CRISIS AND CORRECTION: DO GOVERNMENT RECTIFICATION EFFORTS RESTORE CITIZEN TRUST AFTER GOVERNANCE FAILURE?

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Abstract

In a substantial literature on trust in government, the impact on trust of governance crises and government efforts to fix its mistakes is understudied and unmeasured. We analyze a cycle of crises and contribute a theory of heterogeneous response to correction efforts. We study this in China, an authoritarian state with high trust in government. We leverage the occurrence of two exogenous shocks—a vaccine crisis and a subsequent government correction effort—with administration of a face-to-face, nationally representative survey in 2018. We theorize that response to government correction efforts depends on prior exposure to similar governance failures. Using days from the crisis as an instrument, we find that: (1) the more salient the crisis, the lower the trust in government; and (2) government correction increases trust for citizens experiencing the 2018 crisis as an isolated occurrence but not for those who experienced a similar crisis and correction in 2016.

9,144 words

Keywords: trust in government, governance failure, government correction, China, authoritarianism

1. Introduction

Recent global surveys indicate that trust in government is falling to all-time lows in democracies, but surging in autocracies. China, the world's largest autocracy, ranks in first place (Edelman 2022),[1] a finding consistent with a wide range of existing studies (Shi 2001, 2014; Asian Barometer Survey 2002–2011; Haerpfer et al. 2022). A high level of trust in government has survived numerous governance failures that have resulted in crises directly harming the lives and livelihoods of ordinary Chinese over the past four decades. The outbreak of COVID-19 is only the most extreme recent example.[2] The roots of these crises are easily traced to deficient regulation, failure of oversight and reporting systems, lack of transparency, and official malfeasance. In response, touting the claim that the communist party can "correct its mistakes," Beijing has characteristically conducted high-profile drives aimed at correcting governance problems. Are such efforts at correction effective in restoring

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[1] Ninety-one percent of Chinese surveyed report trust in government. This compares to 47 percent in Germany, 42 percent in the United Kingdom, 39 percent in the United States, and 36 percent in Japan, for example. We recognize problems intrinsic to comparing measures of trust across regime types (Schneider 2017).

[2] On COVID-19, see Huang 2020; Fravel, Manion, and Wang 2021. Other examples of crises due to governance failures abound: other contagious disease outbreaks (Huang 2003; Ye and Lyu 2020), food and drug scandals (Yasuda 2017; Yan 2012), high-speed train crashes (Bondes and Schucher 2014), major industrial accidents (Chan, Wang, Mark, and Liu 2015; Zhao 2016), widespread illness due to environmental pollution (Liu 2010), and substandard construction work revealed by natural disasters (Hui 2009; Lo 2014).

citizen trust? Do regimes emerge from such crises unscathed? A documented high level of trust in government over several decades does not answer these questions.

This paper investigates how crisis and correction affects citizen trust in government in China, a strong authoritarian state. Although there is a substantial literature on routine determinants of trust in government, the impact of crises and government efforts at correction is understudied and unmeasured. We analyze a cycle of similar governance crises to study both crisis and correction and contribute a theory of heterogeneous response to government efforts to fix its mistakes. Specifically, we theorize that citizen response to correction is contingent on prior exposure to a similar crisis.

We study a vaccine crisis in China to test our theory. We leverage the occurrence of two exogenous shocks—the vaccine crisis and the subsequent government attempt to remedy it—during the administration of a face-to-face, nationally representative survey of 3,144 Chinese citizens in summer 2018. The survey data offer a unique opportunity to estimate the impact of both crisis and correction. First, news of the vaccine crisis broke on 21 July 2018, day 11 after the survey went into the field. A major Chinese pharmaceutical company had produced some 250,000 substandard vaccines for diphtheria, tetanus, and whooping cough, which had been used to inoculate thousands of infants. Breaking news about the fake vaccines intersected interviews with survey respondents, giving us a strong identification strategy. Second, several weeks later, on 16 August 2018, the central government held a widely publicized meeting to announce the dismissal of top officials involved in the crisis, giving us an opportunity to measure the impact of a government effort to correct its failure to regulate. Third—and critically for our theory—about 38 percent of survey respondents reside in cities affected by a similar vaccine crisis in 2016, allowing us to measure how recurrence of a

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governance failure affects response to a government correction.

Building on recent studies (Kang and Zhu 2021; Wang and Dickson 2022), we theorize that prior exposure to governance failure impacts how citizens respond to government efforts at correction. A "familiar failure"—a governance failure that individuals can easily recall and recognize as substantially similar and, therefore, suggestive of unsolved underlying problems—is likely to be particularly consequential. In the case studied here, we expect that citizens who experience the 2018 vaccine scandal as an isolated occurrence will be more receptive to the government effort to fix its mistakes and increase trust, but citizens living in cities impacted by the 2016 vaccine scandal will be more skeptical.

We develop a measure of crisis salience to capture varying "closeness" of the 2018 vaccine crisis across survey respondents. We also introduce a behavioral measure of trust, based on consumption of state media, to complement potentially problematic measures of reported trust in China's authoritarian government. We show that, regardless of prior experience, the more salient the 2018 vaccine crisis, the lower the citizen trust in government. Of greater interest, we also show that, as theorized, responses to the government correction effort after the crisis are heterogeneous. After the announcement of promises to reform the regulatory system and severe punishments for top officials involved in the vaccine crisis, trust in government increased for some citizens. However, for the subset of citizens who experienced the 2018 vaccine crisis as a familiar failure, the correction failed to increase trust in government.

The rest of the paper is organized as follows. Section 2 situates the study in existing literature, expands on our theory, and introduces our hypotheses. Section 3 provides contextual background on the 2016 and 2018 vaccine crises and correction efforts. Section 4

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discusses our research design, data and measures, and identification strategy. Section 5 presents results. Section 6 concludes.

2. Theory and Hypotheses

Political trust is people's evaluations of how the government is doing its job in comparison to their expectations of its performance (Stokes 1962; Miller 1974; Hetherington 2005). Literature from a range of empirical contexts has shown that citizen trust in government is critical to outcomes that allow a state to function, such as legal compliance and political stability (Chanley, Rudolph, and Rahn 2000). Moreover, political trust is a component of political support that gives the government room to maneuver when it encounters difficulties in performing its more immediate political tasks (Shi 2001).

Maintaining high levels of political trust is especially crucial for authoritarian governments. In authoritarian states, where citizens cannot punish incumbent governments at the polls, the governance failures that crises reveal have undermined regime authority and mobilized citizens for political action (Haggard and Kaufman 1997; Pepinsky 2009; Geddes, Wright, and Frantz 2018). Furthermore, in the absence of a free media, the government is the only source of credible information: citizens must trust the government and its information and take necessary precautions or the crisis could intensify and even threaten regime stability.

Existing literature has studied many of the sources and determinants of political trust in authoritarian China. National surveys consistently show that most Chinese have comparatively very high levels of trust in the central government (Shi 2001, 2014; Asian Barometer Survey 2002–2011; Haerpfer et al. 2022). Scholars have attributed this to a range of factors: performance legitimacy due to rapid economic growth (Chen, Zhong, and Hillard 1997; Wang 2005; Yang and Tang 2010), traditional Chinese values (Shi 2001; Zhai

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2018), and the effects of propaganda and a state-controlled media (Li 2004; Kennedy 2009), for example. Other studies document the "trust gap" between high levels of trust in the central government and comparatively lower levels of trust in local governments (Shi 2001; Bernstein and Lü 2000; Li 2013; Chen 2017), and sources of eroding trust in government in recent years, including land expropriation (Cui, Tao, Warner, and Yang 2014), corruption (Zhang et al. 2019; Kang and Zhu 2021; Wang and Dickson 2022), and environmental pollution (Zhong and Hwang 2016; Chen and You 2021).

Only a few studies, all focused on China's anticorruption campaigns (Wang and Dickson 2017, 2022; Zhu, Huang, and Zhang 2019; Kang and Zhu 2021), have paid attention to government efforts to regain trust when it is lost and citizen response to such efforts. We build on this work. We take from Wang and Dickson (2022, 36) the insight that the effect of anticorruption efforts depends on how new information relates to prior beliefs: "In order to update their priors, citizens must receive signals that are different from their priors." Similarly, Kang and Zhu (2021) show that the effect of anticorruption campaigns is heterogeneous, determined by prior exposure to the state system: increase in political trust is less pronounced for "insiders" than for "outsiders" because the former have directly witnessed the radical implementation and ineffective results of many anticorruption campaigns. In line with these studies, we theorize that trust in government is impacted by how new information relates to prior beliefs and experiences.

