

Comprehensive Evaluation of Community Public-Health-Safety Resilience Based on Entropy-TOPSIS Method

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Abstract: With China's entry into the stage of normalization of pandemic prevention and control, some "one size fits all" so-called "hard core" pandemic control in some communities exposed the weakness of community public-health safety & resilience. It was urgent to define a set of evaluation index systems of community public health safety resilience to guide the community in handling pandemic prevention and control, management services, and economic and social development. This paper constructed a security & resilience evaluation index system for community public health from the dimensions of "pandemic prevention and control," "economic and social," "livelihood security," and "reflective learning." Based on the survey data of 31 provincial administrative regions in China, the entropy weight TOPSIS method was used for comprehensive evaluation. Although this study attempted to construct a set of security & resilience index systems, it was not easy to cover all the local differences and diversity of the communities.

1. Introduction

Since the 21st century, China has been suffering from pandemic disasters. In 2003, 919 people died of SARS globally, including 349 in the mainland of China.^[1] Since 2013, there have been more than 1000 cases of seasonal human infection with H7N9 avian influenza in China. In January 2017, 192 cases of human infection and 79 deaths were reported. The pandemic of covid was one of the most challenging global public health emergencies encountered by human society in the past 100 years. Till 24:00, March 29, 2021, the cumulative number of cases in mainland China has reached 90190, with 4636 deaths. The cumulative number of foreign cases has reached 127581652, with 2791072 deaths. The pandemic situation of covid was still spreading worldwide, and there was a long-term trend of coexistence with human beings. The global economy and society were facing more unknown uncertainties and challenges. Pandemic prevention and control had become a worldwide battle to safeguard public health, safety, human life and health, and economic prosperity and development, which was related to the future and destiny of humankind. In the stage of normalization of pandemic prevention and control, how to ensure the health and safety of residents and realize the sustainable development of the economy and society was a significant practical problem to be solved.

"Urban and rural communities as micro control units, residential areas as the spatial-scope management target, to layout source control tactics" pandemic prevention and control strategy was China's response to the COVID pandemic, a critical score China got in the historical examination. More than 4 million community workers have been working in 650000 grassroots communities around the country day and night, making significant contributions to anti-pandemic achievements in China. However, due to the weakness and complexity of the community pandemic prevention foundation, there were some problems in some communities, such as "one size fits all" pandemic prevention work and "incremental restrictions layer by layer" pandemic prevention measures. Especially in the pandemic normalization control stage, it was difficult to adjust the pandemic control measures scientifically and flexibly. It was challenging to coordinate all the factors, including people's livelihood, safety, security, and economic and social development. For example, in Hebei, Heilongjiang, and other places, when the outbreak of local clustering cases, some grassroots communities in the Spring Festival were about to enter the peak, without authorization, "incremental restrictions layer by layer," or even "one size fits all" ban on returning home.

The pandemic highlighted that grassroots communities were the first line of risk prevention and control and the problem of resilience construction of public health safety in grassroots communities. It should not only prevent and control complex and diverse sudden risk challenges but also recover from the impact of catastrophe risk and realize innovation constantly adapting to changes.

Communities rely on resilience building as fundamental social units to determine whether it can be more sensitive, efficient, and cost-effective. In reality, the pandemic prevention measures in grassroots communities in China belong to the category of "Engineering" to a certain extent. The attention resources of community residents' autonomy and multi cooperation need to be tilted. When China entered the normalization covid control stage, the Chinese government repeatedly proposed that the communities coordinate pandemic control with economic and social development and adhere to the organic combination of precise normalized control and local emergency response. Moreover, they should timely adjust measures^[2] according to the pandemic situation and convey the new requirements of the Chinese government on improving community resilience. However, with the "hard core" prevention and control, some communities could not effectively implement the central government's major deployment. Community resilient pandemic control emphasized that communities can fully link the resources inside and outside, play the full role of the residents, and adjust the measures according to the actual situation to coordinate the control measures with people's livelihood, safety, and economic and social development. Furthermore, to achieve innovation when adapting to the changes. This study designed an evaluation index system of community public-health safety resilience to evaluate and analyze the resilience situation.

