Measuring what matters:

A practical framework to integrate health into urban climate action

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Contents

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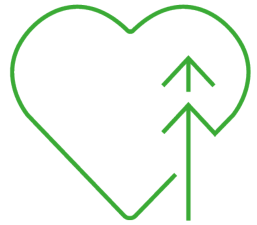
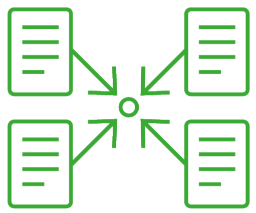
Key insights

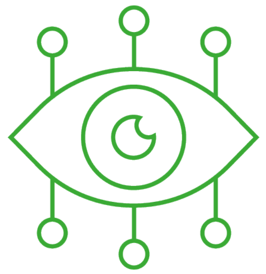
Cities need practical monitoring systems that prioritise meaningful indicators without increasing reporting burden.



Health co-benefits indicators help demonstrate the benefits of climate mitigation and adaptation while supporting better decisions.



A practical framework helps cities to select indicators that are scientifically robust, feasible, and locally relevant.



Monitoring health co-benefits strengthens accountability, policy legitimacy, and public support for climate action.

Why this matters: The role of monitoring in climate action

Monitoring is essential for effective and accountable climate action in cities. It enables local governments to track progress, inform decision-making, assess whether interventions are delivering intended outcomes, and communicate results to policymakers, interest-holders, and citizens. In this context, we define "interest-holders" as groups with legitimate interests in the climate-health issue under consideration[1].

Integrating health or health-related indicators into climate monitoring systems helps make visible the co-benefits of climate actions. As cities increasingly pursue integrated climate strategies, health indicators can provide a common evidence base for monitoring the outcomes of both mitigation and adaptation actions, helping identify synergies and avoid unintended trade-offs. By capturing both health outcomes and the pathways linking climate action to health, these indicators can strengthen the evidence base for climate policies, support public and political engagement, and help prioritise interventions that deliver the greatest societal value.

However, cities face significant challenges in implementing effective climate and health monitoring. Local authorities are confronted with a growing number of indicators and reporting requirements across multiple frameworks, many of which lack clear guidance on data sources, methodologies, and collection processes. Existing monitoring systems are often fragmented, difficult to operationalise, and insufficiently tailored to local decision-making needs. As a result, cities may struggle to select relevant indicators, generate robust evidence, and demonstrate progress in a consistent and credible way.

To address these challenges, the Pan-European Commission on Climate and Health, a body created by the Director of the WHO European Regional Office to provide independent advice on climate health policies, recommends that cities and regions systematically monitor and evaluate climate and health interventions in collaboration with relevant interest-holders[2].

This policy brief responds to that need by presenting a practical framework to help cities select, implement, and use health-related indicators to support urban climate action.

The citiES 2030 case

One of the priorities of the Pathfinder Initiative[3,4] was to strengthen the evidence base linking climate action and health outcomes in cities. However, as highlighted in the previous section, many local authorities face significant challenges in monitoring and evaluating these impacts, including fragmented indicator systems, limited methodological guidance, and constraints in data availability and capacity.

To address these challenges, the Pathfinder Initiative partnered with cities participating in the EU Mission for Climate-Neutral and Smart Cities[5] through the citiES 2030 platform[6]. As cities committed to ambitious climate action and climate neutrality goals, they provide a valuable testing ground for developing and refining practical approaches to monitor the health co-benefits of urban climate policies.

The citiES 2030 platform is Spain's national platform supporting the EU Mission for Climate-Neutral and Smart Cities, bringing together 19 cities alongside universities, public institutions, private organisations, and civil society partners in a collaborative governance model. It provided an ideal environment for this work by bringing together cities, researchers, policymakers, and other interest-holders within a mission-oriented governance model centred on experimentation, collaboration, and continuous learning. Building on this ecosystem, the Pathfinder Initiative adopted a co-creation approach to ensure that the resulting framework reflected cities' real needs, capacities, and decision-making contexts[7].

Through workshops, interest-holder dialogues, and iterative exchanges with participating cities which took place from January 2025 to July 2026, the Pathfinder Initiative sought to identify a set of health-related indicators that are not only scientifically robust, but also useful, feasible, and relevant for local implementation. Rather than increasing reporting burden, the process aimed to explore how existing metrics could be better aligned and harmonised, opening pathways towards greater comparability and improved usability for cities. This collaborative process helped maximize the usability of the framework while strengthening ownership and increasing its potential uptake in practice.

Although the work presented in this policy brief focuses on health co-benefits of climate mitigation actions, reflecting the scope of the Pathfinder Initiative and the EU Mission for Climate-Neutral and Smart Cities, mitigation and adaptation should be considered together wherever possible. The methodological approach presented here can therefore support integrated climate strategies that combine both when appropriate. For brevity, we use "climate action" as an umbrella term throughout the policy brief, encompassing both mitigation and adaptation, while referring specifically to mitigation where this reflects the scope of the Pathfinder Initiative and the EU Mission.

