West Science Interdisciplinary Studies
Vol. 02, No. 05, May and 2024: pp. 999-1009

Public Health in Urban Areas: A Bibliometric Analysis of Strategies to Promote Wellbeing and Sustainable Development

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ABSTRACT

This study employs bibliometric analysis to explore the landscape of research on urban public health and sustainability. Utilizing data extracted from major databases spanning from 1992 to 2024, the research identifies key thematic clusters, examines trends over time, identifies gaps presenting future research opportunities, and investigates author collaboration networks. The findings reveal a distinct shift towards integrating urban design with health outcomes, emphasizing the role of green spaces in enhancing mental and physical well-being. Emerging themes such as the impact of pandemics on urban health and the potential of blue spaces in urban settings are highlighted as under-researched areas that offer significant potential for future studies. Furthermore, the analysis of collaboration networks indicates robust intra-field connections and potential for new interdisciplinary partnerships. This study contributes to a deeper understanding of the evolving dynamics within urban public health research and underscores the importance of multidisciplinary approaches in addressing complex urban challenges.

Keywords: *Public Health, Urban Areas, Promote Wellbeing, Sustainable Development, Bibliometric Analysis*

1. INTRODUCTION

Urban areas are dynamic entities characterized by continuous growth and change [1]. As cities expand, they face unique public health challenges, including increased pollution, limited access to green spaces, and disparities in health care access [2], [3]. These factors can significantly affect the wellbeing of urban populations [4]. At the same time, urban settings offer unique opportunities for promoting health and sustainable development through innovative public health strategies [3]. The interplay between urbanization and health necessitates a comprehensive understanding of effective public health interventions that can drive sustainable urban development [5].

In recent years, the focus on sustainable development within urban public health has intensified [6]. The Sustainable Development Goals (SDGs) set by the United Nations emphasize the importance of good health and well-being (SDG 3) and sustainable cities and communities (SDG 11) [7], [8]. These goals advocate for integrated approaches that not only address immediate health concerns but also promote long-term sustainability in urban environments [9]. Consequently, cities worldwide have been implementing various strategies, such as enhancing walkability, improving air quality, and increasing the availability of public health services [10].

A bibliometric analysis of existing research can elucidate the trends and gaps in the literature on public health strategies in urban areas [11]. By analyzing publication patterns, citation networks, and thematic evolution, researchers can identify the most impactful strategies and highlight areas that require further investigation [12]. This approach provides a structured overview of the academic

landscape, guiding future research and policy-making to enhance both public health and urban sustainability [13].

Despite the growing body of research on urban public health, there remains a critical gap in comprehensive analyses that synthesize and evaluate the effectiveness of various health promotion strategies within these complex environments. Many studies focus on isolated aspects of public health without considering the broader urban context. This lack of integration can lead to suboptimal outcomes in health promotion and sustainability efforts. A bibliometric analysis is essential to map the existing research, identify the most studied and the most impactful strategies, and uncover areas that have been overlooked or require deeper investigation.

The primary objective of this research is to conduct a bibliometric analysis of the literature on public health strategies in urban areas, focusing on their contribution to wellbeing and sustainable development. This study aims to identify key trends, influential works, and emerging themes in the domain. By doing so, it will provide a clearer understanding of how urban public health strategies have evolved over time and how they align with global sustainability goals.

The significance of this research lies in its potential to inform policy-makers, urban planners, and public health professionals about the most effective strategies for promoting health and sustainability in urban settings. By providing a comprehensive overview of the research landscape, this study will help stakeholders make evidence-based decisions that optimize health outcomes and contribute to the broader objectives of sustainable urban development. Additionally, the findings could guide future research directions, encouraging a more integrated and strategic approach to urban health issues.

