COVID-19 vaccine mandates and their relationship with vaccination intention, psychological reactance, and trust: a rapid behavioural evidence synthesis (March 2024 update)

27 March 2024

Research Question

What is the impact of implementing (or removing) COVID-19 vaccine mandates on trust in institutions and in science, on psychological reactance, and/or on intention to get future doses/vaccines?

Summary of Key Findings

- Vaccine mandates were used in Canada and internationally to promote vaccination during the COVID-19 pandemic. However, vaccine mandates may have a negative impact on intention to get vaccinated, psychological reactance, and trust.
- We conducted a rapid evidence synthesis to explore the relationship between vaccine mandates, intention to get vaccinated, psychological reactance, and trust in March 2022, and updated the review in February 2024 to include more recent research. This report focuses on studies conducted in Canada, the USA, the UK, Australia, and New Zealand [Five Eyes (FVEY) countries].
- Our February 2022 search identified 13 relevant studies related to vaccine mandates and intention (n = 6), reactance (n = 6), and trust (n = 1). The initial search only identified one study reporting data that included a Canadian sample (but did not report Canada-specific results). Our updated search in February 2024 identified 17 additional studies (3 in Canada) published since the last search (n=9 on mandates and intention to get vaccinated; n= 10 on mandates and reactance; and n=1 on mandates and trust); note some studies reported on more than one intersection).

travel and sporting events may increase intention to get vaccinated. The survey literature for both hypothetical and experienced vaccine passports, there appears to be a positive association with intention to get vaccinated. The survey literature for employer mandates is less clear as hypothetical employer mandates in the general public suggest a

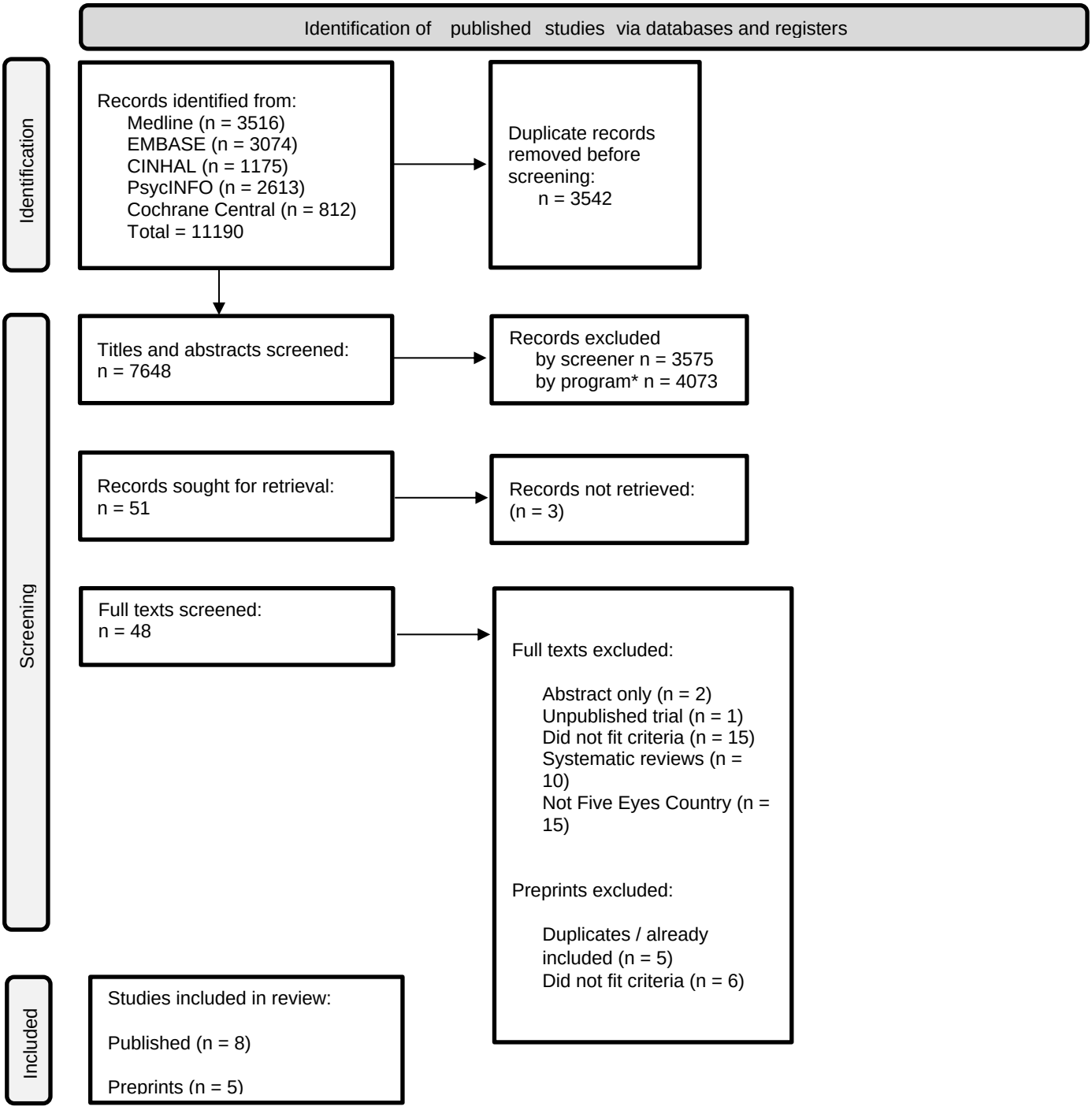
negative association to vaccination intention, whereas experienced employer mandates are based in studies with trainee health care workers and suggest a positive relationship. Taken