Co-benefits indicator selection: Key steps

Indicator mapping

The selection of indicators was guided by a clear understanding of the pathways linking climate mitigation actions to health outcomes. It drew on robust scientific evidence, while also considering data availability at the urban scale, and the ability of indicators to support decision-making and effective communication with policymakers and citizens.

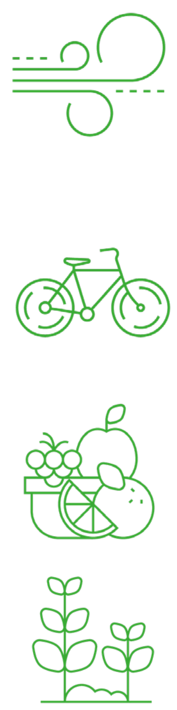
To operationalise these principles, a comprehensive mapping of health-related co-benefit indicators relevant to climate mitigation actions was conducted. Indicators were identified from the NetZeroCities[8] indicator framework, peer-reviewed scientific literature, and three key international reports (Sustainable Development Report 2024[9]; 2019 SDG Index and Dashboards Report for European Cities[10]; and WHO Europe's progress reports on the SDGs and the Ostrava Declaration[11]), as well as from three European databases (the European Environment Agency[12], Eurobarometer[13], and Eurostat[14]).

Following the main health pathways described by Whitmee et al. (2024)[3], indicators were assessed across four priority domains: air pollution, active travel, healthy and sustainable diets, and nature-based solutions.

A traffic-light classification system was developed to evaluate indicators according to four evidence-based criteria: support from existing literature, data availability, methodological maturity, and alignment with citiES 2030 practices. Indicators were classified as red (limited methodological and data readiness), yellow (established methods but limited data availability), green (established methods and available data), or blue (indicators already adopted within citiES 2030).

This process resulted in a shortlist of 15 indicators (Figure 1, for further information see Annex – Table A), prioritising those with the highest levels of feasibility and readiness for implementation, while also retaining a small number of strategically important indicators with strong potential for future development.

Figure 1. List of 15 indicators classified by the four priority domains and the results from the indicator mapping



- PM2.5 concentration levels
- NO2 concentration levels
- Land surface for roads and parking
- Number of traffic calming and speed reduction features

- Modal share of green transport modes and public transport
- 15 minute city
- Public Transport Satisfaction
- Safety perception of walking
- Population exposed to average day-evening-night noise levels (Lden) ≥ 55 dB

- Local food production
- Human Trophic Level

- 3-30-300 rule
- Quality of public spaces
- Structural connectivity of green spaces
- Urban Heat Island (UHI) Effect

Legend

Domains:

Air pollution | Active travel | Healthy and sustainable diets | Nature-based solutions*

Traffic light classification:

- There is literature, methods agreed, data available, it has been agreed to be used by citiES 2030 (as of 11/07/2025)
- There is literature, methods agreed, data available
- There is literature, methods agreed, no data available
- There is literature, no methods agreed, no data available

*Nature-based solutions are technically considered an intervention (a climate change mitigation action), not a pathway for action, but we are including this concept as part of our selection criteria due to its high potential to be used as a group of indicators with a clear relationship to health outcomes.

Arc de Triomf, Barcelona
(Image credit: J Shim on Unsplash)

Understanding the context: scoping calls with Barcelona, Viladecans, and Zaragoza

To ensure that the proposed indicators list responded to real-world needs and constraints, the Pathfinder Initiative conducted scoping calls with three citiES 2030 frontrunner cities: Barcelona, Zaragoza, and Viladecans. These cities were selected because of their strong commitment to climate action and their interest in using health co-benefit indicators to strengthen the design, implementation, and communication of urban climate policies (Table 1).

A consistent finding across all cities was that health provides a powerful rationale for climate action. Health impacts are tangible, directly relevant to citizens' daily lives, and often less politically contested than climate change itself. Several participants emphasised that these immediate and visible health co-benefits often provide a more compelling rationale for local climate action than the longer-term climate benefits of mitigation alone.

