Research Paper

A grounded theory study on COVID-19 prevention and planning support in typical communities of China

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Abstract

COVID-19 broke out at the end of 2019, and China achieved remarkable results in COVID-19's prevention and control. Till May 2021, the epidemic has been controlled in China. Community prevention and control play a key role. To clarify the planning impact mechanism of epidemic prevention and control at the community level in China. This paper proposes a grounded theory research method and conducts in-depth interviews with residents, managers, and merchants in typical communities in China. Three different epidemic scenarios (none, mild, and moderate or severe) have been studied for community epidemic prevention and control from the perspective of behavior compliance and planning support. Through the process of open coding, axis coding, and selective coding, 84 concepts, 18 subcategories, and 5 main categories were obtained. Finally, from the five aspects of "residents' needs", "epidemic compliance behavior ", "community governance", "multiple scenarios application" and "public facilities and planning", the paper puts forward the planning support model and five core factors of epidemic prevention and control. It is found that in three different epidemic scenarios, users' functional needs, and behavior choices for life circle are also different, including business types and travel modes. China's community epidemic prevention and control can be used as a successful example. The conclusions of this study provide theoretical support for promoting community epidemic management and community planning worldwide.

Keywords

Social space, Epidemic prevention and control, Community planning, Epidemic compliance behavior, Grounded theory

1. Introduction

At the end of 2019, COVID-19 broke out. As of now, China has achieved remarkable results in COVID-19 prevention and control, and its prevention and control effect is at the world's leading level. As of July 23, 2021, there were only 663 confirmed cases in China, including 561 imported cases. The outbreak of the local epidemic has been fully controlled, and China's community epidemic prevention and control have

played a key role. It is of great practical significance to study how China's community planning mode plays a role in COVID-19's prevention and control. Since the outbreak of the epidemic in 1918, there have been more than 30 large-scale infectious diseases on the international scene. In the west, research on health emergencies is conducted at the theoretical and practical levels, including the development of physical space guidance, the enactment of laws and regulations, and measures for the construction of the physical environment. The study found that the changes of population mobility (Cartenì, 2020; Xiong, 2020), the changes of behavior of different age groups (Bonaccorsi, 2020; Lio, 2021; pullano, 2020), the changes of population mobility characteristics (Pan, Darzi, kabiri, 2020; Schlosser, Maier, Hinrichs, 2020), public resource allocation (Zou, Fang, Xiong, 2021), and building layout (Gong, 2021), and other aspects are affecting the spread speed of the epidemic in the community. Among them, the governance ability (Chu, 2021) is particularly important in the later control of the epidemic. Outdoor space and safe indoor social places (Tokazhanov, 2021), and social capital ties (Jedwab, 2021) can help individuals' mental health in the process of epidemic prevention. At present, Chinese scholars focus their research on the prevention and control of the epidemic in Xincanopy mainly in the aspects of the physical space environment, epidemic prevention, control and management, outbreak control, user demand, and so on. For example, studies by people such as yang show that the "urban-community'' dual scale epidemic prevention system can be formed by closed-end management and focusing on medical facilities (yang 2021). Liu and others put forward to introduce elastic space into community neighborhood centers based on functional flexibility, spatial ambiguity, and site adaptability (Liu, 2020). At the level of epidemic prevention and control management: Liu proposed that during the epidemic period, it is based on the construction of the neighborhood living circle, the grass-roots epidemic prevention and disaster reduction functional unit, the streets, and towns as the coordination unit, and the community as the control unit, focusing on strengthening the epidemic prevention system based on the importance of life and improving the community living circle Planning and construction (Liu, 2020). Tang proposed that in the face of emergency health incidents, it is necessary to comprehensively improve community governance capabilities from more aspects and scales (Tang, 2020). At the user level, from the perspective of system perception, Xu and others proposed that the public's trust in the epidemic prevention and control system positively affects system compliance behavior. The system trust in epidemic prevention and control plays a part in the intermediary role between system perception and system compliance (Xu, 2020). Western scholars have done a lot of research on disaster prevention and control. For example, studies have shown that controlling emerging infectious diseases is a complex process (Morse et al., 2012). If infected from the community, it will expand rapidly and have a great impact on the society (Jedwab, Khan, Russ, 2021). Since covid-19 has no immediate and effective drug, traditional defense methods are adopted at this stage (Dickens, 2020; Lai, Ruktanonchai, 2020). In the process of epidemic prevention and control, empirical results show that government epidemic prevention guidelines, correct risk cognition and epidemic knowledge (Ahmad, IRAM, 2020) are helpful to prevent community epidemic. Other scholars focus on the quantitative evaluation of resilient community construction, obtaining basic data through questionnaire surveys, urban statistical yearbooks, big data, remote sensing data, etc., to build an evaluation system and clarify specific indicators for resilient community evaluation (Fox-Lent, 2015).