2. LITERATURE REVIEW

2.1 Overview of Public Health Challenges in Urban Areas

Urban areas present unique public health challenges that are influenced by their high population density, socio-economic diversity, and environmental factors [3]. Research indicates that urban residents are often at higher risk of developing chronic diseases due to factors such as air pollution, high levels of stress, and sedentary lifestyles [1], [14]. Studies have also highlighted the prevalence of mental health issues, exacerbated by the urban lifestyle's fast pace and often limited social support networks [2], [15]. For example, [16] discuss how urban environments can act as both stressors and enablers, affecting the health outcomes of their populations in complex ways. These challenges necessitate targeted public health strategies that address the specific needs of urban populations while promoting overall wellbeing.

2.2 Strategies for Enhancing Public Health in Urban Settings

A substantial body of literature has explored various strategies to enhance public health in urban settings [17]. These include physical infrastructure improvements, such as creating pedestrian-friendly zones and green spaces, which not only reduce pollution but also encourage physical activity [18]. Another significant area of focus is on improving access to healthcare services and public health information, which are crucial for disease prevention and health promotion [6]. For instance, [19] emphasizes the role of urban planning in promoting health equity by integrating public health considerations into city design and infrastructure decisions. Additionally, community-

based interventions, which involve local stakeholders in the planning and implementation of health programs, have been shown to be effective in improving health outcomes in densely populated areas [17], [20].

2.3 Integration of Sustainability into Urban Public Health Initiatives

Integrating sustainability into public health initiatives is crucial for the long-term wellbeing of urban populations [21]. Sustainable public health strategies not only address immediate health concerns but also consider environmental and social factors that contribute to a city's overall health profile [2], [22]. Researchers like [23] argue that a holistic approach, which combines urban planning with public health and environmental policy, is essential to create healthy urban environments. Sustainable practices such as promoting public transit and reducing urban sprawl can lead to significant health benefits, including lower rates of obesity and respiratory diseases due to reduced air pollution [23], [24].

2.4 Bibliometric Analysis in Public Health Research

Bibliometric analyses provide valuable insights into the trends and gaps in public health research. These studies use quantitative methods to analyze academic literature, helping identify the most influential theories, authors, and articles in the field. For example, [25] conducted a bibliometric study on global research activity regarding antimicrobial resistance, revealing both regional disparities in research focus and the most frequently addressed topics. In the context of urban public health, bibliometric analysis can help pinpoint which strategies have been most extensively studied and which might require more focus or reevaluation based on their perceived effectiveness and impact.

3. METHODS

3.1 Research Design

This study employs a bibliometric analysis to systematically review the literature on public health strategies in urban areas. The analysis focuses on quantifying the distribution of publications over time, identifying major themes, and recognizing influential authors and works within the field. This approach enables the assessment of trends, patterns, and gaps in the research landscape, offering insights into the evolution of urban public health strategies and their alignment with sustainable development goals.

3.2 Data Sources and Search Strategy

The primary sources of data for this bibliometric analysis will be academic databases including PubMed, Scopus, and Web of Science. These databases provide comprehensive coverage of the literature across health, environmental science, and urban planning disciplines. The search strategy will involve a combination of keywords and phrases related to "urban public health", "public health strategies", "urban sustainability", and "bibliometric analysis". Boolean operators (AND, OR) will be used to refine and combine search terms to ensure a comprehensive retrieval of relevant publications.

3.3 Inclusion and Exclusion Criteria

Publications included in this analysis will be filtered based on the following criteria:

1. Inclusion Criteria: Peer-reviewed articles published in English 1992 - 2024, focusing on public health strategies in urban environments and their implications for sustainable development.
2. Exclusion Criteria: Non-peer-reviewed articles, conference abstracts, editorials, and publications not in English will be excluded. Studies focusing on rural health interventions or those not directly addressing urban public health strategies will also be omitted.

3.4 Data Extraction and Management

Data will be extracted from selected articles and managed using bibliometric software tool such as VOSviewer. The following information will be extracted from each publication:

i. Publication year
ii. Author (s)
iii. Journal Name
iv. Keywords
v. Citation Count
vi. Main Themes and Outcome

This extracted data will be used to create citation networks, co-authorship networks, and keyword co-occurrence networks. These visualizations will help identify the most influential studies, authors, and emerging trends in the field.

