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THE CHANGING GROCERY SHOPPING BEHAVIOUR OF CHINESE CONSUMERS AT THE OUTSET OF THE COVID-19 OUTBREAK

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ABSTRACT

This study focuses on the embryonic stages of the COVID-19 pandemic in China, where most people affected opted to abide by the Chinese government's national self-quarantine campaign. This resulted in major disruptions to one of the most common market processes in retail: food retailing. The research adopts the theory of planned behaviour to provide early empirical insights into changes in consumer behaviour related to food purchases during the initial stages of the COVID-19 outbreak in China. Data from the online survey carried out suggest that the outbreak triggered considerable levels of switching behaviours among customers, with farmers' markets losing most of their customers, whilst local small independent retailers experienced the highest levels of resilience in terms of customer retention. This study suggests avenues for further scholarly research and policy making related to the impact this behaviour may be having around the world on society's more vulnerable groups, particularly the elderly.

KEYWORDS

Retail; consumer behaviour; crisis response; COVID-19; coronavirus; China.

INTRODUCTION

Since its outbreak in Wuhan (China) in early January 2020, the COVID-19 strain of the novel coronavirus spread rapidly across China and beyond to affect 200 countries with tragic consequences – over 2.6 million cases (1.2 million in Europe alone) of reported infections with in excess of 182,000 people dead by the end of April of 2020 (WHO, 2020). This has had a major impact on consumers and the retail sector across Europe and further afield (Feng and Fay, 2020; Evans, 2020). As a response to the initial outbreak, China was the first country in the world to impose a mandatory nation-wide self-quarantine between 23rd January and 9th February 2020 (Bloomberg News, 2020). Since then, many other countries in Europe and further afield have followed suit by issuing restrictions to their citizens' movements in order to stem the spread of the virus (Chinazzi *et al.*, 2020; Hedgecoe *et al.*, 2020).

Although the full impact of this crisis on the retail sector will only emerge once it has been brought under control, early indications show that retail outlet closures ordered by governments around the world as well as changes in consumer behaviours associated with this pandemic are having a detrimental impact on the sector already, to the point that up 20,000 high street retail outlets have been forecast to close in the UK alone as a result of this pandemic (Munbodth, 2020). Indeed, earlier research has shown that major pandemics, such as the Severe Acute Respiratory Syndrome (SARS) outbreak in 2003 or the Middle Eastern Respiratory Syndrome (MERS) outbreak in 2015, can have major impacts on supply chains (Cavinato, 2004; Oke and Gopalakrishnan, 2009) and consumer behaviour in retail with a specific focus on online food shopping even if most of this research has been carried out primarily from a hospitality (Alan *et al.*, 2006; Chien *et al.*, 2006; Jayawardena *et al.*, 2008) or tourism perspective (Wen *et al.*, 2005; Kuo *et al.*, 2009; Jamal and Budke, 2020) with the majority of studies focusing on Asia (McKercher & Chon, 2004; Kuo *et al.*, 2008) due to the prevailing geography of earlier pandemics.

This study seeks to contribute to current knowledge of customer behaviour in retail within the context of a major public health crisis, which has been somewhat dominated by research related to supermarkets and online purchases (e.g. Forster and Tang, 2005) and largely ignored other retail formats, including small independent retailers and traditional markets. For this purpose, the theory of planned behaviour first posited by Ajzen (1991) is adopted to

explore planned changes to consumer food shopping behaviours at the early stages of the COVID-19 outbreak in China. Due to the geographical origin of the COVID-19 pandemic, the data was collected in China with a focus on eliciting early insights from food and grocery shopping behaviours during the embryonic stages of the pandemic when it was still classified as a mere outbreak. During this difficult time, the supply and demand of food was unbalanced due to the shortage of supply and potentially by panic buying behaviours (Cachero, 2020), which have since been replicated in much of the rest of the world. As such, this study presents a customer-centred enquiry of supply versus demand to grocery retailing at the outset of the COVID-19 pandemic. As part of this study, insights were sought on prior shopping patterns – familiar sources of food shopping – as well as evidence of how switching took place. The implications of the findings are discussed later against the backdrop of similar issues emerging in leading western economies currently facing the fallout of this growing pandemic.

