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Healthy City: Territorial Sustainability Strategies

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Cidade Saudável: Estratégias de sustentabilidade territorial

RESUMO

Objetivo – Analisar como a configuração do ambiente urbano influencia a saúde física, mental e social da população, demonstrando que fatores como áreas verdes, mobilidade ativa, conforto ambiental, controle de ruído, sociabilidade, segurança e acesso a serviços essenciais constituem determinantes estruturais do bem-estar. O estudo busca evidenciar que bairros estruturados sob princípios de urbanismo social e integração socioambiental apresentam maior potencial de promover cidades saudáveis e sustentáveis.

Metodologia – O trabalho adota abordagem qualitativa e interdisciplinar, com revisão teórica e documental baseada em relatórios institucionais (PPS, ONU, OMS, União Europeia), estudos científicos nacionais e internacionais, normas técnicas brasileiras (NBR 10.151 e NBR 10.152) e análise de casos empíricos. A investigação articula referenciais da saúde pública, do planejamento urbano e da sustentabilidade para compreender a relação entre ambiente construído e bem-estar coletivo. A partir da base bibliográfica, o estudo sistematiza um conjunto de chaves de análise que estruturam a compreensão da cidade saudável: i) desigualdade territorial, ii) conforto ambiental, iii) infraestrutura verde, iv) capital social, v) mobilidade ativa e vi) gestão integrada.

Originalidade/relevância – O estudo insere-se no gap teórico que articula planejamento urbano, saúde pública e justiça socioambiental, superando abordagens fragmentadas que tratam a saúde como fenômeno exclusivamente biológico. Ao integrar evidências sobre segregação socioespacial, ilhas de calor, poluição sonora e capital social, o trabalho reforça a necessidade de políticas urbanas estruturadas a partir dos determinantes sociais da saúde, contribuindo para o debate contemporâneo sobre cidades saudáveis no contexto das mudanças climáticas e das desigualdades urbanas.

Resultados – Os achados indicam que a segregação espacial e a precariedade infraestrutural estão associadas a piores indicadores de saúde, enquanto diferenças térmicas entre bairros afetam de forma desigual populações vulneráveis. A poluição sonora impacta negativamente o bem-estar, com prejuízos cognitivos e cardiovasculares. Em contrapartida, a presença de espaços verdes, a mobilidade ativa e o fortalecimento das redes de suporte social reduzem riscos à saúde física e mental. Estratégias baseadas na qualificação do espaço público e na integração socioambiental demonstram potencial para mitigar impactos ambientais e fortalecer vínculos comunitários.

Contribuições teóricas/metodológicas – O estudo amplia o debate sobre cidades saudáveis ao integrar saúde ambiental, conforto urbano, capital social e planejamento participativo em uma estrutura analítica unificada. Metodologicamente, sistematiza evidências empíricas sob uma perspectiva socioespacial integrada, oferecendo referencial aplicável à formulação de políticas públicas e intervenções territoriais.

Contribuições sociais e ambientais – Socialmente, o trabalho reforça a necessidade de políticas urbanas que promovam inclusão, pertencimento e redução das desigualdades territoriais. Ambientalmente, destaca a ampliação de áreas verdes, o controle de ruído, a mitigação de ilhas de calor e o incentivo à mobilidade ativa como estratégias concretas para aumentar a resiliência climática e melhorar a qualidade de vida urbana.

PALAVRAS-CHAVE: Cidade Saudável. Sustentabilidade. Planejamento Urbano.

Healthy City: Territorial Sustainability Strategies

ABSTRACT

Objective – To analyze how the configuration of the urban environment influences the physical, mental, and social health of the population, demonstrating that factors such as green areas, active mobility, environmental comfort, noise control, sociability, safety, and access to essential services constitute structural determinants of well-being. The study seeks to demonstrate that neighborhoods structured under principles of social urbanism and socio-environmental integration have greater potential to promote healthy and sustainable cities.

Methodology – The study adopts a qualitative and interdisciplinary approach, based on theoretical and documentary review of institutional reports (PPS, UN, WHO, European Union), national and international scientific studies, Brazilian technical standards (NBR 10.151 and NBR 10.152), and empirical case analyses. The investigation articulates frameworks from public health, urban planning, and sustainability to understand the relationship between the built environment and collective well-being. Based on the bibliographic framework, the study systematizes a set of analytical keys that structure the understanding of the healthy city: i) territorial inequality, ii) environmental comfort, iii) green infrastructure, iv) social capital, v) active mobility, and vi) integrated governance.

Originality/Relevance – The study addresses a theoretical gap at the intersection of urban planning, public health, and socio-environmental justice, overcoming fragmented approaches that treat health as an exclusively biological phenomenon. By integrating evidence on socio-spatial segregation, urban heat islands, noise pollution, and social capital, the research reinforces the need for urban policies structured around the social determinants of health, contributing to the contemporary debate on healthy cities in the context of climate change and urban inequalities.