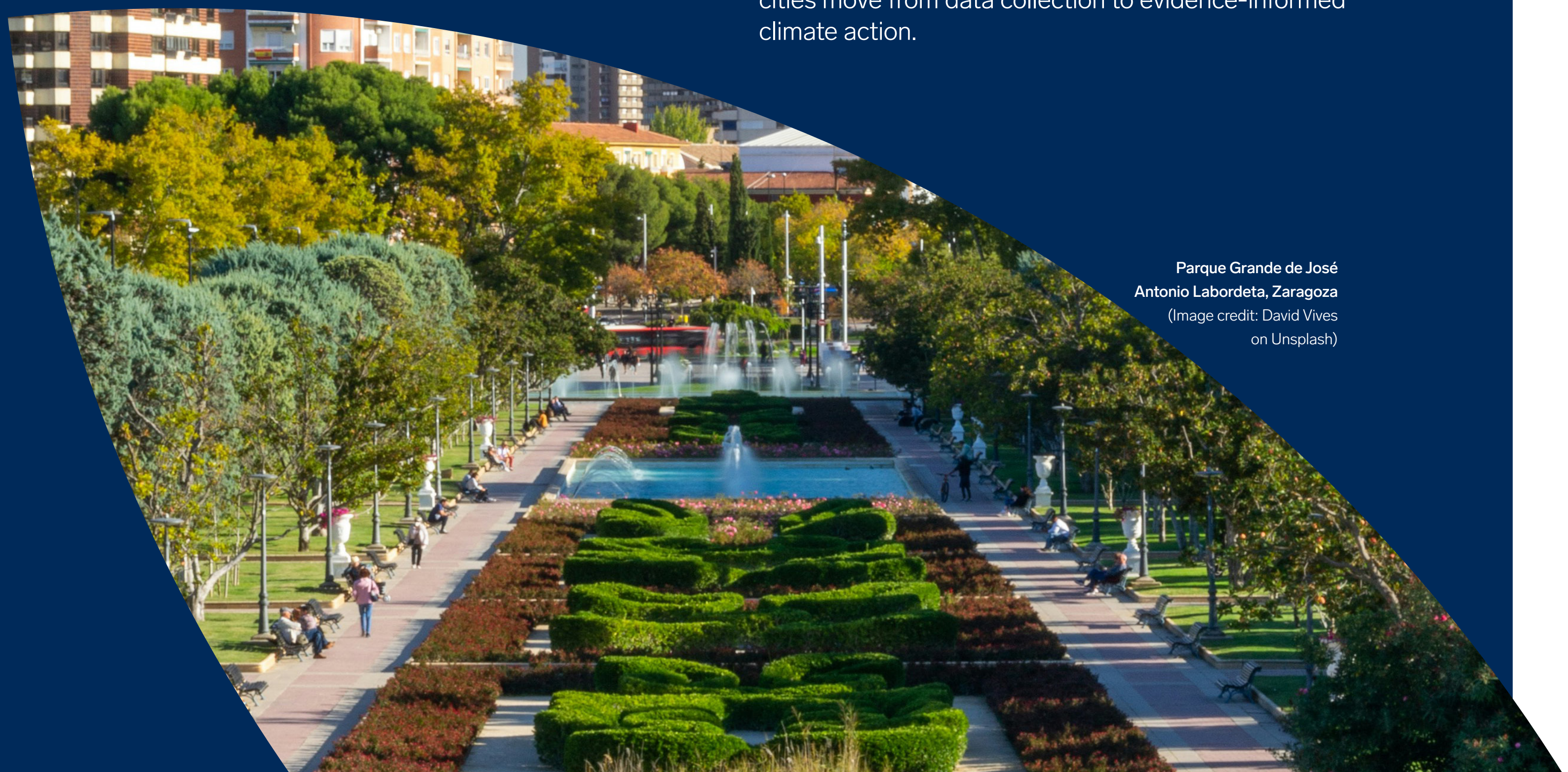
As one participant noted:

> "The cost of the transition can only be 'paid for' and justified through the co-benefits."

The discussions also revealed that the main challenge is not the lack of data, but the difficulty of transforming available data into meaningful information for decision-making. Cities consistently called for a small set of indicators that are comparable, locally relevant, easy to interpret, and explicitly linked to policy priorities. Rather than extensive indicator dashboards, there was strong interest in a limited number of so-called "tractor indicators" - key indicators that can drive or pull broader monitoring efforts by providing clear strategic direction, supporting communication, and signalling progress towards policy objectives.

Cities highlighted the importance of territorialised data, transparent methodologies, and standardised approaches that enable comparison and learning across cities while remaining adaptable to local contexts. They also emphasised the need to distinguish monitoring from evaluation and impact assessment: monitoring can track trends and progress, but demonstrating policy impacts requires complementary attribution and contribution analyses.

Finally, the discussions identified several barriers to effective climate and health monitoring, including limited staff capacity, fragmented governance structures, difficulties in integrating datasets, delays in accessing health data, and the proliferation of indicators across plans and reporting frameworks. These findings reinforced the need for a practical, feasible, and decision-oriented framework that helps cities move from data collection to evidence-informed climate action.



