Research Article

Global Journal of Agriculture, Earth & Environmental Science

OPENPUB GLOBAL PUBLISHERS

Received: 23-05-2025 **Accepted:** 28-06-2025 **Published:** 14-07-2025

Volume 1 | Issue 2

Review on Environmental Determinants of Health in Urban Areas: A Planning Perspective

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Citation: Megalo., M., Desta., H., Gomba., Z. (2025). Review on Environmental Determinants of Health in Urban Areas: A Planning Perspective, Glob. J. Agric. Earth Environ. Sci., 1(2), 1-22.

Abstract

Urban environments significantly influence population health through various environmental determinants. This review examines these key determinants within urban settings, focusing on planning perspectives that mitigate negative impacts and promote healthier cities. We analyze air and water quality, green spaces, noise pollution, urban design, built environment characteristics, and social determinants of health. The paper highlights the role of urban planning in addressing health disparities through integrated and equitable strategies. Case studies demonstrate successful implementations across different contexts, while identifying persistent challenges including institutional barriers, economic constraints, and social inequities. We conclude with actionable recommendations for urban planners to integrate health considerations into their practices, emphasizing interdisciplinary collaboration and evidence-based interventions to foster healthier urban communities.

Keywords: Environmental Determinants, Urban planning, Public Health.

1. Introduction

1.1 Background on urbanization trends and health implication

Urban areas, while centers of economic and social activity, present unique environmental challenges that disproportionately affect vulnerable populations. This review explores the interplay between urban environmental factors and health outcomes, emphasizing the role of urban planning in creating healthier and more sustainable cities. We will analyze the evidence base linking specific environmental exposures to health impacts and discuss effective planning interventions. A One Health approach, recognizing the interconnectedness of human, animal, and environmental health, is crucial in addressing these complex issues [1].

Unsustainable urban development has a negative impact on human health. African cities already face huge demands with regard to human health and urban sustainability, and global environmental change will increase these challenges, making it even more imperative that human health and urban sustainability are simultaneously addressed in locally appropriate ways [2]. In African urban areas, environmental factors significantly impact health, particularly due to rapid population growth, inadequate infrastructure, and climate change. These challenges include air and water pollution, poor sanitation, and inadequate housing, all of which exacerbate health inequities. A planning perspective is crucial for addressing these issues, requiring integrated approaches that consider health alongside urban development [3].

Urban areas are increasingly becoming the focal point of human habitation, with over 55% of the global population residing in cities as of 2020, a figure projected to rise to 68% by 2050 [4]. This rapid urbanization presents both opportunities and challenges for public health. Environmental determinants of health factors in the environment that affect health outcomes are particularly pronounced in urban settings [5]. This paper reviews the literature on these determinants and discusses the implications for urban planning.

In Urban areas, the engines of economic growth and innovation, are also complex ecosystems that significantly impact the health and well-being of their inhabitants. The density of population, infrastructure, and activity within cities concentrates both opportunities and risks, making the environmental determinants of health particularly salient in urban contexts. This review paper explores these environmental determinants from a planning perspective, examining how urban planning strategies can mitigate negative impacts and promote healthier urban

environments.

1.2 Relevance to Contemporary Urban Challenges

This review addresses several urgent challenges facing cities globally. Rapid urbanization, particularly in developing regions where urban populations are projected to double by 2050, creates unprecedented pressure on environmental systems with direct health implications [6]. Simultaneously, climate change intensifies urban vulnerabilities through extreme heat events, flooding, and changing disease vectors, disproportionately affecting marginalized communities [7]. The COVID-19 pandemic has further exposed how urban environmental conditions including housing density, air quality, and public space availability significantly influence health outcomes during crises [8]. Economic constraints following the pandemic have limited municipal budgets for infrastructure improvements, while growing socioeconomic polarization exacerbates environmental health inequities [9]. Additionally, the increasing recognition of the planetary health paradigm demands that urban planning addresses both human health and ecological sustainability [10]. These converging challenges necessitate evidence-based planning approaches that can simultaneously promote health equity, environmental sustainability, and urban resilience in an increasingly complex context [11].

2. Methodology

2.1 Search Strategy

This review employs a systematic approach to gather and analyze existing literature on environmental determinants of health in urban areas. The methodology includes a comprehensive search of academic databases, government reports, and relevant publications to ensure a robust understanding of the topic.

2.2 Inclusion Criteria and Exclusion Criteria

Studies included in this review were selected based on their relevance to the topic, publication date, focus on urban environmental health determinants, planning perspective on health outcomes, English language publication and methodological rigor.

Excluded studies were those that did not focus specifically on urban environments or lacked empirical data.

2.3 Data Sources and analytical approach

Data sources include peer-reviewed journals, books, and reports from reputable organizations such as the World Health Organization and the United Nations. The search strategy involved keywords related to urban health, environmental determinants, urban planning, and public health outcomes.

3.Conceptual Framework: Environmental Determinants of Health

3.1 Definition and Scope

Environmental determinants of health encompass a wide range of factors, including physical, chemical, biological, and social elements that influence health outcomes. These determinants can be categorized into natural and built environments, each playing a crucial role in shaping public health [12].

3.2 Theoretical Foundations

The study of environmental determinants of health in urban settings draws upon several theoretical frameworks that help explain the complex pathways between urban environments and health outcomes. Social-ecological theory, pioneered by Bronfenbrenner (1979) [13] and adapted for public health by Stokols (1996) [14], provides a foundational perspective by conceptualizing health as emerging from multilevel interactions between individuals and their social, built, and natural environments. This model recognizes that health behaviors and outcomes are shaped not merely by individual choices but by environmental contexts that either facilitate or constrain health-promoting options.

Environmental justice theory [15-16] extends this framework by examining how environmental risks and resources are distributed across populations, highlighting how marginalized communities often bear disproportionate environmental burdens. This theoretical lens is particularly relevant in urban settings where spatial segregation frequently aligns with environmental quality gradients.

The “urban health penalty” framework proposed by [3] specifically addresses how concentrated poverty, environmental degradation, and inadequate infrastructure in urban areas create health disadvantages, particularly for vulnerable populations. Conversely, the “urban health advantage” perspective recognizes that cities can offer health benefits through greater access to services, economic opportunities, and social networks when properly designed and governed.

More recently, planetary health theory [17] and One Health approaches [18] have emerged as integrative frameworks that conceptualize human health as inextricably linked to the health of natural systems. These perspectives are increasingly relevant as cities grapple with climate change impacts and recognize their ecological footprints.

Urban planning itself offers theoretical contributions through concepts like “healthy urban planning” [19], which positions health promotion as a central planning objective, and “therapeutic landscapes” [20], which examines how places can be designed to promote healing and well-being. Together, these theoretical perspectives provide a robust foundation for understanding the complex relationships between urban environments and health outcomes, informing both research approaches and policy interventions.

3.3 Urban Planning as a Health Determinant

Urban planning itself constitutes a fundamental determinant of health through its influence on the physical, social, and economic environments in which people live. The decisions made by urban planners shape population health outcomes across multiple pathways and temporal scales [21]. Historically, modern urban planning emerged partially in response to public health crises in industrializing cities of the 19th century, where poor sanitation, overcrowding, and industrial pollution created significant health hazards [22]. This historical connection was later diminished as planning and public health became increasingly specialized and separated disciplines throughout the 20th century [23].

Contemporary research has reestablished the critical relationship between planning decisions and health outcomes. Land use patterns determine population density, mixed-use development, and connectivity, which in turn influence physical activity levels, social cohesion, and access to essential services and amenities [24]. Transportation planning shapes mobility options, affecting air quality, noise exposure, traffic safety, and active transport opportunities [25]. Infrastructure planning for water, sanitation, and waste management directly impacts exposure to environmental hazards and disease vectors [26].

Urban planning also affects health through more indirect pathways. Zoning regulations and housing policies influence residential segregation and the distribution of environmental burdens and amenities, contributing to health inequities across socioeconomic and racial/ethnic lines [27]. Economic development strategies embedded in planning processes affect employment opportunities, income levels, and financial security all recognized social determinants of health [28].

The temporal dimension is particularly important, as planning decisions create path dependencies that shape health outcomes for generations. Infrastructure investments, building standards, and spatial arrangements established today will influence health for decades to come, underscoring the long-term health implications of current planning practices [29].

Increasingly, frameworks like Health in All Policies (HiAP) and Health Impact Assessment (HIA) are being employed to formalize consideration of health outcomes in planning processes [30]. These approaches represent a renewed recognition that urban planning is not merely a technical exercise in spatial organization but a powerful intervention in the social determinants of health with profound implications for population wellbeing and health equity [31].

4. Key Environmental Determinants of Health in Urban Areas

Urban environments contain numerous environmental factors that significantly impact population health outcomes. These determinants operate through complex, often interconnected pathways to influence both communicable and non-communicable disease burdens, mental health outcomes, and overall quality of life [32]. The World Health Organization estimates that environmental factors contribute to 23% of global mortality and 22% of the global burden of disease, with urbanization intensifying many of these exposures [33]. This section examines the most critical environmental determinants of health in urban settings, their mechanisms of impact, and their distribution across urban populations.

4.1 Air Quality

Air pollution represents one of the most significant environmental health threats in urban areas, responsible for approximately 4.2 million premature deaths annually worldwide [34]. Urban air quality is compromised by multiple pollutants including particulate matter (PM2.5 and PM10), nitrogen dioxide (NO2), sulfur dioxide (SO_2), and ground-level ozone (O_3), primarily generated by transportation, industrial activities, energy production, and residential heating and cooking [35]. These pollutants contribute to respiratory diseases, cardiovascular conditions, adverse birth outcomes, and emerging evidence suggests links to neurological disorders and metabolic diseases [36].

