

Article

Conspiracy Beliefs and Vaccine Mandates: Exploring the Politicized determinants for Attitudes to COVID-19 Control in China

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Abstract: A large body of research has examined people's attitudes toward mandatory vaccination to cope with the COVID-19 pandemic. However, studies have yet to explore how Chinese people view the COVID-19 vaccine mandates, let alone placing such views in the country's highly politicized context. On the other hand, facing the high pressure of loosening its zero-COVID policies amidst the worldwide practices of co-existing with the COVID-19 virus, the country has to improve its vaccination coverage quickly. In this situation, it is more than necessary to systematically investigate the Chinese public's attitude to mandatory vaccination against the virus and the underlying determinants. The current study utilizes data from a national survey adopting quota sampling to analyze the Chinese public's medical and non-medical considerations when judging compulsory COVID-19 vaccination. The study reveals that thanks to China's successful lockdown policies, personal risk and benefit perceptions did not dominate their views regarding vaccination mandates. Instead, conspiracy beliefs regarding the pandemic outbreaks, conspiratorial thinking, and nationalism more strongly predicted their willingness to accept mandatory vaccination. Given the potentially massive impacts of the COVID-19 infection, if China opens its door and loosens its strict quarantine restrictions, the Chinese public needs to be educated with more medically valuable and relevant information to improve their vaccination protection against COVID-19.

Keywords: COVID-19; vaccination; nationalism; conspiracy theories; mandatory vaccination

1. Introduction

Three years after the outbreak of the COVID-19 pandemic in late 2019, China maintains its zero-tolerance policy toward the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) that caused the pandemic [1]. While the country's strict lockdown measures had avoided many infections and deaths [2], it kept the herd immunity level low among average Chinese. Massive vaccination of the vast Chinese population seems to be the only chance for the country to eventually open its door and loosen its harsh quarantine practices, stagnating the economy [3].

By 22 October 2022, China had implemented 3.4 billion COVID-19 vaccinations, mostly inactivated vaccines made domestically [4]. The coverage of complete vaccination (two doses) reached 90%, with around 86% of those over 60 fully vaccinated earlier this month [5]. However, the booster shot coverage is much lower, particularly for people over their 60s. Only 57% of people have received a booster. According to a report issued by Capital Economics, China's domestically made vaccines require three doses to achieve a comparable level of protection to two doses of the mRNA vaccines produced by Pfizer or Moderna [6]. By late July 2022, the last time when the Chinese government offered a

detailed breakdown of COVID vaccinations, only 61% of those aged 80 or above had received two doses, and only 38% of those over-80s had received a booster. The most vulnerable persons to the pandemic received low protection.

Therefore, further increasing the vaccination rate remains the key to fighting the COVID-19 pandemic in China [7]. Vaccine mandates may still be needed in China even though the policy has been abandoned by many nations. Improving effective communication around vaccination requires us to understand better the factors underlying people's attitudes to mandatory vaccinations (hereinafter referred to as "MV"). Large amounts of studies have examined such attitudes and their determinants. They covered demographic features, personal perceptions (risk perception, felt health benefits, and judgment of vaccine efficacy, etc.), political and partisan influences, ethical aspects, and intervention measures to improve the acceptance of MV [8-10]. Unfortunately, such studies are still rare in China. The current research is an effort to fill the gap.

For demographic factors, older persons support mandatory COVID-19 vaccination more than others [11, 12]. However, in a study covering six European countries, Mills and Rüttenauer [13] found that increase in vaccine uptake was highest for people younger than 30. Generally, females were more likely to reject COVID-19 vaccine mandates [14]. People who have been vaccinated against COVID-19 normally more favor vaccination mandates than those who have not [15].

Given the highly infectious nature of SARS-CoV-2 and its variants, people with a high perception of risks – in terms of both vulnerability to disease and the perceived severity – were more desirable of taking the jabs and relatively more supportive of vaccine mandates [16-18]. Similarly, the perceived benefit of COVID-19 vaccines boosted people's attitude to and intention for personal vaccination and perhaps MV [19], while the lack of benefit feeling caused vaccine hesitancy [20]. Taking these factors together, we should expect risk and benefit perceptions as determinants of the Chinese public's attitude to compulsory vaccination.

