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Testing the relationship between democratic accountability and the approved use of inactivated COVID-19 vaccines: Evidence from 194 countries

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Abstract

Rapidly inoculating populations with efficacious vaccines is key to ending the ongoing coronavirus disease 2019 (COVID-19) pandemic. This study attempts to identify political determinants that could explain how governments worldwide chose the main COVID-19 vaccines used in their countries. Specifically, it provides a quantitative examination of the association between democratic accountability (i.e., democratic regime type and government accountability) and approved usage of inactivated COVID-19 vaccines (namely, CoronaVac, BBIBP-CorV, and WIBP-CorV) in 194 countries. This examination is conducted using the method of binary logistic regression. Results indicate that the use of such vaccines is negatively associated with government accountability. Conversely, democracies have a higher tendency to approve the use of this vaccine type. This implies that governments with greater accountability, regardless of their political nature, tend to have better COVID-19 vaccine policies, viz., procuring higher-quality COVID-19 vaccines for mass vaccination.

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Introduction

Healthcare is a policy issue area, where a government allocates public funds for the public's health and wellbeing. Ideally, since health is a fundamental human right, everyone should be able to access standard medical treatment and healthcare services. In reality, however, regarding the principles of human rights, public health

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https://doi.org/10.34044/j.kjss.2023.44.1.01 2452–3151/© 2023 Kasetsart University. situations in low- and middle-income countries (LMICs) are still far from such a textbook scenario. For many governments in LMIC regions, public health is not usually on a list of state budget priorities. This is especially true in the case of autocratic regimes, where defense and national security spending is typically prioritized (Bove & Brauner, 2016).

Public health vulnerabilities in LMICs have been dangerously exposed by the coronavirus disease 2019 (COVID-19) pandemic, which stemmed from the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It originated in Wuhan City, China, where confirmed

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COVID-19 cases were first officially reported in December 2019; it rapidly spread globally. In Southeast Asia, some countries, notably Thailand and Vietnam (Muramatsu & Onishi, 2021), highly regarded for their success in coping with virus outbreaks a year earlier, became COVID-19 hotspots. Geographical, socioeconomic, and political circumstances have been cited as catalysts (Chookajorn et al., 2021).

For instance, in 2021, Thailand teetered on the brink of a COVID-19 catastrophe. This was despite it being globally ranked the sixth most prepared country for health security capabilities (Cameron et al., 2019). Since March, the number of suspected or confirmed COVID-19 patients in Greater Bangkok and major provinces far exceeded the healthcare service capacity, leaving several infected persons without ever having received proper COVID-19 treatment, resulting in their deaths at their homes (Rojanaphruk, 2021). Furthermore, the government's COVID-19 vaccine plan was severely limited through its heavy reliance on one main vaccine, namely CoronaVac, an inactivated vaccine produced by Sinovac, a Chinese manufacturer. This lasted until late July and was used as the majority coronavirus vaccine, in addition to a small batch of government-procured vector-based Vaxzevria, produced by the Anglo-Swedish company, AstraZeneca. Together, these were utilized as country-wide vaccinations (Pananond & Pongsudhirak, 2021). As of mid-August, less than 10 percent of people had been fully vaccinated, and less than 20 percent had received one vaccine.

As upper-middle-income economies, countries such as Thailand have no difficulty allocating sufficient budgets for procuring safe and efficacious COVID-19 vaccines. Therefore, Thailand's COVID-19 vaccine plan appeared shortsighted, specifically regarding its heavy reliance on CoronaVac. In addition, the Thai government's procurement of quality COVID-19 vaccines was widely criticized as slow; moreover, its nationwide COVID-19 vaccinations were allegedly administered sluggishly and chaotically. Arguably, a lack of transparency, chronic corruption, inherent nepotism, and vested interests among powerful members of the public ("elites") have resulted in the Thai government's COVID-19 policy failures, marked by vaccine politics, sporadic COVID-19 vaccine shortages, and vaccination inequities between the less privileged and the privileged. Undoubtedly, this contributed to a sharp increase in coronavirus infections and deaths (Ekvittayavechnukul, 2021; Pongsudhirak, 2021; Sanglee, 2021; Sirivunnabood, 2021).

