

A study on the impact of public health emergencies on the consumption structure of urban residents: Take the 8-25 outbreak in Chengdu as an example

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Abstract. To investigate the impact of public health emergencies on the consumption structure of urban residents, this paper focuses on the consumption of urban residents residing in Chengdu during the period of the Corona Virus Disease that emerged on August 25, 2022, and analyzes and evaluates the data results after a questionnaire survey. This study concludes that external factors such as the epidemic and individual consumer characteristics jointly affect consumption levels and consumption structures; differences in specific groups can also cause changes in residents' consumption levels. Finally, based on the analysis and conclusions, relevant policy recommendations are given.

Keywords: Public health emergencies, COVID-19, Consumption structure.

1. Introduction

Public health emergencies, sudden occurrences that cause public serious damage to the health of the public Major infectious disease epidemic, mass unexplained diseases, major food poisoning and other events that seriously affect public health[1], which often have a profound impact on social economy and people's lives, especially in the consumer sector.

Corona Virus Disease 2019, the largest and the strongest infectious disease epidemic worldwide in the last century, had important impacts on the consumption of residents. According to the National Bureau of Statistics, the national per capita consumption expenditure in 2020 decreased by 1.6% compared with the previous year, or 4.0% in real terms after deducting the price factor; among them, the per capita consumption expenditure of urban residents decreased by 3.8%, or 6.0% in real terms after deducting the price factor [2].

During the epidemic, the Chinese government introduced a series of policies [3] to better play the fundamental role of consumption in economic development, which included price stabilization, tax stabilization, employment promotion, and improvement of epidemic prevention and control measures.

2. Statistical Analysis

The questionnaire survey was centered on urban residents in Chengdu, mainly from the personal information of residents, sealing and control situation, and consumption structure before and after the epidemic. A total of 351 questionnaires were collected, of which 291 were valid, with a valid return rate of 82.9%; 119 (40.89%) were male and 172 (59.11%) were female. Meanwhile, according to the national closure and control policy, the closure and control areas were divided into prevention and control areas, control areas, closure and control areas and centralized quarantine areas according to the strictness of control, and the percentage of respondents living in each closure and control area during the epidemic were 41.89%, 26.35%, 20.95% and 10.81%, respectively.

2.1. Impact of the epidemic on the proportion of residents' food consumption

The questionnaire surveyed the changes in the proportion of food consumption of urban residents during the epidemic closure and after the lifting of the closure. The weighted arithmetic mean was derived according to the weights, and the average expenditure share of food consumption was 31% and 28% during and after the closure and control period, respectively.

Apparently, the average expenditure on food consumption of urban residents in Chengdu decreased as a percentage after the lifting of the sequestration. This indicates that the share of food consumption expenditure increased during the closure period due to the decrease of the share of other consumption expenditure. After the closure, the overall consumption of residents increases, and the growth of other consumption exceeds the growth of food consumption, which is reflected in the decrease of the average expenditure share of food consumption after the closure.

2.2. Preference of purchasing methods during the closure control

We conducted a survey on the preference of urban residents' procurement methods during the closure control period. Compared to the centralized government procurement model, most respondents (76.8%) preferred individual free procurement. This is because individual free purchasing can be consumed according to their own needs.

2.3. Whether the consumption structure is reasonable

On the question of whether the household consumption structure was reasonable during the closure and control period, 46.1% of people thought it was reasonable, 29.4% thought it was not, and 24.6% had an unclear attitude. The data indicate that people have less confidence in whether household consumption is reasonable during the closure and control period, and the probability that household consumption psychology and consumption situation will be affected in the face of the impact of the epidemic is higher.

2.4. Explosive consumption behavior

As for the assumption of explosive consumption behavior after unblocking, 16.0% said "perfectly", 29.4% said "somewhat", 23.2% said "not sure", 15.4% and 16.0% said they were "not quite sure" and "not at all sure" respectively. Nearly half of the respondents thought they had an outbreak of consumption behavior after the unsealing, which shows that there was an outbreak of consumption at the time of the end of the epidemic.

3. Analysis of variance

The main purpose of ANOVA in this study is: to investigate whether the characteristics of the respondents have a significant effect on the model of this study. Using one-way ANOVA, we explore whether different factors produce significant differences in the consumption structure of urban consumers.

3.1. Gender-specific effects on consumer spending during epidemic closure

Table.1. Analysis of variance table

ANOVA

	Sum of Square	df	Mean Square	F	Sig.
Changes in transportation and communication Inter.	3.847	1	3.847	2.905	.089

We analyzed whether there are significant differences between genders on different consumption dimensions, we found that the significance of the F-statistic for the change in traffic communication is less than 0.1, which indicates that there are significant differences between genders for this characteristic on this study dimension.