Public health failures can be especially illuminating. Lacking a free press and political contestation, governments and citizens are less likely to learn of governance failures in public health until they become crises: as Huang (2003, 11) comments, politicians routinely pay attention to the economy, but underlying problems in public health may go unrecognized,

undefined, and unaddressed until occurrence of an "attention-focusing event"—such as large-scale contagious disease. The stakes for ordinary citizens are high: they depend on government to regulate and enforce standards to keep them safe. In turn, citizen attitudes towards health and safety issues are closely associated with their confidence in government institutions (Yang 2013; Wu et al. 2017). Regaining public trust after it is marred by government's mishandling of health and safety incidents is particularly difficult (Slovic 1993). As such, in the wake of a crisis, governments often make an explicit, public attempt to correct their failures and restore trust.

We develop a theory to explain impact of governance failure and government efforts to correct failure. We theorize that citizen response to a government correction depends on prior experience. More specifically, we do not expect correction to increase trust if the governance failure is a "familiar" one. Such a failure is familiar in at least one and perhaps two senses: not only is the failure itself a repetition of a prior event but often so is the government response to prevent its recurrence. For citizens without prior exposure to a similar crisis, however, the government correction can be more effective in increasing trust. These citizens have less reason to believe that the correction will not mitigate the likelihood of future crises of a similar nature. In sum, we theorize a government attempt to correct itself after a governance failure has heterogenous effects on trust in government. For citizens who experience the failure as new, trust will be increased. However, citizens who recognize a harmful governance failure as familiar will be more skeptical. As the expression goes: "Fool me once, shame on you; fool me twice, shame on me."

The following testable hypotheses emerge from our theory:

H1. A governance crisis lowers citizen trust in government.

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H2. For citizens who experience the crisis and crisis response as familiar, trust

in government does not increase after correction.

H3. For citizens who *do not* experience the crisis and crisis response as

familiar, trust in government increases after correction.

These hypotheses are summarized in Table 1. We do not hypothesize about heterogeneity in

the effect of the crisis itself on trust. This is because the crisis reveals new information about

governance failure for all citizens experiencing it: even for citizens experiencing it as a

familiar failure, it reveals information about past failure to address sources of harm. We lack a

theoretical basis to hypothesize in a comparative way across sub-groups about the effect of

the crisis on trust.

Table 1. Hypotheses

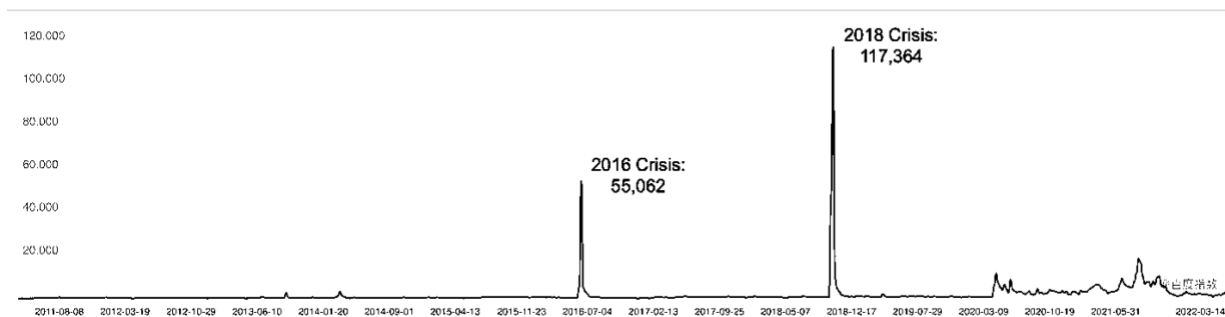|		2018 NEW INFORMATION	
		CRISIS	CORRECTION
2016 crisis exposure	yes	H1: familiar failure, 2016 response as failure: trust lost	H2: familiar response: trust not gained
	no	H1: new failure: trust lost	H3: new response: trust gained

3. Vaccine Crises and Correction in China

Vaccines are consumption goods vital to public health, but consumers cannot evaluate

their quality on their own. Citizens depend on government to regulate and enforce standards

to ensure the vaccines they consume are safe and effective. In China, only in recent decades

have private companies, not only the state, produced and distributed vaccines. Before summer

2018, the 2016 vaccine crisis was only the most recent and serious of several such crises,

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endemic to the organization of drug manufacturing and procurement in China.[3]

Figure 1 shows netizen searches since 2011 for the term "vaccine" on Baidu, China's most popular search engine. The Baidu index is similar to Google Trends. It is a big data sharing platform, providing a normalized search volume for selected keywords, updated daily.[4] As Figure 1 illustrates, the 2016 and 2018 vaccine crises are by far the most salient of several instances where harmful vaccines were distributed in China. The greater recentness and vastly greater salience of the 2016 vaccine crisis, relative to others prior to 2018, make it highly suitable to test our theorized impact of familiar failure. To the extent that all past vaccine crises—or, indeed, governance failures of any sort—influence the outcomes we analyze, this only biases against our results.

Figure 1. Baidu Searches for the Term "Vaccine"

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[3] Vaccine crises occurred in China in 2004, 2005, 2008, 2009, 2010, and 2013. All received Chinese and international press attention. See Appendix 1 on news reports, including reports on the 2016 and 2018 crises.

[4] See http://index.baidu.com/Helper/?tpl=helpandword=#pdesc for more information on the Baidu index. See Mellon (2013) on Google Trends.

3.1. Treatments: Vaccine Crisis and Correction in 2018

On the evening of 21 July 2018, Chinese state media outlets reported that a major pharmaceutical company, Changchun Changsheng in northeast China, had produced at least 250,000 substandard vaccines for diphtheria, tetanus, and whooping cough (DPT) and had engaged in data forgery related to rabies vaccines. The faulty DPT vaccines had been used in Jilin, Shandong, and Anhui provinces to inoculate thousands of infants as young as three months old. Although no deaths or serious illnesses were reported, the news triggered widespread anger on social media. Premier Li Keqiang vowed to "resolutely crack down on all illegal and criminal acts that endanger the safety of people's lives" (China Government Network 22 July 2018). However, netizens widely circulated a screenshot of Li's statement juxtaposed with a nearly verbatim statement that he had offered after the 2016 illegal vaccine scandal, implying that Beijing had failed to resolve the problem. Online discussion was subject to heavy state censorship: the University of Hong Kong Weiboscope project found "vaccine" one of the most restricted terms on Weibo immediately after 21 July (Lo 25 July 2018).

On 16 August 2018, the Politburo Standing Committee, China's top decision-making body, convened a widely-publicized meeting to hear reports on an investigation into the crisis. Communist Party General Secretary Xi Jinping delivered a speech that called for "serious accountability, strict handling in accordance with the law, resolutely guarding the bottom line of safety, and making every effort to protect the vital interests of the masses and social stability" (Xinhua 16 August 2018). In addition, the meeting promised systemic change, pledging to "improve laws, regulations, and institutional rules, clarify and implement supervisory responsibilities, strengthen on-site inspections in the production process, urge

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enterprises to fulfill their main responsibilities and obligations, establish a quality and safety traceability system, and implement a product risk reporting system" (Xinhua 16 August 2018).

The Politburo Standing Committee also announced the immediate dismissal or forced resignation of many senior officials. They included the former director of China's Food and Drug Administration (FDA), several officials with supervisory authority over food and drugs in Jilin province, and the mayor of Changchun (Xinhua 16 August 2018). A separate statement announced that Wu Zhen, a former deputy head of the FDA, known as China's "vaccine czar," was under investigation by the party's anticorruption watchdog (Sohu 17 August 2018). In total, by the time of the 16 August meeting, over 40 officials, including seven provincial-level officials, had been punished for their involvement in the crisis.

3.2. Condition: Vaccine Crisis and Correction in 2016

In February 2016, news broke that an illegal vaccine ring originating in Shandong province had distributed millions of tainted vaccines for children across the country. The news sparked an outpouring of fear and mistrust directed at the government and its regulatory agencies: since 2015, the authorities had been investigating a former pharmacist and her daughter who had illegally sold vaccines worth $88 million. The vaccine ring involved 12 different kinds of vaccines with over 300 illegal distributors located in 87 cities across 24 provinces, as publicized by Shandong FDA (Shandong Food and Drug Administration, 19 March 2016). The vaccines—mostly standard childhood immunizations such as polio, mumps, and hepatitis B—had been stored and transported improperly, rendering many of them ineffective or harmful.

Addressing a public outcry that the government had withheld information, Premier Li

Keqiang vowed "no leniency" for those involved. In the immediate wake of the scandal, 357 officials were fired or demoted and 202 suspects arrested. By March 2018, authorities had sentenced 137 people in 18 provinces, including 64 officials from the National Health Commission, the China Food and Drug Administration, and provincial and city governments. Kingpin pharmacist Pang Hongwei was sentenced in 2019.