The aforementioned policy failures—viz., a government's selective use of coronavirus vaccines with relatively lower efficacy regardless of the accessibility

and availability of safer and higher-quality COVID-19 vaccines, for government procurement at lower or competitive prices—baffle the authors. The aforementioned scenario is not peculiar to Thailand but many other LMICs facing the global COVID-19 pandemic. Since such a scenario does not correspond to the logic of cost-benefit economic rationality, searching for non-economic determinants that probably shed light on patterns of countries' procurement of coronavirus vaccine supplies is deemed necessary for COVID-19 policy research. Below, we briefly review the existing literature on the comparative politics of COVID-19 to explore candidate predictors for our analysis.

Literature Review

Political analyses on COVID-19 have mostly considered two interrelated topics-regime type and state governance. Many scholars argue that democracies, in general, have managed coronavirus outbreaks better than autocratic regimes, although apparently not without flaws (Alon et al., 2020; Roessler & Schmitt, 2021; Ruger, 2020). In particular, well-embedded institutional dimensions of democratic countries, notably transparency and accountability, have played an important role in sustaining public trust amidst epidemics. Public trust is a critical condition in managing the long-haul COVID-19 pandemic and its repercussions (Berengaut, 2020). In contrast, a democratic system, from elected executives to legislative bodies, is more likely to have a detrimental effect on public health if there are immediate and harsh measures taken, especially those limiting individual rights, to enforce control of disease transmissions (Engler et al., 2021; Frey et al., 2020; Piazza & Stronko, 2020).

The problem-solving difficulties (Frey et al., 2020) created by democracy could account for the U.S. and European governments' failure to counter the COVID-19 pandemic during the first year of the outbreak, costing thousands of lives (Yao et al., 2021). This is in sharp contrast to the picture of resilience shown in authoritarian nations, represented by China and Thailand, where strong and stringent policies, such as strict lockdowns and curfews, were imposed without delay (Boossabong & Chamchong, 2020; Li et al., 2020). Such an obvious difference between democracies and autocracies in 2020 made some observers conclude that non-democratic regimes handled COVID-19 crises more effectively than democratic governments (Cepaluni et al., 2021; Dempere, 2021).

Arguably, nearly two years after COVID-19 cases were first reported, evidence has shown that, in the long

term, democracies tend to have better management of coronavirus situations. This can be observed through the low mortality rates of democracies (Karabulut et al., 2021; McMann & Tisch, 2021) compared to authoritarian nations. Over time, the numbers of COVID-19 cases and death tolls reported by the LMIC authorities, especially those with autocratic governments, appear unreliable (Felter, 2021). Their COVID-19 data are allegedly undercounted and underreported (Dyer, 2021; Lau et al., 2021; Silva et al., 2020), if not manipulated or covered up (Annaka, 2021).

However, scholarly work has claimed that a particular type of political regime does not significantly impact the effectiveness of governmental COVID-19 policy responses (Mayer et al., 2020; Mietzner, 2020; Welsch, 2021). Garfinkle (2020) and Stasavage (2020) suggested that it seems unfair to say which regime is better, as both democracy and dictatorship have their own robustness and shortcomings. In addition, political regimes in LMICs are probably neither democratic nor authoritarian, but hybrids (Case, 2020).

