



Research Article

Pandemics & Propaganda: How Chinese State Media Creates and Propagates CCP Coronavirus Narratives

To gain insight into how Chinese state media is communicating about the coronavirus pandemic to the outside world, we analyzed a collection of posts from their English-language presence on Facebook. We observed three recurring behaviors: sharing positive stories and promoting the Chinese Communist Party's (CCP) pandemic response, rewriting recent history in a manner favorable to the CCP as the coronavirus pandemic evolved, and using targeted ads to spread preferred messages. Although spin is not unique to state actors, paid ad campaigns to promote government-run state media pages containing misinformation and conspiracies are problematic. Our findings suggest that platforms should implement clearer disclosure of state-sponsored communications at a minimum, and consider refusing paid posts from such entities.

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Research questions

- How is China using its English-language state media infrastructure on Facebook to communicate with the English-speaking world about the coronavirus?
- How does Chinese state media coverage of the coronavirus targeted at English-speaking audiences compare to U.S. media coverage of the coronavirus?

Essay summary

- China has invested in developing an extensive English-language communication apparatus on Facebook since 2013 via the creation of dozens of regionalized and English-language state media Pages. This gives the CCP access to, at minimum, close to 100 million followers on the platform worldwide. Since January 2020, over 33 percent of the communication coming from these Pages has related to the topic of COVID-19.
- State propaganda has long been used to influence, persuade, and distract audiences. In the age of social media, broadcast properties with Facebook pages can additionally leverage tailored ad

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targeting to push content to specific desired audiences, and receive quantitative feedback in the form of impression and engagement data to optimize their future content.

- Through automated text analysis and a close examination of a sample of Facebook posts by English-language Chinese state media, we observe three recurring behaviors: focusing a significant share of coverage on positive stories, adjusting narratives retroactively, and using ads to spread messaging.
- The data additionally reveals a willingness among Chinese state media to spread misinformation that is overtly conspiratorial. Conspiratorial speculation provides a rhetorical frame that enables a state to deflect responsibility or culpability for a given situation by pointing towards shady, powerful outside forces.
- Although social platforms have taken steps to address covert inauthentic state-sponsored troll operations, our observations suggest that platforms should additionally evaluate the impact of paid state-sponsored content as they work to mitigate misinformation, and should amend their ad policies.

Implications

State media is a tool for public diplomacy, and affords states the power to shape narratives. Unlike publicly-funded outlets, state media lack editorial independence from government bodies and institutions. Many countries have long maintained official state media broadcast outlets across television, radio, print, and increasingly social media to communicate their points of view to the world. These media properties are sometimes called “white propaganda” entities – a reflection of the fact that the attribution of the message to the state actor behind it is fully transparent².

While much of the study of state-sponsored online influence has focused on bots and subversive accounts, this essay focuses instead on the white propaganda capability of the People’s Republic of China on social media, and examines how it has been leveraged in an information conflict around the 2020 novel coronavirus pandemic. Understanding how overt online propaganda properties are developed and leveraged to shape international public opinion provides us with a more complete grasp of the narrative manipulation capabilities available to well-resourced state actors, and suggests potential gaps in tech platform misinformation policies.

The perception of China’s handling of the novel coronavirus has been a messaging challenge for the Chinese Communist Party’s (CCP). There have been a significant number of allegations among Chinese people on China’s domestic social media platforms³, as well as in the global press, that the CCP mishandled the crisis and covered up the outbreak’s severity. To manage the PR crisis, the CCP has attempted to control the narrative⁴ and deflect blame⁵ since early in the pandemic, domestically and abroad. It has done this by drawing on its substantial state media apparatus.

2 United States Department of Defense and United States Joint Chiefs of Staff, *Dictionary of Military and Associated Terms: (Incorporating the NATO and IADB Dictionaries)* (Joint Chiefs of Staff, 1987), digitized on Google Books here: <https://books.google.de/books?id=Rs0auKXnjuoC>.

3 Daniel Victor, “Panic and Criticism Spread on Chinese Social Media Over Coronavirus,” *The New York Times*, January 24, 2020, <https://www.nytimes.com/2020/01/24/world/asia/china-social-media-coronavirus.html>.

4 Annabelle Timsit, “China Mobilizes against Media’s ‘Malicious’ Coronavirus Coverage,” *Quartz*, March 5, 2020, <https://qz.com/1812162/china-mobilizes-against-medias-malicious-coronavirus-coverage>.

5 Bethany Allen-Ebrahimian, “In Global PR Campaign, China Deflects Blame for Coronavirus,” *Axios*, March 11, 2020, <https://www.axios.com/beijings-coronavirus-propaganda-blitz-goes-global-f2bc610c-e83f-4890-9ff8-f49521ad6a14.html>.

China has extensive and well-resourced outwardly-focused state media capabilities (Brady, 2015), which it employs for its public diplomacy strategy (Chang and Lin, 2014). These channels, such as the CCP's properties on Facebook (which is banned in China), relay the government's messaging to other countries' governments and citizens. Since 2003, building and buying media properties has been part of the CCP's explicit effort to ensure that it has the capacity to "nudge" foreign governments and other entities into policies or stances favorable to the party⁶. In periods of unrest or crisis, these properties are put to use to propagate state messaging (Shambaugh, 2017).

Understanding the ways in which online propaganda shapes public opinion – particularly given the rising prevalence of social networks as sources of news, and the capabilities that social media offers for targeting, repetition, and audience-building – is critical to understanding how influence and manipulation play out in modern politics (Woolley & Howard, 2017). It is, however, a challenging undertaking because of the difficulty of isolating any particular account or post as the precipitating factor in shaping an opinion. A debate persists on the impact of online disinformation and misinformation even in the literature on the most widely-studied operations, such as those carried out by Russia's Internet Research Agency (IRA)⁷.

Older research assessing the impact of propaganda more generally similarly acknowledges the challenge of quantitative studies. Propaganda scholar L. John Martin addressed this via a distinction between persuasive communication (communication with intent to achieve an objective) and facilitative communication. Facilitative communication "is an activity that is designed to keep lines open and to maintain contacts against the day when they will be needed for propaganda purposes." It involves building and investing in media infrastructure that leads to the creation of a trusted relationship; successful establishment of the audience is an effect by itself. Martin notes, "[Facilitative communication] is effective if and when it opens up channels of communication with a potential audience" (Martin, 1971). The structure of social platforms lends itself to facilitation, through features designed for rapid, tailored audience-building. Social media account owners receive detailed analytics indicating the extent to which their messaging, targeting, and ads are resonating with the desired audience, which enables precisely-refined strategies. Therefore, understanding white propaganda account strategy is key to understanding the full spectrum of influence capabilities of state actors on social media.

In analyzing the extent to which the CCP's combined strategy works, communication professor and China propaganda scholar Maria Repnikova notes, "The party's persuasion efforts are sometimes dismissed as a rigidly ideological top-down affair or a clumsy spectacle, but the government's handling of the Covid-19 crisis has revealed just how agile China's propaganda operations really are: They are interactive, and they readily engage with public opinion — the better to co-opt it⁸." Our assessment of China's activities on state social media accounts corroborates this observation using quantitative assessments. The behaviors discussed throughout our findings demonstrate ways in which the Chinese government leverages its state media apparatus to shape narratives worldwide: by spinning narratives in a way favorable to the Chinese government, engaging in revisionist history, and paying social media platforms to boost preferred narratives.

We observe long-term audience building via targeted ads, which originally relied on boosting content focused on generic, positive cultural stories. In early 2020, that activity began to involve boosting the promotion of articles related to COVID-19. The COVID-19 content evolved, moving beyond generic

6 Louisa Lim and Julia Bergin, "Inside China's Audacious Global Propaganda Campaign," *The Guardian* 7 (2018): 12.

7 Some scholars suggest the IRA's activities had virtually no impact because trolls targeted those who were already sympathetic to the message (Bail, 2020), some suggest they may have had an impact, though a negligible one given the size of the social media campaign compared to the far-larger partisan broadcast media ecosystem (Benkler et al., 2018), and still others believe the campaign had a significant impact (Jamieson, 2018).

8 Maria Repnikova, "Does China's Propaganda Work?," *The New York Times*, April 16, 2020, <https://www.nytimes.com/2020/04/16/opinion/china-coronavirus-propaganda.html>.

positive spin into misleadingly reframed events, and amplification of conspiracy theories. Conspiracy theories serve an important communication function: helping unite the audience (“the people”) against an imagined secretive, powerful elite (Fenster, 1999). By creating and spreading these theories, particularly those framing the United States as responsible for the coronavirus, the Chinese Communist Party presents itself as a defender of its people. It also perpetuates disinformation.

