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Cities and Health: Preventing NCDs Through Urban Design

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First we shape the cities — then they shape us.
Jan Gehl

City planning is now recognised as an important part of a comprehensive solution to noncommunicable diseases (NCDs). By 2050, some 75% of the world's population will live in cities.[1] Almost 80% of Australians already reside in Australia's major cities, as a result of population movements from rural areas to urban centres since the turn of the 20th century. As discussed in the earlier chapter by Alessandro Demaio, NCDs have overtaken infectious diseases as the leading cause of death and disability globally. This is true for both low to middle and high income countries, and creates a significant healthcare and financial burden. Tackling NCDs in cities must therefore be a priority.

Urban design can have a powerful influence on NCDs and their risk factors, such as physical inactivity, unhealthy diets, social isolation, and poor air quality. While urban populations are on average healthier than rural folk, there are growing concerns about inequities in health outcomes within and between cities.[2] For example, people living in Melbourne's outer suburban growth areas to the north and west are experiencing a higher burden of NCDs compared with Melbourne and Victorian state averages. Glasgow, Scotland is a stark example of area-based

health inequalities, with average male life expectancy varying between 54 years in the deprived area of Calton, and 82 years in the more affluent area of Lenzie.[3]

Demographic characteristics of the population such as income, occupation and education levels explain much of the geographical variation in health outcomes. However, it is not just who we are, but where we live that shapes NCD outcomes at a population level.[4] Many geographical inequities in health partly originate from variations in urban environments, such as access to shops, services, public transport, public open space and walkable neighbourhoods.

This chapter takes a look at the relationship between cities and NCDs, providing an overview of the links between urban design features and some of the leading NCD risk factors. It then outlines the principles of healthy urban design, suggesting approaches that policymakers and planners could use to prevent NCDs through improved city planning.

How cities determine NCDs

Over the past 15 years, significant progress has been made in understanding how specific urban design characteristics directly and indirectly shape common NCD risk factors. Much of this evidence comes from high income countries, with a growing contribution from studies in low to middle income countries.

Physical activity levels

City planning can promote or inhibit physical activity. Physical inactivity is a significant cause of illness and death globally. In Australia, it is the fifth leading contributor to the disease burden, with almost 60% of adults being insufficiently active to benefit health.[5] There are strong links between neighbourhood design and levels of physical activity, particularly active modes of transport such as walking and cycling. Building physical activity into daily activities (for example, commuting to jobs or schools, or trips to

shops and services) makes it much easier to achieve the recommended 30 to 60 minutes of physical activity per day.

Compared with low density urban sprawl development, neighbourhoods with higher housing densities, a good mix of land uses, grid-based street networks and high-quality walking and cycling infrastructure (such as separated bike paths, footpaths and safe pedestrian crossings) can encourage more active transport. This type of urban form makes it easier and more convenient for people to walk and cycle to jobs, retail and essential infrastructure and services.[6–8] Shorter distances to public transport stations or stops also encourage walking for transport. Creating walkable and cycling-friendly neighbourhoods in low income areas may reduce health inequities, by facilitating more physical activity among residents at increased risk of chronic disease.[9]

Urban design and transport planning can also influence whether or not children walk or cycle to school. Children attending nearby schools in neighbourhoods with low traffic volumes, highly connected street networks[10] and increased housing densities are more likely to walk to school.[11] If schools are designed to have more outdoor play areas and physical activity facilities, children and adolescents are also more likely to be active during recess and lunch.[12]

Having accessible and attractive open spaces, such as parks and beaches, can also encourage recreational physical activity among adults, particularly walking.[7] For children and adolescents, having access to sport and recreational opportunities within the local neighbourhood also encourages after school participation.[13] Accessible, attractive and safe streets and public open and green spaces can also have co-benefits for mental health, by encouraging more physical activity, as well as fostering social interactions and exposing people to nature.[7]