4.2 Water Quality and Access

Access to safe drinking water and adequate sanitation remains a critical challenge in many urban areas, particularly in informal settlements and rapidly urbanizing regions of low- and middle-income countries [26]. Contaminated water contributes to infectious disease transmission, including diarrheal diseases, which remain a leading cause of mortality in children under five years [37]. Additionally, chemical contaminants in water supplies, including lead, arsenic, and industrial pollutants, pose risks for developmental disorders, cancer, and cardiovascular disease [38].

4.3 Green Spaces

Urban green spaces including parks, street trees, community gardens, and natural areas provide multiple health benefits through various pathways [39]. Access to green spaces is associated with improved mental health outcomes, increased physical activity, reduced stress, enhanced social cohesion, and mitigation of air pollution and urban heat island effects [40]. The distribution of urban green spaces often follows socioeconomic gradients, with disadvantaged neighborhoods typically having less access to quality green infrastructure [41].

4.4 Noise Pollution

Environmental noise from transportation, construction, industrial activities, and neighborhood sources represents an often-overlooked but significant urban health determinant [42]. Chronic noise exposure is associated with sleep disturbance, cognitive impairment in children, hypertension, cardiovascular disease, and mental health disorders [43]. The WHO estimates that in Western Europe alone, at least one million healthy life years are lost annually due to traffic-related noise [44].

4.5 Built Environment Characteristics

The built environment comprising the human-made surroundings where people live, work, and recreate influences health through multiple pathways [45]. Key characteristics include land use patterns, street connectivity, building design, transportation infrastructure, and food retail environment. These elements shape physical activity levels, dietary behaviors, social interactions, and exposure to environmental hazards [46]. Evidence increasingly demonstrates that walkable, mixed-use neighborhoods with diverse transportation options promote better health outcomes than car-dependent, single-use developments [29].

4.6 Microplastics and Chemicals

Urban environments concentrate exposure to synthetic chemicals and microplastics from consumer products, building materials, food packaging, and industrial processes [38]. These exposures include endocrine-disrupting compounds, persistent organic pollutants, heavy metals, and microplastic particles, which have been linked to developmental disorders, cancer, immune dysfunction, and reproductive health problems [47]. Indoor environments, where urban dwellers spend up to 90% of their time, often contain higher concentrations of many chemical pollutants than outdoor settings [48].

4.7 Climate Change Impacts

Cities experience unique vulnerabilities to climate change impacts, including intensified heat island effects, flooding from extreme precipitation and sea-level rise, and changing patterns of infectious disease [7]. Urban populations facing the greatest climate risks include older adults, children, those with pre-existing health conditions, and residents of informal settlements with inadequate infrastructure [49]. Climate change exacerbates existing environmental health challenges while creating new ones, making it an overarching determinant that interacts with and intensifies other environmental health risks in urban settings [50].

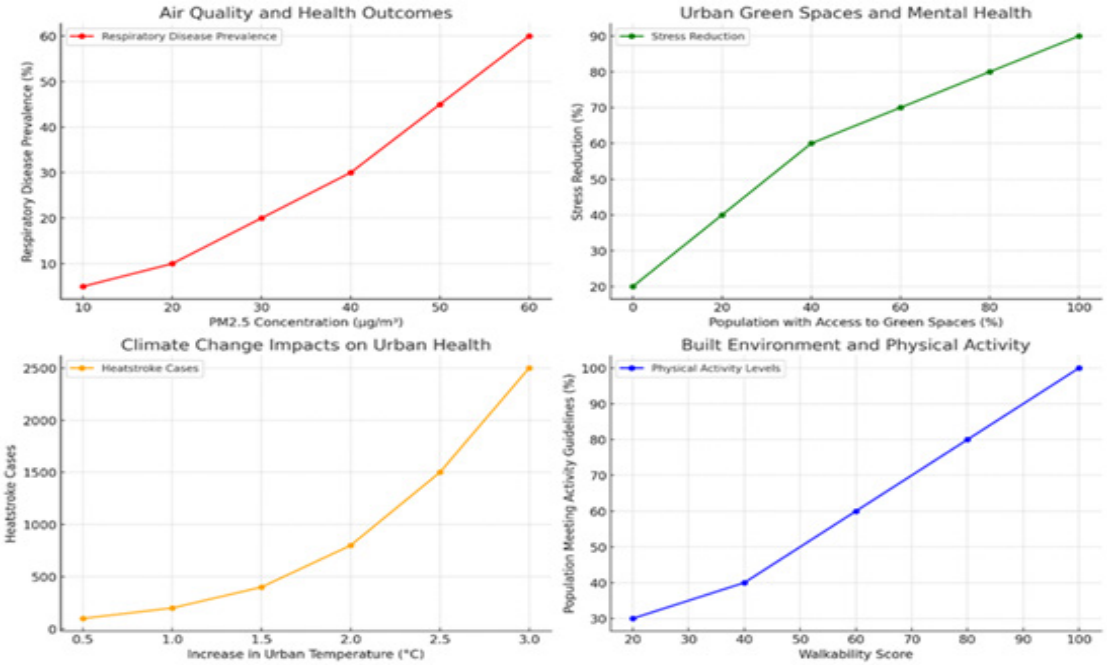

Figure 1: The four indicative graphs of determinants and health

Air Quality and Health Outcomes: A graph showing the relationship between urban air pollution levels (e.g., PM2.5 concentrations) and health metrics such as respiratory disease prevalence.

Urban Green Spaces and Mental Health: A graph depicting the correlation between access to green spaces and mental health indices like stress reduction or physical activity levels.

Climate Change Impacts on Urban Health: A graph showing trends in urban heat island effects and their impact on health outcomes such as heatstroke incidents or mortality rates.

Built Environment and Physical Activity: A visualization of how built environment features (e.g., walkability scores) influence physical activity levels and associated health benefits.

example, HIAs conducted for transportation projects have led t increased provisions for active transport infrastructure, reduce exposure to traffic emissions, and improved access for mobility impaired populations [85].

Health in All Policies (HiAP) extends this approach b embedding health considerations across government sector and decision-making processes [30]. Cities including Helsinki Finland and Richmond, California have implemented HiA frameworks to ensure systematic consideration of health impact across municipal operations [86]. These approaches require bot technical tools and governance structures that facilitate cross sectoral collaboration, including joint planning bodies, share data systems, and aligned performance metrics [87].

6.2 Community Engagement Strategies

Effective urban planning interventions increasingly recogniz community engagement as essential for developing contextuall appropriate, equitable solutions [88]. Participatory planning approaches engage residents in identifying health needs designing interventions, and implementing solutions, thereb increasing both effectiveness and community ownership [89] Methods range from consultative approaches such as survey and public hearings to more empowering strategies includin participatory budgeting, community-based participator research, and co-design processes [90].

Evidence indicates that genuine community participatio improves planning outcomes by incorporating local knowledge increasing intervention acceptance, and ensuring solution address community priorities [91]. For example, participator planning in Barcelona's Superblock program engaged resident in redesigning street networks to reduce traffic, resulting i increased physical activity, reduced air pollution, and stronge social networks [92]. Similarly, community-led planning in th Mathare informal settlement in Nairobi developed innovativ water, sanitation, and public space interventions adapted to loca context and implemented through community partnerships [93]

Effective engagement requires investment in buildin community capacity, addressing power imbalances, and ensurin inclusive representation, particularly of marginalized group often excluded from planning processes [94]. Digital tools an creative engagement methods have expanded opportunities fo participation, though addressing digital divides remains essentia for equitable engagement [95].

6.3 Policy Development Frameworks

Policy frameworks provide the necessary mandate, guidance, and regulatory authority for implementing health-oriented planning interventions. Urban health policies are increasingly adopting integrated approaches that address multiple determinants simultaneously while recognizing their interconnections [96]. Effective policy frameworks typically include clear health objectives, evidence-based intervention standards, accountability mechanisms, and adequate resources for implementation [97].

Cities have developed diverse policy frameworks to address urban health determinants. Barcelona's Urban Mobility Plan integrates health objectives with sustainability goals, establishing comprehensive policies for promoting active transportation, reducing emissions, and enhancing access [25]. Singapore's ABC Waters Programme employs policy tools including design guidelines, certification systems, and demonstration projects to transform water infrastructure into multifunctional blue-green networks that manage stormwater while creating recreational opportunities [98].

Policy frameworks are most effective when they align incentives across sectors, establish clear implementation responsibilities, and include monitoring mechanisms to track outcomes and adapt approaches [99]. Multilevel governance approaches that coordinate national policy, metropolitan planning, and local implementation have proven particularly effective for addressing complex urban health challenges [28].

6.4 Sustainable Transportation Planning

Transportation planning significantly influences urban health through impacts on air quality, physical activity, noise exposure, traffic safety, and accessibility [100]. Sustainable transportation approaches prioritize mobility systems that minimize environmental impacts while maximizing health benefits and social inclusion [101]. Evidence increasingly demonstrates that cities implementing comprehensive sustainable transportation plans achieve measurable health improvements, including reduced cardiovascular disease, respiratory conditions, and obesity [25].

Key interventions include expanding public transportation networks, developing safe cycling and pedestrian infrastructure, implementing vehicle emission controls, and reducing car dependency through pricing and land-use strategies [102]. Transit-oriented development (TOD) integrates transportation and land-use planning by concentrating mixed-use development around high-quality transit nodes, reducing trip distances and car dependency while promoting active mobility [103].

