

HEALTHY CITIES



THE URBAN BURDEN
OF DISEASE ESTIMATION
FOR POLICY MAKING

HOW CAN URBAN PLANNING
IMPROVE HEALTH
IN BARCELONA?



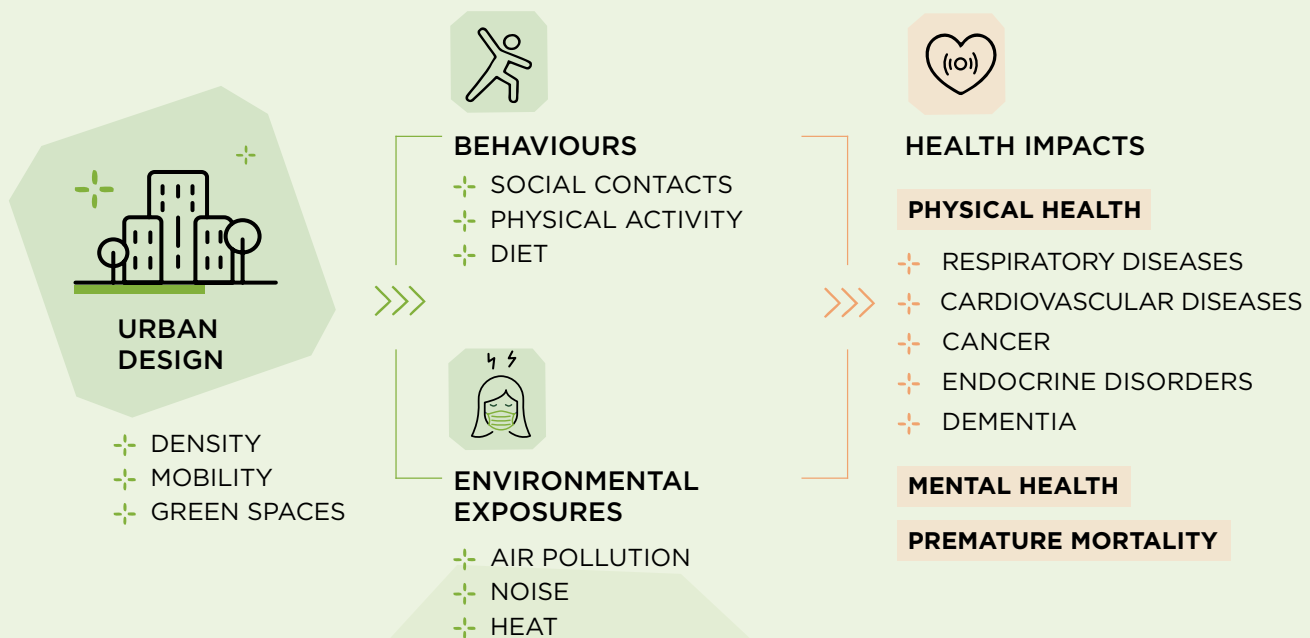
INTRODUCTION

01.

HOW DOES URBAN DESIGN INFLUENCE THE HEALTH OF CITY RESIDENTS?

The urban environment shapes our exposure to environmental factors, our behaviour and our day-to-day health.

Green spaces, air quality, transport, noise, physical activity and the urban heat island effect all influence the risk of cardiovascular and respiratory diseases, mental health problems, premature mortality and health inequalities.¹



IN BARCELONA, THE HEALTH IMPACTS ASSOCIATED WITH URBAN POLICIES ARE BEING STUDIED.

ASSESSMENT

02.

HOW DO WE MEASURE THE IMPACT OF URBAN AREAS ON THE HEALTH OF THEIR INHABITANTS?

Assess before taking action.

To improve urban health, we first need to understand which aspects of the city work well and which need to be improved.

