were implemented, including “carrot-and-stick” measures (Box 1). However, the potential (negative) impact of these strategies on COVID-19 vaccine confidence or hesitancy remain uncertain. This comment highlights what was previously known regarding incentives and disincentives strategies and discuss recent experience with these strategies in the context of the COVID-19 campaign.

## 2. Effectiveness of incentives-based strategies to increase COVID-19 vaccine acceptance and uptake

Prior to the pandemic, evidence of the impact of incentivization strategies on vaccine uptake were mixed, but some reviews indicated a positive impact of cash incentives for promoting adherence with vaccination vaccinated [9,10]. In 2015, the Community Preventive Services Task Force (CPSTF) recommended client or family incentive rewards to increase vaccination rates in children and adults [9]. Despite the lack of clear evidence of impact, many jurisdictions have implemented cash lotteries with large monetary prizes to encourage “complacent” [11] individuals to receive their first or second doses of a COVID-19 vaccine. In Canada, three pro-

vinces (Alberta, Manitoba, Quebec) offered a lottery incentive totalizing cash prizes and non-cash prizes, such as scholarships for youngers. Even if some provinces reported an increase in vaccination appointments over the few days after the lottery announcement [12,13], lotteries seemed to have had little effect on boosting vaccination rates in Canada [14–16]. However, because many other interventions were implemented at the same time (e.g., mobile vaccination clinics, mass communication campaign, outreach by community leaders), it remains difficult to attribute increase in vaccine uptake specifically to these initiatives. To our knowledge, there is no formal evaluation of the impact of lottery's initiatives in Canada and the rates of first COVID-19 doses increased steadily in both Canadian jurisdictions with and without incentive-based strategies [17].

Elsewhere, one of the lottery initiatives that was documented the most was the lottery deployed in Ohio in the United States. Several concurrent research studies, based on different data sources and methodological approaches, reached divergent conclusions with regards to whether the lottery increased or did not increase the uptake of the COVID-19 vaccine in adults [18–22]. Others studies have been published regarding monetary incentives in the COVID-19 vaccination context, which also showed mixed results with regards to their effectiveness to increase vaccine uptake [23,24].

In summary, in the context of COVID-19 vaccination, incentive-based strategies such as lottery may have raised awareness about getting vaccinated, but their capacity to address vaccine hesitancy or to boost vaccine acceptance is uncertain. Vaccination behaviours are triggered by different factors, including what people think and feel about vaccine, social processes, motivation and access to vaccination services [25]. At the individual level, the 3Cs model – or complacency, confidence and convenience [26] – summarizes key factors leading to vaccine hesitancy. While some experts argued that incentives can be effective tools to overcome lack of confidence in vaccination and motivate those who are distrustful to make an effort to be vaccinated [27], others considered that monetary incentives, particularly those involving big cash prizes, may raise doubts about vaccines and even increase resistance [28,29]. In their recent commentary, Brewer and colleagues suggested that incentives for vaccination are most effective when: (1) their receipt

\* Corresponding author at: 2400 d'Estimauville, Québec (Québec) G1E 7G9, Canada.

E-mail address: [eve.dube@inspq.qc.ca](mailto:eve.dube@inspq.qc.ca) (E. Dubé).

is certain, (2) they are delivered immediately, and (3) recipients value them [30], which indicate that smaller incentives to all would be more effective than the possibility to win a big prize in a lottery, which is supported by other studies on the impact of modest payments on COVID-19 vaccine uptake [23,24,31]. By example, findings of a randomized controlled trial conducted in Sweden showed an increase of 4.2 percentage points in vaccination uptake rates with a monetary payment of \$24, highlighting the modest potential of monetary incentives to increase vaccination rate [23].

### 3. Effectiveness of Disincentives-Based strategies to increase COVID-19 vaccine acceptance and uptake

Prior to the pandemic, many countries globally had implemented disincentives-based strategies or mandatory vaccination loosely defined as interventions imposing consequences for non-vaccination using policy and regulatory instruments such as school entry requirements, financial incentives, and financial penalties [26,32]. Most of the available evidence on the effectiveness of disincentives strategies is regarding childhood immunization mandates in school settings [33] and a 2016 systematic review concluded that their effectiveness was highly dependent of the context [34]. Mandatory vaccination for healthcare workers has also been shown to be effective to increase influenza vaccine uptake [35–38].

