Why can governments use regulation but not technology?

by Jovana Jankovic based on a paper by Peter Loewen et al.

Introduction

There has been persistent and often growing beliefs in the ineffectiveness of governments and a concomitant decline in trust within governments. But due to the COVID-19 pandemic, government action and intervention have again become central, necessary, and visible.

From imposing severe restrictions on both citizens and commerce to leading fiscal and economic initiatives like stimuli, governments have made an impressive show of force. Examples include Germany's Economic Stabilisation Fund, totalling approximately €290 billion or 8.3% of its GDP, and Canada's $226 billion in pandemic relief spending.

Citizens have also shown impressive dedication to battling the virus. YouGov data has found that at least 40% of people in the Western world have consistently been "very" or "somewhat" scared that they will contract COVID-19 since March, and the trend is increasing. Citizens' behaviours have matched their beliefs, with more than 60% avoiding crowded places and improving personal hygiene—often at substantial economic, social, and psychological cost. Citizens have also demonstrated marked support of government action during COVID-19.

But governments have used blunt tools like total shutdowns and massive economic support—because, at least in part, they cannot adopt smarter, technology-driven solutions like online testing, the use of technology to enforce quarantines, and digital contact tracing.

This summary of a longer paper (by Peter John Loewen, John McAndrews, Jad El Tal, Kulsoom Khalid, Haobo Chen, Nick Thompson, Anthony Moniuszko, Erika Porco, Mitchell Anderson, and Sapphira Thompson-Bled) is a case study in the unwillingness of citizens to partner with the government in the use of an app. It concludes with three hypotheses about the use of technology versus the use of cruder, more expensive, and blunter instruments of policy.

Note: *detailed descriptions of the methodologies and constraints of the surveys, experiments, and analyses described here is available in the full paper which this document summarizes.*

Data

The data summarized here comes from two sources: 1) Canadian public opinion and behavioural data collected from a weekly online survey run since March 2020, related to beliefs and concerns about COVID and comprising 1500-2500 respondents, and 2) government policy response data taken from a dashboard tracking the openness of economies according to nine dimensions (Schooling/Youth Activities, Manufacturing/Construction, Contact Services, etc.), measured across 34 OECD countries, 5 US states, 10 Canadian provinces, and 3 Canadian territories, and reported weekly.

Certain jurisdictions were grouped based on OECD designations, and 5 US states were highlighted based on their ties (economic and otherwise) to Canada. Epidemiological divergence between regions in Canada was also considered. And, reopening decisions based on certain sectors informed the designation of the nine dimensions. Generally, Borders/Movement continue to be the most closed dimension while Manufacturing/Construction is the most open. Every week, researchers sifted through news articles and government press releases across jurisdictions to draw out various epidemiological situations and average openness levels across dimensions. See www.reopeningaftercovid.com

Policy and citizen responses

Figure 1 demonstrates three findings of note: citizens were, from the beginning, willing to comply with social distancing; when new recommendations came online, citizens largely complied with them; and compliance has continued to today.

Figure 1: Social distancing and masking compliance in Canada (MEO data)

