HUNGRY CITIES PARTNERSHIP

COVID-19 AND FOOD SECURITY RESEARCH BRIEF

JUNE 2020

NO. 3
FOOD SECURITY CHALLENGES IN CHINESE CITIES DURING THE COVID-19 PANDEMIC

TAIYANG ZHONG, NING DAI, ZHENZHONG SI AND JONATHAN CRUSH

SERIES EDITOR: JONATHAN CRUSH

FOOD SECURITY CHALLENGES IN CHINESE CITIES DURING THE COVID-19 PANDEMIC

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

Globally, one of the major consequences of public health responses to the spread of COVID-19 is seen as an increase in food insecurity as agriculture and food supply chains are interrupted, food outlets are shuttered, household income to spend on food declines, and people are partially or completely quarantined at home (CFS 2020, Clapp 2020, Crush and Si 2020, WFP 2020). These impacts are being monitored by the Hungry Cities Partnership (HCP) in a series of blogs and a media observatory. The 11 million residents of the original epicentre of the pandemic in Wuhan, China, were subject to a weeks-long complete shutdown of all economic and social activity and a rigid lockdown of residential communities (Zhong et al 2020). Other Chinese cities experienced varying degrees of restriction on movement, economic shutdown, and residential lockdown. One of these was Nanjing, a city of over 8 million people located about 400km east of Wuhan. By comparing the two cities, new insights are provided on the impacts of pandemic responses on the food security of urban populations in China. This research brief summarizes some of the early findings from a household food security survey conducted by the HCP from March 24–31 2020.

Because of the lockdown of Wuhan and the residential quarantine in Nanjing, a face-to-face survey was not possible. Instead, an online questionnaire was developed and posted on the online survey platform *Wenjuanxing*. Respondents in the two cities were recruited through social media. An unexpectedly large number of responses was received. In total, the questionnaire link was opened 6,409 times, and 2,363 people completed the survey. Of these, 1,445 were in Nanjing and 918 were in Wuhan. In cleaning the data, cases with a survey response time of less than 150 seconds were dropped, leaving 1,822 usable responses (796 from Wuhan and 1,026 from Nanjing).

To measure levels of household food security, the Household Food Insecurity Access Scale (HFIAS) and the Household Food Insecurity Access Prevalence (HFIAP) indicator, two international cross-cultural metrics

* Nanjing University, Nanjing, Jiangsu, China
** University of Waterloo, Waterloo, Ontario, Canada
*** Balsillie School of International Affairs, Waterloo, Ontario, Canada

Find all project information at 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).

developed by the Food and Nutrition Technical Assistance (FANTA) project were used (Coates et al 2007, Swindale and Bilinsky 2006). The average HFIAS scores in Wuhan and Nanjing during the lockdown were 9.4 and 4.8 respectively (out of a possible 27). In a 2015 household survey in Nanjing the average HFIAS was only 0.61 (Si and Zhong 2018) (no comparable data exists for Wuhan) which suggests a considerable increase in food insecurity from pre-COVID levels. Table 1 presents the responses to the nine questions used to calculate the HFIAS and HFIAP.

TABLE 1: Experiences of Food Insecurity in Wuhan and Nanjing

Items	City	Sometimes (%)	Often (%)	Always (%)	Total (%)
Worrying about not having enough food	Wuhan	35.6	12.1	6.9	54.6
	Nanjing	23.3	4.0	2.3	29.6
Not eating preferred food	Wuhan	39.6	19.1	6.4	65.1
	Nanjing	23.3	5.1	2.2	30.6
Eating a limited variety of foods	Wuhan	33.7	23.5	8.9	66.1
	Nanjing	17.5	5.2	1.9	24.6
Eating unwanted food	Wuhan	26.9	8.9	3.8	39.6
	Nanjing	9.2	1.9	1.1	12.2
Eating fewer meals	Wuhan	16.6	5.5	5.7	27.8
	Nanjing	6.4	0.9	1.3	8.6
Eating smaller meals	Wuhan	17.1	4.4	3.1	24.6
	Nanjing	6.6	1.2	1.0	8.8
No food of any kind to eat in your household	Wuhan	8.8	2.3	1.4	12.5
	Nanjing	4.4	0.7	0.6	5.7
Going to sleep hungry	Wuhan	8.2	1.5	1.6	11.3
	Nanjing	4.6	0.4	0.5	5.5
Going a whole day and night without eating	Wuhan	4.5	1.5	1.0	6.0
	Nanjing	3.4	1.2	0.6	5.2

