



COVID-19 AND FOOD SECURITY RESEARCH BRIEF

JUNE 2020

NO. 2

MOBILITY CONTROLS AND URBAN FOOD POLICY RESPONSES TO COVID-19 IN CHINA

TAIYANG ZHONG, ZHENZHONG SI AND JONATHAN CRUSH

SERIES EDITOR: JONATHAN CRUSH

MOBILITY CONTROLS AND URBAN FOOD POLICY RESPONSES TO COVID-19 IN CHINA

by Taiyang Zhong*, Zhenzhong Si** and Jonathan Crush**

At latest count (June 20, 2020), there were over 9 million confirmed cases of COVID-19 worldwide and over 450,000 deaths. While there has been an explosion of biomedical research on the pandemic, detailed empirical research investigating the impact of COVID-19 on food security is scarcer (Crush and Si 2000). This project is therefore examining the impacts on household food security in Chinese cities during the first wave of the pandemic. The main objectives are to: (a) investigate the immediate food security challenges resulting from China's quarantine measures, unstable food supply, and fear of food shopping in two COVID-19-affected cities (Wuhan and Nanjing); (b) compare the food security situation in Nanjing following the COVID-19 outbreak with baseline data collected in 2015; (c) synthesize and assess policies to address food security challenges; and (d) promote effective mitigation measures by engaging local stakeholders. This research brief examines the nature of the policy response to COVID-19 with particular reference to the measures implemented in Wuhan and Nanjing. While these measures contained and eventually controlled the further spread of the virus within and from these cities, they had other indirect consequences including dramatic change to the functioning of urban food systems.

Hungry Cities Partnership studies before the novel coronavirus revealed extremely high levels of urban food security in Chinese cities (Zhong et al 2019). This was partially a function of well-managed and efficient food supply chains, public-private partnerships, price controls, and easily accessible food outlets. As it has subsequently done in other parts of the world to varying degrees, COVID-19 put considerable strain on urban food systems. We hypothesize that it also impacted negatively on all four dimensions of food security (availability, accessibility, utilization, and stability) at the household level in China. A related question concerns the nature of the policy responses to food-related challenges in cities. Many countries have, at different times and with different degrees of stringency, emulated the Chinese model of spatial confinement in response to the virus. Assessing the effectiveness of pre-existing contingency plans and



© HCP 2020

Balsillie School of International
Affairs, 67 Erb St West, Waterloo,
Ontario, Canada N2L 6C2

All rights reserved.

Find all project information at
[hungrycities.net/covid-19-and-
food-security-projects](https://hungrycities.net/covid-19-and-food-security-projects)

The HCP COVID-19 and Food Security project is supported by an operating grant from the Canadian Novel Coronavirus (COVID-19) Rapid Research Funding Opportunity with funding from the Social Sciences and Humanities Research Council (SSHRC).

* Nanjing University, Nanjing, Jiangsu, China

** Balsillie School of International Affairs, Waterloo, Ontario, Canada

the development of emergency food policies in Wuhan and Nanjing may contain lessons for other jurisdictions.