State-sponsored influence campaigns on social media platforms are broader than fake accounts and bots. Addressing overt state media is a policy challenge, not a detection challenge. Given evidence that the CCP has amassed over a hundred million followers on its state media accounts, our findings suggest that although platforms such as Facebook are primarily behaviorally-focused when it comes to taking down misinformation, there is still a need to consider whether affording governments the ability to use ads to push misleading content is a policy gap in counter-misinformation efforts. We believe it is, and that social media platform ad policy requires an update. Some platforms, such as Twitter, have already elected to no longer accept paid state media ads that boost highly slanted coverage; this action was taken in response to Chinese state media promoting tweets misrepresenting events during the Hong Kong protests of 2019⁹. Other platforms should adopt this position in the interests of minimizing targeted propaganda and disinformation. Additionally, more research is urgently needed to better assess how this content shapes public beliefs.

Findings

To gain insight into how Chinese state media communicates with the world beyond its borders, we analyzed a collection of posts drawn from its English-language presence on social media using Crowdtangle and the Facebook Ads API (Table 1). Simultaneously, we examined a collection of U.S. mainstream media Pages covering the coronavirus pandemic, as well as U.S. state-sponsored outlets, to assess the media coverage through a comparative lens (Table 1, discussion of selection criteria in Methodology/Appendix A).

Table 1. Description of four data sets used for analysis

	Data set 1: U.S. mainstream media	Data set 2: U.S. government-funded media	Data set 3: Chinese state media	Data set 4: Chinese state media advertisements
Number of Facebook pages	14	7	8	6 ¹⁰
Min - Max (Average) Page Likes¹¹	0.7 - 32.3 million (9.0 million)	0.2 - 11.3 million (2.5 million)	1.2 - 97.0 million (58.9 million)	N/A
Facebook pages	ABC News; AP; CBS News; CNBC; CNN;	Voice of America - VOA; Radio Free Asia;	CCTV; CGTN; CGTN America;	CCTV; CGTN; CGTN America;

⁹ @Twitter, “Updating Our Advertising Policies on State Media,” Blog, Twitter, August 19, 2019, https://blog.twitter.com/en_us/topics/company/2019/advertising_policies_on_state_media.html.

¹⁰ *People’s Daily, China* and *Global Times* did not run any ads classified as political in the period we analyzed

¹¹ As of March 16, 2020

included	Fox News; Los Angeles Times, MSNBC, NBC News, NPR; POLITICO; The Atlantic; The New York Times; The Wall Street Journal; TIME; Washington Post	VOA Asia; Africa 54; Radio Free Europe/Radio Liberty; VOA Studio 7; VOA StudentU	China.org.cn; China Daily; China Xinhua News; Global Times; People's Daily, China	China.org.cn; China Daily; China Xinhua News
Date range of posts	December 31, 2019 - March 16, 2020	December 31, 2019 - March 16, 2020	December 31, 2019 - March 16, 2020	January 1, 2019 - March 29, 2020
Total number of posts	74,196 posts of which 10,728 (14%) included "coronavirus"	5,594 posts of which 1,145 (20%) included "coronavirus"	23,011 posts of which 7,629 (33%) included "coronavirus" ¹²	146 ads (50 run after Jan 1 2020 including "coronavirus" or "covid")

In a preliminary analysis of Facebook posts early (January to mid-March 2020) in the COVID-19 outbreak, we observed a positive skew in Chinese state media outlets, which reported positive stories about the outbreak more frequently than U.S. media. After gathering posts, we manually coded a randomly-selected subset across all three outlet types to assess how the outlets differed in their coverage. We found that Chinese outlets shared considerably more positive stories than their U.S. counterparts.

Finding 1: Chinese outlets focus a significant share of their coverage on positive stories and emphasized Chinese Communist Party competence across a range of narratives.

To assess differences in framing and sentiment across Chinese and U.S. media, we coded a random sample of 90 posts as positive, neutral, or negative (see Appendix B for examples)¹³. In the Chinese state media posts, eleven (37%) were positive, whereas only one post (3%) in both U.S. mainstream and government-funded media included positive content (Figure 1). The Chinese state media posts also included far fewer negative posts compared to U.S. outlets, with six posts in the Chinese set (20%) compared to 11 (37%) for U.S. mainstream and seven (23%) to U.S. government-funded media.

¹² Data Set 3 included 520 additional posts related to the virus' presence and the experience of citizens in Wuhan, including terms such as #WuhanPneumonia. These were not included in the comparative set, which we limited to "coronavirus".

¹³ See Methods section for a methodological explanation and Appendix B for examples

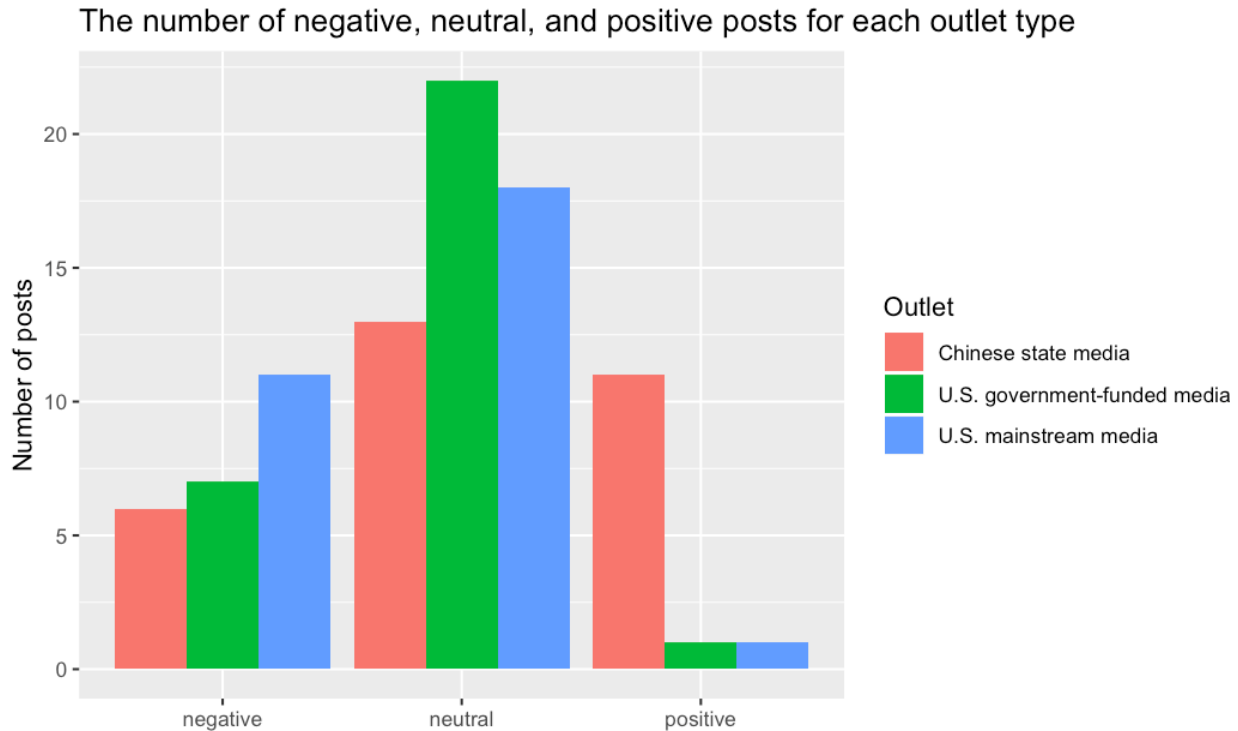


Figure 1: The number of negative, neutral, and positive posts for each of the three outlets across 90 randomly selected posts (30 for each outlet). Chinese state media include a significantly higher share of positive posts.

To further understand this narrative framing, we examined the use of the word “patient” across all three media environments in all posts they shared¹⁴. “Patient” appeared in 16% of Chinese state media posts, but only 3% and 7% in U.S. mainstream and government-funded media respectively.

The terms “infected” and “coronavirus” were most frequently used consecutively with “patient” across all media outlets. Beyond these two terms, however, there were significant divergences. While the U.S. mainstream media focused reporting on patient illness (using words like “sick” or “collapsed”), Chinese media more frequently mentioned treatment- and recovery-related terms (“treating”, “recovered”, “discharged” and “cured”) (Figure 2). Although “treat” appeared as a bigram in U.S. government-funded media, so too did “affected,” “died,” and “diagnosed” (Figure 2). Chinese state media focused on recovery whereas the U.S. articles focused on illness severity and death.

¹⁴ In our collection of Facebook posts, “patient” appeared 1626 times in 1151 Chinese state media posts (16% of the total state media posts), 374 times in 344 posts in U.S. mainstream (3%) and 101 times in 78 of the U.S. government-funded media posts (7%) related to coronavirus.