Parque Grande de José Antonio Labordeta, Zaragoza (Image credit: David Vives on Unsplash)

Table 1. citiES 2030 frontrunner cities

City	Urban context	Priorities & motivation	Main reasons for success
Barcelona	Barcelona is the second largest city in Spain with approximately 1.7 million inhabitants. The city operates in a compact and dense urban context with significant environmental pressures, including air pollution and heat exposure. The city combines a strong climate policy agenda with extensive data infrastructure and analytical capacity developed through its Climate Plan and collaborations with organisations such as the Public Health Agency of Barcelona, Barcelona Regional, the Barcelona Supercomputing Center, and ISGlobal.	The city considers co-benefit indicators a strategic tool for demonstrating the value of climate action, particularly through its impacts on health and equity. City representatives highlighted that co-benefits help justify climate policies, strengthen political and public support, attract funding, and prioritise interventions with the greatest societal returns.	Barcelona's success in using co-benefit indicators stems from its strong culture of evidence-based policymaking and long-standing collaboration between municipal departments, researchers, and public health experts. Co-creation processes have helped identify indicators that are both scientifically robust and relevant for decision-making and communication. The city particularly values indicators that translate climate and health impacts into tangible outcomes that resonate with citizens and policymakers, making climate action more visible, compelling, and actionable.
Zaragoza	Zaragoza has more than 700,000 inhabitants and faces challenges related to urban sprawl, mobility, and climate adaptation. The city is advancing its climate transition through initiatives on energy poverty, urban health, sustainable mobility, and green infrastructure, while updating its city indicator system and emissions inventory.	The city sees co-benefit indicators as a way to connect climate action with citizens' everyday lives, particularly through health outcomes and quality of life. City representatives emphasised that health provides a powerful and politically neutral rationale for climate action, helping communicate the direct benefits of mitigation and adaptation measures while supporting their implementation. Co-benefit indicators are also valued as tools for prioritising investments, tracking progress, and informing future strategies.	A key success factor in Zaragoza has been its commitment to using data to support urban decision-making, combined with a strong interest in developing a small set of meaningful, easy-to-interpret indicators. The city highlighted the importance of indicators that are locally relevant, spatially detailed, and capable of integrating different dimensions of urban sustainability. Co-creation and collaboration with universities, European projects, and other interest-holders have helped strengthen this work, while also highlighting the need for more harmonised methodologies and comparable indicators across cities. Zaragoza's experience suggests that simple, actionable indicators can help cities move from monitoring to strategic management, enabling more targeted and effective climate action.
Viladecans	Viladecans is a medium-sized, compact city of around 67,000 inhabitants that has positioned sustainability and quality of life at the centre of its urban development strategy. The city has a long-term strategic framework (Viladecans 2030–2040 Strategy) structured around two priority missions: carbon neutrality and zero early school leaving. Within the Climate Mission, Viladecans has developed its Climate City Contract as a roadmap for climate action and introduced monitoring indicators and measures such as a municipality-wide Low Emission Zone.	For Viladecans, co-benefit indicators are valuable because they help demonstrate the links between climate action, health, wellbeing, and urban attractiveness. City representatives emphasised that measuring co-benefits is essential not only to improve policies, but also to justify and defend climate measures in a context where actions such as low-emission zones can face public resistance. Indicators are therefore seen as important tools for communication, planning, prioritisation, and demonstrating the economic and social returns of climate investments.	A key factor behind Viladecans' success has been its strong culture of strategic planning and performance monitoring, supported by several established indicator frameworks. The city values co-creation and cross-departmental collaboration as mechanisms for integrating climate objectives into broader urban development goals. It also places particular importance on indicators that are comparable across cities and capable of linking environmental improvements to tangible health and quality-of-life outcomes. While technical capacity for data analysis remains a challenge, Viladecans' experience shows how a clear long-term vision, political commitment, and a focus on evidence-based decision-making can support the integration of co-benefit indicators into local climate governance.

Indicator validation and prioritisation

Building on the indicator mapping and the scoping calls with frontrunner cities, the Pathfinder Initiative organised two participatory workshops to validate and prioritise the proposed indicators. The workshops formed part of the broader evidence-informed co-creation process described in the companion policy brief 'Leveraging Co-Creation for City-Level Climate Action and Health Co-Benefits: Policy Lessons from citiES 2030'. The workshops brought together city representatives, researchers, and practitioners to assess the usefulness, feasibility, and policy relevance of the proposed indicators for local climate governance.

Participants consistently highlighted the need to move beyond comprehensive indicator inventories towards a more focused set of metrics capable of supporting decision-making, communication, and accountability. Scientific relevance alone was not considered sufficient; indicators also needed to be feasible to implement, based on available data, and meaningful for local policymakers and citizens.

As a result, the indicators were grouped based on the discussions held during the workshops, into three main categories. The classification was guided by agreed criteria discussed with cities, including feasibility, data availability, methodological maturity, and policy relevance:

1. **Ready-to-use (feasibility)**
   Indicators that are already feasible to calculate and implement using available methods and data sources.