DATA AND METHODOLOGY

Initially, a number of possible theoretical frameworks were considered for this study, including the technology acceptance model (TAM) and Ajzen's (1991) theory of planned behaviour, when seeking to characterise how consumers tried to purchase food and groceries before and during the COVID-19 outbreak. Building on earlier retail studies with a similar theoretical framework (e.g. Spence and Townsend, 2006; Lobb *et al.*, 2007; Hansen, 2008), the theory of planned behaviour (TPB) was adopted for this study to analyse planned changes in consumers' food shopping behaviour during the early stages of the COVID-19 outbreak in China, in line with research published recently on the impacts of this pandemic on food supply chains, where authors speculated with major potential changes to consumer behaviour in grocery retailing in Canada and elsewhere (Richards and Rickard, 2020).

Firstly, food availability was investigated among different retailers, including online retailers, local independent small shops, supermarket chains and farmers markets. Food was categorised broadly as fresh, packed and canned, cooked and ready to eat, and frozen. Data for this study was collected using a self-administrated online questionnaire launched during the Chinese government's mandatory national 'self-quarantine' campaign adopting a non-probability snowball sampling strategy. The survey was distributed using China's most

popular social media platform – WeChat. In order to avoid repeat responses, WeChat account login was required in each case. Response rates were boosted by means of a survey panel provided by Tencent Group. The survey was closed on 9th February 2020 – the last day of the mandatory national self-quarantine campaign. A total of 961 respondents participated in the survey, with an average survey completion time of 7 minutes. An outline of the survey respondents’ profile is shown in Table 1. Respondents were asked to what extent they could buy food from those channels (1=very difficult, 5=very easy). Overall, customers found it difficult to buy all categories of food across all shopping channels (mean=2.9). Supermarkets had the greatest availability of food across all categories (mean=3.6), while farmers markets (mean=2.8) were the most difficult place to find food during the outbreak (Table 2).

Table 1. Survey respondents’ profile.

	Category	Frequency	%
Gender	Male	575	59.8
	Female	386	40.2
Household size (number of members per household)	1	73	7.6
	2	164	17.1
	3	270	28.1
	4	216	22.5
	5	150	15.6
	6	53	5.5
	7 or more	35	3.6
Age	18 or under 18	21	2.2
	18-24	31	3.2
	25-29	265	27.6
	30-34	218	22.7
	35-39	190	19.8
	40-44	61	6.3
	45-49	50	5.2
	50-54	56	5.8
	55-59	39	4.1
60-64	26	2.7	

	65 or older	4	0.4
Education	Junior high school and lower level of educational attainment	58	6.0
	Senior high school	207	21.5
	College	243	25.3
	University degree (undergraduate)	331	34.4
	Master or above	122	12.7
Household income (RMB)	<30k	125	13.0
	30,000 - 80,000	224	23.3
	80,000 - 150,000	250	26.0
	150,000 - 800,000	220	22.9
	800,000 - 2 million	22	2.3
	> 2 million	2	0.2
	I would rather not to say	118	12.3

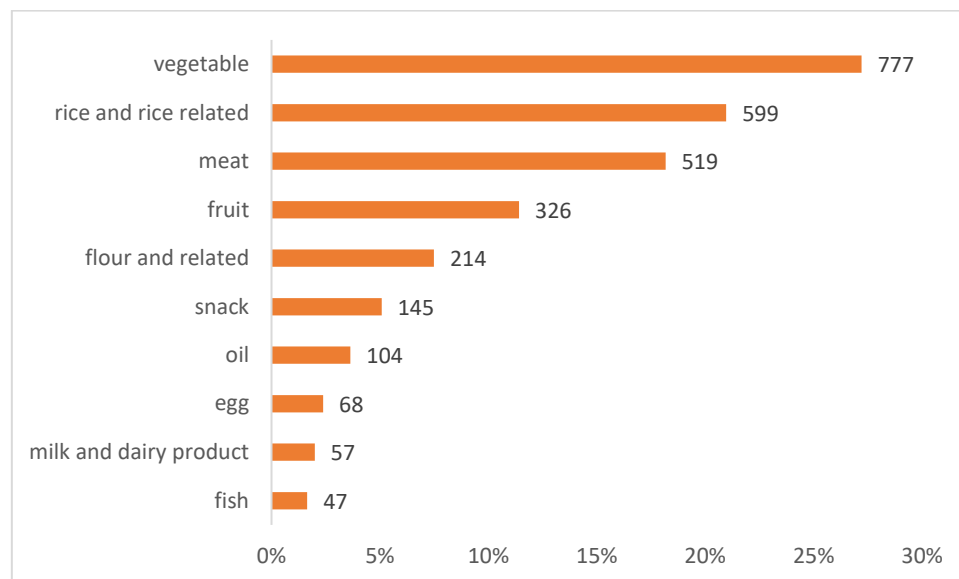
Table 2. Food availability by channel during the early stages of the COVID-19 outbreak.