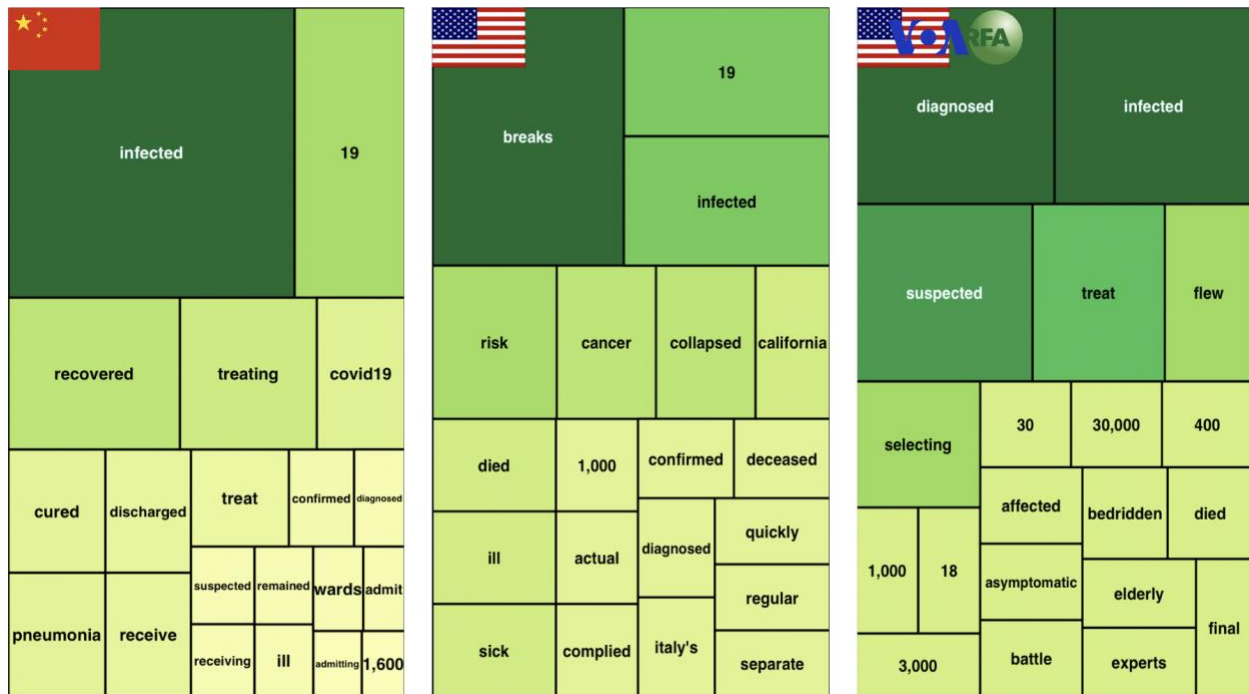


Figure 2: Top 20 most frequently used words in connection with the word “patient” by Chinese media (left), U.S. mainstream media (middle) and U.S. government-funded media (right); Excluding the term “coronavirus” for better visibility of other terms. Larger area size and darker color indicate a more frequent term usage. Chinese media use more recovery- and treatment-related words than U.S. media.

1.1 Chinese outlets praise the Chinese government response, while U.S. media highlight failures

We observed another significant coverage divergence in descriptions of the Chinese government’s crisis response. In the English-language Chinese state media universe, the Chinese government’s response was framed as efficient, effective, and transparent, without deviation. In contrast, the U.S. media highlighted China’s failures.

To evaluate government-response narratives we randomly selected 30 posts that mention keywords related to the Chinese government¹⁵ for each of the three outlet types for a total sample of 90 posts. These posts were then coded as unfavorable, neutral, or favorable in their framing of the Chinese government response¹⁶. In the Chinese state media post sample, 13 posts (43%) used a favorable framing, whereas only one post (3%) in U.S. mainstream media and two (7%) in U.S. government-funded outlets framed the Chinese government response favorably (Figure 3). Moreover, there was only one (3%) government-unfavorable post in the Chinese state media sample, compared with 12 (40%) and 11 (37%) in the U.S. mainstream media and U.S. government-funded outlets, respectively.

The favorable-unfavorable framing dichotomy can be observed in coverage of Xi Jinping. Chinese state media consistently praised Chairman Xi’s efforts to combat the pandemic. In contrast, U.S. media noted

¹⁵ Keywords used: xi, chinese government, chinese leadership, chinese authorities, communist, local authority; Using a space before and after “Xi” to exclude posts including terms such as “taxi”. This generated subsets of 324 Chinese state media posts, 98 U.S. mainstream media posts and 35 U.S. government-funded posts

¹⁶ See Appendix C for examples

that he had retreated from the spotlight during the early outbreak¹⁷ and reported on Xi’s lack of public appearances in the context of questions about his leadership, wondering whether he had retreated to avoid “inevitable blame” and speculating on whether prime minister Li Keqiang would take the fall¹⁸.

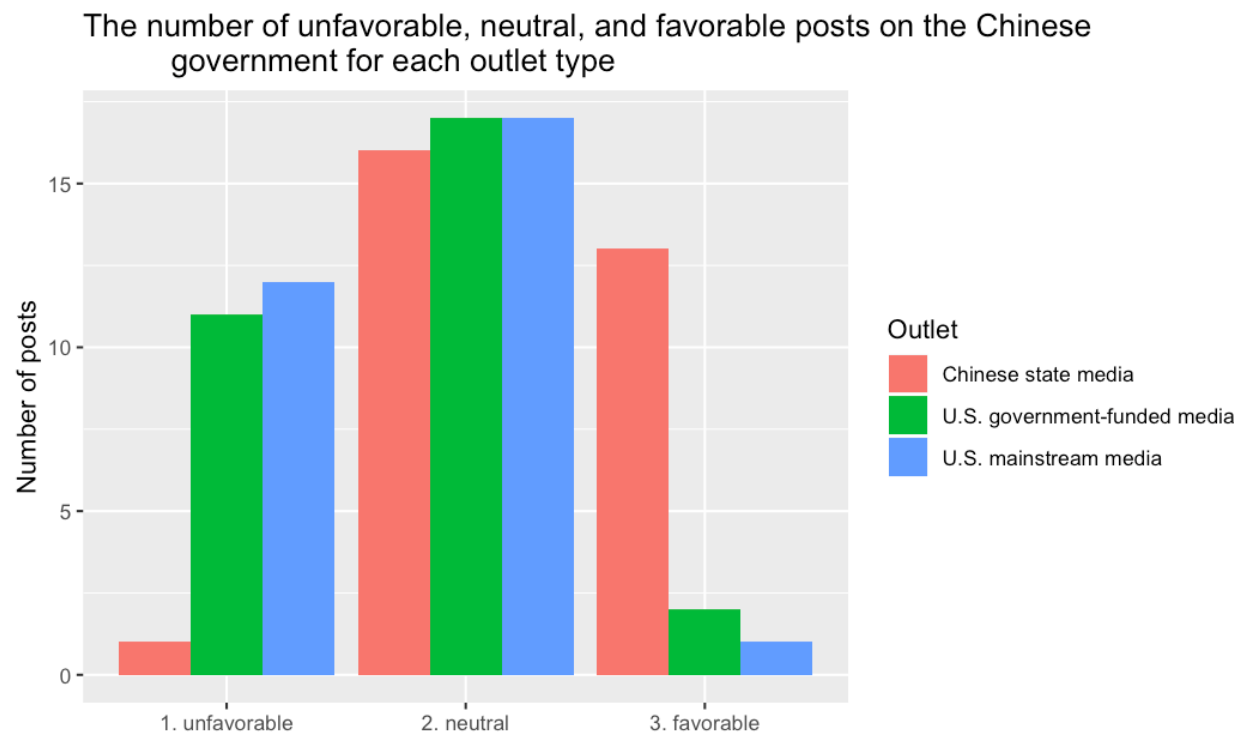


Figure 3: *The number of posts including an unfavorable, neutral, and favorable framing of the Chinese government response for each of the three outlets across 90 randomly selected posts (30 for each outlet) mentioning the Chinese government. Chinese state media include a significantly higher share of favorable posts, but only one (3%) unfavorable one, whereas 12 posts in U.S. mainstream media (40%) are unfavorable on the Chinese government response. See Appendix B for details.*

We did a similar comparative assessment on a third and final popular topic of coverage: news stories related to Leishenshan and Huoshenshan hospitals that were rapidly built for emergency response in late January 2020. This response effort was presented as a significant event in the coronavirus narrative from Beijing: several million viewers watched online live streams of the construction sites hosted by Chinese state broadcaster CCTV¹⁹. Chinese state media disseminated stories about how the international community was “impressed” with China’s rapid building capacity, calling the quick construction a “miracle

17 Chris Buckley and Steven Lee Myers, “Where’s Xi? China’s Leader Commands Coronavirus Fight From Safe Heights,” *The New York Times*, February 8, 2020, <https://www.nytimes.com/2020/02/08/world/asia/xi-coronavirus-china.html>.

18 James Griffiths, “Xi Jinping Is Directing China’s Response to the Virus. But He’s Been AWOL from News Reports,” *CNN*, February 2, 2020, https://edition.cnn.com/asia/live-news/coronavirus-outbreak-02-03-20-intl-hnk/h_65d29eb853f1ed84b219680637fc9b44.