Prior to 2016, the county government centers that directly purchased market-based (non-mandatory) vaccines from drug companies had bought vaccines from manufacturers offering the lowest prices (Zhuang et al. 2019). This caused manufacturers and suppliers to lower prices at the expense of vaccine quality. In response to the 2016 vaccine crisis, the State Council (24 April 2016) amended regulations to exercise stricter oversight of vaccines. Procurement was transferred from the county to the provincial level—but the competitive procurement process, with incentives that sacrificed quality, remained unchanged.

4. Research Design

To test our hypotheses, we exploit the coincidence of the 2018 vaccine crisis and subsequent government correction effort with the administration of a nationwide survey in order to measure the effect of the crisis and correction on citizen trust in government.

4.1. Data and Measures

We analyze data from a nationally representative probability sample survey of 3,144 adults in 63 cities across 24 of China's 31 provincial-level jurisdictions. The survey was conducted in summer 2018 through face-to-face interviews by trained, experienced interviewers affiliated with a well-established survey research center at a major Chinese

university.[5] Iterative spatial sampling via global positioning system ensured inclusion of the large numbers of Chinese internal migrants who are not officially registered at their place of residence. Survey implementation spanned roughly two months, from 11 July through 12 September 2018.[6] Given pandemic-related restrictions on access and a deteriorating environment for survey research in China in recent years, data from a relatively recent, nationally representative, face-to-face survey is rare. As shown in Figure 2, news of the vaccine crisis broke on day 11 of the survey, the government announced its corrective measures on day 38, and the survey concluded on day 64.

Figure 2. Survey Timeline
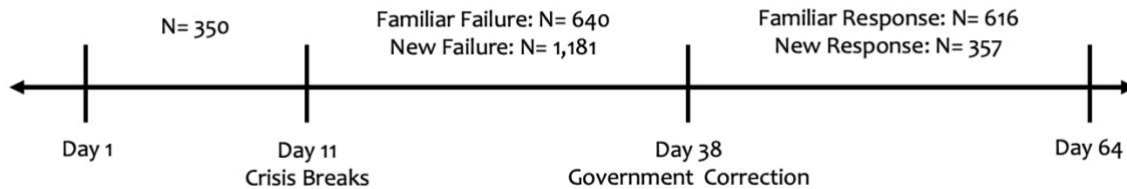
4.1.1. Dependent Variable: Trust in Government

Our outcome of interest is trust in government at both the central and city levels. Theoretically, we are more interested in fluctuations in trust in the central government, but we include city government because the crises we study are primarily city-level incidents handled

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[5] The center has conducted numerous high-quality surveys, including World Values surveys and surveys for U.S. Government NSF-funded projects.

[6] More information on the survey and items we use in our analyses can be found in Appendix 2.

by city-level leaders. We distinguish reported trust from a behavioral measure of trust. For reported trust, we asked respondents two separate questions about the extent to which they trust the central government and city government on a scale of 0 (not at all) to 10 (strongly trust). Such measures are straightforward and commonly used. In authoritarian China, they are not unproblematic, however—which motivates our behavioral measure.[7] Our behavioral measure focuses on consumption of information about current events from official media. Specifically, we asked respondents whether they get their news about political and social issues from television. We treat consumption of television news about these issues as a measure of trust in central government.[8] We detail our reasoning below.

In a crisis that suggests governance failure, Beijing wants citizens to consume its story—and it manages the news carefully. Tight control of the narrative is its usual response. This is evidenced in responses to the 2008 Wenchuan earthquake (Landry and Stockmann 2009), the 2008 melamine infant milk scandal (Yasuda 2017), the 2011 Wenzhou high-speed train crash (Bondes and Schucher 2014), and the outbreak of what became the COVID-19 pandemic (Huang 2020; Swaine 2020), for example. Beijing's "official story" typically draws attention away from governance failure and toward government responsiveness.

Consumption of television news is consumption of the official story. China Central

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[7] There is controversy about the validity of survey measures of trust in government in China. Some recent studies suggest that survey measures relying on direct questions about trust in government are inflated (Li 2016, 2021) or biased (Ratigan and Rabin 2020).

[8] Strictly, we analyze aggregate shifts in behaviors, as we lack longitudinal measures of individual-level defection.

Television (CCTV) Network News, the most controlled and authoritative source for official news and views, is also the most influential and widely viewed television news program in China (Chang and Ren 2016). Simulcast every evening, it remains even today the only prime-time program on television (Huang 2015). Moreover, unlike other official media outlets such as the *People's Daily*, with its exclusive subscriptions, or official news websites that only reach an online audience, television news is accessible to all offline citizens, who account for a substantial proportion of our respondents.

In a public health crisis, citizens are not idly curious: they are concerned about their own physical wellbeing and that of their children and vulnerable relatives; where they turn for information is no trifling matter. Observed shifts away from television news almost certainly reflect a search for alternative information, not a response to lack of information.[9] In normal circumstances, there is low cost to consuming information viewed as less believable, but an event like a public health crisis raises the stakes. Choice of information sources in such a crisis reveals an implicit ranking of sources in terms of credibility. Beijing is uniquely positioned to provide authoritative information on the vaccine crisis. We theorize that citizens for whom the crisis is particularly salient are especially prone to defect from state-controlled television news in search of believable information.
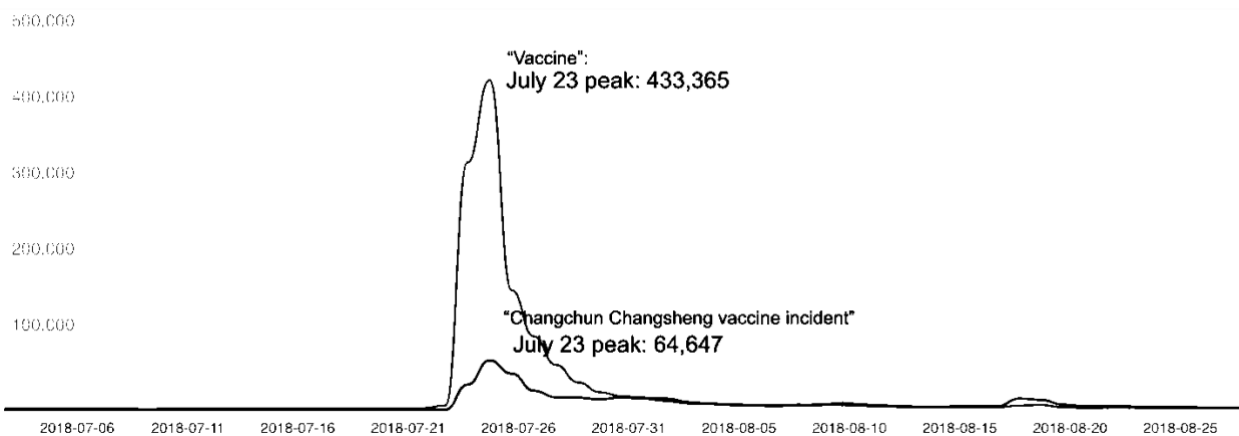
4.1.2. Independent Variable: Crisis Salience

The simplest approach to analyzing the effect of the 2018 vaccine crisis on trust in

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[9] We establish that there is no paucity of information about the 2018 vaccine crisis in Chinese party-state media. We systematically survey *Renmin wang*, an online daily that is the key news mouthpiece of the party-state. See Appendix 3.

government is to distinguish between the 350 respondents interviewed before and the 2,794 interviewed after news of the crisis broke. Yet, we expect the effect of the crisis to diminish over time, across survey respondents interviewed after July 21, as news of it is crowded out by other stories. Indeed, this is suggested by internet searches for terms related to the crisis, as we show in Figure 3: searches for the terms "vaccine" and "Changchun Changsheng vaccine incident" peaked on July 23. A before-and-after estimation approach averages across days and weeks after July 21, which is incorrect for our purpose.[10] We want a measure that exactly captures the diminishing interest in the crisis over time.

Figure 3. Baidu Searches for Terms Related to the 2018 Vaccine Crisis

Our key independent variable—crisis salience—captures the vaccine crisis with a continuous measure that is calibrated to reflect the relative "closeness" of survey respondents

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[10] We show before-and-after estimations in Appendix 4. For our behavioral measure of trust, the coefficient is statistically significant and in the right direction. For reported trust in the center and in local government, the coefficient is not statistically different from zero.

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to the crisis due to spatial and temporal differences. It takes into account variation across respondents who reside in different cities and were surveyed on different dates. We build on work by Chykina and Crabtree (2018), who demonstrate the construct validity of measuring issue salience with Google Trends search data. We use data from Baidu, China's equivalent of Google.