Retail channel	Online	Small independent shops	Supermarkets	Farmers markets
fresh food	2.8 / 1.4	3.1 / 1.4	3.6 / 1.3	3.1 / 1.4
canned food	3.4 / 1.3	3.5 / 1.3	3.9 / 1.2	2.8 / 1.4
cooked food	2.6 / 1.4	2.4 / 1.4	2.9 / 1.4	2.3 / 1.3
frozen food	3.3 / 1.4	3.3 / 1.3	3.9 / 1.2	2.9 / 1.4

Mean / Standard deviation

Although there were a number of food categories the Ministry of Commerce of China had to take control over to ensure supply chain safety (China News Service, 2020), this study investigated the food categories most in demand by Chinese consumers during the early stages of the COVID-19 outbreak. For this purpose, each respondent was asked to indicate his/her most wanted food categories at this early stage in the COVID-19 outbreak. The result (Figure 1) shows that vegetables, rice (with rice-related products) and meat were the most wanted food categories during the early stages of this fast-evolving pandemic.

Figure 1. Percentage of food categories in demand during the outbreak.



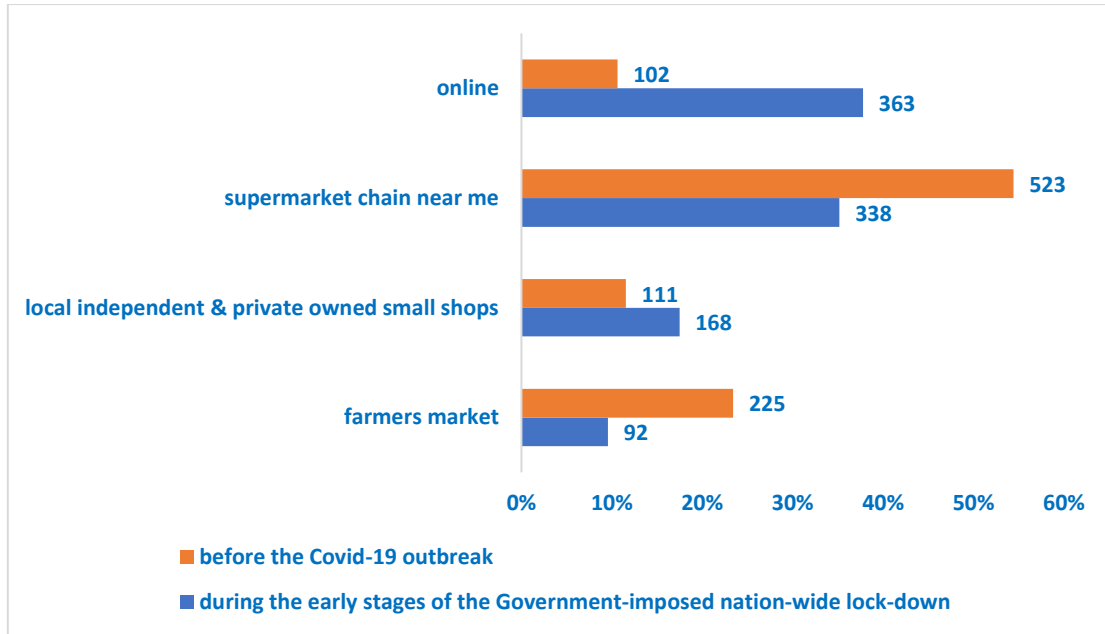
A preliminary, first-cut, principal component analysis (PCA) indicated the presence of four distinct factors: Perceived Usefulness, Perceived Ease of Use, Trust in Retailer (Q: retailer will ensure food hygiene and safety), Trust in Government (Q: local government will ensure food hygiene and safety) (KMO=.752, Cronbach Alpha=.765). We quickly concluded that the overriding factor in a time of great change and crisis was, understandably, Perceived Usefulness (see below). This construct characterised online shopping as a means of reducing the risk of getting infected, as well as the helpfulness of online shopping in one's daily life during the outbreak. It explained 53% of variances of online shopping intention ($p=.000$ VIF<2.5), while other variables were insignificant.