Cities including Copenhagen, Denmark and Bogotá, Colombia

have demonstrated the health benefits of comprehensive cyclin infrastructure networks, including protected bike lanes, traffi calming, and bicycle parking facilities [104]. Low-emissio zones and congestion pricing schemes in cities like London an Stockholm have effectively reduced air pollution exposures particularly in high-traffic urban corridors [105]. Complet streets policies in North American cities have increase infrastructure for safe walking and cycling, improving safet outcomes and physical activity levels [106].

6.5 Green Infrastructure Approaches

Green infrastructure encompasses networks of natural and semi natural features designed to deliver ecosystem services in urba settings, including parks, street trees, green roofs, rain garden and urban forests [107]. These systems provide multiple healt benefits through improved air quality, urban cooling, physica activity opportunities, stress reduction, and social cohesion [108] Planning approaches increasingly recognize green infrastructur as essential for both human health and ecosystem resilience particularly as climate change intensifies urban environmenta stressors [109].

Strategic planning for urban green spaces focuses o quantity, quality, and distribution to maximize health benefits Interventions range from large-scale habitat corridors t neighborhood pocket parks and streetscape greening [41] Evidence suggests that proximity to green space correlates wit improved health outcomes, though quality and perceived safet significantly influence utilization patterns [39]. Distributio equity is particularly important, as disadvantaged neighborhood typically have less access to quality green infrastructure [110].

Green infrastructure increasingly incorporates climat adaptation functions, with nature-based solutions addressin flood risk, urban heat, and water management while providin health co-benefits [111]. The "sponge city" approach pioneere in Chinese cities integrates permeable surfaces, bioswales, an vegetated drainage systems to manage stormwater while creatin urban amenities [112]. Similarly, Copenhagen's Cloudburs Management Plan combines blue-green infrastructure wit traditional engineering to enhance flood resilience while creatin recreational spaces [113].

6.6 Zoning and Land Use Regulations

Zoning and land-use regulations fundamentally shape urba environments by determining the location, density, and mixtur of different activities [114]. These regulatory tools influenc multiple health determinants, including air quality, nois exposure, physical activity, food access, and social cohesion [115]. Evidence demonstrates that traditional single-use zoning with strict separation of residential, commercial, and industrial areas typically produces car-dependent environments with negative health implications [24].

Health-oriented zoning approaches include form-based codes that regulate physical form rather than use, incentive zoning that rewards health-promoting features, performance zoning based on environmental and health impacts, and inclusionary zoning that ensures affordable housing [116]. Mixed-use zoning specifically supports walkable neighborhoods by allowing appropriate commercial activities within residential areas, reducing trip distances and promoting active transportation [117].

Environmental zoning tools protect populations from hazards through buffer requirements between incompatible uses, emissions standards, and requirements for environmental impact assessment [118]. These approaches are particularly important for addressing environmental justice concerns by preventing the concentration of hazardous uses in disadvantaged communities [119]. Some jurisdictions have implemented health-specific zoning overlays that apply additional requirements in areas with elevated health risks or vulnerable populations [114].

Zoning reforms in cities including Denver, Minneapolis, and Portland have eliminated single-family exclusive zoning to increase housing affordability and neighborhood diversity while reducing car dependency [120]. Performance-based approaches in European cities establish environmental quality standards that development must meet, creating flexibility in implementation while ensuring health and environmental outcomes [121].

7. Case Studies

Examining specific urban planning initiatives provides valuable insights into effective approaches for addressing environmental determinants of health. This section presents analyses of both successful interventions and instructive failures across diverse urban contexts. These case studies illustrate the practical application of planning principles and highlight critical factors that influence outcomes, including governance structures, implementation challenges, and contextual variables [31].

7.1 Successful Urban Planning Initiatives

7.1.1 Copenhagen, Denmark: Cycling Infrastructure and Health

Copenhagen's transformation into a cycling-friendly city demonstrates how comprehensive transportation planning can

improve health outcomes. Beginning in the 1970s, Copenhage implemented a continuous expansion of cycling infrastructure including separated bike lanes, bicycle-priority traffic signals and comprehensive parking facilities [104]. This infrastructur network now includes over 385 kilometers of dedicated cycl tracks and 48 kilometers of green cycle routes [122].

The health impacts have been substantial, with 49% o commuting trips now made by bicycle, resulting in estimate annual health benefits of USD 1.2 billion through increase physical activity and reduced air pollution [123]. Copenhagen' success factors include consistent political commitment acros administrations, incremental implementation over decades integration with public transportation networks, and supportiv land-use policies that prioritize proximity [124]. The initiativ demonstrates how sustained investment in active transportatio infrastructure can transform urban mobility patterns and healt outcomes.

7.1.2 Singapore: Integrated Planning for Environmenta Health

Singapore has pioneered comprehensive approaches t environmental health through integrated urban planning since its independence. The city-state's planning framewor coordinates housing, transportation, industrial development, an environmental management through a centralized governanc structure [125]. Singapore's Housing Development Boar has provided high-quality public housing for over 80% of th population, incorporating green spaces, community facilities and sustainable design principles [126].

The city's Active, Beautiful, Clean (ABC) Waters Programm has transformed water infrastructure from single-functio drainage systems into multifunctional blue-green network that manage flooding while providing recreational space and ecosystem services [127]. Singapore's "Park Connecto Network" links green spaces throughout the urban area, creatin corridors for biodiversity and human mobility [128]. Thes integrated approaches have contributed to Singapore achievin among the world's highest life expectancy despite tropica climate challenges and high urban density [129].

Key success factors include strong governance institutions long-term planning horizons, substantial public investment and adaptive management systems that monitor and respond t emerging challenges [5]. Singapore's experience demonstrate how coordinated planning across sectors can effectively addres multiple environmental determinants simultaneously.

7.1.3 Curitiba, Brazil: Sustainable Urban Development

Curitiba's integrated approach to urban planning has created a model for sustainable development in middle-income contexts. Beginning in the 1970s under architect Jaime Lerner's leadership, the city implemented coordinated transportation, land use, and environmental initiatives despite limited resources [130]. Curitiba's bus rapid transit (BRT) system established dedicated lanes and tube stations along structural axes, providing efficient mass transit at significantly lower cost than rail alternatives [131].

The city's land-use planning concentrated higher-density development along transit corridors while preserving flood-prone areas as linear parks, simultaneously addressing transportation needs and flood management [132]. Innovative waste management programs, including the "Garbage Purchase" initiative that exchanges recyclables for food in low-income areas, improved sanitation while addressing food insecurity [133].

Health benefits include improved air quality compared to similar-sized Brazilian cities, increased physical activity through walkable urban design, reduced flood-related disease risks, and enhanced food security for vulnerable populations [134]. Curitiba's success factors include visionary leadership, institutional continuity through the Urban Planning Institute, emphasis on cost-effective solutions appropriate to local resources, and strong community engagement [132].

7.1.4 Kigali, Rwanda: Post-Conflict Urban Transformation

Kigali exemplifies how urban planning can address environmental health determinants in a post-conflict, rapidly urbanizing African context. Following the 1994 genocide, Kigali implemented ambitious planning initiatives to manage growth while improving environmental conditions [135]. The city developed a comprehensive master plan in 2008 that emphasized green infrastructure, sanitation improvements, and controlled development to protect environmentally sensitive areas [136].

Implementation included upgrading informal settlements through participatory approaches rather than clearance, developing green corridors along wetlands, instituting monthly community cleanup days (Umuganda), and enforcing environmental regulations [137]. A plastics ban reduced waste and associated pollution, while wetland restoration projects have improved flood management and water quality [138].

Health outcomes include significantly reduced waterborn disease incidence, improved air quality, and enhanced climat resilience [12]. Success factors include strong politica commitment, international partnerships that provided technica expertise and funding, cultural practices that support collectiv action, and an emphasis on developing local planning capacit [136]. Kigali's experience demonstrates how post-conflict citie can leverage urban planning to address environmental healt challenges despite resource constraints.

7.2 WHO Response and One Health Approaches

The World Health Organization has increasingly advocate integrated approaches to urban health that recognize th interconnections between human, animal, and environmenta health. The WHO Healthy Cities programme, initiated in 1986 has expanded to include over 1,400 cities globally, promotin holistic approaches to urban health through networks tha facilitate knowledge exchange and capacity building [139] This initiative has evolved to increasingly incorporate On Health perspectives that address the human-animal-environmen interface in urban settings [33]. WHO's Urban Healt Initiative specifically focuses on air pollution and climat change mitigation, working with cities to implement policie that simultaneously improve air quality, reduce greenhous gas emissions, and enhance public health [40]. In pilot citie including Accra and Kathmandu, this approach has supporte integrated assessment of pollution sources and health impacts facilitating evidence-based policymaking [140].

The One Health approach has gained traction in urban planning particularly following the COVID-19 pandemic, whic highlighted zoonotic disease risks in urban environments [141] Cities including Toronto and Bangkok have implemented On Health urban planning frameworks that address food safety vector control, and habitat management to reduce diseas transmission risks at the human-animal interface [142]. Thes approaches coordinate across health, veterinary, environmental and planning agencies to develop comprehensive strategies fo addressing health risks [18].

Key success factors for WHO and One Health approaches includ building sustained intersectoral collaboration mechanisms developing integrated surveillance systems that track bot environmental and health indicators, and strengthenin governance structures that enable coordinated responses t complex health challenges [143].

7.3 Lessons Learned from Failures

Examining planning failures provides equally valuable insights for improving urban health interventions. Several instructive cases highlight common pitfalls and their consequences for environmental health.

