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Public Health 207 (2022) 39–45

Contents lists available at ScienceDirect

Public Health

journal homepage: www.elsevier.com/locate/puhe

Original Research

Understanding the societal factors of vaccine acceptance and hesitancy: evidence from Hong Kong

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ARTICLE INFO

Article history:
Received 3 November 2021
Received in revised form
13 March 2022
Accepted 18 March 2022
Available online 26 April 2022

Keywords:
COVID-19
Vaccine
Vaccine hesitancy
Societal
Interpersonal
Political
Hong Kong

ABSTRACT

Objectives: Vaccination is considered to be an important public health strategy for controlling the COVID-19 pandemic. Besides subjective evaluations of the vaccine and the health threat, societal factors have been seen as crucial to vaccination decisions. Based on a socioecological perspective, this study examines the role of societal factors in COVID-19 vaccine hesitancy in Hong Kong.

Study design and method: An online survey was fielded between 25 and 28 June 2021, collecting 2753 complete responses. Multinomial logistic regression was conducted to examine how subjective evaluations of the vaccine (summarised by the 5C model – Confidence, Collective responsibility, Constraints, Complacency and Calculation), threat perception, interpersonal influences and institutional trust contribute to explaining three types of decision – *acceptant* (vaccinated, scheduled or indicated 'Yes'), *hesitant* (unvaccinated and indicated 'Maybe' on intention) and *resistant* (unvaccinated and indicated 'No').

Results: A total of 43.2%, 21.7% and 35.1% of respondents were acceptant, hesitant and resistant. Although the 5C model remained useful in explaining vaccination decisions, respondents were heavily influenced by the decisions of their family, although they were less influenced by friends. Second, respondents tended to accept the vaccine when they had a weaker perception that the act is supportive of the government and were less resistant if they had stronger institutional trust.

Conclusion: Under the low-incidence and low-trust environment such as Hong Kong, vaccination decisions are heavily influenced by family's decision and the perception of vaccination as socially and politically desirable. Our findings highlight the importance of a nuanced conception of interpersonal and political influence towards vaccine acceptance/hesitancy.

Introduction

Despite strenuous efforts worldwide to promote COVID-19 vaccination, many countries are struggling with vaccine hesitancy.[1–9] Previous research has suggested factors influencing hesitancy to different vaccines (e.g. influenza, human papillomavirus and measles), including demographic characteristics, health beliefs, norms, economic and political contexts and vaccine attributes.[1,10,11] A commonly used framework is the 5C model,[12] which highlights psychological antecedents, including attitudes (confidence), perceived invulnerability (complacency), perceived barriers (constraints), preference for deliberation (calculation) and communal orientation (collective good). The model was found efficacious in predicting the acceptance of COVID-19 vaccination in healthcare workers,[13,14] community-dwelling adults,[15] and university students during COVID-19 outbreaks.[16] On top of these five 'Cs,' Geiger et al.[17] added two more 'Cs'—conspiratorial thinking and compliance with social monitoring and sanctioning for non-adherence—to highlight the social nature of decision-making for COVID-19 vaccination. Their findings call for deepened understanding of how societal factors shape COVID-19 vaccination decisions. Hence, based on a socioecological framework,[18–20] this study examined the role of two societal factors, namely, interpersonal influences and trust towards public institutions.

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https://doi.org/10.1016/j.puhe.2022.03.013
0033-3506/

Pre-COVID-19 studies found that influences from one's family, friends and the community are crucial in determining vaccination decisions.[18,21–25] For COVID-19, as a high vaccination rate is needed for effective protection for a community, interpersonal influences will be pivotal in motivating vaccination, especially among people with disparate levels of perceived vulnerability and when the incidence of COVID-19 may be low at that moment, giving people a false sense of safety. Although studies have examined interpersonal influences on preventive behaviours, such as mask-wearing, under the COVID-19,[26,27] few have targeted vaccination as an invasive behavioural outcome, especially during a mass roll-out.