In addition to personal risk feelings, several studies have shown that partisanship influences people's attitude to mandatory COVID-19 vaccination. In the United States, for example, liberals were more likely to support MV [21]. Further studies showed that among the liberals, it is left-wing authoritarians that endorsed the measure most [22]. However, in France, compared with partisans of the center, partisans of the far left and green parties were more likely to be opposed to mandatory COVID-19 vaccine [23]. Though the directions of support by partisans were inconsistent across nations, political inclinations were strong predictors of attitudes to MV in many Western countries [15, 24].

In China, political polarization and its influences become increasingly apparent [25, 26]. Nevertheless, due to the difficulty in accurately assessing the political attitude caused partly by the authoritarian rule and partly by its unique social context, scholars often used nationalism as a proxy measure to examine the health consequences of the people's sociopolitical values [27-29]. In this study, we investigate the effect of people's nationalism score on their attitude to COVID-19 vaccine mandates.

In many parts of the world, opposition to COVID-19 vaccination stems from politicization through conspiracy theories and party politics [12]. Conspiracy theories shake the authority of scientists and the government hiring them [30]. Therefore, believing the pandemic is a conspiracy naturally leads to the rejection of MV [31]. However, different conspiracy theories may result in divergent health consequences in the COVID-19 setting [32, 33]. In addition, COVID-19 conspiracy theories in China involved multiple actors rather than just the scientific community and government [27, 28]. We would investigate how the Chinese public's belief in conspiracy theories and their conspiracy mentality (general susceptibility to explanations based on conspiracy theories) may impact their attitude towards MV.

2. Materials and Methods

2.1. Study design

This study is based on an online questionnaire survey administered in April 2021 by the Shanghai-based survey firm Diaoyanba. The sample was collected from all 31 provincial administrative units in China with quota sampling in accordance with the Statistical Yearbook 2019 of China. The demographic data captured for each surveyed individual included age, gender, education level, and monthly income. In each provincial administrative unit, the age and sex distributions of the sample were consistent with the Yearbook.

An online survey was a primary research method used in public health management, health communication, medical sociology, and other fields, particularly during the COVID-19 pandemic [34-36]. The questionnaire was done anonymously and stressed the protection of privacy. Participants can exit at any time if they feel uncomfortable.

The online questionnaire employed in this study aimed to assess the following four points:

1. The Chinese public's attitude towards the COVID-19 vaccine mandate.
2. The Chinese public's perceptions of COVID-19 infection risk and vaccination's benefits.
3. The Chinese public's political attitudes toward COVID-19 control (including their nationalism score and views on the pandemic's threat to China).
4. The Chinese public's belief in conspiracy theories and their conspiratorial thinking.

The survey was conducted between the 1st and 8th of April 2021. The questionnaire was pre-tested by the researchers. The final Cronbach's alpha of the survey is 0.92. Although the pandemic changed quickly worldwide, China's strict quarantine policy has never been loosened. Although full vaccination coverage (two doses) has reached 90% so far, the country faces a new round of booster vaccination if it wants to open up eventually[35]. Conspiracy theories ranging from the foreign origins of COVID-19 and US entities' synthesis of the virus remained popular on Chinese social media when this paper was written[37]. Therefore, we don't think our data are outdated. Instead, it is still relevant in revealing common determinants underlying the Chinese public's attitude to vaccine mandates.

2.2. Statistical Analysis

When describing the Chinese public's attitude to mandatory vaccination and their perception of conspiracy theories, we applied the Descriptive Statistics-Frequency function of SPSS. We analyzed the relationship between the Chinese public's attitude to MV, the contributing political factors, and their understanding of conspiracy theories with the Hierarchical Linear Regression function of SPSS. The statistical analysis was performed using SPSS Version 25.0 (IBM Corp, Armonk, NY, USA). A p-value < 0.05 was considered statistically significant, and the exact values were reported in the text unless $p < 0.001$.