Background

Vaccine mandates were implemented in several countries as part of public health responses to manage the COVID-19 pandemic, including Canada, the United States (US), the United Kingdom (UK), Australia, Denmark, France, Germany, Israel, Ireland, Italy, Switzerland, and Saudi Arabia[1,2]. For this review, we define vaccine mandates as any requirement imposed by an external party (e.g., business, school, organisation, government) for an individual or group to receive a particular vaccination to access, attend, contribute to or remain in a given setting (e.g., work, business, school, travel). Mandates, in this case, may include vaccine passports where access to specific settings is restricted to those who can demonstrate having a defined vaccination to encourage uptake and provide a guarantee to others in that given setting.

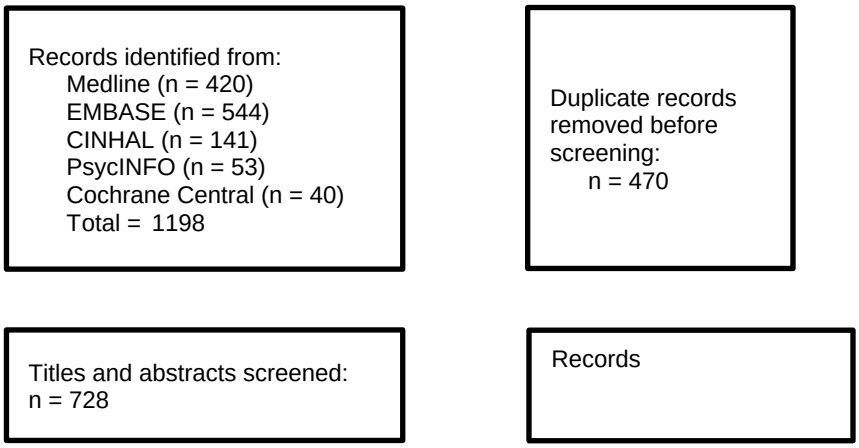
Vaccine mandates are a policy-level strategy that may be effective in increasing vaccination itself and

Figure 2. PRISMA diagram Original search up to Feb 2022



* n = 4073 records were not screened based on predictions provided by Abstrackr that suggested most relevant sources had been identified.