In Canada, three provinces have mandatory childhood vaccination policies, but all jurisdictions have implemented forms of disincentive-based strategies for COVID-19 vaccination, with varied restrictions, administration, indicated duration, and enforcement policies (see Box 1) – as did many other jurisdictions worldwide [39]. Between August 5th and September 21st all 10 provinces announced mandates (proof-of vaccination) requirements to attend different activities. The implementation of vaccine passport was supported by the vast majority of Canadians at that time [40–43]. However, the implementation of vaccine passports and mandatory vaccination to travel outside of Canada also fueled criticism among some subgroups of the population, that culminated in “liberty convoys” that occupied the Capital for several weeks. The important polarization and politization of vaccination in the COVID-19 context indicate that comparison with other mandatory programs should be made with caution. In their review on effectiveness of interventions for increasing COVID-19 vaccine uptake, Batteux and colleagues concluded that mandating vaccination is unlikely to be an effective strategy to increase vaccination uptake [44], especially in individuals with low vaccination intentions. Moreover mandates can affect the receipt of future doses or increase inequalities [44]. Even if some studies concluded that disincentives strategies did increase COVID-19 vaccine uptake [45], another study [46] suggested that vaccine passports may lead to a lower vaccination intention in socio-demographic groups that are less confident in COVID-19 vaccines.

In Canada, there is currently limited evidence to support an association between the introduction of disincentive measures and increases in COVID-19 vaccine uptake, but a preprint publication data using counterfactual simulations (i.e., difference-in-differences statistical analysis using dates of announcement of vaccine passports) based on Canadian province-level data indicated a small positive impact [47].

In summary, while the impact on vaccine uptake appears better than for incentives-based strategies, the potential impact of disincentive measures on vaccine acceptance remains unclear. A study surveyed people across the United Kingdom and Israel found a link between vaccine hesitancy and a perceived lack of free will over vaccine passports. The authors' results suggested that control mea-

asures, such as vaccine passports, may have negative effects on some people's sense of autonomy, motivation, and willingness to receive a vaccine [48]. As with incentives, disincentives impact on vaccine confidence are unclear, especially when it comes to acceptance of booster doses or reducing vaccine hesitancy [49]. As highlighted by the Collaboration on Social Science and Immunisation: “*Before a mandate is introduced, there should be sufficient time for voluntary acceptance. Non-coercive measures targeting known causes of low vaccination should be exhausted (e.g., on-site vaccination, reminders and incentives), in concert with efforts made to understand and address other context specific barriers using available tools*” [50].

### 4. Unanticipated consequences of “Carrots-and-Sticks measures

Incentive and disincentive approaches implemented in the context of the COVID-19 vaccination campaigns are not always grounded on evidence-based data and may raise important equity and implementation concerns and potentially cause harms.

There is mixed evidence of effectiveness of monetary incentives or lottery strategies to increase vaccine acceptance and uptake. Incentives are not “one-size-fits-all” and the potential impact of different types of incentives on willingness to vaccinate varies significantly by age, gender, religious and ethnic background, and other living conditions. In addition, if barriers to access are not addressed in parallel, these approaches run the risk of widening inequities in vaccine uptake rates. These approaches may also be expensive, difficult to administer and raise ethical questions about undue influence on vaccine decision making [51].

Disincentives approaches, such as mandates or required proofs of vaccination, have been shown to be effective in enhancing vaccine uptake rates in different contexts and for different vaccines. However, coercive measures raise significant ethical and acceptability issues. The studies presented in this commentary showed that these approaches can significantly increase resistance towards COVID-19 vaccines in the most vaccine hesitant.

Future studies measuring the impact of carrot-and-stick initiatives should not only assess impact on vaccine coverage rates but should also evaluate their impact on health equity and potential discrimination or stigma based on vaccine status.