The purpose of this study is to study the mechanism of users' functional needs and behavior choice for life circle under three different epidemic situations and reveal the planning support theory and core factors of epidemic prevention and control in typical communities in China, The conclusions of this study provide theoretical support for promoting community epidemic control and community planning all over the world.

2. Methodology

2.1. Participants and interviews

A total of 15 respondents were selected by purposeful sampling , they have more than 3 years of typical community life experience in China. At the same time, the sample covers the users in three different scenarios: no epidemic situation, mild epidemic situation and moderate and severe epidemic situation. The selection characteristics of the sample focus on the following aspects: the user categories include community residents, community managers and community merchants, basically including the types of users in the community. The study conducted an in-depth interview with each respondent for about 30-40 minutes and recorded it. All the procedures of the interview have been approved by the respondents, and the written contents have been anonymous without involving anything unrelated to the research content. As shown in Table 1.

Table 1 Summary of samples

Sample	Age	Gender	Occupation
1	50	Female	Community managers (Director of neighborhood committee)
2	58	Male	Community managers (Security)
3	43	Male	Community merchants (Store owner)
4	25	Female	Community residents (Students)
5	19	Female	Community residents
6	50	Male	Community managers (Accounting)
7	41	Female	Community residents
8	48	Male	Community residents (Water quality supervisor)
9	40	Male	Community residents (Teachers)
10	82	Female	Community residents
11	49	Male	Community residents
12	52	Female	Community merchants
13	30	Female	Community managers (Administrative assistants)
14	54	Female	Community managers (Street director)
15	67	Male	Community residents (Retirees)

2.2. Data analysis

1) Initial coding

The specific process of data initial coding analysis is as follows:

The first step is to label (define phenomenon) and define the preliminary concept: define the data sentence by sentence and word by word. In the first column of the table, mark each phenomenon with "(AX)", and further summarize and define the preliminary concept, which is represented by "(AAX)". Through the definition of the preliminary concepts sentence by sentence, 84 preliminary concepts are finally obtained. As shown in Table 2.

Table 2 Initial coding table: definition of preliminary concepts

Interview data	Lnitial code	
	Labeling (Defining phenomena)	Labeling (Defining phenomena)
Define the preliminary concept (have you changed your life?) I actually think it is very convenient	a1 The Internet is now more convenient a2 Express can deliver everything to the door	A1 Network virtual facilities A2 Facility quality