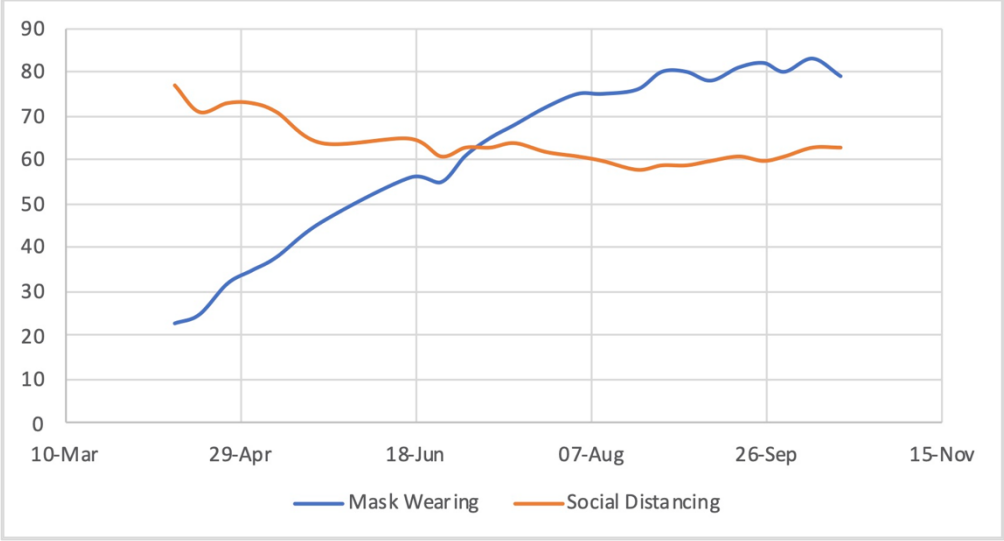
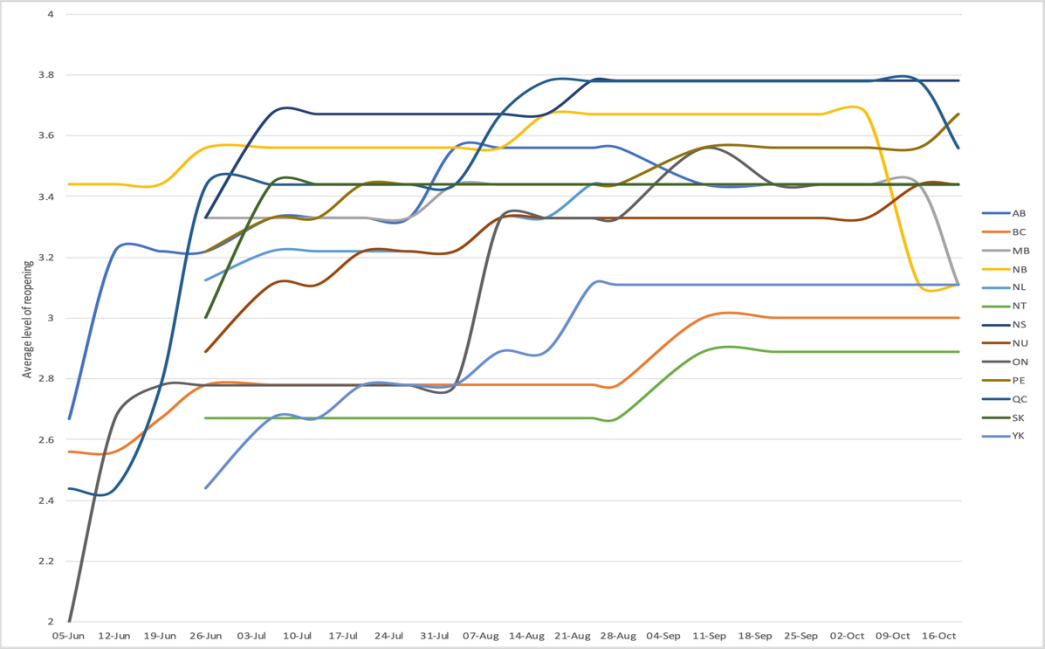


Figure 2 traces governments' relaxation of restrictions over the summer, followed by an almost monotonic shift towards more closed policies as case counts now rise. The pattern is even more dramatic in OECD countries, where governments showed a remarkable ability to rapidly change their closure or opening policies.

Figure 2: Canadian provincial and territorial changes in reopening



The findings above are not a small matter considering how difficult it is to engage citizens in voluntary behaviour or to get the increasingly complex administrative state to make rapid changes to policies on commerce and labour. The exception is the domain of technology, especially contact tracing applications.

As Figure 3 shows, only three of the 24 countries sampled have COVID-related app download rates greater than 40% as of November 2020. Importantly, contact tracing apps require a minimum rate of adoption (an estimated 60-70% of a population) to be useful in combatting the coronavirus. And app adoption does not appear related to time in market, suggesting it isn't merely a matter of time before adoption reaches critical thresholds.