19 William Zheng and Laurie Chen, “Live from Wuhan: Millions Tune in to Watch China Build Coronavirus Hospitals,” *South China Morning Post*, January 28, 2020, <https://www.scmp.com/news/china/society/article/3047943/live-wuhan-millions-tune-watch-china-build-coronavirus-hospitals>.

20.” In contrast, both U.S. mainstream and government-funded media reported on the rapid building of the hospitals as a response to overwhelmed medical facilities ²¹, and noted that the temporary structures could hardly be characterized as hospitals ²²(Figure 4).

The image shows a collage of social media posts. At the top left is a post from CGTN (January 29) with the headline "All eyes in Wuhan: fast construction of hospitals on livestream" and a photo of construction workers. To its right is a post from NPR (February 2) with the headline "PHOTOS: China Builds A Medical Center From Scratch In Under 2 Weeks" and a photo of a large construction site. Below these is a post from Voice of America (February 3) with the headline "Construction workers are rapidly working to complete the Huoshenshan hospital in Wuhan, China, Sunday, February 2, to combat the deadly coronavirus epidemic that has severely strained medical facilities and resources." and several photos of the hospital's interior and exterior.

CGTN January 29 · 🌐
 How can China build a hospital in six days? 🤖 Although tens of millions of Chinese are stuck at home to avoid infection, Chinese netizens became "volunteer supervisors" to watch the "construction miracle." The construction of the two makeshift hospitals for novel coronavirus patients can be seen 24/7 with around-the-clock livestreaming. #coronavirus

NPR February 2 · 🌐
 China says it's building two hospitals in under two weeks. The time frame doesn't seem to be an exaggeration — it's expected to open on Feb. 3, with 1,000 beds for coronavirus patients. But the term "hospital" may not be exactly on point.

NEWS.CGTVN.COM
All eyes in Wuhan: fast construction of hospitals on livestream Learn More

NPR.ORG
PHOTOS: China Builds A Medical Center From Scratch In Under 2 Weeks

Voice of America - VOA February 3 · 🌐
 📺: Construction workers are rapidly working to complete the Huoshenshan hospital in Wuhan, China, Sunday, February 2, to combat the deadly coronavirus epidemic that has severely strained medical facilities and resources.
 📌: China said Saturday at least 304 people have died and more than 14,000 have been infected with the virus.
 Reports, including some from Wuhan residents, indicate that early information about the outbreak was covered up, and many people, including doctors, speaking about the virus in December were threatened by the government or even detained.
 U.S. Defense Secretary Mark Esper approved a request from the Department of Health and Human Services (HHS) for help in housing 1,000 people who may have been exposed to the coronavirus and need to be quarantined upon arrival to the U.S. from overseas, the department said in a statement Saturday.
 The U.S. Centers for Disease Control and Prevention (CDC) has confirmed eight cases of coronavirus in the United States.
 A man in the Philippines died of the coronavirus Sunday, marking the first death from the virus outside of China.
<https://www.voanews.com/.../first-coronavirus-death-reported-...>

Figure 4: Top: Chinese state outlet CGTN (left) calls the hospital a “construction miracle”; NPR (right) reports on the building, but qualifies that “the term hospital may not be exactly on point”; Bottom: U.S. government-funded outlet VOA shares images of the construction at Huoshenshan stating that the pandemic had “severely strained medical facilities.”

20 CGTN on Facebook: <https://www.facebook.com/ChinaGlobalTVNetwork/posts/3946024018771722>

21 Voice of America on Facebook: <https://www.facebook.com/voiceofamerica/posts/10157384977428074>

22 NPR on Facebook: <https://www.facebook.com/NPR/posts/10158917095001756>

1.2 Chinese state media maintained a favorable framing of the CCP response, adjusting the justification for lauding the CCP response over time

Over the course of the analyzed period, Chinese state media maintained a favorable framing of the Chinese government response at all times. Articles from early in the pandemic (January 2020) claimed that China's government had "selflessly" contained the virus through decisive action thus saving the world. State media outlets declared local victory over the virus and pointed to China's efforts, facilitated by its superior governance system. An editorial published in the China Daily on February 20 boasted: "Were it not for the unique institutional advantages of the Chinese system, the world might be battling a devastating pandemic"²³.

As the disease spread, the narrative shifted to China had bought the world time to prepare for the pandemic. This narrative appears after Xi specifically instructed Chinese media on February 3 to make China's response look heroic (Xi, 2020). On February 4, Xinhua ran the headline "Swift, decisive, transparent, cooperative – China buying world time in fight against coronavirus epidemic"²⁴. On the same date, the Facebook post with most interaction shared by U.S. mainstream media in our data set was from CNN²⁵ on whistleblower doctor Li Wenliang and his reported COVID-19 infection; we discuss Li Wenliang in section 2.1.

As deaths outside China began to outnumber those reported from within, focus shifted toward coverage highlighting China's international shipments of personal protective equipment and delegations of Chinese medical experts.

Finding 2: Chinese state media revised, eliminated, and fabricated aspects of narratives to bolster the image of the CCP

Our second finding is that beyond simply applying positive spin and cheering on the Chinese government, the English-language Chinese state media content revised, eliminated, and outright fabricated aspects of narratives in order to bolster the image of the CCP. This is best exemplified in two cases: that of a whistleblower doctor, and the narrative surrounding the origin of the coronavirus.

2.1 Whistleblower doctor Li Wenliang was first silenced, then celebrated

Li Wenliang, an ophthalmologist, was one of the first medical professionals to report the existence of COVID-19. He issued a warning to fellow medics in a chat group on December 30, 2019, which was shared widely within Chinese social media. On January 3, 2020, police detained Li and forced him to sign a letter stating that he had made "false comments." Li died of COVID-19 on February 7, 2020. The substantial public anger²⁶ that erupted over his death created a dangerous moment for the CCP regime²⁷, and Chinese state media had to delicately cover his story without casting the government in a bad light.

23 "China's Unprecedented Measures Prevent Novel Coronavirus Infecting the World: China Daily Editorial," China Daily, February 20, 2020, <https://www.chinadaily.com.cn/a/202002/20/WS5e4e7a7ca310128217279147.html>.

24 Yage Guo, "Xinhua Headlines: Swift, Decisive, Transparent, Cooperative -- China Buying World Time in Fight against Coronavirus Epidemic," Xinhua, February 4, 2020, http://www.xinhuanet.com/english/2020-02/04/c_138755660.htm.

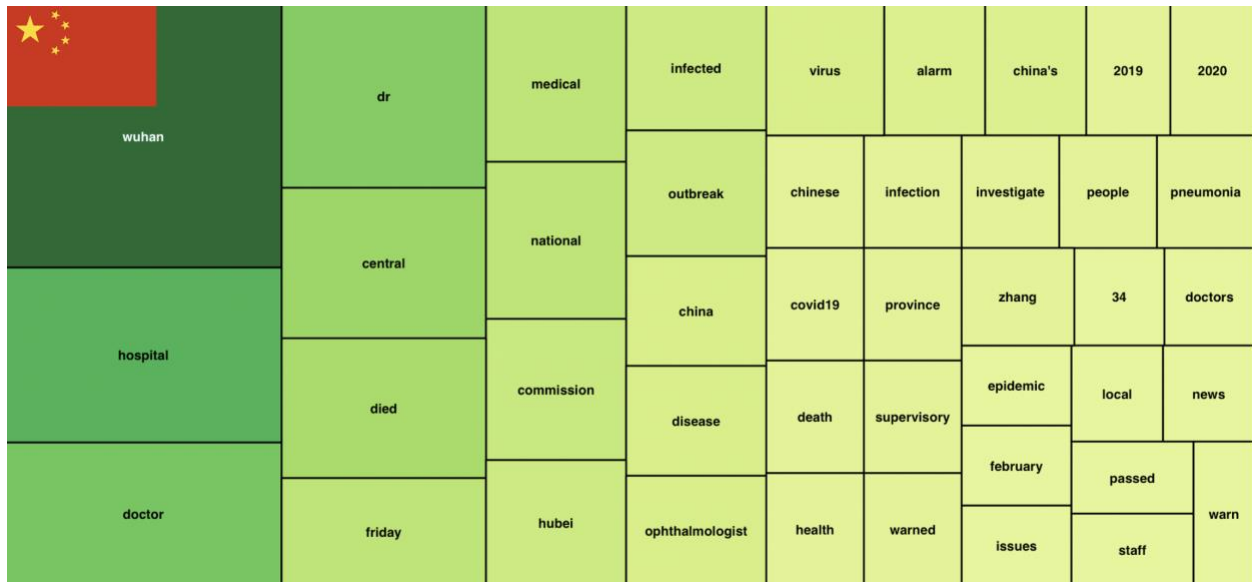
25 CNN on Facebook: <https://www.facebook.com/cnn/posts/10160421933651509>

26 Verna Yu, "'Hero Who Told the Truth': Chinese Rage over Coronavirus Death of Whistleblower Doctor," The Guardian, February 7, 2020, <https://www.theguardian.com/global-development/2020/feb/07/coronavirus-chinese-rage-death-whistleblower-doctor-li-wenliang>.