3. Results

3.1. Demographic Characteristics

In the end, we received 2,038 valid questionnaires from the survey company. The demographic breakdown of the groups was shown in Table 1. Of all participants, 51.3% were male and 48.7% female. Most respondents were middle-aged (40-49 years old, 26.6%, and 30-39 years old, 25.9%). Among the highest level of education completed, 12.4% had a secondary school degree, 17.5% a high school degree, 34% a junior college degree, 33.8% an undergraduate degree, and 2.4% a postgraduate degree. Most earn 3001-5000 RMB (36.2%) or 5001-10,000 RMB (30.6%) per month (1 USD = 6.77 RMB). A tiny proportion of all subjects (7.3%) have been vaccinated with the COVID-19 vaccine because China's vaccine popularization activities had just started when the questionnaire was issued.

Table 1. Distribution of demographic characteristics of the sample (n = 2038).

Variable	%/n
Age	

18–29	21.7 (443)
30–39	25.9 (527)
40–49	26.6 (542)
50–59	25.8 (526)
Gender	
Male	51.3 (1045)
Female	48.7 (993)
Education level	
Junior high school and below	12.4 (253)
Senior high school	17.5 (356)
Junior college education	34.0 (692)
College degree	33.8 (688)
Postgraduate and above	2.4 (49)
Monthly income	
3000 or less	25.1 (511)
3001–5000	36.2 (738)
5001–10000	30.6 (623)
10,001–20,000	7.0 (142)
More than 20,000	1.2 (24)
Whether vaccinated or not	
yes	7.3(148)
no	92.7(1890)

3.2. Attitude to mandatory vaccination

We asked participants whether they agreed with the following claims on a five-point scale to examine the level of the respondents' attitude to MV (Table 2). The Cronbach's alpha of the dimension was 0.70. The data showed that most public approved mandatory vaccination in China ($M=3.5$, $SD=0.95$). In general, more participants agreed ($M=18.35\%$) or totally agreed ($M=32.23\%$) to the statements related to MV than those who disagreed ($M=9.6\%$) or totally disagreed ($M=11.73\%$). In addition, an average of 28.1% of subjects adopted a neutral attitude.

Table 2. Participants' attitudes to MV (n = 2038).

Question: Please Make Your Judgment on the Following Statements on COVID-19 Vaccine Management:					
	Totally disagree	Disagree	Neutral	Agree	Totally agree
People who have been vaccinated with the COVID-19 vaccine should have greater freedom of movement than those who have not.	317 (15.6%)	197 (9.7%)	586 (28.8%)	399 (19.6%)	539 (16.4%)
The government has the right to force people to be vaccinated with the COVID-19 vaccine.	309 (15.2%)	276 (13.5%)	640 (31.4%)	325 (15.9%)	488 (23.9%)
People have the right to choose whether to be vaccinated with the COVID-19 vaccine.	114 (5.6%)	118 (5.8%)	483 (23.7%)	433 (21.2%)	890 (43.7%)
The government has the right to force people to show their COVID-19 vaccination records in public when necessary.	214 (10.5%)	192 (9.4%)	581 (28.5%)	340 (16.7%)	711 (34.9%)

3.3. Perceptions of Benefits, Susceptibility, Severity, and threat of being quarantined

Next, the study measured participants' perceptions of the susceptibility, severity, and social threat (being quarantined and isolated) related to the infections and benefits of vaccination (Table 3). Most participants (47.5%) believed that vaccination would help them from contracting the virus, and almost half of participants (46.2%) didn't see COVID-19 as a life-threatening disease. They didn't seem to think they (65.8%) were more likely to be infected, and most people (43.5%) were worried about their being quarantined or socially isolated. The public generally had a low level of perceived susceptibility and a high

level of perceived severity. They were more concerned about quarantine and isolation from others brought about by Covid-19 infection.

Table 3. Participants' perceptions about COVID-19 vaccination (n = 2038).

