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by Ning Dai and Danshu Qi**

Wet markets have been the backbone of urban food provisioning in Chinese cities for several decades now (Si et al 2016, Zhang and Pan 2013, Zhong et al 2018, Zhong et al 2020). The role of wet markets as the primary source of food in cities may be shifting, however, as the COVID-19 pandemic draws food purchase away from wet markets to online platforms. Online food platforms emerged and grew over the last decade and the pandemic has boosted this growth. Online platforms are coordinated by various stakeholders in China including the government, private businesses, and civil society groups. This HCP research brief presents preliminary findings about the development of various new online food platforms during COVID-19 and highlights the strengths and limits of each platform based on research findings in Wuhan and Nanjing. The data comes from an online survey of 1,026 residents of Nanjing and 796 residents of Wuhan in March 2020, supplemented by comparative data from a city-wide household survey conducted in Nanjing in 2015 (Si and Zhong 2018). Because the online survey participants were self-selected, this is not necessarily a representative sample of all residents of the two cities, unlike the 2015 survey. However, it still provides new insights into China's changing food system during the COVID-19 crisis.

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Food Sources during Quarantine

The first major finding from the survey suggests that a much smaller proportion of the residents of both Wuhan and Nanjing visited physical retail outlets (such as wet markets, supermarkets and other food stores) during the lockdown period. This is consistent with the increasingly tighter controls on movement, which were significantly more restrictive in Wuhan than Nanjing (Zhong et al 2020). One-third of Wuhan households surveyed did not visit a food retail outlet at all in the two-month period between January 23 and the last week in March. Another 51% did so once per week or less on average. In fact, there was a time in Wuhan's lockdown when no one was allowed to leave their residence, unlike in Nanjing. There, only 6% of the sampled households never purchased

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food at a retail outlet, with 50% doing so once per week per week and 39% two or three times a week. In the earlier HCP survey of Nanjing by contrast, 75% of households in Nanjing visited wet markets alone at least five times per week (Si et al 2016). The online survey suggests a significant drop in patronage with only 6% of households in Nanjing visiting wet markets or other food outlets more than four times per week. The percentage was even smaller in Wuhan (less than 1% of those surveyed).

TABLE 1: Frequency of Food Purchase at Physical Outlets and Online Platforms during Quarantine

	Wuhan		Nanjing	
Frequency	Physical outlets (%)	Online platforms (%)	Physical outlets (%)	Online platforms (%)
Never	32.8	23.1	5.7	22.8
≤ once per week	50.5	39.1	49.6	35.8
2-3 times per week	15.8	33.9	38.6	35.5
4-6 times per week	0.6	3.0	4.9	4.5
7+ times per week	0.3	0.9	1.2	1.4

The second major finding from the survey concerns the use of online food purchasing. Nearly 80% of households in both cities purchased food online during this period. Interestingly, the profile for frequency of usage of online platforms was relatively similar in both cities (Table 1), with 39% of those surveyed in Wuhan ordering online once per week or less compared to 36% in Nanjing. Similarly, 38% of Wuhan households and 41% of Nanjing households bought food online at least twice per week. Comparing patronage of online platforms with retail outlets, it is clear that in Wuhan residents relied more on online platforms than retail outlets for food purchase.

Four factors explain the rise of online food purchase platforms during the COVID-19 crisis. First, in Wuhan most wet markets were shut down during this period. Second, Wuhan residents were prohibited by the government from leaving their gated communities between mid-February and early April. The mobility restriction made it almost impossible for residents to exit their communities, let alone visiting food outlets (Zhong et al 2020). In Nanjing, they could only do so with special permits to leave their residential neighbourhoods. Online ordering was one way around these restrictions. Third, some local supermarkets in Wuhan were price gouging, according to some survey respondents. More specifically, they reported that the two largest local supermarkets in Wuhan, *Zhongbai* and *Wushang*, significantly raised the prices of vegetables and meat. One respondent noted spending 40 yuan (about USD6) on a single cabbage at a supermarket. In addition, the supermarkets ruled that some popular food items could only be purchased in combination with less popular items in order to clear their inventory. Fourth, like any other crowded public space, physical food outlets were (and still are) considered a risky place for the spread of the new coronavirus.