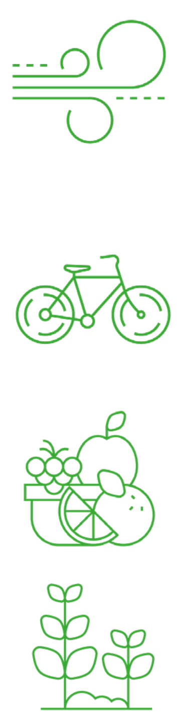
2. **Requiring common methodologies (standardisation)**
   Indicators considered highly relevant but requiring further standardisation, methodological guidance, or harmonisation across cities.

3. **To be reconsidered (simplification)**
   Indicators perceived as difficult to operationalise, insufficiently actionable, or of limited value for monitoring climate mitigation action outcomes.

In addition, cities agreed to incorporate four of these indicators into the latest iteration of their Climate City Contracts[15]. The different categories are represented in Figure 2.

The workshops also highlighted the importance of transparency in indicator selection, clear methodological guidance, and a balance between comparability across cities and local adaptability. Overall, the co-creation process helped ensure that the framework was not only scientifically robust but also practical, usable, and responsive to the realities of city administrations.

Figure 2. The original list of 15 indicators classified by the four priority domains and the results from co-creation workshops



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- Structural connectivity of green spaces
- Urban Heat Island (UHI) Effect

Legend

Domains:

Air pollution | Active travel | Healthy and sustainable diets | Nature-based solutions*

Traffic light classification:

- Ready to use & included in citiES 2030 Climate City Contracts
- Ready to use
- Requiring common methodologies
- Reconsideration or exclusion

*Nature-based solutions are technically considered an intervention (a climate change mitigation action), not a pathway for action, but we are including this concept as part of our selection criteria due to its high potential to be used as a group of indicators with a clear relationship to health outcomes.

A practical framework to integrate health into urban climate action

Building on the indicator mapping and insights gathered through the scoping calls and workshops, the Pathfinder Initiative developed a practical framework to support the integration of health into urban climate action. The framework incorporates cities' feedback on the relevance, feasibility, and usability of indicators, while remaining flexible and scalable to accommodate different levels of data availability and technical capacity.

Rather than offering a fixed indicator set, it provides a structured, iterative pathway to integrate health into urban climate action by:
(i) identifying relevant climate action areas;
(ii) selecting health-related indicators based on their methodological maturity and implementation feasibility, and;
(iii) using monitoring results to inform decision-making and communicate co-benefits.

The framework synthesises the lessons emerging from the indicator mapping, scoping calls, and workshops into a practical five-step process that cities can adapt to their own contexts (Figure 3).

Embedding health into urban climate monitoring and decision-making leads to more relevant, credible, and effective climate action - delivering measurable co-benefits for people and places.

Figure 3. A practical framework to integrate health into urban climate action

1 Identify the climate action or policy domain

Cities define the main domain where health integration is applied, ensuring alignment with existing policy priorities.

Build on the priority domains identified in the Lancet Pathfinder Commission Report[3], including:

Air pollution | Active travel | Healthy and sustainable diets | Nature-based solutions

2 Build on existing indicators and select them according to maturity

Review existing monitoring frameworks and indicator sets relevant to the selected domain, avoiding duplication and building on established indicators.

Select indicators according to their readiness and usability:

- **Core indicators:** widely available, comparable, and ready to use.
- **Development indicators:** relevant but requiring further methodological standardisation to make them comparable across cities or improved data systems.
- **Contextual indicators:** locally defined indicators reflecting specific urban priorities or vulnerabilities.

This tiered approach enables cities to start with feasible metrics while progressively strengthening their monitoring systems.

3 Monitor progress

Cities monitor selected indicators over time to assess changes associated with climate actions, combining environmental, behavioural, equity and health data where possible.

4 Evaluate progress and outcomes

Interpret monitoring results alongside information on implemented interventions to assess whether observed changes are consistent with expected health co-benefits and to identify potential trade-offs.

Where appropriate, cities should complement monitoring with attribution or contribution analyses to better understand policy impacts.

5 Communicate co-benefits

Translate findings into actionable insights for policy design, reporting, and communication, strengthening accountability and highlighting the health benefits of climate action.

Iterative process

Learning from monitoring and evaluation informs refinements to indicators, interventions, and policies.

From monitoring to action: health co-benefits as a driver of urban climate policy

Monitoring is essential for accountable and effective urban climate action, but its value lies in what cities do with it. When health is integrated into climate indicators, monitoring systems make visible the wider benefits of action - cleaner air, more active travel, reduced heat exposure, and improved wellbeing.

The experience presented in this policy brief shows that health co-benefit indicators can become more than monitoring tools. When embedded within planning and evaluation processes, they help cities prioritise actions that deliver multiple benefits, strengthening both the evidence base and the political relevance of climate policies. This reflects the Health in All Policies (HiAP) principle[16], which calls for health to be systematically integrated across policy sectors rather than treated as an additional consideration.