Figure 3. PRISMA diagram (updated search Feb 2022 to Feb 2024)



Vaccine mandates and impact on intention to get vaccinated

We originally identified 5 studies that explored intention to get COVID-19 vaccines and 1 study on intention to get a flu vaccine under hypothetical mandates. Data for COVID-19 studies were collected between November

In a US study[48] collecting cross-sectional online survey data in July 2021 among 5,144 unvaccinated US adults randomized respondents to consider one of four settings (attending a concert, sports event, restaurant or a vacation) then randomised them to a scenario whereby COVID-19 vaccine was needed or not to participate. A significantly higher percentage of unvaccinated respondents randomized to a hypothetical vaccination requirement to attend a sporting event (27% vs 19%) and for travelling (32% vs 23%) intended to get vaccinated; no statistically significant difference was observed of such mandates for dining out or attending a concert.

Finally, an online nationally representative online US study of 1006 participants investigated the incentivising role of a range of measures including employer vaccine mandates[42]. Participants were presented with a series of hypothetical vaccination profiles and asked whether they would or would not take up the vaccination. They did not find any evidence that employer mandates increase intention to get vaccinated, and this was consistent across political affiliation.

Experimental research Experienced mandates

We did not identify any studies to date using an experimental design to evaluate actual effect on intention to get vaccinated.

Survey research Hypothetical mandates

In our original search, we identified two studies that sought to explore the relationship between hypothetical vaccine mandates (for travel) and vaccination intention using cross-sectional survey designs. A large cross-sectional survey (N = 17,611) conducted in April 2021 in the UK to assess participant views on the effects of a COVID-19 vaccine passport on their intent to get vaccinated[29]. Participants were asked how inclined they would be to accept a COVID-19 vaccine if a domestic COVID-19 passport were introduced (i.e., where proof of vaccination or immunity would be required to attend social events) and how inclined they would be to accept a COVID-19 vaccine if a COVID-19 passport were introduced for international travel. Almost half of participants indicated their intention to get vaccinated would not change in response to either domestic (46.5%) or travel (42%) related vaccine passport -19 vaccine for domestic use (48.8%) and international travel (42.9%). The authors were also interested in exploring who was more likely to see a change in intention and found that COVID-19 vaccine mandates may have a polarizing impact whereby those who already intended to get vaccinated experience an increase in vaccine acceptance whereas those with a pre-existing lower intention to get vaccinated experience decreases in vaccine acceptance. de Figueiredo et al. also found that the impact of passports on COVID-19 vaccine acceptance differed across demographic variables. Specifically, men, participants identifying as Black or Black British, those who are unemployed, working part-time, or had another work status, those looking after the home, and those who spoke another language reported decreases in vaccine intentions if domestic mandates were introduced. Similar trends were reported for international travel mandates.

A US-based study[32] of N=1478 survey respondents used the Health Belief Model as a foundation for understanding willingness (intention) to be vaccinated for COVID-19 before travelling, and showed a positive cross-sectional association between intention and support for a vaccine mandate. The observed association was strongest for respondents who travelled more frequently.

In our updated search in February 2024, we identified three additional studies presenting (cross-sectional) survey data, both focused on hypothetical employer vaccine mandates in the general public. In a US-based survey[49] conducted in Summer 2021 with 14,142 participants, in the n=2,135 employed respondents reporting being unvaccinated, when asked if they intended to get vaccinated if mandated by their employer, 32% intended, 26% were undecided and 42% did not intend. In another US survey with n=2546 respondents from the general public in August-September 2021, 86% of those who were unvaccinated reported that they would not get vaccinated if their employer mandated it. Taken together, these US-based surveys based on hypothetical employer mandates in the general public suggest that a substantial proportion would remain unwilling to get vaccinated.

A large demographically-matched online study of American adults[48] showed that 35% of n=5091 responding to an online survey in July 2021 and 32% of n=4373 responding in Oct 2021 of unvaccinated Americans who work outside the home would be motivated to get a COVID-19 vaccination if their employer required it; with this motivator being more pronounced among unvaccinated Latino and Latina respondents (46%). In another US study investigating the views of N=523 unvaccinated respondents 6% reported intending to get vaccinated in the future, 55% were uncertain and 40% reported being unlikely; when asked their intention if their employer mandated vaccination, population-weighed percentages indicated that 49% reported intended to get vaccinated, 16% were uncertain and 5% did not intend.

