



The European research cluster to understand the impacts of urban environment on health and wellbeing of people

February 2025

Joint Policy Brief

Third Issue

Prioritising health in Urban policies across Europe - A call to action for physical and mental health and well-being



The projects of the Urban Health Cluster have received funding from the European Union's Horizon 2020 research and innovation programme, under grant agreement, No. 945307 (eMOTIONAL Cities), No. 945238 (ENLIGHTENme), No. 945105 (HEART), No. 945095 (RECETAS), No. 945391 (URBANOME), No. 945097 (WELLBASED)

BACKGROUND



As urbanization accelerates, cities face growing challenges in ensuring healthy, equitable, and sustainable living conditions.

Research on urban health has advanced significantly, with European initiatives driving innovative policies to improve health and well-being. Findings from EU Horizon 2020-funded projects - URBANOME, RECETAS, eMOTIONAL Cities, ENLIGHTENme, HEART, and WELLBASED, collectively forming the Urban Health Cluster aimed to promote urban health within Europe by demonstrating together how the urban environment impacts physical and mental health and well-being and how to make it more positive and beneficial.

Over four years of collaboration (2021-2025), these projects exchanged knowledge and research outcomes to identify common recommendations for embedding health considerations across urban policies. These findings represent a collective effort to bridge the gap between research and practice, offering practical tools and strategies for urban policymakers across Europe.

UHC PROJECTS' KEY RECOMMENDATIONS



Summative view

Put people at the center of urban planning processes and provide mechanism for their input into decision making.

Actively involving communities, especially vulnerable groups, ensures urban health policies address real needs and gain acceptance. Inclusive engagement fosters sustainability, while cross-sector collaboration strengthens policy development. Engaging policymakers, health professionals, and community representatives integrates health into urban planning for more effective, equitable, and sustainable outcomes.

Define spatial priorities for targeted interventions.

This is crucial to target health interventions effectively, addressing most relevant inequalities in the right way and optimizing resource allocation.

Employ Technology that enhances data collection and sharing.

Effective integration of technology in urban policies allows robust data collection and analysis to understand health determinants and design interventions. Advanced tools enhance monitoring and engagement but must balance innovation with ethics, local capacity, and usability.

DEEP DIVE INTO THE RECOMMENDATIONS



Recommendation 1

Put people at the center of urban planning processes and provide mechanisms for their input into decision making”





Which are the associated challenges?

Institutional silos, bureaucratic hurdles, and political cycles obstruct cross-sector collaboration and policy alignment.

Vulnerable populations are often hard to reach due to social, economic, or cultural barriers. Building trust with these communities takes time and consistent effort, which can be resource-intensive.

Ensuring meaningful participation requires addressing power imbalances, as some voices may dominate decision-making processes while others are overlooked. While public involvement is essential, it does not absolve governments of their obligations to protect public goods and ensure equity.



What can be done to alleviate these?

1. Strengthen inter-sectoral collaboration and capacity building

- ✓ Forming interdisciplinary teams involving urban planners, health professionals, and environmental experts fosters collaboration and bridges gaps across sectors.
- ✓ Addressing well-being at multiple levels - individual behaviour, community support, housing, and social policies - yields greater public health benefits than single-level interventions. A multi-layered approach enhances the impact and sustainability of urban health improvements.
- ✓ Capacity-building programs enhance collaboration by fostering a shared understanding, helping health professionals address broader determinants, guiding decision-makers, and equipping city managers with cross-sectoral strategies for urban health.
- ✓ Public Empowerment: campaigns should raise awareness about urban health issues and the impact of the built environment on mental and physical health. These should draw interdisciplinary knowledge - from the social, natural (environmental), and health sciences to promote healthier lifestyles and sustainable behaviours.

EXAMPLE CASES



Source: ENLIGHTENme - Promoting Urban Health through Health City Management

Healthy City Manager

The Healthy City Manager Training Program is a 100-hour course promoted by the National Association of Italian Municipalities and Italy's Ministry of Youth. It equips city officials—urban planners, social service staff, and community activists—with skills to apply global health principles across urban planning, housing, environment, and transportation.