27 Melinda Liu, "How Do You Keep China's Economy Running With 750 Million in Quarantine?," *Foreign Policy* (blog), February 24, 2020, <https://foreignpolicy.com/2020/02/24/xi-jinping-coronavirus-china-covid-19-quarantine>.

In our dataset, 24 posts by Chinese media, 24 posts by U.S. mainstream media, and seven posts by U.S. government-funded media contain “Li Wenliang”. The treemaps below represent most common words used in these articles²⁸.

In U.S. mainstream media, prominent terms associated with Li include “warning,” “authorities”, “silenced”, and “reprimanded”; U.S. government-funded media mentions “free” and “speech” as well as “1989”, the year of the Tiananmen square protests (Figure 5). Such terms are notably absent in Chinese media, which instead focus on him being an “ophthalmologist.” There is no mention of the whistleblower controversy or his detention early in the outbreak.



²⁸ Treemaps include the most common terms after filtering out words such as “the” using the stop_words function (see “Methods” section) and excluding the terms “coronavirus”, “li”, and “wenliang”. For both types of U.S. outlets, all words shown in the treemap were used three or more times in these posts. For Chinese outlets, all words in the treemap appeared four or more times. This higher threshold is due to the length of Chinese outlet posts increasing the overall word count, resulting in 72 words used two or more times for Chinese outlets producing an illegible treemap.

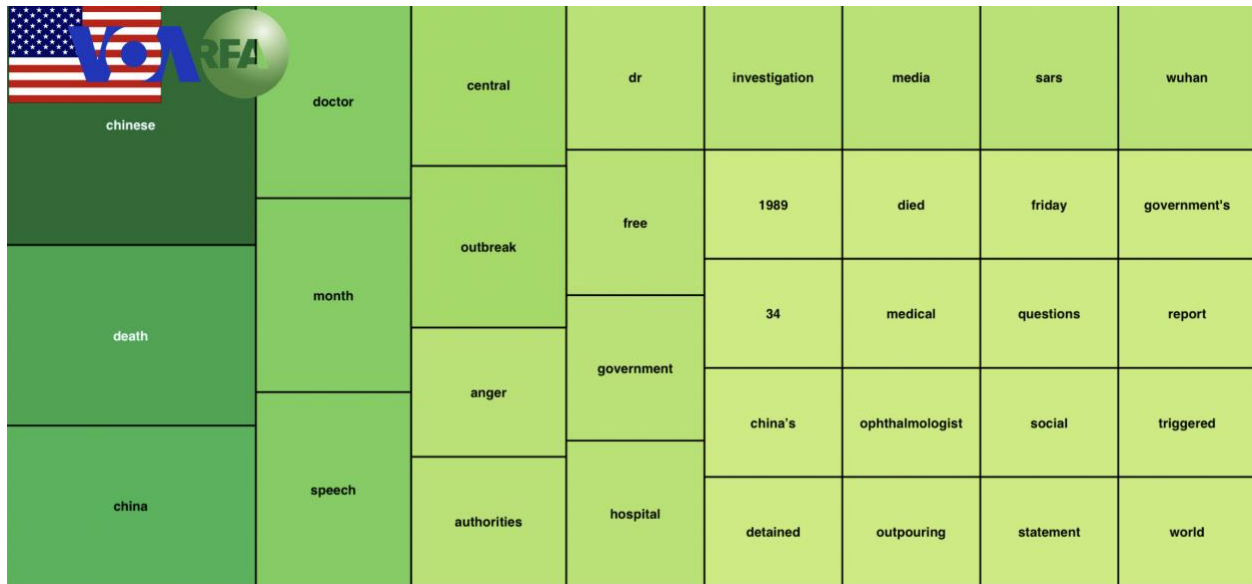


Figure 5: Words frequently used in Facebook posts mentioning Li Wenliang by Chinese media (top) U.S. mainstream media (middle) and U.S. government-funded media (bottom); Excludes Li Wenliang’s name and the term “coronavirus” for better visibility of other terms.

2.2 The origin of the coronavirus: First unambiguously Wuhan, then various layers of uncertainty culminating in conspiracy theories

Chinese state media ran a variety of stories about the origin of the pandemic over a period of six weeks (Figure 6), gradually reframing the narrative towards increasing ‘uncertainty’ about COVID-19’s origins. In its earliest coverage, the origin of the outbreak was unambiguously presented as Wuhan, and the uncertainty simply focused on what unknown *animal* had transmitted the virus. The uncertainty broadened to *where* it had originated. Finally, the media began to amplify conspiratorial speculation on whether the virus could have in fact been carried to China by outsiders - specifically, by U.S. military personnel who had taken part in the Military World Games in Wuhan in November 2019. Figure 6 documents this evolution, in which a combination of verified social government media accounts, press conferences featuring prominent doctors, and state media all amplified the conspiracy theory.

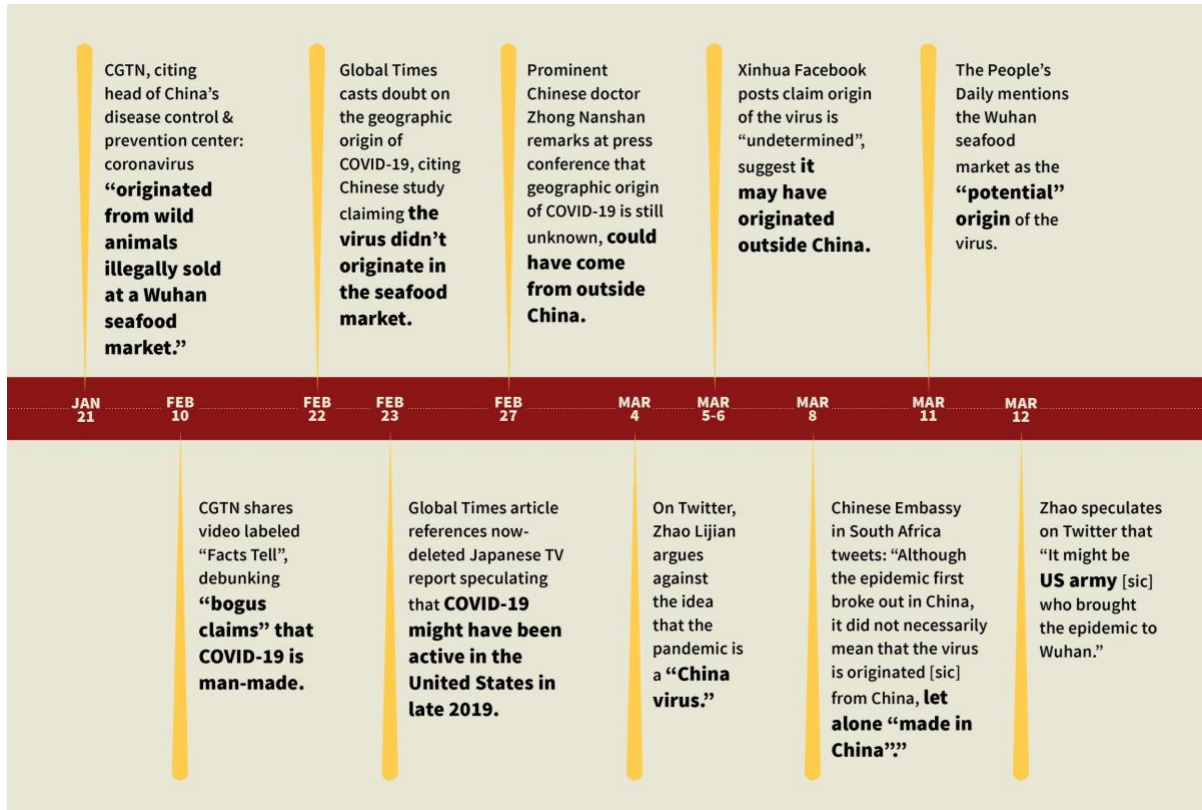


Figure 6: Timeline of evolving coronavirus origin narrative on several English-language Chinese state media Facebook pages and Twitter accounts.

The Chinese ambassador to the United States, Cui Tiankai, refuted Zhao Lijian’s comments on March 22, calling it “crazy” to spread a conspiracy theory about a U.S. military link to the coronavirus origin²⁹. However, official Chinese state media channels such as the [Global Times](#) continued to spread it. An April 26 headline read: “US military victim or spreader of virus?”³⁰ This devolution into outright conspiracy attracted widespread public attention. China scholars saw this example as indicative of Beijing’s increasingly assertive tone on social media since 2019³¹, and a shift from the strategy of simply disseminating positive stories about China³².

29 Swan, Jonathan, and Bethany Allen-Ebrahimian. “Top Chinese Official Disowns U.S. Military Lab Coronavirus Conspiracy.” *Axios*, March 22, 2020. <https://www.axios.com/china-coronavirus-ambassador-cui-tiankai-1b0404e8-026d-4b7d-8290-98076f95df14.html>.