Survey research Experienced mandates

We identified four survey-based studies investigating the link between intention to get vaccinated in the context of having experienced mandates. Two of these studies focused on the general public and vaccine passports. A study among n=8911 residents of Quebec[43] from March 2020-Sept 2021 investigated how introducing a vaccine passport was reported to affect their intention to get a COVID-19 vaccine. In those who reported not having yet been vaccinated, 39% reported that the vaccine passport positively influenced their intention to get vaccinated.

In a 2021 study[44] involving n=6010 respondents Canadians to understand intention to take a third or annual COVID-19 vaccination dose, respondents were classified as those who accepted (intenders), were undecided, or reported refusing (non-intenders) to get a third dose or annual dose. Seventy percent and 64% reported willing to accept a 3rd dose and an annual dose (respectively), while 15% (third dose) and 18% (annual dose) were undecided. In those intending to get a future dose, only 3% indicated vaccine mandates as the main motivation for getting previous doses (with protection of self and family and wanting to return to normal being greater motivators). Among the undecided, 18% indicated that mandates were a past motivator and similarly 20% of non-intenders indicated that mandates were a motivator for getting a previous dose. Findings suggest mandates have negligible influence on those who already want to get a future dose, and relatively limited impact on motivation in the undecided and unmotivated.

The two other identified studies focused on employer mandates.

In our initial search, we identified six studies related to psychological reactance (anger and resistance that results from perceived threats to freedom) and vaccine mandates. All but one study (Porat et al. 2021) reported results based on hypothetical mandates. Studies reported on data collected during the pandemic were conducted between April 2020 May 2021. All studies were conducted with samples from the general population. In our updated search in February 2024, we identified 9 additional studies (1 in Canada). Table 1 summarizes the main findings from these studies.

Experimental research hypothetical mandates

Five studies used experimental and quasi-experimental methods to gather data on whether vaccine requirements incite reactance and in turn impact intention or willingness to be vaccinated. Four of these studies found evidence to suggest that compulsory vaccines incite reactance which in turn negatively impact vaccine acceptance. For example, one study assessed how pre-existing vaccine intentions influenced the association between vaccine mandate and reactance. Sprengholz et al. conducted an experiment with American (N = 1394) adults to assess the impact of vaccine mandates and vaccine scarcity on reactance[36]. They found that those with pre-existing low intention to get vaccinated against COVID-19 expressed more reactance when they were in a vaccine mandate experimental condition as opposed to an unrestricted or scarce vaccine condition. They also found that those with higher levels of reactance who were in the vaccine mandate condition rated higher in measures of activism, intent to avoid COVID-19 vaccines, and lower in intentions to obtain other vaccinations (e.g., chicken pox) and engage in protective behaviours (e.g., getting tested for COVID-19).

Another study by Sprengholz et al.[35] sought to assess the impact of COVID-19 vaccine mandate attitudes on reactance and uptake of other vaccines. In an experiment with a representative American sample (N = 576) that excluded healthcare workers

vaccinated irrespective of personality trait reactance levels as measured by the short form of the Hong Psychological Reactance Scale.

In another experimental study[51], 371 students from two US university campuses were randomised in Spring 2021 to see a message that their own university or the other university was considering introducing a COVID-19 vaccine mandate for students, and further randomized to see a message that there would or would not be sanctions (in this case, being dropped from all courses). These messages were designed to investigate whether a direct (vaccine mandate at own university) or indirect (mandate at another university) threat to freedom affected reactance, and whether the magnitude of the freedom threat (having a sanction or not to not following through with the mandate) affected reactance. Those exposed to direct or indirect threat to freedom did not show higher reactance scores than control. Those exposed to messages about sanctions had higher reactance than those without sanctions. They also showed an interaction: in particular, those exposed to an indirect freedom threat (mandate at another university) that had a sanction experienced the greatest impact on psychological reactance. This finding underscores the potential social impact of observing similar other people having a perceived freedom removed and a negative consequence of not adhering, which has potentially important implications mandate related policies and how they are communicated. This study featured a hypothetical rather than an actual mandate.