Typology of Online Platforms

Three main types of online food purchase platform operated during the lockdown and thereafter, each with a different coordinator:

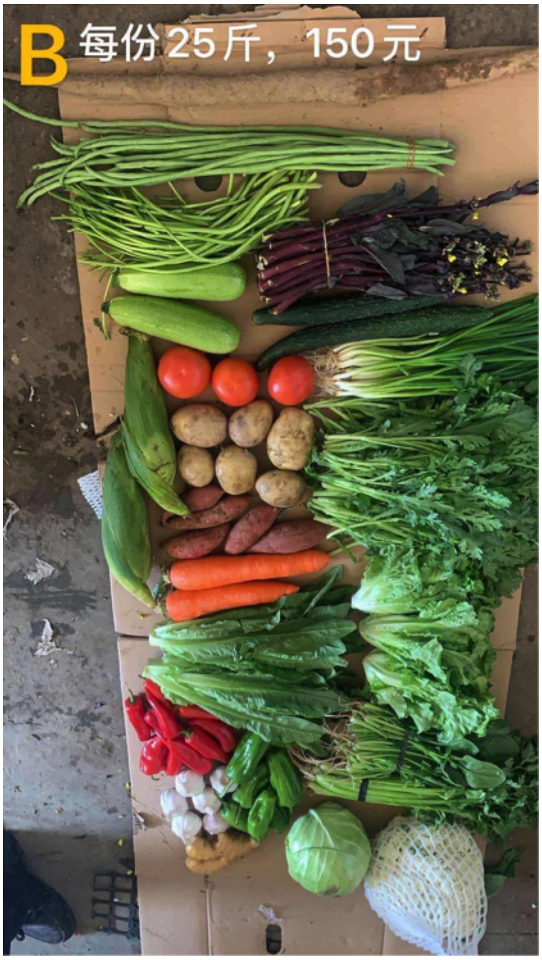
Government Platform

The government platform was organized by the *Shequ* government, the lowest administrative body in China. *Shequ* is the spatial unit of administration and covers a few neighbourhoods (Derleth and Koldyk 2004). A *Shequ* government is responsible for anywhere from thousands to hundreds of thousands of households. The *Shequ* government platform was a chatroom embedded in *WeChat*, the most widely used phone application in China. The government first established a *WeChat* chatroom and then invited all households within its administration to join. In these chatrooms, the government announced what food was available for purchase and households placed their orders accordingly. After aggregating the food orders, the government deployed its employees to purchase the food at designated wholesale markets and delivered the orders to households. The food orders were either placed on people's doorsteps or taken to a designated space in gated communities for pick up. In addition to sourcing food from wholesale markets, the government also received food donations from farmers within Hubei province and beyond. Some of the donated food was distributed to households free of charge.

Overall, the government platform made use of two strengths. First, government has the contact information of all households in its administration and thus could establish an inclusive *WeChat* space. Second, the government has information about vulnerable households, including elderly people living alone, people with disabilities, and households without internet access. The government would send its staff to attend to the needs of these households and purchase food on their behalf. Without these special arrangements, these households might have been left out of the online platforms.

The government platform had five main challenges. First, depending on their resources, some governments did not have sufficient human capacity/vehicles to manage food orders and logistics of delivery efficiently. Respondents mentioned that food orders through the government platform were often delayed. Second, food orders were package deals (Figure 1). Residents could not choose to order individual foods as they wished. The package deals were found expensive by survey respondents, with prices 2-3 times higher than wet market prices. Third, the government platform only worked for group purchasing, which required reaching a certain scale to initiate the purchase. For example, one respondent said that due to high prices and limited choice, group purchase for meat and fish was rarely successful in their *Shequ*. Fourth, respondents said that food was not as fresh as from other platforms. Fifth, the efficacy of the government platform depended on the capacity of its officials. As a result, in some *Shequs*, the government platform offered cheap food and fast delivery while in others it was less active. Interviews with respondents suggest that although *Shequ* platforms were especially popular at the beginning of the quarantine, many people have since switched to other platforms.

