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Impact of COVID-19 on peoples' willingness to consume wild animals: Empirical insights from China

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ABSTRACT

The COVID-19 pandemic has led to a dramatic loss of human life worldwide and presented an unprecedented challenge to public health and food systems. It is debated in the literature that SARS-CoV-2 accountable for COVID-19 originated from nature, and wildlife colonized in nature are also likely to cause COVID-19 havoc. In this study, we attempted to explore the effect of COVID-19 on peoples' willingness to consume and pay for wild animals. Data were gathered online from 1250 household heads of both urban and rural residents of Hubei, Hunan, and Guangdong provinces of China from the 19th to March 26th, 2020. The Probit and Tobit models were employed to meet the study objectives, and the results showed that around 39% of residents were willing to consume wild animals (WCWA), and their amount of willingness to pay (AWP) was 134.65 USD/year. The mediating effects of market control & home restriction policies showed strong effects between COVID-19 and peoples' WCWA. In contrast, the results of ecological environment risk and food security risk perceptions showed relatively weaker effects. The overall results of the current study provided acumens for policymakers to raise awareness within the populations concerning the adverse upshots resulting from consuming wild animals.

1. Introduction

In mid-December 2019, a novel infectious coronavirus (COVID-19) outbreak began in Wuhan, the most populous city of China's Hubei province. Coronaviruses are common in certain species of wild animals. Although the transmission of coronaviruses from animals to humans is rare, it is still unclear exactly how the virus first spread to humans. Scientists worldwide have been focused on determining the virus that leads to the outburst of COVID-19 [1,2]. It is found that the COVID-19 is an airborne disease that is highly contagious among humans and leads to a considerable number of deaths globally [3]. The recent World Health Organization (2021) report depicted that the number of diagnosed cases worldwide had exceeded 113 million, including 2.5 million deaths by March 1st, 2021 [4]. The figures are likely to change as the situation evolves. The pandemic has brought widespread adverse effects on employment, poverty, education, and even altered food systems [5,6]. The COVID-19 is destabilizing supply chains at all levels and creating instability in food prices and supply [7–9]. Generally, it is regarded as a human, economic and social crisis.

It is debated that the COVID-19 outbursts due to increased contact with humans and wildlife [10–12]. The World Health Organization suggested that wild animals' interaction and consumption are the leading causes of contagious diseases [13,14]. In China, wild animals are considered an essential source of food and income throughout China's history. Urban demand for wild meat as a culinary delicacy further triggers the sale and consumption of wild animals. Moreover, China's consumer economy's development substantially increased the demand for wild animal products for medicinal purposes [15,16]. The World Food Program (2020) documented that emergence of infectious diseases is associated with the trade of high-risk live wild animals [17]. It is worth noting that if the WCWA is not decreased, wild animal trading is likely to shift to an illegal market. The illicit trade of wild animals and unsafe handling practices further increases human exposure to animal pathogens and leads to the transmission of host species and animal pathogens across geographies. Every year, hundreds of thousands of wild animals are traded across international borders for commercial purposes. The less stringent regulation allied with the sale and consumption of wild animals in markets further aggravates infectious disease risks. Reducing colossal reliance on wild animals by people is an effective measure to mitigate contagious diseases [18,19]. In this regard,

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the government needs to halt high-risk wildlife trade and monitor and enforce stringent laws to combat wild animals' illicit trade.

During COVID-19, people's market conditions and psychological perceptions towards wild animals' consumption are significantly changed. In China, the supply of wild animals has been banned primarily due to COVID- 19, which influenced the consumers' willingness to consume wild animals [20]. Further, the home restriction policy caused residents to consume only those species offered by the government. Under this situation, peoples' WCWA and AWP are gradually reduced [21]. In China, the government has widely publicized the hazardous consequences of eating wild animals. Thus, people's perceptions of risk associated with wild animals are continually increased, and their WCWA declined. Wild animals have obvious environmental externalities, and prohibiting their consumption can influence them positively [22]. The COVID-19 pandemic has driven residents to take potential measures to conserve the natural ecosystem by considering both human beings and their interaction with wild animals. It is believed that peoples' increased environmental perceptions also inhibited their willingness to pay for consuming wild animals.