Realising this shift requires monitoring systems that are both comparable and adaptable. Standardisation enables learning across cities, while flexibility ensures relevance to local contexts and data realities. Strengthening data integration is key to making health impacts visible and usable.

Beyond technical value, health framing also strengthens communication and legitimacy of climate action. Making co-benefits visible helps translate climate policy into outcomes that citizens can understand and support, reinforcing public engagement and accountability. In this sense, health is not only an outcome of climate action but also a strategic entry point for designing, communicating, and sustaining ambitious urban climate policies.

Barcelona, Spain
(Image credit: Marc Wieland on Unsplash)

Operational implications and key messages

Embedding health into urban climate monitoring requires coordinated action by city administrations, policymakers and relevant institutions, and researchers.

The Pathfinder Initiative experience, developed in collaboration with citiES 2030, demonstrates both the demand for and the feasibility of integrating health into urban climate monitoring. By providing a practical and co-created approach, it helps cities turn health co-benefits into actionable knowledge, strengthening the relevance, legitimacy, and effectiveness of climate action.

Cities can embed health indicators into climate monitoring and planning and invest in the capacity to use and integrate environmental and health data, including anonymised datasets where governance frameworks allow.

Policymakers and relevant institutions should ensure health is explicitly included in climate policy monitoring and evaluation, support harmonised indicator frameworks, and enable interoperable data systems that allow meaningful comparison and learning.

Researchers should co-develop practical tools with cities, strengthen evaluative evidence on climate-health impacts, and advance methods that link environmental exposures with health outcomes under robust ethical standards.

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Pathfinder Initiative

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Annex

Table A. Description of the 15 proposed and discussed indicators

Domains	Name	Unit	Target	Definition	Calculation	Literature Sources	Data Source
Air Pollution	PM2.5 concentration levels	µg/ m3	↓ (EU limit: 25 µg/ m3; WHO limit: 5 µg/ m3)	This indicator corresponds to the highest annual mean of PM2.5 concentration recorded in a particular year at stations in urban and suburban background locations.	This indicator corresponds to the highest annual mean of PM2.5 concentration recorded in a particular year at stations in urban and suburban background locations. Data can be obtained: 1) From air quality monitoring reports in different stations on a municipal or regional level and 2) Based on measurements made in urban and suburban background locations established for this purpose. When a city is not able to report this value due to the non-existence of monitoring stations within city boundaries, they may report PM2.5 values from the closest regional/national station where concentration values are available.	NetZeroCities Indicator (Recommended). European Commission (2022), Green City Accord, Clean and Healthy Cities for Europe, GCA Mandatory Indicators Guidebook, Version of 29 April 2022	EEA, Interpolated air quality data
Air Pollution	NO2 concentration levels	µg/ m3	↓ (EU limit: 40 µg/ m3; WHO limit: 10 µg/ m3)	This indicator corresponds to the highest value of the annual mean of nitrogen dioxide (NO2) concentrations recorded in a particular year at stations with the highest traffic locations.	This indicator corresponds to the highest value of the annual mean of nitrogen dioxide (NO2) concentrations recorded in a particular year at stations with the highest traffic locations. Data can be obtained: - From air quality monitoring reports in different stations on a municipal and regional level; and - Based on measurements made in urban and suburban background locations established for this purpose.	NetZeroCities Indicator (Recommended). European Commission (2022), Green City Accord, Clean and Healthy Cities for Europe, GCA Mandatory Indicators Guidebook, Version of 29 April 2022	The European Nitrogen Assessment
Air Pollution	Land surface for roads and parking	%	≤ 25 % of total	Space for circulating and parked private motorized transport is minimized.	To calculate the land surface for roads and parking, determine the area of each standard component and multiply by the quantity needed, including a buffer for access lanes, landscaping, and traffic flow. For rectangular areas, simply multiply length by width. For irregular areas or for complex projects, use GIS software to measure and tabulate pervious and impervious surfaces like roads and parking lots within designated zones.	Mueller 2021; Barcelona Urban Ecology Agency, 2018; Dávalos et al. 2016	NA