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Results – The findings indicate that spatial segregation and infrastructural precariousness are associated with poorer health indicators, while thermal differences between neighborhoods disproportionately affect vulnerable populations. Noise pollution negatively impacts well-being, with cognitive and cardiovascular consequences. Conversely, the presence of green spaces, active mobility, and strengthened social support networks reduces risks to physical and mental health. Strategies based on public space qualification and socio-environmental integration demonstrate potential to mitigate environmental impacts and strengthen community bonds.
Theoretical/Methodological Contributions – The study advances the debate on healthy cities by integrating environmental health, urban comfort, social capital, and participatory planning within a unified analytical framework. Methodologically, it systematizes diverse empirical evidence from an integrated socio-spatial perspective, offering a framework applicable to public policy formulation and territorial interventions.
Social and Environmental Contributions – Socially, the study reinforces the need for urban policies that promote inclusion, belonging, and the reduction of territorial inequalities. Environmentally, it highlights the expansion of green areas, noise control, mitigation of urban heat islands, and the promotion of active mobility as concrete strategies to enhance climate resilience and improve urban quality of life.

KEYWORDS: Healthy City. Sustainability. Urban Planning.

Ciudad saludable: estrategias de sostenibilidad territorial

RESUMEN
Objetivo – Analizar cómo la configuración del entorno urbano influye en la salud física, mental y social de la población, demostrando que factores como áreas verdes, movilidad activa, confort ambiental, control del ruido, sociabilidad, seguridad y acceso a servicios esenciales constituyen determinantes estructurales del bienestar. El estudio busca evidenciar que los barrios estructurados bajo principios de urbanismo social e integración socioambiental presentan mayor potencial para promover ciudades saludables y sostenibles.
Metodología – El trabajo adopta un enfoque cualitativo e interdisciplinario, con revisión teórica y documental basada en informes institucionales (PPS, ONU, OMS, Unión Europea), estudios científicos nacionales e internacionales, normas técnicas brasileñas (NBR 10.151 y NBR 10.152) y análisis de casos empíricos. La investigación articula marcos teóricos de la salud pública, la planificación urbana y la sostenibilidad para comprender la relación entre el entorno construido y el bienestar colectivo. A partir del marco bibliográfico, el estudio sistematiza un conjunto de claves de análisis que estructuran la comprensión de la ciudad saludable: i) desigualdad territorial, ii) confort ambiental, iii) infraestructura verde, iv) capital social, v) movilidad activa y vi) gestión integrada.
Originalidad/Relevancia – El estudio se inserta en el vacío teórico que articula planificación urbana, salud pública y justicia socioambiental, superando enfoques fragmentados que tratan la salud como un fenómeno exclusivamente biológico. Al integrar evidencias sobre segregación socioespacial, islas de calor urbano, contaminación acústica y capital social, la investigación refuerza la necesidad de políticas urbanas estructuradas a partir de los determinantes sociales de la salud, contribuyendo al debate contemporáneo sobre ciudades saludables en el contexto del cambio climático y las desigualdades urbanas.
Resultados – Los hallazgos indican que la segregación espacial y la precariedad infraestructural están asociadas a peores indicadores de salud, mientras que las diferencias térmicas entre barrios afectan de manera desigual a las poblaciones vulnerables. La contaminación acústica impacta negativamente el bienestar, con perjuicios cognitivos y cardiovasculares. En contraste, la presencia de espacios verdes, la movilidad activa y el fortalecimiento de las redes de apoyo social reducen los riesgos para la salud física y mental. Las estrategias basadas en la cualificación del espacio público y en la integración socioambiental muestran potencial para mitigar impactos ambientales y fortalecer los vínculos comunitarios.
Contribuciones teóricas/metodológicas – El estudio amplía el debate sobre ciudades saludables al integrar salud ambiental, confort urbano, capital social y planificación participativa en una estructura analítica unificada. Metodológicamente, sistematiza evidencias empíricas desde una perspectiva socioespacial integrada, ofreciendo un marco aplicable a la formulación de políticas públicas e intervenciones territoriales.
Contribuciones sociales y ambientales – En el ámbito social, el trabajo refuerza la necesidad de políticas urbanas que promuevan inclusión, sentido de pertenencia y reducción de las desigualdades territoriales. En el ámbito ambiental, destaca la ampliación de áreas verdes, el control del ruido, la mitigación de islas de calor y el fomento de la movilidad activa como estrategias concretas para aumentar la resiliencia climática y mejorar la calidad de vida urbana.

PALABRAS CLAVE: Ciudad saludable. Sostenibilidad. Planificación urbana.

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1 INTRODUCTION

The relationship between the urban environment and public health has increasingly consolidated itself as one of the central axes of contemporary debates on urban planning and city management. Moving beyond the traditional biomedical perspective, recent literature demonstrates that health is conditioned by social and spatial determinants, such as housing conditions, access to infrastructure and sanitation, distribution of green areas, environmental quality (air, noise, and temperature), mobility and accessibility to services, urban safety, and social support networks. In this context, urban form and territorial organization cease to be merely functional dimensions and become structuring variables of collective health, directly influencing the physical, mental, and social well-being of populations.