FIGURE 1: Example of package deal on a government platform



Note: 150 yuan (about USD21) for 12.5kg of assorted vegetables as displayed

Commercial Platforms

Another major type of online food source was organized by private companies or entrepreneurs such as supermarket chains and group purchase platforms. Some of these commercial platforms operated their own websites or apps. Others were embedded in *WeChat*, either in the form of a chatroom or an add-on. The group purchase platforms usually organized food distribution at the residential community level. The platforms hired a "purchase leader" for each gated community who was responsible for aggregating individual orders in that community, transporting food from distribution centres, packing and labelling food, and delivering it to the community.

The commercial platforms had three strengths. The first was quick delivery. Food was usually delivered one day after it was ordered. Second, there was a price advantage as the group purchase platforms often promoted special deals. Figure 2 illustrates how the purchase leader advertised these special deals to members of their community in a *WeChat* chatroom. Third, there was a greater variety of food available, which increased as the platforms evolved during quarantine.

The commercial platforms faced two difficulties. First, they did not cover all communities. Some communities did not have enough users who buy food online to reach an economy of scale and/or were located far from the city centre. In these communities, commercial platforms did not work efficiently. Second, some platforms ran out of food stocks quickly and could only accept a limited number of orders per day. This added to the difficulty of food purchase for residents. For example, some respondents said that they needed to stay awake late into the night to place an order because new stocks were released at midnight and were often sold out within five minutes of release.

FIGURE 2: Chatroom deal organized by a commercial platform, Shixianghui

Civil Society Platforms

Civil society platforms were established by local residents in collaboration with food producers and wet market vendors. Some residents had connections with food producers in nearby townships and arranged direct sales from farm to household. For example, respondents mentioned direct sales of leafy greens from vegetable farms and grass carps and bream fish from fish farms in their community. In another case, a wet market vendor delivered fresh food to a community where some residents volunteered to organize the food ordering and pick-ups.

Also, in some communities, residents sold home-prepared dishes online, such as hot dry noodles (Reganmian), a traditional dish of Wuhan.

The strengths of civil society platforms include affordability and freshness. According to respondents, some of the food they bought through direct sales was even cheaper than the average food prices prior to the COVID-19 outbreak. The challenge facing civil society platforms was the limits of government registration. Only a small number of vendors were designated by the government while others had to operate without official permission. For example, the wet market vendor in the abovementioned case was unable to acquire a government permit and therefore could not enter the gated community to distribute food. Instead, the vendor had to lift the food over the wall so that volunteers on the other side could receive it.

The strengths and challenges facing the three types of online food purchase platforms are summarized in Table 2.

TABLE 2: Strengths and Challenges of Different Online Food Purchase Platforms

	Government-led platform	Market-led platform	Civil-society-led platform
Strengths	1. Having household contact information 2. Attending to vulnerable communities	1. Affordable food 2. Quick delivery 3. Wide variety	1. Affordable food 2. Fresh food
Challenges	1. Delayed delivery 2. Package deals only 3. Large-scale group purchase only 4. Food lacking freshness	1. Limited to certain communities 2. Food supply falling short of demand	1. Limited to certain communities 2. Lack of official approval from government

Conclusion

The survey results indicate that food purchase was most challenging two to three weeks after the beginning of complete or partial residential quarantine when residents' mobility was restricted and food prices increased. The establishment of online food purchase platforms eased the challenges in food access. Some residents noted that online food purchase was even cheaper than at the physical markets prior to the COVID-19 outbreak, because of direct sales and the economy of scale in group purchase. Some residents said they would continue to purchase food online for reasons of affordability, convenience and safety concerns.

The impact of the COVID-19 pandemic on China's urban food provisioning may be far-reaching. Before the outbreak, online food purchasing was gaining momentum in Chinese cities with the development of New Retail Businesses (Dai and Si 2020). The pandemic appears to have accelerated the trend. Several questions arise. Will online food purchase continue to grow in Chinese cities when the pandemic subsides? What are the long-term social, economic and health implications of this transition towards online purchase? How will wet markets adapt to this transition? These questions are the subject of ongoing research by the HCP's COVID-19 and food security project.

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