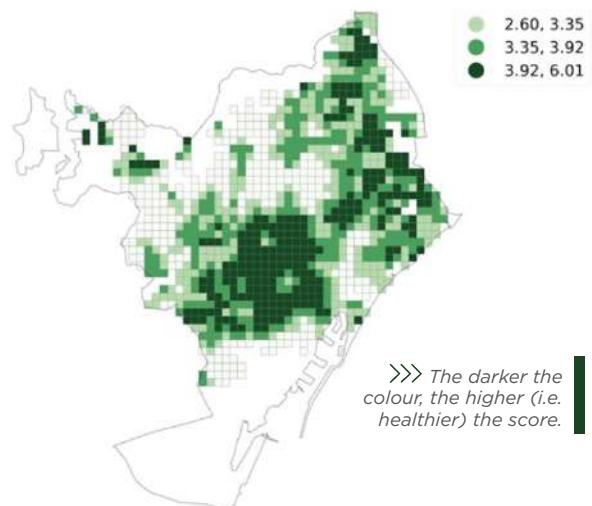
The Healthy Urban Design Index (HUDI)² assesses how the urban design of cities influences the health of their inhabitants.

The index incorporates various dimensions of urban planning and environmental quality, such as:

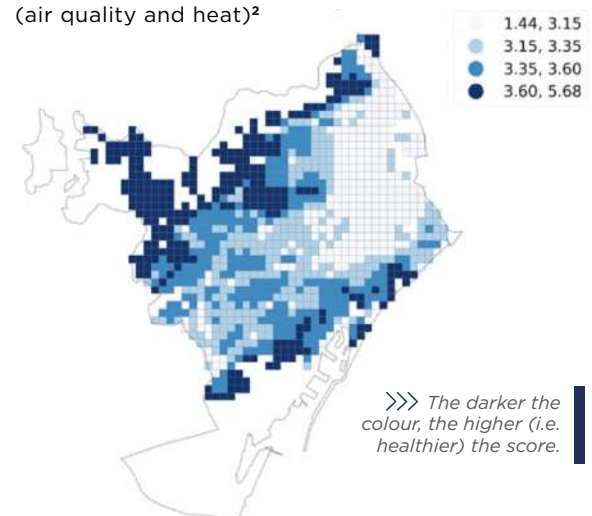
- + GREEN SPACES
- + WALKABILITY
- + CYCLING INFRASTRUCTURE
- + ACCESS TO PUBLIC TRANSPORT
- + DEPENDENCE ON PRIVATE VEHICLES
- + URBAN LAYOUT

THE AIM IS TO PROVIDE LOCAL AUTHORITIES WITH TOOLS TO BETTER UNDERSTAND THE RELATIONSHIP BETWEEN URBAN DESIGN AND HEALTH IN CITIES, IDENTIFY OPPORTUNITIES FOR IMPROVEMENT AND PROMOTE HEALTHIER URBAN POLICIES.

Access to a green space of ≥ 0.5 hectares within 300 metres of the residence²



Environmental quality in Barcelona (air quality and heat)²



The **ISGlobal City Ranking³** enables European cities to be compared according to various environmental determinants and urban characteristics related to health.



**ATMOSPHERIC
POLLUTION**



**GREEN
SPACES**



**URBAN
NOISE**



CITIES CAN VIEW THEIR RESULTS AND COMPARE THEM WITH THOSE OF OTHER EUROPEAN MUNICIPALITIES TO HELP GUIDE FUTURE ACTION.

2.1

BARCELONA: STRENGTHS AND AREAS FOR IMPROVEMENT IN THE CITY

This assessment, based mainly on the HUDI and the City Ranking, shows that Barcelona has a favourable urban foundation for promoting health, while also identifying priority areas for action.



2/11

2nd highest score in the ranking of major metropolitan areas.²



VISIT ISGLOBAL'S RANKING³

AREAS FOR IMPROVEMENT

3

STRENGTHS

Barcelona has a compact urban model designed around proximity:²

- + High urban compactness **(100/100)**, promotes proximity, active travel and easy access to services. >>>

However, it also requires climate mitigation and adaptation measures to address the effects of high urban density, such as heat accumulation and pollution levels.