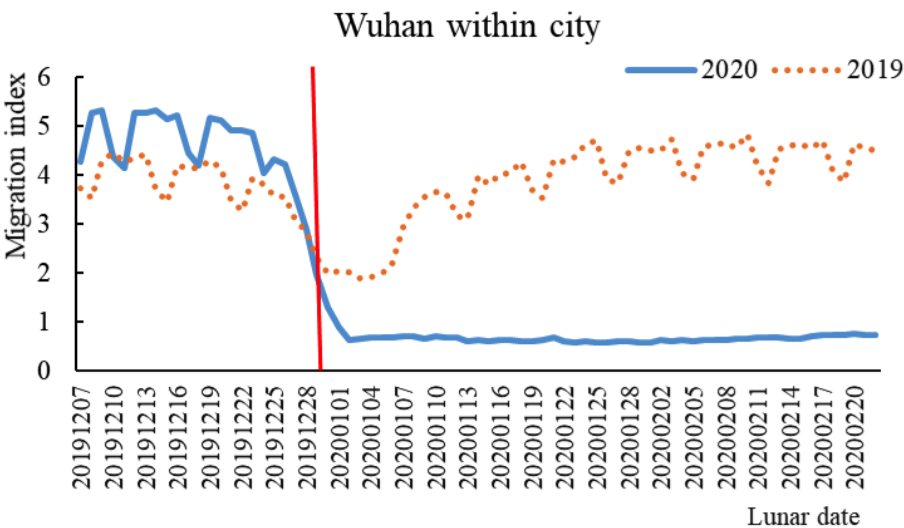
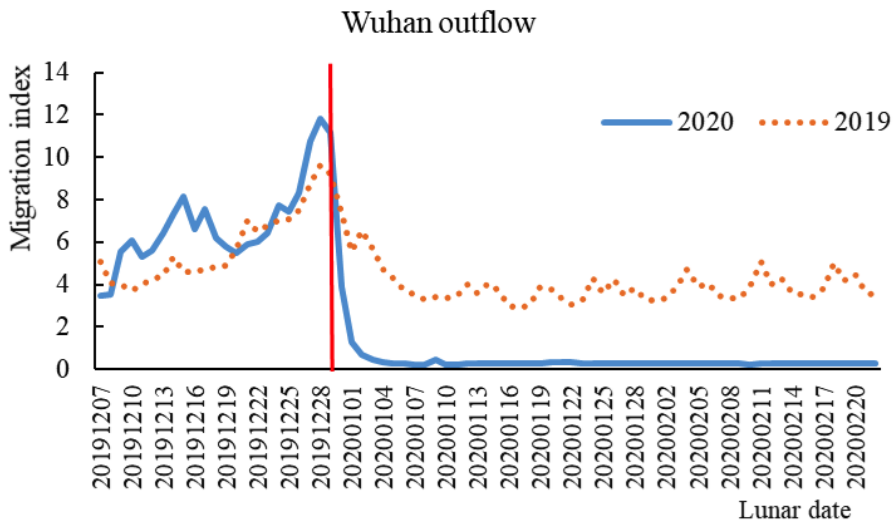
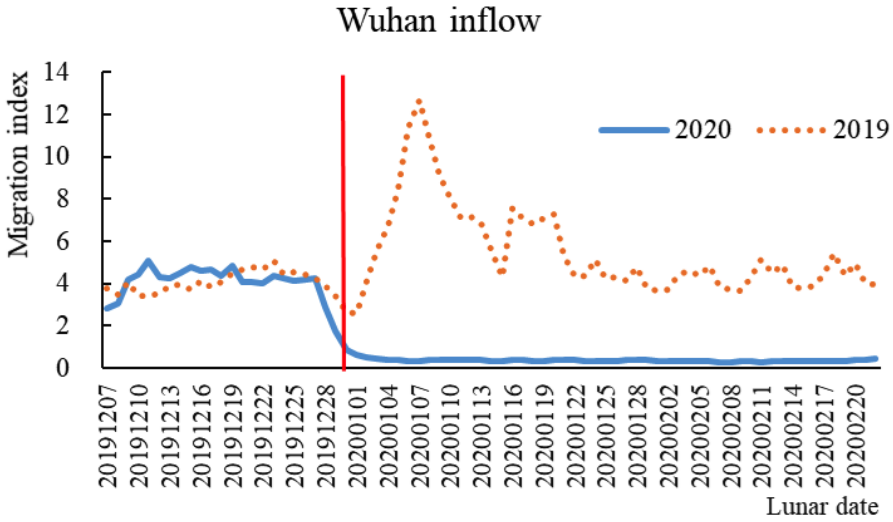
Containment Measures