Based on the above discussion, the present study is a novel attempt to explore the effect of COVID-19 on peoples' WCWA and AWP in China. It is further hypothesized that market control and home restriction policies influence the consumption of wild animals. The peoples' perception regarding food safety and ecological risk also affects their willingness to consume wild animals. Therefore, the following hypotheses are proposed in the current study and research framework (see Fig. 1).

H0. : COVID-19 significantly reduces peoples' WCWA and AWP.

H1. The effect of COVID-19 is exerted through market control policy.

H2. The effect of COVID-19 is exerted through the home restriction policy.

H3. The effect of COVID-19 is exerted through food safety risk perception.

H4. The effect of COVID-19 is exerted ecological environment risk perception.

The remaining structure of the paper is organized below. The subsequent "methodology" section shows the data sources and analytical strategies. The findings based on estimations are presented in the "Results" section and discussed in the "Discussion" section. The conclusion with possible policy recommendations is revealed in the "Conclusion and policy recommendations" section.

2. Methodology

2.1. Study sites and research participants

Data were randomly collected online from both urban and rural households of Hubei, Hunan, and Guangdong provinces using the We chat software from 19th to March 26th, 2020. These areas were selected based on their massive reliance on the trading of wild animals. Moreover, residents of these provinces were accustomed to consuming wild animals such as bats, civets, pangolins, snakes, etc. The urban and rural people and different occupational groups were selected to reflect the objective reality. Furthermore, the Chinese government divided COVID-19 ridden areas into low-risk, medium-risk, and high-risk areas. Comparatively low-risk areas, the government implemented stringent market control and home restriction policies in medium and high-risk areas.

The high-risk areas comprised 25 households, which were not truly representative; therefore, low and medium risk areas were considered to meet the study objective. Questionnaires that were blank or invalid were excluded, and finally, 1250 valid questionnaires out of 1416 questionnaires were retained for analysis. Low risk and medium risk areas were comprised of 412 and 838 households, respectively. In the context of sample areas, 425 from Hubei, 399 from Hunan, and 426 from Guangdong households, accounting for 34.00%, 31.92%, and 34.08%, respectively, were chosen. As per individual characteristics, the sample consisted of 824 male household heads, accounting for 65.92% of the total sample. Regarding age, 420, 425, and 405 sample respondents belonged to age less than 40 years, 40 to 60 years, and above 60 years, accounting for 33.60%, 34.00%, and 32.40% of the sample areas, respectively. A total of 812 households had more than nine years (high school) of education, accounting for 64.96%. Thus, the sample selected in this study showed good typicality and representativeness.

3. Variable selection

3.1. Dependent variable

Wild animals fall under the category of animal species in peril of extinction due to dramatic changes in the environment and the expansion and progress of human activities [15]. Because of the variety of wild animal products such as meat, blood, fur, etc., and significant differences in residents' consumption behavior such as eating, drinking, wearing, etc., the questionnaire only encompassed those products that could be used to satisfy the basic need of food, i.e., meat. So individuals consuming wild animals for meat purposes are only selected in the current study. Consumption willingness is an indicator that reveals peoples' consumption under unconstrained conditions, so WCWA and AWP are used as the dependent variables in the present study. The measurement of variables with assigned values is portrayed in Table 1.

3.2. Independent variable

The independent variable is COVID-19, characterized by the severity of COVID-19 in different areas (low-risk and medium-risk regions).