Notwithstanding the aforementioned, and as we contend elsewhere, regime type does matter in policy responses to COVID-19 situations; however, other sociopolitical determinants such as governance quality should also be considered (Bunyavejchewin & Sirichuanjun, 2021). Several study findings suggest significant relationships between governance quality, often operationally defined by worldwide governance indicators (WGIs), and the effectiveness of government policy responses to control the spread of COVID-19 and limit its subsequent impacts (Alfano & Ercolano, 2021; Bunyavejchewin & Sirichuanjun, 2021; Nabin et al., 2021). In some cases, one particular factor of overall governance was reportedly associated with several types of COVID-19 records. For instance, Liang et al. (2020) found that the COVID-19 mortality rate is negatively associated with government effectiveness, a WGI indicator.

Though several scholarly works exist on political determinants and policy responses to COVID-19, there has not been any research on policies shaping their selection across countries at the global level. Hence, there is a gap in the existing literature concerning the comparative politics of COVID-19.

Aim of the Study

This study focuses on the patterns of COVID-19 vaccine selection across countries worldwide. Confused by the Thai case, the authors questioned what political determinants could explain why some countries with purchasing power have relied heavily on inactivated COVID-19 vaccines, whose efficacy is still doubtful and relatively lower than others. Through a review of the existing literature, two explanatory factors—democracy and government accountability—were nominated in this study. The former is a regime type, whereas the latter is one of the six WGIs. Accountability is preferred over other WGI indicators because accountability, especially when it comes to exercising state power, is an absolute necessity of any democracy, regardless of its attributes. (Collier & Levitsky, 1997).

Theoretically, aside from studies surveyed earlier, such nomination was based on a hypothetical prediction of Mesquita et al. (2003) selectorate theory, namely, elected leaders in democratic regimes tend to invest substantially more in public funds than those in autocracies, simply because it is a way to enhance their longevity in democratic office (i.e. to win the next election). In contrast, autocratic leaders tend to spend more on private goods, exclusively shared by small elite groups, such as a junta or an extended ruling family, who essentially constitute these leaders' power.

Guided by the relevant theory and existing scholarly research, it is hypothesized that, in handling the COVID-19 pandemic, democracies with increased accountability ratings tend to spend more heavily on public health emergency responses (in this case, procuring and securing quality-assured COVID-19 vaccines for mass vaccination in their countries). In short, the aim here is modest and straightforward: that is, to empirically test whether democracy and government accountability in 194 countries are associated with the approved use of inactivated COVID-19 vaccines, predominantly developed by pharmaceutical manufacturers in China.

Methodology

Hypothesis and Data Sources

Given the considerations described above, the authors formulated the following hypothesis:

Hypothesis: The better democratic accountability is in a country, the less likely it is for the government to approve the use of inactivated coronavirus vaccines.

Democratic accountability is defined as a mixture of two constituents: (1) democratic political regime; and (2) government accountability to its citizens.

All data used in this study were extracted from widely used public databases. A list of the main vaccines, distributed in 194 countries, was retrieved from the international COVID-19 vaccination dataset, made available online by the Our World in Data project (Ritchie et al., 2020). In addition, the New York Times Coronavirus Vaccine Tracker was used as a reference for details about coronavirus vaccines (Zimmer et al., 2021). Data on regime type were obtained from the Bjørnskov-Rode regime dataset (Bjørnskov & Rode, 2020). Meanwhile, for data on governance, the authors relied upon the World Governance Indicators (WGI) project. Specifically, the latest version of the WGI dataset was used, recently updated in late September 2021, which covers the period 1996–2020 (Kaufmann & Kraay, 2021).

Apart from the aforementioned, secondary materials on various COVID-19 matters, such as media outlets, were used as background information and as supplementary data.