Figure 3: Relationship between percentage of downloads and app release date

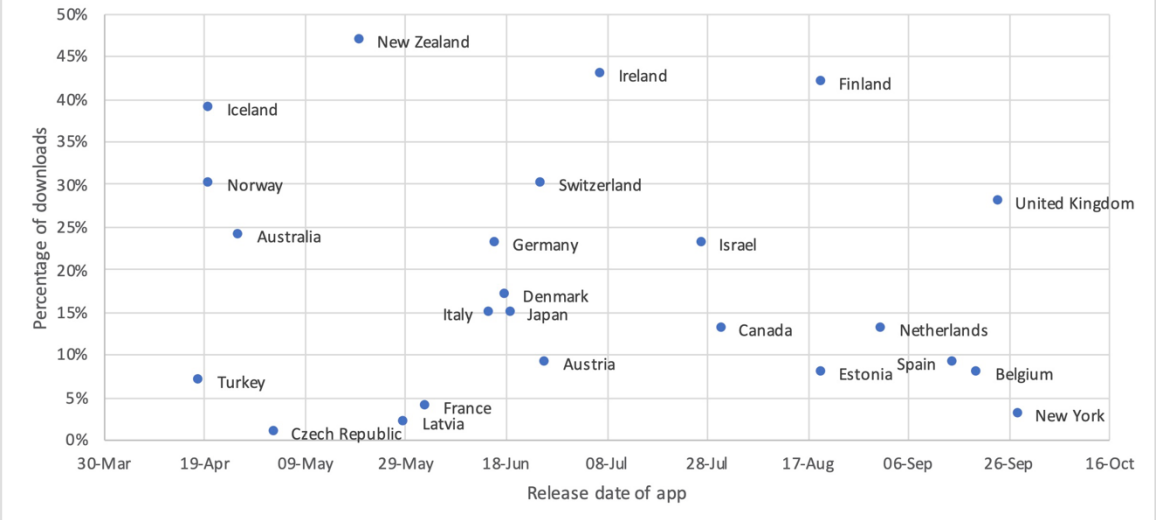
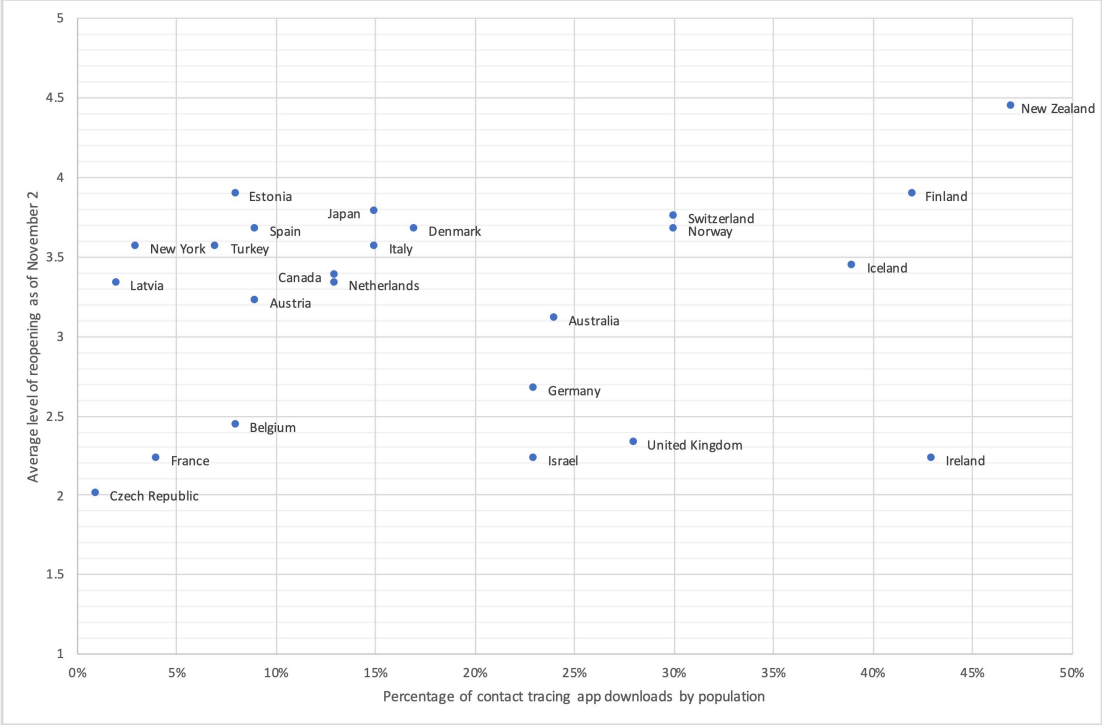


Figure 4 plots the average level of openness in a country as a function of its app uptake. Unsurprisingly, governments are not linking economic openness policy to technology, likely because they cannot count on the latter to support the former.