There was a mild level of anxiety on food supply (Q: "I am worried that there is a food shortage in my local area" 1=Strongly Disagree, 5=Strongly Agree; Mean=3.1 Std. dev.= 1.3). ANOVA and subsequent post-hoc were tested for various demographic variables (including age, gender, household size, income, etc.). The result suggested that those with a Masters degree or higher ($p<.005$), were less worried about food shortages, while the fear of running out of food showed no difference within other demographic categories. Clearly these patterns require further research, particularly in the context of western economies.

Before the outbreak, as many as 54% of the survey's respondents bought their food and groceries from supermarkets. However, while supermarkets remained a popular choice during the outbreak, the proportion of consumers choosing supermarkets dropped to 35%. There was also a sharp decline in purchases from farmers markets, with the proportion of people shopping from this channel dropping from 23% to 10%. In contrast, there was a surge in online shopping, with the percentage of consumers buying food and groceries online increasing from 11% before the outbreak to 38%, with online food shopping becoming the most popular channel during the outbreak. Local independent small shops also saw an increase during the outbreak from 12% to 17%, as shown in Figure 2.

In line with this, consumers' switching behaviour (Table 3) unveils that 76% of online shoppers remained online, the rest moved to local small shops (14%) and supermarket (11%). We do not have the detail to know if any switching from the internet was due to inability to arrange a delivery in time. Small independent shops demonstrated a high customer retention, among consumers who used to make their food shopping primarily in small independent shops, 75% remained buying from their local independent small shops during the outbreak, with 23% moved to online shopping. Among previous supermarket shoppers, 34% moved to shop online with 60% continue shopping in supermarket. Farmers markets experienced the highest levels of customer churn, which may be attributable to the outbreak being identified initially in a wet market in Wuhan – only 40% of consumers continued buying from this channel, 38% of consumers moved online, 16% moved to local privately-owned small independent shops, whilst 6% switched their food shopping to supermarkets.

Figure 2. Consumers' food and grocery shopping channel choice before and during the outbreak.



However, the nation-wide government-imposed lockdown, which coincided with the Chinese New Year national holiday, resulted in a general shortage of food supply (Rosner, 2020; Cachero, 2020). Largely as a result of this nation-wide lockdown, 47% of respondents reported that the retail outlets where they previously bought their food had closed. While respondents based in larger cities (e.g. Beijing, Shanghai, Shenzhen and Guangzhou) only reported a food retail outlet closure rate of 35%, respondents from smaller cities and towns reported a food retail outlet closure rate of 52%.

Table 3. Consumers channel switching behaviour

Primary shopping channel before outbreak	Food and grocery shopping channel during the early stages of government-imposed nation-wide lock-down	Frequency	Percent
online	Online	77	75.5
	local independent & private owned small shops	14	13.7
	supermarket chain near me	11	10.8
	Sub total	102	100.0
local independent & private owned small shops	Online	26	23.4
	local independent & private owned small shops	83	74.8
	farmers market	2	1.8

	Sub total	111	100.0
supermarket chain near me	Online	175	33.5
	local independent & private owned small shops	34	6.5
	supermarket chain near me	314	60.0
	Sub total	523	100.0
farmers market	Online	85	37.8
	local independent & private owned small shops	37	16.4
	supermarket chain near me	13	5.8
	farmers market	90	40.0
	Sub total	225	100.0

DISCUSSION OF EMPIRICAL FINDINGS AND STRUCTURAL INFLUENCES

This research note evaluates the impacts of major disruptions to previously routinised food shopping behaviour as a result of a dramatic and unanticipated event: a major public health crisis caused in this case by the COVID-19 strain of the coronavirus. The research presented does not consider the aetiology of the coronavirus (Yang *et al.*, 2020) nor those of its many precursors including SARS or Ebola (nor, indeed, food scares *per se* (Whitworth *et al.*, 2017). However, it builds on earlier research related to the impact of epidemics on consumer behaviour, where the theory of planned behaviour has been often used as well (Spence and Townsend, 2006; Lobb *et al.*, 2007; Hansen, 2008), by making a contribution to present knowledge (see, for instance, Forster and Tang, 2005; Richards and Rickard, 2020) from a perspective that represents a key priority for consumers in the midst of a major public health crisis: food shopping. Less deterministically, though still within the theoretical research framework adopted in this study, there is the underlying factor of food cultures which have been found to notably differ across Europe (Askegaard, 1995) as is similarly the case in China. Food retailing, interpreted as the study of the outlets and organisations that re-sell food products to the public but one conditioned by wider background social or economic factors (Christopherson, 1993; Burt and Sparks, 2003; Wortmann, 2004; Kim, 2011), remains subject to major long term changes, particularly in the food supply system. Among these, for instance, Hallsworth (2013; p. 275) noted the “... restructuring away from the small shop format (Seth and Randall, 1999)” whilst “as new markets open up so retail structure research continues” (Wang and Jones 2002; Kim and Jin, 2001). The restructuring of retail in Asia (Kim, 2008; Kim and Hallsworth, 2016) and particularly in China (Goldman, 2001;