In **ENLIGHTENme**, a condensed version of the training was delivered in two editions across **Bologna, Amsterdam, and Tartu**, focusing on urban lighting as a key health determinant. Participant feedback was positive, with insights from the first round improving the second. The pilots revealed strong interest in the Healthy City Management (HCM) approach, alongside challenges like data access in Tartu, integration with planning tools in Bologna, and cross-sector collaboration in Amsterdam. These trainings underscored the importance of embedding this intervention into city strategies and enhancing interdepartmental coordination.



Source: WELLBASED - D3.4 Final report on the implementation of the urban programme

Urban Programs to fight Energy Poverty

The **WELLBASED Urban Programs to fight Energy Poverty** provided municipal-level, multidimensional solutions to address Energy Poverty and its health impacts through inter-institutional collaboration and community participation. The program targeted four socioecological layers: Individual behavior; Community networks; Living conditions; Policy and governance.

Among the activities carried out, there were trainings aimed to combat Energy Poverty by building professional networks, equipping socio-health staff, teachers, and social workers with tools to identify cases, design solutions, connect individuals to resources, and develop effective interventions (Policy Recommendations and guidelines extracted from these programs are available [here](#)). Cross-sectoral collaboration and holistic interventions were proved essential to address the health impacts of energy poverty.



Source: eMotional Cities - Experiment 4 Portfolio

Cities Walker Experiments

The eMOTIONAL Cities project united experts from urban planning, architecture, medicine, public health, housing, and policy across public and private sectors to design 1km walking routes in Lisbon, the project's main pilot city. In a first workshop, routes were selected based on spatial data analysis of health, environmental, socioeconomic, and climate factors. Volunteers equipped with biosensors and brain devices collected human-centric data, demonstrating the value of collaborative, interdisciplinary approaches in addressing health and well-being.

In a second workshop, previous and new specialists reviewed findings from the eMOTIONAL Cities Walker experiments, correlating empirical insights with biofeedback data. Working groups then developed **policy recommendations**, supporting innovative, science-backed, cross-sectoral urban planning strategies.

2. Participatory Methods for Tailoring Solutions to Local Conditions, Culture, and Values

- ✓ Establishing collaborative environments such as Urban Living Labs to foster inclusion of diverse community voices, following a 4P-Helix approach incorporating: Public Sector, Private Sector, Academia and Research Institutions, and Civil Society.
- ✓ Ensuring that vulnerable people such as older adults, low SES populations, minority groups, and marginalised communities have a voice in decision-making, planning and implementation processes through co-creation of interventions, local policy and environmental solutions.
- ✓ Iterative experimentation through Small-Scale Installations and prototypes: localised test environments for assessing and refining interventions under real-world conditions before a larger scale interventions, to obtain valuable insights into their feasibility and impact.

✓ Regular feedback to citizens: A proactive, transparent approach builds trust in science, promotes sustainable behaviours, and ensures citizens feel valued and informed, thus encouraging greater engagement in health-related decisions. Robust monitoring and evaluation mechanisms are also important activities that ensure effectiveness, scalability, and policy integration.

EXAMPLE CASES



Source: ENLIGHTENme - D2.2 Outdoor Lighting Design Report

Urban Lighting Labs

Urban Lighting Labs were established in selected districts of the three ENLIGHTENme cities (Amsterdam, Bologna, and Tartu) to address specific urban, lighting, and socio-economic vulnerabilities.

They brought together older adults, caregivers, policymakers, designers, and local organizations to co-design outdoor lighting solutions through social research approach, and provided a base for consultation and assessment during the lighting installation phase.

Lighting trials and demonstrations, provided continuous involvement of the local communities that were engaged in playing with light (i.e., experiments with dimming and colour temperature settings)



Source: WELLBASED - D3.4 Final report on the implementation of the urban programme

Citizen School of the Right to Energy

The **WELLBASED Citizen School of the Right to Energy in Valencia**, hosted monthly “Berenars Energètics” (Energetic Snack Time) at the local Energy Office, engaging vulnerable residents facing energy poverty. Participants included low-income individuals, single mothers, older adults, migrants, and precariously employed youth. Sessions covered energy efficiency, bill optimization, and health promotion, addressing self-care, physical activity, nutrition, sleep quality, and mental well-being.