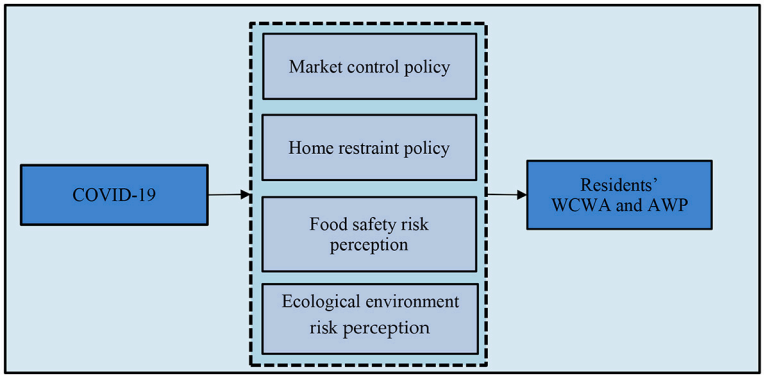

Fig. 1. Research framework operationalized in the current study.

Table 1
Measurement of variables with their descriptive Statistics.

Variables	Measurement of variables	Mean	Std. error
Dependent variables			
WCWA	Willing = 1, unwilling = 0	0.3920	0.1705
AWP	Amount willing to pay (USD/year)	134.6500	14.1702
Independent variables			
COVID-19	Severity of COVID-19 (medium-risk area = 1, low-risk area = 0)	0.6704	0.2022
Control variables			
Gender	Male = 1, female = 0	0.6592	0.2006
Age	Actual age (years)	49.1425	3.8023
Education level	Actual years of schooling (years)	9.1014	1.2725
Family income	Net household income in the last year (USD)	4315.1220	196.2516
Consumption time	Amount of time eating wild animals (years)	16.7512	3.2028
Face perception	Is eating wild animals a symbol of social identity? (yes = 1, no = 0)	0.7021	0.2032
Nutritional awareness	Does wild animal meat have higher nutritional content? (1 = completely unlikely, 5 = completely likely)	3.8192	1.2024
Urban or rural area	Area of residence (urban = 1, rural = 0)	0.5825	0.1011
Mediating variables			
Market control policy	How many wild animal trading markets have been canceled around you?	3.1612	0.0927
Home restriction policy	How many hours do you spend indoors every day?	16.1012	4.2935
Ecological environment perception	Do you think banning the consumption of wild animals will help improve the ecological environment?(1 = completely impossible, 5 = completely possible)	3.0128	1.0626
Food safety risk perception	Do you think that prohibiting the consumption of wild animals will help maintain food safety? (1 = completely impossible, 5 = completely possible)	4.1025	1.4070
Regional dummy variable			
Does are you located in Hubei?	Yes = 1, No = 0	0.3400	0.0925
Does are you located in Guangdong?	Yes = 1, No = 0	0.3408	0.0910

Residents of low-risk areas are regarded as the control group, and medium-risk areas are taken as the treatment group. There were differences between low and medium-risk areas. The government implemented more stringent policies such as market control and home restriction policies in medium-risk areas. The peoples' perceptions concerning the ecological environment and food safety risk had further altered the WCWA and AWP. Therefore, this study also explored the mediating effects of market control & home restriction policies and peoples' perceptions of the ecological environment and food safety risk between COVID-19 and WCWA and AWP. The measurement of the desired variables employed in the study with assigned values is shown in Table 1.

3.3. Control variables

The study also encompassed control variables such as gender, age, educational level, family income, consumption time, face perception, nutritional awareness, and urban or rural areas. Compared to male household heads, female household heads act as the major players in making decisions about household food consumption [23]. The older the head of the household, the more inclined to the local food patterns [24]. Similarly, families having a low educational level have weaker perceptions of the ecological environment and food safety risk [25]. Household income is also an essential factor in food consumption & expenditure behavior [26]. The time of consumption is a crucial indicator of food culture [27]. Peoples' dietary consumption choices are closely related to face perception [28]. Compared to rural residents, urban residents' food consumption structure is more rational [29]. Regions such as Hubei and Guangdong were taken as dummy variables, and Hunan was taken as a control group. The descriptive statistics of all control variables are presented in Table 1.