Experimental research experienced mandates

We did not identify any experimental studies evaluating the effect of actual mandates on psychological reactance.

Survey research hypothetical mandates

One study identified in our initial search used quantitative survey methods to assess the relationship between vaccine mandates and psychological reactance. Porat et al. conducted a cross-sectional survey with adults from the UK (N = 681) and drew from self-

support for domestic vaccine passports increased over time and that anger reactions decreased between measurement points; no differences over time were observed for international vaccine passports.

Survey research experienced mandates

We did not identify any survey studies evaluating the relationship between actual mandates and psychological reactance.

Qualitative research hypothetical mandates

We identified three qualitative studies focused on hypothetical mandates and reactance. In one study participants[40] held mixed views regarding vaccine mandates and passports; those who intended to accept a vaccine suggested mandates may be acceptable in some contexts, whereas both intenders and hesitators viewed mandates as coercive and a threat to autonomy. Those who disagreed with mandates believed personal choice and informed consent were essential.

Another interview study[55] with 39 Western Australia healthcare workers (mostly pharmacists and nurses) in the first half of 2021 showed that most were supportive of employer mandates. However, all but two in the sample had been vaccinated at least once or intended to, which may have impacted on surfacing reactance views.

A third qualitative study[58] -19 vaccine mandates. This study was conducted prior to an announcement that care home workers in the UK would be mandated to get a COVID-19 vaccine as a condition of employment and so captures participants anticipatory views. The authors found that care home workers opposed vaccine mandates, as they viewed compulsory vaccine policies as an infringement on their freedom. They expressed anger and a sense of betrayal about being forced to get vaccinated when many had refused to get vaccinated due to mistrust in authorities. While some participants indicated they would unwillingly accept a vaccine to remain employed, others would rather leave a job they enjoyed than abide by mandates.

Qualitative research experienced mandates

We identified four qualitative studies based on reactance to experienced mandates. In the only Canadian study identified, 25 people with a South Asian background in Ontario and British Columbia were interviewed from July 2021 to January 2022 about perceptions of COVID-19 risk and vaccine confidence. Mandate reactance-related findings focused mostly on the desire to have choice and the frustration stemming from differences in mandates between workplaces.

A US-based interview study[53] in spring 2022 among unvaccinated people in the Bay area of California showed that among the most common reasons for not getting a COVID-19 vaccine was specifically because there was a vaccine mandate, with one participant indicating that they would have considered it more had there not been a mandate.
In a study of 56 healthcare aides in New York City from June-Oct 2021[57], vaccine mandates were reported to be insulting to their duty of care. The authors noted that while the mandates may have achieved the short-term goal of expediting the decision to get vaccinated amongst healthcare aides, the mandate did not itself address reasons for uncertainty in getting vaccinated.

considerable anger, resentfulness and negativity, describing themselves as involved in civil disobedience due to perceived authoritarianism.

Summary

psychology Experimental research on reactance has a long history and many studies have found evidence to suggest that vaccine mandates incite psychological reactance and, in turn, negatively impact intention to get vaccinated, though one study found evidence to the contrary. Importantly, views about vaccine mandates are associated with the experience of reactance, such that those with negative views towan vaccineand mandate( )17(a)-8(r)7(e)-8( )17(m)-14oa

(a)-8(cci)5(n)-8(e)-8( )17(m)-14(a)13(n)-8(d)13(a)-8(t)-4(e)-8sy whether paort or empr297( )-4(m)-14(a)13(

some evidence that communicating the public health and economic benefits of high rates of vaccination may help attenuate the negative impacts of psychological reactance on