The second type of societal factor concerns attitudes towards the authority that administers the vaccination programme.[28,29] Trust is crucial to the compliance with COVID-19 containment policies,[30,31] which often require government emergency powers and limit civic freedom. As governments have rolled out COVID-19 vaccines under emergency use authorisation, attitudes towards the governments would be crucial to the receptiveness of such brand-new vaccines, especially against the backdrop of their safety and side-effect concerns.[32] Attitudes on COVID-19 vaccination have been divided by political partisanship, and the behaviour is seen as politicised in politically polarised states.[33–35] However, what or who is being distrusted (or trusted) — for example, the government system or the political parties — awaits clarification.

Hong Kong provides a useful case for investigating how societal determinants contribute to COVID-19 vaccine hesitancy. Shortly after COVID-19 vaccines were approved by COVAX, the Hong Kong government managed to procure sufficient vaccines for all adult citizens by February 2021. However, vaccine uptake was slow in the first few months. Local surveys conducted shortly before the mass vaccination programme found only about 40% of the adult population intended to be vaccinated.[36,37] Five months into the programme, as of 1 September 2021, only 46% of the population was fully vaccinated, falling dramatically behind major countries, including the United Kingdom, Canada and Singapore, despite nearly no vaccine supply issues.[8,9]

Two reasons may account for Hong Kong's vaccine hesitancy. First, the low incidence of COVID-19 under the government's zero tolerance policy and the high compliance with mask-wearing[38] might have mitigated citizens' perceived infection risks, reducing the effects of threat appraisal. Second, trust in the government had plummeted after the citywide protests in 2019 sparked off by the introduction of the extradition law amendment bill. The lack of trust was reflected in the early months of the pandemic when citizens relied heavily on civil society mobilisation to source masks and pressure the government to close the city's borders.[39,40] Thus, when the vaccination programme was introduced, it was quickly shrouded in scepticism and distrust.[41]

Hong Kong serves as an interesting context outside of the often-studied Western countries to examine how vaccination decision hinges on societal factors when perceived threat and public trust are low. Although we expected the five 'Cs' to remain robust factors of vaccine hesitancy, based on the socioecological framework of vaccine trust,[18,43] we hypothesised that interpersonal influences as well as attitudes to public institutions are also crucial determinants.

Methods

We conducted an online survey in traditional Chinese with Hong Kong residents aged ≥18 years through a panel from the Public Opinion Research Institute, an independent polling agency, between 25 and 28 June 2021 and collected 4386 responses. Respondents provided their e-consent before beginning the survey and were not compensated for their participation. Responses completed under 5 min were excluded on suspicion about data quality and attention to the question items.

First, to measure vaccine hesitancy, respondents were asked, 'Have you been vaccinated? (Yes/Scheduled/No)'. Those who answered 'No' were further asked, 'Are you planning to get vaccinated in the next few months? (Yes/Maybe/No)'. This allowed us to categorise respondents into *acceptant*, *hesitant* and *resistant*. As vaccine hesitancy can be represented on a spectrum from complete refusal to temporary undecidedness,[1] we distinguished the group who were undecided (i.e. *hesitant*) from those who expressed refusal (i.e. *resistant*). The former's vaccination intention could be more amenable to change than the latter and render them more realistic policy targets. Hence, our analysis sought to distinguish those who accepted vaccination (i.e. vaccinated, scheduled or indicated a positive intention; i.e. *acceptant*) and the *resistant* from the *hesitant*.

The survey then asked attitudinal questions to construct the independent variables, including threat appraisal towards COVID-19 and towards the vaccine based on the 5C model,[12] trust towards public institutions (Hong Kong SAR government, the public health departments and public health experts),[19,20] confidence towards government's containment measures and whether getting vaccinated is an act of supporting the government. The threat appraisal items were adapted from the Health Belief Model and were used in our previous study.[42] The items for the five 'Cs' (except complacency) were adapted from Betsch et al.,[12] with additional items constructed as per the COVID-19 containment policies at the time of data collection. To measure interpersonal influences, respondents were asked to estimate, on two self-created items, the proportion of their family and friends that had been vaccinated. Demographics, media usage and trust towards their family, friends and the community were also collected as control variables. As the study was conducted after the enactment of the National Security Law (NSL), under the sensitive political environment, we invited respondents to identify themselves in one of the following categories for their political orientation: non-pro-establishment, pro-establishment, centrist, others, unaffiliated to or unknown of any political orientation. At the point of observation, there is no conclusive remark on whether the NSL could mobilise Hong Kong citizens to further commit to their political identity or if they feel the need to withdraw from politics in fear of their safety and well-being.[43] We used non-conservative as a reference group and grouped other categories as politically conservative (see Tables 1 and 2 for the items).