Diets

Unhealthy diets are another leading cause of the global NCD burden, as an independent risk factor for conditions like type 2

diabetes and cardiovascular disease, and through obesity pathways.[5] The availability and accessibility of food options in urban environments can determine what people eat.[7] Cities offer a wide range of food choices, many of which are unhealthy, such as convenience and fast foods high in fats and sugars. Along with sedentary lifestyles, food environments in cities may partly explain why urbanisation lowers the risk of underweight in children, but increases their risk of being overweight.[14]

Having nearby access to a reliable source of fresh, healthy food, such as a supermarket, is associated with healthier diets, with higher consumption of fruit and vegetables. Food purchasing may also be influenced by the ratio of healthy to unhealthy food outlets (such as fast food stores).[15] The type of food available near schools is a determinant of what children eat. Access to healthy food is typically more difficult in lower socio-economic neighbourhoods, contributing to health inequities.[7] In addition, there may be a relationship between higher numbers of alcohol outlets in a particular area and harmful consumption of alcohol and alcohol-related violence.[16]

Access to healthcare and other services

The design of urban areas also affects access to other essential infrastructure and services that determine health outcomes. In the case of NCDs, a range of health and community services play an important role in the prevention, early detection and appropriate and timely treatment of disease. Unfortunately, some neighbourhoods do not have easy access to these services, either in terms of proximity, or transport accessibility, particularly by public transport. This may contribute to inequities in health outcomes.

Inequities in access to healthcare exist in high as well as low to middle income countries. For example, in the rapidly expanding suburbs on the fringe of Australia's major cities, there can be significant delays in providing local essential healthcare services as well as public transport. Being reliant on distant health services

that can only be reached by car is a barrier to access for people who do not drive, such as the elderly or those with no or limited access to a motor vehicle.

Air quality

Poorer air quality contributes to respiratory disease and can exacerbate other NCDs such as cardiovascular disease.[17] While poor air quality in low to middle income countries results from a range of factors, including industrial pollution and burning of biomass fuels for heating and cooking, motor vehicle traffic is a significant contributor, with motor vehicle ownership growing at unprecedented rates. Transport-related air pollution also remains a key concern in many cities in high income countries.

The design of urban areas can affect exposure to air pollution, particularly from motor vehicle traffic. For example, living within 300 metres of a busy road significantly increases exposure to air pollutants, such as particulate matter, nitrogen oxide and carbon monoxide.[18] Land use and transport planning that encourages active transport, and locates houses and schools away from busy roads can reduce exposure to traffic and air pollution, with resultant benefits for health.

Cities and climate change

As the source of about 70% of global greenhouse gas (GHG) emissions, cities are a major contributor to climate change and associated health effects.[19] Climate change impacts NCDs in a range of ways, including increases in illnesses, injuries and mental health problems associated with more frequent extreme weather events, increases in air pollutants, and heat stress exacerbated by the urban heat island effect.[20] The urban heat island effect is when higher temperatures are experienced in urban areas compared to the surrounding rural areas, largely due to heat absorption in the built environment.

A recent *Lancet* report called for a transition to cities that are healthy for both humans and the planet, recognising the many

opportunities to achieve co-benefits for NCDs through action to prevent and adapt to climate change.[21] For example, in addition to physical activity and mental health benefits, provision of green open spaces and tree coverage in city landscapes can partly ameliorate the urban heat island effect.[22] Road transport is a major contributor to GHG emissions from cities, particularly in highly automobile-dependent metropolitan areas. Therefore, policies that prioritise walking, cycling and public transport can have multiple environmental and health benefits.[23]

We need to build healthier cities

There is a growing recognition among city planners that we need to create healthier cities. In Australia, creating healthy and liveable neighbourhoods is a goal of metropolitan planning policies such as Plan Melbourne, A Plan for Growing Sydney, and the Liveable Neighbourhood Guidelines for Perth. The National Heart Foundation of Australia has been leading the way with guidelines, such as Healthy by Design, that assist urban planners to design urban environments that prevent NCDs.