Variables and Operationalization

In this study, there was a single outcome variable, namely, the approved use of inactivated coronavirus vaccines, mostly developed by Chinese manufacturers, as the main vaccines across countries worldwide. These 194 countries excluded China, which is the country of vaccine origin. The inactivated virus vaccines were as follows: (1) CoronaVac, commonly known as Sinovac; (2) BBIBP-CorV, popularly known as Sinopharm-Beijing; and (3) WIBP-CorV, better known as Sinopharm-Wuhan (Omrani & Tleyjeh, 2021; Zimmer et al., 2021). Three vaccine brands were selected since all were listed as leading COVID-19 vaccines by The New York Times Coronavirus Vaccine Tracker (Zimmer et al., 2021). Moreover, they have been widely sold or donated overseas by the Chinese government (Cohen, 2020). It is noteworthy that India's Covaxin, the inactivated COVID-19 vaccine developed by Bharat Biotech in Hyderabad, was intentionally omitted from this study. It had only recently been authorized for emergency use in India and a few other countries compared to those developed by Chinese manufacturers (see Zimmer et al., 2021).

The outcome variable, mentioned above, was operationally delineated in nominal, binary terms (i.e., 0 = not used, 1 = used). If a country did not approve of using one of the inactivated vaccines mentioned above, that country would be coded as zero (not used). Contrarily, if a country approved using any of them, they would be coded as one (used). This was based on data reported on the Our World in Data website as of September 8, 2021 (Ritchie et al., 2020).

Two predictor variables were considered: The first predictor was regime type, operationalized in a dichotomous form (i.e. 0 = dictatorship, 1 = democracy). This coding relied upon information from the year 2020, as reported in Bjørnskov and Rode's (2020) regime

dataset. Their regime-type classification used the minimum criteria of democracy, namely: "[a] country is defined as democratic if elections were conducted, these were free and fair, and if there was a peaceful turnover of legislative and executive offices following those elections" (Bjørnskov & Rode, 2018).

The second predictor was government accountability, one of the six WGI indicators, namely, Voice and Accountability. As a governance dimension, the predictor demonstrated "...perceptions of the extent to which a country's citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media" (Kaufmann et al., 2010). It measures this specific aspect of governance quality in percentile rank for each nation. Its values range from zero (lowest) to 100 (highest), with higher values indicating increased government accountability outcomes (see Kaufmann et al., 2010).

It should be noted that economic predictor variables for example, the size of each country's economy and the country's economic reliance on top exporters of COVID-19 vaccines (e.g., China)—were deemed extraneous here. The authors screened them deliberately.

Data Analysis

The analysis methods included: (1) descriptive statistics; and (2) binary logistic regression analysis. All statistical analyses were conducted using SPSS Statistics software (IBM Corporation, 2011). These are described below.

Descriptive statistics

Descriptive statistics, including cross-tabulation analysis, were conducted to summarize and describe the data.

Binary logistic regression analysis

Binary logistic regression analysis was employed to test this hypothesis. Technically, to process the output, the SPSS software internally recoded the coding schema of our outcome variable (i.e., the approved use of inactivated coronavirus vaccines): (a) the lower value was assigned a code of 0 (i.e., not used), and became the reference category; and (b) the higher code was assigned a code of 1 (i.e., used), and became the target category.

However, as the authors coded the variable in a way that corresponded to a software application, the internal recode made by the SPSS did not affect our intended coding schema. Nonetheless, the target category was compared with the reference category. Additionally, the dictatorship was set as the reference predictor category with regards to the categorical predictor, regime type, while democracy was set as the focus predictor category.

Results

Descriptive Statistics

Table 1 is a contingency table constructed by crosstabulating the regime type and the approved use of inactivated COVID-19 vaccines. Table 2 reports the descriptive statistics of the government accountability score, operationally defined by the WGI's Voice-and-Accountability indicator. This table includes the total number of cases, mean, standard error of the mean, standard deviation, and minimum, median, and maximum values.