We first performed univariate analyses by one-way analyses of variance with Tukey's adjustment to identify significant predictors, followed by multinomial logistic regression using the statistically significant predictors to predict vaccine hesitancy with *hesitant* as the reference category. Among the 4386 respondents, 2753 provided complete responses for the analysis. Following the simulation study of Pepinsky,[44] we opted for listwise deletion over multiple imputation, as the data have been identified as missing-not-at-random and multiple imputation may produce more biased results than listwise deletion. The data have been weighted with raking by the age group and gender of the respondents according to the Hong Kong census. This study was approved by the Human Research Ethics Committee of the University of Hong Kong (EA2003003).

Results

Our sample had a vaccination rate of 34.6% ($n = 952$), whereas 4.6% ($n = 125$) had scheduled their vaccination and 60.9% ($n = 1675$) had not been vaccinated. The vaccination rate was very similar to the official estimate of 33.0% population coverage rate

Table 1
Items measuring factors of vaccine hesitancy.

Variable	Items	Cronbach alphas
Confidence Range = 1 (strongly disagree) to 7 (strongly agree)	1. The COVID-19 vaccine may have physical side-effects and I don't want risk my health (R) 2. I believe that the COVID-19 vaccine can reduce my chance of infection or the severity of the disease in case of an infection. 3. I believe that I can travel abroad earlier after vaccination. 4. I am confident about the safety of COVID-19 vaccine.* 5. I worry about the short protection duration of the COVID-19 vaccine 6. I am worried that if I don't get vaccinated, I will need to practice social distancing for an extended period of time. 7. I wish others to know that I have been vaccinated as I want to be seen as COVID-free.	0.75
Collective good Range = 1 (strongly disagree) to 7 (strongly agree)	1. I believe that COVID-19 vaccine can protect my loved ones and the vulnerable groups in the community. 2. Persuading others to get vaccinated can enhance collective good.	0.77
Complacency Range = 1 (strongly disagree) to 7 (strongly agree)	1. As an infectious disease, COVID-19 is not severe enough to warrant vaccination. *	N/A
Constraints Range = 1 (strongly disagree) to 7 (strongly agree)	1. My everyday stress and schedules made me reluctant to get vaccinated.*	N/A
Calculation Range = 1 (strongly disagree) to 7 (strongly agree)	1. When I decide whether to get vaccinated, I will consider the risks and the benefits and made the best decision out of such consideration. *	N/A
Threat appraisal of COVID-19 Range = 1 (not at all) to 10 (very much)	1. How severe do you think the current outbreak is? 2. How likely do you think you will be infected with COVID-19?	0.63
Institutional trust Range = 1 (not at all) to 7 (very much)	1. To what extent do you trust the HKSAR government? 2. To what extent do you trust the public health departments? 3. To what extent do you trust the public health experts?	0.71
Confidence in government policy Range = 1 (not at all) to 10 (very much)	1. To what extent are you confident that the existing pandemic control policies of the government can prevent you from COVID-19 infection?	
Vaccination as support to government Range = 1 (strongly disagree) to 7 (strongly agree)	1. Getting vaccinated can be seen as supporting the government's policy.	
Extent of family vaccinated Range = 1 (none) to 4 (all)	1. What is the proportion of your family members who have been vaccinated with COVID-19 vaccine?	
Extent of friends vaccinated Range = 1 (none) to 4 (all)	1. What is the proportion of your friends who have been vaccinated with COVID-19 vaccine?	
Interpersonal trust Range = 1 (not at all) to 7 (very much)	1. To what extent do you trust your family members? 2. To what extent do you trust your friends? 3. To what extent do you trust your neighbours? 4. To what extent do you trust a stranger?	0.69
Reliance on traditional media Range = 1 (not at all) to 7 (very much)	1. How often do you rely on newspapers for news-related information? 2. How often do you rely on television for news-related information?	0.51
Reliance on online media Range = 1 (not at all) to 7 (very much)	1. How often do you rely on online news media for news-related information? 2. How often do you rely on social media for news-related information?	0.59