Topics also included renewable energy and climate change. The initiative emphasized capacity building and empowerment, fostering behavioral change and reinforcing the Right to Energy and Health.

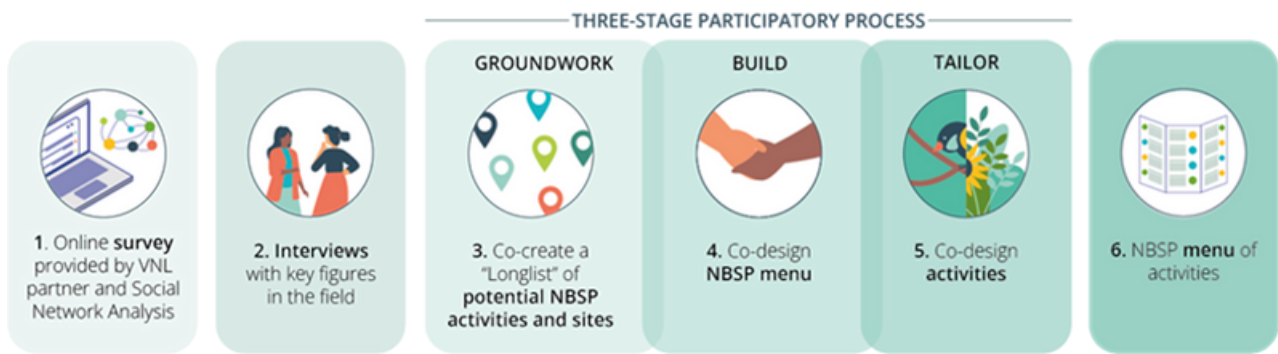


Source: eMOTIONAL Cities - Experiment 5 Portfolio

Clinical experiments

The **clinical experiments of the eMOTIONAL Cities** were developed as a pilot experiment designed to offer proof-of-principle evidence on the pivotal role that urban planning can play in promoting urban space living among individuals with premorbid dementia. Specifically, the study involved 25 patients with mild cognitive impairment, as well as 25 age and gender-matched controls, who each performed a spatial navigation task within a virtual reality simulation.

This simulation represented a neighbourhood in Lisbon that included urban design and planning considerations optimised for dementia-inclusive environments, contrasting with the current city layout, providing a framework to analyse the hypothetical real-world before intervening at the larger scale in the territory to produce such conditions.

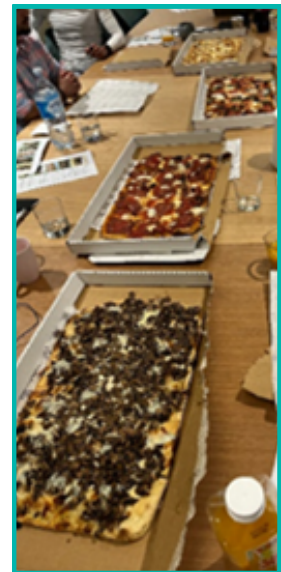


Source: RECETAS - D2.3 Summary outreach report

Nature-Based Social Prescription Menus

The RECETAS project developed **nature-based social prescription (NBSP) menus** for the Friends in Nature (FiN) intervention, reflecting available green assets and involving healthcare, social, and nature stakeholders. Researchers followed a standardized protocol while tailoring NBSP menus to local resources.

These menus were used to test the FiN intervention and will later serve broader community purposes. The co-creation approach supports stakeholder engagement, flexible adaptation, and collaboration, ensuring effective social prescription adoption and implementation. Building trust and aligning objectives require adequate time and planning.



Source: RECETAS - D2.3 Summary outreach report

DEEP DIVE INTO THE RECOMMENDATIONS



Recommendation 2

Define spatial priorities for targeted interventions”





Which are the associated challenges?

Limited access to reliable, disaggregated data hinders spatial prioritization for health interventions.

Lack of unified indicators makes it challenging to detect health related issues like energy poverty and loneliness.



What can be done to alleviate these?