Specifically, we construct the variable 2018 Vaccine Crisis Salience by aggregating citizen search for information about the crisis, as measured by Baidu searches for the terms "vaccine" and "Changchun Changsheng vaccine incident" in the respondent's city on the respondent's interview date. Baidu search behavior can vary for several reasons. Timing is certainly important: as we showed in Figure 3, the frequency of Baidu searches for the two terms exploded on 22 July, the day after news of the fake vaccines broke, and peaked on 23 July. In a public health crisis such as the one we study here, however, search behavior reflects more than idle curiosity about breaking news: in cities geographically proximate to Changchun, where the faculty vaccines were distributed, families with young children were directly impacted. Cities across China vary in other ways relevant to our construct of interest too, in internet penetration and even mass public interest in political affairs, for example. Our measure captures variation across cities for respondents interviewed on the same date and variation within cities for respondents interviewed on different dates.

We adjust city-day salience values in two ways. First, because the scale of crisis salience in each city depends on city-specific characteristics, we normalize each city-day's salience by the average search frequency for the term "vaccine" in the city from 11 July 2017 to 11 July 2018. This controls for baseline interest in "vaccine." Second, we take the logarithm of the normalized sum of Baidu search indices for the two terms in the respondent's

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city on the respondent's interview date. This reflects our assumption that crisis salience diminishes non-linearly. Our choice of functional form also ensures that possible heteroskedasticity due to city-specific characteristics can be normalized by city fixed effects.

Figure 4 displays the distribution of logarithmic values for 2018 Vaccine Crisis Salience, by survey cities across the 64 days the survey was conducted. As the measure exhibits temporal and spatial variation, it is unlikely that our analytical results will be driven by unobservable events that vary similarly both spatially and temporally. Substantively, in a correct model, crisis salience is allowed to vary across time and place. In Figure 4, we observe that Baidu search intensity captures the diminution of crisis salience not long after 21 July and 16 August. Further, we observe that the gain and then attenuation in search intensity is more pronounced in Anhui and Shandong, provinces directly affected by the vaccine crisis.[11]

Baidu searches lead to a variety of sources, including official sources. We recognize, however, the concern that our crisis salience measure may reflect not only innate interest in the crisis but an appetite for unofficial narratives, which can be a measure of longstanding distrust in government. To address this possible endogeneity, we exploit a component of variation in our measure that is clearly not influenced by prior opinion about the government. Specifically, we instrument Baidu search intensity with the number of days from July 21, when news of the crisis broke. This captures the mechanical variation in interest driven only by the respondent's interview date. If the instrumented crisis salience measure decreases trust in government, then we can be sure that the decrease is due to the breakout of the crisis. Results of our multivariate instrumental variable estimation are presented in Table 2.

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[11] Unfortunately, all respondents in the two provinces were surveyed after 21 July.

Figure 4. 2018 Vaccine Crisis Salience in 63 Cities, by Interview Date

Salience by dates. Vertical lines denote July 21 and August 16.
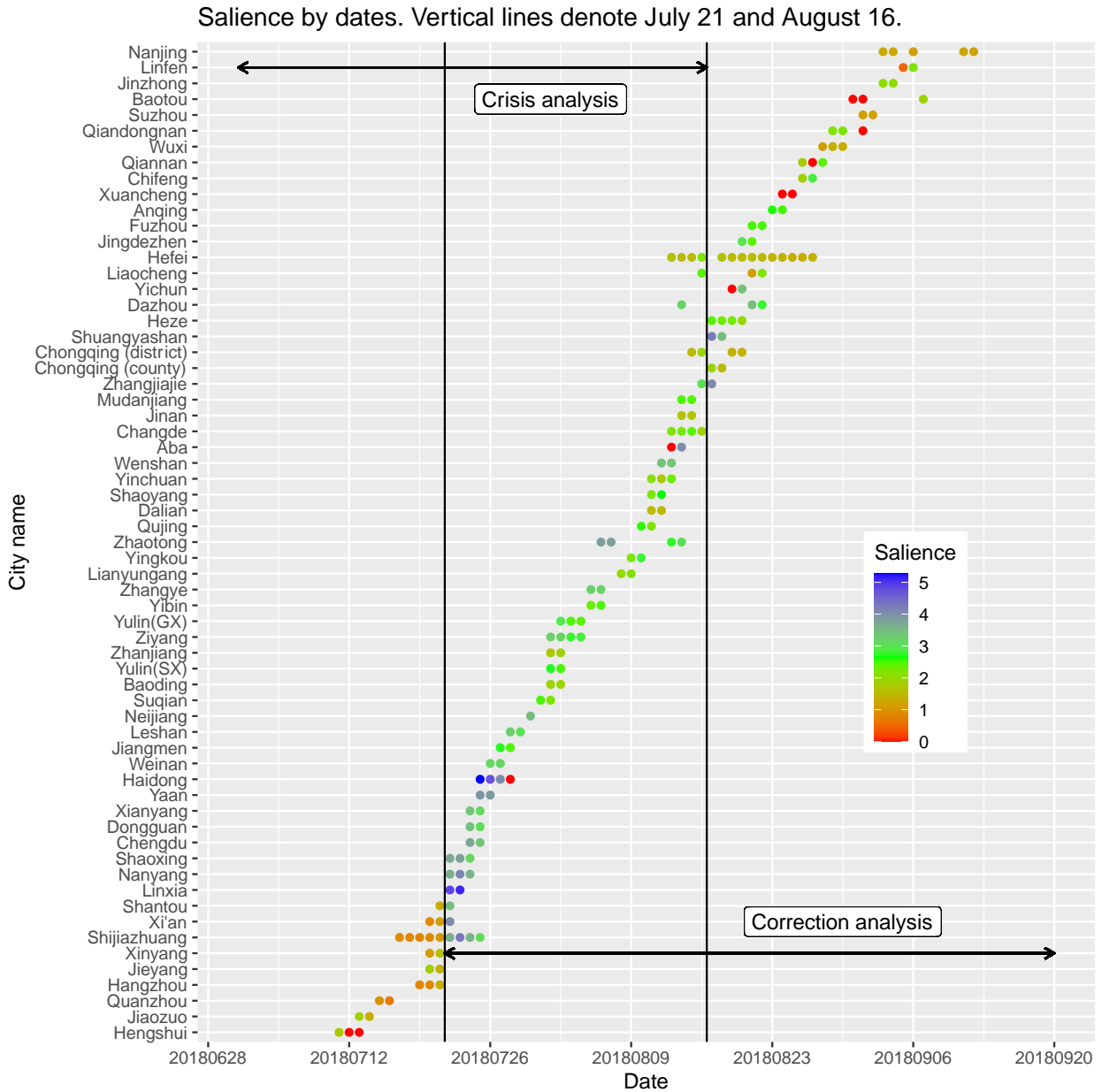
Unsurprisingly, in the first stage estimation, crisis salience is negatively associated with days after July 21. Reassuringly, in the second stage estimation, our measure of crisis salience is negatively associated with two key measures of trust in government: reported trust in the center and our behavioral measure, watching TV news.

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Table 2. Impact of 2018 Crisis, Instrumental Variable Estimation

	First Stage	Second Stage		
	(1)	(2)	(3)	(4)
Outcome Variable	Salience	Trust in Center	Trust in City	Watch TV News
Salience		**−0.881**	0.273	**−0.126**
		(0.184)	(0.199)	**(0.034)**
Days from crisis	**−0.032**			
	(0.003)			
Controls	Yes	Yes	Yes	Yes
Observations	2064	1969	1930	2061
R-squared	0.158	-0.228	0.015	0.018
Cragg-Donald Wald F statistic		146.520	148.853	149.312

Dependent variables: (1) crisis salience of the city-day (2) trust in central government, on 0–10 scale; (3) trust in local government, on 0–10 scale; (4) sources of recent consumption of information on political and social topics: television.

Control variables: sex, age, age-squared, ethnicity, education, income, marital status, children under 6 years old, official residential status, communist party membership, ownership of device to access internet, ties outside mainland China, urban locality

For respondents surveyed from day 1 to day 38.
Bolded: p<.05

As we note above, the functional form we choose for our measure ensures that heteroskedasticity due to city-specific characteristics can be normalized by city fixed effects. We cannot use city fixed effects with our instrumental variable estimation, however, because respondent city and our instrument are too highly correlated. Reassured by our instrumental variable estimation that 2018 Crisis Salience, our key independent variable, is not endogenous with longstanding trust in government, we test our hypotheses with different, appropriate estimations that include city and date fixed effects.

