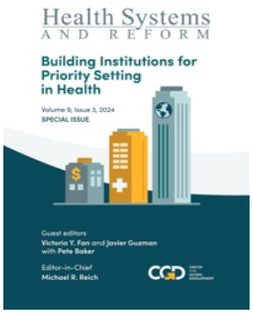

Taylor & Francis
Taylor & Francis Group

Health Systems & Reform

ISSN: (Print) (Online) Journal homepage: www.tandfonline.com/journals/khsr20

Battle to Survive: The Association Between Accountability and Chinese Local Government Response to COVID-19

Bingqing Guo & Karen Ann Grépin

To cite this article: Bingqing Guo & Karen Ann Grépin (2024) Battle to Survive: The Association Between Accountability and Chinese Local Government Response to COVID-19, Health Systems & Reform, 10:1, 2400725, DOI: 10.1080/23288604.2024.2400725

To link to this article: https://doi.org/10.1080/23288604.2024.2400725

HEALTH SYSTEMS & REFORM
2024, VOL. 10, NO. 1, 2400725
https://doi.org/10.1080/23288604.2024.2400725

Taylor & Francis
Taylor & Francis Group

RESEARCH ARTICLE

OPEN ACCESS Check for updates

Battle to Survive: The Association Between Accountability and Chinese Local Government Response to COVID-19

Bingqing Guo and Karen Ann Grépin

School of Public Health, Li Ka Shing Faculty of Medicine, The University of Hong Kong, Hong Kong, SAR, China

ABSTRACT

China's ability to sustain the zero-COVID strategy over three years has garnered global attention, but little is known about the factors contributing to its long-term adherence. Based on the political promotion tournament model, this article theorizes that China's strict administrative accountability system, which tied local officials' career prospects to their performance in crucial policy goals, incentivized local governments to sustain COVID-19 policies. Using data from the Oxford COVID-19 Government Response Tracker and major official Chinese media outlets, we performed interrupted time series analysis (ITSA) to examine whether the accountability events affected the local government's COVID-19 responses. Noticeably, our analyses found that from May 4, 2020, to September 30, 2022, when an accountability event happened, officials in the affected (local effects) and unaffected (spillover effects) provinces all increased their containment responses and decreased their economic support responses. This is true even for provinces without new localized outbreaks. The effects of accountability events increased with decreasing geographical distance. These findings remain consistent after several robustness checks. The administrative accountability system is a key institutional factor in implementing China's zero-COVID strategy, which contributed to the global literature about the pandemic policy process in centralized countries.

ARTICLE HISTORY
Received 26 January 2024
Revised 9 June 2024
Accepted 31 August 2024

KEYWORDS
Accountability system; China; COVID-19 response; policy implementation; political promotion tournament model

Introduction

Effective governance in health systems is essential to achieve policy goals.[1,2] Previous studies have shown that institutional factors influenced the extent to which governments around the world were able to achieve their policy goals during their COVID-19 responses. Countries like Spain, the Pacific Island countries, and India achieved their policy goals more effectively when there was a higher level of political alignment in goals between local and central governments, a supportive decision-making structure, and fewer parliamentary parties.[3–5] China sustained its zero-COVID strategy for three years, but little is known about the institutional factors that enabled it to sustain its policy response to COVID-19 for such a long time.[6]

China's zero-COVID strategy began in January 2020 when the National Health Commission (NHC) announced the strictest public health measures for COVID-19.[7] It categorized China's COVID-19 response into four stages: Emergency Containment (January to April 2020), Regular Prevention and Control (May 2020 to July 2021), Dynamic Zero (August 2021 to December 2022), and the New Stage (since January 2023).[8,9] In the first stage, China aimed to eliminate domestic cases by locking down the epicenter until there were no new cases.[10] During the second and third stages, the central government aimed to quickly control subnational outbreaks rather than ensuring absolutely no infections.[8,11] During the New Stage, China ended its zero-COVID strategy and aimed to treat patients and prevent serious illness.[9]

Throughout the pandemic, to achieve the central government's policy goals, most Chinese local governments strictly enforced or even over-implemented the zero-COVID strategy—despite its enormous economic and social costs.[12,13] For instance, according to the Oxford COVID-19 Government Response Tracker (OxCGRT), 27 out of 31 provinces canceled public events for more than 900 days from January 2020 to September 2022. In April 2022, international arrivals in Shenyang had to quarantine and be monitored for 28 + 28 days, exceeding the central government's 14 + 7-day requirement.[11,14]

At the same time, many Chinese officials were punished due to inadequate COVID-19 responses. The number was approximately 3,000 in or near Wuhan from January to April 2020.[13] The Accountability

CONTACT Karen Ann Grépin kgrepin@hku.hk School of Public Health of the University of Hong Kong, 7 Sassoon Road, Pok Fu Lam, Hong Kong SAR
Supplemental material for this article can be accessed online at https://doi.org/10.1080/23288604.2024.2400725

System for the Cadres of the Communist Party of China (CPC) and Government (*Dang Zheng Ling Dao Gan Bu Wen Ze Zhi Du*), which was established in the 1980s,[15] might help to explain how local government officials were able to continue to implement such strict policies throughout the pandemic. In China, administrative accountability events are disciplinary actions that are initiated by higher-level government or CPC institutions against lower-level officials. Accountability events can lead to reprimand, promotion opportunity loss, demotion, or criminal charges and are strictly enforced —leaving zero tolerance for misconduct and negligence by lower-level officials.[16] During the SARS outbreak of 2003, the Chinese health minister and the Beijing mayor were both removed from their posts.[17]

However, the effects of this accountability structure on Chinese local governments' COVID-19 responses remain unclear. Previous studies yielded inconsistent findings. Zeng and Yi found a link between governors' motivation to avoid accountability events and fewer localized COVID-19 cases during the first five months of the pandemic.[18] In contrast, Ye et al. reviewed 340 COVID-19-related accountability events in China, suggesting overemphasizing punishment may have led to the evasion or shifting of responsibilities.[19] Moreover, previous studies focused only on the early phases of the pandemic, and most were narrative,[13] providing limited quantitative evidence. None explored the spillover effects of accountability events on responses in unaffected provinces. This paper fills this research gap by examining the effects of accountability events on the COVID-19 response of affected (local effects) and unaffected provinces (spillover effects) in China from May 2020 to September 2022 using an interrupted time series analysis (ITSA).

The political promotion tournament (PPT) model argues that in a centralized personnel system, local officials endeavor to outperform their peers by achieving important policy goals to secure a promotion.[20] It was selected in this study to study local government responses because the accountability system and PPT model both predict that local officials are motivated to respond to protect their careers. The PPT model was initially proposed by Zhou to explain China's rapid economic growth: the centralized promotion mechanism incentivized local officials to be passionate about one of the most important goals of central government: economic development.[20] The PPT model has also been applied to other policy sectors, such as environmental protection and health care.[21,22] China's local government officials are appointed by higher-level governments or CPC committees.[23] The CPC Central Committee and the Chinese central government appoint provincial officials, who then appoint lower-level officials (Figure 1).[24] This mechanism extends down from the provincial to the township level.[23] Political conformity is a crucial criterion for officials' appointments, and state-owned organizations dominate the labor market in sectors like health care.[25] Striving for promotion within this singular labor market is almost the only option for Chinese officials. Moreover, only winners in previous tournaments can participate in subsequent promotion competitions.[20]

A simplified example is presented in Figure 1. In this example, only 7.53% (2,844 of 37,779) of township mayors could be promoted to county magistrates, and