1. Identify Useful Indicators

- ✓ Relevant indicators to consider for underlying spatial priorities refer to different urban dimensions. A possible list is provided below. They should be collected across different city departments and relevant public health institutions and systematised to allow to cover the entire urban system with a good degree of precision.
- ✓ Socioeconomic Indicators: average income levels, unemployment rates, percentage of vulnerable population, housing conditions, education attainment, access to essential services, household size, time-activity patterns, population density, percentage of non-EU inhabitants, and the percentage of people living alone.
- ✓ Health and wellbeing Indicators: Prevalence of chronic diseases, mental and physical health statistics, physical activity levels, access to healthcare services, medical prescriptions or hospitalisation rates, level of mortality and premature mortality, and life expectancy.
- ✓ Environmental Indicators: Air, light and noise pollution (indoor and outdoor), temperature extremes, green/blue space availability, proximity to green/blue spaces, and flood-able areas.
- ✓ Urban and Building indicators: presence of and accessibility to public services, and amenities, green/blue spaces and public transport facilities and usage, availability and quality of pedestrian pathways, bike lanes, outdoor lighting characteristics, quality and type of buildings.
- ✓ Emotional and Social wellbeing Indicators: Metrics for loneliness, direct and indirect measures of loneliness, with explicit focus on emotional, social and existential loneliness, and measures of social connection, belonging, purpose, and general wellbeing.

EXAMPLE CASES



eMOTIONAL Cities Toolbox

The **eMOTIONAL Cities toolbox** is a methodological protocol to conduct a spatial analysis of urban health. This protocol helped to identify the hot spots of the most vulnerable communities, that are identified at a more neighbouring and street level scale to capture the urban parameters, looking at the city fabric along the environmental and climate factors, elements that fire our brain and trigger our emotions.

The assessed associations provide findings on how the surrounding environment we live in affects our emotions and well-being.

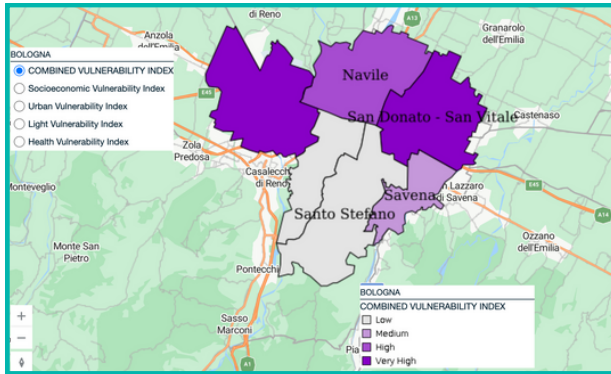


Source: eMOTIONAL Cities - Toolbox for Spatial Analysis

2. Mapping Techniques for highlighting vulnerability

- ✓ GIS Mapping to combine key socioeconomic, urban, energy, lighting, and health indicators into a synthetic index to identify spatial vulnerabilities and priority areas for intervention.
- ✓ Detection Protocols that standardise screening by healthcare and social workers to identify vulnerable individuals, uncovering different vulnerabilities.
- ✓ Social Network Mapping assesses partnerships in urban health, evaluating connections, trust, and resource sharing to enhance collaboration and optimise resource allocation.

EXAMPLE CASES



Source: ENLIGHTENme - Atlas Platform



Source: WELLBASED - D3.4 Final report on the implementation of the urban programme

WebGIS-based Urban Lighting and Health multiscale platform

The ENLIGHTENme project has developed a **WebGIS-based Urban Lighting and Health multiscale platform** including City-level urban lighting and health maps created for the three ENLIGHTENme cities.

Indicators of socio-economic determinants, urban lighting patterns, satellite-detected lighting, and population health and well-being are mapped and combined to calculate Vulnerability indexes.