3.5 Analytical Techniques

The study will utilize several bibliometric indicators:

1. Citation Analysis: To assess the impact and influence of specific works and authors in the field.
2. Co-citation Analysis: To identify clusters of studies that are frequently cited together, suggesting related thematic areas.
3. Content Analysis: To examine the themes and topics discussed in the literature, using keyword analysis to track the evolution of research focus over time.

4 RESULTS AND DISCUSSION

4.1 Research Data Matriks

Table 1. Research Data Metrics

Publication years	: 1992-2024
Citation years	: 32 (1992-2024)
Paper	: 980
Citations	: 240671
Cites/year	: 7520.97
Cites/paper	: 245.58
Cites/author	: 112341.41
Papers/author	: 430.97
Author/paper	: 3.13
h-index	: 227
g-index	: 475
hI,norm	: 149
hI,annual	: 4.66
hA-index	: 84

Papers with ACC	: 1,2,5,10,20:882,844,738,570,360

Source: Publish or Perish Output, 2024

Table 1 presents a comprehensive set of bibliometric indicators derived from Publish or Perish for the years 1992 to 2024, analyzing a dataset that spans 32 years and includes 980 published papers. These papers have accumulated a substantial 240,671 citations, averaging 7,520.97 citations per year and 245.58 citations per paper. This indicates a high impact of the published research within its field, as evidenced by an impressive h-index of 227, which suggests that 227 papers have each been cited at least 227 times. The g-index is even higher at 475, indicating that the top 475 papers have collectively garnered at least 225,625 citations. The normalized individual h-index (hI,norm) stands at 149 and the annualized individual h-index (hI,annual) is 4.66, further underscoring the lasting influence and relevance of the research. The hA-index, which adjusts for multi-authorship, is 84, reflecting substantial contributions by multiple researchers. Furthermore, the distribution of papers across citation accumulation classes (1, 2, 5, 10, 20) shows a high level of citation concentration, with a significant majority (882) of the papers receiving at least one citation, and a respectable number (360) achieving 20 citations. This dataset illustrates a strong and sustained impact in the field, reflecting both prolific authorship and significant scholarly influence.

4.2 Network Visualization

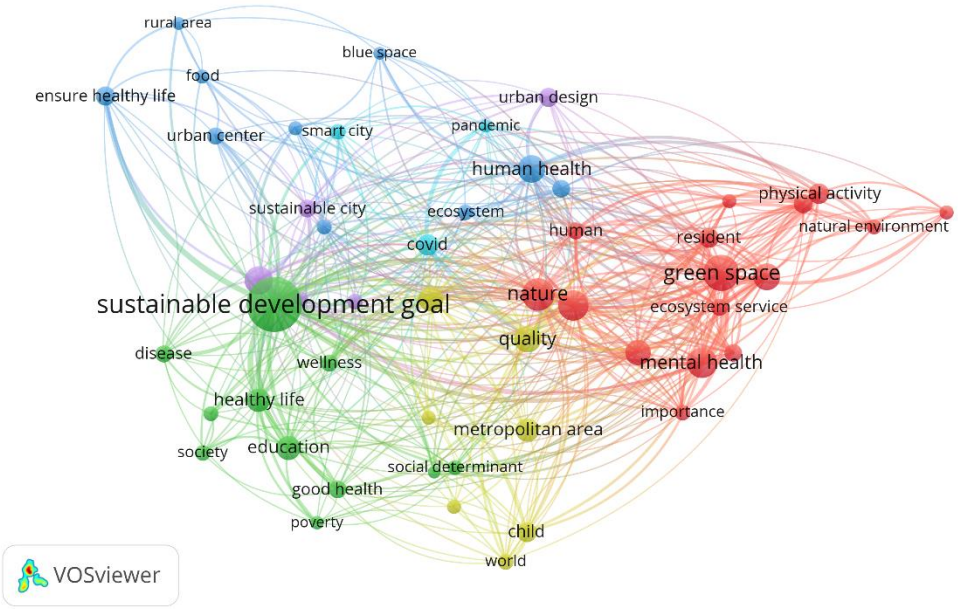

Figure 1. Network Visualization

Source: Data Analysis Result, 2024

This figure maps out the thematic clusters and key topics within the research on public health and sustainability in urban environments. This network diagram uses different colors to represent various clusters, each linked by their contextual and thematic relationships.