Organizations such as the Project for Public Spaces (PPS, 2016) demonstrate that the quality of public spaces is directly associated with the construction of healthier communities, highlighting attributes such as sociability, diversity of uses, territorial integration, and environmental comfort. However, the incorporation of these principles still occurs unevenly, especially in contexts marked by socio-spatial segregation.

In the Brazilian context, such asymmetries become even more evident in light of territorial fragmentation and the unequal distribution of urban infrastructure. Significant thermal differences between neighborhoods, associated with the scarcity of green areas and soil impermeabilization, expose vulnerable populations to greater risks arising from urban heat islands (O Globo, 2024; 2025). Similarly, continuous exposure to urban noise has been associated with cardiovascular, cognitive, and psychological impacts (Münzel cited in Bienath, 2024; Eniz; Garavelli, 2006), highlighting the need to integrate environmental comfort parameters into urban planning strategies.

At the same time, international and national research demonstrates that the strengthening of social support networks, sense of belonging, and social capital constitute relevant protective factors for mental and physical health (DHHS, 2023; Knight Foundation, 2010). Social isolation, on the other hand, significantly increases the risks of mortality, cardiovascular diseases, and cognitive decline (Cupani, 2024). These findings reinforce that urban design not only organizes flows and land uses but also structures opportunities for interaction, safety, and community cohesion.

In light of this context, approaches such as social urbanism and feminist urbanism have proposed reorientations in planning, seeking to integrate territorial equity, social inclusion, and environmental quality (Alvim et al., 2024). These perspectives recognize that healthy cities do not result merely from punctual technical interventions but from integrated processes of urban governance capable of articulating infrastructure, socio-spatial justice, and civic participation.

Thus, discussing healthy cities within the field of urban management implies recognizing that health, sustainability, and territorial planning constitute interdependent dimensions. Contemporary urban governance must incorporate scientific evidence on socio-environmental determinants of health and translate such evidence into structured public policies capable of addressing historical inequalities and enhancing the climate and social resilience of cities.

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2 OBJECTIVES

This article aims to critically analyze how the configuration of the urban environment influences the physical, mental, and social health conditions of the population, arguing that territorial planning constitutes a structural determinant of collective well-being. It is grounded in the understanding that factors such as green areas, active mobility, environmental comfort, noise control, sociability, safety, and access to essential services are not peripheral dimensions of urban space, but central components in the production of quality of life and socio-environmental equity. The study seeks to demonstrate that socio-spatial inequality intensifies health and environmental vulnerabilities, while simultaneously reinforcing the need for integrated urban policies capable of articulating sustainability, territorial governance, and social justice.

3 METODOLOGIA/MÉTODO DE ANÁLISE

The present study adopts a qualitative approach of an essay-analytical nature, grounded in a critical and interdisciplinary review of the literature. The investigation articulates theoretical frameworks from public health, urban planning, and sustainability, mobilizing national and international scientific publications, institutional reports from multilateral organizations (such as the UN, WHO, and the European Union), as well as technical and normative documents relevant to the Brazilian context, including NBR 10.151 (ABNT, 2000) and NBR 10.152 (ABNT, 1987), related to urban environmental comfort. The analysis also incorporates recent empirical evidence and technical reports in order to establish connections between socio-spatial determinants and health indicators.

Based on this bibliographic foundation, the study systematizes a set of analytical keys that structure the understanding of the healthy city: i) territorial inequality, ii) environmental comfort, iii) green infrastructure, iv) social capital, v) active mobility, and vi) integrated governance. This is not an empirical investigation supported by statistical modeling, but rather a structured reflection that organizes dispersed evidence from a critical socio-spatial perspective. These analytical keys emerge from an articulated reading of the literature and enable the construction of an interpretative framework that relates urban governance, environmental quality, and socio-environmental justice, thereby challenging the field of city management in light of the contemporary debate on sustainability and public health.

4 STRATEGIES FOR ENVIRONMENTAL SUSTAINABILITY

The way different neighborhoods are planned and structured exerts a profound and often underestimated influence on the physical and mental health of their residents. Every detail of the urban environment—from the distribution of public spaces to the presence of green areas, the availability of essential services, the organization of urban furniture, and conditions of safety and accessibility—composes a complex and interconnected network that directly interacts with individual well-being. This set of factors may operate positively, promoting quality