SARS-CoV-2 was first definitively identified in early January 2020 in the city of Wuhan in Hubei Province. Interventions to contain the virus included improved diagnostic testing, rapid isolation of suspected and confirmed cases and their contacts, and restrictions on inter and intra-city movement (Kraemer et al 2020). Beginning on January 23, Wuhan’s restriction policies escalated from closure of all public transportation, to no private vehicles without a special permit, to partial enclosure of residential communities, and finally to complete enclosure and lockdown on February 14 (Table 1). Most urban households in China live in gated residential communities, which are relatively easy to lock down. Under the policy of partial enclosure of residential communities, one person per household was allowed to go out and buy food from supermarkets every three days. With complete enclosure of residential communities, people were prohibited from leaving their apartment buildings and consumers therefore had no direct access to their everyday food outlets. The lockdown of nine million people in Wuhan represents “the largest quarantine in public health history” and “significantly reduced the virus transmission” within and outside the city (Fang et al 2020: 1, 3). The dramatic impact of the lockdown on inflow, outflow, and within-city mobility of people in Wuhan is illustrated in Figure 1, which compares mobility from 7 December 2019 to 20 February 2020 with the equivalent period in 2018-2019. Zhang et al (2020) also show that the average daily number of contacts was significantly reduced from 14.6 during December 2019 to 2.0 during the outbreak period.

TABLE 1: Timeline of Containment Measures in Wuhan

Types of measures	Date
Announcement of lockdown No public transportation	January 23, 2020
Halving taxi service, prohibiting ride-hailing	January 24-26, 2020
Prohibiting automobile travel, special permit required for driving	January 26, 2020
Partial enclosure of residential communities - Allowing one person per household to exit every three days - One gateway per neighbourhood	February 11-14, 2020
Complete enclosure of residential communities No going out without a permit for specific purposes such as essential work	February 14, 2020
Partial lifting of enclosure of residential communities - Compulsory mask wearing - Compulsory body temperature taking when entering - Taking registers of people entering and leaving	April 2, 2020
Lifting of lockdown	April 8, 2020

FIGURE 1: Changes in Mobility in Wuhan



Source: Adapted from <https://qianxi.baidu.com/2020/>

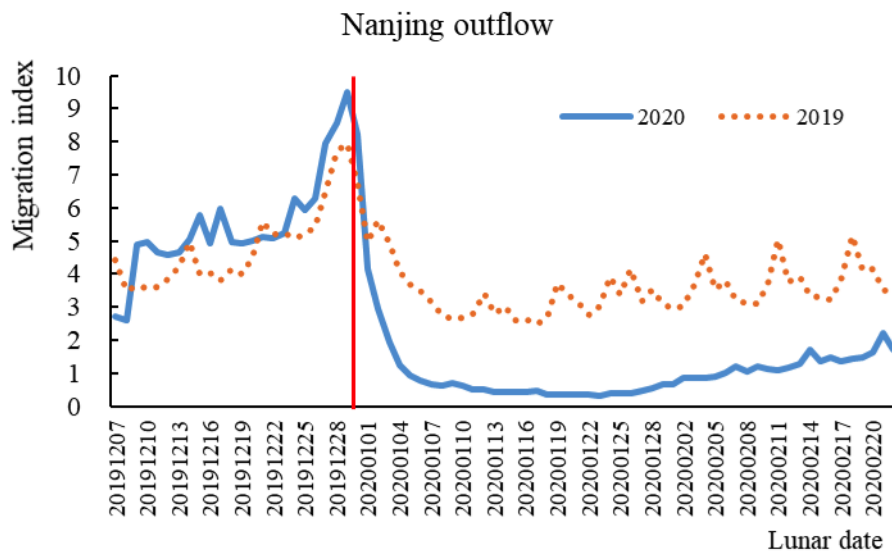
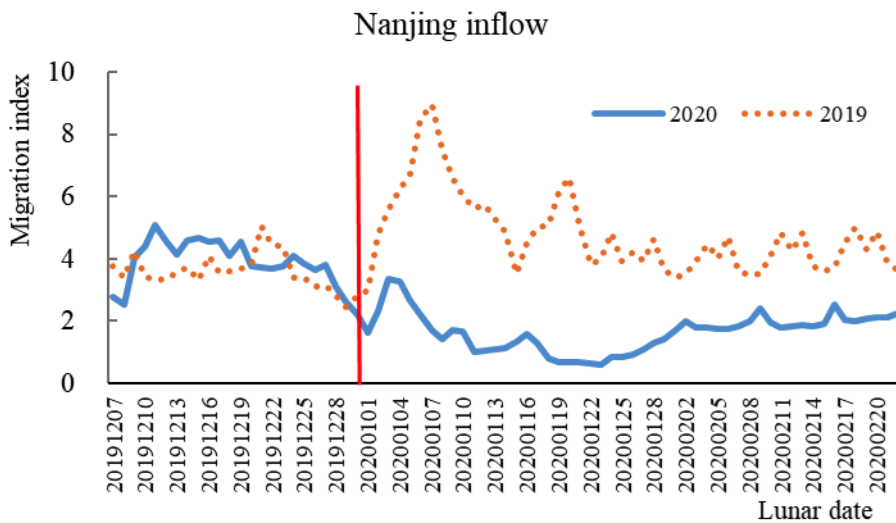
Other cities in China experienced various levels of shutdown during February 2020 (Fang et al 2020). Complete lockdowns were eventually imposed on the 14 other cities in Hubei, affecting a total of 57 million people (Fang et al 2020:7). Nanjing, with a population of over 8 million, and located 400km to the east of Wuhan, did not implement a complete lockdown. In Nanjing, there was a series of announcements of increasingly restrictive containment measures and three orders of response (Table 2). The critical difference with Wuhan is that the enclosure of residential communities was partial rather than total.