Question: To What Extent do You Agree with the Following Statements?					
	Totally Disagree	Disagree	Neutral	Agree	Totally Agree
Perception of Benefits					
The COVID-19 vaccine will prevent me from getting sick caused by the pandemic.	1.1% (23)	6.1% (125)	45.2% (922)	34.7% (707)	12.8% (261)
Perception of Susceptibility					
There is a good chance that I will have COVID-19.	52.2% (1064)	13.6% (278)	20.1% (410)	5.6% (115)	8.4% (171)
Perception of Severity					
I am worried that I will die of COVID-19.	32.7% (667)	13.5% (275)	21.3% (434)	10% (204)	22.5% (458)
Perception of the threat of being quarantined or isolated					
I am worried that I will be quarantined or isolated by people around me because I have Covid-19 or become a suspected case.	24.5% (500)	11.6% (236)	20.4% (415)	13.5% (276)	30% (611)

3.4. Political Factors for Attitude to MV

We asked participants to answer the following questions to measure the perception of national benefits from vaccination (Table 4) and the level of nationalism (Table 5). We used an updated instrument based on expanding a well-established measure to examine nationalism [27, 38]. The measure consisting of six questions was reported in Table 5, and the latter three were explicitly designed for COVID-19. Cronbach's alpha for the six questions was 0.86. Respondents generally had a high level of nationalism (M=5.9, SD=1.14), assessed in a measure modified from a well-established study [38].

Table 4. Participants' perception of national benefits from vaccination (n = 2038).

Question: To What Extent do You Agree with the Following Statements?					
	Totally Disagree	Disagree	Neutral	Agree	Totally Agree
Participants' Perception of National Benefits from Vaccination					
Extensive vaccination of the COVID-19 vaccine can protect the country from the pandemic	1.5% (30)	3.0% (62)	21.8% (445)	48.9% (996)	24.8% (505)
Extensive vaccination of the COVID-19 vaccine can protect China's economy from the pandemic	2.0% (41)	4.8% (97)	24.8% (505)	46.1% (940)	22.3% (455)

Table 5. Participants' nationalism score (n = 2038).

Question: To What Extent do You Agree with the Following Statements?							
	Totally Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Totally Agree
Participants' Nationalism Score							
I would instead become a citizen of China than of other countries	2.7% (56)	1.5% (30)	2.2% (44)	5.1% (103)	5.7% (116)	7.1% (144)	75.8% (1545)
My country is better than most other countries	2.1% (43)	1.2% (24)	1.8% (36)	5.1% (104)	6.1% (125)	7.9% (160)	75.9% (1546)

We should support our government even if it is wrong	19.2% (391)	7.0% (143)	13.9% (284)	22.0% (449)	12.9% (263)	6.4% (131)	18.5% (377)
China performed better than most other countries in controlling COVID-19	1.9% (39)	1.0% (20)	2.4% (49)	5.2% (105)	5.4% (111)	7.6% (154)	76.5% (1560)
China performed better than most other countries in controlling COVID-19	1.7% (34)	1.0% (20)	2.3% (46)	6.0% (123)	6.1% (124)	8.1% (165)	74.9% (1526)
China performed better than most other countries in controlling COVID-19	2.5% (51)	1.2% (25)	2.8% (57)	9.0% (184)	9.7% (197)	10.5% (214)	64.3% (1310)

3.5. Belief in COVID-19 Conspiracy Theories and Conspiratorial Thinking

Finally, we asked respondents about their agreement on a five-point scale of conspiracy theories about COVID-19 (Table 6). The measure consisted of four questions about beliefs in COVID-19 and vaccine-related conspiracy theories. They came from the real-world conspiracy claims used in previous studies [28, 33]. Cronbach's alpha for the four questions was 0.74. The results showed that the respondents had low trust in conspiracy theories. We also set five questions to measure conspiratorial thinking, which previously published research [39, 40]. Cronbach's alpha was 0.90. Statistics also showed that people scored relatively high on conspiratorial thinking ($M=3.15$, $SD=1.16$).

Table 6. Participants' belief in conspiracy theories and conspiratorial thinking ($n=2,038$).