1. Green cluster, this cluster focuses on overarching themes like "sustainable development goal," "disease," "wellness," and "healthy life." It appears to connect the general concepts of health and sustainability goals, indicating discussions around how urban health initiatives align with broader sustainable development objectives.
2. Red cluster, dominated by terms such as "green space," "physical activity," "mental health," and "natural environment," this cluster clearly emphasizes the impact of urban

greenery and physical environments on physical and mental health. It highlights the importance of natural spaces in urban areas for promoting health and wellbeing.

3. Blue cluster, here, terms like "rural area," "urban center," "smart city," and "sustainable city" suggest a focus on urban planning and the structural aspects of cities. This cluster might explore the distinctions between rural and urban settings, the concept of smart cities, and how urban design can be leveraged for sustainable living.
4. Yellow cluster, featuring "child," "world," "poverty," and "education," this cluster seems to address social determinants of health and broader societal issues. It likely discusses how factors like socioeconomic status, education, and global trends impact public health.
5. Purple cluster, terms like "ecosystem," "human," and "pandemic" indicate a focus on the interaction between human health and broader ecological or global health challenges, including the management of pandemics in urban settings.

4.3 Overlay Visualization

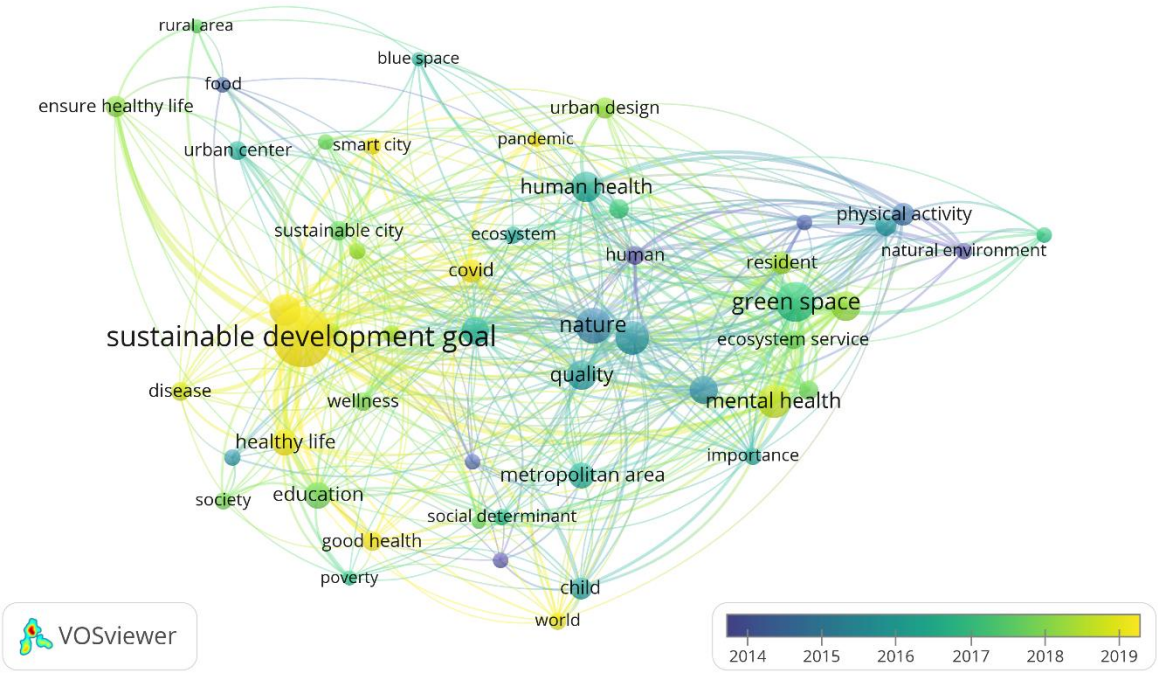

Figure 2. Overlay Visualization
Source: Data Analysis Result, 2024

The second figure includes a temporal component represented by a color gradient from blue (2014) to yellow (2019), which indicates the change in research focus over time within the field of urban public health and sustainability. Based on the figure, there is a visible shift from topics highlighted in blue (earlier years, around 2014) towards topics in green and yellow (later years, approaching 2019). This suggests a temporal transition in research themes and priorities over the given years.

By 2019, the yellow nodes such as "mental health," "green space," and "physical activity" suggest that recent research has increasingly focused on the direct impact of urban environments on physical and mental well-being. This indicates a growing acknowledgment of the role that urban planning (green spaces, recreational areas) plays in promoting mental and physical health. The core theme of "sustainable development goal" remains central throughout the timeline, transitioning from blue to green, reflecting its consistent importance in the literature. This theme serves as a foundational element that intersects with various emerging research topics over the years.