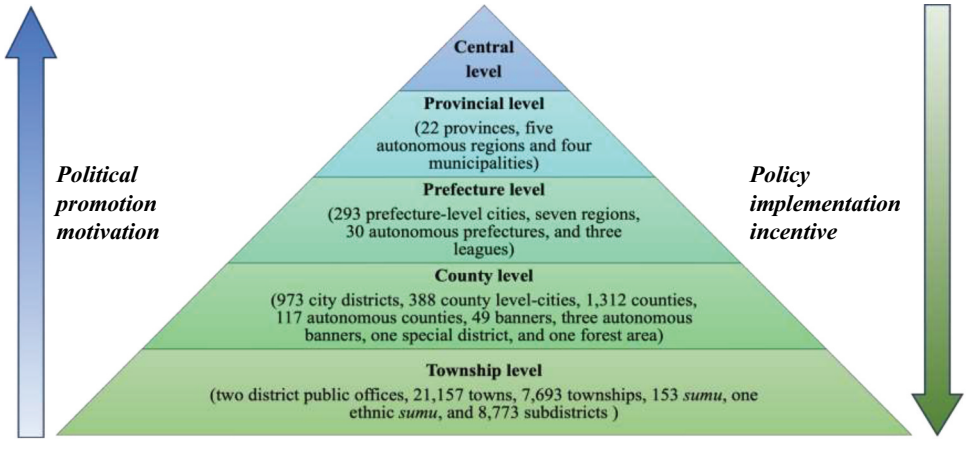

Figure 1. Territorial levels of the state administration system in mainland China. Notes: Different units can have different names even if they are at the same administrative level. For instance, an autonomous region is a provincial level administrative unit with a significant ethnic minority population (i.e., Ningxia Hui Autonomous Region), while a municipality is a provincial level administrative unit that is important for politics, economics, transportation, etc. (i.e., Beijing and Shanghai). Data source: web site of the Ministry of Civil Affairs of China.

only 11.71% (333 of 2,844) of winners could be promoted to city mayors, creating intense competition. As such, Chinese officials will exert maximum effort to contend with peers in achieving or even exceeding their superiors' expectations and at least avoid any stain of poor performance.[20] Officials' performance is usually the sum of their subordinates' performance. Thus, officials must motivate their subordinates to meet or exceed goals in order to demonstrate they have achieved their policy goals. However, goals are often inflated at each level, imposing unrealistic requirements for frontliners and causing detrimental outcomes to society. For instance, the central government set a 7.5% annual GDP growth rate goal for 2006–2010, prompting provinces to set an average goal of 10.1%.[26] Local officials typically overlook goals that are not tied to promotion evaluations. Qiao et al. highlighted how mayors prioritized boosting GDP, even at the expense of pollution.[27]

We consider the policy intensity of local governments' containment and economic support responses to COVID-19.[28] The former comprises policies directly related to the goal of "(dynamic) zero," such as public place closure and travel restrictions. The latter financially supports people affected by the pandemic or related measures. These two kinds of responses are complementary. We began with the local effects, specifically, the effects of an accountability event on local governments within the affected province. According to the PPT model, accountability events reduce officials' promotion prospects, which can often also include being fired. Consequently, officials in affected provinces intensify their COVID-19 responses to mitigate damages. Two hypotheses were developed:

H1a- *Administrative accountability events increased the policy intensity of COVID-19 containment responses from governments within the affected province.*

H1b- *Administrative accountability events increased the policy intensity of COVID-19 economic support responses from governments within the affected province.*

We also propose the spillover effects of accountability events on the intensity of COVID-19 response policy in unaffected provinces. These events warned officials of the consequences of inadequate COVID-19 responses on their promotions. Officials in unaffected provinces responded by intensifying their efforts to avoid similar damages. Ambitious Chinese officials must rank amongst the top of their peers regarding the performance of core sectors. These events also reminded officials that the COVID-19 response was one of the core sectors where they must surpass their peers, thus triggering competition and intensifying their COVID-19 responses. Two hypotheses were developed:

H2a- *Administrative accountability events increased the policy intensity of COVID-19 containment responses from governments in unaffected provinces.*

H2b- *Administrative accountability events increased the policy intensity of COVID-19 economic support responses from governments in unaffected provinces.*

Materials and Methods

Data Sources

We constructed a weekly provincial-level panel dataset covering administrative accountability events and local government responses to COVID-19 in China during the pandemic. Data on local government's responses to COVID-19 were extracted from the Oxford COVID-19 Government Response Tracker (OxCGRT). OxCGRT collects COVID-19 policies from countries, including containment, closure, health systems, economic support, and vaccination policies.[29] It covers the period from January 1, 2020, to the end of 2022.[29] We used China's provincial-level data. The data on administrative accountability events were collected by the research team from three major state-owned media outlets in China: The People's Daily (the official organ of the CPC), Xinhua News Agency (China's state news agency), and China Central Television News (China's state television). Based on the three sources, we compiled an accountability event dataset manually. Data on covariates were from the Chinese government's administrative data (Supplementary Appendix 1).

Sample

We included 31 mainland China provinces from May 4, 2020, to September 30, 2022. We excluded the first stage of the COVID-19 response, which had a different goal of achieving zero infections. To avoid effects of the 20th National Congress of the CPC,[30] which opened on October 16, 2022, we concluded our study period two weeks before the Congress. Considering the central government regarded two weeks as the incubation period for COVID-19,[11] we expect most local governments to take preemptive measures two weeks in advance to ensure the prevention and control of localized outbreaks before Congress. Our analysis included 3,906 observations spanning 31 provinces and 126 weeks.

Variables

Local Government's Responses to COVID-19

The outcomes of this study, the containment and health index (referred to as the containment response index) and the economic support response index, are both on a scale of 0–100. The containment response index reflects the government's efforts to control infections through containment, closure, and health system policies. The economic support response index measures income support and debt/contract relief efforts. They reflect the most intense policies within a province. The index calculation process was developed by OxCGRT and is detailed elsewhere.[29] The OxCGRT provides a daily dataset from January 1, 2020, to December 7, 2022. We used this daily dataset from May 4, 2020, to September 30, 2022, condensed it into a weekly interval, and calculated the weekly average index for each province.

Administrative Accountability Events

The People's Daily, Xinhua News Agency, and China Central Television News are commonly seen as representing the opinions of the Chinese Central Government and the Central Committee of the CPC and are given importance by officials.[31] Thus, officials nationwide would be aware of accountability events reported by them. Therefore, we collected data on accountability events as events reported by the People's Daily, Xinhua News Agency, and China Central Television, wherein officials were held accountable for their poor performance in COVID-19 responses. We searched the three major media outlets, including newspapers (if available), websites, and accounts on the most popular Chinese mobile social media platform, WeChat.[32] We searched articles published during the study period containing any Chinese translations of "COVID-19," "accountability," "dereliction of duty," "containment," or "control." For each search result, a native Chinese speaker author reviewed the full article. News articles in these three outlets clearly describe why officials were held accountable, allowing us to identify eligible articles accurately and objectively (an example is shown in Appendix 2). We finally collected 131 articles mentioning COVID-19-related accountability events in 18 provinces (Appendix 2). For example, in June 2020, Xinhua News Agency reported the removal of the Deputy Head of the Fengtai District of Beijing due to a localized outbreak that caused 283 cases.

We aggregated all 131 events chronologically by week, irrespective of where they occurred. After aggregating, we identified 42 weeks with at least one accountability event (Table S1). Figure 2 shows the weeks with accountability events clustered over several periods. Thus, we redefined the 42 weeks into eight clusters