Note. Asterisked items were adapted from a study by Betsch et al.[12]

(excluding those aged <18 years) as on 28 June 2021, supporting the representativeness of our data regarding vaccination status. Among the 1675 respondents who had not vaccinated, only 6.6% (111/1675) were planning to do so (*Yes*). Meanwhile, 35.7% (598/1675) were considering getting vaccinated (*Maybe*), and 57.4% (967/1675) were not planning to do so (*No*). Hence, the three groups – *acceptant*, *hesitant*, and *resistant* – constituted 43.2% (1188/2753), 21.7% 598/2573) and 35.1% (967/2573) of the sample, respectively.

Sample characteristics are presented in Table 2. About half were male, with 40–44 years being the median age group. About one-third of the sample had at least one health condition, and 46.4% were living with a vulnerable individual. About 10% were in an occupation that requires regular COVID-19 testing, and 66.2% identified themselves as non-pro-establishment.

Univariate comparisons across the three groups (*acceptant*, *hesitant* and *resistant*) are presented in Table 3. The three groups were significantly different on all 5Cs, except calculation, which indicated a ceiling effect (mean scores over six out of seven). *Acceptant* was highest on confidence and collective good and lowest on complacency and constraints. The three groups were also significantly different in institutional trust. *Resistant* was most distrustful of public institutions and were most likely to see vaccination as supportive of the government.

Acceptant indicated more vaccinated family members and friends than *hesitant* and *resistant*. The proportions of respondents

Table 2
Sample characteristics (N = 2753).

Variable	Category	Valid, n (%)/M (SD)
Gender	Female	1352 (49.1%)
	Male	1401 (50.9%)
Age group	18–25	213 (7.7%)
	25–29	217 (7.9%)
	30–34	252 (9.2%)
	35–39	286 (10.4%)
	40–44	256 (9.3%)
	45–49	252 (9.2%)
	50–54	232 (8.4%)
	55–59	268 (9.7%)
	60–64	225 (8.2%)
	65+	551 (20.0%)
Education	Primary or less	5 (0.2%)
	Junior secondary	69 (2.5%)
	Senior secondary	464 (14.5%)
	Diploma	400 (14.5%)
	Undergraduate or more	1813 (65.9%)
Socio-economic status	Lower	8 (0.3%)
	Lower middle	112 (4.1%)
	Middle	1080 (39.2%)
	Upper-middle	1124 (40.8%)
	Upper	428 (15.5%)
Health condition vulnerable to a severe course of COVID-19 infection (pregnancy, cardiovascular diseases, high blood pressure, diabetes, chronic respiratory diseases, cancer and others)	Present	860 (31.3%)
	Absent	1892 (68.7%)
Co-residence with physically vulnerable individual (a toddler, child, woman in pregnancy, older adult, person with physical disabilities or chronic illnesses and others)	Yes	1277 (46.4%)
	No	1476 (53.6%)
Occupation that requires regular COVID-19 testing (such as workers of residential care homes for elderly/persons with disabilities, nursing homes, day care units, Hong Kong International Airport, quarantine sites, hotels, catering industry, construction sites, swimming pools and beaches, tour groups)	Yes	276 (10.0%)
	No	2477 (90.0%)
Political orientation	Non-conservative	1821 (66.2%)
	Conservative	931 (33.8%)

indicating more than half of their family or friends being vaccinated were 34.6% and 12.5%, respectively, for *acceptant*, but only 1.3% and 0.7% for *resistant*. A total of 16.8% of *acceptant* and 57.8% of *resistant* indicated none of their family members have been vaccinated. The estimation for friends' vaccination tended to be more conservative and clustered around 'Quite a bit' (79.3% [*resistant*] to 90.3% [*hesitant*]). *Acceptant* reported highest reliance on traditional media (television and newspaper), whereas *resistant* indicated highest reliance on online information. Interpersonal trust was similar across the three groups. All groups had low threat appraisal (less than 3 out of 10).

All predictors were used in the multinomial logistic models together with the demographic variables, except calculation, interpersonal trust and threat appraisal, which did not vary

Table 3
Comparisons of key variables by vaccination intention (N = 2753).