Newer topics like "covid" and "pandemic" appear in the later years (green nodes), indicating how recent global health challenges have been integrated into the urban public health discourse. This integration shows the adaptability of the field to current global events and their impact on urban health dynamics. The prominence of terms like "natural environment" and "ecosystem service" in more recent years highlights a growing concern for environmental factors in urban public health research, suggesting a shift towards more ecological and holistic approaches to health in urban settings.

4.4 Citation Analysis

Table 2. The Most Impactful Literatures

Citations	Authors and year	Title
8431	[26]	World Health Statistics 2016 [OP]: Monitoring Health for the Sustainable Development Goals (SDGs)
5228	[27]	Social determinants of health: the solid facts
4320	[28]	Urban green space, public health, and environmental justice: The challenge of making cities 'just green enough'
3860	[29]	The role of urban parks for the sustainable city
3663	[30]	Global action plan on physical activity 2018-2030: more active people for a healthier world
3608	[31]	Sustainable development: mapping different approaches
3442	[32]	Promoting ecosystem and human health in urban areas using Green Infrastructure: A literature review
3416	[33]	Sustainable development goals for people and planet
3028	[34]	From millennium development goals to sustainable development goals
3025	[35]	Establishing and maintaining healthy environments: Toward a social ecology of health promotion.

Source: Publish or Perish Output, 2024

Table 2 outlines the ten most impactful pieces of literature in the realm of urban public health and sustainability, as indexed by Publish or Perish. The list is topped by the World Health Organization's 2016 report, "World Health Statistics 2016: Monitoring Health for the Sustainable Development Goals (SDGs)," which has garnered 8,431 citations, underscoring its pivotal role in guiding global health policies. Following closely, Wilkinson and Marmot's 2003 seminal work, "Social determinants of health: the solid facts," has received 5,228 citations, highlighting its influence in shaping the understanding of social factors in health. Other notable works include Wolch, Byrne, and Newell's 2014 study on the intersection of urban green spaces, public health, and environmental justice, and Chiesura's 2004 analysis of the role of urban parks in sustainable city development, both of which have significantly contributed to the discourse on urban environment and public health. The list also features a mix of reports, reviews, and scholarly articles that collectively address a wide spectrum of topics from physical activity and sustainable development to ecosystem health and social ecology, reflecting a diverse and interdisciplinary approach to tackling health and sustainability in urban contexts.