30 Chinese state officials were not alone in their willingness to turn to speculation. U.S. Senator Tom Cotton, for example, claimed on January 30th that coronavirus did not originate in Wuhan’s Huanan seafood market and floated the theory that it was potentially bioweapons research tied to a nearby lab, a theory which was dismissed by experts. However, neither mainstream U.S. media nor U.S. government-funded media covered or promoted these allegations on their Facebook properties.

31 Zhaoyin Feng, “The Year China Got Louder on Social Media,” *BBC News*, December 29, 2019, sec. China, <https://www.bbc.com/news/world-asia-china-50832915>.

32 Nahal Toosi, “In Response to Trump, China Gets Mean,” *POLITICO*, December 8, 2019, <https://www.politico.com/news/2019/12/08/china-trump-twitter-077767>.

Finding 3: Chinese state media pays to amplify high-priority narratives

Chinese state media Facebook Pages used paid amplification - ads - to grow followers and increase the audience for their content. Both the volume and tone of the ads changed when the outbreak began.

3.1 Chinese state media ads target English-speakers worldwide

Facebook ads provide accounts with a way to push posts to people who do not already follow them, and can be targeted to viewers by country, interest, or other demographic criteria. Regional targeting data can indicate a Page owner’s geographic audience prioritization, and examining the content of the ads offers insights into prioritized topics.

We looked at advertisements run by the English-language Chinese state media Pages in our data set from January 1, 2019 to March 29, 2020. The ads appear to be geographically targeted across a range of regions (Figure 7) . Facebook’s Ads API returned lists of cities and regions in which users were served the content. Figure 7 illustrates the regions and volume of ads; the many regions suggest that paid promotions are helping to cultivate a global audience for Chinese state media outlets.

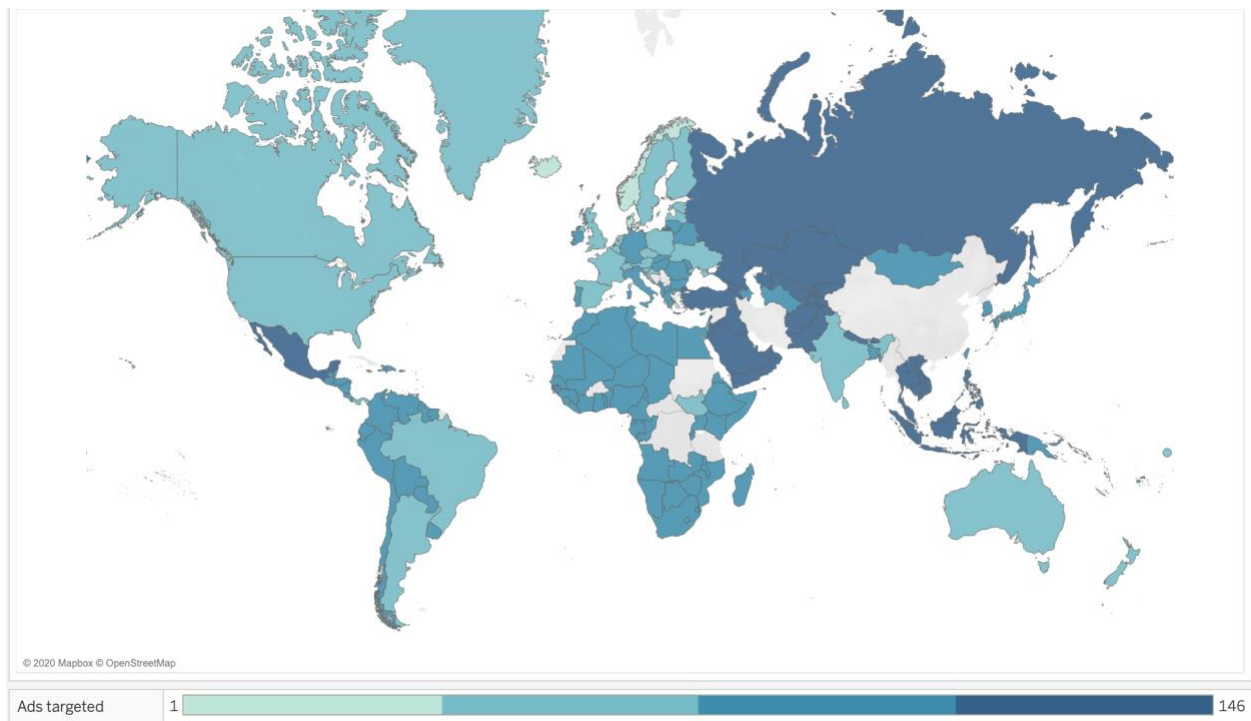


Figure 7: Map of Chinese state media Facebook ad targeting by country between January 1, 2019 and March 29, 2020. Darker color indicates a higher number of ads targeted at a certain country (Lightest color: 1-36 ads; 37-73, 74-109, 110-146). Gray indicates no ads targeted at a certain country. An individual ad was often targeted at more than one country.

3.2 Chinese State Media significantly increased ads after January 2020, with most new ads promoting Xi Jinping's pandemic response

Beginning in January 2019, our Chinese state media pages ran a total of 146 advertisements, spending between US\$28,500 and US\$63,054 and amassing between 80.48 million and 91.60 million impressions³³. Most of these ads focused on boosting general stories related to Chinese culture.

Nearly half of the advertisements in our data set (65/146 advertisements, or 45%) were created between January 1, 2020 to March 29, 2020, during the coronavirus outbreak (20% of the overall observation period; see Figure 8). 77% of these ads mention “coronavirus” or “covid.” The coronavirus-related subset of ads accounts for between US\$12,100 and US\$18,250 of the total ad spend, amassing between 36.72 million and 38.19 million impressions.

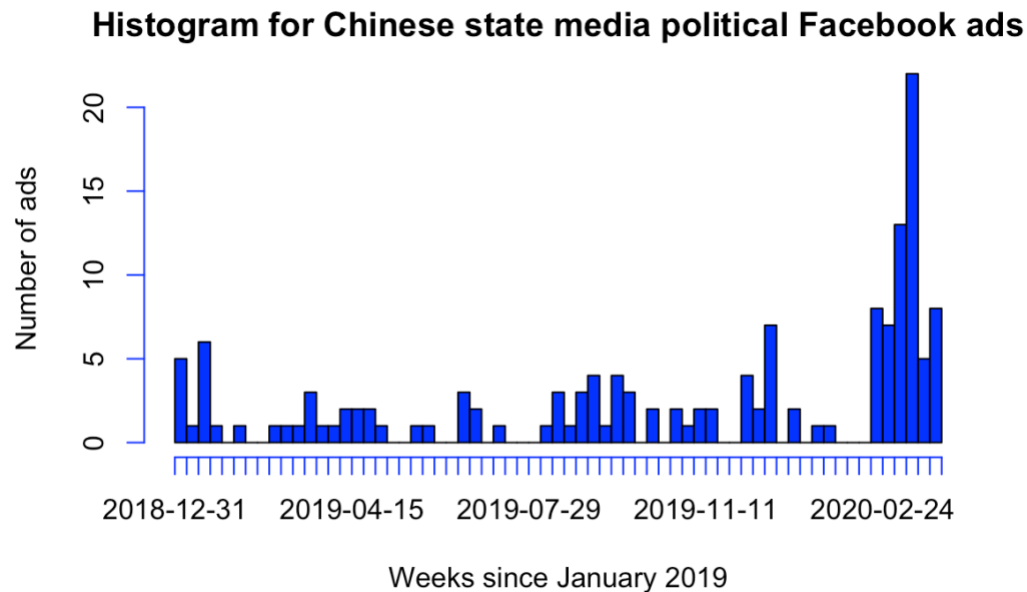


Figure 8: Histogram showing number of Chinese state media Facebook advertisements per week between January 1, 2019 and March 29, 2020. More than half of all advertisements were created in the period from January 1, 2020 to March 29, 2020, 77 percent of the newer ads mention “coronavirus” or “covid.”

³³ The number of impressions generated by an ad represents the number of times any Facebook user has seen a specific advertisement. Users may see multiple ads on their feed; this cumulative number of impressions thus does not necessarily mean that between 80.48 million and 91.60 million individual users have seen an ad by a Chinese state media page.

In addition, these numbers are low estimates for two reasons: The Facebook Ad API shows impressions per ad as a range, e.g. 25,000-29,999 impressions. The lower number in our estimate equals the sum of the lower end for each advertisement. For advertisements with 1 million or more impressions however, only a lower bound is specified; in these cases, we used the lower bound (1 million) as the upper bound as well. Therefore, the total number of impressions may be even higher than calculated here. 33 of the 65 advertisements in our analysis had 1 million or more impressions. In addition, for some locations, the designation of political Facebook advertisements as “political” is optional. There is [evidence of cases](#) of such undeclared political advertisements by Chinese state media on Facebook regarding the coronavirus pandemic. Because non-designated advertisements are unavailable in the Facebook Ads API, the total number of political advertisement expenses and impressions may thus be significantly higher than our analysis shows. For more information, see the “Methods” section.