2. Design of Evaluation Index System of Community Public-Health Safety Resilience

The concept of "resilience" originated in the field of physics. It originally referred to the characteristics that matter was not easy to break and damage in deformation. It became an essential concept of ecology in the 1970s. In the 1980s, resilience was introduced into psychology, and the study of resilience turned from environment to human. In the 1990s, the study of resilience changed from individual and psychology to group and culture.^[2] From the perspective of the research context, the connotation and extension of resilience were constantly improving. From paying attention to the resilience of the system to emphasizing the adaptive development ability of the system, it has gone through the development process from "engineering resilience" to "ecological resilience," and finally to "evolution resilience"^[3]. In recent years, the concept of resilience has been widely used in urban community risk management, and the *Resilient Community* has become one of the most concerning research topics in the field of grassroots governance. A resilient community was dynamic^[4] based on

joint community action, integrated internal and external resources, effectively responds to risks and disasters, and quickly recovered from harmful impacts to realize sustainable development. This concept highlighted that resilient communities could prevent and control complex and diverse disaster risks. It could also recover from the impact of disaster risk and realize the meaning of innovation in adapting to changes constantly.

There were two main types of community resilience assessment indicators. One was to focus on community capacity and resources. The Federal Emergency Management Agency (FEMA) proposed community resilience assessment indicators, including essential community ability, risk management and rescue action ability, and post-disaster recovery and reconstruction capacity. They all depended on the community resources with dynamic characteristics. The United Nations Development Program (UNDP) constructed a community resilience assessment system^[4] from the perspective of capital and capacity. These evaluation models usually covered the community's existing resources, the community's ability to obtain external resources, and the potential for development and transformation. The second was comprehensive indicators, among which the most representative was the Baseline Resilience Indicator for Communities, which was based on the Drop model proposed by Cutter^[5]. It considered the social environment index, such as the social capital index, social organization index, etcetera.

Generally, most current scholars focused on the single dimension evaluation index or established a comprehensive evaluation index from their own disciplines' perspectives. The evaluation index was relatively scattered to a certain extent and tends to the aspect of engineering disaster. Therefore, it was urgent to design a localized evaluation index system that can fully reflect the resilience of community public-health safety. It could also apply to public health and safety prevention and control. Based on existing research, this study combined the Chinese government's emphasis on "coordinating and working in the normalization of pandemic prevention and control and management services" and "striving for the double victory of pandemic prevention and control and economic and social development" Four dimensions named daily life, economic order, pandemic prevention& control, and reflective learning were selected to measure and describe the resilience of community public health safety. Among them, daily life meant that the community meets the daily living conditions of the residents, the economic order was to stabilize the economic and social development, the pandemic prevention and control was the regular and accurate prevention and control of the pandemic situation, and reflective learning was to summarize and learn the experience of pandemic prevention and control in the community. The index values followed the 5-point Likert scale and were assigned to 1-5, which means very poor, relatively poor, average, relatively good, and very good. On this basis, the entropy weight method was used to calculate the weight of each dimension. It was found that each dimension strongly correlated with the resilience of community public health security.

The selection of indicators affected the objectivity and rationality of quantitative evaluation. Therefore, it was necessary to select and screen the indicators scientifically and reasonably. In order to test the scientificity and practicability of the preliminary evaluation index system of community public health safety resilience, this study conducted expert consultation, combined with expert opinions and practical experiments. Some indicators that did not meet the requirements were adjusted and replaced to achieve the expected effect. Finally, through the steps of establishing the hierarchical structure, constructing a pairwise judgment matrix, and consistency test, the combined weight of each level factor to the overall goal was calculated and sorted. Finally, four indicators, namely, daily life, economic order, pandemic prevention & control, and reflective learning, were determined, covering 12 secondary indicators (as shown in table 1).

Table 1. Evaluation indexes of community public health safety resilience

Primary indexes	Secondary indexes	Third level indexes
Pandemic prevention and control	Accurate prevention and control by division and classification	According to the actual risk level, timely adjust the situation of pandemic prevention and control measures
	Precise prevention and control according to local conditions	According to the actual situation of a community, carry out differentiated prevention and control according to local conditions
	Normalization of pandemic prevention and control	Ensure the scientific prevention & control, and precise implementation of policies under the regular operation of the community
social and economic	Transportation	To what extent and scope the pandemic situation affects transportation
	Product supply	The quantity, type, and channel of product supply affected by the pandemic situation
	Price level	The price fluctuates abnormally, and the price is unreasonably affected by the pandemic situation
Livelihood security	Necessities of life	Convenience, accessibility, and satisfaction of daily necessities of life
	Medical care for the elderly	The regular order and security level of elderly medical treatment affected by the pandemic situation
	Consumer entertainment	Regular entertainment consumption, places, and behaviors affected by the pandemic situation
Reflective learning	Summarize experience	According to the spirit of the Central Committee and practical problems, summarize their prevention and control experience
	Learn advanced experience	Take the initiative to learn from the advanced experience of precision pandemic prevention in other places
	Identify existing problems	Take measures to prevent, identify, warn and solve problems