The table reveals a number of important aspects about the experience of food insecurity in the two cities:

- On every metric, Wuhan residents were more negatively affected than Nanjing residents, suggesting that the total lockdown in Wuhan had a more serious impact than the less stringent policies in Nanjing.
- Levels of concern about not having enough food were much higher in Wuhan (55%), but still close to one-third in Nanjing.
- A smaller percentage of households in both cities experienced an absolute shortage of food at some point (6% in Wuhan and 5% in Nanjing) or went to sleep hungry (11% in Wuhan and 6% in Nanjing).

- Food insecurity primarily manifested in not having access to preferred foods, eating a limited variety of food (two-thirds of Wuhan residents and 25-30% of Nanjing residents), and having to eat unwanted food (40% in Wuhan).
- In Wuhan, around one-quarter of households had been forced to eat fewer meals or smaller meals. In Nanjing, by contrast, the figure was only 10%.

To assess the overall level of household food insecurity, the HFIAP was calculated. This indicator uses an algorithm to divide households into one of four categories: food secure, mildly food insecure, moderately food insecure, and severely food insecure (Table 2). In Wuhan, only 5% of households were completely food secure during the lockdown, while nearly 40% were severely food insecure. Overall levels of food insecurity in Nanjing were lower (31% food secure and 22% severely food insecure), suggesting that milder public health responses had less serious consequences for household food security. At the same time, it would be incorrect to conclude that Nanjing's COVID-19 experience did not lead to a significant overall deterioration in food security in the city. To elucidate this point, Table 2 includes HFIAP data for Nanjing from the pre-pandemic HCP survey (2015). Although the data is not strictly comparable, the proportion of food secure households was 79% in the original survey and only 31% during the quarantine period. The proportion of severely food insecure households was 2% in the original survey and 22% during the quarantine period.

TABLE 2: Levels of Food Insecurity in Wuhan and Nanjing

Categories	Wuhan in 2020		Nanjing in 2020		Nanjing pre-COVID-19	
	No.	%	No.	%	No.	%
Food secure	41	5.2	315	30.7	929	78.9
Mildly food insecure	124	15.6	297	28.9	162	13.8
Moderately food insecure	329	41.3	192	18.7	62	5.3
Severely food insecure	302	37.9	222	21.6	25	2.1
Total	796	100.0	1,026	100.0	1,178	100.0

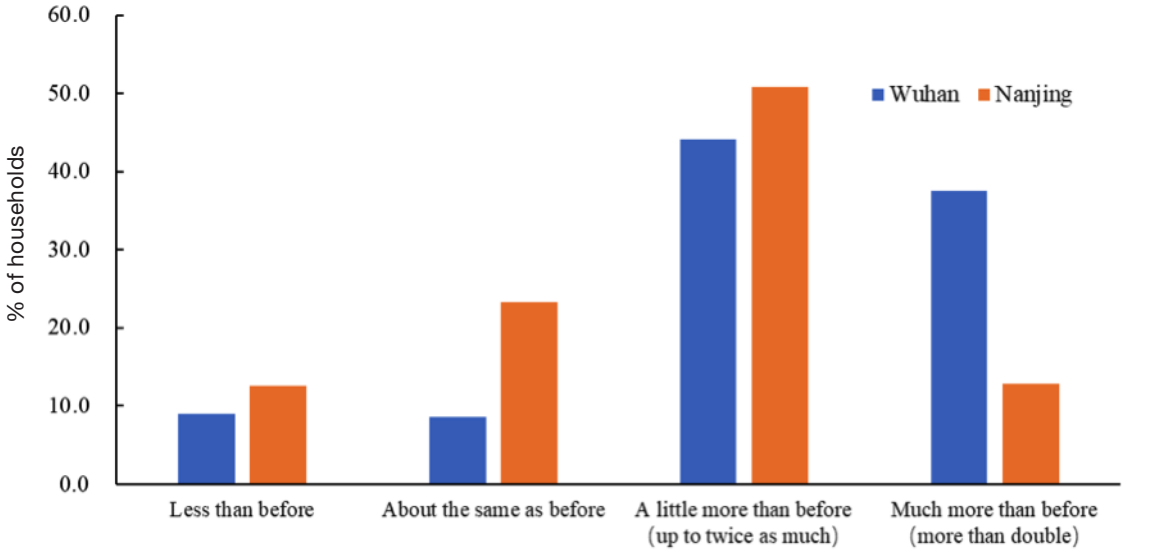
Survey respondents were also provided with a list of mobility and food-related challenges and asked if they had experienced any since the start of lockdown (Table 3). In each case, as expected, the residents of Wuhan experienced stricter controls and restrictions than their counterparts in Nanjing. For example, 60% of Wuhan residents experienced restricted access to food retail outlets compared to 34% of Nanjing residents. Also, 38% of Wuhan residents had experienced restricted access to online food outlets compared to only 12% of Nanjing residents. There were also significant differences in restrictions on home delivery of food and in the freshness of food. Underlying these differences, and the different levels of general food insecurity, are differences in food price increases and household income. As Table 3 shows, as many as 61% of Wuhan respondents reported food price increases, compared with 35% of Nanjing respondents. In addition, 51% of Wuhan households reported loss of income due to COVID-19, compared to 20% of Nanjing households.