to eat and what such general knowledge of life. Because there are also stores in the community that can buy things, and then online shopping is OK. You can also deliver the goods to the door, and you can see them in that area. Do you think it's inconvenient Another is that if you can't avoid it, for example, you're going out there? Try to avoid these things as much as possible. In the community can still feel the importance of building materials. (what places do you think can be improved?) Because a community is not a community, it still manages several community affairs, doesn't immediately connect to the whole community of the whole district, and what this. ……	a3 I am quite willing to drive for half an hour and take my daughter to Wanda a4 It's important to see where you live a5 Is related to the prosperity of the region a6 After the epidemic, it is found that building materials in the community are still very important a7 After the epidemic, it is found that building materials in the community are still very important a8 Don't want people outside to come in after unsealing. a9 There are pharmacies, but the categories are not complete a10 Unified management of multiple cells a11 After the epidemic, it is found that building materials in the community are still very important. The level of medical treatment and control in a12 Area will affect the community. a13 Mainly has complete facilities, and basically goes to the square once a day ……	A3 User scope A4 Facility type A5 Behavior attributes A6 Behavior type A7 Scope of conduct A8 Personal characteristics A9 Subjective psychological cognition A10 Objective behavior restrictions A11 Cultural background influence A12 Policy transmission at all levels A13 Management level A14 Epidemic prevention and control methods ……

The second step, categorization: further classify and abstract the obtained preliminary concepts, and refine the category "(AX)" step by step. This is a centralized and active treatment of the preliminary concept. Since categories are more directional, selective and conceptual than the preliminary concept, the task of analyzing and studying complex and huge data is simplified to investigate these categories, and finally 18 categories are obtained. The typical contents and processes are shown in Table 3.

Table 3 List of preliminary concepts and categorization

Preliminary concept	Categorize
aa1 Contactless shopping platform	A1 Network virtual facilities
aa2 Technical support, space (Rookie)	A2 Facility quality
aa3 Scale requirements of different activity types	A3 User scope
aA4 Physical environment	A4 Facility type
aa5 Impact of economic level	A5 Behavior attributes
aa6 Environmental issues	A6 Behavior type

aa7 Facility quality	A7 Scope of conduct
aa8 Community safety	A8 Personal characteristics
aa9 Convenience	A9 Subjective psychological cognition
aa10 Home use	A10 Objective behavior restrictions
aa11 Multi cell sharing	A11 Cultural background influence
aa12 Indoor activity room	A12 Policy transmission at all levels
aa13 Community health care	A13 Management level
aa14 Leisure Plaza	A14 Epidemic prevention and control methods
……	……

2) Axis coding and Theoretical coding

Axis coding connects categories together by using the typical model of "condition → phenomenon → context → intermediary condition → action/interaction → result", and answers the questions of "where, why, who, how, and what the result is"(Charmaz,2014).

By using the typical model to continue to classify and abstract the categories, five main categories are obtained, namely AA1 "public facilities and space", AA2 "life circle behavior activities", AA3 "compliance behavior", AA4 "control and community governance", and AA5 "scene of life circle use". These main categories are formed by the following typical models. The typical models and category relations are shown in Table 4-7.

Table 4 AA1 Utilities and spaces

Causal condition	Facility quality……	Intermediary conditions	Network virtual facilities……
Action strategy	Contactless hopping……	Result	User range……

Table 5 AA2 Life circle behavior activities

Causal condition	Behavior properties……	Intermediary conditions	Behavior properties……
Action strategy	Type of behavior……	Result	Type of behavior……

Table 6 AA3 Compliance behavior

Causal condition	Cultural background……	Intermediary conditions	Spontaneous behavior……
Action strategy	Objective behavior restrictions……	Result	Personal characteristics……

Table 7 AA4 Control and community governance

Causal condition	Policy transmission at all levels……	Intermediary conditions	Shared management of multiple cells……
Action strategy	Management level……	Result	Community safety……

Table 8 AA5 Scenarios used in life circle

Causal condition	Use function / distance / time……	Intermediary conditions	Multi platform collaboration……
Action strategy	Service and distribution……	Result	Function improvement of life circle……

3. Results

3.1. Main category

Through open decoding and spindle decoding, five main categories are extracted. Clarify the connotation and nature of the main category to prepare for the subsequent relationship analysis. The main category is obtained by further analyzing the internal relationship between multiple categories. This experiment summarizes the main categories of 18 categories obtained from open coding and explains the meaning of categories, which can lay a good foundation for theoretical construction. This study finally developed five main categories and further explained the meaning of categories.