3. Evaluation Data and Tools

3.1. Evaluation Data

The survey method of this study combines stratified sampling and random sampling. First, a city (31provinces×1city) was randomly selected from each province, and sampling cities should consider economic development level and city size. Secondly, 10 communities (31provinces×1city×10communities) were randomly selected in each city. In order to make the sample more comprehensive and rich, the choice of community was both urban community and rural community. Finally, 70 residents and community-related staff in each selected community were randomly selected (31provinces×1city×10communities×70staff) as samples. In order to obtain a more in-depth survey on pandemic prevention, the questionnaire was mainly used to obtain more detailed information. Due to the need for pandemic prevention and control, an Online survey was the primary data collection method, and an in-person interview survey was an auxiliary. Considering the relative uncertainty of the online questionnaire survey, the research group randomly selected 10% of the respondents to conduct a follow-up visit to test the quality of the questionnaire data to ensure its reliability. A total of 2170 questionnaires were distributed. After 58 invalid questionnaires were manually screened out, 2112 valid questionnaires were finally collected. The effective rate reached 97.3%, meeting 90% of the questionnaire efficiency requirements.

3.2. Data Analysis

Geographical, the number of effective samples in the East, central and western regions accounted for 46%, 24%, and 30%, respectively. In terms of age distribution, most of the respondents were young adults aged 18-40 years old, and a small number of middle-aged and young people. In terms of household registration, although most of the respondents lived in urban areas, there was a slight difference in the proportion of rural and urban hukou (residence registration). Most of the respondents had a bachelor's degree or above (accounting for 59.66%), junior college and higher vocational education accounted for 28.37%, and junior high school and below accounted for 11.97%. The educational level of the respondents was generally good. In terms of occupation, the interviewees' occupations were widely distributed. Generally speaking, the sample was highly representative.

3.3. Evaluation Tools

There were many mature assessment tools and frameworks for community resilience, such as Renschler, who put forward a people assessment system and built a comprehensive analysis framework and calculation model based on this but tended to use quantitative data. Some of the evaluation methods were too simple to explain the complex situation. Depending too much on experts' subjective opinions caused deviation from the actual situation. After the comparative analysis of various evaluation methods, the entropy weight TOPSIS with higher availability, measurability, and scientificity was selected as the evaluation method. Entropy TOPSIS was a comprehensive evaluation method that combines the entropy and TOPSIS methods. Its logic principle was that the entropy weight method gave objective weight to each object. Then the TOPSIS method was used to measure the distance between different object index values to evaluate the optimal solution. Finally, the evaluation steps were completed by sorting the objects to be evaluated according to the distance value. The operation process of the Entropy TOPSIS method was convenient and straightforward, and it could apply to the requirements of comprehensive and diverse national community assessment and significant data processing.

3.4. Assessment Process

3.4.1. Standardized matrix

Assuming that the original data matrix of post community public health safety resilience is:

$$V = \begin{bmatrix} v_{11} & v_{12} & \cdots & v_{1n} \\ v_{21} & v_{22} & \cdots & v_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ v_{m1} & v_{m2} & \cdots & v_{mn} \end{bmatrix} \quad (1)$$

In order to obtain the standardized matrix, the normalization method could be used to process the original data. Therefore, the standardized processing method is shown in formula (2), and the standardized matrix is shown in equation (3).

$$r_{ij} = \frac{v_{ij} - \min(v_{ij})}{\max(v_{ij}) - \min(v_{ij})} \quad (2)$$

$$R = \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1n} \\ r_{21} & r_{22} & \cdots & r_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ r_{m1} & r_{m2} & \cdots & r_{mn} \end{bmatrix} \quad (3)$$

In the formula, V is the initial evaluation matrix, and v_{ij} was the initial value of the j th index of the i th interviewee; R is the standardized evaluation matrix, and r_{ij} was the standardized value of the j th index of the i th interviewee; $i = 1, 2, \dots, m$, m is the number of respondents; $j = 1, 2, \dots, n$, n is the number of evaluation indexes.