Domains	Name	Unit	Target	Definition	Calculation	Literature Sources	Data Source
Air Pollution	Number of traffic calming and speed reduction features	n	↑	Traffic calming and speed reductions features are incorporated	To "calculate" the number of traffic calming features, you don't perform a mathematical calculation, but rather a quantitative count and analysis of existing features and the need for new ones. This involves counting every existing feature (speed humps, chicanes, etc.) within a specified area, such as a street or neighbourhood, and assessing the street's conditions to determine how many more features are needed to achieve the desired speed reduction and safety goals. The process depends on specific objectives, such as achieving a certain speed limit or improving pedestrian safety.	Mueller 2021; Cairns et al. 2015; Winters et al., 2012	NA
Active Travel	Modal share of green transport modes and public transport	% of the average total number of trips per inhabitant and day done by active travel modes.	↑	The indicator can be defined as the average number of trips per day that an inhabitant of the city does walking, biking or going by public transport, expressed as a percentage of the average total number of trips per inhabitant and day.	[MS]_green = (T_w+T_b+ T_train+ T_bus+ T_tram)/T_total x 100 Where: T_w=Walking trips per capita and day T_b=Bike trips per capita and day T_train=Train trips per capita and day T_bus=Bus trips per capita and day T_tram=Tram trips per capita and day T_total=Total trips per capita and day	NetZeroCities Indicator (Recommended). N/A	Eurobarometer
Active Travel	15 minute city	%	↑	The percentage of the population in urban areas living within 15-minute walking distance from a point of interest (i.e. hospitals, schools, supermarkets, restaurants, etc.) Distance is established through pedestrian street network data and the percentage of population in the radius is estimated using gridded population density.	To calculate the urban population with access to points of interest (POIs) within a 15-minute walk, you'll need geospatial data and a GIS (Geographic Information System). First, divide the urban area into a grid and map the population distribution. Next, define essential POI categories and create 15-minute walking "catchment areas" or isochrones from each POI. Finally, count the population within the POI-specific catchment areas and sum these percentages to get a comprehensive measure of 15-minute city accessibility. percentage of people with access to a certain number of these amenities, depending on the specific metric you are using.	Pozoukidou, G.; Chatziyiannaki, Z. 15-Minute City: Decomposing the New Urban Planning Eutopia. Sustainability 2021, 13, 928. https://doi.org/10.3390/su13020928	SDSN (2023), based on Nicoletti, L., Sirenko, M., & Verma, T. (2023)

Domains	Name	Unit	Target	Definition	Calculation	Literature Sources	Data Source
Active Travel	Public Transport Satisfaction	%	↑	Satisfaction with public transport service quality attributes (reliability/ functionality, information, courtesy/simplicity, comfort, safety) relate to overall travel satisfaction, and that satisfaction with daily travel relate to the overall quality of life.	To calculate public transport satisfaction (%) for Eurostat, you need to find data from a survey, such as the "European Quality of Life Survey," which asks people to rate their satisfaction with public transport on a scale (e.g., 0-10). The percentage is then typically the proportion of respondents who expressed a certain level of satisfaction (e.g., "satisfied" or "very satisfied") out of the total number of respondents. Example: If a survey found that 1,000 people responded, and 700 of them rated their satisfaction with public transport as "satisfied" or "very satisfied," the calculation would be: (700 / 1,000) * 100 = 70% satisfaction.	Sukhov 2021: https://doi.org/10.1016/j.trd.2021.102732	Eurostat
Active Travel	Safety perception of walking	%	↑	Proportion of population that feel safe walking alone around the area they live after dark	This indicator needs to be based on data collected through sample surveys of the adult population, either through a dedicated survey such as Crime Victimization Surveys (CVS), or through the integration of a question on perception of safety in suitable household surveys conducted in the country. Example: If 1,000 people responded to a survey and 700 rated how safe they felt walking alone in their neighbourhood after dark as "Very safe" or "Safe", the calculation would be: (700 / 1,000) × 100 = 70%	Roman 2024: https://doi.org/10.1016/j.healthplace.2024.103316	UNODC - United Nations Office on Drugs and Crime
Active Travel	Population exposed to average day-evening-night noise levels (Lden) ≥ 55 dB	%	↓	The indicator 'Population exposed to average day-evening-night noise levels (Lden) ≥ 55 dB' represents the average noise level to which a citizen is exposed throughout the day, evening, and night over the period of one year.	Lden= 10log10 1/24 (12 × 10Lday/10 + 4 × 10Levening+5/10+ + 8 × 10 Lnight+10/10) In which Lday, Lnight and Levening are the A-weighted long-term Averages. Simulated LDEN (numerical predictions): NMPB2008 or CNOSSOS-EU (see reference pdf document from UN/Ifsttar/LAE/BG). Measurement unit: Decibels with A ponderation: "dB(A)"	NetZeroCities Indicator (Recommended). Green City Accord; European Commission (2021c), Evaluating the Impact of Nature-based Solutions: Appendix of Methods.	EEA
Healthy and Sustainable Diets	Local food production	%	↑	Share of food consumption produced within a radius of 100 km	(Food produced in 100 km radius (tons) / Total food demand within city (tons)) * 100	NetZeroCities Indicator (Recommended). Bosch, P., Jongeneel, S., Rovers, V., Neumann, H.-M., Airaksinen, M., & Huovila, A. et al. (2017) CITYkeys list of city indicators.	NA