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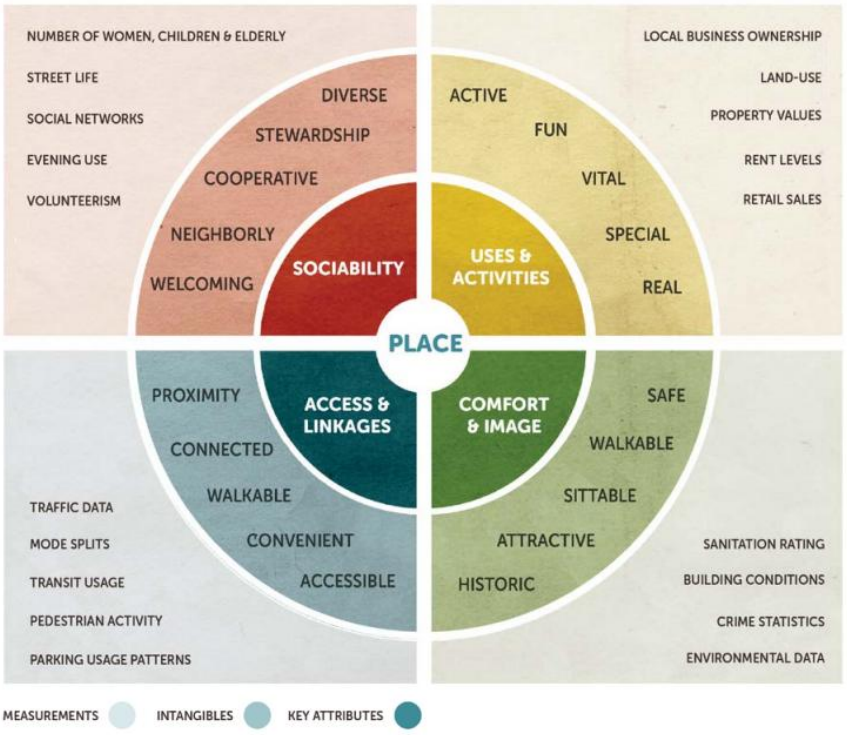
of life and balance, or, conversely, become an obstacle to healthy development, affecting both the body and the mind of those who inhabit these spaces.

4.1 Project Public Spaces

The Project for Public Spaces (PPS) is a nonprofit organization based in New York that, since 1975, has sought to help communities create and sustain public spaces that strengthen the neighborhoods in which they are embedded. The organization has worked with more than 3,000 communities across all 50 U.S. states and in 43 countries worldwide.

To support its analyses, the research draws on the concept of *placemaking*, a multidisciplinary strategy aimed at fostering healthy urban communities. Placemaking refers to the process of planning and designing high-quality public spaces that contribute to the well-being of the local community. Within its methodological framework, PPS considers four key attributes: i) sociability, ii) uses and activities, iii) access and integration, and iv) comfort and image (Figure 1).

Figure 1 – The four attributes and their respective dimensions of a quality neighborhood.



Source: PPS (2016).

When a neighborhood is planned with the participation of residents in local decision-making, taking into account their needs and aspirations, the likelihood increases that the area will become a healthy and welcoming environment for its inhabitants.

In its 2016 publication The Case for Healthy Places: Improving Health Outcomes through Placemaking, PPS identifies five key elements for the development of healthier places: i) Social Support and Interaction, ii) Play and Active Recreation, iii) Green and Natural Environments, iv) Healthy Food, and v) Walking and Cycling (Table 1).

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Table 1 – Key Elements for the Development of Healthier Environments

KEY ELEMENTS	JUSTIFICATION
Social Support and Interaction	Strong social networks and social support are essential for strengthening the sense of belonging within a community, a factor that positively impacts mental health and overall well-being. Placemaking initiatives—both the public spaces created and the community engagement process itself—provide opportunities for gatherings, social interaction, and volunteerism, which have been shown to be effective in reducing psychological distress and depression. They also contribute to an increased sense of safety and to the mitigation of crime.
Play and Active Recreation	Regular physical activity is essential for maintaining a healthy weight, increasing longevity, enhancing cognitive functions, and reducing the risk of chronic diseases such as heart disease and type 2 diabetes. Placemaking strategies aimed at creating or improving parks and recreational spaces encourage physical activity and expand the range of uses for these areas. Furthermore, involving local stakeholders in the planning process of these spaces strengthens the sense of community and belonging, thereby promoting greater use of parks.
Green Spaces and Natural Environments	Well-designed and effectively utilized green spaces provide multiple benefits, including increased physical activity and improved cardiometabolic health; reduced mental health problems, such as depression, anxiety, and stress; enhanced cognitive functions, including attention and memory; and the promotion of social interaction and community-based activities that strengthen social capital. In addition, these spaces indirectly contribute to public health by reducing violent crime, improving air and water quality, and increasing resilience to flooding. Placemaking initiatives can use vegetation as a simple, accessible, and short-term intervention to make public spaces more attractive, comfortable, and distinctive.
Healthy Nutrition	Access to healthy and affordable food is essential to prevent malnutrition and inadequate diets that may lead to obesity and chronic diseases, such as heart disease, type 2 diabetes, and certain types of cancer. Placemaking initiatives, such as the creation of public markets and community gardens, encourage the consumption of fruits and vegetables, ensure food security—particularly for low-income populations and vulnerable groups—stimulate the economic development of producers, distributors, and other actors within the local food system, promote environmental sustainability, and create opportunities for entrepreneurship, community strengthening, and food education.
Walking and Cycling Mobility	Walking, cycling, and using active modes of transportation contribute to physical and cognitive health, while also reducing risk factors associated with obesity and chronic diseases. Placemaking fosters more walkable and bikeable communities by promoting the creation of new sidewalks, cycling infrastructure, and community destinations, thereby improving street safety and accessibility. Furthermore, it strengthens the local economy and encourages more sustainable modes of transport. The most effective strategies for active mobility are those implemented at the citywide scale.