Urban Highway Expansion: Health Consequences of Car-Centric Planning

Mid-20th century urban highway construction in many North American and European cities demonstrates the negative health consequences of car-centric planning. Projects such as Boston's Central Artery, New York's Cross-Bronx Expressway, and similar initiatives worldwide displaced communities, created physical barriers within cities, and concentrated air and noise pollution in adjacent neighborhoods [144]. These projects disproportionately affected low-income communities and communities of color, creating environmental injustices that persist decades later [15].

Health impacts included increased respiratory disease, cardiovascular conditions, and traffic injuries in affected communities, while reduced walkability contributed to physical inactivity and associated chronic diseases [145]. Boston's subsequent "Big Dig" project to bury the Central Artery cost over $24 billion, demonstrating the enormous expense of correcting such planning failures [146].

Key lessons include the importance of comprehensive health impact assessment before major infrastructure projects, recognition of distributional equity concerns, consideration of long-term consequences beyond traffic flow, and the value of community participation in planning processes [147]. Many cities are now removing urban highways, reclaiming land for public space and reconnecting divided neighborhoods [148].

Public Housing Towers: Design Failures and Health Consequences

Large-scale public housing tower developments built in many countries during the mid-20th century illustrate how well-intentioned interventions can create new health problems through inadequate design. Projects such as Pruitt-Igoe in St. Louis, USA and similar developments worldwide often concentrated disadvantage while creating built environments unconducive to wellbeing [149].

Health consequences included elevated rates of mental health conditions, respiratory disease from inadequate ventilation and maintenance, injury risks from deteriorating infrastructure, and social pathologies exacerbated by environmental conditions

[149]. Many such developments were ultimately demolished, a with Pruitt-Igoe's famous 1972 implosion, representing massiv disinvestment in public resources [150].

Lessons learned have informed subsequent public housin approaches, including mixed-income development, human scale design, attention to safety through environmental design integration with surrounding neighborhoods, and residen involvement in management [151]. Singapore's successfu public housing program demonstrates how these principles ca be applied to create high-density housing that supports rathe than undermines health [126].

Flood Control Infrastructure: Engineering without Ecology

Traditional flood control approaches that relied exclusively o engineered solutions without ecological considerations hav frequently failed with significant health consequences. Nev Orleans' experience with Hurricane Katrina in 2005 exemplifie how levee systems that constrained natural water flow whil encouraging development in vulnerable areas ultimately create catastrophic risks [152].

Health impacts from such failures include not only immediat mortality and morbidity during flood events but also long-ter mental health consequences, waterborne disease outbreaks fron contaminated floodwaters, and extended displacement fron homes [153]. These impacts typically fall disproportionately o disadvantaged communities with fewer resources to prepare fo and recover from disasters [152].

Key lessons include the importance of integrating green an gray infrastructure in flood management, preserving natura watershed functions, limiting development in flood-pron areas, and developing retreat strategies where risks cannot b adequately mitigated [154].

8. Challenges and Barriers

Despite growing evidence supporting urban planning interventions to address environmental determinants of health significant challenges impede implementation. Understanding these barriers is essential for developing effective strategie to overcome them and advance health-promoting urba environments. This section examines key institutional, economic and social barriers that constrain progress toward healthier urba planning practices.

8.1 Institutional Barriers

Institutional barriers encompass the governance structures organizational arrangements, and regulatory frameworks that complicate efforts to integrate health considerations into urban planning. Perhaps the most fundamental challenge is the siloed organization of government functions, with health, planning, transportation, environment, and economic development typically operating as separate departments with distinct mandates, budgets, and performance metrics [87]. This fragmentation hinders the cross-sectoral collaboration necessary to address complex environmental health determinants effectively.

Professional cultures and training further reinforce these divides, as urban planners, public health professionals, and environmental specialists often employ different methodologies, terminologies, and analytical frameworks [22]. For example, planners typically focus on spatial and physical dimensions of urban form, while health professionals emphasize epidemiological evidence and population-level interventions. These distinct professional orientations complicate communication and collaboration across disciplinary boundaries [155].

Regulatory frameworks frequently lag behind scientific understanding of environmental health relationships. Outdated zoning codes, building standards, and environmental regulations may not reflect current evidence on health impacts or may actively reinforce unhealthy patterns of development [114]. For instance, minimum parking requirements in many jurisdictions encourage automobile dependency and reduce land available for housing, green space, or active transportation infrastructure [156].

Political cycles and short-term planning horizons present additional challenges, as the health benefits of urban planning interventions often materialize over decades while political incentives favor visible short-term results [28]. This temporal mismatch can undermine sustained commitment to health-promoting initiatives that require long-term investment and policy consistency. Elected officials may prioritize immediate economic development over long-term health considerations, particularly when health benefits are difficult to quantify or attribute to specific interventions [23].

Data limitations further complicate evidence-based decision-making, as many cities lack integrated systems that connect environmental conditions with health outcomes at neighborhood or block levels [157]. Without spatially resolved health data linked to environmental exposures, planners struggle to identify priority areas for intervention or evaluate the effectiveness of implemented measures. Privacy concerns, technical capacity constraints, and interoperability issues between data systems

exacerbate these challenges [158].

8.2 Economic Constraints

Economic constraints significantly limit the implementatio of health-promoting urban planning initiatives, particularly i resource-constrained settings. Perhaps most fundamentally, man urban areas face severe fiscal limitations that restrict investmen in public infrastructure, environmental improvements, an health services [159]. Municipal budgets in both develope and developing contexts frequently prioritize immediate need and maintenance of existing infrastructure over transformativ investments in healthier urban environments [160].

Market dynamics and economic incentives often favo development patterns with negative health implications. Fo instance, greenfield development at urban peripheries typicall costs developers less than brownfield redevelopment or infil in existing neighborhoods, leading to sprawling, car-dependen patterns of urbanization [161]. Similarly, short-term profi maximization may prioritize rapid construction with minima amenities over developments incorporating health-promotin features like green space, active transportation infrastructure, o mixed uses [162].

Funding mechanisms for urban infrastructure frequently separat capital costs from long-term maintenance expenses, creatin perverse incentives to construct facilities without adequat provision for their upkeep [163]. This pattern has contributed t deteriorating infrastructure in many cities, with attendant healt risks from poor water quality, unsafe transportation systems, an inadequate waste management [164].

Economic valuation methods typically fail to capture the ful health benefits of urban planning interventions, making i difficult to justify investments through conventional cost-benefi analysis [165]. While methods for quantifying health economi benefits have advanced, many positive outcomes remain difficul to monetize, including improved quality of life, enhance social cohesion, and long-term health improvements [99]. Thi valuation challenge particularly affects interventions addressin social determinants of health with complex causal pathways an extended time horizons [166].

Distributional questions further complicate economi considerations, as costs and benefits of planning intervention often accrue to different stakeholders [167]. For example, privat developers may bear costs for including health-promotin features in new developments, while benefits accrue to residents healthcare systems, and society broadly. Without mechanism to align incentives across stakeholders, economically rational actors may underinvest in health-promoting features [168].

8.3 Social Inequities

Social inequities represent both a critical challenge for health-oriented urban planning and a consequence of failed planning approaches. Historical patterns of discrimination, segregation, and uneven development have created profound spatial inequities in environmental conditions and health outcomes across urban areas globally [169]. These patterns manifest in the disproportionate concentration of environmental hazards in disadvantaged communities alongside reduced access to health-promoting amenities [15].

Environmental justice research consistently demonstrates that low-income communities and communities of color bear disproportionate exposures to air pollution, noise, toxic facilities, and other environmental hazards [66]. For example, studies across multiple countries show that ambient air pollution exposure inversely correlates with neighborhood socioeconomic status, contributing to health disparities in respiratory and cardiovascular conditions [170]. Similarly, access to green space, healthy food options, safe pedestrian infrastructure, and quality housing shows consistent gradients across socioeconomic lines [41].

These inequities reflect historical planning decisions, including discriminatory zoning, redlining practices that restricted investment in minority neighborhoods, and infrastructure development that prioritized wealthy communities [171]. The cumulative impact of these decisions creates “spatial injustice” that systemically disadvantages certain populations through their physical environment, perpetuating health disparities across generations [172].

Gentrification and displacement present significant equity challenges for health-promoting urban interventions. Paradoxically, improvements in environmental conditions and public amenities can increase property values and rents, potentially displacing vulnerable residents from neighborhoods as they become healthier [173]. This “green gentrification” phenomenon has been observed following major urban greening initiatives, infrastructure improvements, and environmental cleanups in cities worldwide [174].

Participation inequities in planning processes further reinforce these patterns, as disadvantaged communities often have less capacity to engage with complex planning systems or influence decision-making [94]. Barriers include limited time due to work

commitments, language and technical knowledge gaps, distrus based on historical experiences, and planning processes that fai to accommodate diverse participation styles [175].

These social inequities create a profound challenge for urba planning: how to improve environmental conditions an health outcomes without exacerbating displacement an exclusion [174]. Addressing this challenge requires explici equity considerations in planning processes, includin targeted investments in historically disadvantaged areas, anti displacement policies, meaningful community participation, an ongoing equity assessment of planning outcomes [176].

9. Discussion

9.1 Implications for Urban Health

This review demonstrates the significant influence of urba planning on population health outcomes. By systematicall addressing environmental determinants, planners can reduc disease burden, lower healthcare costs, and enhance quality o life, particularly in rapidly urbanizing regions. The evidenc suggests that targeted interventions in air quality, green spac provision, and built environment design yield measurable healt benefits across multiple dimensions.

9.2 Interdisciplinary Approaches

The complexity of urban health challenges necessitate collaboration across disciplines. Effective interventions emerg when urban planners work alongside public health professionals environmental scientists, social scientists, and communit stakeholders. This integration facilitates comprehensive solution that address both immediate environmental exposures and thei underlying structural causes. Case studies from diverse globa contexts affirm that integrated governance models produce mor sustainable health outcomes.

