Highly Cited Papers on Urban Public Security Research: A Bibliometric Analysis

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Abstract. Sudden natural disasters and public security incidents are emerging one after another. Scholars and governments are increasingly concerned about the issues of urban public security. This paper analyzes the high-cited literature on 261 urban security-related topics in Web of Science in the form of knowledge maps. We found that the United States and China have the strongest research on such issues as health, disease prevention and control, pollution, residential environment issues, agriculture and food issues etc. Among them issues related to new technologies are hotspots in urban security research.

1 Introduction

In recent years, there have been frequent public events in the world that affect urban security, such as the US "911" terrorist attacks, the spread of China's SARS epidemic, and the nuclear radiation caused by the 2011 Japanese tsunami, the summer rains in Beijing in 2012, and the London fire in 2017. Resource-based cities are confronted with various natural disasters and public security incidents, which have made urban security issues significantly attentive for the government, enterprises and the public.

Urban public security has a wide range of implications and covers multiple disciplines. From the research on urban disasters, urban security refers to the ability of cities to resist and mitigate natural or man-made disasters, the destruction of urban construction, and the threats of people's lives and property. In order to further grasp the frontiers and hotspots of urban security research, this paper employs WoS data to comb the high-cited papers on urban security issues in the past 10 years (2009-2018), and analyzes the core scientific research distribution and research hotspots of urban security, in order to provide theoretical reference and reference for future urban public security research.

2 Data sources and methods

The data of relevant research literature on urban public security originates from the WOS platform, and four data bases such as SCI-EXPANDED, SSCI, CPCI-S and CPCI-SSH are selected as source libraries. The search formula is "TS= ((urban* OR city OR cities) AND (safe* OR secur*))", the time span selection: 2009-2018, and the language and file type are not limited, the search date is Sep.25,2019. After the search results were condensed, and 261 highly cited papers in the field were obtained, which were used as the basic data for the analysis.

The knowledge map can visually show the development of the subject [1]. This paper employs VOSviewer analysis software to analyze the participation and cooperation of countries involved in urban security issues, and analyzes core researchers, core journals and institutions using HistCite software. Clustering analysis is used for the research of urban security via CiteSpace.

3 Analysis of research distribution

3.1 Core research countries

Table 1 lists the top ten countries in terms of urban security research results. Figure 1 shows the national clustering chart. In Figure 1, each sphere represents a country, and the larger the ball, the more published papers. At the core of the research, Canada has the closest connection. China is in a relatively marginal position in the study of such issues, mainly in close contact with the United States and Canada and Asian countries. The European countries centering upon Germany constitute another cluster of research due to geographical similarity.

Table 1. Top 10 Countries

No.	Country	Recs
1	USA	116
2	China	70
3	UK	35
4	Canada	29
5	Germany	23
6	Australia	21
7	Belgium	17
8	Netherlands	17

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9	Switzerland	14
10	France	13
11	Italy	12

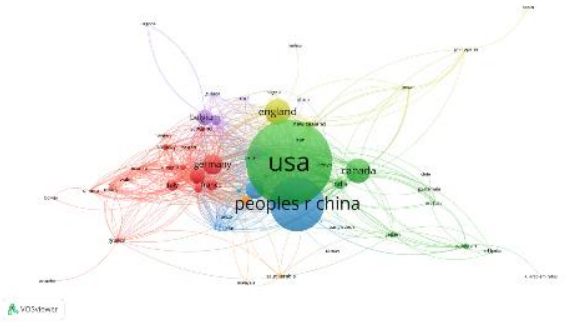

Fig 1. National clustering of urban security research

Tables 1 and Figure 1 show that the United States and China possess the largest number of papers. European countries such as the United States have more emphasis on urban security research due to factors such as crime rate, internal stability, police and judicial status, and geopolitical security. The research interests of the United States in urban security are: public environmental occupational health, general internal medicine, engineering, environmental sciences ecology, computer science, etc. Its research has been supported by the US HHS, NIH and NSF funds. In recent years, China's urbanization process has been accelerating, and the rapid development of the economy has highlighted various social issues, with particular emphasis on rural and food security research. The main research directions in China are: environmental sciences ecology, engineering, computer science, telecommunications, transportation, etc. China's NSFC fund supports the research above.