Further examining the collected data, we found that the percentage of increase in transportation and communication change expenditure for males (60.5%) was greater than that for females (54.6%), this indicates that during the epidemic closure period, especially under the strict closure policy, men may have more social interaction needs and need to be relieved because of the loneliness that tends to accumulate during the closure period, so men will increase their transportation and communication expenditures.

3.2. Impact of different closure areas on different consumption expenditures during the epidemic closure

Based on the statistical data, we found that different enclosed areas have different dimensions of changes in food, housing, and transportation and communication.

Residents in control and prevention areas can be affected to a large extent by mobility restrictions in the transportation and communication category of expenditure.

In terms of changes in the housing category, one is the increase in housing prices and rental prices during the epidemic, and residents in other containment areas will pay more in rental costs compared to the centralized quarantine; second is the out-of-pocket expenses for quarantine during the 8-25 period, and some residents in areas other than the containment areas will have to bear additional housing costs.

The most significant difference in the change in the food category among the three groups of variables is mainly due to the difference between self-purchased supplies and centralized government purchasing, and this part of the data is important for the policy recommendations of this study.

3.3. Impacts of different closure control regions on different consumption expenditures after the unsealing of the epidemic

Table.2. Analysis of variance table

ANOVA

		Sum of Square	df	Mean Square	F	Sig.
Changes in the entertainment after unblocking	Inter.	12.686	3	4.229	3.073	.028

Based on the data, we found that there were significant differences in the changes in entertainment spending in different blocked areas after the closure.

The change in recreational spending of residents in this region after deconstriction is particularly significant, considering that residents in the blocked and centrally isolated areas have extremely restricted movement and less freedom compared to other regions. It is worth noting that such changes often go hand in hand with the explosive spending mentioned earlier.

3.4. Impact of different incomes on different consumption expenditures during epidemic closure

We also found that there are significant differences in the characteristics of different incomes in changes in food, housing, daily necessities, education, culture, sports, entertainment, and healthcare.

The impact of the epidemic on consumption expenditures of households with different incomes is different, so basic living expenditures such as food, housing, household goods, education and culture will be affected differently; due to the special nature of public health emergencies, people will pay more attention to health care expenditures; household consumption during the epidemic may favor basic living needs and reduce non-essential consumption expenditures, so entertainment consumption in this group of variables. The variability is most obvious.

3.5. Impact of different incomes on different consumption expenditures after the epidemic is unblocked

After unsealing, through data, we found significant differences in changes in food, daily necessities, education, culture, sports, entertainment, healthcare, transportation, communication, and clothing among different incomes.

Households with different income levels will flexibly adjust their post-unblocked consumption according to their financial ability. Low-income households will focus more on practicality, safety and economy in their consumption behavior and consumption style, while middle-income and high-income households will prefer personalized and premium consumption experience and quality.

3.6. Impact of epidemic containment on consumption expenditure of children and elderly

During the epidemic closure period, children's food increased by 60.1%, education spending increased by 57.4%, and recreational supplies increased by 53.6%, in addition to spending on maternal and child products and children's apparel. In response to public health emergencies and influenced by their own consumer psychology and parents' perceptions of responsibility for their children, households increase their spending on children's food and stockpile a significant amount of children's food to safely survive the crisis. In the context of home quarantine, parents make additional investments to address issues such as their children's Internet classes, which manifests as increased household education expenditures. In addition, the epidemic quarantine reduces children's time outside the home, and parents will also increase their children's spending on recreational supplies, taking into account children's mental health and recreational social needs.

During the period of closure and control of the epidemic, respondents believed that expenditure on drugs increased (66.2%), while expenditure on health products and health products increased (52.3%). In addition, expenditure on nursing and physical therapy, rehabilitation, leisure and exercise increased.

In order to respond to public health emergencies, and based on the uncertainty caused by the risk of the epidemic, families will choose to increase spending on drugs and other materials, and stabilize their emotions by hoarding related materials. At the same time, compared with other groups, the level of autoimmunity of the elderly is low. Once infected with COVID-19, the risk of severe illness and death of the elderly is higher than that of other groups. Therefore, the medical expenses of the elderly during the epidemic will be significantly increased.

4. Conclusions and policy recommendations

4.1. Conclusions

By studying the impact of public health emergencies on changes in the consumption structure of urban residents, the following three conclusions were obtained.

- (1) External factors such as the epidemic affect consumption levels and consumption structures.
- (2) Individual consumer characteristics influence consumption levels and consumption structures.
- (3) Differences in specific groups, such as children and the elderly, also cause changes in the level of consumption of the population.

4.2. Policy Recommendations

We believe that a comprehensive approach is needed to promote the rationalization of residents' consumption structure in the face of COVID-19.

- (1) Strengthen the emergency response capacity for crisis events.
 - (2) Improve the quality of public services and establish a psychological service system.
- Focus on special groups and implement special policies.

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