Tacconelli and Wrigley, 2009) has undoubtedly brought new formats into the system and left local communities with an enhanced range of possible purchase opportunities. This study has focused on how such changes played out in a short but turbulent time, namely a major pandemic.

A particular characteristic of supermarkets and yet larger outlets is their capacity to process large numbers of shoppers in a short space of time. That focus on high volume and rapid turnover was in dramatic opposition in this particular instance to the need for isolation and quarantine. Figure 2 and Table 3 both provide similar evidence of a move away from close contact, mass formats to smaller retail formats or online purchases, though further research is required to explore the longer-term implications of this behavioural change and whether it will remain in place once the COVID-19 crisis is over. As in South Korea with its world-leading fast broadband, China facilitated online shopping well before the present COVID-19 crisis. It is, therefore, likely that online retail will go from strength to strength globally as a result with early movers most likely to benefit. This could offer a tentative explanation for the lower expressions of stress displayed by survey respondents with a higher level of educational attainment, though further research is required on this front to establish whether job security and expendable income may not be key here instead of the respondents' level of educational attainment.

CONSUMER REACTIONS TO RETAIL CHANGE: THE THEORETICAL BASIS

What, then, does this tell us about the relevance of competing theoretical approaches towards understanding (rapid) retail change? Building on the work of Ajzen (1991), the theory of planned behaviour attempted to understand the interface between the individual and the choices presented by a rapidly retail environment in the context of a major public health crisis. In common with similar approaches, the underlying initial proposition was that people would make broadly rational decisions given the known choices available. In the context of switching behaviours to online shopping, earlier studies have investigated this (e.g. Elms *et al.*, 2016). Underpinning this, by implication, is an ongoing assessment of the available options that themselves slowly and steadily evolve through time. If we look at the evolution of the work of leading retail researchers, Timmermans (1980), for instance, rapidly moved from rational choice models to cognitive/ behavioural approaches. In recent decades, building

on the work of Kahneman and Tversky (1979) and their successors (see Thaler and Sunstein, 2008), there has been a growing acceptance of behavioural economics including the importance of routine, habit, heuristics and so on. At the consumer/structure interface, Clarke *et al.* (2006) argued that local shopping behaviour was fitted into complex lifestyles rather than consumers exerting free choices, unhindered by their time-juggling complex lifestyles. Perfect information, time availability, utility maximisation functions, human (ir)rationality, consumer preferences, willingness and ability to know and compare, are everyday underpinnings to routinised food shopping behaviour. All such approaches, it would seem, inherently struggle with rapid, sudden and dramatic change. For instance, behavioural approaches founded in game theory (GT) place special emphasis (again see Kahnemann and Tversky *et seq*) on how individuals respond when they do not, or cannot, know how others will act, i.e. decision making under uncertainty. However, government-imposed restrictions in China and elsewhere have effectively contributed a fundamental element of certainty even if only by removing certain shopping options.

If events surrounding the early days of the COVID-19 outbreak in China are to be understood through a retail prism, the fundamental challenge for local residents was to find an available format (or formats) that (still) worked in a rapidly changed environment. In line with this, it could be posited that what emerged was in effect a variant on the technology acceptance model (TAM). Although with TAM it is possible to add variables such as Trust (in government or retailer/supplier), the Perceived Usefulness dimension of TAM over-rides other considerations. Online shopping is a TAM-based “fix” that pretty much explained all the variances of intention to use in this study. Ease of use, conversely - always popular in times of stability - was surely not a factor because it was often difficult for customers to rely on online channels due to unusually high traffic volumes. In China, retailers often had to close down their site and this seems to have recurred in the UK and elsewhere less than two months since the survey was carried out. At root, online (like downsizing to use smaller, quieter outlets) was effectively a functional choice and one that appears to have worked for many hard-pressed consumers in China consulted in this study. Transparently, there will be specific local factors in other countries. Italy, for instance, has a notably low penetration rate for internet grocery shopping (some 15 times lower than that of the UK). In contrast as noted above, internet grocery shopping has grown rapidly in China – and especially so in South Korea, also affected by this pandemic, with its fast internet and high population densities as key structural facilitators.