- + **63.9%** of the infrastructure is allocated to walking.
- + **78.7%** of the population has a public transport stop within 300 metres of their residence.

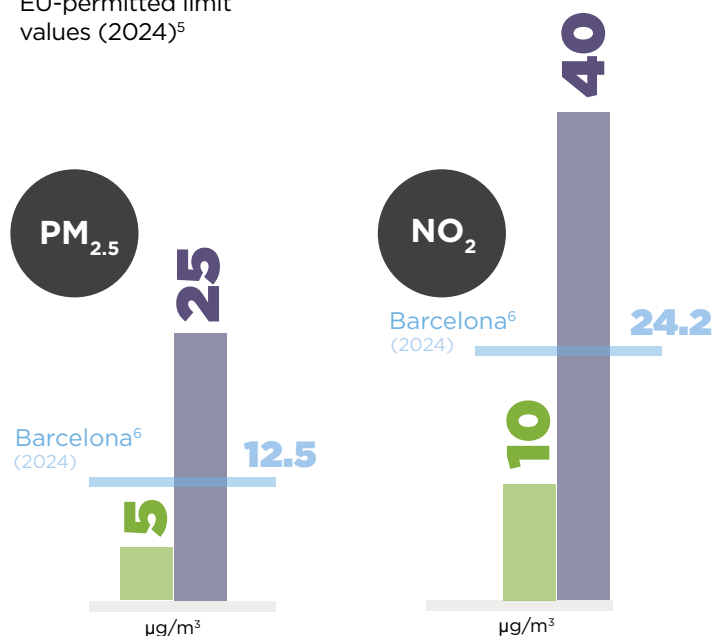


AIR QUALITY STANDARDS AND POLLUTANT LEVELS IN BARCELONA

WHO-recommended guideline levels (2021)⁴

EU-permitted limit values (2024)⁵

NO₂ and PM_{2.5} particles are two of the main air pollutants affecting human health.



The WHO guidelines are considered the gold standard for protecting human health.

KEY CHALLENGES

Despite these strengths, Barcelona still has room for improvement:

- + **Urban greenery:** only 15.4% of the population lives in areas with adequate levels of vegetation² and only 6% of the population meets the 3-30-300 green space rule.⁷ >>>
- + **Air quality:** levels of gases and particulate pollutants (NO₂, PM_{2.5}...) exceed the current recommendations of the World Health Organisation (WHO).²
- + **Sustainable mobility:** only 5.6% of the road network consists of cycling infrastructure.²
- + **Noise:** traffic noise levels exceed WHO recommendations.⁸
- + **Urban heat:** excess heat is linked to 112 premature deaths per year in Barcelona.⁹ The urban heat island effect and episodes of extreme heat due to climate change represent a growing challenge to health.^{10 11} >>>

THE 3-30-300 GREEN SPACE RULE:¹¹

The 3-30-300 green space rule proposes that everyone should be able to:

3



See at least **3 trees** from their residence.

30%

Live in neighbourhoods with at least **30% tree canopy cover**.

300m

Have a high-quality **green space within 300 metres** of their residence.



URBAN HEAT ISLAND:¹⁰



What is it?

Cities tend to accumulate more heat than natural environments because urban materials (such as asphalt and concrete) **absorb and retain solar radiation**. In addition, a dense urban layout, as in Barcelona, makes it harder for trapped heat to escape.

Health effects

This phenomenon, known as the **urban heat island effect**, leads to higher temperatures in neighbourhoods and increases people's exposure to extreme heat events, with impacts on health.

FROM ASSESSMENT TO ACTION

03.

HOW CAN WE IMPROVE HEALTH IN BARCELONA?