9.3 Policy Advocacy

Strong policy frameworks are essential to institutionalize healt priorities within urban planning. Policymakers must advocat for regulatory standards, such as mandatory health impac assessments and zoning laws that limit environmental hazards Incentive structures for health-promoting urban designs, suc as green infrastructure and active transportation networks, ca drive sustainable development. Effective advocacy also involve public awareness campaigns to garner support for policies aime at fostering healthier urban environments

10. Limitations

10.1 Scope of Review

This review is limited by its focus on specific urban contexts and environmental determinants of health. While it provides a comprehensive overview, the findings may not fully account for unique challenges in less-studied regions or rapidly urbanizing areas. Additionally, the emphasis on peer-reviewed literature may overlook valuable insights from grey literature, case studies, and local government reports

10.2 Methodological Considerations

The review's reliance on secondary data introduces potential biases, including variability in study design, data collection methods, and analytical frameworks. Differences in regional and temporal contexts among studies also pose challenges to generalizability. Furthermore, the inclusion of studies primarily published in English may exclude valuable research from non-English-speaking regions

10.3 Evidence Gaps

Several evidence gaps hinder a holistic understanding of urban environmental health. Key areas requiring further exploration include:

- Longitudinal studies to assess the long-term impacts of urban planning interventions on health outcomes.
- Comprehensive evaluations of integrated One Health approaches in urban contexts.
- The interplay between environmental justice and health equity, particularly in marginalized communities.
- Innovations in urban design that mitigate the impacts of climate change on health

11. Conclusion

Environmental determinants of health in urban areas present complex, interrelated challenges requiring coordinated responses from urban planners, public health officials, and communities. This review demonstrates that integrating health considerations into urban planning creates environments that enhance public health while promoting social equity and environmental sustainability. The evidence highlights that successful interventions address multiple determinants simultaneously through interdisciplinary approaches. Urban planners play a vital role in this process by implementing thoughtful design and evidence-based policies that reduce health disparities, particularly among vulnerable populations. As urbanization

accelerates globally, continued research and advocacy remai essential to address evolving challenges and strengthen th evidence base for health-promoting urban environments.

12. Recommendations

Based on the evidence reviewed, we propose the followin recommendations for improving health outcomes through urba planning:

1. Policy Integration

- Adopt One Health frameworks in urban policy developmen
- Establish health as a mandatory consideration in plannin approvals
- Develop cross-sectoral policies linking environmenta health and urban development

2. Practice Improvements

- Strengthen interdisciplinary collaboration between planners public health experts, and ecologists
- Implement comprehensive health impact assessments for al major urban developments
- Prioritize evidence-based interventions in high-need areas

3. Equity Focus

- Prioritize equity metrics in health-impact assessments
- Target resources toward environmentally disadvantage communities
- Ensure meaningful community participation in plannin processes
- 4. Research Priorities
- Develop standardized metrics for measuring health impact of urban interventions
- Conduct longitudinal studies on planning interventions an health outcomes
- Evaluate cost-effectiveness of health-promoting urba design features.

Declarations

Lists of abbreviation

ABC: Active, Beautiful, Clean,

BRT: Bus Rapid Transit,

HIA: Health Impact Assessment,

HiAP: Health in All Policies, PM: Particular Matter,

SDG: Sustainable Development Goal,

TOD: Transit Oriented Development,

WHO: World Health Organization

Data availability: Data will be made available on request

Conflict of interest: not applicable (The authors report no conflicts of interest in this work)

Ethical consideration: All authors approved to participate in this review and in the manuscript.

Consent for publication: All authors approved this manuscript to be published.

Funds: This review did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Authors Contribution: Melkamu Megalo: prepared the draft manuscript and material collection from published literature;

Hayal Desta: Edit the draft manuscript;

Zinabu Gomba: Edit and comment

Funding Information – No body funds this review.

References

1. Salgado, M., Madureira, J., Mendes, A.S. et al. Environmental determinants of population health in urban settings. Asystematic review. BMCPublicHealth 20, 853 (2020). https://doi.org/10.1186/s12889-020-08905-0
2. Warren Smit, & Susan Parnell, Urban sustainability and human health: an African perspective, Current Opinion in Environmental Sustainability, Volume 4, Issue 4, 2012, Pages 443-450, ISSN 1877-3435, https://doi.org/10.1016/j.cosust.2012.07.004
3. Vlahov, D., & Galea, S. (2005). Urban health: A new discipline. The Lancet, 365(9466), 1089-1092.
4. United Nations. (2019). World Urbanization Prospects: The

2018 Revision. Department of Economic and Social Affairs

5. Tortajada, C., Joshi, P. K., & Biswas, A. K. (2013). The Singapore water story: Sustainable development in a resource-constrained island city-state. Routledge.

6. UN-Habitat. (2020). World Cities Report 2020: The Value of Sustainable Urbanization. United Nations Human Settlements Programme.

7. Watts, N., Amann, M., Arnell, N., Ayeb-Karlsson, S., Beagley, J., Belesova, K., et al. (2021). The 2020 report of The Lancet Countdown on health and climate change: Responding to converging crises. The Lancet, 397(10269), 129-170.

8. Megahed, N. A., & Ghoneim, E. M. (2020). Antivirus-built environment: Lessons learned from Covid-19 pandemic. Sustainable Cities and Society, 61, 102350.

9. Ahmed, F., Ahmed, N., Pissarides, C., & Stiglitz, J. (2019). Why inequality could spread COVID-19. The Lancet Public Health, 5(5), e240.

10. Capon, A., Synnott, E. S., & Holliday, S. (2018). Urbanism, climate change and health: Systems approaches to governance. New South Wales Public Health Bulletin, 20(2), 24-28.

11. Corburn, J. (2017). Healthy city planning. Routledge.

12. Kabera, T., Manirakiza, V., & Uwizeyimana, J. D. (2019). Urban resilience and planning for sustainable urban development in Rwanda: A case of Kigali city. International Journal of Regional Development, 6(2), 54–71.

13. Bronfenbrenner, U. (1979). The Ecology of Human Development: Experiments by Nature and Design. Harvard University Press.

14. Stokols, D. (1996). Translating social ecological theory into guidelines for community health promotion. American Journal of Health Promotion, 10(4), 282-298.

15. Bullard, R. D. (2000). Dumping in Dixie: Race, class, and environmental quality. Westview Press.

16. Schlosberg, D. (2007). Defining Environmental Justice: Theories, Movements, and Nature. Oxford University Press.

17. Whitmee, S., et al. (2015). Safeguarding human health in the Anthropocene epoch: Report of The Rockefeller Foundation–Lancet Commission on planetary health. The Lancet, 386(10007), 1973-2028.

18. Zinsstag, J., Schelling, E., Waltner-Toews, D., & Whittaker, A. (2011). One Health: The theory, value, and application of integrating human, animal, and environmental health. Acta Tropica, 120, S1-S10.

19. Barton, H., & Tsourou, C. (2000). Healthy Urban Planning. Spon Press.

20. Gesler, W. M. (1992). Therapeutic landscapes: Medical issues in light of the new cultural geography. Social Science & Medicine, 34(7), 735-746.

21. Barton, H., Thompson, S., Burgess, S., & Grant, M. (2015). The Routledge Handbook of Planning for Health and Well-Being. Routledge.

22. Corburn, J. (2004). Confronting the challenges in reconnecting urban planning and public health. American Journal of Public Health, 94(4), 541-546.

23. Northridge, M. E., & Freeman, L. (2011). Urban planning and health equity. Journal of Urban Health, 88(3), 582-597.

24. Frank, L. D., Sallis, J. F., Conway, T. L., Chapman, J. E., Saelens, B. E., & Bachman, W. (2006). Many pathways from land use to health: Associations between neighborhood walkability and active transportation, body mass index, and air quality. Journal of the American Planning Association, 72(1), 75-87.

25. Mueller, N., Rojas-Rueda, D., Salmon, M., Martinez, D., Ambros, A., Brand, C., et al. (2017). Health impact assessment of cycling network expansions in European cities. Preventive Medicine, 109, 62-70.

26. Bartram, J., & Cairncross, S. (2010). Hygiene, sanitation, and water: Forgotten foundations of health. PLoS Medicine, 7(11), e1000367.

27. Acevedo-Garcia, D., Lochner, K. A., Osypuk, T. L., & Subramanian, S. V. (2014). Future directions in residential segregation and health research: A multilevel approach." American Journal of Public Health, 93(2), 215-221.

28. Rydin, Y., Bleahu, A., Davies, M., Dávila, J. D., Friel, S., De Grandis, G., et al. (2012). Shaping cities for health: Complexity and the planning of urban environments in the 21st century. The Lancet, 379(9831), 2079-2108.

29. Giles-Corti, B., Vernez-Moudon, A., Reis, R., Turrell, G., Dannenberg, A. L., Badland, H., et al. (2016). City planning

and population health: A global challenge. The Lancet 388(10062), 2912-2924.

30. Rudolph, L., Caplan, J., Ben-Moshe, K., & Dillon, L (2013). Health in All Policies: A Guide for State and Loca Governments. American Public Health Association an Public Health Institute.

31. Corburn, J. (2017). Urban place and health equity: Critica issues and practices. International Journal of Environmenta Research and Public Health, 14(2), 117.

32. Prüss-Üstün, A., Wolf, J., Corvalán, C., Bos, R., & Neira, M (2016). Preventing Disease through Healthy Environments A Global Assessment of the Burden of Disease fron Environmental Risks. World Health Organization.