Variable	(a) Acceptant (n = 1188), mean (SD)	(b) Hesitant (n = 598), mean (SD)	(c) Resistant (n = 967), mean (SD)	Omnibus P	(a) vs (b) P	(b) vs (c) P	(a) vs (c) P
Confidence	4.20 (0.98)	3.27 (0.78)	2.71 (0.81)	<0.001	<0.001	<0.001	<0.001
Collective good	4.86 (1.52)	3.66 (1.39)	2.77 (1.46)	<0.001	<0.001	<0.001	<0.001
Complacency	2.78 (1.66)	3.53 (1.47)	3.92 (1.75)	<0.001	<0.001	<0.001	<0.001
Constraints	2.73 (1.53)	3.60 (1.65)	3.48 (1.90)	<0.001	<0.001	0.397	<0.001
Calculation	6.08 (1.05)	6.07 (0.96)	6.10 (1.23)	0.826	0.988	0.843	0.873
Threat appraisal of COVID-19	2.90 (1.45)	2.92 (1.37)	2.82 (1.58)	0.386	0.975	0.463	0.469
Institutional trust	2.74 (1.31)	2.34 (1.00)	1.97 (0.88)	<0.001	<0.001	<0.001	<0.001
Confidence in government policy	2.64 (2.10)	2.12 (1.57)	1.86 (1.45)	<0.001	<0.001	0.013	<0.001
Vaccination as support to government	2.94 (1.86)	3.95 (1.95)	4.22 (2.12)	<0.001	<0.001	0.023	<0.001
Extent of family vaccinated	2.32 (0.92)	1.59 (0.59)	1.44 (0.53)	<0.001	<0.001	<0.001	<0.001
Extent of friends vaccinated	2.09 (0.40)	1.94 (0.31)	1.81 (0.42)	<0.001	<0.001	<0.001	<0.001
Interpersonal trust	4.44 (0.87)	4.33 (0.85)	4.27 (0.90)	<0.001	0.027	0.400	<0.001
Reliance on traditional media	4.04 (1.72)	3.93 (1.59)	3.84 (1.70)	0.021	0.389	0.549	0.015.
Reliance on online media	5.85 (1.11)	5.93 (0.97)	6.04 (1.06)	<0.001	0.301	0.112	<0.001

Note. The omnibus P values were determined by analysis of variance. The P values of the paired comparisons were determined by post-hoc analyses with Tukey's adjustment.

Table 4
Results of multivariate multinomial logistic regressions ($n = 2753$).

Independent variables	Acceptant (Ref = hesitant) aOR (95% CI)	Resistant (Ref = hesitant) aOR (95% CI)
Sex (Ref = female)	0.83 (0.65–1.05)	1.44 (1.15–1.81)**
Age group	0.95 (0.90–1.00)*	1.04 (1.00–1.09)
Education	1.13 (0.97–1.32)	0.87 (0.76–1.00)
Socio-economic status	0.86 (0.72–1.02)	0.96 (0.82–1.12)
Health condition vulnerable to a severe course of COVID-19 infection (pregnancy, cardiovascular diseases, high blood pressure, diabetes, chronic respiratory diseases, cancer and others) (Ref = Nil)	0.61 (0.46–0.80) ***	1.50 (1.17–1.93)**
Co-residence with physically vulnerable individual (a toddler, child, woman in pregnancy, older adult, and person with physical disabilities or chronic illnesses and others) (Ref = Nil)	1.26 (0.99–1.60)	1.01 (0.81–1.27)
Occupation that requires testing (Ref = Nil)	1.78 (1.20–2.65)**	0.87 (0.59–1.28)
Political orientation (Ref = conservative)	0.92 (0.71–1.19)	1.08 (0.85–1.37)
Confidence	2.67 (2.21–3.23)***	0.54 (0.45–0.64)***
Collective good	1.06 (0.95–1.17)	0.86 (0.79–0.95)**
Complacency	0.91 (0.84–0.98)*	1.07 (1.00–1.15)*
Constraints	0.90 (0.84–0.97)**	0.92 (0.86–0.98)*
Trust in government	0.91 (0.80–1.03)	0.85 (0.74–0.96)*
Confidence in government COVID containment policy	0.93 (0.85–1.00)	1.07 (0.98–1.15)
Vaccination as support for government	0.80 (0.75–0.85)***	1.05 (1.00–1.11)
Extent of family vaccinated	2.68 (2.23–3.23)***	0.71 (0.59–0.86)**
Extent of friends vaccinated	1.40 (0.96–2.04)	0.53 (0.38–0.73)***
Traditional information source	0.94 (0.87–1.08)	1.02 (0.95–1.10)
Online information source	0.96 (0.86–1.08)	1.07 (0.96–1.19)