4.5 Author Visualization

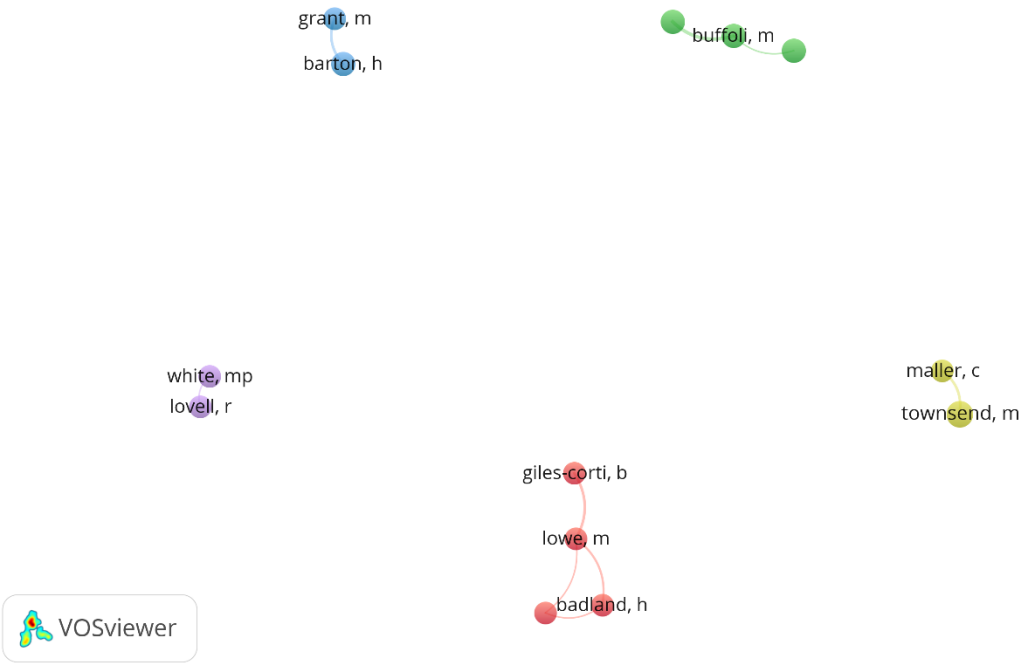

Figure 4. Author Visualization
Source: Data Analysis Result, 2024

The network features several distinct clusters, indicating groups of authors who frequently collaborate with each other. Each cluster is marked by a different color, which helps in distinguishing the collaboration patterns between groups. Each node represents an author, with the node size potentially indicating the number of publications or the prominence of the author within the network. The lines connecting the nodes represent collaborations between the authors. A thicker or more prominently colored line might indicate more frequent or significant collaborations.

The purple cluster shows authors like "white, mp" and "lovell, r" close together but without visible links, suggesting they work within the same thematic area but do not directly collaborate. In the red cluster, "giles-corti, b" is connected to "lowe, m" and "badland, h," showing a direct collaboration among these researchers. This connection is highlighted by the red line, suggesting a possibly strong or frequent collaboration.

Some authors like "buffoli, m" and "maller, c" appear as isolated nodes with no visible links to others in this particular visualization. This could imply that their research is either highly specialized within the field or that their collaborations are outside the scope of the dataset used for this visualization.