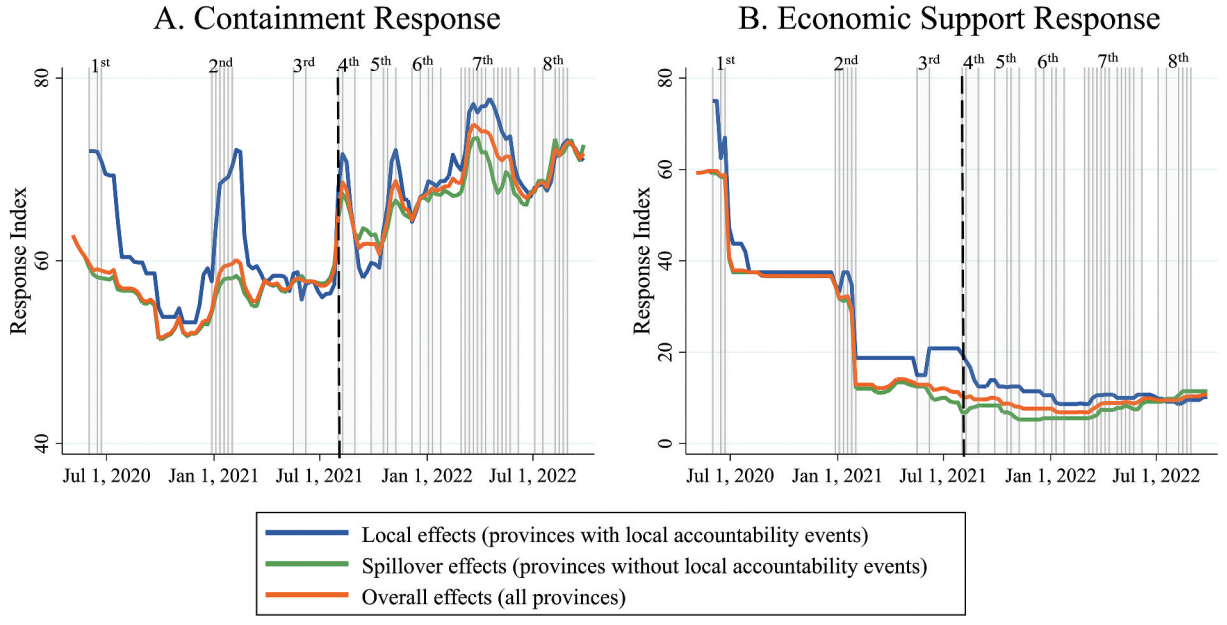

Figure 2. Administrative accountability event clusters and local governments' (A) containment responses and (B) economic support responses to COVID-19 in China from May 4, 2020, to September 30, 2022. Notes: Gray lines and blocks: administrative accountability events and clusters. Blue lines: the average response of provinces that had local accountability events in or before the corresponding week. Green lines: the average response of provinces that had not have local accountability events by the corresponding week. Orange lines: the average response of all provinces. Black long dash line: the end of the second stage of the Chinese response to COVID-19. Data sources: Oxford COVID-19 Government Response Tracker, the People's Daily, Xinhua News Agency, and China Central Television News.

Table 1. Summary of accountability event clusters in China from May 4, 2020 to September 30, 2022.

Treatment number	Event	Week Number	Monday of this Week
Stage 2 Regular Prevention and Control			
	Cluster 1		
1	Cluster 1 Start	5	June 1, 2020
2	Cluster 1 End	8	June 22, 2020
	Cluster 2		
3	Cluster 2 Start	35	December 28, 2020
4	Cluster 2 End	40	February 1, 2021
	Cluster 3		
5	Cluster 3 Start	55	May 17, 2021
6	Cluster 3 End	58	June 7, 2021
Stage 3 Dynamic Zero			
	Cluster 4		
7	Cluster 4 Start	66	August 2, 2021
8	Cluster 4 End	70	August 30, 2021
	Cluster 5		
9	Cluster 5 Start	74	September 27, 2021
10	Cluster 5 End	80	November 8, 2021
	Cluster 6		
11	Cluster 6 Start	84	December 6, 2021
12	Cluster 6 End	91	January 24, 2022
	Cluster 7		
13	Cluster 7 Start	96	February 28, 2022
14	Cluster 7 End	110	June 6, 2022
	Cluster 8		
15	Cluster 8 Start	114	July 4, 2022
16	Cluster 8 End	122	August 29, 2022

Notes: The week of May 4, 2020, is the first week of this study. Data sources: the People's Daily, Xinhua News Agency, and China Central Television News.

(Table 1 and Figure 2). We used a four-week criterion, considering two adjacent weeks with events as part of the same cluster if the time gap between them was less than four weeks. This was done because ITSA requires a minimum of three data points before and after the treatment.

To examine the geographical heterogeneity in the effects, we also created a categorical variable to represent the distance between each province and the event. We classified the provinces into three categories: those where the event occurred within the province, in neighboring provinces, and in other provinces.

Covariates

We included epidemic, economic pressure, health system, and other factors, including newly confirmed COVID-19 cases, localized outbreaks, the type of variant in circulation (Delta and Omicron), the proportion of the non-primary sector's GDP, registered urban unemployment rate, a proportion of the population living in an urban area, the number of health professionals per 10 thousand people, the number of health facility beds per 10 thousand people, the logarithm of GDP per capita, population size, and dummy variables of the month. For details, see Appendix 1.

Methods

Equation 1 shows the ITSA model we used, where Y_{it} is the outcome, and $Time_t$ is the study period in week t (i.e., 1, . . . , 126). *Cluster 1 begin*$_t$ to *Cluster 8 begin*$_t$ represent cluster 1 to cluster 8 that began in week t. *Time after cluster 1 begin*$_t$ to *Time after cluster 8 begin*$_t$ represent the weekly trends following the beginning of cluster 1 to cluster 8 at time t. Similarly, *Cluster 1 end*$_t$ to *Cluster 8 end*$_t$ and *Time after cluster 1 end*$_t$ to *Time after cluster 8 end*$_t$ represent the corresponding cluster ends. We modeled accountability cluster-related items with a one-week lag. $Month_{it}$ represents the month of time t, controlling for seasonal trends. X_{it} represents covariates in Table 2. We incorporated a random effect to allow provinces' intercepts to vary v_{0i}. Equation 2 represents the error term in Equation 1, which is modeled by a three-period autoregressive (AR) structure (model selection details see Appendix 3). All standard errors were clustered at the provincial level. While examining the geographical heterogeneity in the effects of accountability events, we added a term representing geographical distance, $Distance_{it}$, to Equation 1.

To examine local effects, we used 2,268 observations of 18 provinces with local accountability events. To

$$
\begin{aligned}
Y_{it} = {} & \beta_{0i} + \beta_1 * Time_t \\
& + \left(\beta_2 * Cluster\ 1\ begin_t + \beta_3 * Time\ after\ cluster\ 1\ begin_t \right. \\
& \left. + \beta_4 * Cluster\ 1\ end_t + \beta_5 * Time\ after\ cluster\ 1\ end_t\right) \\
& + \left(\beta_6 * Cluster\ 2\ begin_t + \beta_7 * Time\ after\ cluster\ 2\ begin_t \right. \\
& \left. + \beta_8 * Cluster\ 2\ end_t + \beta_9 * Time\ after\ cluster\ 2\ end_t\right) \\
& + \ldots \left(\beta_{30} * Cluster\ 8\ begin_t + \beta_{31} \right. \\
& * Time\ after\ cluster\ 8\ begin_t + \beta_{32} * Cluster\ 8\ end_t + \beta_{33} \\
& * Time\ after\ cluster\ 8\ end_t + \beta_{34} * Month_t + \beta_{35} * X_{it} \\
& + v_{0i} + \varepsilon_{it}
\end{aligned} \tag{1}
$$

examine spillover effects, we removed observations of provinces with accountability events in or before the corresponding week, using 2,890 province observations for analyses. We also analyzed all 3,906 observations to examine the overall effects.

We discussed the possibility of using difference-in-difference (DID). However, we found it impossible to find untreated areas as the PPT would predict spillover effects (details are in Appendix 4).

$$
\varepsilon_{it} = \sum_{k=1}^{3} \rho_{i(t-k)} \varepsilon_{i(t-k)} + u_{it} \tag{2}
$$

Results

Descriptive Statistics

Table 2 presents that the mean of containment response indices was higher during the event clusters (66.23) than in other weeks (59.12). However, the mean of economic support response indices was lower during the clusters than in other weeks (14.70 versus 23 USD.93).

Main Results

Local Effects

We plotted each province's COVID-19 responses over time. Figure 3 shows that amongst the 56 local

Table 2. Weekly provincial-level descriptive statistics (from May 4, 2020 to September 30, 2022).