Binary Logistic Regression

A binary logistic regression analysis was used to model the dichotomous variable of the approved use of inactivated coronavirus vaccines (utilizing the not-used category as the reference category). The predictor variables were the binary variable of regime type, with democracy as the focus category, and the continuous variable of accountability, with higher scores suggesting greater levels of good governance. Based on a default value of 0.5 for the classification threshold prediction probability of vaccine uptake, the results of the logistic analysis demonstrated that the two-predictor model provided a statistically significant prediction of the approved use of the inactivated COVID-19 vaccines, χ^2 (2, n = 194) = 39.882, p < .001. The Nagelkerke pseudo R^2 showed that the model accounted for 24.8 percent of the total variance. Classification accuracy for the cases based on a classification cutoff value of 0.500 for predicting countries using inactivated coronavirus vaccines was moderate, with an overall correct prediction rate of 71.6 percent, and correct prediction rates of 72.5 percent for countries using inactivated COVID-19 vaccines, and 70.9 percent for countries reporting no inactivated coronavirus vaccine uptake (see Table 3).

Table 4 presents the regression results, the Wald test, the odds ratio, and the 95 percent confidence intervals (CI) for the odds ratios for each predictor variable. The Wald test indicated that both regime type and government accountability were statistically significant predictors of the utilization of inactivated COVID-19 vaccines. The influence of regime type was significant; democracies were approximately four times (CI = 1.428, 10.920) more likely than dictatorships to approve using inactivated COVID-19 vaccines, adjusting for government accountability. For each single-point decrease in the accountability score, there was 0.951 times less likelihood of approving the use of inactivated coronavirus vaccines, controlling regime type.

 Table 1
 Regime type and the approved use of inactivated COVID-19 vaccines

			Inactivated COVID-19 Vaccines		Total
			Not Used	Used	
Regime Type	Dictatorship	Count	31	44	75
		(%) of Total	16.0%	22.7%	38.7%
	Democracy	Count	72	47	119
		(%) of Total	37.1%	24.2%	61.3%
Total		Count	103	91	194
		(%) of Total	53.1%	46.9%	100.0%

Note: Pearson chi-squared test: 6.789; 1 df; asymp. sig. (two-sided), and .009.

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Variable	n	M	SEM	SD	Minimum	Mdn	Maximum
Government	194	48.8097	2.07133	28.85029	.00	48.3092	100.00
Accountability							

Table 3 Classification

Observed	Predicted					
	Inactivated COV	Percentage Correct				
	Not Used	Used				
Inactivated COVID-19 Vaccines						
Not Used	73	30	70.9			
Used	25	66	72.5			
Overall Percentage			71.6			

, , ,						
Model	b	SE	Wald	р	Exp (B)	95% CI Exp (B)
Regime type	1.374	0.519	7.006	.008	3.949	1.428-10.920
Government accountability	-0.050	0.010	26.645	.000	0.951	0.933-0.969
Constant	1.425	0.324	19.390	.000	4.158	

 Table 4
 Binary logistic regression results

Note: The outcome variable was the approved use of inactivated COVID-19 vaccines that were used as the target category and were not used as the reference category; democracies were the focus group of the regime type variable; Exp (B) = odds ratio; Nagelkerke $R^2 = .248$.

Discussion

This hypothesis is partially supported. Specifically, the approved use of inactivated COVID-19 vaccines is negatively associated with government accountability; however, accountability, as the results suggest, does not necessarily relate to regime type in general and democracy in particular. Conversely, democracies have a higher tendency to approve the use of inactivated coronavirus vaccines. Nonetheless, dictatorial governments with greater accountability might be more likely to procure coronavirus vaccines made from newer medical technology, such as messenger Ribonucleic Acid (mRNA)-based COVID-19 vaccines.

Democracies may be more likely to approve inactivated coronavirus vaccines because they have sought to diversify their sources of COVID-19 vaccines, to mitigate various potential risks amid high demand for vaccines against mutated coronavirus strains. High-risk scenarios include a vaccine shortage due to delivery delays caused by fastgrowing demands for COVID-19 vaccines. CoronaVac, as an example of an inactivated vaccine promoted by the Chinese government, was among the first generation of coronavirus vaccines to be produced on a global scale, thus procurement thereof from Chinese manufacturers, in parallel with procurement from U.S. companies such as Moderna and Pfizer, is the rational choice for any government. This direction in vaccine procurement policies became more favorable in uncertain supply situations, especially for national governments in LMIC regions.