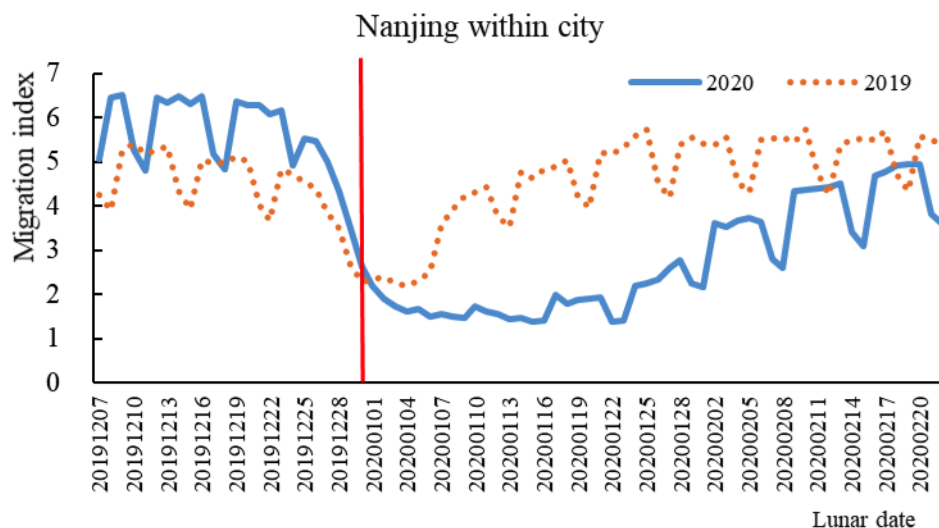
TABLE 2: Timeline of Containment Measures in Nanjing

Types of measures	Date
First announcement Those returning from Wuhan after January 10 were required to self-isolate Hotels barred from receiving travellers from Wuhan Public gatherings cancelled (with some exceptions)	January 23, 2020
Second announcement Closure of public places (with some exceptions)	January 23-March 28, 2020
Third announcement Mask wearing compulsory in public places	January 26-March 28, 2020
First order response (fourth announcement) No entry to public places without a mask No business allowed except daily necessities	January 26-February 24, 2020
Special regulation on transport (fifth announcement) Pass permit policy – no restrictions on vehicles and persons with a pass permit issued for activities such as food transport Compulsory body temperature taking when entering or leaving Nanjing Calls for staying at home	February 2–March 28, 2020
Partial enclosure of management of residential community (sixth announcement) One entry gateway per neighbourhood Everyone to wear masks Compulsory body temperature taking when entering No entry of non-residents No entry of food and other delivery services	February 4–March 28, 2020
Seventh announcement Some departments of medical institutions required to close	February 4–March 28, 2020
Eighth announcement Required contact tracing and medical observation of close contacts	February 6, 2020
Ninth announcement Containment measures at construction sites	6 February, 2020
Work resumption policy (10th announcement) Gradual work resumption	10 February, 2020
Downgrading to second grade response	24 February, 2020
Downgrading to third grade response	28 March, 2020
<i>Note: There are four grades of response to emergency public health events in China that signal different degrees of severity of an event as determined by the central government. Each grade indicates a specific set of policy requirements on medical treatment, restrictions on mobility and public gathering, reporting of cases and so on. The first grade is the most urgent and significant. A detailed definition of the different grades of public health events can be found at: http://www.chinacdc.cn/jkzt/tfggwssj/gl/201810/t20181015_194984.html.</i>	