Stories of Xi's leadership figured heavily in the coronavirus-related ads: His name was mentioned in 32 of 50 (64%) ads. The ads pronounced him China's leader in the "battle" against COVID-19, quoted his speeches ("For the Chinese government, people's safety and health always come first")³⁴, and reported on his visits to Wuhan and Huoshenshan hospital.

While this is not a large ad spend in the context of many types of marketing campaigns, the increase in the rate of advertising, and shift in topical focus from generic cultural stories to coronavirus and Xi-related content, suggests a push to distribute the CCP's point of view to the broader, ad-targetable world as the information battle over the pandemic began. None of the U.S. government-sponsored media properties have run any ads during 2020; Voice of America ran 34 ads in 2019.

Given what we observe in our findings - and given the stated commitment of social network technology companies to mitigate influence operations - clearer disclosure of state media communication, and the cessation of paid boosted posts from such entities, appears in line with platform goals.

Methods

Because of Facebook's international popularity and accessible data, we chose to focus our research on an English-language collection of Facebook Pages (see Appendix A for full discussion of media properties).

We created lists of Facebook pages for English-language Chinese state, U.S. mainstream, and U.S. government-funded media outlets using Crowdtangle, a social monitoring platform. The U.S. mainstream media pages included on this list were selected on the basis that they, too, are English-language media that post frequently and reach an audience of English-language audiences worldwide. To incorporate U.S. media narratives across the political spectrum, we selected major U.S. outlets and a news wire agency. We separately analyzed two U.S. government-funded outlets for an additional comparative angle.

To generate our data sets, we downloaded all Facebook posts shared by the pages on our three lists on Crowdtangle between December 31, 2019 and March 16, 2020. This resulted in 7,629 posts for our Chinese, 10,728 posts for our U.S. mainstream and 1,145 posts for our U.S. government-funded media list. Our data set included data related to user interactions with each post, as well as follower growth data for the Pages themselves.

Sentiment analysis on posts related to the coronavirus pandemic is complicated by the fact that various terms coded as "negative" in common sentiment analysis libraries (such as the word "patient" or "hospital") can be used in both a positive and a negative context, such as by reporting on recovered patients or on patients who have passed away. Therefore, we employed other methods such as analyzing bigrams and having two people each manually code a random selection of posts for each outlet as neutral, negative, or positive to examine a possible divergence in positivity of coronavirus-related coverage across U.S. and Chinese media outlets. Positive, neutral, or negative indicates coverage of a positive, negative, or neutral story or framing of the pandemic. For example, a post referring to the coronavirus as "dangerous" or "deadly" was coded as negative, whereas a post reporting on a recovered patient was coded as positive. We have included examples of posts and their coding in Appendix B.

When analyzing bigrams, we removed common words such as "a" and "the" by using the lexica included in the `stop_words` function from the `tidytext` package in R. This lexicon includes 1,149 commonly-used

34 CGTN Advertisement in the Facebook Ad library:

https://www.facebook.com/ads/archive/render_ad/?id=220154975798124&access_token=EAAHlBs2DhZCABAGvx7LmB3U4iZCsMcB8xtCqnISdZA9v38MfWdCi9WxZBN9ZAZAUsKfsYMDNXogeAllIdAdZCJ1nEyztA3m5Hf9iITny0RZADoRbEes82BbIA7EosomMaC5WjKDS2qVJJC5tKZBnbC0RL3BUfKXp9sVdWQ2zkMzZCdHC78DDPZCNeZAcB

words.³⁵ We used the same approach to remove commonly-used words for creating the treemaps for “patient” and on Li Wenliang.

To track the social media spread of the narrative involving the origin of the virus, we used CrowdTangle Search and TweetDeck.

We additionally used the Facebook Ads API to analyze a set of paid advertisements run by these Chinese state media properties, to determine which coronavirus-related narratives they considered a priority to boost. The Facebook Ads API generated a data set of all the ads run by our list of Chinese media outlets that were classified as “political” from January 1, 2019 to March 29, 2020. This provided us with insights into audience growth and desired target audience for each page.

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Competing interests

³⁵ Silge, J., and D. Robinson. *Tidytext: Text Mining and Analysis Using Tidy Data Principles in R/ Open Source Softw.* 1 (3), 37 (2016), doi:10.21105/joss.00037

Neither of the authors have conflicts of interest.

Ethics

Institutional review for this project was unnecessary as it analyzes only public social media posts; posts reproduced here are available in public data archives.

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Data availability

This work was created using data from CrowdTangle and the Facebook Ads Archive. <https://doi.org/10.7910/DVN/5BXL7A>.

Appendix

Appendix A: Chinese state media and their social media presence

Chinese state media have a significant presence on social media, which they use to communicate the state point of view to the outside world. The Chinese state media properties are large; the average of the ones we examined have 59.8 million Page Likes (Table A), while the Facebook Page with the greatest number of Likes in our U.S. media data set is CNN (33.0 million, Table B), the Chinese state media in our set have an average of 59.8 million Page Likes (Table A). In comparison, U.S. government-funded media average 2.5 million page likes, about 4 percent of the Chinese average (Table C).

On Facebook, most Chinese state media pages post routinely, have high follower counts, and several regularly run ads to grow their audiences, promote their apps, and boost their content. Their audiences are growing quickly, with an average growth rate of 37.79%; interestingly, they have what appears to be a low average interaction rate of 0.006% on their posts (Table A). In contrast, U.S. mainstream media grow at an average rate of 0.08% (1/5000 the rate of Chinese pages) and have an average interaction rate of 0.41% (68 times the rate of Chinese pages) (Table B). U.S. government-funded media also have much smaller audience growth rates (1.19% on average) and significantly higher interaction rates than their Chinese counterparts (Table C). The low engagement for Chinese state media Facebook pages could indicate less engaging content, an audience that may be less active on Facebook, or indicate inauthentic activity.³⁶









	Page Name	Total Interactions	Interaction Rate	Avg. Posts Per Day	Views on Owned Videos	Page Likes	Growth % and #
	Average Total	62.43M	0.006%	35.39	575.31M	59.82M	+37.79%
1	 CGTN	221.30M	0.012%	46.93	1.06B	99,070,190	+35.88% +26,162,666
2	 People's Daily, China	74.17M	0.008%	29.38	305.24M	78,443,695	+43.44% +23,757,933
3	 China Daily	67.63M	0.005%	40.67	924.52M	89,390,219	+42.53% +26,672,906
4	 China Xinhua News	64.13M	0.003%	71.37	810.16M	75,798,672	+34.88% +19,602,232
5	 CCTV	39.58M	0.006%	29.33	1.05B	49,882,278	+4.47% +2,134,845
6	 Global Times	26.89M	0.003%	43.65	383.44M	52,213,579	+53.67% +18,235,671
7	 China.org.cn	5.17M	0.005%	9.17	48.09M	32,488,802	+83.38% +14,771,756
8	 CGTN America	572,178	0.008%	12.6	19.26M	1,280,254	+4.07% +50,071

Table A: List of Chinese state media Facebook pages analyzed using the tool CrowdTangle from Jan 1, 2019 to March 31, 2020, showing rapid audience growth, a significant audience size, and minimal audience interaction rates

³⁶ Mareike Ohlberg, "Propaganda beyond the Great Firewall," Mercator Institute for China Studies, December 5, 2019, <https://www.merics.org/en/china-mapping/propaganda-beyond-the-great-firewall>.

