POLICY GUIDELINES

A Pathway to Prioritizing and Delivering Healthy and Sustainable Cities

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ABSTRACT: Creating healthy and sustainable cities should be a global priority. Some cities prioritize 15-minute cities as a planning approach with co-benefits for health, climate change mitigation, equity, and economic recovery from COVID-19. Yet, as our recent *Lancet Global Health* series on "Urban Design, Transport, and Health" showed, many cities have a long way to go to achieve this vision. This policy guideline summarizes the main findings of the series, which assessed health and sustainability indicators for 25 cities in 19 countries. We then outline steps governments can take to strengthen policy frameworks and deliver more healthy, equitable, and sustainable built environments.

The *Lancet Global Health* series provided clear evidence that cities need to transform urban governance to enable integrated planning for health and sustain-

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ability and commit to policy implementation. Evidence-informed indicators should be used to benchmark and monitor progress. Cities need policy frameworks that are comprehensive and consistent with evidence, with measurable policy targets to support implementation and accountability. The series provided evidence-informed thresholds for some key urban design and transport features, which can be embedded as policy targets. Policies and interventions must prioritize identifying and reducing inequities in access to health-supportive environments. Governments should also invest in open data and promote citizen-science programmes, to support indicator development and research for public benefit. We provide tools to replicate our indicators and an invitation to join our 1000 Cities Challenge via the Global Observatory of Healthy and Sustainable Cities.

KEYWORDS: healthy cities; sustainability; 15-minute cities; indicators; policy targets

Introduction

At the height of the COVID-19 pandemic, the C40 network of city mayors assumed global leadership with a promise to "build back better" by creating "15-minute cities" where residents could access their daily living needs within 15 minutes by active modes of transport (C40 Cities & Arup, 2021, p.35). 15-minute cities are expected to improve health, equity, and sustainability, and contribute to climate change mitigation, through compact design that enables active transportation and reduces motor vehicle dependency. This aspiration aligns with the United Nations Sustainable Development Goals agenda (United Nations General Assembly, 2015) and our recent _Lancet Global Health_ series on "Urban Design, Transport, and Health" (van den Broek d'Obrenan & Huxley, 2022). The series highlighted the co-benefits for human, ecosystem, and planetary health of transitioning to cities that enable healthy and more sustainable lifestyles by prioritizing walking, cycling, and public transport (Giles-Corti, Moudon, Lowe, Cerin, et al., 2022). Essentially these would be 15-minute cities designed using eleven _integrated_ urban and transport planning and design interventions—the 11Ds (Giles-Corti, Moudon, Lowe, Adlakha, et al., 2022; Giles-Corti et al., 2016). These include four regional planning interventions (_destination accessibility_ by high-quality public transport, _distribution of employment_ to reduce commuting distances, _demand management_ to reduce driving, and _disaster mitigation_) and seven local urban design interventions (_density_, _design_, _distance to public transport_, _destination proximity_, _diversity_ of housing types and destinations, _distributed_ interventions and resources to support equity, and _desirability_ [i.e., safety and neighbourhood attractiveness]). We argued that

cities built according to these principles would be healthier for the world's growing urban populations (United Nations, 2018), with less air and noise pollution and smaller ecological footprints (Giles-Corti, Moudon, Lowe, Cerin, et al., 2022).

This article provides an overview of *The Lancet Global Health* series and its policy recommendations. We briefly summarize the study and its findings before highlighting policy implications for governments seeking a pathway to delivering healthy and sustainable cities.

The Lancet Global Health series on "Urban Design, Transport, and Health"

Working with collaborators in 25 cities across 19 countries (13 high-income countries and 6 middle-income countries) on 6 continents, we assessed the presence and quality of urban policies to investigate whether they support the creation of healthy and sustainable cities (Lowe et al., 2022). We also developed and mapped spatial indicators of the presence of urban design and transport features to assess whether those cities had inequities in access to health-supportive environments (Boeing et al., 2022). Finally, we identified evidence-informed optimal thresholds for selected built environment features, which could be incorporated into urban planning standards to foster healthy and sustainable lifestyles (Cerin et al., 2022).