4.1.3. Familiar Failure

We theorize heterogeneous effects of government correction, depending on whether or not citizens experience the crisis and correction as a familiar failure. About 38 percent of respondents in our 2018 survey reside in cities affected by the 2016 vaccine crisis. Following that crisis, the Shandong Food and Drug Administration (19 March 2016) published a list of

names, phone numbers (with area code), and cities of 300 suppliers and distributors implicated in distribution of the vaccines. These 300 local brokers bought the illegal vaccines and sold them in their cities. There is abundant evidence to suggest citizens in these cities were well aware of this by 2018: the cases were covered in local media and highly publicized legal proceedings. We identify 23 cities in 16 provinces in the survey as cities in which local brokers distributed the illegal vaccines in 2016.[12] Survey respondents in these cities total 1,217. In our analysis, these respondents are treated as citizens who experience the crisis and correction as a familiar failure.

4.1.4. Control Variables

We control for whether respondents have young children because we expect citizen judgements about the vaccine crisis we study here to be affected by the specific personal harm they present.[13] We also control for official residence status (i.e., urban or rural), communist party membership, ownership of a device to access the internet, and ties outside of mainland China. We also include standard demographic controls: sex, age, age-squared, ethnicity, education, income, and marital status.

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[12] We list the 23 cities in Appendix 5. Note that discovery of the list of victim cities does not depend on capacity of these cities since they were exposed by the kingpin; moreover, given the pervasiveness of vaccine scandal in China, we do not expect significant selection bias for victim cities in our sample.

[13] The survey instrument does not measure this directly. However, an interviewer checklist asks about the presence of others during the interview. We create a dichotomous measure that takes the value of 1 for presence of children under six years old and 0 otherwise.

We include city fixed effects and date fixed effects to control for unit-invariant unobservables on each date and date-invariant unobservables in each city. Date fixed effects are particularly important because we do not assume loss of trust in government is necessarily static. Even after a crisis for which the government bears major responsibility, citizens may regain trust in the state if they perceive an effective crisis response. Date fixed effects capture fluctuations in government credibility as citizens gather more information about the crisis and their government. Summary statistics for variables used in the analyses are reported in Appendix 6.

4.2. Identification Strategy

4.2.1. Crisis Effect

We exploit a natural experiment in which an unexpected public health crisis intersects with a nationally representative survey of citizen political opinions and information consumption patterns. Since our measure of salience captures both surging curiosity after the crisis and inherent local curiosity about the issue, it acts as an exogenous assignment of city-level vaccine crisis information on individual respondents. We assume that the more salient the crisis was in that city on the interview date, the more likely the respondent was aware of the crisis. Admittedly, the measure has the limitation of not directly observing whether individual respondents know about the crisis, because the survey could not foresee its occurrence. However, city-level salience can be used to estimate intention-to-treat (ITT) effects of the crisis when studying the effect of a macro event on individuals without knowing compliance status, as some recent studies (e.g., Wang and Dickson 2022) show. Analyzing the sample of respondents surveyed before the government correction effort on 16 August, this design can identify the differential effects of the vaccine crisis across cities due to varying

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salience.

The identification assumption is that: without the vaccine crisis, the difference in average government trust between cities with higher and lower salience should stay constant over time and be controlled for by city fixed effects. The assumption is supported by the fact that the vaccine crisis was the single most important news item for days with the most variation in salience. Our survey of the official party-state online daily *Renmin wang* finds that all top-ranked news articles on 23 July and four of the seven top-ranked articles on 16 August are about the vaccine crisis (see Figure A.3.1. in Appendix 3). It is unlikely that the variations in salience of the vaccine crisis were significantly confounded by other time-variant factors.

4.2.2. Correction Effect

We especially want to test how government efforts at correction affect citizen trust in government. We estimate the heterogenous effects on trust of Beijing's order on 16 August to purge officials it held responsible for the vaccine crisis across city-days for which the crisis salience varies. The government correction should have a stronger effect when and where the crisis had higher salience. Analyzing the sample of respondents surveyed after the crisis broke on 21 July, this design can identify the differential effects of the 16 August correction across city-days. The variable of interest is the interaction term of crisis salience and government correction. Although one may still be concerned that the crisis salience measure captures innate distrust in government, the exogenous timing of government correction ensures that the

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interaction term can be consistently estimated by OLS estimators (Bun and Harrison 2019).[14]

Another major theoretical interest is the heterogenous effects of correction that are due to whether or not respondents experience the 2018 vaccine crisis as a familiar failure: the repetition of a recent, similar harmful governance failure, which also suggests the ineffectiveness of the previous government correction to prevent future harm. To investigate this effect, we separate the sample into respondents who live in cities affected by the 2016 vaccine crisis and respondents who live in other cities.

5. Results

We test our hypotheses in three analytical steps. Step 1 tests Hypothesis 1 by estimating an ITT effect of crisis salience. Steps 2 and 3 test Hypotheses 2 and 3 investigating heterogeneous effects as a result of familiar failure.

5.1. Crisis Effect

We use ordinary least squares (OLS) models with city and date fixed effects on respondents surveyed between the start of the survey and the government correction on 16 August.[15] In Table 3 we present results from OLS models estimating the effect of the 2018

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[14] Bun and Harrison (2019) show that even if there is an endogenous regressor in the interaction term, whenever the functional form instruments are weak, OLS consistency for the interaction term can be ensured, but the full marginal effect is biased. We are only interested in the interaction term here.

[15] We use OLS estimation because we control for city and date fixed effects in all models. We do not use non-linear models because maximum likelihood estimators with fixed effects are inconsistent and may be biased in finite samples (Greene 2004).

vaccine crisis. We estimate the effect for reported trust in the central government (column 1), reported trust in local government (column 2), and consumption of television news about political and social issues (column 3).

Table 3. Impact of 2018 Vaccine Crisis

Outcome Variable	(1) Trust in Center	(2) Trust in City	(3) Watch TV News
Salience	**−0.231**	**−0.325**	**−0.038**
	(0.104)	**(0.148)**	**(0.014)**
Constant	7.693	8.538	0.569
	(0.787)	(1.190)	(0.135)
City Fixed Effects	Yes	Yes	Yes
Date Fixed Effects	Yes	Yes	Yes
Controls	Yes	Yes	Yes
Observations	1968	1929	2060
R-squared	0.260	0.209	0.202

Dependent variables: (1) trust in central government, on 0–10 scale; (2) trust in local government, on 0–10 scale; (3) sources of recent consumption of information on political and social topics: television.

Control variables: sex, age, age-squared, ethnicity, education, income, marital status, children under 6 years old, official residential status, communist party membership, ownership of device to access internet, ties outside mainland China, urban locality

Standard errors clustered around cities. For respondents surveyed from day 1 to day 38. Bolded: p<.05

Coefficients for 2018 Vaccine Salience are consistently negative and statistically significant. Both reported trust and our behavioral measure of trust in government are lower when the crisis salience is higher, supporting Hypothesis 1. The coefficients indicate a greater loss of trust in city governments, which supports what we know about the central-local "trust gap," but also show a significant loss of trust at the central level. Also, the co-movement of both measures of reported trust and our behavioral measure of trust lends confidence to our theory that governance failure impacts credibility of official information as a result of lost trust. The results reported in Table 1 show that the citizens we expect to be relatively more

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motivated to inform themselves about the vaccine crisis are more likely to not waste their time on official sources in doing so.

5.2. Correction Effect

We use OLS to fit the following model for respondents surveyed after news of the crisis broke on 21 July up to the end of the survey on 12 September:

$$Trust\ in\ Government_{itj} =$$

$$\theta_0 Salience_{tj} + \theta_1 Salience_{tj} \times Post\text{-}Correction_t + X\beta + \eta_t + \zeta_j + \epsilon_i$$

where *Trust in Government_{itj}* is trust in government for city *j*'s respondent *i* interviewed on date *t*, *Salience_{tj}* is crisis salience for city *j* on date *t*, and *Post-Correction_t* is whether the interview date *t* occurs after August 16, when Beijing purged officials it held responsible for the crisis. θ_1 is the interaction estimator. *X* is a vector of the demographic controls discussed in Section 3.

Our theory predicts that the effect of the government effort at correction is contingent on prior experience with familiar governance failure. Figure 5 plots the marginal effects of government correction on trust in the central government at low, medium, and high levels of crisis salience, separating the sample into cities that experience the crisis and correction as a familiar failure and other cities. The higher the level of crisis salience, the more the correction improves trust for respondents in cities that experience the 2018 crisis as the first major vaccine crisis. This effect is statistically significant at medium and high levels of crisis salience. If the city experienced the 2018 vaccine crisis as a familiar failure, however, there is no such association: the government correction does not increase trust as crisis salience increases.