Question: To What Extent do You Agree with the Following Statements?					
	Totally Disagree	Disagree	Neutral	Agree	Totally Agree
Participants' Belief in Conspiracy theories					
The coronavirus came out of a foreign military laboratory.	41.3% (842)	16.9% (344)	22% (448)	10.4% (211)	9.5% (193)
The coronavirus originated from a virus research institute in Wuhan, China.	43% (877)	18.2% (371)	22% (449)	9.3% (190)	7.4% (151)
Pharmaceutical companies often fabricate vaccine effectiveness data.	41.3% (842)	16.9% (344)	22% (448)	10.4% (211)	9.5% (193)
5G technology helps spread the coronavirus.	61.1% (1245)	9.5% (193)	13.9% (284)	7.2% (147)	8.3% (169)
	Totally Disagree	Disagree	Neutral	Agree	Totally Agree
Participants' Conspiratorial Thinking					
The inside story of many essential things in the world is kept from the public.	11.3% (231)	10.7% (218)	31% (632)	16.2% (331)	30.1% (626)
Officials often do not tell us the real motives behind their decisions.	14.6% (297)	12.4% (252)	32.1% (655)	16.2% (331)	24.7% (503)
Government agencies closely monitor all citizens.	28% (570)	16.8% (343)	28.6% (582)	11.3% (230)	15.4% (313)
Incidents that appear to be unconnected are often the result of covert activities.	18.4% (374)	11.9% (243)	31.3% (637)	15.4% (313)	23.1% (471)
Some secret organizations have a significant influence on political decision-making.	16.9% (344)	11.4% (232)	29.1% (594)	16.6% (338)	26% (530)

3.6. The Association between Public Perspectives, Political Polarization, Conspiracy Thinking, and Public Attitude to MV

This study uses the stratified linear regression method to examine the influencing factors of the public's attitude to MV of the COVID-19 vaccine. The first model examined demographic variables, including age, gender, education, monthly income, and COVID-19 vaccination status.

The second model examined the relationship between risk and benefit perceptions and attitudes to MV. It included four independent variables: COVID-19 susceptibility perception, COVID-19 severity perception, social threat perception, and the perception of personal vaccination benefit. We found that susceptibility perception, social threat perception, and personal benefit perception were positively correlated with mandatory vaccination attitudes and remained significant in model 2 through model 4. However, in model 4, when we added conspiracy theories-related variables, the co-efficient of both risk and benefit perceptions remarkably decreased.

In the third step, we examined political beliefs, including nationalism level and the perception of national benefits. The fourth model focused on the influence of COVID-19 and vaccine-related conspiracy beliefs and conspiratorial thinking on mandatory vaccination attitudes. When we added these two types of factors to the models, their explanatory power increased by 20% of the variance. Nationalism, perceptions of national economic benefits, belief in conspiracy theories, and conspiracy thinking strongly affected respondents' attitudes to MV. The results of hierarchical linear regression are shown in Table 7.

Table 7. Hierarchical regression model of factors associated with attitudes to MV (n =2038).

Variable	Attitudes to MV			
	Model 1	Model 2	Model 3	Model 4
	β	β	β	β
Demographic factors				
Gender (ref. male)				
Female	-.042	-.025	-.034	.005
Age	.015	.019	.006	.002
Education (ref. Primary/Lower secondary)				
Upper secondary	.022	.025	.015	.031
Junior college	-.023	-.002	-.032	.000
Undergraduate degree	-.019	.015	-.036	.015
Postgraduate degree	-.037	-.026	-.027	-.013
Income	.067*	.046	.043	.034
Whether vaccinated or not	-.037	.002	.000	
Risk and benefit Perceptions				
Perceptions of susceptibility		.121***	.126***	.054*
Perceptions of severity		.043	.030	.006
Perceptions of being quarantined		.136***	.112***	.065*
Perceptions of personal benefits		.171***	.101***	.105***
Politicized factors				
Perceptions of national benefits			-.033	.023*
Perceptions benefit that the national economy can be exempt from the impact of the pandemic.			.061*	.057*
Nationalism			.323***	.274***
Conspiracy beliefs and conspiratorial thinking				
Conspiracy beliefs				.200***
Participants' conspiratorial thinking				.228***
Model statistics				

Adjusted R ²	.005	.099	.200	.313
ΔR ²	.010	.096	.102	.112
ΔF	1.865**	54.001***	86.214***	166.290***

*p < .05. **p < .01. ***p < .001.