Table 1. Summary of findings from published studies included in this report

Mandates and intention to get vaccinated								
Authors	Year	Country	Design	Sample	Demographic details	Data collection period	Type of mandate and co-interventions	Main findings
Sotiset al[31]	2021	US	Experiment	General population N = 4000	Age: NR Gender: 58%	May 15th 2021	COVID-19 travel mandate	Status quo and peer effect combined nudges improved support for travel mandates Nudges did not negatively impact intent to vaccinate given travel mandate No evidence that49.3 164.33
Algara et al[42]	2023	US	Experiment	General Population N = 1,006	Age range: NR Female: NR Ethnicity: NR	January 28, 2021-February 2, 2021	Employment mandates	

					Prefer not to say			
Dube et al[43]	2022	Canada	Cross sectional survey	General population N = 8911	Age range: 18-35+ Female: ~50% Ethnicity: NR	March 2020 - Sept 2021	Vaccine lottery and passport	The vaccine lottery had a limited impact on willingness to receive COVID-19 vaccines among unvaccinated adults in Quebec, but the implementation of the vaccine passport appears more influential based on survey respondents' responses
Reifferscheid et al[44]	2022	Canada	Cross sectional survey	General population N = 6010	Age range: 18-70+ Female: 57% Ethnicity: 67.7%White, 23.8% Visible minority, 8.5% Indigenous, 1.6% Prefer not to answer	October 14 2021- November 12 2021	Vaccine mandate	Approximately 2.9% of vaccin acceptors identified vaccine mandates or restrictions as a main motivator. Protection of self and family were also the top two most commonly identified motivators for the undecided group (44.3% and 20.7%, respectively), with vaccine mandates or restrictions the third most commonly chosen reason (17.8%).
Dudley et al[45]	2022	US	Cross sectional survey	General population N = 2546	Age range: 18->60 Female: 49.3% Ethnicity: 40.6% White, 11.9% Black, 31% Hispanic, 4.6% Other/Non-Hispanic	24 August- 8 September 2021	Employer mandate	Most (86%) of the unvaccinated reported they would not vaccinate if mandated by their employer.

			Cross
Naeim et al [48]	2022	US	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								reactance in those with negative attitudes toward mandatory vaccines Explaining importance of vaccines for economic recovery and herd immunity attenuated impac of reactance on decreased intentions to vaccinate in the future
Sprengholz & Betsch[35]	2020	United States / Germany	Experiment	General population N = 576	Age: M=31.91, SD=5.96 Gender = 52.4%	July 2019	Mandatory vs voluntary vaccine for fictitious disease	Participants who experienced anger in response to selective mandates and were not given an explanation of herd immunity were less willing to get vaccinated
Kriss et al[51]	2022	US	Experiment	General Population N = 371	Age: M=20.73 (18-46) Gender: 62.8% F 58.8% White; 18.6% Hispanic 14% Asian American; 13.2% Black; 4.3% Latin American; 1.1% Native Hawaiian/Pacific Islander; 0.5% American Indian	Spring 2021	University vaccine mandate	Participants experienced significantly greater freedom threat perceptions when the mandate include sanctions compared to when it did not, but freedom threat perception did not differ when the mandate was on their own campus as to the other campus. An interaction effect was also observed in which perceived freedom threat and reactance was greatest among participant receiving an indirect (as opposed to direct) threat with sanctions.

Albarracin et al.[38]	2021	US	3 quasi-experiments + 1 experiment	General population N = 299-606	Age: M=32.66-50.63 (SD 10.93-19.23) Gender: 50-55% F	Jan-April 2021

examining the trajectory of change in support over tim finds that individualising foundations positively predict changes in utilitarian and deontologica reasoning over time. In contrast, a fall in anger ove time predicts increased support towards vacci n passports


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Previous related syntheses: Castillo, G., Wilson, M., Smith, M., Grimshaw, J.M., Presseau, J. COVID-19 vaccine mandates and their relationship with vaccination intention, psychological rc Heal96/792 re W,-n it

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39. Cross-Sectional Study in the UK and Israel on Willingness to Get Vaccinated against COVID-19. Vaccines (Basel)