	All Weeks			Cluster Weeks			Other Weeks		
Variables	Obs.	Mean (%)	Std. Dev.	Obs.	Mean (%)	Std. Dev.	Obs.	Mean (%)	Std. Dev.
Outcomes									
Containment response index	3,899	62.39	9.38	1,797	66.23	8.97	2,102	59.12	8.42
Economic support response index	3,863	19.70	21.22	1,772	14.70	20.20	2,091	23.93	21.14
Epidemic factors									
New confirmed cases	3,906	41.02	538.87	1,798	80.10	791.80	2,108	7.69	32.63
Local outbreaks									
Yes	175	4.48	–	144	8.01	–	31	1.47	–
Delta									
Yes	20	0.51	–	17	0.95	–	3	0.14	–
Omicron									
Yes	114	2.92	–	94	5.23	–	20	0.95	–
Economy pressure									
Non-primary sector GDP ratio	3,906	90.69	5.21	1,798	90.64	5.22	2,108	90.74	5.19
Unemployment rate	3,906	3.14	0.60	1,798	3.18	0. 60	2,108	3.11	0.60
Urban population ratio	3,906	63.66	10.90	1,798	64.01	10.80	2,108	63.37	10.98
Health system capacity factors									
Health professionals per 10 k population	3,906	77.73	12.95	1,798	79.20	13.19	2,108	76.47	12.60
Health facility beds per 10 k population	3,906	63.66	10.78	1,798	63.89	11.85	2,108	63.47	9.78
Other factors									
Ln per capita GDP	3,906	11.12	0.37	1,798	11.15	0.37	2,108	11.10	0.37
Population size (10 k)	3,906	4,547.18	3,001.85	1,798	4,548.59	3,007.43	2,108	4,545.97	2,997.79

Notes: All provinces are included in this table. Data sources: Oxford COVID-19 Government Response Tracker, China Data Lab at Harvard University, National Health Commission of China, *China Health Statistical Yearbook*, China Economic Net, and *Health Statistical Yearbooks of China*.

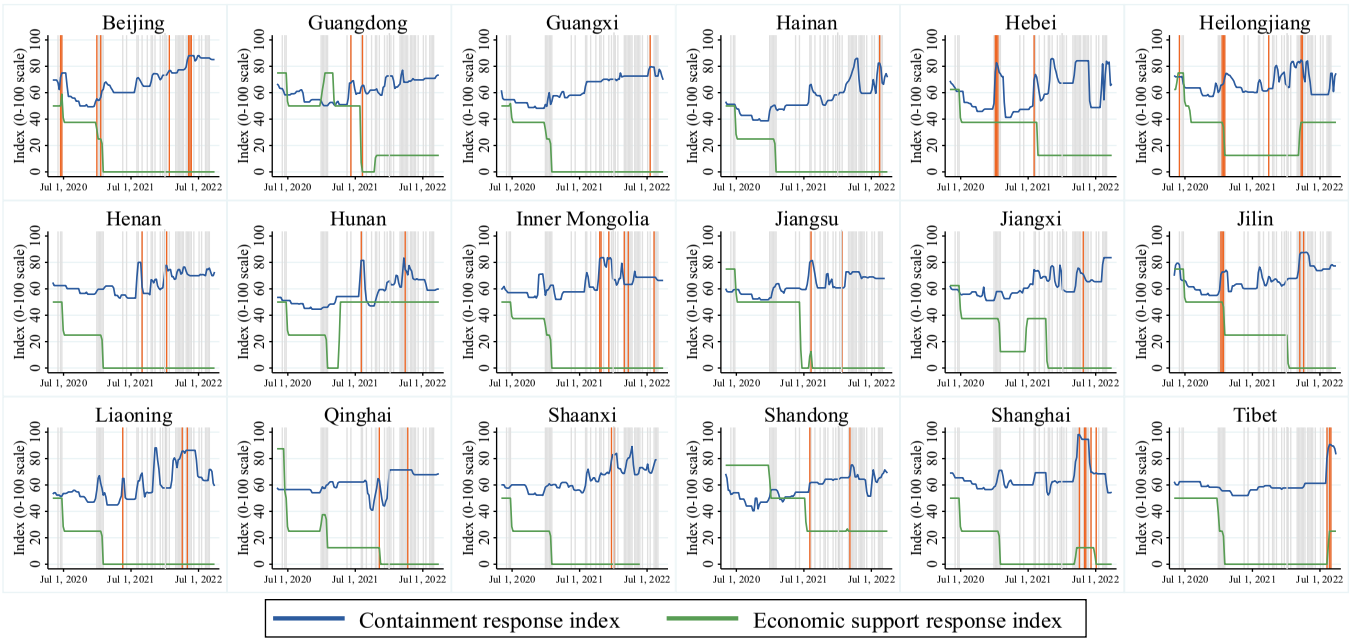

Figure 3. Local effects of administrative accountability event clusters on local government's containment responses and economic support responses to COVID-19 from May 4, 2020 to September 30, 2022. Notes: Gray lines and blocks: administrative accountability events and clusters. Orange lines: administrative events that happened locally. Data sources: Oxford COVID-19 Government Response Tracker, the People's Daily, Xinhua News Agency, and China Central Television News.

accountability events, the local containment response index increased following 29 (or 51.79%) of them and peaked when 14 (or 25%) of them occurred. The economic support response index in Figure 3 shows inconsistent changes: Beijing's economic support response declined following its fourth accountability event, but Shanghai increased its response after its first event. For the ITSA results, see Table S4.

Spillover Effects

The level change indicates how the response indices immediately shifted from the last observation before the cluster starts or ends to the first one after. For example, the level change associated with the second cluster start (week 35) reflects the changes in the outcome from week 34 to week 36. The response indices exhibit a trend slope over time, and the trend change reveals alterations in this slope following each cluster start or end. For example, the trend change of the first cluster start presents the changes in slope from the last period before it (week 9-week 34) to the first interval after (week 35-week 40). A positive trend change implies a faster increase, a reversal from a decreasing to an increasing trend, or a slower decrease than the last period.

Columns (1) to (2) of Table 3 display the spillover effects of accountability event clusters on policy intensity of containment responses. Specifically, Columns (1) and (2) of Table 3 Panel A illustrate the impacts of cluster starts. Following the start of the second accountability event cluster, governments immediately increased their containment responses by 3.17 on average. The corresponding trend change is 1.25, reflecting a positive alteration from the last period preceding the second cluster. The start of the fourth cluster was associated with an immediate increase in the level of containment response (Coeff = 1.25, SE = 0.58, $p < 0.05$) and a decrease in its trend Coeff = −1.89, SE = 0.39, $p < 0.01$). The start of the sixth cluster was also significantly associated with a 1.62 immediate increase in the level of containment policy intensity. In contrast, Table 3 Panel B (1) and (2) show that following the end of the second cluster, the trend of the containment response decreased significantly by 0.86 on average in the subsequent weeks. After the end of the fourth cluster, the trend of containment response increased by 1.03 on average ($p < 0.05$). Regarding the fifth cluster, an average 0.77 decrease in the level of containment response was significant at $p < 0.1$. Regarding the seventh cluster, the level of containment response immediately decreased by 0.77 on average ($p < 0.1$). Table 3 columns (3) and (4) show that the overall effects on containment responses were similar to spillover effects.

Columns (5)-(6) of Table 3 show the spillover effects on policy intensity of economic support responses. Table 3 Panel A (5) and (6) show that at the start of the second cluster, the level of economic support response immediately decreased significantly by 7.31. The corresponding trend change was −2.44 ($p < 0.01$), showing a negative alteration. The start of the sixth cluster was associated with a 0.27 increase in the level. The start of the seventh cluster was associated with a 2.83 decrease in the level and a 2.41 decrease in the trend of the economic support responses. At the start of the eighth cluster, the level decreased by 0.53 immediately, and the trend showed a negative alteration of 0.34 ($p < 0.01$). However, as Table 3 Panel B (5) and (6) show, the end of clusters affected the economic support responses in a mixed way. Following the end of the first cluster, the economic support response level decreased dramatically by 16.81 ($p < 0.01$). However, the end of the second cluster was associated with a 4.20 significant increase in level and a 2.65 significant increase in its trend. Similar to containment responses, Table 3 columns (7)-(8) show no fundamental differences between spillover effects and overall effects.

Localized COVID-19 epidemics greatly affected local government responses. To mitigate the bias, we limited our analysis to observations that did not involve new localized outbreaks in the corresponding week. Results are shown in Table 4, demonstrating no significant difference from Table 3, with even larger coefficients in some cases.

Heterogeneity in Effects of Accountability Events by Geographical Distance

Table 5 columns (1) and (2) show that accountability events occurring within a province or a neighboring province were associated with more intense containment responses. Table 5 columns (3)-(4) show that the distance was not associated with the economic support responses. Table S5 shows the full results.