Note. The first column refers to the comparison between *acceptant* and *hesitant*; the second column the comparison between *resistant* and *hesitant*.
aOR, adjusted exponentiated odds ratios; CI, confidence interval.
*$P < 0.05$; **$P < 0.01$; ***$P < 0.001$.

significantly across the groups. Table 4 presents the results of the multinomial regressions (Akaike information criterion = 4038.5; Bayesian information criterion = 4275.4; −2LogLikelihood = 3958.5; Likelihood test: $\chi^2(38) = 1887.5$, $P < 0.001$).

First, the 5C model only partially explained vaccination decisions. Respondents who had confidence in the vaccines were more likely to be acceptant and less likely to be resistant. Those who were more complacent (i.e. perception that COVID-19 is not serious enough for warranting vaccination) were more likely to be resistant and less likely to be acceptant. However, collective good only had a partial positive effect. Although respondents who thought vaccination promotes the collective good were less likely to resist the vaccine (compared with *hesitant*), they were not statistically more likely to accept it (also compared with *hesitant*). Meanwhile, although constraints were statistically significant, its effect was not linear – *hesitant* tended to report facing more constraints than *acceptant* and *resistant*.

Second, trusting public institutions made people less resistant to the vaccine, but it did not make them more acceptant. A partial effect was also found with perceiving vaccination as supportive of the government. The construct divided respondents who accepted the vaccine from those who did not, but it was not helpful in further dividing those who were hesitant from the resistant respondents. No significant effect, meanwhile, was shown in respondents' confidence in the government's containment policy.

Third, vaccination among family members had a particularly important impact. Not only did it make respondents less resistant to the vaccine but also significantly enhanced their likelihood of accepting it. However, there was only a partial effect in vaccination among friends. Respondents who had more friends who were vaccinated were less likely to resist, but they were not necessarily more likely to accept the vaccine.

Finally, male respondents were more likely to be *resistant* than *hesitant*, whereas younger respondents were more likely to be *acceptant* than *hesitant*. No independent significant effect was found with education, socio-economic status, sources of information and political orientation. Respondents who were required to have regular testing because of their occupation were more acceptant than hesitant. However, the presence of a health condition rendered respondents not only hesitant (compared with *acceptant*) but also resistant (compared with *hesitant*) to the vaccine.

Discussion and conclusion

This study investigated how individual and societal factors shape vaccination hesitancy in Hong Kong – a context where there has been both low incidence of COVID-19 due to the government's zero tolerance policy,[45–49] and low trust in the government after the year-long social unrest since the mid-2019.[39–41] While confidence and complacency had significant effects similar to the findings of extant studies,[13,14,16] the other 3 'Cs' – collective good, constraints and calculation – had either minimal or partial effects. Our findings are interesting in several ways. First, Hong Kong's low COVID-19 incidence may have made 'protecting others' a less compelling reason for getting vaccinated. Although collective good makes people less resistant to the vaccine, it does not lead them to accept it. Second, *resistant* and *acceptant* reported fewer constraints than *hesitant*. Hence, perceived barriers may only matter when people are juggling with getting vaccinated or not, rather than swaying them towards a positive or negative stance. Third, calculation was consistently high across all three groups, indicating that Hong Kong citizens carefully weigh the cost against the benefits of vaccination regardless of their stances. In a local study, which examined parental decision on COVID-19 vaccination for their

school-aged children, only confidence emerged as a significant predictor.[50] Parental decisions about COVID-19 vaccination are often heavily impacted by concerns over safety and side-effects, especially the long-term ones.[51] The contrasting findings of this study with ours call for investigation on the potentially differentiated cognitive processes behind a vaccination decision for oneself vs one for a vulnerable relative.