Public facilities and space: it is the basic support of the material environment for users to live in the community. Users' most intuitive expression of space demand is also the best embodiment of residents' quality of life in community construction. It includes three aspects, such as network virtual facilities, facility quality, and facility type.

Life circle behavior activities: users' behavior choices under the support of life circle in these three situations. It includes three aspects: A) behavior attribute; B) type of behavior; C) scope of conduct

Compliance behavior: Residents' cognition and defining elements of compliance behavior under three scenarios. It includes four aspects: A) personal characteristics; B) subjective psychological cognition; C) epidemic risk; D) service support.

Management and control and Community Governance: in the face of the first line of defense against the epidemic, the existing community material space should be used to assist the management, including three aspects: A) Policy transmission at all levels, and finally implemented to each household through the transmission of superior policies at all levels; B) There are differences in management level in the community; C) Mutual assistance among residents.

Scenarios used in the life circle: the user's feelings are different in the three scenarios, and there are also differences and choices in the user's life scenarios. It includes five aspects: A) service and distribution; B) epidemic prevention and control methods; C) use function / distance / time; D) function of life circle; E) multi-platform collaboration.

3.2. Core theory

After summarizing and reconstructing the main category, the author constructs two core theories: "interactive improvement of community internal environment" and "intervention and correction of community governance".

In the theory of "interactive promotion of the internal environment of the community", starting from the spatial environment, there are three core categories: "public facilities and space", "behavior activities in the life circle", and "scenes used in the life circle". The study found that in these three situations, the realization of users' needs changes with the choice of behavior and activities. With the reduction of the epidemic situation, people's needs for facilities around the community, and in the living circle are constantly strengthened, and the degree of demand is constantly changing from shallow to deep. However, at present, the material space of community construction is limited, and the matching degree

of demand and supply cannot be updated and corrected in time. Therefore, it has an impact on the use capacity and provided by the living circle in peacetime and in case of an epidemic.

From the perspective of community governance, the theory of "intervention correction of community governance" is supported by two core categories: "compliance behavior", "control and community governance". The study found that during the epidemic prevention and control period, the period from the occurrence of the epidemic to nationwide protection is the deepest and most direct stage that has the most direct impact on users' compliance behavior. For example, to further promote users' psychological perception of compliance behavior and generate psychological motivation for compliance behavior through information dissemination. At the same time, in this process, the control and governance of the community, under the transmission of policies at all levels, transfer the information to different users, and feedback the results of different users' feedback to the governance within the community, providing further support for community governance.

In this study, through the repeated research, comparison, and analysis of the five main categories, this paper studies the problem of community epidemic prevention and control from the perspective of prevention and control behavior compliance and planning support. Finally, the storyline between the main categories in this study is clarified. In the three scenarios, the needs and feelings of users promote the differences of users' needs in different life circles and influence compliance behavior and life circle behavior activities through their behavior preferences. Among them, the generation process of compliance behavior and community governance complement each other. The interaction of the two factors will jointly put forward further service requirements for the scenes, public facilities, and space used in the life circle. Form a unique life circle usage scenario.

4. Conclusion

China's community epidemic prevention and control work simultaneously through the interaction and improvement of the community internal environment of the spatial environment and the intervention and correction of community governance from the perspective of governance. There are five main categories in this process, namely "public facilities and space", "life circle behavior activities", "compliance behavior", "control and community governance" and "scene of life circle use".

In the process of epidemic prevention and control, users present corresponding behavior characteristics and guidelines in three situations. Under the three scenarios, public facilities and space are the basis of user behavior, compliance / non-compliance is the obvious feature in the prevention and control process, and control and community governance are the decisive factors for intervention and correction in the epidemic prevention process. The life circle behavior activities in peacetime/epidemic situation are the feedback results of compliance behavior, control and community governance in the process of epidemic prevention, and finally, form the characteristics of the scene used in the life circle in peacetime/epidemic situation.

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