Page Name	Total Interactions	Interaction Rate	Avg. Posts Per Day	Views on Owned Videos	Page Likes	Growth % and #
Average Total	1.41M	0.041%	63.24	7.95M	9.07M	+0.08%
1 Fox News	6.61M	0.104%	49.86	43.00M	18,280,104	+0.10% +19,032
2 CNN	3.00M	0.022%	58.57	18.63M	33,024,219	+0.17% +56,919
3 ABC News	2.79M	0.025%	110.86	45.41M	14,547,436	+0.04% +6,081
4 NPR	1.92M	0.09%	45.86	989,970	6,635,259	+0.03% +1,888
5 NBC News	1.59M	0.014%	156.14	3.66M	10,147,773	+0.03% +2,860
6 The New York Times	1.58M	0.021%	62	1.65M	17,227,081	+0.10% +18,000
7 MSNBC	1.30M	0.08%	99.29	1.66M	2,354,854	+0.07% +1,602
8 CBS News	1.27M	0.033%	92.14	6.36M	5,978,779	+0.06% +3,613
9 Washington Post	1.02M	0.059%	38.71	213,582	6,413,398	+0.10% +6,425
10 TIME	413,377	0.013%	34.86	3.91M	12,793,923	-0.02% -2,845
11 POLITICO	355,232	0.062%	43.29	495,926	1,899,626	+0.04% +806
12 Los Angeles Times	224,057	0.014%	81.14	217,330	2,893,612	+0.01% +369
13 The Atlantic	167,408	0.026%	38.14	—	2,419,464	+0.05% +1,267
14 The Wall Street Journal	162,285	0.007%	48.43	618,741	6,469,846	+0.06% +3,969
15 CNBC	120,909	0.011%	46.71	393,819	3,249,242	+0.07% +2,116
16 AP	22,388	0.074%	5.86	27,680	738,485	+0.33% +2,396

Table B: List of U.S. mainstream media Facebook pages from CrowdTangle from Jan 1, 2019 to March 31, 2020, showing a smaller audience size, much slower audience growth, but significantly higher audience interaction rates as compared to the outlets in Table A















	Page Name	Total Interactions	Interaction Rate	Avg. Posts Per Day	Views on Owned Videos	Page Likes	Growth % and #
	Average Total	556,748.43	0.016%	10.56	4.85M	2.46M	+1.19%
1	 Voice of America - VOA 	3.32M	0.014%	28.7	28.66M	11,275,745	+0.68% +76,560
2	 VOA Asia 	294,494	0.015%	14.89	266,540	1,729,982	-0.47% -8,119
3	 Radio Free Europe/Radio Liberty 	170,154	0.041%	9.99	3.40M	548,099	+0.96% +5,194
4	 VOA Studio 7 	58,048	0.014%	11.91	1.34M	450,692	+3.42% +14,895
5	 Radio Free Asia 	49,308	0.005%	6.03	164,867	2,282,995	+1.24% +27,860
6	 Africa 54 	6,472	0.012%	0.91	123,194	742,743	-0.47% -3,507
7	 VOA StudentU 	2,864	0.013%	1.5	16,552	197,231	+2.96% +5,668

Table C: List of U.S. government-funded media Facebook pages analyzed using the tool CrowdTangle from Jan 1, 2019 to March 31, 2020, showing a smaller audience size, much slower audience growth, and significantly higher audience interaction rates as compared to the outlets in Table A

Appendix B - Examples of Facebook posts and their manual coding as “neutral”, “negative” or “positive”

Table 1: Chinese state media

Message	Value
Good news! A 33-year-old woman infected with novel #coronavirus pneumonia gave birth to a baby girl with no infection in Northwest China's Shaanxi province. #COVID19	positive
Construction of Huoshenshan Hospital underway in Wuhan Aerial photos taken on Jan. 28 show the construction site of Huoshenshan Hospital in Wuhan, central China's Hubei province. The construction of Huoshenshan Hospital, a makeshift hospital for treating patients infected with the novel coronavirus, is underway in Wuhan. (Xinhua)	neutral
Mayor London Breed says there have been no COVID-19 cases in San Francisco, but plenty of xenophobia.	negative

Table 2: U.S. mainstream outlets

Message	Value
A second person in the U.S. has been infected with a dangerous new coronavirus that is spreading in China, the CDC says.	negative
This was the first time Sanders has mentioned coronavirus on the campaign trail. Bloomberg questioned the choice of Pence to lead the response.	neutral
As the novel coronavirus spreads around the globe, doctors say very few children have been diagnosed with it. And of those who have, most have had mild cases.	positive

Table 3: U.S. government-funded outlets

Message	Value
Locals threw stones and clashed with police as a group of evacuees from Wuhan arrived. Nine police officers and a civilian were hospitalized.	negative
After being flown from China to San Diego, California, 160 people were quarantined on a military base for two weeks while doctors determined if they were infected with the Coronavirus. VOA spoke to some of them when they were finally released. For VOA, Christina Shevchenko has more.	neutral
GENEVA - A high-ranking Chinese official says he is confident strong measures taken by his government to tackle the coronavirus outbreak are working and will succeed in preventing the deadly virus from spreading. Chinese authorities say the number of confirmed cases has risen to nearly 10,000, including 213 deaths. “The main battlefield is in China, especially in (the city of) Wuhan. And, we did witness the spread in some of the other parts of the world. But you will find that only occupies one percent of the total affected, one percent. That means the measures taken by China are very much effective.” The WHO says 98 cases of the coronavirus have been identified in 18 countries outside China and no deaths. The agency has said the main reason for the declaration was fear of the coronavirus spreading to countries with weak health systems that were ill-prepared to deal with the disease.	positive

Appendix C - Examples of Facebook posts including keywords related to the Chinese government and their manual coding as “neutral”, “unfavorable” or “favorable”

Table 1: Chinese state media

Message	Value
The #COVID19 outbreak is a major public health emergency that has spread fast in the country, causing the most extensive infections since the founding of the People's Republic of China. The epidemic is also the most difficult to contain in the country so far. President #XiJinping took command of China's war against COVID-19. "The Chinese nation has experienced many ordeals in its history, but it has never been overwhelmed. Instead, it has become more courageous and more mature, rising up from the hardships," Xi said. #coronavirus	neutral
The Chinese government has taken the most comprehensive and strict prevention and control measures to win the battle against the novel coronavirus outbreak, a Chinese diplomat in Los Angeles said.	favorable
"I feel ashamed of myself. Had we taken stronger measures earlier, the situation would have been much better," said Wuhan Communist Party Secretary Ma Guoqiang. He has been faulted on social media for disclosing the outbreak too late, which led to an over-optimistic estimation from experts analyzing the #coronavirus.	unfavorable

Table 2: U.S. mainstream media

Message	Value
Chinese authorities say the outbreak began in a seafood and live-animal market in the city of Wuhan. The Washington state patient, a man in his 30s, had traveled to Wuhan, but says he did not visit the market in question or know anyone who had the virus	neutral
Over the weekend, a transcript of an internal Chinese Communist Party speech appeared to reveal that President Xi Jinping knew about and was directing the response to the virus on January 7 -- almost two weeks before he commented on it publicly.	unfavorable
WATCH: China's President Xi raises a laugh as he tells Beijing residents he won't shake hands with them during this "special period."	favorable

Table 3: U.S. government-funded media

Message	Value
The economic effects of the deadly coronavirus sent global stock and oil prices plunging Monday, while the infectious disease forced China to postpone its annual legislative session and posed new health threats across the world. Key stock indexes in the U.S. plummeted about 2.5% in early trading in New York, following sharper losses in European markets and more modest drops at Asia's top exchanges. A day after Chinese President Xi Jinping called the infectious disease a "\"crisis\"" that would hurt the country's economy, Beijing said the National People's Congress would not meet as scheduled on March 5. A new legislative start date would be decided later, China said. Beijing also retreated from an earlier announcement that it would ease travel restrictions on Wuhan, the city at the epicenter of the coronavirus outbreak, in a signal that China was still concerned about the spread of the virus within the country even as new outbreaks were reported in places far removed from China. China reported 150 more deaths from coronavirus and 409 more affected people, bringing the cumulative death toll to nearly 2,600 and the number of cases to more than 77,000.	neutral

<p>GENEVA - For the third time in one week, a World Health Organization Emergency Committee will meet to decide whether the new coronavirus poses a global health threat. The latest number of confirmed cases has risen to 7,700, including 170 deaths. The two previous emergency meetings ended inconclusively. WHO experts were split on whether the spread of the coronavirus was large enough to constitute a Public Health Emergency of International Concern. But this quickly evolving disease may change some of the doubters' minds. WHO Director General, Tedros Adhanom Ghebreyesus praises the strong response taken by the Chinese government to try to stop the epidemic. This includes the lockdown of Wuhan city, the epicenter of the disease and other cities in the country where the virus has been identified. But he acknowledges that events on the ground in China and abroad are moving too quickly to be ignored. He says the emergence of any new pathogen with the potential to cause severe illness and death is of grave concern and must be taken with utmost seriousness. "The continued increase in cases and the evidence of human-to-human transmission outside China, are, of course, both deeply concerning. Although the numbers outside China are still relatively small, they hold the potential for a much larger outbreak," he said.</p>	<p>favorable</p>
<p>China's state media has published a speech that President Xi Jinping delivered on February 3 about his involvement with the country's response to the coronavirus epidemic. The speech was published late Saturday. Local Chinese officials have been criticized for their handling of the virus outbreak, while the president's involvement was been downplayed, until now. The publication of Xi's speech, however, has done little to squelch questions about China's management of the response. The president apparently handed down instructions on combating the virus on January 7 and he ordered the shutdown of Hubei province. "On Jan. 22, in light of the epidemic's rapid spread and the challenges of prevention and control, I made a clear request that Hubei province implement comprehensive and stringent controls over the outflow of people," Xi told a meeting of the top leadership of the Communist Party. Officials from the Wuhan - the city where the virus apparently emerged - and from Hubei - the province where Wuhan is located - have been fired by the Communist Party because of what was perceived as their inadequate response to the virus emergency.</p>	<p>unfavorable</p>