The impact of the lockdown on inflow, outflow, and within-city movement of people in Nanjing is illustrated in Figure 2, again with comparative data for the equivalent period in 2018-2019. Comparing Figures 1 (Wuhan) and 2 (Nanjing), clear differences emerge. In both cities, all three forms of mobility were significantly lower than a year earlier. In Wuhan, inflow and outflow virtually ceased while in Nanjing they were severely restricted but not eliminated. The biggest difference was in movement within the two cities. In Wuhan, with the population locked down in their residential communities, movement was confined to essential services and remained very low. In Nanjing, by contrast, movement initially fell quickly. It started to recover from 12 February, but never reached the levels of a year earlier.

FIGURE 2: Changes in Migration of Nanjing





Source: Adapted from <https://qianxi.baidu.com/2020/>

Contingency Food Planning

Prior to the pandemic, there were contingency food policies at the city level. In 2016, for example, Wuhan Municipality issued a Contingency Plan for Daily Necessities and Refined Oil and the Wuhan Municipal Commerce Bureau issued an Implementation Plan for Contingency Plan for Daily Necessities and Refined Oil. The daily necessities defined by the two plans included grain, cooking oil, meat, eggs, vegetables, salt, sugar, bottled drinking water, instant noodles, and sanitary products. The contingency measures included information disclosure, enterprise procedure response, interregional coordination, releasing food reserves, and establishing temporary spots for food supply. The two plans also allocated the responsibilities between governmental departments. For example, the implementation plan identified four companies to play the lead role in any contingency action (Table 3). These companies have combined their efforts to provide the service of CGB (community group buying).

TABLE 3: Four Companies with Special Role in Food Contingency Planning of Wuhan

Company	Ownership structure	Number of shops or food items
Wuhan Department Store Group Co. Ltd.	State-controlled by Wuhan government (49.53%)	About 50 supermarkets in Wuhan
Zhongbai Holdings Group Co. Ltd.	State-controlled by Wuhan government (49.23%)	76 supermarkets in 2018
Wuhan Zhongshang Commercial Group Co. Ltd	Change from state-controlled by Wuhan government to privately-owned in 2019	21 supermarkets
Wuhan Non-Staple Food Reserve Company	State-controlled company	Responsible for the reserve of pork, beef and mutton, and sugar

Sources: https://www.tianyancha.com/company/2965477693?enterprise_full=true; <http://dy.163.com/v2/article/detail/E6CU15J505381MHQ.html>; <http://www.zhongshang.com.cn/about-distribution.aspx?nid=10006>; <https://www.tianyancha.com/company/523583156>

Four regulations and two contingency plans formed the institutional framework of emergency food supply management in Nanjing. The regulations were the Nanjing Regulation on Emergency Requisition Daily Necessities, the Nanjing Regulation on Grain Reserves, the Nanjing Regulation on Vegetable Reserve, and the Nanjing Regulation on Meat Reserves. The contingency plans were the Nanjing Contingency Plan for Daily Necessities and the Nanjing Contingency Plan for Grain, both released in 2018. The food reserve is operated by state-owned and privately-owned food companies (Table 4). Emergency situations are classified into four grades, mainly determined by the rate of food price increase and the number of days without stock. The first grade is most urgent and the fourth is least urgent.