Source: Prepared by the authors (2025). Data from PPS (2016).

4.2 Environmental Comfort and Urban Health

In 2012, during a lecture delivered to the academic community of the Harvard School of Public Health (HSPH), Assistant Professor Melody Goodman of the University of Washington

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highlighted the relationship between segregation and poor health, emphasizing the profound influence that the environment in which we live exerts on our health and well-being. In her presentation, Goodman stressed that an individual's place of residence may be a more significant determinant than their own genetic makeup: "Your zip code is a better predictor of your health than your genetic code" (Goodman cited in Roeder, 2014, online).

This statement brings into focus an important point: health is not merely a biological issue, but also a social one. Goodman's assertion suggests that factors such as access to healthcare services, quality of life, housing conditions, safety, and even the structure of transportation systems and public spaces may directly affect an individual's health, often more significantly than genetic predispositions. Furthermore, the text addresses a crucial issue—segregation—which is deeply connected to social inequality. Spatial segregation, in which certain communities are isolated from resources and opportunities, perpetuates disparities in health, education, and overall well-being.

A survey conducted by *O Globo* (2025) indicates that, during the summers of the past ten years, the difference in maximum temperatures between the hottest and coolest neighborhoods in the city (measured by the municipality's 29 secondary weather stations) has averaged 4.2°C. Geographer Milena Pires de Sousa, from the Graduate Program in Physical Geography at the University of São Paulo (USP), reports that the disparity in heat between different neighborhoods is not a natural phenomenon:

> These changes are largely related to the city's physical characteristics. But they are also linked to infrastructure issues influenced by public policies, such as the distribution of green areas, the presence of parks, and permeable surfaces. Differences in building construction are also significant—whether in terms of materials or the form of the buildings [...] Anything that prevents air from circulating near the ground also has an influence (Souza cited in *O Globo*, 2025, online).

A study conducted by the Municipal Department of the Environment, in partnership with the Oceanographic Institute of the University of São Paulo (USP), identified that communities and peripheral neighborhoods may record temperature variations of up to 10°C above the average of wealthier and more urbanized areas (*O Globo*, 2024). According to André Fernandes, founder of the Favela News Agency (ANF), "This is not a problem of one community; it is a problem for all. The climate crisis has arrived, and it does not affect everyone in the same way. It is the duty of governments to implement public policies to reduce the impacts that favelas have been experiencing due to excessive heat" (Fernandes cited in *O Globo*, 2024, online).

Another issue related to environmental comfort is urban noise. In 2024, during a lecture at the European Society of Cardiology (ESC) Congress, researcher Thomas Münzel of the University of Mainz (Germany) reported that noise can impair the cardiovascular system through two different pathways: i) a direct connection between continuous exposure to noise and adverse health outcomes, such as hearing loss, and ii) an indirect relationship, such as hindering communication and directly affecting the sleep of individuals living in highly noisy neighborhoods (Münzel cited in Bienath, 2024).

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These two factors, in turn, trigger stress, irritation, and anger. Over time, these emotions become persistent, leading to the release of substances that compromise the integrity of the endothelium (the layer lining the interior of blood vessels). The resulting damage may evolve into more severe conditions, increasing the risk of acute myocardial infarction or stroke. According to the researcher, for every 10-decibel increase in traffic noise, there is a 3.2% increase in the risk of developing diseases affecting the heart and circulatory system (Münzel cited in Bienath, 2024).

However, there are effective public policies that have already been evaluated and can be implemented in practice, according to the European Union's *Future Brief* (EU, 2017). In the case of highways, avenues, and streets, it is possible to establish limits on vehicle engine noise emissions, provide incentives for electric vehicles (which are significantly quieter), modify asphalt and tire compositions (which can absorb sound or reduce friction, for example), install sound barriers along heavily trafficked roads (which can reduce noise by up to 20 decibels), and reduce speed limits in densely populated areas. For rail transport, some strategies include improving train infrastructure to reduce braking noise and investing in electric models (EU, 2017).