Figure 4: Relationship between percentage of downloads and economic reopening



Why don't citizens use contact tracing apps?

The Canadian COVID Alert app is presently in use in 8 of 10 Canadian provinces, and uses the most privacy preserving option on offer in the countries under examination. We examined which factors do and do not affect self-reported adoption likelihood, generating insights into why a majority of the population is still yet to use the app. Our estimated model considers four sets of factors: demographics, beliefs about COVID, beliefs about digital privacy, and a measurement of approval of government and political ideology. As a benchmark, our data show that only 1/3rd of respondents indicate they've downloaded the app.

The model suggests:

- App adoption likelihood declines with age and appears unrelated to gender.
- There's no discernible relationship between income and likelihood of app adoption.
- Overall concern for the pandemic is strongly correlated with app uptake.
- Expected endurance of preventative measures is not related to app adoption (suggesting adoption is not seen a substitute for other prophylactic measures).
- A generalized concern over data safety is not correlated with app uptake.

- A belief that government should use technology to fight the virus is strongly correlated with app adoption likelihood (but note that there is likely an endogeneity here—those who use the app may come to hold the aforementioned belief).
- No effect for political variables: evaluations of governments' handling of the pandemic aren't related to app uptake, nor are partisan affiliations. We cannot attribute varying opinions on, or support for, the government's actions to low app adoption.

These findings complement previous work, such as Loewen's findings in May 2020 of widespread support in principle for a contact tracing app, with concerns over government usage of data as a notable constraint. This was, however, before the availability of an app. Rheault and Musulan's Canadian study in 2020 found an internalized trade-off between technology adoption and other prophylactic measures, with anxiety about COVID correlated to support for an app and resistance rooted in concerns about violations of rights and freedoms. Horvath et al's UK study in 2020 found that citizens prefer a centralized system of data collection to a decentralized one, and have no discernible preference between human and digital contact tracing, regardless of potential privacy concerns—indicating that trust in the management of data is key to supporting new technology deployment.

In addition to understanding app uptake, we also wanted to know what might convince those who have not adopted the app to do so. Two experiments explored 1) the influence of possible effects of adoption on particular people, and 2) the influence of perceived uptake rates by others.

Experiment #1: Effects on app adoption of helping different populations

The following baseline statement was presented alone to participants, and then adapted and presented with reference to 3 affected groups (adaptations in italics): "Experts agree that if enough people download the app, it can help stop the spread of the virus. *This will especially help [1. older Canadians 2. those with underlying conditions 3. those who use the app].* Knowing this, how likely are you to download and use the app in the next two weeks?"
Do prosocial appeals or benefits to the user themselves increase likelihood of uptake? Our results suggest that the overall rate of willingness to adopt is relatively low—somewhere between the survey categories of not very likely and somewhat likely. Most importantly, there is no appreciable difference related to which group apparently may benefit. See Model 3 in Table 1 below.

Further, does a baseline belief about the government's use of technology affect belief in ostensible benefits to a particular target group? The answer is yes. We found a clear difference between believing government should use technology in the pandemic and not holding this belief when it comes to likelihood of app adoption.

The bottom line is: there is little difference in potential uptake according to the capacity of app adoption to help others. Uptake instead depends on whether citizens think government should be using technology to fight the pandemic. See Model 4 in Table 1.

Table 1. Models of uptake and adoption. Every model is an OLS regression. The Ns are 1060, 543, 543, 543, and 543, respectively. Adjusted r2 measures are .06, .25, .26, .22, and .22. Each model includes fixed effects for province. Respondents from Alberta and BC are excluded, as the COVID Alert app is not presently used in those jurisdictions.