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Appendix A

Search terms		
Database	Key word terms	Subject terms/MeSH terms
MEDLINE Embase CINHAL PsycINFO Cochrane Central Register of Controlled Trials	COVID-19 vaccine/vaccines/vaccination/immunization mandates/compulsory/mandatory/passport/passports Psychological reactance/psychological reactance theory/reactance Trust COVID-19 vaccine intention/uptake vaccine/vaccines/vaccination/immunization mandates/mandatory/compulsory/passport/passports	COVID-19 COVID-19 vaccine SARS-CoV-2 vaccine SARS-CoV-2 Coronavirus Mandatory programs Immunization programs Immunization Vaccination Vaccines Public health Prevention Policy making Trust Trust (social behaviour) Psychological theory Psychological reactance Freedom Intention Intent Behavioural intention Behaviour
PsyArXiv	(vaccin* OR immuni*) AND (manda* OR requir* OR pass*)	with subject: Life Sciences; Psychiatry; Social and Behavioral Sciences.
MedXiv	(vaccin* OR immuni*) AND (manda* OR requir* OR pass*)	

Search Strategy (Ovid MEDLINE)

1	exp COVID-19 Vaccines/ or exp Vaccination/	126987
2	((covid* or sars-cov 2 or sars cov2) adj4 (vaccin* or immuni?ation*)).tw,kf.	41425
3	vaccination*.ti.	77754
4	1 or 2 or 3	169306
5	Mandatory Programs/	2909
6	(mandat* or compulsor* or passport* or requir* or certificat*).tw,kf.	2589894
7	Mandatory Vaccination/	6
8	5 or 6 or 7	2591181
9	4 and 8	15078
10	(vaccin* adj2 (mandat* or compulsor* or passport* or certificat*)).tw,kf.	2471
11	9 or 10	15617
12	react*.mp.	2786137
13	Trust/	13427
14	trust.tw,kf.	52202
15	motivation/ or intention/	96668
16	Vaccination Hesitancy/	1070
17	(intent* or motivat* or Hesitan* or confiden*).tw,kf.	1059081
18	or/12-17	3872767
19	11 and 18	3757
20	exp canada/	184979
21	(Alberta or British Columbia or Manitoba or New Brunswick or Newfoundland or Labrador or Northwest Territories or Nova Scotia or Nunavut or Ontario or Prince Edward Island or Quebec or Saskatchewan or Yukon).tw,kf.	87409
22	canad*.tw,kf.	167400
23	exp United States/	1475628
24	(Alabama or Arkansas or American Samoa or Arizona or California or Colorado or Connecticut or "District of Columbia" or Delaware or Florida or Georgia or Guam or Hawaii or Iowa or Idaho or Illinois or Indiana or Kansas or Kentucky or Louisiana or Massachusetts or Maryland or Maine or Michigan or Minnesota or Missouri or Mississippi or Montana or North Carolina or North Dakota or Nebraska or New Hampshire or New Jersey or New Mexico or Nevada or New York or Ohio or Oklahoma or Oregon or Pennsylvania or Puerto Rico or Rhode Island or South Carolina or South Dakota or Tennessee or Texas or Utah or Virginia or Virgin Islands or Vermont or Washington or Wisconsin or West Virginia or Wyoming).tw,kf.	490823
25	(usa or united states).tw,kf.	455589
26	exp United Kingdom/	393043
27	(uk or united kingdom or england or scotland or ireland or wales).tw,kf.	284709
28	exp Australia/	173858
29	australia*.tw,kf.	180730
30	New Zealand/	44785
31	new zealand*.tw,kf.	65457
32	or/21-31	2895147
33	19 and 32	930
34	limit 33 to yr="2022-	

35	limit 34 to english language	364
36	remove duplicates from 35	361

Appendix B

Data extraction template

Study characteristics													
Authors	Year	Title	Aim	Design	Analysis	Time of data collection	Country	Subgroups of interest (e.g., gen pop, HCWs, public service)	Sample size	Race/ ethnicity	Age	Gender	Other demographic variables
Vaccine mandates and outcomes													
Mandate description	Vaccine type	Hypothetical / Actual mandate	Time frame	Main findings	Impact on intention / Reactance / Trust		Other factors implicated	Other findings					