4. Discussion and conclusions

The findings offer fresh evidence of the relationship between the Chinese public’s attitude to mandatory COVID-19 vaccines and their politicized beliefs, including their faith in conspiracy theories. First, the results differed from many studies in that all demographic variables – age, education level, gender, income, and whether vaccinated – cannot predict the attitude to vaccine mandate [10, 11, 41, 42]. The fact that no demographic element influenced the Chinese attitude to a vaccination policy and the very low variance explained by Model 1 may show that the Chinese public did not consider vaccination very personally relevant.

As indicated in Models 2 through 4, the perceived vulnerability weakly predicted the support for MV, and the perceived severity wasn't associated with the attitude. Interestingly, the fear of being locked down was also a statistically significant determinant for the support for compulsory vaccination, indicating that people’s attitude was influenced not just by the health aspect of the vaccination but also by how the issue is dealt with at the policy level.

In model 3, the perception that compulsory vaccination can exempt China from economic impact after opening to the outside world was consistent with nationalism – evaluating one's feeling of belonging to the state and their satisfaction with the state's epidemic control in our study – in positively predicting the support for MV at a much robust strength. The more significant coefficients of the variables and higher explanatory power of Models 3 and 4 seemed to indicate that our respondents considered the nation more than their interests.

While national interest’s explanatory power for the vaccination attitude wasn’t inconsistent with previous studies covering the role of collectivism [43, 44], the role of conspiracy belief was. Previous studies often showed the conspiracy belief was linked to the opposition to masks and vaccines [45]. However, in our research, the faith in a batch of conspiracy theories – covering both the pandemic origin and vaccine manipulation – was positively rather than negatively associated with the attitude to vaccination mandates. In addition, conspiratorial thinking, which disbelieves the authority of scientists and the government and hence encourages the rejection of vaccines and other preventive measures recommended by them in many other nations [39, 46], also positively predicted the attitude to mandatory vaccination in our study. Moreover, Model 4 significantly increased its explanatory power after adding conspiracy beliefs and conspiratorial thinking. At least in the COVID-19 vaccination setting, conspiracy belief functions strongly in China but in a different mechanism from in the West.

Combining the findings, our study revealed a sharply distinct scenario regarding the public attitude to vaccination policies. The politicized determinants – nationalism, the perceived national benefits, conspiracy beliefs, and conspiratorial thinking – play a much more vital explanatory role than individual factors like risk and personal benefit perceptions. While the situation may result from China's successful quarantine policies, which dramatically reduced the COVID-related hazards visible to the public, it may also be caused by the country's powerful mobilizational and organizational capacity. The weaker role of personal risk/benefit perceptions can also be rooted in the collectivist orientation in the Chinese sociopolitical culture. However, the attitude was also linked to the Chinese public's conspiracy belief and entrenched conspiratorial thinking, which can hardly be rational. No matter how conspiracy beliefs and conspiratorial thinking can strongly predict attitudes to vaccination policies, we cannot rely on them to increase people's vaccination intentions and improve the nation's overall vaccination coverage.

The current study highlights the politicized factors influencing people's attitudes to vaccines and vaccination policies in China, which were previously neglected. As China urgently needs to improve its booster vaccine coverage, more studies are required to explore how to utilize our findings to fulfill the goal.

Our effort to investigate politicized determinants of vaccination and other health behaviors can go beyond the COVID-19 setting. In this highly politically polarized world, partisanship is found to have influenced many public health measures and behaviors, such as reducing soda uptake to fight [47]. China shouldn't be an exception. Future studies can focus on those behaviors that can be politicized in China, such as accepting domestically developed innovative drugs and therapies.

Finally, our study is not without limitations and invites extensions. Firstly, this study is mainly based on a cross-sectional survey, and the sample size is small compared with China's huge population. Second, our April 2021 data were relatively older. However, we don't think these limitations reduced the validity of this study. The politicization of Chinese people's attitude to and intention for COVID-19 vaccination is visible in many studies [27, 28, 33, 43, 44]. Follow-up research might address this limitation with new data and methods while exploring the political aspects of Chinese people's health behaviors and attitudes.

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