Table 4 shows similar results for reported trust in government and television news

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Figure 5: Marginal Effects of Government Correction on Trust in Center
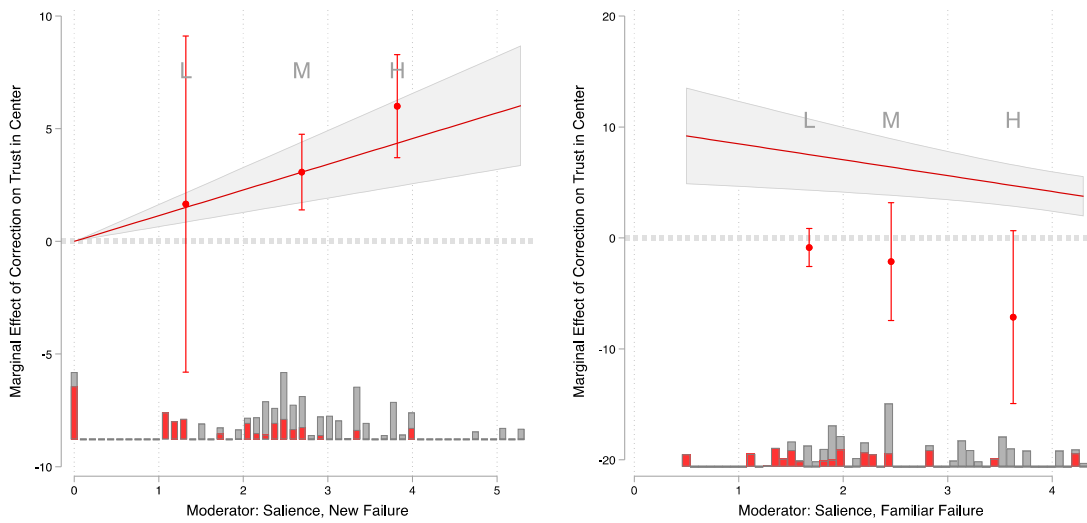
Note: The bars below refer to the distribution of the moderator and red parts denote the proportion of being after 16 August. We follow the best practice proposed by Hainmueller et al. (2019) and provide a binning estimator to divide the samples into three groups (low, medium, and high) based on their crisis salience level.

Table 4. Heterogenous Effects of Government Correction

	NEW FAILURE			FAMILIAR FAILURE		
	(1)	(2)	(3)	(4)	(5)	(6)
Outcome Variable	Trust in Center	Trust in City	Watch TV News	Trust in Center	Trust in City	Watch TV News
Salience	−0.153	−0.165	**−0.026**	**2.274**	**7.782**	−0.491
	(0.119)	(0.109)	(0.011)	(0.648)	(1.028)	(0.474)
Salience*Post-Correction	**1.140**	**3.318**	**0.631**	**−1.432**	**−6.435**	0.356
	(0.256)	(0.359)	(0.095)	(0.543)	(0.721)	(0.419)
City Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Date Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1706	1673	1759	914	896	955
R-squared	0.250	0.324	0.217	0.290	0.209	0.163

Dependent variables: (1) trust in central government, on 0–10 scale; (2) trust in local government, on 0–10 scale; (3) sources of recent consumption of information on political and social topics: television.

Control variables: sex, age, age-squared, ethnicity, education, income, marital status, children under 6 years old, official residential status, communist party membership, ownership of device to access internet, ties outside mainland China, urban locality

Standard errors clustered around cities.
Bolded: p<.05

consumption. We split the sample to allow for different effects of covariates across the two types of cities, as theorized.[16] The across-model Wald test shows that coefficients on salience*post-correction are significantly different for the two types of cities for reported trust in central and local government. The government correction effort has significantly less effect in increasing trust in cities where respondents experience the 2018 crisis as a familiar failure.[17] The positive coefficients on salience reassure us that search intensity for the crisis is not itself a measure of distrust, but a measure of citizen curiosity.

6. Conclusion

In this article, we present evidence consistent with a theory that citizen trust in government is impacted by their prior experience with government attempts to correct itself in the wake of a governance failure. In the first step of our analysis, we show that the more salient the crisis, the less *all* citizens trust the government and government information. The co-movement of reported trust and our behavioral measure of trust—information consumption—grants more confidence to our argument that governance failure should affect credibility of official information as a result of lost trust.

More interestingly, we also analyze the *heterogeneous* effects of how citizens update their beliefs about government credibility on the basis of relevant experience with past

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[16] This is also required because the two groups are unbalanced (see Appendix 7).

[17] The positive coefficients on salience do not contradict results in Table 1. The Table 1 analyses on crisis effects include respondents surveyed before and after news of the vaccine crisis broke, permitting us to capture the crisis effect on trust. The analyses of correction presented in Table 3 exclude respondents surveyed before the crisis.

governance failure. If citizens experience the 2018 vaccine crisis as an isolated incident, the government correction effort significantly improves trust in the central government. However, if citizens experience the 2018 vaccine crisis as a familiar failure, the correction is ineffective in increasing citizen trust. We observe similar results for trust in local government and government news consumption. Experience in the recent past with a similar crisis results in a more substantial impact on citizen trust in government than does a single crisis.

Our findings have broad implications for governance in authoritarian states such as China, where political participation excludes replacing the ruling party at the polls. We agree with Lu, Pan, and Xu (2021) that governance crises do not necessarily imperil popular support in authoritarian regimes. Looking beyond the immediate aftermath of a single crisis, however, we show the importance of true government responsiveness: while corrective gestures may work the first time, without substantive improvement, trust can easily be lost—and is harder to regain thereafter. Low levels of public trust are characteristically associated with dissatisfaction with the government, noncompliance with regulations, and even social unrest (Paige 1971; Zhu and Rosen 1993; Levi and Stoker 2000).

Indeed, COVID-19 National Preparedness Collaborators (2022) studying the conditions associated with cross-country variation in the pandemic find that infection rates are not explained by pandemic-preparedness indices that measure a state's health security capacity. Nor are there meaningful links between COVID-19 outcomes and intuitive explanatory variables such as regime type, health care coverage, or levels of inequality. Lower infection rates, higher vaccination rates, and adherence to social distancing policies are positively and statistically significantly associated with trust in government, however. In sum, trust in government and government information is critical for effective response to crises. As

we show here, effective response to crises is critical for maintaining and regaining trust.

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Appendix 1. Recent Vaccine Crises in China and Links to Examples of Media Coverage of Them

Crisis	Brief Description	Domestic Media	International Media
2004	3,000 infants inoculated with illegally distributed and stored vaccines	http://news.sina.com.cn/c/2004-08-27/10484154133.shtml	
2005	Substandard hepatitis A vaccines cause death of 1 student and sicken over 200 others	http://news.sina.com.cn/c/2005-06-30/08296308427s.shtml https://web.archive.org/web/	http://www.chinadaily.com.cn/english/doc/2005-06/28/content_455255.htm
2008	Two major companies produce and distribute over 200,000 substandard rabies vaccines	http://finance.sina.com.cn/consume/puguangtai/20100516/02357942963.shtml http://news.sohu.com/20100516/n272144685.shtml	
2009	5-year-old child dies from counterfeit rabies vaccine, ensuing investigation reveals fake rabies vaccines widespread in region	https://3g.163.com/money/article/6OBR4TH000253B0H.html http://www.hinews.cn/news/system/2010/09/27/011198442.shtml	https://www.scmp.com/article/733910/fake-rabies-vaccine-ring-jailed-over-boys-death
2010	4 children die and over 70 others sickened by improperly stored and distributed vaccines	https://view.news.qq.com/a/20100321/000001.htm http://news.sohu.com/20100317/n270897639.shtml	https://www.nytimes.com/2010/03/19/world/asia/19china.html https://www.reuters.com/article/idINIndia-47014620100318
2013	2 infants die and others sickened after receiving substandard hepatitis B vaccines	http://finance.people.com.cn/n/2013/1231/c364101-23984920.html http://www.gov.cn/jrzg/201312/13/content_2547595.htm https://www.163.com/money/article/9G834CDL00254TI5.html	https://www.bbc.com/news/world-asia-china-25505332 https://www.caixinglobal.com/2013-12-23/death-of-infant-after-vaccination-causes-confusion-concern-101013877.html
2016	Illegal vaccine ring originating distributes	https://www.sohu.com/a/243075878_100169910	https://www.bbc.com/news/world-asia-china-35859927

Crisis	Brief Description	Domestic Media	International Media
	millions of tainted vaccines through over 300 illegal distributors in 24 provinces	https://news.qq.com/a/20160318/013750.htm?qq=0&ADUIN=1810925261&ADSESSION=1458261096&ADTAG=CLIENT.QQ.5389_.0&ADPUBNO=26466 https://baike.baidu.com/reference/19467587/0575dDBV97N-5wTPWZAB1RPSJRKb_N50BUlv-fabGOs_Yry9-KtZuKSVjSRQpOffO6egAGgiyfR9PjN1HHBpm5kPDR41TMx-no6PdYNxUbBo4JOK1IgHaASoDQ	https://www.nytimes.com/2016/04/19/world/asia/china-vaccine-scandal.html https://www.economist.com/china/2016/04/01/a-vaccine-scandal-in-china-causes-an-outcry
2018	Major pharmaceutical company produces 250,000+ substandard vaccines for diphtheria, tetanus, and whooping cough, and engages in data forgery related to rabies vaccines	http://news.cctv.com/2018/07/22/ARTIh2wgaCnlL3PVQUMG30aL180722.shtml https://baike.baidu.com/reference/22752278/7170aCRYDD5afG1vGDA8CJnjHZsD_QlHXZsbaxlTH_onX64b6EYF4F4AynoQlm1SJGBi10g2Hv3m2D8OgSFxoJOrdYwuX_T-ss0hMyAtrTuyNA	https://www.nytimes.com/2018/07/23/world/asia/china-vaccines-scandal-investigation.html https://www.theguardian.com/world/2018/jul/23/china-outcry-over-sale-of-250000-faulty-vaccines-prompts-investigation https://www.reuters.com/article/uk-china-vaccines-timeline-factbox/the-unfolding-of-chinas-changsheng-vaccine-scandal-idUKKBN1KE1M4

Note: (1) Earlier vaccine crises were less well covered in international media than later ones. (2) Many stories, both domestic and international include discussion of widespread social media outcry.