3.4. Statistical analysis

3.4.1. Probit and Tobit model

In this study, we have employed a probit model to analyze the effect of COVID-19 on peoples' WCWA. The model is set as follows:

$$Prob(decision = 1|COVID-19, X) = \varphi(\alpha + COVID-19\beta + X\theta + \varepsilon) \quad (1)$$

where *decision* indicates WCWA; *decision* = 1 means people are willing to consume wild animals and *decision* = 0 means they are not. COVID-19 is the core independent variable. X represents the control variables, β and θ indicate the coefficient estimation vector of the regression model and ε represents the error term. $\varphi(\cdot)$ is the probability function of the normal distribution.

Based on the analysis of WCWA, it was necessary to analyze peoples' AWP as AWP that can better reflect the propensity to consume wild animals. Moreover, the notion of AWP may provide the basis for the government to implement strict penalties in the future. If the imposed amount on consuming wild animals is lower than that of AWP, residents may risk exploiting wild animals illegally. Therefore, this study also explored the effect of COVID-19 on peoples' AWP by employing the Tobit model. The study model is formulated as follows:

$$\begin{cases} degree^{*} = \alpha + COVID-19\gamma + X\rho + \varepsilon \\ degree = max(0,\ degree^{*}) \end{cases} \quad (2)$$

where deg ree* represents the AWP, and γ ρ are the coefficient and the other variables are the same as in Eq. (1).

4. Mediating effect model

The study also explored the mediating effect of market control & home restriction policies and ecological environment & food safety risk perception by following the approach suggested by Wen et al. [30]. The hierarchical regression method is used to establish the relationships among variables. The model is structured as follows:

$$\begin{aligned} Y &= cX + e_1 \\ M &= aX + e_2 \\ Y &= c'X + bM + e_3 \end{aligned} \quad (3)$$

where X represents the independent variable, M represents the mediating variables, and Y represents the dependent variable.

5. Results

5.1. COVID-19 and peoples' willingness to consume wild animals

Peoples' WCWA and AWP are likely to be correlated, so the Heckman test is used to address this issue which may otherwise lead to biased results. Based on the independence test results (*rho = 0*), the null hypothesis of two-way independence is accepted, so the Probit and Tobit models are found more appropriate to analyze the effects of COVID-19 on peoples' WCWA and AWP. The results in Table 2 showed that comparatively Model 1, the LRχ^2 value of Model 2 is more significant, with 34.42 at a 1% level of significance. Comparatively Model 3, the

Table 2
Estimated effects of COVID-19 on residents' WCWA and AWP.

Explanatory variables	WCWA		AWP	
	Model 1	Model 2	Model 3	Model 4
COVID-19	−0.3725***	−0.3122***	−19.2801	−16.2271
	(0.1160)	(0.1006)	(12.6002)	(10.9646)
Gender		0.0392**		9.8006
		(0.0187)		(6.0804)
Age		0.0649		8.2124
		(0.0482)		(9.0160)
Education level		−0.0914**		−2.9403***
		(0.0410)		(0.6723)
Family income		0.0685		3.2082***
		(0.0720)		(1.0411)
Consumption time		0.1101***		1.2625
		(0.0305)		(0.8024)
Face perception		0.0816*		4.8125**
		(0.0419)		(1.9011)
Nutritional awareness		0.1239*		1.7362**
		(0.0667)		(0.7809)
Urban or rural area		0.0593**		3.6922***
		(0.0268)		(1.2012)
Are you located in Hubei?		−0.0328***		−0.8285***
		(0.0080)		(0.2428)
Are you located in Guangdong?		0.0297		0.1867
		(0.0309)		(0.1501)
LR χ^2 value	31.67***	34.42***	42.12***	46.25***
Prob > F	0.0000	0.0000	0.0000	0.0000
Sample size	1250		1250	

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively. Values outside the parentheses represent the marginal effect values. Values in parentheses represent the standard error of robustness.