Robustness Checks

First, we removed all covariates as a robustness check (Figure 4 and Table S6) to ensure that the covariates used were not collinear or leading to imprecise estimation. Second, we also employed a parsimonious model that only included four covariates: new confirmed cases, the number of health professionals per 10 thousand people, the logarithm of GDP per capita, and population size (Figures 4 and Table S7). Third, we reanalyzed the results after removing 252 observations from Hubei (where Wuhan is

Table 3. Effects of each accountability cluster on containment and economic support responses from May 4, 2020, to September 30, 2022.

	Containment Response Index				Economic Support Response Index			
	Spillover Effects		Overall Effects		Spillover Effects		Overall Effects	
	Level (1)	Trend (2)	Level (3)	Trend (4)	Level (5)	Trend (6)	Level (7)	Trend (8)
Panel A: Effects of the start of each accountability event cluster								
Stage 2 Regular Prevention and Control								
Cluster 1 Start	−0.22	0.54**	−0.27	0.63**	0.28	−0.60	0.39*	−0.45
	(0.53)	(0.23)	(0.53)	(0.27)	(0.27)	(0.69)	(0.23)	(0.64)
Cluster 2 Start	3.17***	1.25***	2.50***	1.45***	−7.31***	−2.44***	−6.52***	−2.95***
	(0.93)	(0.27)	(0.92)	(0.29)	(0.99)	(0.43)	(0.93)	(0.38)
Cluster 3 Start	0.03	0.15	0.06	−0.03	0.19	−0.14	0.17	−0.08
	(0.26)	(0.41)	(0.21)	(0.45)	(0.28)	(0.24)	(0.23)	(0.20)
Stage 3 Dynamic Zero								
Cluster 4 Start	1.25**	−1.89***	0.63	−2.57***	−0.11	0.34	0.07	0.03
	(0.58)	(0.39)	(0.57)	(0.51)	(0.27)	(0.50)	(0.35)	(0.46)
Cluster 5 Start	−0.16	0.34	0.01	0.83	−0.48	−0.71	−0.48*	−0.37
	(0.71)	(0.71)	(0.49)	(0.57)	(0.32)	(0.48)	(0.28)	(0.30)
Cluster 6 Start	1.62***	1.23	2.23***	1.65***	0.27***	−0.01	0.24***	−0.08
	(0.55)	(0.75)	(0.47)	(0.62)	(0.05)	(0.02)	(0.06)	(0.18)
Cluster 7 Start	0.83	−0.33	0.93	−0.62*	−2.83***	−2.41***	−2.68***	−2.00***
	(1.09)	(0.30)	(0.97)	(0.32)	(0.33)	(0.35)	(0.34)	(0.24)
Cluster 8 Start	0.64	−0.35	0.26	0.31	−0.53***	−0.34***	−0.27	−0.02
	(0.60)	(0.60)	(0.48)	(0.51)	(0.15)	(0.11)	(0.19)	(0.20)
Panel B: Effects of the end of each accountability event cluster								
Stage 2 Regular Prevention and Control								
Cluster 1 End	−0.15	−0.14	−0.27	−0.24	−16.81***	0.24	−17.01***	0.18
	(0.17)	(0.13)	(0.24)	(0.22)	(1.20)	(0.67)	(1.14)	(0.65)
Cluster 2 End	−0.72	−0.86***	−0.77	−1.16***	4.20***	2.65***	5.06***	3.13***
	(0.48)	(0.27)	(0.50)	(0.32)	(0.63)	(0.52)	(0.57)	(0.46)
Cluster 3 End	−0.12	0.67	0.18	1.12**	−1.12	0.28	−0.89	0.10
	(0.65)	(0.48)	(0.55)	(0.51)	(1.30)	(0.31)	(1.04)	(0.29)
Stage 3 Dynamic Zero								
Cluster 4 End	0.26	1.03*	0.58	1.62***	−1.02***	−0.38	−0.72**	0.06
	(0.66)	(0.54)	(0.61)	(0.52)	(0.36)	(0.41)	(0.33)	(0.39)
Cluster 5 End	−0.77*	−0.99	−1.76***	−1.99***	0.47	0.51	−0.21	0.22
	(0.43)	(0.77)	(0.55)	(0.73)	(0.34)	(0.45)	(0.48)	(0.32)
Cluster 6 End	−0.30	−0.27	−0.35	−0.04	−1.64***	2.74***	−1.45***	2.33***
	(0.56)	(0.40)	(0.48)	(0.38)	(0.16)	(0.30)	(0.19)	(0.29)
Cluster 7 End	−0.77*	0.34	−0.80***	0.11	0.28**	0.21	0.13	0.07
	(0.44)	(0.47)	(0.28)	(0.40)	(0.11)	(0.26)	(0.13)	(0.22)
Cluster 8 End	1.21	0.11	0.05	−0.64	−0.72***	0.02	−0.78***	−0.14
	(1.54)	(0.55)	(0.81)	(0.48)	(0.12)	(0.04)	(0.11)	(0.13)
Time Trend	Yes		Yes		Yes		Yes	
Month	Yes		Yes		Yes		Yes	
Control variables	Yes		Yes		Yes		Yes	
Obs.	2,890		3,899		2869		3,863	
AIC	13708.57		19624.55		13150.28		17,659.52	

Notes: Provincial-level clustered standard errors are in parentheses. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. For all columns, we modeled cluster-related items with a one-week lag. For spillover effects (columns 1, 2, 5, and 6), provinces with local accountability events in or before the corresponding week were removed. All provinces were included for overall effects (columns 3, 4, 7, and 8). Data sources: Oxford COVID-19 Government Response Tracker, China Data Lab at Harvard University, National Health Commission of China, *China Health Statistical Yearbook*, China Economic Net, and *Health Statistical Yearbooks of China*.

located) and Shanghai since they implemented full-scale lockdowns during the study period (Figures 4 and Table S8). Lockdowns would likely drive unusual responses, contributing to poor estimation. Fourth, we reanalyzed without the lag of treatment (Figure 4 and Table S9). We included a one-week lag in cluster terms since local governments perhaps needed time to change their responses. However, the extent to which the government required time was unclear. Finally, we employed eight weeks as the criterion for clustering accountability events. Thus, four clusters were defined, with the previous fourth to eighth clusters combined (Figure 4 and Table S10). No significant alterations were observed after each robustness check.

Discussion

To the best of our knowledge, this is the first study to empirically explore the effects of the Chinese adminis-

Table 4. Effects of each accountability cluster on containment and economic support responses from May 4, 2020, to September 30, 2022, among provinces without new localized outbreaks.