33. WHO. (2016). Preventing Disease through Healthy Environments: A Global Assessment of the Burde of Disease from Environmental Risks. World Healt Organization.

34. WHO. (2021). WHO Global Air Quality Guidelines Particulate Matter (PM2.5 and PM10), Ozone, Nitroge Dioxide, Sulfur Dioxide and Carbon Monoxide. Worl Health Organization.

35. Brook, R. D., Rajagopalan, S., Pope, C. A., Brook, J. R. Bhatnagar, A., Diez-Roux, A. V., et al. (2010). Particulat matter air pollution and cardiovascular disease: An updat to the scientific statement from the American Hear Association. Circulation, 121(21), 2331-2378.

36. Schraufnagel, D. E., Balmes, J. R., Cowl, C. T., De Matteis S., Jung, S. H., Mortimer, K., et al. (2019). Air pollutio and noncommunicable diseases: A review by the Forun of International Respiratory Societies' Environmenta Committee, Part 2: Air pollution and organ systems.Chest 155(2), 417-426.

37. Prüss-Ustün, A., Wolf, J., Bartram, J., Clasen, T., Cumming O., Freeman, M. C., et al. (2019). Burden of disease fron inadequate water, sanitation and hygiene for selecte adverse health outcomes: An updated analysis with a focu on low- and middle-income countries. International Journa of Hygiene and Environmental Health, 222(5), 765-777.

38. Landrigan, P. J., Fuller, R., Acosta, N. J., Adeyi, O., Arnold R., Basu, N., et al. (2018). The Lancet Commission o pollution and health. The Lancet, 391(10119), 462-512.

39. Markevych, I., Schoierer, J., Hartig, T., Chudnovsky, A. Hystad, P., Dzhambov, A. M., et al. (2017). Exploring pathways linking greenspace to health: Theoretical and methodological guidance. Environmental Research, 158, 301-317.

40. Kondo, M. C., Fluehr, J. M., McKeon, T., & Branas, C. C. (2018). Urban green space and its impact on human health. International Journal of Environmental Research and Public Health, 15(3), 445.

41. Wolch, J. R., Byrne, J., & Newell, J. P. (2014). Urban green space, public health, and environmental justice: The challenge of making cities 'just green enough'. Landscape and Urban Planning, 125, 234-244.

42. Basner, M., Babisch, W., Davis, A., Brink, M., Clark, C., Janssen, S., & Stansfeld, S. (2014). Auditory and non-auditory effects of noise on health. The Lancet, 383(9925), 1325-1332.

43. Münzel, T., Schmidt, F. P., Steven, S., Herzog, J., Daiber, A., & Sørensen, M. (2018). Environmental noise and the cardiovascular system. Journal of the American College of Cardiology, 71(6), 688-697.

44. WHO Regional Office for Europe. (2018). Environmental Noise Guidelines for the European Region. World Health Organization.

45. Sallis, J. F., Bull, F., Burdett, R., Frank, L. D., Griffiths, P., Giles-Corti, B., & Stevenson, M. (2016). Use of science to guide city planning policy and practice: How to achieve healthy and sustainable future cities. The Lancet, 388(10062), 2936-2947.

46. Renalds, A., Smith, T. H., & Hale, P. J. (2010). A systematic review of built environment and health." Family & Community Health, 33(1), 68-78.

47. Trasande, L., Zoeller, R. T., Hass, U., Kortenkamp, A., Grandjean, P., Myers, J. P., et al. (2015). Estimating burden and disease costs of exposure to endocrine-disrupting chemicals in the European Union. The Journal of Clinical Endocrinology & Metabolism, 100(4), 1245-1255.

48. Logue, J. M., McKone, T. E., Sherman, M. H., & Singer, B. C. (2012). Hazard assessment of chemical air contaminants measured in residences. Indoor Air, 22(3), 200-213.

49. Revi, A., Satterthwaite, D. E., Aragón-Durand, F., Corfee-Morlot, J., Kiunsi, R. B., Pelling, M., et al. (2014). Urban areas. In C. B. Field, V. R. Barros, D. J. Dokken, K. J. Mach,

M. D. Mastrandrea, T. E. Bilir, et al. (Eds.), Climate Chang 2014: Impacts, Adaptation, and Vulnerability (pp. 535-612) Cambridge University Press.

50. Haines, A., & Ebi, K. (2019). The imperative for climat action to protect health. New England Journal of Medicine 380(3), 263-273.

51. Cohen, D. A., Marsh, T., Williamson, S., Han, B., Derose K. P., Golinelli, D., & McKenzie, T. L. (2017). The potentia for pocket parks to increase physical activity. America Journal of Health Promotion, 28(3) suppl), S19-S26.

52. WHO. (2018a). Burden of Disease from Environmenta Noise: Quantification of Healthy Life Years Lost in Europe World Health Organization, Regional Office for Europe.

53. Creatore, M. I., Glazier, R. H., Moineddin, R., Fazli, G S., Johns, A., Gozdyra, P., et al. (2016). Association o neighborhood walkability with change in overweight obesity, and diabetes. JAMA, 315(20), 2211-2220.

54. Stanaway, J. D., Afshin, A., Gakidou, E., Lim, S. S., Abate D., Abate, K. H., et al. (2018). Global, regional, and nationa comparative risk assessment of 84 behavioral, environmenta and occupational, and metabolic risks or clusters of risk for 195 countries and territories, 1990–2017: A systemati analysis for the Global Burden of Disease Study 2017. Th Lancet, 392(10159), 1923-1994.

55. Wolf, J., Hunter, P. R., Freeman, M. C., Cumming, O. Clasen, T., Bartram, J., et al. (2018). Impact of drinkin water, sanitation and handwashing with soap on childhoo diarrhoeal disease: Updated meta-analysis and meta regression. Tropical Medicine & International Health 23(5), 508-525.

56. WHO. (2019). Progress on Household Drinking Wate Sanitation and Hygiene 2000-2017: Special Focus o Inequalities. World Health Organization.

57. Stanaway, J. D., Shepard, D. S., Undurraga, E. A., Halasa Y. A., Coffeng, L. E., Brady, O. J., et al. (2016). The globa burden of dengue: An analysis from the Global Burden o Disease Study 2013. The Lancet Infectious Diseases, 16(6) 712-723.

58. Wilson, A. L., Ratliff, A., Boelaert, M., Flowers, C. Garner, P., Bijleveld, S., et al. (2015). The importance o vector control for the control and elimination of vector borne diseases. PLoS Neglected Tropical Diseases, 9(10) e0004146.

59. Ezeh, A., Oyebode, O., Satterthwaite, D., Chen, Y. F., Ndugwa, R., Sartori, J., et al. (2017). The history, geography, and sociology of slums and the health problems of people who live in slums. The Lancet, 389(10068), 547-558.

60. Lilford, R. J., Oyebode, O., Satterthwaite, D., Melendez-Torres, G. J., Chen, Y. F., Mberu, B., et al. (2017). Improving the health and welfare of people who live in slums. The Lancet, 389(10068), 559-570.

61. Peden, M., Scurfield, R., Sleet, D., Mohan, D., Hyder, A. A., Jarawan, E., & Mathers, C. (2018). World Report on Road Traffic Injury Prevention. World Health Organization.

62. WHO. (2018b). Global Status Report on Road Safety 2018. World Health Organization.

63. Keall, M. D., Pierse, N., Howden-Chapman, P., Cunningham, C., Cunningham, M., Guria, J., & Baker, M. G. (2015). Home modifications to reduce injuries from falls in the Home Injury Prevention Intervention (HIPI) study: A cluster-randomised controlled trial. The Lancet, 385(9964), 231-238.

64. Turner, S., Arthur, G., Lyons, R. A., Weightman, A. L., Mann, M. K., Jones, S. J., et al. (2011). Modification of the home environment for the reduction of injuries. Cochrane Database of Systematic Reviews.

65. Branas, C. C., South, E., Kondo, M. C., Hohl, B. C., Bourgois, P., Wiebe, D. J., & MacDonald, J. M. (2018). "Citywide cluster randomized trial to restore blighted vacant land and its effects on violence, crime, and fear. Proceedings of the National Academy of Sciences, 115(12), 2946-2951.

66. Hajat, A., Hsia, C., & O'Neill, M. S. (2015). Socioeconomic disparities and air pollution exposure: A global review. Current Environmental Health Reports, 2(4), 440-450.

67. Popay, J., Whitehead, M., & Hunter, D. J. (2018). Journal of Public Health, 32(2), 148-149.

68. Chetty, R., Stepner, M., Abraham, S., Lin, S., Scuderi, B., Turner, N., et al. (2016). The association between income and life expectancy in the United States, 2001-2014. JAMA, 315(16), 1750-1766.

69. Schlosberg, D., & Collins, L. B. (2014). From environmental to climate justice: Climate change and the discourse of environmental justice. Wiley Interdisciplinary Reviews: Climate Change, 5(3), 359-374.

70. Heaviside, C., Macintyre, H., & Vardoulakis, S. (2017) The urban heat island: Implications for health in a changing environment." Current Environmental Health Reports, 4(3) 296-305.

71. Gasparrini, A., Guo, Y., Hashizume, M., Lavigne, E. Zanobetti, A., Schwartz, J., et al. (2015). Mortality risk attributable to high and low ambient temperature: A multicountry observational study. The Lancet, 386(9991) 369-375.

72. Watts, N., Amann, M., Arnell, N., Ayeb-Karlsson, S. Beagley, J., Belesova, K., et al. (2021). The 2020 report of The Lancet Countdown on health and climate change: Responding to converging crises. The Lancet, 397(10269) 129-170.