	Model 1 - uptake among all Canadians	Model 2 - adoption as a function of target groups	Model 3 - adoption as a function of target groups	Model 4 - adoption as a function of total usage rate	Model 5 - adoption as a function of total usage rate
Age	-0.18 (.01)	-0.04 (.59)	-0.04 (.52)	0.01 (.86)	0.02 (.78)
Gender	0.01 (.65)	-0.05 (.03)	-0.06 (.02)	-0.05 (.05)	-0.05 (.05)
Income	0.22 (.00)	0.12 (0.03)	0.12 (.04)	0.04 (.47)	0.04 (.47)
Covid concern	0.15 (.00)	0.31 (.00)	0.31 (.00)	0.26 (.00)	0.09 (.14)
Pandemic length estimate	0.06 (.29)	-0.05 (.31)	-0.06 (.17)	-0.03 (.54)	-.03 (.57)
Concerns for digital privacy	-0.12 (.07)	0.07 (.24)	0.07 (.22)	0.09 (.13)	0.09 (.14)
Belief in government using data	0.16 (.00)	0.17 (.00)	0.09 (.06)	0.18 (.00)	0.11 (.02)
Government approval	0.02 (.66)	0.05 (.29)	0.06 (.21)	0.05 (.30)	0.04 (.31)
Treatment 1a: help those with underlying conditions		0.04 (.29)	-0.04 (.45)		
Treatment 1b: help older Canadians		0.01 (.74)	-0.07 (.18)		
Treatment 1c: help app users		0.03 (0.44)	0.00 (.93)		
Treatment 1a* Government using data			0.14 (.06)		
Treatment 1b* Government using data			0.14 (.04)		
Treatment 1c* Government using data			0.03 (.57)		
Treatment 2: percentage of individuals using app				0.12 (.00)	0.04 (.55)
Treatment 2 * Government using data					0.15 (.09)
Liberal PID	0.06 (.18)	0.13 (.00)	0.13 (.00)	0.09 (.01)	0.09 (.01)
Conservative PID	-0.00 (.98)	0.01 (.70)	0.01 (.73)	0.01 (.86)	0.00 (.93)
NDP PID	0.07 (.23)	0,02 (.71)	0,02 (.69)	-0.02 (.72)	-0.02 (.72)
BQ PID	0.11 (.08)	0.05 (.37)	0.05 (.43)	0.02 (.75)	0.02 (.74)
Green ID	-0.06 (.23)	0.05 (.49)	0.05 (.43)	0.03 (.70)	0.03 (.71)
Other ID	-0.07 (.70)	-0.35 (.14)	-0.23 (.17)	-0.18 (.30)	-0.17 (.30)
Intercept	0.05 (.66)	-0.03 (.82)	0.03 (.78)	0.09 (.41)	0.12 (.31)

Experiment #2: Effects on app adoption of varying current uptake rates

Is app uptake conditional upon others using an app? If yes, there are two reasons why this might be the case: 1) some cost—say, privacy invasion—is outweighed by the benefits of collective adoption, or 2) the app's perceived efficacy or attractiveness may be based on how many others use—an inference of quality that is a common human practice.

In this experiment, participants were told: "Suppose X percent of people in your province downloaded the app. Knowing this, how likely are you to download and use the app in the next two weeks?"

X was randomized with equal likelihood of 1, 10, 20, 30, 40, 50, 60, 70, 80, 90. See Model 4 in Table 1, above.

Across the entire range of others' possible app uptake (1% to 90%), participants' own uptake likelihood increased from .07 to 0.16—statistically significant, but substantively underwhelming. However, when adjusting these results to incorporate a belief about whether government should or should not be using technology in fighting the pandemic, the effects of perceiving others' uptake is stronger. Figure 5 presents these findings.