Our results were sobering. Despite cities expressing policy aspirations to be healthy, liveable, and sustainable, many lacked urban and transport policies with evidence-consistent measurable targets that would achieve their vision (Lowe et al., 2022). These policy limitations may be contributing to urban development patterns that are neither healthy nor sustainable. We found that access to health-supportive environments varied significantly within and between the 25 cities studied. For example, in many cities, those living in outer suburban areas had poorer access to walkable neighbourhoods than central areas (Boeing et al., 2022). We also found minimum thresholds for levels of population density, street connectivity, and public transport access that would foster active and sustainable lifestyles (Cerin et al., 2022). Although the evidence is only preliminary, there may also be upper thresholds for some of these features, above which the proportion of residents achieving healthy lifestyles may decline (Cerin et al., 2022; Eom & Cho, 2015).

While most of the cities in middle-income countries were relatively walkable compared with the Australasian and U.S. cities, they generally had inadequate access to public open space. Importantly, few of the cities in middle-income countries had high-quality urban and transport policies that would guide future development (Lowe et al., 2022). This is of concern, because many middle-income countries are rapidly urbanizing (United Nations, 2018). Without strong policy frameworks in place, they risk adopting unhealthy and unsustainable practices that are common in countries such as the United States and Australia, resulting in car-centric housing developments that will negatively affect future generations (Boeing et al., 2022; Lowe et al., 2022).

Policy implications

For the 25 cities in the study, the *Lancet Global Health* series identified specific policy strengths and limitations and levels of access to health-enhancing urban design and transport features. To assist policymakers in addressing issues for their city, we developed city-specific reports and scorecards of these findings, available in multiple languages on the Global Observatory of Healthy and Sustainable Cities: https://www.healthysustainablecities.org/ (Global Healthy and Sustainable City-Indicators Collaboration, 2022). The series also developed broader recommendations for all governments responsible for city planning, as summarized next.

Transform urban governance

We urge governments to transform city planning governance and policy frameworks to respond to current and emerging urban problems. This is easy to say and hard to do. It requires transparent, inclusive, accountable, and nimble urban governance and leadership (Giles-Corti, Moudon, Lowe, Cerin, et al., 2022). To create healthy, zero-carbon, 15-minute cities, governments must create an *authorizing* environment that actively promotes integrated planning and policy alignment (Lowe et al., 2018), vertically between levels of government and jurisdictions and horizontally across sectors, building on ideas from the health-in-all-policies approach to planning (Lowe et al., 2022). Integrated planning requires leadership at the highest political and bureaucratic levels, along with well-resourced intersectoral governance structures (e.g., interdepartmental committees and joint budgeting arrangements; parliamentary committees) that support cross-government action (Lowe et al., 2018; World Health Organization & UN-Habitat, 2010). Legislation can mandate consideration of health and the environment in decision-making, and health impact assessments can be useful for estimating the likely health effects of major infrastructure and urban development proposals (Lozzi & Monachino, 2021).

Creating healthy and sustainable cities should be viewed as an opportunity for multisectoral co-benefits. For example, policies to encourage walking and cycling over motorized vehicle use increase physical activity, reduce air and noise pollution, and decrease carbon emissions, resulting in health, environmental, and economic benefits (Lowe et al., 2022; Sallis et al., 2015). As discussed further in the next section, policy implementation should be monitored to ensure it is on track and to avoid unintended negative consequences.

We encourage cities to share policy and governance insights and success stories with peers through relevant city networks such as C40 and through research-practice networks to accelerate cities' progress towards reaching urban health and sustainability targets and to help build policy capacity in low- and middle-income countries (Lowe et al., 2022). Multilateral and non-governmental organizations play a key role in providing "guidance, tools, and technical support to incorporate health, sustainability, net zero emissions, and equity in all urban policies, including procurement and financing mechanisms" (Giles-Corti, Moudon, Lowe, Cerin, et al., 2022, p. e924).

Benchmark and monitor progress

Policy is only as good as its implementation (Hooper et al., 2014). We urge city planners and leaders to develop detailed implementation plans and to use indicators, such as those we developed, to help benchmark and monitor health-enhancing, equitable city planning policies and interventions. We found it is feasible to consistently measure policy and spatial indicators of urban health and sustainability across diverse cities internationally (Giles-Corti, Moudon, Lowe, Cerin, et al., 2022), and we have provided tools to enable indicators to be replicated in any city (Global Healthy and Sustainable City-Indicators Collaboration, 2022; Liu et al., 2022). Policy indicators can be used to identify the completeness and quality of policy frameworks, allowing specific policy gaps and limitations to be addressed (Lowe et al., 2022). Spatial indicators assess and visually display inequities in access to urban design and transport features and can be used to monitor policy implementation and outcomes (Lowe et al., 2020). When repeated over time (e.g., every 5 years), changes in the built environment can be benchmarked and tracked to provide an early warning system and inform policy adjustments required to ensure progress towards healthy and sustainable cities (Giles-Corti, Moudon, Lowe, Cerin, et al., 2022). Table 1 shows selected examples of the indicators measured in the series.