A representative example of these strategies can be observed in the interventions carried out at Public School 98 in New York. Bronzaft and McCarthy (1975) conducted a pioneering study on the effects of noise on children's academic performance, with emphasis on reading ability. Their research revealed that students assigned to classrooms on the side of the school exposed to railway noise performed worse on reading tests compared to those studying on the quieter side of the building. The results indicated that classes located in the noisier area reached the same reading level as their peers in the quieter sector with a delay of three to four months. In response to these findings, mitigation measures were adopted: the Transit Authority installed rubber dampers on the tracks to minimize noise propagation, while the Board of Education installed soundproofing materials in classrooms, providing a more suitable learning environment.

A 2022 study conducted in Barcelona analyzed the impact of traffic noise pollution on working memory and attention among 2,700 children aged 7 to 10 in 38 schools. Foraster et al. (2022) measured outdoor noise at specific classroom points and repeated the measurements six months later to determine average sound exposure. Additionally, quarterly cognitive tests were administered over one year. The results indicated that road, air, and rail traffic noise may impair cognitive functions essential for learning. The study also demonstrated that sudden fluctuations in noise levels—such as honking or engine acceleration—are particularly harmful to concentration, even when the average noise level remains lower. The research focused specifically on noise fluctuations, since no international guidelines are currently in place to measure this parameter. According to Foraster et al. (2022), the most effective way to protect children from noise pollution is to minimize traffic near schools. The researcher argues that more strategic urban planning, distancing educational institutions from heavily trafficked roads and incorporating parks and green areas into their surroundings, would significantly improve the learning environment.

In Brazil, NBR 10.151 (ABNT, 2000) establishes that sound pressure levels for outdoor environments in school areas should not exceed 50 dB during the day and 45 dB at night. For

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indoor environments, acoustic comfort levels according to NBR 10.152 (ABNT, 1987) are as follows: i) 35 to 45 dB in libraries, music rooms, and drawing rooms; ii) 40 to 50 dB in classrooms and laboratories; and iii) 45 to 55 dB in circulation areas. A study conducted in ten schools in the Federal District (Eniz; Garavelli, 2006) revealed that 90% of the evaluated institutions presented noise levels above the recommended limits. One of the schools analyzed, located along an aircraft route leading to Brasília International Airport, recorded sound pressure levels above 90 dB. Another institution, situated near a heavily trafficked avenue in Taguatinga, registered values above 65 dB due to intense vehicular traffic. In light of this scenario, the authors also emphasize the need for control strategies and urban planning measures to mitigate noise exposure in school environments. Among the proposed measures are the implementation of acoustic barriers, the use of construction materials with sound insulation properties, and careful site selection of schools in relation to major sources of urban noise pollution.

Another example is highway paving in Belgium. Over a 20-year period, Belgian researchers developed a paving technology that significantly reduces noise generated by road traffic. Research conducted by the Belgian Cement Industry Federation (FEBELCEM) identified that the primary source of noise is not vehicle engines but the contact between tires and pavement (FEBELCEM, 2014). To mitigate this effect, a two-layer concrete pavement was developed: a lower layer with aggregates ranging from 20 mm to 31 mm and an upper layer with uniform 10 mm aggregates. This composition provides a smoother and more flexible surface, reducing noise by up to 5 decibels (FEBELCEM, 2014). Tests initiated in 2002 demonstrated progressive noise reductions, culminating in 2016 with the application of this technology on the E313 highway, which connects the country's interior to Antwerp. Although costs remain high, the innovation represents a significant advancement in reducing highway noise pollution. Belgium intends to expand the application of low-noise pavement to highways connecting the country to France, the Netherlands, and Germany, seeking partnerships with these nations. The objective of this cooperation is to share costs, considering that the investment per kilometer of this type of paving is no less than 500,000 euros.

4.3 Sociability and Belonging as a Strategy for a Healthy Territory

The way spaces promote sociability is also closely related to the construction of a healthy place. According to the World Health Organization (WHO) and the Healthy People 2030 initiative of the U.S. Office of Disease Prevention and Health Promotion, social support and positive social relationships are key determinants of health and well-being (DHHS, 2023). Social support—whether provided by friends, family members, or broader community networks—helps individuals meet both emotional and practical needs. Belonging to a strong social network, which requires communication and mutual obligations, fosters a sense of being cared for and valued.

Numerous academic and professional studies consistently demonstrate that individuals with a strong sense of belonging to their local community tend to live healthier lives and face fewer mental health challenges than those who lack this emotional and spatial connection. In fact, several studies indicate that community belonging has a significant impact on health-

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related behavior change: the stronger the sense of belonging, the greater the likelihood that individuals will exercise, lose weight, or adopt healthier eating habits.

Scientific evidence also indicates that social isolation and loneliness significantly increase the risk of mortality. For example, the WHO reports that loneliness can raise the risk of death by 25%, increase the risk of dementia by 50%, and elevate the risk of cardiovascular disease by 30% (Cupani, 2024). Additionally, research shows that socially isolated individuals face approximately a 30% higher risk of mortality compared to those with broader social networks (*O Globo*, 2023). These data emphasize the importance of maintaining close social ties with family members, friends, and the wider community in order to promote health and well-being.