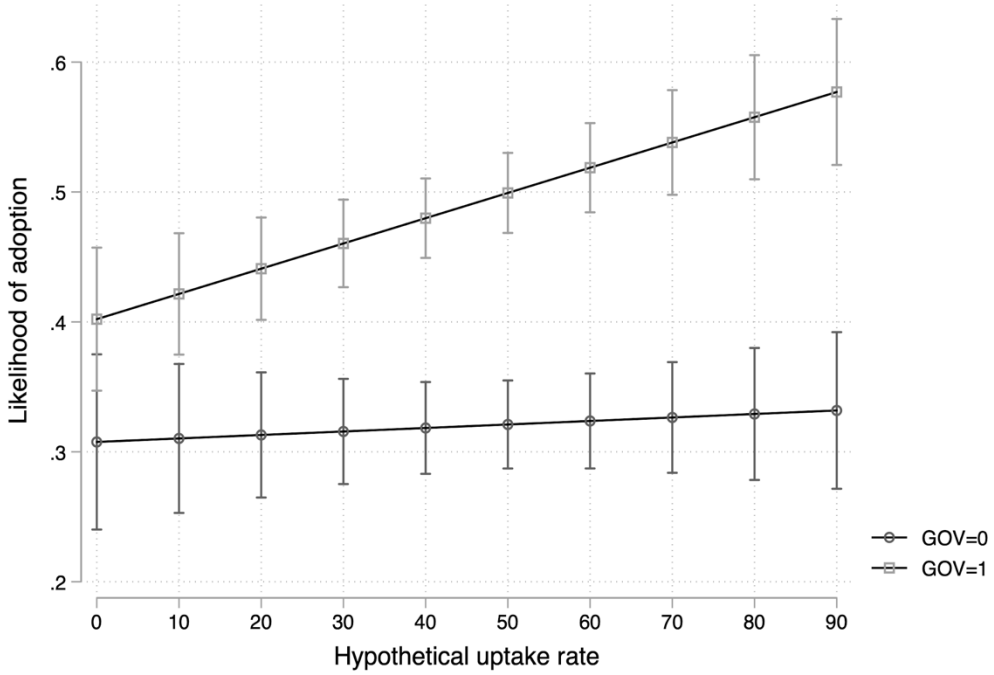


Figure 5: likelihood of app adoption according to hypothetical uptake rates by other citizens.

Importantly, citizens' willingness to use government technologies seems conditional on two factors: belief that the government should deploy technology, and belief that others will use it.

Why can governments regulate but not promote widespread technology adoption?

The technological revolution of the last 30 years—computing power, internet, smartphones, and massive amounts of data—have altered many parts of our daily lives, such as travel, shopping, and learning, but not necessarily others, such as the work of government. The lack of widespread, app-based monitoring of COVID-19 is a principal example.
We've tried to understand here why governments have been unable to push large-scale, effective adoption of contact tracing apps—despite both significant government action and demonstrated citizen action to combat the pandemic in other ways (stimuli, behaviours, etc.)

We hypothesize three explanations, which are not mutually exclusive:

1. Lack of trust in government to properly handle data and protect privacy—our survey findings confirm this and align with data from other countries.
2. Lack of confidence that any technology promoted by a government can be effective—hardly a ringing endorsement of the idea of digital government.
3. Lack of confidence that others will use technology in high enough numbers to matter. Our findings show that Canadians correctly believe this, indicating that government hasn't successfully encouraged rates of cooperation on this collective action problem.

How far do these results extend to other domains in which governments may want to employ technology but have been reluctant? In Canada, not many similarities to COVID-19 abound. Other government services—tax filing, license renewals—have been digitized with some success, but these are services for which the government has a monopoly.
There are other domains where the government has resisted or even failed to imagine applications to address large-scale public problems: public health campaigns on nutrition and exercise, for example.

The solution for this collective action problem is not necessarily making technoOlogy usage mandatory, but rather increasing its attractiveness, through, say, say, direct or indirect payments. While certainly not without its problems, such a solution may be vastly less expensive than regulating and limiting whole industries and sectors.

The COVID pandemic has demonstrated that governments—at least in Canada—are ready to regulate again. They are not ready, however, to harness the power of technology to monitor and control the spread of the coronavirus. At a time when government matters more than it has in decades, it has picked up worn out tools, and left newer ones on the shelf. This is in good part because citizens do not expect much else of their governments. This tells us a lot, we think, about the potential for the government to use technology into the future.

See References and Appendix in the full version of this paper.