	Containment Response Index				Economic Support Response Index			
	Spillover Effects		Overall Effects		Spillover Effects		Overall Effects	
	Level (1)	Trend (2)	Level (3)	Trend (4)	Level (5)	Trend (6)	Level (7)	Trend (8)
Panel A: Effects of the start of each accountability event cluster								
Stage 2 Regular Prevention and Control								
Cluster 1 Start	−0.25	0.56**	−0.35	0.51**	0.30	−0.58	0.34	−0.54
	(0.55)	(0.22)	(0.53)	(0.24)	(0.26)	(0.69)	(0.22)	(0.62)
Cluster 2 Start	3.34***	1.25***	2.35***	1.58***	−7.50***	−2.32***	−6.77***	−2.90***
	(1.01)	(0.27)	(0.80)	(0.31)	(1.00)	(0.42)	(0.99)	(0.39)
Cluster 3 Start	0.07	0.13	0.15	0.04	0.20	−0.14	0.18	−0.07
	(0.26)	(0.37)	(0.22)	(0.45)	(0.28)	(0.24)	(0.23)	(0.20)
Stage 3 Dynamic Zero								
Cluster 4 Start	1.20**	−1.70***	0.76	−2.43***	−0.09	0.40	−0.04	0.24
	(0.55)	(0.36)	(0.54)	(0.48)	(0.28)	(0.51)	(0.31)	(0.45)
Cluster 5 Start	−0.17	0.37	0.00	0.81	−0.49	−0.71	−0.45*	−0.37
	(0.70)	(0.67)	(0.51)	(0.53)	(0.32)	(0.48)	(0.27)	(0.30)
Cluster 6 Start	1.93***	1.37*	2.39***	1.70***	0.23***	−0.03	0.20***	−0.10
	(0.41)	(0.71)	(0.38)	(0.58)	(0.04)	(0.03)	(0.06)	(0.19)
Cluster 7 Start	0.78	−0.37	0.50	−0.58*	−2.87***	−2.57***	−2.81***	−2.12***
	(1.24)	(0.32)	(1.03)	(0.34)	(0.33)	(0.37)	(0.40)	(0.28)
Cluster 8 Start	−0.16	−0.49	0.01	0.01	−0.50***	−0.34***	−0.24	−0.09
	(0.53)	(0.58)	(0.46)	(0.47)	(0.14)	(0.10)	(0.19)	(0.16)
Panel B: Effects of the end of each accountability event cluster								
Stage 2 Regular Prevention and Control								
Cluster 1 End	−0.12	−0.13	−0.07	−0.15	−16.82***	0.23	−16.81***	0.29
	(0.16)	(0.13)	(0.16)	(0.17)	(1.21)	(0.67)	(1.16)	(0.63)
Cluster 2 End	−0.72	−0.86***	−0.91	−1.28***	3.99***	2.53***	4.83***	3.06***
	(0.48)	(0.27)	(0.56)	(0.36)	(0.62)	(0.51)	(0.59)	(0.47)
Cluster 3 End	−0.22	0.63	−0.12	0.98**	−1.12	0.24	−0.91	0.06
	(0.62)	(0.44)	(0.57)	(0.48)	(1.31)	(0.32)	(1.05)	(0.30)
Stage 3 Dynamic Zero								
Cluster 4 End	0.27	0.90*	0.57	1.53***	−1.02***	−0.37	−0.81***	−0.11
	(0.68)	(0.53)	(0.60)	(0.50)	(0.36)	(0.41)	(0.30)	(0.36)
Cluster 5 End	−0.74*	−1.10	−1.64***	−1.94***	0.47	0.51	−0.19	0.23
	(0.44)	(0.75)	(0.58)	(0.67)	(0.34)	(0.45)	(0.50)	(0.32)
Cluster 6 End	−0.57	−0.32	−0.80*	−0.12	−1.59***	2.86***	−1.36***	2.43***
	(0.45)	(0.40)	(0.46)	(0.42)	(0.18)	(0.32)	(0.21)	(0.28)
Cluster 7 End	−0.67	0.46	−0.51	0.12	0.35***	0.29	0.16	0.08
	(0.41)	(0.49)	(0.35)	(0.39)	(0.10)	(0.25)	(0.12)	(0.21)
Cluster 8 End	2.25	0.10	1.04	−0.31	−0.71***	0.05	−0.70***	−0.03
	(1.80)	(0.48)	(1.03)	(0.39)	(0.12)	(0.04)	(0.09)	(0.07)
Time Trend	Yes		Yes		Yes		Yes	
Month	Yes		Yes		Yes		Yes	
Control variables	Yes		Yes		Yes		Yes	
Obs.	2,828		3,725		2807		3691	
AIC	13208.77		18378.57		12769.80		16795.84	

Notes: Provincial-level clustered standard errors are in parentheses. *$p < 0.1$, **$p < 0.05$, ***$p < 0.01$. One-week lag of cluster-related items applied. Observations with new localized outbreaks excluded. For spillover effects (columns 1, 2, 5, and 6), provinces with local accountability events in or before the corresponding week were removed. All provinces were included for overall effects (columns 3, 4, 7, and 8). Data sources: Oxford COVID-19 Government Response Tracker, China Data Lab at Harvard, National Health Commission of China, *China Health Statistical Yearbook*, China Economic Net, and *Health Statistical Yearbooks of China*.

trative accountability system on its adherence to the zero-COVID strategy. It is also the first attempt to understand the spillover effects of accountability events on local officials' responses to COVID-19.

When accountability events occurred in a province, local Chinese governments increased their containment responses considerably. The political promotion tournament model suggests that Chinese local officials who wished to be promoted would even try to surpass the goal.[18] The accountability system kept officials constantly anxious about potential damage to their promotion prospects if their COVID-19 response was inadequate. All clusters had at least one event where officials were removed from office for poor pandemic control (Table S1), one of the most consequential accountability events. Thus, they were always vigilant in COVID-19 containment and adopted more public

Table 5. Effects of the geographical distance from the accountability event on responses from May 4, 2020, to September 30, 2022.

	Containment Response Index		Economic Support Response Index	
	Spillover Effects (1)	Overall Effects (2)	Spillover Effects (3)	Overall Effects (4)
Distance (Ref: In Others)				
Within the Province	–	0.43**	–	−0.06
	–	(0.17)	–	(0.13)
In the Neighboring Province	0.56***	0.88*	0.04	0.36
	(0.16)	(0.47)	(0.11)	(0.26)
Accountability event terms	Yes	Yes	Yes	Yes
Time Trend	Yes	Yes	Yes	Yes
Month	Yes	Yes	Yes	Yes
Control variables	Yes	Yes	Yes	Yes
Obs.	2,890	3,899	2,869	3,863
AIC	13635.42	19547.97	13088.22	17594.25

Notes: Provincial-level clustered standard errors are in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. For all columns, we modeled cluster-related items with a one-week lag. For spillover effects (columns 1&3), provinces with local accountability events in or before the corresponding week were removed. All provinces were included for overall effects (columns 2&4). Data sources: Oxford COVID-19 Government Response Tracker, China Data Lab at Harvard University, National Health Commission of China, *China Health Statistical Yearbook*, China Economic Net, and *Health Statistical Yearbooks of China*.

health measures. This mechanism helps to explain China's capacity to sustain the costly zero-COVID strategy for three years.

Interestingly, accountability events were associated with a decreased level of economic support responses. A possible explanation is that no accountability events reported by the major media outlets were related to the failure of economic support (Table S1). Local officials may assume that their performance in economic support would not impact their careers, thus allocating limited resources for economic support. Similarly, Qiao et al. found that governments prioritized economies over the environment despite the latter also being the goal of their superiors.[27] This is believed to be tacit consent: superiors nominally list multiple goals, but under complex policy conditions, they will not punish lower-level officials for poor performance on goals that are not a genuine concern of superiors.[20]

Our study also builds upon our understanding of the PPT model in explaining the administrative accountability system in China. Previous studies assumed that the PPT model would not likely incentivize officials with no promotion ambitions due to increased age or short remaining tenure.[33] However, our study shows that in China, inadequate COVID-19 responses can result in severe punishment, including termination. Consequently, all officials were incentivized to remain vigilant, including those without promotion ambitions. Thus, we argue that officials strive to achieve important goals to not only secure promotions but also avoid punishments such as termination. We suggest future studies that employ the PPT model also take this punishment-avoiding motivation into account.

Although the administrative accountability structure allowed China to maintain containment policies throughout the pandemic, we also find that there was limited pressure to increase economic support, and the intense pressure from high-level officials may have also led to the inflation of containment policy goals.[26] As such, China could have also benefited from prioritizing complementary goals, namely containment and economic support responses.[34] If many local officials were punished for inadequate economic support during the pandemic, perhaps more economic support would have been provided. Officials could have also been held responsible for implementing unnecessary public health measures. Therefore, we argue prioritizing complementary goals could prevent officials from severely inflating singular policy goals and could have improved other aspects of the pandemic response.