Conversely, positive social networks, civic engagement, and social interaction have been associated with reduced risks of mental disorders and certain physical health conditions. There is also evidence linking social capital—including factors such as volunteering and community trust—to improved health outcomes. Social participation and community empowerment have been shown to increase protective factors against dementia and cognitive decline among older adults.

The James L. Knight Foundation is a U.S.-based philanthropic organization dedicated to strengthening culture and promoting sustainable urban development, among other objectives. In the field of community development, the foundation supports initiatives that encourage civic engagement, creativity, and urban innovation, aiming to transform public spaces and improve quality of life. One of its most influential projects was the study entitled *Soul of the Community*, conducted by the Knight Foundation in partnership with the Gallup Institute between 2008 and 2010. This study investigated place attachment—the emotional and psychological connection that individuals develop with their physical and social environment. This concept goes beyond simple geographic belonging and encompasses feelings of identity, pride, and emotional investment in the place where one lives (Knight Foundation, 2010). The three-year study interviewed nearly 43,000 people across 26 communities and identified three essential qualities of a place that foster this attachment (Table 2).

Table 2 – Essential Qualities of a Place with Strong Social Support

QUALITIES	JUSTIFICATION
Social Offerings	The presence of spaces and opportunities for meaningful social interactions, such as parks, squares, cafés, and community events.
Openness and Inclusiveness	The extent to which a place is receptive to diversity and promotes the inclusion of different groups and cultures.
Aesthetics and Green Spaces	The aesthetic quality of the urban environment—including architecture, squares, parks, and natural elements—which influences people's well-being.

Source: Prepared by the author (2025). Data from Knight Foundation (2010).

Urban sociability is closely associated with safety conditions and the perception of risk within a territory, as environments marked by high crime rates tend to restrict the use of public spaces and reduce opportunities for social interaction. The Healthy People 2030 initiative (DHHS, 2023) identifies crime and violence as key determinants of the health of a neighborhood or built environment. In this context, placemaking strategies play a fundamental role by

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fostering regular social interactions, particularly in vulnerable communities undergoing deterioration or where opportunities for social coexistence among residents are limited.

The Environmental Design Guidelines of the U.S. National Crime Prevention Council include several strategies that connect crime prevention to spatial interventions, such as promoting open spaces and community events (including neighborhood festivals or collective clean-up efforts); increasing natural surveillance through improved lighting and the development of more pedestrian-friendly streets, thereby reducing traffic-related risks; organizing community meetings and events; and fostering a sense of belonging and collective responsibility through the incorporation of signage and public art in shared spaces.

Social urbanism represents an approach that can be applied in such contexts. It seeks to integrate urban policies with social initiatives in order to promote sustainable development and social inclusion in cities. This perspective emphasizes the importance of planning and intervening in urban spaces in ways that address the needs of all segments of society—particularly the most vulnerable—thereby advancing equity and social justice. The Center for Cities Studies – Arq. Futuro Laboratory at Insper developed a guidebook on social urbanism aimed at disseminating knowledge and practices related to this approach (Alvim et al., 2024). The guidebook presents ten fundamental principles and six pillars that guide this framework, with the objective of fostering more inclusive, sustainable, and socially integrated urban development.

4.4 Analytical Framework for the Healthy City

The reflection developed throughout this article reaffirms that the healthy city cannot be understood as the result of isolated interventions or sectoral policies, but rather as the expression of a structural articulation between territory, socio-environmental justice, and urban governance. Health, in this sense, emerges as the synthesis of the material, symbolic, and relational conditions that shape urban space.

A first analytical key refers to socio-spatial inequality, evidenced by territorial segregation and the unequal distribution of infrastructure and services. As discussed, urban location functions as a determinant of health, confirming the premise that territory conditions opportunities, risks, and life expectations. Urban fragmentation—marked by significant thermal differences, unequal exposure to noise pollution, and scarcity of green areas—reveals that urban form materializes power relations and reproduces structural asymmetries.

The second key concerns environmental comfort and the ecological quality of urban space. Recent literature and technical standards demonstrate that noise, temperature, and ventilation are not merely technical variables, but factors directly related to cardiovascular, cognitive, and psychological diseases. Discussions on urban heat islands and green infrastructure reinforce that territorial sustainability constitutes an indispensable condition for promoting collective health, in dialogue with the principles of sustainable development established since the Brundtland Report (WCED, 1987) and reaffirmed by the 2030 Agenda (UN, 2015).

A third central dimension is social capital and urban sociability. Studies published by the Department of Health and Human Services (2023) and the Knight Foundation (2010) indicate that belonging, support networks, and community interaction play a protective role in physical

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and mental health. The city, therefore, is not merely a physical substrate but a relational environment in which the design of public spaces influences social cohesion, safety, and urban vitality. In this regard, contributions from the Project for Public Spaces (2016) and social urbanism approaches reinforce the importance of qualifying public space as a strategy for strengthening community ties.