Based on the results, the conceptual marriage between democracy and governance quality (in this case, government accountability) is probably disadvantageous to COVID-19 policy research. Analytically, it may imply an ethnocentric bias among scholars: democracy and good governance are similar to conjoined twins—difficult to separate. However, they are not. Furthermore, democracy is not flawless, and apparently, democracies have made many errors in dealing with COVID-19 outbreaks. The United States, under President Donald Trump, provides the best example of this point (Bunyavejchewin & Sirichuanjun, 2021). Our results seem to highlight the fact that government policy responses to the COVID-19 pandemic could not be explained in terms of binary opposition, such as good democracy versus bad dictatorship.

Theoretically, the results imply that policy performance (i.e. the provision of needed public goods), especially during global emergencies such as the COVID-19 pandemic, concerns any political regime regardless of its type. This appears to be the case for autocracies, whose regime legitimation relies upon their policy performance, upholding and improving people's living conditions by providing adequate public goods and services (Cassani, 2017; Freedman, 2005). Singapore, a small city-state with a single dominant party system, classified as a dictatorship in the Bjørnskov-Rode regime dataset (Bjørnskov & Rode, 2020), is a good example. The Singaporean government has effectively kept coronavirus outbreaks and their impacts at bay. This, in turn, has allowed the government to gain a high level of trust and legitimacy (Woo, 2020, 2021).

Finally, the authors acknowledge the study's limitations. Even though we used 194 cases, our analysis only uncovered a fraction of patterns of governmental COVID-19 vaccine policies across different countries at a particular point in time. Therefore, this limits generalizability. Still, doing so, we assert, is necessary to better capture COVID-19 vaccine policies politically, from an academic perspective, rather than from a medical and public health perspective, which has remained needed (see Greer et al., 2020).

Conclusion and Recommendation

Puzzled by Thailand's COVID-19 vaccine procurement policy, this study hypothesized that democratic accountability, represented by democratic regime type and government accountability, should have a negative association with countries' approved use of inactivated COVID-19 vaccines since their efficacy has remained controversial. Nevertheless, statistical analysis found that only government accountability had a statistically significant negative relationship with the use of these vaccines. Nonetheless, the lower a country's accountability, the higher the possibility appeared that its government would approve of using inactivated coronavirus vaccines. This accountability seems to have nothing to do with the country's regime type. For instance, Chad and Gabon, two African nations governed by less-accountable regimes, relied solely on Sinopharm vaccines imported from China. Democracies in Southeast Asia, like Malaysia and Indonesia, also approved using of inactivated Chinese vaccines. However, at the same time, they diversified their coronavirus vaccine supplies by securing mRNA-based Moderna and Pfizer vaccines for mass vaccination (Ritchie et al., 2020).

Contrary to what the authors initially expected, democracies have a higher tendency to approve the use of inactivated vaccines. Such a tendency could be seen as a form of hedging to offset potential risks, such as a vaccine shortage, amidst the fast-growing demand for high-quality vaccines against mutated coronavirus strains.

The aforementioned provides a broad perspective of COVID-19 vaccine policies worldwide at a certain point in time. This study offers a few glimpses of the complex political phenomena of government policy responses to COVID-19 situations. The only general conclusion that can be drawn is that governments with greater accountability tend to have better COVID-19 vaccine policies, viz., procuring quality-assured COVID-19 vaccines for mass vaccination of their general population. This is simply a general tendency. It does not necessarily hold true in some LMICs, where effective policy responses to the pandemic, including vaccine procurements, have been systemically under the siege of embedded nepotism and chronic corruption. Arguably, this is perhaps best exemplified by the Thai case.

Conflict of Interest

The authors declare that there is no conflict of interest.

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