TABLE 3: Experiences of Mobility and Food Access Challenges in Wuhan and Nanjing

	Wuhan (%)	Nanjing (%)
Restricted mobility	73.9	30.2
Food price increases	60.9	35.1
Restricted access to public markets and supermarkets	60.2	33.5
Loss of income due to COVID-19 restrictions	50.6	20.4
Restricted access to online stores	38.2	11.7
Food not fresh	38.1	16.2
Limited food availability and lack of food variety at online stores	34.4	17.2
Limited food availability and lack of food variety at public markets or supermarkets	32.8	26.7
Restricted food delivery to your home	25.6	9.2

One of the common general indicators of a deteriorating food security situation is that a household spends a greater share of its income on food. Figure 1 shows that, in both cities, the majority of households spent more on food during the lockdown (82% in Wuhan and 64% in Nanjing). Around half of the households in both cities had spent up to twice the usual amount on food. The major difference was that in Wuhan nearly 40% of households had spent more than double the usual amount, while in Nanjing the figure was less than 15%.

FIGURE 1: Expenditures on Food Before and During Pandemic



In conclusion, the food security situation in both cities clearly deteriorated and became serious as the authorities battled to contain the further spread of the virus. These were cities with an efficient public-private food system and very high levels of food security prior to the pandemic (Zhong et al 2019). However, this quickly changed with COVID-19. The situation in Wuhan was clearly the more serious with a greater number of households experiencing

food insecurity as food accessibility decreased, food prices increased, and households experienced loss of income. A subsequent research brief will examine this analysis further to determine which of these changes was most significant and which types of households were more negatively affected: for example, were households with infected members more vulnerable to food insecurity than unaffected households? Did the size and age profile of households play any role? And were some households more IT-adept at switching from face-to-face to online food purchasing?

References

1. CFS (Committee on World Food Security) (2010). "Impact of COVID-19 on Food Security and Nutrition (FSN)" Interim Issues Paper, High-Level Panel of Experts on Food Security and Nutrition, Rome.
2. Clapp, J. (2020). "Spoiled Milk, Rotten Vegetables and a Very Broken Food System" *New York Times* 8 May 2020.
3. Crush, J. and Si, Z. (2020). "COVID-19 Containment and Food Security in the Global South" COVID-19 and Food Security Research Brief No. 1, Waterloo and Nanjing.
4. Si, Z. and Zhong, T. (2018). *The State of Household Food Security in Nanjing, China* Hungry Cities Partnership Report No. 9, Cape Town and Waterloo.
5. 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.
6. Zhong, T., Si, Z. and Crush, J. (2020). "Mobility Controls and Urban Food Policy Responses to COVID-19 in China" COVID-19 and Food Security Research Brief No. 2, Waterloo and Nanjing.
7. WFP (2020). COVID-19 *Economic and Health Impacts on Regional Food and Nutrition Security.* Rome: World Food Programme.