LRχ^2 value of Model 4 is also found significant, with 46.25 at a 1% level of significance. The likelihood estimation parameter showed that the model is a better fit with the addition of control variables and regional dummy variables.

After adding control variables and regional dummy variables, the marginal effect of COVID-19 is significantly reduced in model 2 compared to model 1, specifying that peoples' WCWA is also affected by other factors. However, compared to Model 3, the marginal effect of COVID-19 in Model 4 is not significantly changed. In particular, the COVID-19 reduces the probability of peoples' WCWA by 31.22%, but the impact on AWP is not found significant. Therefore hypothesis H_0 of "COVID-19 significantly reduces peoples' WCWA and AWP" is thus partially confirmed. The government in the medium-risk areas has implemented stringent policies in the market and imposed strict rules on the use of wild animals. Wild animals are prohibited for consumption as well as marketing [31]. Such factors made it nearly impossible for residents to consume wild animals, resulting in reduced WCWA. The government also widely publicized that wild animals' consumption causes COVID-19. Long-term consumption of wild animals may even deteriorate the ecosystem, prolong the epidemic, and adversely affect the food situation [32]. In this scenario, peoples' perceptions concerning the ecological environment and food safety risk are increased, and they are unwilling to consume wild animals. However, the average number of peoples' AWP is found at 134.65 USD, much lower than the consumption amount of 3048 USD of urban and rural residents in China in 2019. Thus, wild animal consumption has not yet constituted a significant part of household expenditure. Therefore, COVID-19 is not found influential in changing the peoples' AWP.

Some control variables also showed a significant effect of COVID-19 on peoples' WCWA. The WCWA of the male household head is found higher than that of the female household head by 3.92%. Although women in China are mainly responsible for purchasing meat products, men are keener to try new wild animal products. Moreover, a one-year increase in education decreases the WCWA by 9.14% and declines the AWP by 2.9403 USD. Thus, the higher the education level, the more awareness regarding the protection of wild animals, and the lower the WCWA. If wild animal consumption time increases by one year, the probability of WCWA increases by 11.01%. Thus, it is worthy to say that the longer the consumption time, the more consumption concepts and habits, and wild animal consumption thereby becomes an essential part of the diet structure. The WCWA and AWP of peoples with sharp face perceptions increase by 8.16% and 4.8125 USD, respectively. In Chinese culture, face perception is an essential aspect of conduct in social relations. Another reason for consuming wild animals is the perception that wild animal meat is free of pollution or chemicals and has higher nutritional value. So, if nutritional awareness is increased by 1 unit, WCWA and AWP are likely to increase by 12.39% and 1.7362 USD, respectively. Interestingly, although rural people are more likely to catch wild animals, urban peoples' WCWA and AWP are increased by 5.93% and 3.6922 USD, respectively, and their ability to pay is much higher than that of rural people. Compared to other regions, the WCWA and AWP of Hubei peoples are significantly lower than in other provinces. It reflects the fact that COVID-19 first erupted in Hubei Province, thus having a more profound effect on Hubei people behavior regarding wild animals' consumption.

5.2. Test results of mediation effect

The moderation results in the market control policy showed that the regression coefficient value of *b* is not significant. Still, the value of *a* is 0.3234 at a 10% significance level (see Table 3). Therefore, according to the *Sobel* test, the mediating effect of market control policy, i.e., 34.20% (0.0409/0.1196), implies that government intervention is essential in maintaining residents' consumption promotion of social welfare [33]. As wild animal meat does not follow health inspection processes, repealing the wild animal trade and reducing peoples' WCWA are essential measures to reduce people's reliance on wild animals. In the context of home restriction policy, the regression coefficients of both *a* and *b* are significant, and *c'* is substantial. It indicates that the mediating

Table 3
Mediating test results.