3.2 Core research institutions

Table 2. Published research institutions with more than 5 papers

No.	Institution	Recs
1	Chinese Acad Sci	15
2	Columbia Univ	8
3	Harvard Univ	7
4	Univ Calif Los Angeles	7
5	Univ Maryland	7
6	Univ Melbourne	7
7	WHO	7
8	Univ Hong Kong	6
9	Dalian Univ Technol	5
10	Northwestern Univ	5
11	Rutgers State Univ	5
12	Tsinghua Univ	5
13	UCL	5
14	Univ British Columbia	5
15	Univ Chicago	5
16	Univ Colorado	5
17	Univ Ghent	5
18	Univ Toronto	5
19	Zhejiang Univ	5

The core research institutions of the 19 urban security areas in Table 2 are mainly from China and the United States. The prominent research of the Chinese Academy of Sciences is on environmental pollution and rural land. The research of Columbia University in the United States is the most powerful in terms of urban community security and resident health. In addition, WHO has 7 papers, mainly on research on virus prevention and control, water resources, and vaccines.

3.3 Core researchers

The researchers in Table 3 are experts in the field of urban security, mainly from China and the United States. Among them, Pucher J and Buehler R are experts of green travel research, and China Shen j focuses on smart city construction research. Van Cauwenberg J and Cerin E focus on the study of the impact of the environment on adults. Levine MM is involved in the prevention and control of viral infections. Long HL focuses on China's new rural construction. Ning ZL and Wang l, on areas of intelligent transportation networks, and Zheng N focuses on urban pollution research.

Table 3. Authors of the top 10

No.	Author	Recs
1	Pucher J	4
2	Shen J	4
3	Van Cauwenberg J	4
4	Buehler R	3
5	Cerin E	3
6	Levine MM	3
7	Long HL	3
8	Ning ZL	3
9	Wang L	3
10	Zheng N	3

3.4 Core journals

261 core papers were published in 152 journals. The publications with a volume of 5 or more were: Lancet (10), Science of The Total Environment (9), Future Generation Computer Systems-The International Journal of Escience (8) , Accident Analysis and Prevention (6), Applied Energy (6), International Journal of Behavioral Nutrition and Physical Activity (6), Land Use Policy (6), Landscape and Urban Planning (6), Global Environmental Change-Human and Policy Dimensions (5). The nine publications are from USA and Netherlands. All five journals are Q1 journals in WoS, and the total number of published documents is 62, accounting for 24% of the total number of publications. The research direction of journals mainly includes: general & internal medicine. Environmental sciences & ecology, computer science, public environmental & occupational health, transportation, energy & fuels, nutrition & dietetics physiology, physical geography, public administration, urban studies.

4 Analysis of research hotspots

This paper uses CiteSpace's automatic clustering labeling algorithm to describe the urban security theme co-clustering cluster map, and label each cluster (Figure 2). Through the merger, the research on urban security issues is attributed to four hot issues--health, disease prevention and control, pollution research; living environment issues; research on agriculture and food issues; and application research of new technologies in urban security.

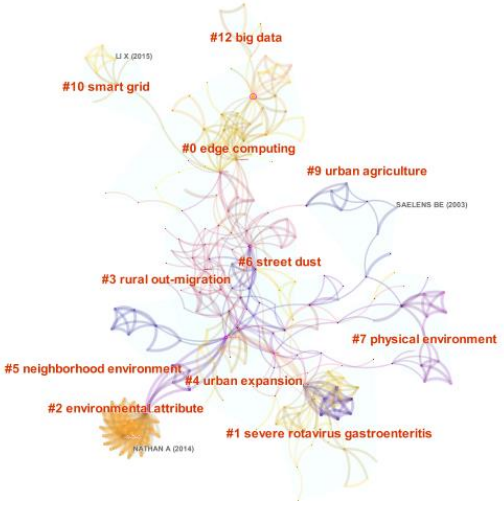

Fig2.Urban security hotspots clustering

(1) Research on health, disease prevention and control, pollution (Including labels 1, 2, and 6)

The high-frequency keywords that appear in label 1 are: placebo, vaccine, pentavalent rotavirus vaccine, severe rotavirus gastroenteritis, dose, etc. The main content includes prevention and control of infectious diseases and other diseases in the protection of urban public security. Armah GE [2] believes "We support WHO's recommendation for adoption of rotavirus vaccine into national expanded programmes on immunisation in Africa".