This study suggests the administrative accountability structure contributed to China's adherence to the zero-COVID strategy. In comparison, earlier abandonment of the zero-COVID strategy was observed in other countries, especially in federal states.[5,35] In China's highly centralized contexts, the higher-level authorities control the career prospects of lower-level officials. Thus, by using the administrative accountability system as a tool, the central government could effectively urge local officials nationwide to align with its zero-COVID strategies. However, we argue that it would be nearly impossible to establish a similar accountability system in most countries because of their different institutional contexts.[34]

Limitations

First, most accountability events were attributed to localized outbreaks in the affected provinces, so it is technically impossible to eliminate localized outbreak-related bias when testing the local effects. However, when we reexamined the spillover effect after removing all

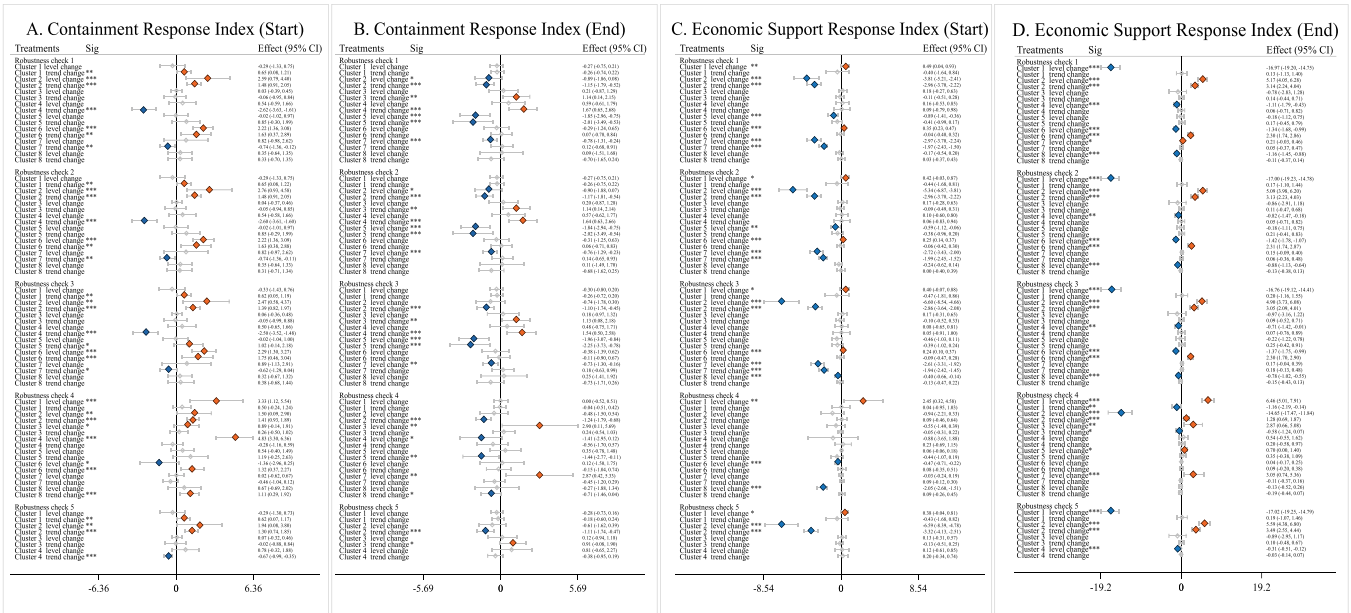

Figure 4. Forest plots of robustness check results. (A) Effects of the cluster start on the containment response; (B) effects of the cluster end on the containment response; (C) effects of the cluster start on the economic support response; (D) effects of the cluster end on the economic support response. **Note**: Orange symbols: significant positive effects; Blue symbols: significant negative effects. For all models, provincial-level clustered standard error was used. For robustness checks 1, 2, 4, and 5, we modeled cluster-related items with a 1-week lag. Robustness check 1: Covariates were removed. Robustness check 2: Four covariates, including per 10 k population, Ln per capita GDP, and population size were included. Robustness check 3: Hubei and Shanghai observations were removed. Robustness check 4: A reanalysis without incorporating any treatment lag was conducted. Robustness check 5: Adjacent accountability events were defined as a cluster if the gap between them was less than eight weeks. Data sources: Oxford COVID-19 Government Response Tracker, China Data Lab at Harvard University, daily reports of China's National Health Commission, *Statistical Yearbooks of China*, *the Statistical Communiqués on the Economy and Social Development of Provinces*, and *Health Statistical Yearbooks of China*.

observations with new localized outbreaks, the results remained consistent, suggesting that the accountability system indeed explained the local government's responses to COVID-19 to some extent. Second, we did not source accountability events from video news. However, most news was published in text from the incorporated media outlets, and important videos are typically also published in text. Third, due to data limitations, we could not explore the effectiveness of the policy response. Fourth, we did not investigate the long-term effects of accountability events due to short intervals between each cluster. However, since pandemics can rapidly change, our goal was to better understand short-run effects. Fifth, we acknowledge that we could not formally test the assumption of ITSA based on our data- the pre-intervention time series trend, if not intervened, would continue in the post-intervention period due to the short study period and a relatively large number of clusters. Finally, the regression coefficients should be interpreted carefully. The outcomes in this study are calculated based on an aggregated index of multiple policies.[29] Therefore, we could not interpret the coefficients as changes in a specific policy. However, the OxCGRT team has justified the validity of these indicators elsewhere.[29] Previous studies have also interpreted the changes in these indicators as a directional change instead of linking them to a specific policy.[36,37]

Conclusion

We suggest China's administrative accountability structure was essential to the sustainability of the zero-COVID response but also that the response could have been improved by also prioritizing complementary policy goals. The insights of this study could be used to improve health governance during future pandemics in China.[34]

Acknowledgments

We appreciate insightful comments from anonymous reviewers. We wish to thank Mrs. Laura Amy Trakman for her help in editing. We also thank Mr. Ajibola Toluwani Ogunsola and Miss. Ziru Deng for their advice regarding wording. We wish to thank the committee and participants of conferences and seminars for the presentation opportunity and valuable feedback, namely the Seventh Global Symposium on Health Systems Research (HSR 2022), the Asia Pacific Public Policy Network (AP-PPN 2023), the Health Economics, Policy, and Management Seminar of The University of Hong Kong, and the Conference on Policy Process Research 2024 (COPPR 2024).

Disclosure Statement

The authors reported there is no funding associated with the work featured in this article.

Funding

No funding was provided for this project.

Data Availability Statement

The data that support the findings of this study are openly available from multiple sources. Oxford COVID-19 Government Response Tracker (OxCGRT) is available in GitHub at https://github.com/OxCGRT. News articles were retrieved from People's Daily (newspaper database: http://data.people.com.cn/rmrb/20230412/1?code=2., official websites: http://www.people.com.cn/., WeChat account ID: rmrbwx), Xinhua News Agency (official websites: http://www.news.cn/., WeChat account ID 1: xinhuashefabu1, WeChat account ID 2: newsxinhua), and China Central Television News (official account: https://news.cctv.com/, WeChat account ID: cctvnewscenter) by authors. The details can be seen in the supplementary appendix.

Author Contributions

Guo Bingqing: Formal analysis, Investigation, Software, Validity, Writing-Original draft preparation. **Karen Ann Grépin**: Conceptualization, Methodology, Project Administration, Writing-Original draft preparation, Writing-Review and Editing.

Ethics Approval Statement

As the study involved the analysis of existing data, our institute does not require ethical approval for this type of study.

Patient Consent Statement

We did not involve any human participants directly in this study. Thus, patient consent statement is not required.

Clinical Trial Registration

Clinical trial registration is not required for this research.

ORCID

Bingqing Guo http://orcid.org/0000-0002-4656-2426
Karen Ann Grépin http://orcid.org/0000-0003-4368-0045