Test steps	Coefficients	Std. error	*P*-value
Market control policy			
First step	c = 0.1196***	0.0292	0.000
Second step	a = 0.3234**	0.1399	0.021
Third step	b = 0.0985	0.1101	0.221
	c′ = 0.1031***	0.0301	0.000
Sobel test	0.0316***	0.0101	0.000
Direct effect	0.0787**	0.0391	0.012
Indirect effect	0.0409***	0.0101	0.000
Total effect	0.1196***	0.0292	0.000
Home restriction policy			
First step	c = 0.1196***	0.0292	0.000
Second step	a = 0.2021*	0.1154	0.061
Third step	b = 0.1641**	0.0774	0.023
	c′ = 0.0931**	0.0437	0.019
Ecological environment risk perception			
First step	c = 0.1196***	0.0292	0.000
Second step	a = 0.1705	0.1399	0.261
Third step	b = 0.1284**	0.0558	0.023
	c′ = 0.0732***	0.0229	0.000
Sobel test	0.0292***	0.0932	0.000
Direct effect	0.1101***	0.0311	0.000
Indirect effect	0.0095*	0.0126	0.000
Total effect	0.1196***	0.0292	0.000
Food safety risk perception			
First step	c = 0.1196***	0.0292	0.000
Second step	a = 0.1234**	0.0536	0.021
Third step	b = 0.0985**	0.0460	0.221
	c′ = 0.1031***	0.0302	0.000

Note: *, **, and *** represent significance at the 10%, 5%, and 1% levels, respectively.
Conceptual framework.

effect of home restriction policy is 27.73% (0.2021*0.1641/0.1196). The home restriction policy also emerged as an essential measure and was encouraged by World Health Organization [3]. It reduces the horizontal transmission of the virus between people and cuts off vertical transmission between wild animals and humans. As such, the home restriction policy is proven to reduce the possibility of peoples' consumption of wild animals and gradually improve dietary culture.

Regarding perceptions of ecological environment risk, the regression coefficient *a* is not significant, but *b* is 0.1284, which is substantial at a 5% significance level. Therefore, according to the *Sobel* test, the mediating effect of ecological environment risk perception is 7.94% (0.0095/0.1196). It suggests that wild animals are an essential part of the ecosystem [34]. Looking back over SARS in 2003, it is apparent that humans' overexploitation of wild animals adversely affects the economy. The outbreak of COVID-19 again raised peoples' perceptions of ecological and environmental risk, stimulating their awareness towards wild animals' protection. In terms of food safety risk perception, the values of the regression coefficients *a* and *b* are both found significant, and *c'* is substantial. It indicates that the home restriction policy's mediation effect is 10.16% (0.1234*0.0985/0.1196). Overall findings of the current study depict that wild animals possess many viruses; among them, people's long-term consumption may cause some viruses to continually mutate and seriously jeopardize food safety [35], resulting in infectious disease outbreaks. Therefore, it is apparent that the outburst of COVID-19 has effectively reduced peoples' WCWA. In summary, all hypotheses such as H_1, H_1, H_3, and H_4 are confirmed.

6. Discussion

It has been discussed in the existing literature that the protection of wild animals is essential for the harmonious coexistence of humans and nature [36,37]. But stemming from various factors such as the geographical, environmental, and food culture, wild animals, have been an essential part of many people's diet structure [38,39]. However, such wild animal consumption has created several challenges for international public health due to the outbreak of infectious diseases [40]. From the SARS epidemic in 2003 to COVID-19, studies have confirmed that the coronavirus originated from wild animals and acted as viral hosts. And the human consumption of certain types of wild animals serves as a possible intermediate host [41,42], leading to global infectious disease [43]. Therefore, examining COVID-19's effect on peoples' WCWA can provide guidelines for policymakers to prevent contagious diseases in the future. Moreover, the government's strict regulations are also essential to combat people's consumption willingness [31,44].