3.4.2. Calculate the entropy

The entropy e_i of interviewee i calculates as follows:

$$e_i = -k \sum_{j=1}^n p_{ij} \cdot \ln p_{ij} \quad (4)$$

Where the adjustment coefficient,

$$k = \frac{1}{\ln n}, \quad p_{ij} = \frac{r_{ij}}{\sum_{j=1}^n r_{ij}}$$

3.4.3 Determination of entropy weight

The entropy weight method can effectively consider the variation degree of indicators and objectively reflect its importance. The calculation formula of entropy weight shows in formula 5:

$$w_i = \frac{1 - e_i}{m - \sum_{i=1}^m e_i} \quad (5)$$

3.4.4. Construction of evaluation matrix based on entropy weight

In order to further improve the objectivity of the resilience evaluation matrix of community public health safety, with the aid of the weighted idea, the weighted standardized evaluation matrix Y is constructed using the entropy weight w_i , and the formula (6) is the calculation for Y .

$$Y = \begin{bmatrix} y_{11} & y_{12} & \cdots & y_{1n} \\ y_{21} & y_{22} & \cdots & y_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ y_{m1} & y_{m2} & \cdots & y_{mn} \end{bmatrix} = \begin{bmatrix} r_{11} \bullet w_1 & r_{12} \bullet w_1 & \cdots & r_{1n} \bullet w_1 \\ r_{21} \bullet w_2 & r_{22} \bullet w_2 & \cdots & r_{2n} \bullet w_2 \\ \vdots & \vdots & \ddots & \vdots \\ r_{m1} \bullet w_n & r_{m2} \bullet w_n & \cdots & r_{mn} \bullet w_n \end{bmatrix} \quad (6)$$

3.4.5. Determination of positive and negative ideal solutions

Let Y^+ be the maximum value of the i th interviewee in the j index in the evaluation data, called the positive ideal solution; Y^- is the minimum value of the i th interviewee in the j th index in the evaluation data, which is called a negative ideal solution. Its calculation method shows in formula 7 and formula 8:

$$Y^+ = \left\{ \max_{1 \leq i \leq m} y_{ij} \mid i = 1, 2, \dots, m \right\} = \{y_1^+, y_2^+, \dots, y_m^+\} \quad (7)$$

$$Y^- = \left\{ \min_{1 \leq i \leq m} y_{ij} \mid i = 1, 2, \dots, m \right\} = \{y_1^-, y_2^-, \dots, y_m^-\} \quad (8)$$

3.4.6. Distance calculation

In this paper, Euclidean distance is used as the distance calculation formula. Let D_j^+ be the distance between the i th interviewee and y_i^+ , and D_j^- be the distance between the i th interviewee and y_i^- . The specific calculation formulas show in formulas 9 and 10.

$$D_j^+ = \sqrt{\sum_{i=1}^m (y_i^+ - y_{ij})^2} \quad (9)$$

$$D_j^- = \sqrt{\sum_{i=1}^m (y_i^- - y_{ij})^2} \quad (10)$$

3.4.7. Calculation of closeness degree between evaluation object and ideal solution

Let it be the closeness degree of the j th index, and the value range is between 0 and 1. When $T_j=0$, the resilience is the worst; When $T_j=1$, community public health safety resilience is the best. The calculation formula of community public health safety resilience is shown in equation (11).

$$T_j = \frac{D_j^-}{D_j^+ + D_j^-} \quad (11)$$

4. Assessment Results and Analysis

According to the above formula, the resilience index of community public health safety in China calculates using MATLAB, and the resilience index of community public health safety in eastern, central, and western regions calculates by division.

4.1. Overall Assessment

In a high-risk society with the superposition of emerging technology risks, the communities were the first place for risk formation, disposal, and post recovery^[6]. However, the existing community governance model was challenging to cope with major sudden risk challenges. In recent years, resilient governance has become the focus of "resilient city" and "resilient community" in order to resist the vulnerability of the city (community) under the risk society and overcome the limitations of the previous bureaucratic, rigid governance^[7]. According to the calculation, the closeness degree C_i of community public health safety resilience was 0.4539, which was a general state, indicating that the current situation of the resilience of public health safety in China's communities still needs to be improved. It was mainly manifested in the incompatibility between the static nature of the community governance model and the strangeness of community emerging risks, the decentralization of community governance resources, and the dynamic changes of sudden risk challenges^[8]. In the early stage of the outbreak, local communities attached great importance to the prevention and control of the pandemic and took strict prevention and control measures to block the spread of the pandemic effectively. After entering the stage of normalization of pandemic prevention and control, some

communities, driven by the complexity of coordinating pandemic prevention and control, people's livelihood security and economic and social development, and the awareness of avoiding administrative accountability, selectively downplayed the practical needs of coordinating pandemic prevention and control and management services, and eliminated the responsibilities and risks that they should bear in the way of "incremental restrictions layer by layer."