TABLE 4: Quota of Food Reserves in Nanjing

Food item	Reserve quota	Reserve organization
Grain	More than 3 months' demand	Nanjing Grain Company (State-owned)
Cooking oil	7,000 tons	Nanjing Grain Company
Frozen pork	1,800 tons	Jiangsu Foodstuff Group Co. Ltd. Yurun Holding Group Co. Ltd. BGX Logistics Development (Group) Co. Ltd. Tianhuan Food Group Co. Ltd. Lvliuju Food Company (Privately-owned)
Frozen beef	100 tons	Same as above
Pigs	30,000 pigs (equivalent 1,500 tons of pork)	Same as above
Cattle	600 cattle	Same as above
Vegetables	In winter: 3,000 tons (in storehouse), 10,000 tons (on field)	Zhongcai Market (State-controlled)
<p>Source: http://www.nanjing.gov.cn/zdjk/201512/t20151230_1056761.html; http://www.nanjing.gov.cn/zdjk/201810/t20181022_574116.html; http://jiangsu.sina.com.cn/news/m/2016-12-27/detail-ifxyusa5534141.shtml; http://wmdw.wmjj.gov.cn/home/about/?13782-444019.html http://swj.nanjing.gov.cn/bsfw/swfg/201711/t20171130_446772.html</p>		

Food Access During Lockdown

Policies to contain the COVID-19 epidemic dramatically changed households' physical access to food outlets. During the lockdown, food wholesale markets remained open in both cities, but there were major changes in food retailing. In Wuhan, all public (wet) markets were closed from January 30. Initially, one person per household was allowed to leave the residential community to buy food from supermarkets (which remained open). After only one week, new restrictions required all residents to stay home, completely shutting access to everyday food outlets. Emergency food policies implemented in Wuhan between January 23 and March 28 focused on supporting food retailing operations while preventing the spread of the virus through food distribution.

After the implementation of the lockdown policy, food contingency planning in Wuhan was structured in two parts: ensuring the supply of food to the city and food distribution within

the city. The central government was responsible for ensuring the supply of food to Wuhan. The Ministry of Commerce established a working team on January 23 to coordinate the supply of food to Wuhan from nearby provinces. The central government reserved 10,000 tons of frozen meat for Wuhan on February 3, and 60,000 tons of vegetables were stored in nearby provinces for Wuhan market (21st Century Business Herald 2020). A Joint Mechanism for Ensuring Food Supply Among Nine Provinces (including Hubei, Anhui, Jiangxi, Shandong, Henan, Hunan, Yunnan, and Chongqing) was established on January 23 and formally announced on February 17. The Joint Mechanism assigned nine provinces the task of ensuring the supply of non-grain food and grains to Wuhan, including vegetables, meat, eggs, milk, cooking oil, rice, wheat flour, and instant food (Ministry of Commerce 2020).

To ensure food accessibility within the city in the context of complete enclosure of residential communities, the food distribution system was restructured. A food provision policy called “community group buying” (CGB) was put in place from February 17 until March 19. The CGB policy involved four methods of ensuring food access (Hanyang District Government 2020): (a) online food buying where individual households bought food from an online retailer and picked up the food at a designated spot within the enclosed residential community (Kraemer et al 2020); group buying from supermarkets where residential or neighbourhood committees acted as food purchasing agents, collected the consumers’ orders, then bought food from supermarkets and used government-allocated delivery services; (c) buying provided by producers (Kraemer et al 2020); and (d) the allocation of food donations with priority given to low-income households.

The CGB faced two main challenges. First, there was limited capacity for transporting food from supermarkets or producers to residential communities. Second, there was a shortage of labour for rapidly distributing food to buyers. The Wuhan government used buses and requisitioned some private vehicles to address the first challenge (Hubei Daily 2020). The government recruited volunteers to address the second challenge. The CGB was implemented city-wide until March 19, when public markets and other food stores were allowed to re-open in areas where residential communities were classified as “communities without epidemic risk” (defined as having no confirmed, suspected or close-contact cases and no fever cases for a minimum of 14 days.)

Emergency food policies implemented in Nanjing between January 23 and March 28 focused on supporting food retailing operations and preventing the spread of the virus through food distribution. Unlike in Wuhan, the Nanjing Municipality ensured that some wet markets remained open. The number of operating markets increased from 112 on January 29 to 311 on February 24, and all markets resumed business on March 21. However, food retailing capacity in the markets was limited by the fact that more than half of the food vendors in public markets in Nanjing are migrants to the city (Zhong et al 2019). Normally, most of these vendors go back their hometown for the Spring Festival and return to work a week later. This year, however, they were required to self-isolate for two weeks when they returned to Nanjing and some food vendors could not, or were reluctant to, return to Nanjing because of the quarantine requirements and travel restrictions.