Internationally, the World Health Organization's Healthy Cities Initiative, launched in 1986, promotes the integration of health concerns into the political, social and economic agendas of local governments. This has grown into a global movement with over 10,000 Healthy Cities projects worldwide. Unlike the Millennium Development Goals, the new United Nations Sustainable Development Goals address NCDs, and include a goal related to making cities more inclusive, safe, resilient and sustainable.

In many cities, healthy urban design principles are not being consistently applied, creating urban environments that are not NCD-friendly. For example, in an attempt to provide 'affordable' housing, low-density, single land use suburbs, with poor access to jobs, shops, services and public transport, continue to be developed at a rapid rate on the fringe of many cities, including in Australia.[24] These neighbourhoods discourage physical activity, and

make social interaction and healthy eating more difficult, with residents commuting long distances by car to reach employment, schools and services. Once established, housing developments are difficult and expensive to retrofit and redesign, hence there is an urgent need to build in NCD-friendly design from the outset. More established inner city areas typically have better access to services and public transport. However, they often have unaffordable housing and residents who oppose higher density development that would make housing with local amenity more affordable and enable older residents to downsize and age in place. Poor housing quality and exposure to air and noise pollution are also major concerns in many cities, particularly in low to middle income countries. Providing higher quality housing and reducing exposure to environmental stressors would reduce both health and environmental inequities.

What would a healthier city look like?

Some cities are further ahead when it comes to certain aspects of healthy urban environments. European cities such as Copenhagen and Amsterdam have very successfully increased cycling rates, by implementing a raft of consistent and reinforcing transportation and land use policies. Portland, Oregon in the United States and Vancouver, Canada are other leading examples of cities that are prioritising walking, cycling and public transport over car use in their metropolitan planning. Bogota, Colombia is well known for its efforts at expanding walking, cycling and public transport infrastructure. This city has also dramatically reduced crime rates, partly through urban design interventions.

Thinking holistically, the notion of developing 20-minute neighbourhoods is gaining traction globally, as a promising way of promoting health and liveability. Twenty-minute neighbourhoods have jobs, shops and services located within a 20-minute journey of most homes, via walking, cycling or public transport.[25] These types of neighbourhoods are sometimes referred to as ‘complete

communities'.[26] Regardless of the terminology, the idea is to provide safe and convenient access to all the infrastructure and services needed for daily life, prioritising active modes of transport in the urban landscape. Melbourne and Portland are examples of cities currently working towards creating 20-minute neighbourhoods.

Twenty-minute neighbourhoods have the potential to reduce NCD risk factors. Areas reflecting the 20-minute neighbourhood ideal (usually in the inner city) are typically healthier and more liveable places to live. Residents are more likely to walk, cycle and/or use public transport to travel to work and school. In this way, physical activity is built into their daily routine. If designed to reduce motor vehicle traffic exposure, these neighbourhoods feel safer and more pleasant for pedestrians and cyclists. In 20-minute neighbourhoods, local shops, services and cafes can be reached on foot or by bike or public transport, making it easier to access healthy food and other goods. The GP might be just around the corner, and other essential services are nearby. With people using the attractive, tree-lined streets and local parks, it is easier to have informal interactions with neighbours and friends. This is good for mental health, making people feel safer and more socially-connected.