4.2. Urban and Rural Assessment

As shown in Table 2, the closeness degree of rural community public health safety resilience $C_i(0.4579) >$ that of urban area $C_i(0.4539)$, the rural community's public health security resilience was slightly better than the urban community's. The reason was that the agricultural social space was stable, and the rural residents could realize the social time orderly and make sufficient preparation for the high annual yield of agriculture^[6]. Community public health safety resilience was not only the response and disposal of significant public health risk challenges but also emphasized the governance of all kinds of human risks in the community field to strengthen resilience. The rural community was "born by the soil" and can achieve self-sufficiency in production and life. In contrast, people's livelihood materials in urban communities rely on external supplies. Too rigid pandemic prevention measures were easy to hinder economic development, and livelihood security was challenging to guarantee. In addition, community resilience not only attached importance to the construction of safety and prevention and control oriented infrastructure, but it also paid attention to the maintenance of harmonious neighborhood relations, the construction and extension of community social networks, and the restoration and reconstruction of community belonging, cohesion and community consciousness^[9]. An urban community belonged to a "stranger community" to a certain extent, and residents' emergency knowledge and quality for self-help, mutual rescue, and disaster prevention and mitigation were relatively deficient. However, it should be noted that weak infrastructure and lack of professionals affect the resilience of rural community public health security, which was also the focus of future rural community improvement.

4.3. Regional Assessment

As shown in Table 2, the closeness degree of community public health safety resilience in Central China $C_i(0.4604) >$ that of the eastern region $C_i(0.4560) > C_i(0.4544)$ in the eastern region, which was closely related to the economic base, pandemic impact, and attention degree of different regions. There was a great imbalance in community development in China, especially in urban areas with backward economic development and weak community infrastructure construction in remote villages and towns^[10]. The results showed that the resilience of community public safety in Central China ranks first. It was closely related to the reality of pandemic centrality in Wuhan. Although the pandemic first hit the central region, the Chinese government gathered the strength at home and abroad to ensure the people's livelihood and took adequate measures to control the pandemic. Especially the front-line command and comprehensive guidance of the central steering groups in Wuhan and other places with the brutal pandemic have played critical roles. In the short term, they have curbed the spread of the pandemic, ensured the people's livelihood, and restored the economic and social order. The critical experience of the grassroots community to deal with risk was implementing the emergency management of "better prepared not used, than not available when needed," which needs to pay attention to the coupling of multiple dimensions^[11]. The eastern region has a more significant population density and economic volume than the other two regions. The overall economic and social development was greatly affected, and the resilience of community public health security was weak. However, the western region was also faced with the problem of insufficient medical resources due to the weak economic foundation and the small economic volume

affected due to the lack of large-scale outbreaks of the pandemic.

4.4 Assessment by Dimensions

As shown in Table 2, the closeness degree C_i of each dimension of community public health safety resilience was not balanced, pandemic prevention and control (0.5066) > economic and social (0.4668) > livelihood security (0.4407) > reflective learning (0.4016). After the outbreak of covid, the Chinese government always stressed people's lives and health in the prevention and control of the pandemic and made every effort to ensure the needs of the people's livelihood in the community. China's economic and living order can be stabilized through measures such as unblocking transportation channels, logistics distribution, and stabilizing prices. To a certain extent, both pandemic prevention & control and economic and social order recovery and development were considered. However, there were still deficiencies to be improved. For example, when the Spring Festival transportation in 2021 was about to enter the peak period, some communities increased their restrictions at different levels. They even implemented a "one size fits all" ban on returning home. After a year's battle with the pandemic, some grassroots communities returned to the elementary level of "incremental restrictions layer by layer." Self-reflection and learning due to disasters have always been the unique historical gene of the Chinese nation. It was a crucial weapon for the Chinese government to win the battle of pandemic prevention and control.