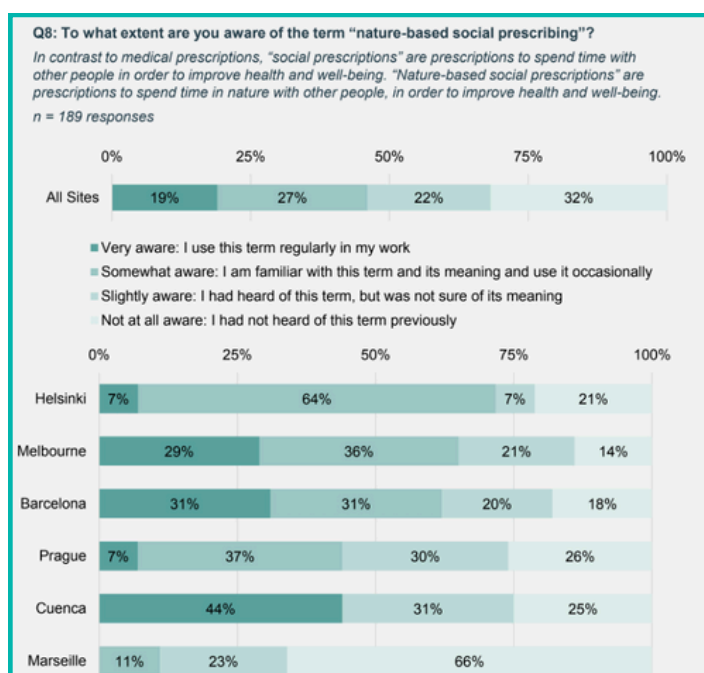
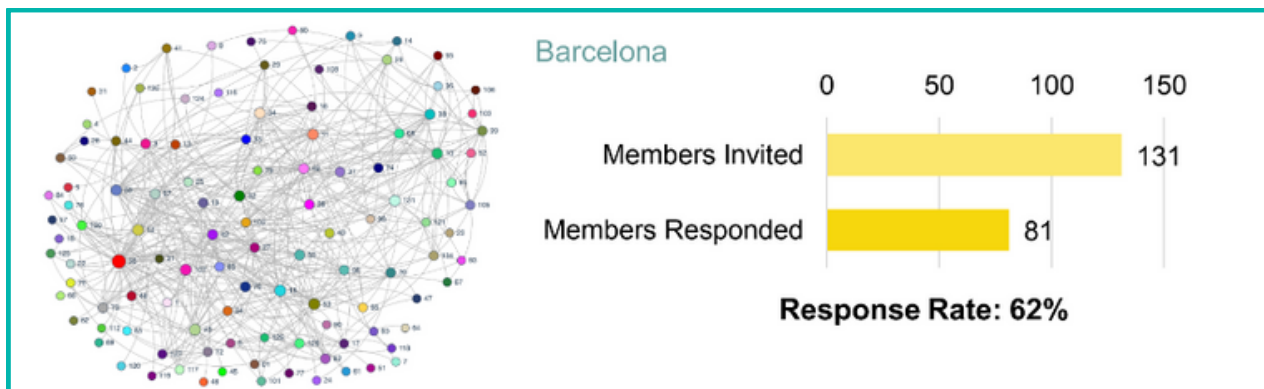
These maps supported the identification of districts for targeted interventions.

Detection and referral protocol

During one session of a **WELLBASED Citizen School of the Right to Energy** for healthcare professionals in Valencia, participants collaboratively developed a detection and referral protocol, identifying key data, variables, patient screening questions, and barriers to implementation. The protocol is available within the **WELLBASED Policy Recommendations (Section 6.b. Best Practices, p.68-70)**.

This protocol aimed to standardise early identification and support for individuals affected by Energy Poverty. The training was part of a broader initiative to build professional networks among socio-health staff, teachers, social workers, and third-sector entities.

These networks enhanced problem detection, solution design, and referral processes, equipping professionals with tools to connect affected individuals to appropriate resources and create community-driven solutions.



Source: RECETAS - D2.3 Summary outreach report

Social Network Analysis

RECETAS project conducts a quantitative social network analysis (SNA) across six cities to explore how stakeholder organisations address loneliness, mental health, and well-being through social prescribing and nature-based activities.

A structured network survey, developed using **Visible Network Labs' PARTNER platform**, was distributed to stakeholders in the six cities, identified through participatory processes.