73. Ebi, K. L., & Semenza, J. C. (2008). Community-based adaptation to the health impacts of climate change. American Journal of Preventive Medicine, 35(5), 501-507.

74. De Sario, M., Katsouyanni, K., & Michelozzi, P. (2013) Climate change, extreme weather events, air pollution and respiratory health in Europe. European Respiratory Journal 42(3), 826-843.

75. Caminade, C., Kovats, S., Rocklov, J., Tompkins, A. M. Morse, A. P., Colón-González, F. J., et al. (2014). Impact of climate change on global malaria distribution. Proceedings of the National Academy of Sciences, 111(9), 3286-3291.

76. Bambra, C., Riordan, R., Ford, J., & Matthews, F. (2020) The COVID-19 pandemic and health inequalities. Journal of Epidemiology and Community Health, 74(11), 964-968

77. Zhen, J., Chan, C., Schoonees, A., Apatu, E., Thabane, L., & Young, T. (2020). Transmission of respiratory viruses when using public ground transport: A rapid review to inform public health recommendations during the COVID-19 pandemic. South African Medical Journal, 110(6), 478-483

78. Wu, X., Nethery, R. C., Sabath, M. B., Braun, D., & Dominici, F. (2020). Air pollution and COVID-19 mortality in the United States: Strengths and limitations of an ecological regression analysis. Science Advances, 6(45) eabd4049.

79. Hooper, M. W., Nápoles, A. M., & Pérez-Stable, E. J (2020). COVID-19 and racial/ethnic disparities. JAMA 323(24), 2466-2467.

80. Honey-Rosés, J., Anguelovski, I., Chireh, V. K., Daher, C. Konijnendijk van den Bosch, C., Litt, J. S., et al. (2020). The impact of COVID-19 on public space: An early review of the emerging questions design, perceptions and inequities. Cities & Health, 1-17.

81. Corburn, J. (2009). Toward the Healthy City: People, Places, and the Politics of Urban Planning. MIT Press.

82. Barton, H., & Grant, M. (2013). Urban planning for healthy cities. Journal of Urban Health, 90(1), 129-141.

83. Bhatia, R. (2011). Health Impact Assessment: A Guide for Practice. Human Impact Partners.

84. Dannenberg, A. L., Bhatia, R., Cole, B. L., Heaton, S. K., Feldman, J. D., & Rutt, C. D. (2008). Use of health impact assessment in the US: 27 case studies, 1999–2007. American Journal of Preventive Medicine, 34(3), 241-256.

85. Rogerson, B., Lindberg, R., Baum, F., Dora, C., Haigh, F., Simoncelli, A., et al. (2020). Recent advances in health impact assessment and health in all policies implementation: Lessons from an international convening in Barcelona. International Journal of Environmental Research and Public Health, 17(21), 7714.

86. Corburn, J., Curl, S., Arredondo, G., & Malagon, J. (2014). Health in All Urban Policy: City services through the prism of health. Journal of Urban Health, 91(4), 623-636.

87. De Leeuw, E., & Peters, D. (2015). Nine questions to guide development and implementation of Health in All Policies. Health Promotion International, 30(4), 987-997.

88. Arnstein, S. R. (1969). A ladder of citizen participation. Journal of the American Institute of Planners, 35(4), 216-224.

89. Cyril, S., Smith, B. J., Possamai-Inesedy, A., & Renzaho, A. M. (2015). Exploring the role of community engagement in improving the health of disadvantaged populations: A systematic review. Global Health Action, 8(1), 29842.

90. Fung, A. (2015). Putting the public back into governance: The challenges of citizen participation and its future. Public Administration Review, 75(4), 513-522.

91. 91. Corburn, J. (2005). Street Science: Community Knowledge and Environmental Health Justice. MIT Press.

92. Mueller, N., Rojas-Rueda, D., Khreis, H., Cirach, M., Andrés, D., Ballester, J., et al. (2020). Changing the urban design of cities for health: The superblock model.

Environment International, 134, 105132.

93. Weru, J., Okoyo, O., Wambui, M., Njoroge, P., Muhonja J., Kingori, E., et al. (2018). The Akiba Mashinani Trust Kenya: A grassroots finance mechanism for slum upgrading Environment and Urbanization, 30(1), 53-66.

94. Quick, K. S., & Feldman, M. S. (2011). Distinguishing participation and inclusion. Journal of Planning Educatio and Research, 31(3), 272-290.

95. Afzalan, N., Sanchez, T. W., & Evans-Cowley, J. (2017) Creating smarter cities: Considerations for selecting onlin participatory tools. Cities, 67, 21-30.

96. De Leeuw, E. (2017). Engagement of sectors other tha health in integrated health governance, policy, and action. Annual Review of Public Health, 38, 329-349.

97. Kickbusch, I., & Gleicher, D. (2012). Governance for Healt in the 21st Century. World Health Organization, Regiona Office for Europe.

98. Lim, C., & Lu, X. X. (2016). Sustainable urban wate management in Singapore. International Journal of Wate Resources Development, 32(4), 590–605.

99. Giles-Corti, B., Lowe, M., & Arundel, J. (2020). Achievin the SDGs: Evaluating indicators to be used to benchmark an monitor progress towards creating healthy and sustainabl cities. Health Policy, 124(6), 581-590.

100. Nieuwenhuijsen, M. J. (2016). Urban and transport planning environmental exposures and health-new concepts, method and tools to improve health in cities. Environmental Health 15(1), 161-171.

101. Banister, D. (2008). The sustainable mobility paradigm Transport Policy, 15(2), 73-80.

102. Litman, T. (2013). Transportation and public health. Annua Review of Public Health, 34, 217-233.

103. Cervero, R., & Sullivan, C. (2011). Green TODs: Marryin transit-oriented development and green urbanism International Journal of Sustainable Development & Worl Ecology, 18(3), 210-218.

104. Pucher, J., & Buehler, R. (2016). Safer cycling throug improved infrastructure. American Journal of Public Health 106(12), 2089-2091.

105. Holman, C., Harrison, R., & Querol, X. (2015). Reviev of the efficacy of low emission zones to improve urban air quality in European cities. Atmospheric Environment, 111, 161-169.

106. Moreland-Russell, S., Eyler, A., Barbero, C., Hipp, J. A., & Walsh, H. (2013). Diffusion of Complete Streets policies across US communities. Journal of Public Health Management and Practice, 19, S89-S96.

107. Benedict, M. A., & McMahon, E. T. (2006). Green Infrastructure: Linking Landscapes and Communities. Island Press.

108. Kabisch, N., van den Bosch, M., & Lafortezza, R. (2017). The health benefits of nature-based solutions to urbanization challenges for children and the elderly–A systematic review. Environmental Research, 159, 362-373.

109. Demuzere, M., Orru, K., Heidrich, O., Olazabal, E., Geneletti, D., Orru, H., et al. (2014). Mitigating and adapting to climate change: Multi-functional and multi-scale assessment of green urban infrastructure. Journal of Environmental Management, 146, 107-115.

110. Nesbitt, L., Meitner, M. J., Girling, C., Sheppard, S. R., & Lu, Y. (2019). Who has access to urban vegetation? A spatial analysis of distributional green equity in 10 US cities. Landscape and Urban Planning, 181, 51-79.

111. Kabisch, N., Frantzeskaki, N., Pauleit, S., Naumann, S., Davis, M., Artmann, M., et al. (2016). Nature-based solutions to climate change mitigation and adaptation in urban areas: Perspectives on indicators, knowledge gaps, barriers, and opportunities for action. Ecology and Society, 21(2).

112. Chan, F. K. S., Griffiths, J. A., Higgitt, D., Xu, S., Zhu, F., Tang, Y. T., et al. (2018). Sponge City' in China—A breakthrough of planning and flood risk management in the urban context. Land Use Policy, 76, 772-778.

113. Lerer, S. M., Righetti, F., Rozario, T., & Mikkelsen, P. S. (2017). Integrated hydrological model-based assessment of stormwater management scenarios in Copenhagen's first climate resilient neighbourhood using the three point approach. Water, 9(11), 883.

114. Schilling, J., & Linton, L. S. (2005). The public health roots of zoning: In search of active living's legal genealogy. American Journal of Preventive Medicine, 28(2), 96-104.

115. Maantay, J. (2001). Zoning, equity, and public health.

American Journal of Public Health, 91(7), 1033-1041.

116. Chriqui, J. F., Leider, J., Thrun, E., Nicholson, L. M., & Slater, S. (2016). Communities on the move: Pedestrian oriented zoning as a facilitator of adult active travel to worl in the United States. Frontiers in Public Health, 4, 71.

117. Durand, C. P., Andalib, M., Dunton, G. F., Wolch, J. & Pentz, M. A. (2011). A systematic review of buil environment factors related to physical activity and obesit risk: Implications for smart growth urban planning. Obesit Reviews, 12(5), e173-e182.

118. Wilson, S., Hutson, M., & Mujahid, M. (2010). Hov planning and zoning contribute to inequitable development neighborhood health, and environmental injustice Environmental Justice, 3(4), 211-216.

119. Maantay, J. (2002). Mapping environmental injustices Pitfalls and potential of geographic information systems i assessing environmental health and equity. Environmenta Health Perspectives, 110(suppl 2), 161-171.

120. Steuteville, R. (2020). A movement against single-famil zoning in progressive cities. Public Square: A CNU Journal Congress for the New Urbanism.

121. Hirt, S. (2007). The devil is in the definitions: Contrastin American and German approaches to zoning. Journal of th American Planning Association, 73(4), 436-450.

122. City of Copenhagen. (2017). Copenhagen City of Cyclists The Bicycle Account 2016. Technical and Environmenta Administration.