By helping cities to mitigate and adapt to climate change, 20-minute neighbourhoods could also benefit health through environmental sustainability pathways. In particular, designing healthy and liveable neighbourhoods could reduce transport-related greenhouse gas emissions, and ameliorate the heat island effect through urban greening. As discussed above, this could help to prevent and manage the impacts of climate change on a range of NCDs.[23]

There are a number of key building blocks of healthy, liveable and sustainable 20-minute neighbourhoods.[27] Many of these urban design features were introduced as determinants of NCD risk factors earlier in the chapter. Increased housing density is needed to house the rapidly growing urban population, but it is also the

foundation of walking and cycling-friendly neighbourhoods. This is because having more people in a particular area helps to support local jobs, shops and public transport. However, as cities densify, there needs to be careful consideration of the design and location of buildings, and the demographic and socioeconomic make-up of the local population, to ensure that higher density housing enhances the health and wellbeing of residents.[8]

In particular, differing housing needs across the life-course requires a diversity of housing in terms of size, type and affordability. Streets need to be connected and land use planning needs to support a mixture of local land uses, as this increases the number of destinations and daily activities close to homes.[7] Open spaces, local sport and recreation opportunities, and healthy food options must be provided as part of mixed land use neighbourhoods. The main goal should be to create equitable access to services and infrastructure across a city.

Finally, higher-density, mixed-use neighbourhoods need to include high-quality walking and cycling infrastructure, and be based around public transport networks, to provide safe and convenient active transport routes. Transit-oriented development is a popular concept that could contribute to creating 20-minute neighbourhoods, by locating housing and mixed land use developments around public transport nodes.

Planning cities to prevent NCDs

So, what needs to happen to ensure that we build neighbourhoods and cities that prevent NCDs? First and foremost, transformation of our cities in the coming decades will require strong urban governance, and long-term strategic planning. We need consistent and forward-thinking leadership and public policy to achieve health-promoting outcomes in our cities. This would create clearer direction for private developers and other government and non-government organisations charged with delivering housing and urban infrastructure and services.

Evidence about the impact of cities on NCDs needs to be more consistently translated into public policy.[24] There is still much to be understood about the complex processes that shape urban health, and this requires more innovative research to be undertaken. However, there is now a large body of evidence to guide decisions about urban planning, design and management. In particular, cities can learn from each other's experiences, innovative ideas, successes and challenges in urban planning and design.

All levels of government and many different sectors are involved in shaping cities, including infrastructure, planning, housing, transport, finance, economics, education, health, energy and environment. All of these sectors, across levels of government, need to work together in an integrated fashion to create healthier urban environments. This intersectoral approach requires partnerships and collaboration across sectors, aiming for alignment of all policies in a consistent health-promoting direction.[24] The health sector can provide vital leadership on evidence-based approaches to preventing NCDs through city planning. However, all sectors should consider the health impacts of their policies and projects.

To this end, there are growing calls for more extensive use of health impact assessment to guide decision-making in city planning. There are a range of health impact assessment tools in existence, often in the form of a checklist. These tools can be used to assess the current or potential health impacts of a policy or development proposal.[24] This enables policymakers to maximise benefits for NCD prevention, and minimise potential unintended harms.

There must also be a clear line of sight between health-promoting urban policies and what is delivered on the ground. The gap between policy and practice can hamper efforts to prevent NCDs through city planning. To assist with closing this implementation gap, it is important to link key policies and infrastructure proposals with government funding, while ensuring accountability

for implementation through clear allocation of responsibility, and the use of indicators and measures to monitor progress.

Finally, community involvement in planning and policy development is vital. Engaging the community in the process ensures that community concerns and viewpoints are considered and reflected in decision-making. This can facilitate policy implementation by giving community members a sense of ownership of the policy or project. For community participation to be most effective, the process should be inclusive and transparent, with open sharing of concerns and ideas about how cities should grow and develop.

Conclusion

City planning has the potential to make a significant contribution to global efforts to tackle NCDs. The United Nations and the World Health Organization are providing global leadership on promoting healthy urban design at the international level. However, preventing NCDs in cities will require local leadership and bipartisan support.[28] No two cities are the same, with each facing unique planning and health challenges. Hence, the principles of healthy urban design must be considered in relation to the local context. Policies and interventions must be prioritised to reduce inequities in NCD outcomes within and between cities. Integrated, comprehensive, intersectoral planning is essential to create cities that prevent NCDs and promote health and community wellbeing.

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