Because it was good at summing up and learning that the Chinese government has adopted the strategy of "crossing the river by feeling the stones," constantly "touching," and taking the initiative to "cross the river." It not only dynamically analyzed the situation of pandemic prevention and control according to the feedback information from previous practice but also made flexible and decisive decisions according to the changing situation of the pandemic situation and adequately adheres to the "two pronged" strategy of pandemic prevention and control and economic and social development, to achieve the "double victory" of pandemic prevention & control and economic & social development, and ensure the realization of the goal of building a moderately prosperous society in an all-round way on schedule. In particular, local community pandemic prevention work faces internal inspection and external supervision, so the community has to timely, even actively summarize and reflect on the pandemic prevention and control measures and adjust the measures accordingly. Nevertheless, it was also noteworthy that due to the impact of the pandemic situation, the input of external resources in some grassroots communities was blocked, and the internal covid material reserve was rugged to effectively link and integrate the resources around the community due to the lack of standardized institutional arrangements. As a result, some communities were short of livelihood materials, and the flow of personnel was hindered, resulting in the low economic order and livelihood security resilience index.

Table 2. Assessment of community public health safety resilience

Index Region	Daily life		Economic order		Pandemic prevention & control		Reflective learning		Overall	
	w	Ci	w	Ci	w	Ci	w	Ci	Ci	
Urban	0.1324	0.4432	0.1447	0.5161	0.5733	0.4389	0.1495	0.4347	0.4539	
Rural	0.1874	0.4600	0.1835	0.5027	0.2104	0.4340	0.4186	0.4494	0.4579	
Overall	0.1512	0.4501	0.1642	0.4289	0.1759	0.5148	0.5085	0.4238	0.4544	
Urban	0.2203	0.4750	0.2560	0.3793	0.2777	0.3635	0.2460	0.4392	0.4142	
Rural	0.2066	0.4484	0.2331	0.3749	0.2732	0.3364	0.2871	0.4895	0.4123	
Central	Overall	0.1683	0.4644	0.1775	0.5347	0.2036	0.4248	0.4505	0.4178	0.4604

	Urban	0.2246	0.4816	0.2727	0.3813	0.2312	0.4148	0.2715	0.4420	0.4088
	Rural	0.2119	0.5224	0.2246	0.3762	0.2835	0.3535	0.2800	0.4576	0.4305
Western	Overall	0.1966	0.4468	0.1911	0.4845	0.2147	0.4362	0.3976	0.4564	0.4560
	Urban	0.1939	0.4769	0.2444	0.3638	0.2659	0.3291	0.2958	0.4654	0.4299
	Rural	0.1810	0.5335	0.2856	0.4254	0.2495	0.3502	0.2839	0.4129	0.4274
Overall		0.2461	0.4407	0.2480	0.4668	0.4183	0.5066	0.0876	0.4016	0.4539

5. Conclusion and Discussion

In the process of the Social Governance gravity sinking, how to improve the adaptive governance ability of grassroots public health safety risk was a major issue that must be solved for the Chinese society in the process of profound transformation. The pandemic situation of covid provides a vital window opportunity for studying the resilience of community public health safety. In particular, as China entered the normalized pandemic prevention and control stage, some communities exposed the weakness of community public health and safety resilience to the vicious competition of the "hard core" prevention and control. It was urgent to refine the evaluation index system of local community public health safety resilience to guide the community to change the pandemic prevention and control measures appropriately. We should handle pandemic prevention and control, manage services, and ensure economic and social development. The academic field had not yet reached a consensus on the evaluation index system of community public health safety resilience and had not formed a universal, operable and replicable index system framework. So, to construct the resilience evaluation index system of community public health safety, we should fully consider the actual needs and pay attention to the localized design of the system framework.

Based on the essence conception of community resilience and the essential requirements of normalized pandemic prevention, this study constructed the evaluation index system of community public-health safety resilience from the dimensions of "pandemic prevention and control," "economic and social," "livelihood security" and "reflective learning." Based on the survey data of 31 provincial administrative regions in China, the Entropy Weight TOPSIS method evaluated China's community public health safety resilience. Of course, although this study attempted to put forward a set of indicators system of community public health safety resilience, it also discusses the Chinese style construction of community public health safety resilience to a certain extent. This study aimed to help us understand the "Chinese model" of community public health safety resilience and enrich the academic pedigree of community resilience. However, the grassroots communities, which originated from the local society and were in the process of marketization, had distinctive local, pluralistic, and differential characteristics, which were not covered and expressed by this set of indicators. This study was more an exploration based on the existing research, and the academic community needs to explore further the evaluation index system of public health safety resilience in grassroots communities with diverse patterns.

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