Overall, this study has attempted to offer a retail-focused insight to the early development stages of the COVID-19 outbreak in China. Many people - most of whom would not go on to be affected by the pathogen - were advised to self-quarantine but without any clear behavioural precedents on which to work. As in Venice, Milan, Madrid, Paris, New York and other major cities affected by the coronavirus, this involved a sudden, immediate and major disruption to one of the most common market processes: food retailing. This research note, albeit not in a conclusive manner, attempts to nevertheless shed some light on how such a large number of people initially sought to find food supplies under unusual, difficult and rapidly changing circumstances.

POLICY IMPLICATIONS

What has emerged since our data gathering is that countries, and their citizens, have varied in their preparedness and responsiveness. It is alleged that in 2016 the British government felt able to ignore warnings of a potential future shortage of ventilators and protective equipment: the very shortage it now faces. Surely that error cannot be repeated in future. Again, however, our focus is on consumer responses to COVID-19. Our data relate to the first time-period when residents faced the rapid removal of options to buy food. They had no precedents on which to rely on aside from the SARS pandemic of 2003-2004, which was far less virulent due to the specific characteristics of the pathogen's strain involved. In the case of the COVID-19 outbreak and subsequent global pandemic, a large proportion of governments around the world, including the Chinese government, acted to close down outlets on which many rely for food – including restaurants, cafes, bars and, in the UK, the traditional “pub”, with a dramatic impact on the service sector and, more specifically, catering, hospitality, food retail and their wider supply chains. Similarly, in China and elsewhere social distancing and self-quarantine measures were introduced by governments, which varied considerably from one country to another in terms of their severity. The still-functioning food system, however, is and remained a free market operation and it has long been known that home delivery is not cost-effective for retailers. On occasions of food stockpiling or instances of buying excessive amounts of food, as experienced in much of Europe, Australia and other western economies, it was the decision of retailers – not government – that this should be curbed. One of the key findings of this study is that a significant response from consumers

was to switch their food shopping to online channels; a trend copied in several other countries where internet shopping and home delivery were available options. In the case of the United Kingdom, as Kirby-Hawkins *et al.* (2019) revealed, consumer take-up of internet shopping was exhibiting clear trends well before the COVID-19 crisis. None of those trends particularly favoured the older, less mobile, less wealthy, less tech-savvy shoppers who have been the ones most affected by government “lock-down” policies related to the COVID-19 crisis only to compound the fact that many of these groups, certainly more elderly consumers, remain particularly vulnerable to this pandemic in terms of their physical and mental health. Given that the heaviest internet users tend to be younger, wealthier, but time-pressed, home deliveries of food purchases made online have become difficult due the lack of availability of delivery slots. This is often affecting particularly the more vulnerable groups discussed here. However, further research is required to analyse how these dynamics are affecting consumers, including whether more elderly people have had little option but to come out of self-isolation to buy their food in supermarkets, markets or local shops and, in doing so, increasing their risk of contracting the virus. The same issue applies to ethnic minorities and socio-economically disadvantaged groups, as there is a growing body of evidence showing that they have been most affected by this pandemic in the United States, the United Kingdom and other European countries. Future policy research must surely address how those most affected can reliably obtain basic food under future pandemic conditions.

Overall, this study has attempted to offer a retail-focused insight to the implications of the early development stages of the COVID-19 outbreak in China. As we have stressed, many people - most of whom would not go on to be affected by the pathogen - were advised to self-quarantine but without any clear behavioural precedents on which to work. As in Venice, Milan, Madrid, Paris, New York and other major cities affected by the coronavirus, this involved a sudden, immediate and major disruption to one of the most common market processes: food retailing. This research note, albeit not in a conclusive manner, attempts to nevertheless shed some light on how such a large number of people initially sought to find food supplies under unusual, difficult and rapidly changing circumstances.

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