We recommend that cities and international organizations partner with researchers to develop an expanded set of evidence-informed indicators that measure the human and planetary health consequences of city planning, including but not limited to biodiversity, tree canopy, urban heat, air pollution, levels of low-income housing built in disaster-prone areas, crime rates, and traffic injuries (Giles-Corti, Moudon, Lowe, Cerin, et al., 2022). International organizations and governments in higher-resource countries can assist with data infrastructure and technical capacity building in cities in low- and middle-income countries, with global benefits for sustainable development and health equity.

Develop comprehensive policy frameworks

Integrated and comprehensive policy frameworks are needed to deliver the full suite of transport and urban design features of healthy and sustainable cities (Lowe et al., 2022). In our policy study, we found many cities lacked policies for governing aspects important for health and sustainability, such as street connectivity, employment distribution, and investment in active and public transport (Lowe et al., 2022). These policy gaps need to be filled with new legislation, strategies, and plans to ensure policy frameworks are complete, with evidence-informed actions for all of the 11Ds (Giles-Corti, Moudon, Lowe, Cerin, et al., 2022), as discussed further in the next section.

Ensure policies are consistent with evidence

City planning policies across all sectors need to be aligned with current evidence on how to plan healthy and sustainable urban environments. While there is

Table 1: Examples of policy and spatial indicators from *The Lancet Global Health* series on "Urban Design, Transport, and Health" (adapted from Giles-Corti, Moudon, Lowe, Adlakha, et al., 2022)

Selected indicator domains	Example policy indicators*	Example spatial indicators†
Integrated planning	Specific health-focused actions in metropolitan urban policy	
	Health Impact Assessment requirements in urban or transport policy/legislation	
Air pollution	Air pollution policies related to transport planning	
Destination accessibility	Requirements for public transport access to employment and services	Percentage of population living within 500 m of a fresh food market, a convenience store, and public transport: (a) any; (b) with high-frequency service
Design	Public open space access requirements	Percentage of population living within 500 m of a public open space: (a) any; (b) larger than 1.5 hectares
	Street connectivity requirements	Street intersection density in the local walkable neighbourhood of residence
Density	Housing density requirements	Population density in the local walkable neighbourhood of residence
Distance to public transport	Public transport access requirements	Percentage of population living within 500 m of any public transport stop
Transport infrastructure investment	Information on government expenditure on infrastructure for different transport modes	
Walkability		Combined population density, street intersection density, and daily living destinations in local neighbourhood

* Where relevant, policy indicators assessed both policy presence and quality (evidence-consistency and measurability).
† Mapping spatial indicators of the presence of urban design and transport features showed inequities in access across each city.

always more to discover about what constitutes healthy and sustainable built environments, there is an established body of evidence on which to base decisions (Giles-Corti, Moudon, Lowe, Adlakha, et al., 2022; Giles-Corti et al., 2016). We found some cities had policies that were contrary to this evidence. Some Australasian and U.S. cities had unambitious active transport and housing density targets or policies actively supporting car use, which undermine the goal of healthy and zero emission cities (Lowe et al., 2022). For example, Melbourne, Australia, had a housing density target of 20 dwellings per hectare (Department of Environment Land Water and Planning, 2017), which is too low to support walkability. Baltimore, United States, had a relatively low target to increase cycling/walking mode share to 5% by 2040 (Baltimore Regional Transportation Board, 2016). In turn, our spatial analysis showed that Australasian and U.S. cities had lower walkability (Boeing et al., 2022). Unfavourable policies should be urgently revised and any new policies need to be consistent with evidence to avoid cities being locked into unhealthy and unsustainable urban development patterns (Lowe et al., 2022).

Include evidence-informed, measurable policy targets

The widespread adoption of evidence-informed policy targets could facilitate progress towards attaining the Sustainable Development Goals (United Nations General Assembly, 2015) by aiding policy implementation and accountability. As mentioned earlier, we found many policies were stated as general aims or aspirations without measurable targets for delivering urban design and transport features (Lowe et al., 2022). For example, while 92% of cities studied had requirements for pedestrian infrastructure, only 32% had measurable targets to guide implementation. Street connectivity contributes to neighbourhood walkability, but only two cities in our sample had measurable evidence-consistent street connectivity policy targets (Lowe et al., 2022). To illustrate the type of evidence-informed policy targets required, Ghent, Belgium, had a requirement that district parks should be closer than 400 m from each house and greater than one hectare in size (Stad Gent, 2018).