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Appendix 2. 2018 Survey

We analyze data from the China Internet Survey. Its main focus is how Chinese citizens use the internet—but the survey itself is a face-to-face, not online, survey. It is nationally representative, with respondents sampled using GPS sampling (see Landry and Shen 2005) to include the large percentage of migrants not accessed with sampling based on lists of registered residents. Samplers drew a representative sample of 4,686 mainland Chinese residents from 18 to 65 years of age. In order to obtain a representative sample of the working-age Chinese population, survey weights were calculated based on age, gender, and education information from China's most recent inter-census population survey, conducted by the National Bureau of Statistics in 2015. Interviews took an average of 44 minutes to complete. Responses were recorded with paper and pencil. The response rate was 67.1 percent. The survey was not conducted in Beijing, Shanghai, Tianjin, Hubei, Jilin, Xinjiang, or Hainan. For more detail on the survey project, see www.chinainternetsurvey.net.

We note that the survey item on television consumption refers to "the past three months." We draw on known psychological biases in survey question interpretation to assume respondents recall their most recent experiences of television consumption. See, for example, Schwartz (1990, 100), on how "the past three months" becomes "recently" for survey respondents. We are reassured in this interpretation by significant effects in predicted directions on television consumption in our analyses.

A.2.1. Survey Items Used in Tables 1, 2, and 3

(1) "To what extent do you trust the central government?" (1-10 scale)

(2) "To what extent do you trust the city government?" (1-10 scale)

(3) "Did you get information about current political and social topics through the following

traditional media channels in the last three months? Response yes: television.

Appendix 3. Official News about the 2018 Vaccine Crisis

We conduct a systematic investigation to discover the quantity and substance of information related to the 2018 vaccine crisis available to ordinary Chinese who access official party and government sources from July 21 through September 12. We look at *Renmin wang*, an online daily that is the key news mouthpiece of the Chinese party-state. We code the Daily Top-Ranked News Items (always 7 items) and the Important News of the Day (usually about 20 items). These rankings reflect official decisions: the former is an editorial choice, the later a combination of popularity and editorial choice. *Renmin wang* is but a small subset of information from official sources easily available to interested Chinese; if there is enough in its top-ranked and important news to constitute a reasonably full "official story," then we can interpret a shift away from official sources toward social sources of information about the 2018 vaccine crisis as a "defection" rather than, for example, a search for relevant information due to the paucity of it in official sources. We conclude from our study of this sample that official stories are not scarce in quantity and the "official story" is fairly comprehensive in its coverage of relevant topics.

Figure A.1 shows the frequency of stories in our 64-day survey period: 51 stories related to the vaccine crisis, 16 of which appeared in the first three days after the scandal erupted. Stories averaged one per day, shown in the solid horizontal line; not surprisingly, stories peaked early, on July 23 with seven stories. Table A.1.1 reports on the substance of the stories in 11 topic categories developed from analysis of story content. Notably, stories that show officials in a bad light are relatively few. Instead, stories deflect from faults of the regulators to players in the marketplace, focusing more on criticism and investigation of enterprises.

Figure A.3.1. Stories in *Renmin wang* on 2018 Vaccine Crisis,
Daily Top-Ranked News Items and Important News of the Day
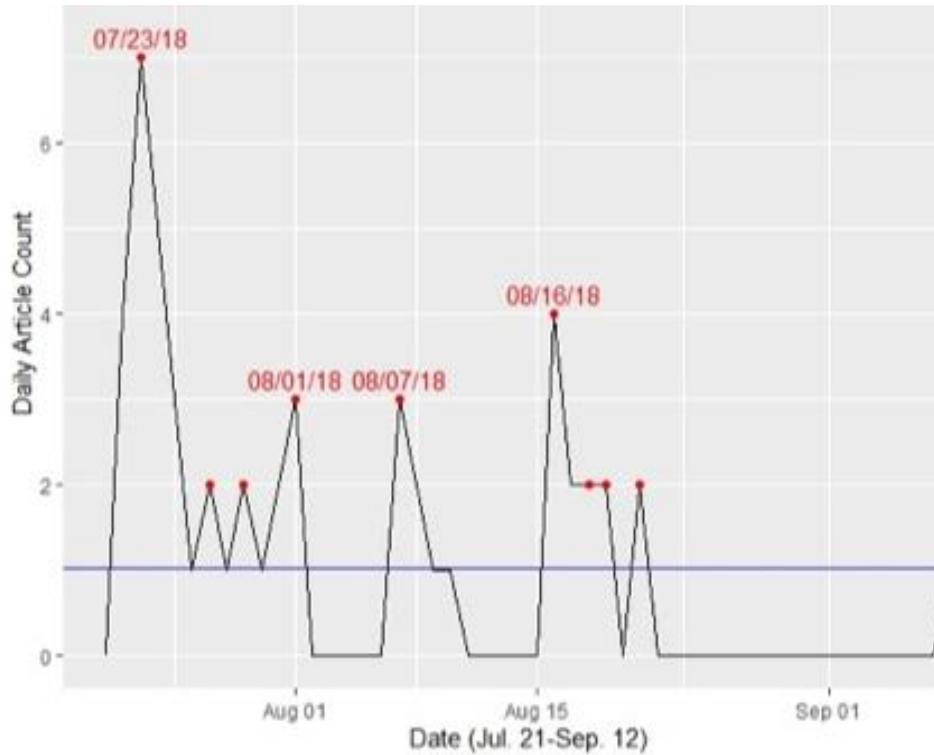
Table A.3.1. Topic Categories for 51 Stories in *Renmin wang* on 2018 Vaccine Crisis,
Daily Top-Ranked News Items and Important News of the Day

		%
1	Instructing officials about response	52.9
2	Results of investigation	45.1
3	Urging investigation	43.1
4	Punishment of enterprises	41.1
5	Criticism of enterprises	39.2
6	Response to public concerns	39.2
7	Institutional or legal reforms	27.5
8	Punishment of officials	17.7
9	Criticism of officials	15.7
10	Voicing public concerns	13.7
11	Description of the issue	13.7
	Note: On average, a single story contains 3.5 topics.	

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Below we quote at length from a selection of stories that ran in *Renmin wang*, simply to give a qualitative sense of the "official story" that was easily accessible to ordinary Chinese after news of the scandal broke.

1, 3. Instructing Officials about Response, Urging Investigation. (i) "This requires local health departments, centers for disease control, and food and drug supervision departments to act quickly, to conduct detailed investigations, to release authoritative information in a timely manner in order to appease the society and ease public anxiety. This is the most critical part of addressing public opinion." (ii) "Localities and departments concerned should pay close attention, investigate immediately and thoroughly, strictly hold individuals involved accountable according to law, promptly announce the investigation progress, and effectively respond to public concerns." (iii) "In accordance with instructions from Xi Jinping and Li Keqiang, the State Council has established a case-specific process and sent an investigation team to Changchun Changsheng Biotechnology Co., Ltd. to conduct an investigation. The team will expedite case investigation, track down responsibility, and evaluate risk. Jilin province has also established provincial and city-level investigation teams to cooperate with the State Council's investigation team, so as to comprehensively evaluate high-risk pharmaceutical companies based on this case." (iv) "All localities have been instructed to withdraw and destroy unused vaccines involved in the case. Those that have been exported are to be recalled and the World Health Organization and relevant countries are to be notified in a timely way."