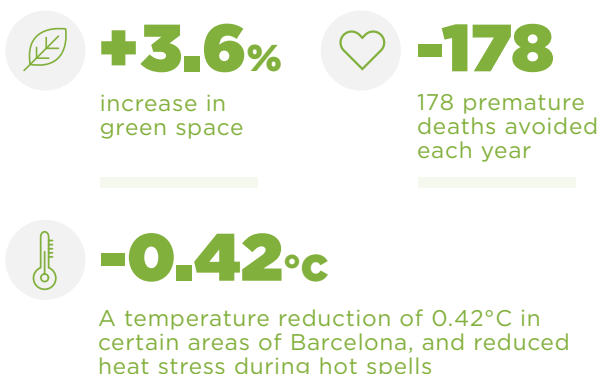
It is important to estimate the potential health benefits of different urban policies before they are implemented.

3.1

MORE NATURE, BETTER HEALTH

URBAN GREEN SPACES ARE ESSENTIAL INFRASTRUCTURE FOR PROTECTING HEALTH AND ADAPTING TO CLIMATE CHANGE.

A study of an urban plan for incorporating **green corridors**¹² showed that, if implemented across Barcelona, it could achieve the following results:¹³



Green corridors, combined with other climate measures, help create healthier neighbourhoods: they can significantly improve public health and well-being and also support good mental health.

Full implementation of this type of **green-corridor** plan could prevent the following each year:¹⁴

- + **31,353** cases of perceived poor mental health.
- + **16,800** visits to mental health specialists.
- + **45 million euros** in annual savings on mental health-related costs.

FINDINGS SHOW THAT GREENING STREETS IS ALSO AN INVESTMENT IN MENTAL HEALTH, QUALITY OF LIFE AND WELL-BEING FOR EVERYONE.

GREEN CORRIDORS:

Green corridors are **traffic-calmed streets** with greenery and spaces for people to gather and relax, making it comfortable and safe to get around on foot.

New squares emerge where these green corridors intersect: comfortable places to spend time, where vegetation and street furniture play a central role.

The Green Axes Plan¹² proposed a network of green corridors across the city so that residents would have a square or green corridor at **no more than 200 metres from their home**. This would significantly improve the provision of places to meet and enjoy public space in the central Eixample district, the area with the city's highest levels of air and noise pollution and the fewest green spaces.

GREEN SPACES IN BARCELONA



LOW-EMISSION ZONE (LEZ)¹⁵



Low-emission zones are urban areas where access by the most polluting vehicles is restricted in order to reduce traffic-related emissions.

These measures help improve air quality, reduce exposure to pollutants such as NO₂ and promote healthier, more sustainable mobility.

Barcelona has a Low-Emission Zone (ZBE Rondes de Barcelona), covering more than **95 km²**, where the circulation of the most polluting vehicles is progressively restricted to reduce air pollution and protect public health.



SUPERBLOCKS:¹⁶

Superblocks are an urban planning model that **reorganises mobility** within a network of streets to reduce through traffic and prioritise pedestrians, cycling and public spaces.

This transformation creates healthier, safer and more pleasant environments, with more space for community life, physical activity and urban greenery.

3.2

RETHINKING URBAN MOBILITY

Urban mobility is one of the main factors affecting air quality, noise pollution, social connections and public health. Reducing motorised traffic and committing to more sustainable transport brings fundamental benefits.

Various scenarios for urban transformation and mobility in Barcelona, including measures such as **green corridors**, **Superblocks**¹⁶, **Low-Emission Zones (LEZs)**¹⁵ and the **electrification of the Port**, show that:^{17, 18}

- + **Reducing private car use by 25% could lower** levels of air pollutants (NO₂) by 17.6%.
- + In addition, if the **Port of Barcelona were to be electrified**, levels would decrease by 19.4%.
- + **The scenario combining a reduction in private car use and the electrification of the Port** would prevent up to 228 premature deaths annually.



PROMOTING ACTIVE MOBILITY TO IMPROVE HEALTH

Active travel: building movement into everyday life.

Encouraging active travel, such as walking or cycling, incorporates physical activity into daily routines, reduces sedentary behaviour and helps prevent cardiovascular disease and other health problems.



LESS TRAFFIC:

Reducing motor traffic encourages active modes of travel.