References

1. Campos PA, Reich MR. Political analysis for health policy implementation. Health Syst Reform. 2019;5(3):224–35. doi:10.1080/23288604.2019.1625251.
2. World Health Organization. The world health report 2000. Geneva: World Health Organization; 2000.
3. Bellinger N, VanDusky-Allen J. Political parties and initial COVID-19 policies: subnational trends in India. Contemp South Asia. 2023;31(1):125–32. doi:10.1080/09584935.2023.2169906.
4. Phillips G, Kendino M, Brolan CE, Mitchell R, Herron L-M, Kõrver S, Sharma D, O'Reilly G, Poloniati P, Kafoa B, et al. Lessons from the frontline: leadership and governance experiences in the COVID-19 pandemic response across the Pacific region. Lancet Reg Health West Pac. 2022;25:100518. doi:10.1016/j.lanwpc.2022.100518.
5. Salazar AO, Zeng YZ, Arbetman-Rabinowitz M. The mitigating effects of political capacity and political alignment on COVID-19 mortality, an examination of Spanish autonomous communities. Can Foreign Pol. 2022;28(1):40–60. doi:10.1080/11926422.2022.2043403.
6. Burki T. Dynamic zero COVID policy in the fight against COVID. Lancet Respir Med. 2022;10(6):e58–9. Epub 2022/04/24.doi: 10.1016/S2213-2600(22)00142-4.
7. National Health Commission of China. Include COVID-19 in statutory infectious disease management (2020 number one). Beijing: National Health Commission of China; 2020 Jan 20 [accessed 2023 Jan 6]. http://www.nhc.gov.cn/jkj/s7915/202001/e4e2d5e6f01147e0a8df3f6701d49f33.shtml .
8. Liang W, Liu M, Liu Y. China's "dynamic zero" strategy to prevent and control the pandemic of COVID-19. Chin Med J-Peking. 2022;102(4):239–42. doi:10.3760/cma.j.cn112137-20211205-02710.
9. National Health Commission of China. The overall plan for the implementation of "Class B Management" for COVID-19 (joint prevention and control mechanism 2022 No. 144). Beijing: National Health Commission of China; 2022 Dec 26 [accessed 2023 Jan 6]. http://www.nhc.gov.cn/xcs/zhengcwj/202212/e97e4c449d7a475794624b8ea12123c6.shtml .
10. Prem K, Liu Y, Russell TW, Kucharski AJ, Eggo RM, Davies N, Centre for the Mathematical Modelling of Infectious Diseases COVID-19 Working Group, Jit M, Klepac P, Flasche S, et al. The effect of control strategies to reduce social mixing on outcomes of the COVID-19 epidemic in Wuhan, China: a modelling study. Lancet Public Health. 2020;5(5):E261–70. doi:10.1016/s2468-2667(20)30073-6.
11. National Health Commission of China. The eighth edition of the COVID-19 prevention and control plan. Beijing: National Health Commission of China; 2021 May 14 [accessed 2023 Jan 6]. http://www.nhc.gov.cn/jkj/s3577/202105/6f1e8ec6c4a540d99fafef52fc86d0f8.shtml.
12. Chen J, Chen W, Liu E, Luo J, Song MZ. The economic cost of locking down like China: evidence from city-to-city truck flows. The Chinese University of Hong Kong-Tsinghua University joint research center for Chinese economy working paper 0040. The Chinese University of Hong Kong: Hong Kong SAR; 2022. https://research-center.econ.cuhk.edu.hk/en-gb/research/research-papers/515-the-economic-cost-of-lockdown-in-china-evidence-from-city-to-city-truck-flows.
13. He AJ, Shi Y, Liu H. Crisis governance, Chinese style: distinctive features of China's response to the COVID-19 pandemic. Policy Des Pract. 2020;3(3):242–58. doi:10.1080/25741292.2020.1799911.
14. Shenyang COVID-19 prevention and control headquarters. Announcement on Shenyang travel measures for COVID-19 prevention and control (no. 53). Liaoning: Shenyang Committee of the Communist Party of China and Shenyang Government; 2022 Apr 20 [accessed 2023 Jan 6]. http://www.shenyang.gov.cn/zt/fkxxgzbdgrdfyyq/tzgg/202204/t20220420_2924021.html.
15. Wang XH, Xiao HY, Yan B, Xu JY. New development: administrative accountability and early responses during public health crises-lessons from COVID-19 in China. Public Money Manage. 2021;41(1):73–76. doi:10.1080/09540962.2020.1819012.
16. Hu C. Accountability of public servants under dominant political settlements of China: effects, challenges, and issues. Int J Public Admin. 2016;40(3):240–55. doi:10.1080/01900692.2015.1107735.
17. CPC CCot. The central committee of CPC adjusted the high-level officials of the ministry of health and Beijing municipality. Beijing: General Office of the State Council; 2005 Jun 28 [accessed 2023 Jan 6]. http://www.gov.cn/test/2005-06/28/content_10703.htm.
18. Zeng SA, Yi CD. The impact of accountability on local officials' behavior in the pandemic prevention and control in China based on utility maximization. Glob Health Res Pol. 2022;7(1):ARTN 33. doi:10.1186/s41256-022-00268-w.
19. Ye Z, Ma B, Ma Y. Structural differences of government officials' avoiding responsibility in crisis management: take COVID-19's accountability as an example. Chin Public Adm. 2022(2):149–55. (in Chinese).doi: 10.19735/j.issn.1006-0863.2022.02.18.
20. Zhou L-A. Career concerns, incentive contracts, and contract renegotiation in the Chinese political economy [dissertation]. Ann Arbor: Stanford University; 2002.
21. Feng YC, Wang XH, Hu SL. Accountability audit of natural resource, air pollution reduction and political promotion in China: empirical evidence from a quasi-natural experiment. J Clean Prod. 2021;287:287. doi:10.1016/j.jclepro.2020.125002.
22. Zhang Y. "Promotion tournament 2.0": why local cadres expand health-care provision in China. Governance. 2020;33(4):897–914. doi:10.1111/gove.12429.
23. Lu WW, Tsai KS. Picking places and people: centralizing provincial governance in China. China Quart. 2021;248(1):957–86. doi:10.1017/s0305741021000606.
24. Ministry of Civil Affairs of China. Statistical table of administrative divisions of the People's Republic of China for the year of 2020. Beijing: General Office of the State Council; 2005 Jun 28 [accessed 2023 Jan 6]. http://xzqh.mca.gov.cn/statistics/.
25. Xue L. The development course and experience of the official personnel system in People's Republic of China

during the past 70 years. Study & Explor. 2019;8:65–72. (in Chinese). doi: CNKI:SUN:XXTS.0.2019-08-009.
26. Li H, Zhou L-A. Political turnover and economic performance: the incentive role of personnel control in China. J Public Econ. 2005;89(9):1743–62. doi:10.1016/j.jpubeco.2004.06.009.
27. Qiao K, Zhou L, Liu C. Interim rank, promotion incentives and current performance: evidence from the dynamic tournament among Chinese local officials. Chin J Of Econ. 2014;1(3):84–106. (in Chinese). doi: 10.16513/j.cnki.cje.2014.03.005.
28. Wang JSH, Peng CH, Luo H, Zhang JB, Oh H. Containment, health, and social policies in the time of COVID-19-determinants and outcomes of initial responses across 120 countries. Health Policy Plan. 2021;36(10):1613–24. doi:10.1093/heapol/czab115.
29. Hale T, Angrist N, Goldszmidt R, Kira B, Petherick A, Phillips T, Webster S, Cameron-Blake E, Hallas L, Majumdar S, et al. A global panel database of pandemic policies (oxford COVID-19 government response tracker). Nat Hum Behav. 2021;5(4):529–38. Epub 2021/03/10.doi: 10.1038/s41562-021-01079-8.
30. Shi QL, Shi CC, Guo F. Political blue sky: evidence from the local annual "two sessions" in China. Resour Energy Econ. 2020;61:14. doi:10.1016/j.reseneeco.2020.101165.
31. Wang Y, Li N, Li J. Media coverage and government policy of nuclear power in the People's Republic of China. Prog Nucl Energ. 2014;77:214–23. doi:10.1016/j.pnucene.2014.07.007.
32. Tencent. Tencent annual report. 2020.
33. Lu S, Yao Y, Wang H. Testing the relationship between land approval and promotion incentives of provincial top leaders in China. J Chin Polit Sci. 2022;27(1):105–31. doi:10.1007/s11366-020-09707-2.
34. Zhu HS. Constructive conflict in China: managing policy tradeoffs under authoritarianism. SSRN working paper 4274576. 2022. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4274576.
35. Greer SL, King EJ, Da Fonseca EM, Peralta-Santos A. The comparative politics of COVID-19: the need to understand government responses. Glob Public Health. 2020;15(9):1413–16. doi:10.1080/17441692.2020.1783340.
36. Chen C, Frey CB, Presidente G. Disease and democracy: political regimes and countries responsiveness to COVID-19. J Econ Behav Organ. 2023;212:290–99. doi:10.1016/j.jebo.2023.04.034.
37. Pulejo M, Querubín P. Electoral concerns reduce restrictive measures during the COVID-19 pandemic. J Public Econ. 2021;198:104387. doi:10.1016/j.jpubeco.2021.104387.