2. Results of Investigation. (i) "To reduce costs and increase production, the company violated the approved production process by using different batches of stock solution to blend for product packaging, concentrating and purifying the blended stock solution twice. Individual batches of products use stock solutions that exceed the prescribed validity period. … [The

Electronic copy available at: https://ssrn.com/abstract=3593561

company] falsely labeled the production date of the products, and what should be the post-production test was carried out in the stock solution production stage. To conceal the above-mentioned illegal actions, the company systematically fabricated production and inspection records, and issued purchase invoices with false dates in order to deal with inspections from regulatory officials."

4, 5. Criticism and Punishment of Enterprises. (i) "This is by no means a problem of a few bad companies. … We have seen that punishment of some lawless and unconscionable evil enterprises is insignificant compared with the evil gains, so they are not motivated to change. What we see behind the life-threatening farce are powerless victims unable to defend their rights, purportedly punished enterprises, and habitually silenced regulators. Such laxness is another important incentive encouraging enterprises to produce and sell fake products."

6. Response to Public Concerns. (i) "The flow of problematic vaccines has been ascertained: after investigation, Changchun Changsheng Biotechnology Co., Ltd. produced 252,600 vaccines with batch number 201605014-01, all of which were sold to the Shandong Provincial Center for Disease Control and Prevention; 190,520 of 400,520 vaccines with batch number 201607050-2 produced by Wuhan Institute of Biological Products Co., Ltd. sold to Chongqing Center for Disease Control and Prevention and the other 210,000 vaccines sold to the Hebei Provincial Center for Disease Control and Prevention." (ii) "According to the adverse reaction monitoring data of the Chinese Center for Disease Control and Prevention, there has been no abnormality in the adverse reactions of rabies vaccine injection in recent years. The adverse reaction rate of the rabies vaccine produced by Changchun Changsheng Company after vaccination was 0.2 per ten thousand, and no serious adverse reactions were seen." (iii) "The expert group comprehensively assessed the situation and suggested that those who have not

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completed the vaccination procedure be re-vaccinated by other qualified companies for free by the vaccination unit. According to the characteristics of rabies, those who have completed the vaccination program do not need to be reinjected. If the recipient wishes a new injection, the vaccination unit can inject for free after ascertaining the protective effect of the vaccine and precautions after vaccination. According to the rabies report issued by the World Health Organization in April 2018, the incubation period of rabies is usually 1 to 3 months, rarely more than 1 year."

7. Institutional or Legal Reforms. (i) "Regarding problematic vaccines, investigation and punishment is important as long as we find a single one. Yet, it is more important to find the root of the problem through every incident. Otherwise we will be trapped in passive 'remedial response.' In this sense, the emergence of problems is also an opportunity for reform. Are there still regulatory loopholes in the production and sales of vaccines? How to strengthen the entire supervision chain before and after the event and formulate a long-lasting vaccine safety management mechanism ? How to strengthen penalties so that companies do not want, cannot, or dare not to violate the law? We must not only hold pharmaceutical companies accountable, but also regulate the market order and improve the supervision system to avoid similar incidents for good." (ii) "The meeting emphasized the necessity to improve laws, regulations and the system; to specify and implement supervision responsibilities; to strengthen on-site inspections of the production process; to supervise enterprises to fulfill obligations; to establish a quality and safety traceability system; and to implement a product risk reporting system. For high-risk and highly specialized vaccines, the regulatory authority must be specified. Based on local jurisdictional management, agencies must be dispatched to conduct inspections. It is necessary to strengthen the capacity building of the supervisory team, and establish a sound professional and

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professional inspection team for vaccine drugs as soon as possible." (iii) "Many legal experts told Voice of China that within the existing legal framework, the triple penalty is indeed a 'heavy penalty'. As for whether the circumstances are 'serious', it is difficult to determine since there is no evidence to prove that the DTP vaccine has had significant impact. However, they also stated that the current handling of similar violations of laws and regulations is relatively light, and warnings are not enough."

8, 9. Criticism and Punishment of Officials. (i) "Based on results of the investigation team of the State Council, on August 16, the Standing Committee of the Jilin Provincial Party Committee decided to discipline relevant personnel for ineffective supervision of the illegal production of Changchun Changsheng Company's rabies vaccines and incapacity in fulfilling management responsibilities on the part of those with direct leadership responsibilities. In accordance with legal procedures, it was decided to remove Guo Hongzhi from the posts of Secretary and Director of the Jilin Food and Drug Administration and to remove Bai Xugui from the posts of Secretary and Director of the Jilin Provincial Department of Industry and Information Technology (as deputy mayor of Changchun City from April 2016 to February 2018."

10. Voicing Public Concerns. (i) "Will the problematic vaccine do any harm to children's bodies? For children who have been vaccinated with fake vaccines, do they need re-vaccination?" (ii) "At this time, the 'authoritative truth' should be used to respond to public concerns: what exactly is 'falsifying production records'? What's the impact on vaccine efficacy? Do earlier vaccines have the same problem? Where did the problematic 'DTP' vaccine flow?"

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Appendix 4. Before-and-After Estimations

	Trust Central (1)	Trust City (2)	Watch TV (3)
After crisis	-0.088	0.068	**-0.066**
	(0.131)	(0.290)	**(0.024)**
Constant	7.088	7.389	0.519
	(0.831)	(1.147)	(0.131)
City FE	Yes	Yes	Yes
Demographics	Yes	Yes	Yes
Observations	1968	1929	2060
R-squared	0.241	0.188	0.187

Dependent variables: (1) trust in central government, on 0–10 scale; (2) trust in local government, on 0–10 scale; (3) sources of recent consumption of information on political and social topics: television.

Control variables: sex, age, age-squared, ethnicity, education, income, marital status, children under 6 years old, official residential status, communist party membership, ownership of device to access internet, ties outside mainland China, urban locality

Standard errors clustered around cities. For respondents surveyed from day 1 to day 38. Bolded: p<.05.

Appendix 5. Cities Affected by 2016 Vaccine Crisis

City	Province	N
Baoding	Hebei	41
Chengdu	Sichuan	42
Chifeng	Inner Mongolia	42
Chongqing (county)	Chongqing	42
Chongqing (district)	Chongqing	84
Hangzhou	Zhejiang	42
Hefei	Anhui	42
Heze	Shandong	84
Jieyang	Guangdong	42
Jinan	Shandong	42
Lianyungang	Jiangsu	42
Liaocheng	Shandong	42
Linfen	Shanxi	42
Nanyang	Henan	84
Quanzhou	Fujian	41
Shijiazhuang	Hebei	126
Shuangyashan	Heilongjiang	42
Suqian	Jiangsu	42
Weinan	Shaanxi	42
Xi'an	Shaanxi	42
Yulin	Guangxi	84
Zhangye	Gansu	42
Zhanjiang	Guangdong	42

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Appendix 6: Summary Statistics

DEPENDENT VARIABLES	N	Mean	SD	Minimum	Maximum
Trust in Central Government	3024	8.55	1.92	0	10
Trust in Local Governments	2964	7.31	2.47	0	10
Television News	3139	0.75	0.43	0	1

KEY INDEPENDENT VARIABLES	N	Mean	SD	Minimum	Maximum
2018 Vaccine Salience	3144	5.09	1.75	0	8.85
2016 City	3144	0.39	0.49	0	1
After Correction	3144	0.31	0.46	0	1

CONTROL VARIABLES	N	Mean	SD	Minimum	Maximum
Education	3139	3.05	1.72	1	9
Age	3144	46.31	13.86	18	65
Marital Status	3144	0.83	0.37	0	1
Child under 6 Present	3144	0.07	0.26	0	1
Urban Residence Status	3138	0.33	0.47	0	1
Income Category	3118	2.08	0.55	1	4
Urban Locality	3144	1.26	0.44	1	2
Male	3144	0.49	0.5	0	1
Ties Abroad	3142	0.06	0.24	0	1
Han Ethnicity	3103	0.90	0.30	0	1
Communist Party Member	3104	0.05	0.22	0	1
No Online Device	3144	0.25	0.43	0	1

Appendix 7. Balance Table of Respondents in Familiar Failure Cities vs. New Crisis Cities

	Familiar Failure City		New Crisis City	
	mean	variance	mean	variance
Education	3.257	3.108	2.91	2.765
Age	45.77	207.6	46.81	181.7
Marital Status	0.8219	0.1465	0.8424	0.1329
Child under 6 Present	0.07534	0.06973	0.07059	0.06565
Urban Residence	0.3305	0.2215	0.3307	0.2214
Urban Locality	1.26	0.1927	1.265	0.1948
Male	0.4803	0.2498	0.4883	0.25
Ties Abroad	0.07791	0.0719	0.04246	0.04068
Han Ethnicity	0.9872	0.01269	0.8386	0.1354
CPC Member	0.06164	0.05789	0.0483	0.04599
No Online Device	0.2354	0.1802	0.2606	0.1928