Usually supermarkets keep operating and wet markets temporarily close during the Spring Festival. To ensure that the markets resumed operations, governments at city and district level issued plans and policies for epidemic control. These included intensification of sterilization efforts in marketplaces, crowd control, and shortening of the business day. The Nanjing government also supported the resumption of catering enterprises, such as restaurants. As online selling of cooked food needs a permit from the county-level Administration of Market Regulation, the administration transferred face-to-face application submissions to online submissions, ensuring that restaurants received permits for online selling rapidly. Three types of temporary policies were also implemented. One was to allow shops selling food to enlarge their scope; for instance, fruit shops without a permit for selling vegetables were allowed to do so. Second, restaurants and food vendors were permitted to sell food in open spaces, such as in small plazas in front of residential neighbourhoods (when the second-order and third-order responses were applied). Third, convenience stores were permitted to sell fresh vegetables and meat. All these policies contributed to ensuring Nanjing households' access to fresh produce and cooked food.

Comparing policy responses in Wuhan and Nanjing, it is clear that the suite of responses to COVID-19 varied with the type and severity of the measures taken to contain the spread of the virus. Both cities had pre-coronavirus food security contingency plans in place. However, COVID-19 was an unprecedented challenge and confinement of millions of people in residential communities was an unprecedented policy response. As a result, additional strategies and resources were mobilized to deal with the sudden disruption of mobility and the established food system. The question of whether these measures ensured continued access to food and mitigated the potential for increased food insecurity will be explored in Research Brief No 3.

References

1. Crush, J. and Si, Z. (2020). *COVID-19 Containment and Food Security in the Global South*. Research Brief No. 1, Waterloo and Nanjing.
2. Dai, N. and Si, Z. (2020). "Food Retailing Transitions and New Retail Businesses in Nanjing, China" *HCP Discussion Paper No. 40*, Waterloo and Cape Town.
3. Fang, H., Wang, L. and Yang, Y. (2020). "Human Mobility Restrictions and the Spread of the Novel Coronavirus (2019-NCOV) in China" Working Paper, National Bureau of Economic Research.
4. Hubei Daily (2020). "800 buses were Requisitioned to Increase the Delivery Capacity of Group Buying" At: <https://baijiahao.baidu.com/s?id=1659872322957210500&wfr=spider&for=pc> (in Chinese).
5. Hanyang District Government (2020). "Four Methods of Community Group Buying and Delivery Service Provision" At: <http://www.hanyang.gov.cn/hyyw/newsdetail-87992.html> (in Chinese).
6. Kraemer, M. Yang, C., Gutierrez, B. et al. (2020). "The Effect of Human Mobility and Control Measures on the COVID-19 Epidemic in China" *Science* 368: 493-497.
7. Liu, M., Ning, J., Du, Y. et al. (2020). "Modelling the Evolution Trajectory of COVID-19 in Wuhan, China: Experience and Suggestions" *Public Health* 183: 76-80.
8. Ministry of Commerce (2020). "Notice of Improving the Joint Collaboration among Nine Provinces for Ensuring Supply of Daily Necessities during the Epidemic" At: http://www.gov.cn/zhengce/zhengceku/2020-02/18/content_5480622.htm (in Chinese)

9. Zhang, J., Litvinova M., Liang, Y., et al. (2020). "Changes in Contact Patterns Shape the Dynamics of the COVID-19 Outbreak in China" *Science* [10.1126/science.abb8001](https://doi.org/10.1126/science.abb8001)
10. Zhong, T. , Si, Z., Crush, J., Scott, S. and Huang, X. (2019). "Achieving Urban Food Security Through a Hybrid Public-Private Food Provisioning System: The Case of Nanjing, China" *Food Security* 11: 1071-1086.
11. 21st Century Business Herald (2020). "60,000 Tons of Vegetables and 10,000 Tons of Meat Reserved by the Central Government are Ready to be Released to the Food Market in Wuhan" At: <http://finance.sina.com.cn/china/gncj/2020-02-03/doc-iimxyqvy9890230.shtml> (in Chinese).