Another interpretative key involves active mobility and access to essential services, which structure opportunities for safe movement, territorial inclusion, and everyday autonomy. Promoting walkability, cycling mobility, and high-quality public transportation integrates preventive health, emission reduction, and the democratization of urban space, highlighting the interdependence between environmental sustainability and social equity.

By drawing on the contributions of authors such as Alvim et al. (2024), who discuss social urbanism and inclusive perspectives, as well as recent empirical evidence on thermal inequality and noise pollution, this article argues that the healthy city must be understood as a political and territorial project. It entails recognizing that urban planning and management are not neutral activities, but instruments capable either of reproducing vulnerabilities or of promoting socio-environmental justice.

Figure 2 – Analytical Framework for the Healthy City

Source – Prepared by the authors with the assistance of Artificial Intelligence tools, 2026.

Thus, the various analytical keys (Figure 2) outlined here—territorial inequality, environmental comfort, green infrastructure, social capital, active mobility, and integrated governance—converge toward an expanded understanding of the healthy city as a synthesis of public health, sustainability, and urban planning. By adopting an essayistic approach, this study does not intend to exhaust the subject but rather to challenge the field of city management,

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arguing that the systematic incorporation of socio-environmental determinants of health constitutes an indispensable condition for building more resilient, inclusive, and environmentally balanced cities.

Ultimately, the healthy city is not limited to a normative ideal but is configured as a strategic horizon for contemporary urban governance, requiring intersectoral integration, political commitment, and a critical reading of the territorial dynamics that shape urban life.

5 CONCLUSION

The reflection developed throughout this article reaffirms that the healthy city cannot be understood as a spontaneous product of urbanization nor as the outcome of isolated and sectoral interventions. Rather, it constitutes a territorial and political construction, dependent upon the structured articulation between urban planning, integrated governance, and socio-environmental justice. Health, in this sense, emerges as the synthesis of the material, environmental, and relational conditions that shape urban space.

The analysis of the literature and empirical evidence mobilized in this study allowed for the systematization of six fundamental interpretative keys for understanding the healthy city: territorial inequality, environmental comfort, green infrastructure, social capital, active mobility, and integrated governance. These dimensions do not operate in isolation; instead, they form an interdependent system that structures risks and opportunities within the territory.

Territorial inequality emerged as a structural element of health inequities, confirming that socio-spatial segregation materializes differences in access to infrastructure, green areas, environmental quality, and urban services. The identification of significant thermal variations between neighborhoods and unequal exposure to noise pollution demonstrates that territory functions as a social determinant of health, reinforcing the premise that urban form expresses historical relations of power and exclusion.

Environmental comfort, in turn, ceases to be understood as a technical variable restricted to urban engineering and becomes recognized as an essential component of collective health. Excessive noise, urban heat islands, and poor environmental quality have been shown to exert direct impacts on cognitive, cardiovascular, and psychological functions. Therefore, technical standards and mitigation strategies must be incorporated into planning processes as preventive instruments of public health.

Green infrastructure appears as a structuring axis of territorial sustainability, articulating thermal regulation, air quality improvement, water management, and the promotion of sociability. In dialogue with contemporary approaches to nature-based solutions, this dimension demonstrates that environmental sustainability and urban health are inseparable.

Social capital and urban sociability reaffirm that the city is also a relational space. Support networks, belonging, and community engagement demonstrate significant protective effects on physical and mental health, indicating that urban design directly influences social cohesion, safety, and territorial vitality. Qualified public space thus emerges as an arena for the production of health and citizenship.

Active mobility broadens this perspective by integrating safe movement, physical activity, emission reduction, and democratized territorial access. Walkability and cycling

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mobility constitute strategies that are simultaneously sanitary, environmental, and economic, reaffirming the interdependence between territorial planning and the prevention of chronic diseases.

Finally, integrated governance consolidates itself as a transversal condition for the effective implementation of the other dimensions. The healthy city requires intersectoral coordination among health, mobility, environment, housing, and urban development policies. Without institutional integration and strategic planning, actions tend to remain fragmented and incapable of addressing structural inequalities.

By adopting an essayistic-analytical character, this study does not intend to offer a closed normative model, but rather to challenge the field of city management, arguing that the systematic incorporation of the socio-environmental determinants of health must constitute a structuring axis of contemporary urban policies. The healthy city, therefore, is not merely a discursive ideal but a strategic horizon that demands political commitment, scientific grounding, and innovation in territorial governance.

Ultimately, it is argued that contemporary urban management must overcome fragmented technocratic approaches and recognize that health, sustainability, and socio-spatial justice are inseparable dimensions of spatial production. Building healthy cities means, above all, reorganizing territorial priorities, redistributing urban opportunities, and reaffirming planning as an instrument of equity and social transformation.

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