### 5. Conclusion

While “carrot-and-stick” approaches can be effective in increasing vaccine uptake rates, their impact should not be overestimated nor then their potential for unanticipated negative effects be downplayed – especially in the context of emergence of new variants that impact vaccine effectiveness against infection and the need for booster doses. Although incentives- and disincentives-based strategies may have positive impact on uptake in the short run, their long-term benefits are unsure (e.g., addition of booster doses in vaccine passports, new drawings for booster doses). As of April 2022, 90% of Canadians adults had completed the primary series of COVID-19 vaccination [17]. However, as highlighted in this commentary the success of the Canadian vaccination campaign can hardly be attributed to the use of incentives- and disincentives-based strategies. It is much more likely that the combination of interventions that aimed at increasing easy access to vaccination services while building the public's confidence in vaccine safety and efficacy via trusted messengers were more effective – but the impact of different approaches in multicomponent interventions remains hard to evaluate.

Maintaining the public trust in immunization is of foremost importance for COVID-19 vaccination, but also for routine immunization programs, and this should be kept in mind when imple-

menting such strategies that impact on voluntary decision-making about vaccines. It is well recognized that tailored multi-level strategies based on an in-depth understanding of the barriers to immunization in communities and groups are very effective. While incentive and disincentive measures may increase vaccine uptake at some point, neither of these approaches address the underlying causes of vaccine hesitancy and intersectionality in factors leading to sub-optimal vaccine uptake rates [52]. Evidence-based and behaviourally informed strategies should be used for education, outreach, and for reducing barriers in access before considering – or in parallel to – implementing incentives or imposing vaccination [30,53–55].

Box 1 . Definition of incentive and disincentive measures in the context of vaccination.

#### Incentive measures (carrot)

Vaccine incentives are rewards used to encourage people to receive the recommended vaccines. Incentives strategies include a large array of possibilities ranging from monetary ones (e.g. gift cards, cash payments, lottery draws) or non-monetary ones (e.g. meal vouchers, baby products, etc.). Rewards may be given in exchange for keeping an appointment, receiving a vaccination, returning for a vaccination series, or producing documentation of vaccination status. Usually, rewards given to motivate people are small. In the context of COVID-19 vaccination, Quebec, Manitoba, and Alberta have implemented lotteries with high monetary prizes.

Examples in the context of COVID-19 vaccination in Canada:

Vaccinated Albertans could get \$100 if they got their first or second dose between September 3 and October 14<sup>1</sup>; A specialty grocer in Toronto, Ontario, called Sombrero Latin Foods, offered a free gift to customers who posted a vaccination selfie<sup>2</sup>.

#### Disincentive measures (stick)

Vaccine disincentives are coercive measures deployed in a way to make difficult the choice not to get vaccinated. Mandatory vaccination policies can take many different forms; they can involve requirements (e.g. vaccination is required to attend school, or be employed), sanctions (e.g. fines may be imposed on the unvaccinated), or both. Vaccine or immunity certificates (or passports or “proof of vaccination cards”) are similar but their goal is more to incentivize vaccination by regulating entry into specific settings (bars, restaurants, etc.) or to travel.<sup>3</sup>

Examples in the context of COVID-19 vaccination in Canada:

Vaccine or frequent testing requirements for healthcare personnel in different jurisdiction<sup>4</sup>; Implementation of vaccine passport or need of a proof of vaccination for attending certain social events or recreational settings<sup>5</sup>.

<sup>1</sup>Retrieved from: <https://www.alberta.ca/vaccine-debit-card.aspx> (Accessed on October 25, 2021).

<sup>2</sup>Retrieved from: <https://dailyhive.com/toronto/ontario-covid-19-vaccine-freebies> (Accessed on October 25, 2021).

<sup>3</sup>Retrieved from: <https://www.canada.ca/en/public-health/services/diseases/coronavirus-disease-covid-19/vaccines/life-after-vaccination/vaccine-proof.html> (Accessed on October 25, 2021).

<sup>4</sup>Retrieved from: <https://www.cbc.ca/news/canada/toronto/ontario-covid-vaccines-requirement-health-care-education-1>.

6143378; <https://news.gov.bc.ca/releases/2021HLTH0150-001598>; <https://www.nationalobserver.com/2021/08/17/news/quebec-premier-says-covid-19-vaccination-will-be-mandatory-health-workers>.

(Accessed on October 25, 2021).

<sup>5</sup>Retrieved from: <https://www.retailcouncil.org/coronavirus-info-for-retailers/vaccination-requirements-by-province> (Accessed on October 25, 2021).

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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