4.6 Density Visualization

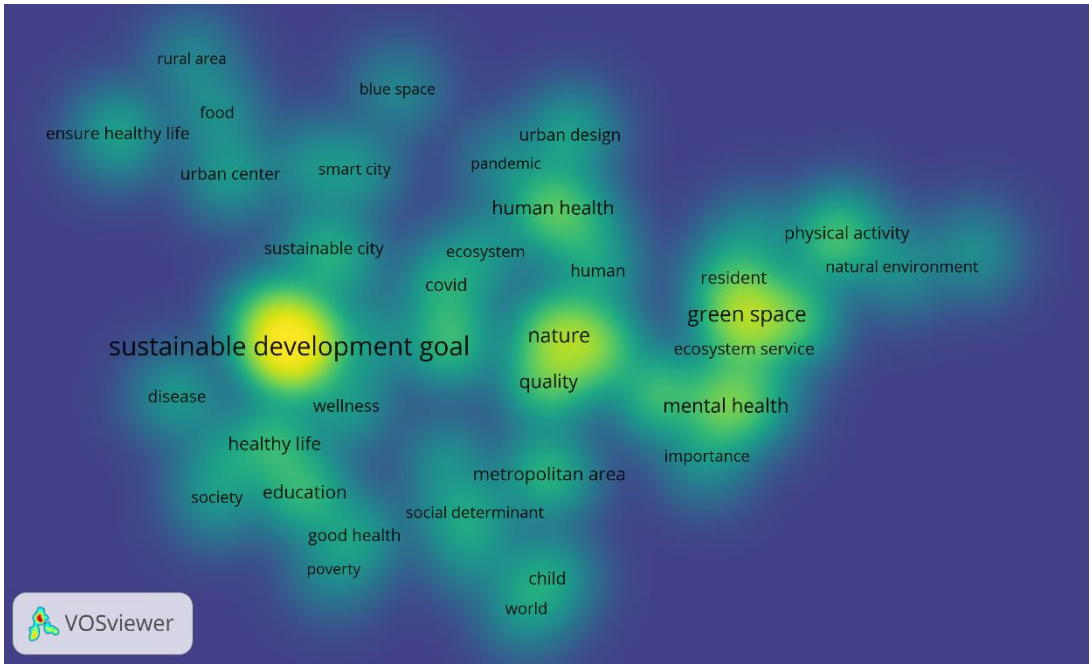

Figure 4. Density Visualization

Source: Data Analysis Result, 2024

This last figure uses a color gradient to represent the intensity of research focus within the field of public health and urban sustainability. Brighter areas indicate topics that have been more frequently researched, while the less bright areas signify topics that might be underexplored or emerging, presenting potential areas for future research.

The central and most illuminated part of the map focuses on "sustainable development goal," which suggests a high level of research activity around this theme. Surrounding this are topics like "human health," "nature," and "green space," which are also quite bright, indicating substantial existing research focus. While several areas identified as less bright areas such as:

1. Rural Area and Food

   These topics appear in the periphery with a dimmer presence, suggesting that while they are connected to urban public health, they may not have been as extensively studied. Future research could explore the intersections of rural dynamics with urban public health strategies, perhaps investigating how urban sustainability practices can be extended or adapted to rural contexts.
2. Blue Space

   Another less bright area is "blue space" which refers to aquatic environments. Research into how these spaces affect urban health and well-being could be expanded, especially considering the psychological and physical benefits associated with water bodies.
3. Smart City and Urban Design

   While receiving some attention, these areas appear less intense compared to central themes. Future studies could delve deeper into how smart city technologies and urban design innovations contribute to or detract from public health outcomes and sustainability goals.

The visualization hints at potential interdisciplinary research opportunities, particularly at the intersections of less bright areas with brighter, more researched themes. For instance, integrating

"food" and "rural area" studies with sustainable urban development could yield innovative insights into sustainable food systems in urban planning.

CONCLUSION

The bibliometric analysis and visualization above have given a multi-faceted view into the state of research in urban public health and sustainability. Firstly, the thematic clusterization revealed a broad array of interrelated topics such as green spaces, mental health, and sustainable city planning, indicating a multidisciplinary approach to understanding urban environments. Secondly, the research trend over time showed a clear shift in focus towards the direct impacts of urban design on physical and mental well-being, particularly highlighted by increased attention to green spaces and health in the latter years. This evolution in research priorities also hints at an adaptive research community that responds to global and societal changes such as pandemics. Thirdly, areas identified as having less research intensity, like rural health impacts and blue spaces, present valuable opportunities for future investigations that could enhance and broaden the current understanding of urban sustainability and public health. Lastly, the author collaboration network emphasized both well-established research clusters and potential for new collaborations, particularly between researchers focusing on emerging topics. Together, these insights not only sketch the current landscape of urban public health research but also pave the way for future studies that could fill existing gaps and foster interdisciplinary collaborations for a holistic approach to urban health challenges.

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