In this study, it is found that COVID-19 significantly reduces the peoples' WCWA. Specifically, the probability of WCWA in medium-risk areas is lower than in low-risk areas, which is generally consistent with the related declaration reported by the State Council (2020) [45]. However, it is found that COVID-19 not significantly reduces the peoples' AWP. Just it is explained that AWP is much lower than the daily household consumption expenditure of residents. Of course, this explanation is only given from the perspective of economic consumption theory. In practice, peoples' wild animal consumption is irrational and closely related to dietary habits, so many studies have proven the analysis from cultural economics and sociology [46,47]. Consequently, peoples' consumption decision-making behaviors result from internal and external factors act together [48].

The respondents' individual and demographic characteristics further showed that women in China are reluctant to consume new wild animals. The results correspond well with the earlier study of Shi et al. [49], who also found that comparatively women, men are more willing to take the risk of buying wild animals. It is found that more educational level results in lowering WCWA as individuals can grasp the hazardous effects of consuming wild animals with increased education. According to Wang et al. [50], education level is of great significance to improve the peoples' dietary structure. Moreover, in Chinese culture, face perception can influence individual behavior to recognize and appreciate others. It may sometimes cause people to choose products they do not want [51]. Additionally, our research further confirmed the findings of Lu [52], who stated that residents have deviations in the nutritional awareness of wild animals and believe that wild animals do not necessarily have unique nutritional value.

Moreover, the mediation results further showed that market control policies act as a mediator between COVID-19 and its effect on WCWA. The reduction of WCWA in medium-risk areas is because the government banned the wild animal market and reduced the frequency of human–wild animal interaction. The mediating effect of the home restriction policy indicates that the system is strictly followed in medium-risk areas. The wild animal consumption is sluggish, and the wild animal trading chain is cut off from the demand side. The results in the context of perceptions of ecological environment risk have shown lesser effects and inferred that if peoples' perceptions of environmental risk are lower, it may not influence the WCWA. The mediating role of food safety risk perception further indicated that people are unaware that wild animals carry many viruses and can lead to infectious diseases [53,54]. The mediating effects of market control and home restriction policies are more nuanced. It deliberated that the home restriction policy can efficiently lessen the possibility of peoples' consumption of wild animals. It suggests that wild animals are an essential part of conserving the ecosystem [34]. Looking back over SARS in 2003, it is concluded that humans' overexploitation adversely affects the economy.

7. Conclusions and implications

The present study explored the effect of COVID-19 on Chinese peoples' willingness to consume wild animals (WCWA) and the amount of willingness to pay (AWP). It is found that COVID-19 significantly reduced the peoples' WCWA and AWP. Moreover, the effect of COVID-19 on peoples' WCWA through market control and home restriction policies is exceptionally significant. In contrast, the impact of perceptions of the ecological environment and food safety risk perception is relatively weak. The results infer that lax market control and the home restriction policy can increase wild animal consumption risk. The study also confirmed that government control measures in china are effective but have short-term effects. Moreover, supporting residents to abandon wild animals' consumption and improve their dietary structure are necessary measures required by the government to curb COVID-19 and other related outbursts of infectious diseases in the future.

Restricting wild animal consumption has universal relevance. In this vein, the results indicate that government should strengthen and develop wild animal protection laws and regulations to inform residents about the consequences of consuming wild animals. The government should provide awareness to the masses through print and electronic media. Moreover, the government should strictly prohibit the illegal marketing of wild animal products, punish violators, and create a suitable environment for curbing wild animal consumption worldwide.

Availability of data and materials

The datasets generated and analyzed during the current study are not publicly available but are available from the corresponding author on reasonable request.

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Consent for publication

Not applicable.

Competing interests

The authors declare that they have no competing interests.

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