Domains	Name	Unit	Target	Definition	Calculation	Literature Sources	Data Source
Healthy and Sustainable Diets	Human Trophic Level	numerical value (best 2-3 worst)	↓	Trophic levels are a measure of the energy intensity of diet composition and reflect the relative amounts of plants as opposed to animals eaten in each country. A higher trophic level represents a greater level of consumption of energy-intensive animals.	To calculate the Human Trophic Level (HTL), you take a weighted average of the trophic levels of all the foods in the human diet, where the weight is the proportion of that food in the diet. This process involves assigning a trophic level to each food item (producers are level 1, herbivores are level 2, etc.) and then calculating a single, average value that reflects the human population's position in the global food web. Example Calculation (Simplified) Imagine a simplified diet consisting of: Grain: (Plant/Producer): Trophic Level 1 Chicken: (Eats grain): Trophic Level 3 Fish: (Eats smaller fish): Trophic Level 4 If the diet was 50% grain, 30% chicken, and 20% fish: HTL = (1.00 * 0.50) + (3.00 * 0.30) + (4.00 * 0.20), HTL = 0.50 + 0.90 + 0.80, and HTL = 2.20.	Bonhommeau et al. (2013) data updated to 2017	Bonhommeau et al. (2013) data updated to 2017
Nature-based Solutions	3-30-300 rule	combined index	3-30-300 rule	The "3-30-300 rule" is a guideline for urban planning that aims to ensure equitable access to green spaces for all residents, promoting physical and mental health benefits. It suggests that people should be able to see three trees from their dwelling, have 30% tree canopy cover in their neighbourhood, and live within 300 meters of a high-quality green space.	To calculate the 3-30-300 rule, use Geographic Information Systems (GIS) and data to assess if individuals meet the criteria: having 3 mature trees visible from their location, 30% tree canopy cover in their neighbourhood, and living within 300 meters of a public green space. The calculation involves applying buffers and analysing tree canopy data and street networks to determine compliance for buildings, neighbourhoods, and accessibility to parks.	Konijnendijk, C.C. Evidence-based guidelines for greener, healthier, more resilient neighbourhoods: Introducing the 3–30–300 rule. J. For. Res. 34, 821–830 (2023). https://doi.org/10.1007/s11676-022-01523-z	NA

Domains	Name	Unit	Target	Definition	Calculation	Literature Sources	Data Source
Nature-based Solutions	Quality of public spaces	# (rating from 0 to 10 of overall satisfaction with green and non-green public spaces)	↑	This indicator corresponds to residents' self-reported satisfaction with public spaces in their city. This indicator has been designed to analyse results from the European Commission's Urban Audit, a perception survey on quality of life in European cities which is being conducted by Eurostat based on telephone interviews on a regular basis. The parameter is an averaged score of survey responses about a respondent's satisfaction with green and non-green public spaces.	$\overline{SAT} = \frac{\sum_m \overline{ASPECT}_m}{m}$ $m\ being\ the\ number\ of\ aspects\ (dimensions)$ $\overline{ASPECT}_m = \sum_h \overline{AGREE}_{h,m}$ $h\ being\ the\ four\ replies\ of\ the\ agreement\ scale:$ $(strongly\ agree, somewhat\ agree, somewhat\ disagree, strongly\ disagree)$ $\overline{AGREE}_{h,m} = \frac{\#times\ agreement\ h\ was\ used\ in\ sample\ for\ aspect\ m}{\#people\ sample\ of\ aspect\ m - \#\frac{DK}{NA}\ answers\ in\ sample\ m} x C_h$ $C_{h=strongly\ agree} = 10;\ C_{h=somewhat\ agree} = 6.66;$ $C_{h=somewhat\ disagree} = 3.33; C_{h=strongly\ disagree} = 0$	NetZeroCities Indicator (Recommended). Rupprecht Consult et al (2020) Technical support related to sustainable urban mobility indicators (SUMI).	Eurostat
Nature-based Solutions	Structural connectivity of green spaces	ha	↑	Degree of physical ("structural") connectivity between natural environments within a defined urban area	1/A total (A2/1 + A2/2 + A2/3 + …+A2/n) Where: • Atotal is the total area of all natural areas. • A1 to An are areas that are distinct from each other (i.e. more than or equal to 100m apart). • n is the total number of connected natural areas.	NetZeroCities Indicator (Recommended). UNaLab; Chan, L., Hillel, O., Elmqvist, T., Werner, P., Holman, N., Mader, A. & Calcaterra, E. (2014). User's Manual on the Singapore Index on Cities' Biodiversity (also known as the City Biodiversity Index). Singapore: National Parks Board, Singapore.	EEA, Natura 2000 Database
Nature-based Solutions	Urban Heat Island (UHI) Effect	°C UHImax	↓	Maximum difference in air temperature within the city compared to the countryside during the summer months	At least one meteorological (temperature) measurement station within the built environment and other station in the outside (that functions as reference station), to then look for the largest temperature difference (hourly average) during the summer months.	NetZeroCities Indicator (Recommended). Bosch, P., Jongeneel, S., Rovers, V., Neumann, H.-M., Airaksinen, M., & Huovila, A. et al. (2017) CITYkeys list of city indicators.	NA