Cities in middle-income countries tended to have fewer measurable policy targets than those in high-income countries, suggesting an urgent need to strengthen policy quality in those contexts. São Paulo in Brazil could be a positive example for other cities in middle-income countries, as it had a high-quality policy framework relative to many cities in high-income countries (Lowe et al., 2022). It was encouraging that those policy strengths were matched with better spatial outcomes in São Paulo compared with other cities in middle-income countries (Boeing et al., 2022).

We recommend that cities strive to develop specific policy targets that are informed by evidence of the thresholds required for urban design and transport features to support healthy and sustainable urban development (Cerin et al., 2022; Lowe et al., 2022). In our *Lancet Global Health* series for example, we found that for cities to meet the World Health Organization's physical activity targets through walking, neighbourhoods need a population density of at least 5,700 people per km², which supports nearby services such as public transport and shops. Neighbourhoods also need street connectivity of about 100 intersections per km², which creates convenient walking routes, and adequate public transport access—about

25 public transport stops per km² (Cerin et al., 2022). Across the 25 cities studied, most policy targets did not reflect these benchmarks (Lowe et al., 2022), with variable proportions of neighbourhoods across each city meeting these thresholds (Boeing et al., 2022). Evidence-informed minimum thresholds should be embedded in policy to help optimize walking and other health-related outcomes, being mindful of a possible upper limit above which health benefits decline. These upper thresholds need to be established through further study (Cerin et al., 2022).

Target interventions to reduce urban design and transport inequities

As the World Health Organization's *Hidden Cities* report argues, reducing spatial inequities in access to health-enhancing urban design and transport features must be a priority (World Health Organization & UN-Habitat, 2010). As noted above, our spatial indicator mapping showed significant within-city inequities in features such as walkability and population access to public open space within 500 metres (Boeing et al., 2022). Information from spatial mapping can be used to target policies and prioritize interventions to reduce inequities in access to urban design and transport features that foster health and well-being. While not assessed in our study, there is a need to measure other issues pertinent to urban disadvantage, such as overcrowded housing, pollution, and basic essential infrastructure provision (e.g., water and sanitation) (Lowe et al., 2022).

Support development and use of the open data commons

To support the public good, we recommend all cities participate in the open data commons and encourage citizen science programmes (Boeing et al., 2022). Open data and open-source tools enable each city's progress to be quantified, monitored, and compared with other cities globally. Open-source approaches overcome limitations of closed-source official data, in terms of data availability and comparability across jurisdictions, especially in low- and middle-income countries (Liu et al., 2022; UN-Habitat, 2022). Cities can use and actively contribute data to established standard open platforms such as OpenStreetMap and commit to open data policies and consistent digitization standards for local data collection (Boeing et al., 2022). Governments can further support data quality and civic engagement by encouraging local populations to become involved in crowdsourcing additional spatial data about their own communities (Boeing et al., 2022).

Conclusion

Most cities have a long way to go to achieve the vision of healthy and sustainable 15-minute cities. This reality should spur rather than discourage action. There is a growing urgency to accelerate transformation towards healthy and sustainable cities, to drive global climate change mitigation and adaptation, and protect the health of growing and aging urban populations. If the ambition to build back bet-

ter is to move from rhetoric to reality, COVID-19 recovery should be harnessed as a renewed opportunity to invest in a healthy and sustainable urban future. Policy and spatial city planning indicators can point the way to healthier and more sustainable cities, helping to target policies and interventions to reduce urban inequities and benchmark and monitor progress. To support indicator development and sharing, we developed tools to support the measurement of indicators in any city (Liu et al., 2022). We have also launched the 1000 Cities Challenge via the Global Observatory of Healthy and Sustainable Cities (https://www.healthysustainablecities.org/), in which we invite policymakers, advocates, and researchers to participate in gathering policy and spatial data for their city and calculating indicators of healthy and sustainable urban policy, design, and planning (Global Healthy and Sustainable City-Indicators Collaboration, 2022).

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Competing interests

Deepti Adlakha serves as a Steering Committee Member for the International Society for Physical Activity and Health. James F. Sallis is a National Advisory Panel member for the AARP Liveability Index, reports personal fees from SPARK programs of Gopher Sport Inc, has a copyright on SPARK physical activity programs with royalties paid by Gopher Sport Inc., and serves on the Rails to Trails Conservancy board of directors.

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