SAFE AND ACCESSIBLE SPACES:

A city that makes walking and cycling easy, with safe and accessible spaces, promotes healthier and more equitable habits for everyone.



PHYSICAL ACTIVITY RECOMMENDATIONS:¹⁹

The WHO recommends that adults engage in between 150 and 300 minutes of aerobic physical activity per week, combined with muscle-strengthening exercises at least two days a week.¹

»»» **DESIGNING CITIES FOR ACTIVE MOBILITY IS ONE OF THE MOST EFFICIENT AND EFFECTIVE WAYS TO HELP PEOPLE ACHIEVE THESE GOALS.**

3.3

LESS NOISE, GREATER WELL-BEING

Environmental noise is one of the main health risk factors in cities. Continued exposure to traffic noise is associated with sleep disorders, stress, cardiovascular disease and a poorer quality of life.²⁰

- + **More than 85%** of noise exposure comes from road traffic.²⁰
- + **83.4%** of the population is exposed to traffic noise levels above WHO recommendations.¹
- + Meeting international recommendations could prevent up to **599 premature deaths** a year in Barcelona associated with traffic noise.²¹

Traffic-reduction policies and the creation of noise-protection areas can significantly reduce urban noise.²²



BARCELONA STRATEGIC NOISE MAP:²³

Barcelona City Council's Strategic Noise Map allows users to view and analyse environmental noise levels across the city by source (road traffic, railways, industry and leisure activities) and time of day.



VISIT THE BARCELONA CITY COUNCIL'S
STRATEGIC NOISE MAP²³

PROJECTIONS AND ADAPTATIONS

3.4

ADAPTING THE CITY TO URBAN HEAT

URBAN HEAT IS ONE OF THE MAIN RISKS ASSOCIATED WITH CLIMATE CHANGE IN CITIES.

High temperatures increase heat stress — the body's response to excessive heat — and are associated with a higher risk of death.

Cities accumulate and generate more heat than natural environments: this is known as the urban heat island effect.

Its impact is not evenly distributed: neighbourhoods with less vegetation, denser buildings and greater social vulnerability tend to experience higher heat exposure.

Urban greening, increasing shade and planning cooler spaces are key tools. For example:

- + **Creating a dense, accessible network of climate shelters** to provide cool spaces during heatwaves.
- + **Identifying urban routes with lower heat exposure** to help people plan everyday journeys.
- + **Increasing tree canopy cover to 30%** to prevent approximately one-third of heat-related deaths.²⁶



HEAT INDEX:²⁴

The temperature we feel depends on the combination of air temperature and humidity.

The heat index helps estimate the heat stress to which people are exposed and identify situations that pose a greater risk to health.



COOL ROUTES FINDER:²⁷

The Cool Routes Finder, developed by Barcelona Regional and the Barcelona Metropolitan Area (AMB), is an interactive tool that helps people plan walking journeys that minimise exposure to heat by identifying the coolest, most walkable routes between two points or locating the nearest climate shelter.¹¹



VISIT ISGLOBAL'S HEAT INDEX²⁵ CALCULATOR

HOW DO WE CALCULATE IT?

The data on the impacts of heat relate to periods before 2026.

In the current context of climate change and rising temperatures, heat exposure and its health impacts are expected to increase.

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CONCLUSIONS



Designing cities also means designing health.

The health of city residents depends on more than the healthcare system. It also depends on **how we plan streets, green spaces, mobility and environmental quality**. Measuring the factors that affect health, identifying priorities and assessing the impact of policies enables us to **move towards healthier, more resilient and more equitable cities**.

Scientific evidence from urban health research shows that **investing in more green spaces, sustainable mobility and better environmental quality can prevent hundreds of premature deaths** and improve people's mental health and quality of life.

This investment also generates **substantial savings for the health and social care system**.

Measuring, identifying priorities and assessing the impact of urban policies is the first step towards building healthier cities.

DESIGNING CITIES ALSO MEANS SHAPING PEOPLE'S HEALTH AND WELL-BEING.

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