The high-frequency keywords that appear in Tag 2 are: adults, neighbourhood, cycling, transport, total walking, etc. mainly focusing on the urban community security of the elderly. Barnett [3] believes "Safe, walkable, and aesthetically pleasing neighbourhoods, with access to overall and specific destinations and services positively influenced older adults' PA participation. Results support strong links between the neighbourhood physical environment and older adults 'active travel" [4].

The high-frequency keywords that appear in label 6 are: children, inhalation, heavy metal, vegetables, wastewater recycling, etc. focusing on the impact of pollution on human survival. Among them, water resources and air pollution are the research hot issues.

(2) Research on agriculture and food issues (Including labels 3, 4, and 9)

The high-frequency keywords that appear in tag 3 are: land use transition, trend, dynamics, out-migration, land-use system, etc. Godfray thinks more food should be produced using sustainable intensification (SI) strategies [5], This rapid growth of the purchasing sector Will change the diets of the food insecure as much as that of the food secure across rural and urban LMIC's [6].

The high-frequency keywords that appear in label 4 are: grain production transition, farmland transition, grain production, farmland, rice, etc. This cluster mainly studies the issue of agricultural output. Land-use planning can affect both the location and the form of urbanization and thus appears as an important measure to minimize further losses in crop production [7].

The high-frequency keywords that appear in label 9 are: world, associations, differences, disadvantaged groups, products, etc. focusing on the population health problems brought by agricultural products. Osypuk [8] conducted a research on the health of residents living in urban areas. Lovasi [9] believes One strategy to reduce obesity would interact changing the built environment to be more supportive of physical activity and a healthy diet.

(3) Research on living environment issues (Including labels 5 and 7)

The high-frequency keywords that appear in label 5 are: street dust, metal, cu contents, inhalation, health risk, etc., focusing on the impact of living environment and residents' health. Branas [10] believes that greening, vacant plots can reduce certain crimes and promote health.

The high-frequency keywords that appear in label 7 are: wind security, urban areas, pedestrian wind comfort, wind comfort, pedestrian, etc. focusing on the study of security issues in urban environments. Buehler [11] believes that cycling is safer and has fewer cars. More students, less pollution, and cities with higher gasoline prices should ride bicycles to work as much as possible.

(4) Application research of new technologies in urban security (Including labels 0, 10 and 12)

The high-frequency keywords that appear in the label 0 are: emerging technologies, computing-based IOT, edge computing-based IOT, IOT development, smart city applications, etc. focusing on the impact of Internet of Things technology on urban security. Xu QC [12] present a novel Theoretical model to deliver secure content with edge nodes in order to save energy for green cities. Shi WS et al. [13] introduced the definition of edge computing, and illustrated the role of edge computing in smart city security.

The high-frequency keywords that appear in the label 10 are: user, internet security protocols, hierarchical iot network, automated validation, key management protocol, etc., focusing on the study of urban security issues under the Internet of Things. Li, Xiong [14] this paper first summarizes the security and function requirements of authentication for GLOMONET in smart city environment

The high-frequency keywords that appear in the label 12 are: fog computing, smart cities, sensors, new urban agenda, sustainable development goal, etc. Akpakwu [15] searched the latest IoT application requirements and related communication technologies. 5g communication in urban security the practical application of the problem provides technical support.

5 Conclusion

Through the quantitative analysis of 261 high-cited papers of the urban security field on the WoS platform, it can be seen that the United States and China are the core research countries of such problems and have the strongest strength. Among them: Chinese Academy of Sciences, Columbia University, Harvard University and other scientific research institutions are the strongest. European countries such as the United States are more concerned with urban community security research, while China is more concerned with the research in new rural construction. Pucher J, Shen J, Van Cauwenberg J, etc. are top experts in the industry. Such research has strong interdisciplinarity and cross-cutting. Research hot issues include: research on health, disease prevention and control, pollution; research on residential environment issues; research on agriculture and food issues; and application of new technologies in urban security.

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