123. Andersen, L. B., Schnohr, P., Schroll, M., & Hein, H O. (2018). All-cause mortality associated with physica activity during leisure time, work, sports, and cycling t work. Archives of Internal Medicine, 160(11), 1621–1628.

124. Nielsen, T. S., Hansen, A. L., & Nielsen, B. F. (2013) Promoting cycling through urban planning: Copenhage as a case study. Transportation Research Part A: Policy an Practice, 54, 15-31.

125. Yuen, B. (2011). Planning Singapore: The experimenta city. Routledge.

126. Phang, S. Y. N. (2018). Housing in Singapore: Policies an politics. Oxford University Press.

127. Lim, H. S., & Lu, X. X. (2016). Sustainable urba stormwater management in the tropics: An evaluation o Singapore's ABC Waters Program. Journal of Hydrology, 538, 842-862.

128. Tan, P. Y. (2006). Singapore's park connector network: Planning for a green city. Journal of Urban Planning and Development, 132(1), 39-46.

129. Yang, L., Ng, E., & Yu, P. (2018). Assessing the impact of urban greenery on human thermal comfort in high-density Singapore. International Journal of Biometeorology, 62(10), 1767-1782.

130. Rabinovitch, J. (1992). Curitiba: Towards sustainable urban development. Environment and Urbanization, 4(2), 62-77.

131. Lindau, L. A., Hidalgo, D., & Facchini, D. (2010). Curitiba, the cradle of Bus Rapid Transit. Built Environment, 36(3), 274–282.

132. Macedo, J. (2013). Curitiba's urban transformation: From social to sustainable. Island Press.

133. Branas, C. C., South, E., Kondo, M. C., Hohl, B. C., Bourgois, P., Wiebe, D. J., & MacDonald, J. M. (2020). Citywide cluster randomized trial to restore blighted vacant land and its effects on violence, crime, and fear. Proceedings of the National Academy of Sciences, 115(12), 2946–2951.

134. Miranda, V., Barcellos, C., Xavier, D. R., Garcia, L. P., & Monteiro, C. A. (2012). Changes in food consumption and nutrient intake among Brazilian adults between 1987-1988 and 2002-2003. Revista de Saúde Pública, 46, 581-589.

135. Goodfellow, T. (2013). Planning and development in post-conflict cities: Connecting urban resilience and peacebuilding. Routledge.

136. Michelon, J. (2016). Urban planning and climate change: The case of Curitiba, Brazil. Routledge.

137. Uwimbabazi, G., & Lawrence, A. (2011). Upgrading informal settlements in Kigali, Rwanda: Participatory planning and implementation. Habitat International, 35(2), 318-327.

138. Manirakiza, L. (2014). The impact of plastic ban on solid waste management in Kigali City, Rwanda. Waste Management & Research, 32(11), 1088-1093.

139. De Leeuw, E., Webster, P., & Egger, G. (2015). Healthy cities: The theory, policy, and practice. Oxford University Press.

140. Giles-Corti, B., Vernez-Moudon, A., Reis, R., Turrell, G. Dannenberg, A. L., Badland, H., & Owen, N. (2019). City planning and population health: A global challenge. The Lancet, 388(10062), 2912–2924.

141. UN-Habitat. (2020). World Cities Report 2020: The Value of Sustainable Urbanization. United Nations Human Settlements Programme.

142. Machalaba, C. C., Romanelli, C., & Zinsstag, J. (2015). One health in action: Example cities. One Health, 12–16.

143. Rüegg, S. R., O'Hanlon, K., Gondard, L., Brookes V., Rushton, J., Mather, J. A., & Zinsstag, J. (2018) Evaluation of the contribution of One Health approache to strengthening health systems in low-and middle-incom countries. Social Science & Medicine, 162, 197-205.

144. Fullilove, M. T. (2016). Root shock: How tearing up city neighborhoods hurts America, and what we can do about it One World/Ballantine.

145. Cerin, E., Leslie, E., du Toit, L., Owen, N., & Frank, L. D (2009). Destinations that matter: Associations with walking for transport. Health & Place, 13(3), 713–724.

146. Tajima, Y. (2003). Cost escalation of public works projects Journal of the American Planning Association, 69(2), 103 113.

147. Lee, C., Moudon, A. V., & Kurka, J. M. (2008). Buil environments and physical activity in U.S. adolescen females. Health & Place, 14(4), 447–457.

148. Napolitan, V., & Zegras, C. (2008). Removing urban freeways: A synthesis of practice. Journal of Urban Technology, 15(3), 3-26.

149. Krieger, J., & Higgins, D. L. (2002). Housing and health Time again for public health action. American Journal o Public Health, 92(5), 758–768.

150. Bristol, K. G. (1991). The Pruitt-Igoe myth. Journal o Architectural Education, 44(3), 163-171.

151. Chaskin, R. J., & Joseph, M. L. (2015). Integrating th inner city: The promise and perils of mixed-income publi housing transformation. University of Chicago Press.

152. Kates, R. W., Colten, C. E., Laska, S., & Leatherman, S P. (2006). Reconstruction of New Orleans after Hurrican Katrina: A research perspective. Proceedings of the Nationa Academy of Sciences, 103(40), 14653–14660.

153. Alderman, K., Turner, L. R., & Tong, S. (2012). Floods and human health: A systematic review. Environment International, 47, 37-47.

154. Liao, K. H. (2014). Green infrastructure and its role in integrated urban flood management: A review of case studies. International Journal of Sustainable Development & World Ecology, 21(1), 1-15.

155. Harris, P., Friel, S., & Wilson, A. (2015). Including health in systems responsible for urban planning: A realist policy analysis research programme. BMJ Open, 5(7), e008822.

156. Shoup, D. C. (2005). The High Cost of Free Parking. Planners Press, American Planning Association.

157. Pineo, H., Zimmermann, N., & Davies, M. (2018). Integrating health into the complex urban planning policy and decision-making context: A systems thinking analysis. Palgrave Communications, 4(1), 1-14.

158. Badland, H., Whitzman, C., Lowe, M., Davern, M., Aye, L., Butterworth, I., et al. (2014). Urban liveability: Emerging lessons from Australia for exploring the potential for indicators to measure the social determinants of health." Social Science & Medicine, 111, 64-73.

159. Chokshi, D. A., & Farley, T. A. (2012). The cost-effectiveness of environmental approaches to disease prevention. New England Journal of Medicine, 367(4), 295-297.

160. Campbell, S. (2015). Planning history timeline: A selected chronology of events. In S. S. Fainstein & J. DeFilippis (Eds.), Readings in Planning Theory (pp. 56-85). Wiley Blackwell.

161. Burchell, R. W., Downs, A., McCann, B., & Mukherji, S. (2005). Sprawl Costs: Economic Impacts of Unchecked Development. Island Press.

162. Frumkin, H., Frank, L., & Jackson, R. J. (2004). Urban Sprawl and Public Health: Designing, Planning, and Building for Healthy Communities. Island Press.

163. Pagano, M. A. (2011). Funding and investing in infrastructure. Urban Institute.

164. Zimmerman, R. (2009). Making infrastructure competitive in an urban world. The Annals of the American Academy of Political and Social Science, 626(1), 226-241.

165. Cohen, A. J., Brauer, M., Burnett, R., Anderson, H. R., Frostad, J., Estep, K., et al. (2017). Estimates and 25-year

trends of the global burden of disease attributable to ambien air pollution: An analysis of data from the Global Burden o Diseases Study 2015. The Lancet, 389(10082), 1907-1918

166. Bambra, C., Gibson, M., Sowden, A., Wright, K., Whitehead M., & Petticrew, M. (2010). Tackling the wider socia determinants of health and health inequalities: Evidenc from systematic reviews. Journal of Epidemiology & Community Health, 64(4), 284-291.

167. Truelove, M. (1993). Measurement of spatial equity Environment and Planning C: Government and Policy 11(1), 19-34.

168. Braveman, P., Egerter, S., & Williams, D. R. (2011). Th social determinants of health: Coming of age. Annua Review of Public Health, 32, 381-398.

169. Marmot, M., Friel, S., Bell, R., Houweling, T. A., & Taylo S. (2008). Closing the gap in a generation: Health equit through action on the social determinants of health. Th Lancet, 372(9650), 1661-1669.

170. Fairburn, J., Schüle, S. A., Dreger, S., Karla Hilz, L., & Bolte, G. (2019). Social inequalities in exposure to ambien air pollution: A systematic review in the WHO Europea Region. International Journal of Environmental Researc and Public Health, 16(17), 3127.

171. Rothstein, R. (2017). The Color of Law: A Forgotten History of How Our Government Segregated America. Liveright Publishing.

172. Soja, E. W. (2010). Seeking Spatial Justice. University of Minnesota Press.

173. Cole, H. V., Lamarca, M. G., Connolly, J. J., & Anguelovski, I. (2017). Are green cities healthy and equitable? Unpacking the relationship between health, green space and gentrification. Journal of Epidemiology and Community Health, 71(11), 1118-1121.

174. Anguelovski, I., Connolly, J. J., Pearsall, H., Shokry, G., Checker, M., Maantay, J., et al. (2019). Opinion: Why green 'climate gentrification' threatens poor and vulnerable populations. Proceedings of the National Academy of Sciences, 116(52), 26139-26143.

175. Silverman, R. M. (2006). Central city socio-economic characteristics and public participation strategies: A comparative analysis of the Niagara Falls region's municipalities in the USA and Canada. International Journal of Sociology and Social Policy, 26(3/4), 138-153.

176. Meehan, M. E., & Brisson, I. E. (2019). The role of planning in the promotion of health and equity. Urban Planning, 4(1), 87-90.