Beyond the 5C model,[12] our results show that societal factors are essential in explaining vaccine hesitancy in Hong Kong. On the one hand, decisions are evidently shaped by attitudes towards public institutions in this low public trust environment.[39–41] This echoes with a recent study from Korea, which shows an inverse relationship between vaccine hesitancy and trust in government's COVID-19 countermeasures.[52] Their measurement of trust was competence based, which is slightly different from ours. Nonetheless, these findings make intuitive sense because trusting public institutions can reduce people's misgivings about the consequences of getting the COVID-19 vaccines under the concerns over them being newly developed, entailing new technologies, and bearing unknown side-effects.[32] However, trusting public institutions does not necessarily entail acceptance – it only makes people more likely to consider it. We found that what differentiates people who accept from those who hesitate or resist is an alternative measure of trust in the government – the extent to which people perceive vaccination as an act of supporting the government. This measure captures a more relational dimension of trust, with the implication that people may not want to be publicly seen as supporting the government when public trust in the government remains low.[39–41] Altogether, our findings reveal that it is not institutional trust or political orientation that makes people accept the vaccine; instead, it is the perception that vaccination is a socially – or politically – sensitive behaviour that matters. Although extant studies have shown political partisanship may affect the intention to receive COVID-19 vaccination,[33–35,52,53] we urge future studies to account for the sociopolitical meaning of vaccination, especially in highly polarised states. This study also offers a socioecological perspective for studying the antivaccine movement or how people withdraw from vaccination campaign due to bundling of vaccination and political identity. In principle, strategies such as borrowing trust from trusted experts to improve the trustworthiness of the vaccination programme, promoting vaccination when the perceived risk is elevating or offering realistic incentives to reward vaccination (e.g. relaxing social distancing for vaccinated individuals) may work. However, the effectiveness of these strategies may be sensitive to the social context, and the empirical findings regarding why they work in one context but not in the other remain scant and inconclusive.[54]

Furthermore, family is an important medium in which vaccination decisions are transmitted in Hong Kong. Yet, friends are weak influencers. Our findings indicate that the socialisation of vaccination decisions seldom goes beyond the family, which undermines the networked effect of vaccination. An important point to note here, however, is that our findings merely point to correlation, rather than causation. While it could be friends and family that influence individuals' vaccination decisions, it could also be the other way around. Thus, we call for more family-friendly arrangements for vaccination, such as allowing a family member to register and attend the vaccination session together with a vulnerable relative.

In addition to the data being cross-sectional and therefore unable to infer the direction of causality, some items were constructed in response to the fast-changing and specific context of COVID-19 in Hong Kong rather than based upon standardised instruments. We acknowledge the limitation of this approach in psychometric terms, yet this would have safeguarded the contextual relevance and validity of our findings. The sample was recruited from a panel of the polling company, and hence, a non-probability one. Representation by individuals who are less educated, unable to access the internet or have difficulties reading traditional Chinese was constrained. As foreign workers and foreign domestic helpers were excluded as the survey was conducted in traditional Chinese, our vaccination rates might be slightly lower than the actual number. As the survey was self-reported, there was no way to verify the accuracy of respondents' vaccination status and whether they got vaccinated eventually. Finally, we witnessed a high incompletion rate, especially among male, older and less educated respondents, similar to other surveys.[55,56] However, the political orientation of those who completed the survey and those who dropped out was not significantly different. Hence, their attrition is unlikely due to political stances and should not bias our findings.

To conclude, the case of Hong Kong reveals that vaccination for COVID-19 is as much a *social* decision as a *personal* decision. COVID-19 vaccination decisions are shaped by societal factors, namely, interpersonal influences and institutional trust. Although most policies to boost vaccination uptake pre-COVID-19 relied on information provision, education, incentives, reminders and quasi-mandatory schemes,[57] policymakers – especially those in a low-trust, low-incidence context – should examine the interpersonal and political determinants and devise solutions accordingly to render COVID-19 vaccination socially desirable.

Author statements

Ethical approval

This study was approved by the Human Research Ethics Committee of the University of Hong Kong (EA2003003).

Funding

This project is funded by 'Overcoming vaccine hesitancy in Hong Kong' research initiative from the Baptist University of Hong Kong, Hong Kong.

Competing interests

None declared.

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