In 2021, 639 organisations were invited to participate in a SNA with 226 responding (35% response rate). RECETAS used these data to engage stakeholders in the project's initiatives.

DEEP DIVE INTO THE RECOMMENDATIONS



Recommendation 3

*Employ Technology that enhances data
collection and sharing* ”





Which are the associated challenges?

Overcoming resistance to technology adoption and providing adequate training are critical to fostering stakeholder and community support.

Ethical considerations, such as data ownership, informed consent, and responsible use, are essential to align technology with public values and rights.

Ensuring data privacy and security is crucial to maintaining public trust when handling sensitive health and environmental information.



What can be done to alleviate these?

1. Data Collection and Monitoring

✓ The real-time data gathered at different scales is vital for identifying health risks, driving timely interventions, and empowering individuals to make behaviour changes:

- Macro-scale data gathering: Sensors and monitoring systems track real-time data on key environmental variables such as pollution, noise, temperature, humidity, and CO2 levels, etc.
- Human-scale data gathering: Wearable health devices monitor individual health metrics in relation to environmental conditions.

EXAMPLE CASES



Source: WELLBASED - Smart City Monitor platform

Smart sensors to monitor indoor environmental quality

The WELLBASED project deployed smart sensors in participants' homes to monitor indoor environmental quality.

The sensors tracked temperature, humidity, and CO₂ levels in near real-time. Participants accessed their data through either in-home LED-displays with intuitive interfaces or online dashboards.

In some cases, energy coaches used dashboard data to provide personalized recommendations.

Indoor parameters were collected using identical measurement protocols and platforms across all locations to ensure data consistency and comparability, with the aim of capturing the impact of project interventions on home comfort (**Smart City Monitor platform**)



Source: eMOTIONAL Cities - Experiment 4 Portfolio

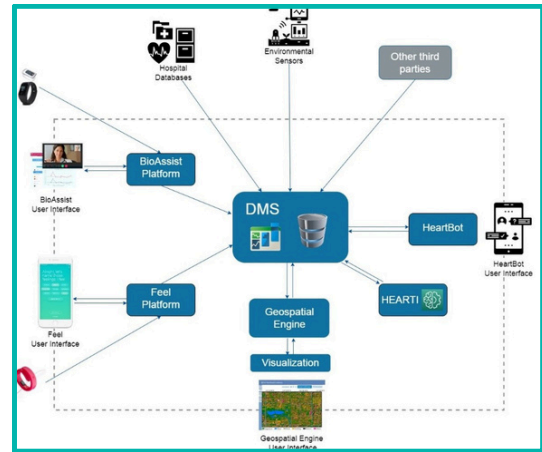
Backpack wearable sensors

eMOTIONAL Cities wearable sensors integrate and fuse data from both biosensors and environmental sensors, capturing real-time information at a human scale. These backpacks monitor physiological metrics such as heart rate and stress levels, while also collecting environmental data (e.g., air quality, temperature) through GPS-based geolocated time-stamped records.

Combining personal health indicators with contextual environmental factors offers valuable insights into how urban living conditions affect well-being.

The HEART BioAssist & Feel Platforms

HEART's data collection framework integrates medical, socio-economic, and environmental data from clinical trials, wearable sensors, questionnaires, and in-situ monitoring. The **HEART by BioAssist** platform, which is linked with a wearable provided by HEART, collects health and activity data, tracks locations, and transmits information to the Data Management System (DMS), while the **Feel platform**, which is linked with the wristband also provided by HEART, captures emotional and physiological responses. Additionally, historical medical data is gathered from national and municipal health databases to assess long-term health trends in project locations.



Source: HEART - D5.1 Deployment of the ICT tools to the demonstration sites



Source: URBANOME - Sensors package

The URBANOME wearable sensor package

The **URBANOME wearable sensor package** includes a device for monitoring personal exposure to particulate matter and TVOCs, with GPS-based geolocated time-stamped data.

Additional devices include smart activity trackers for heart rate, sleep quality and fitness monitoring, an open-source app for measuring and sharing noise levels, silicone wristbands for assessing chemical compounds like PAHs and phosphates, and static sensors such for indoor air quality monitoring.

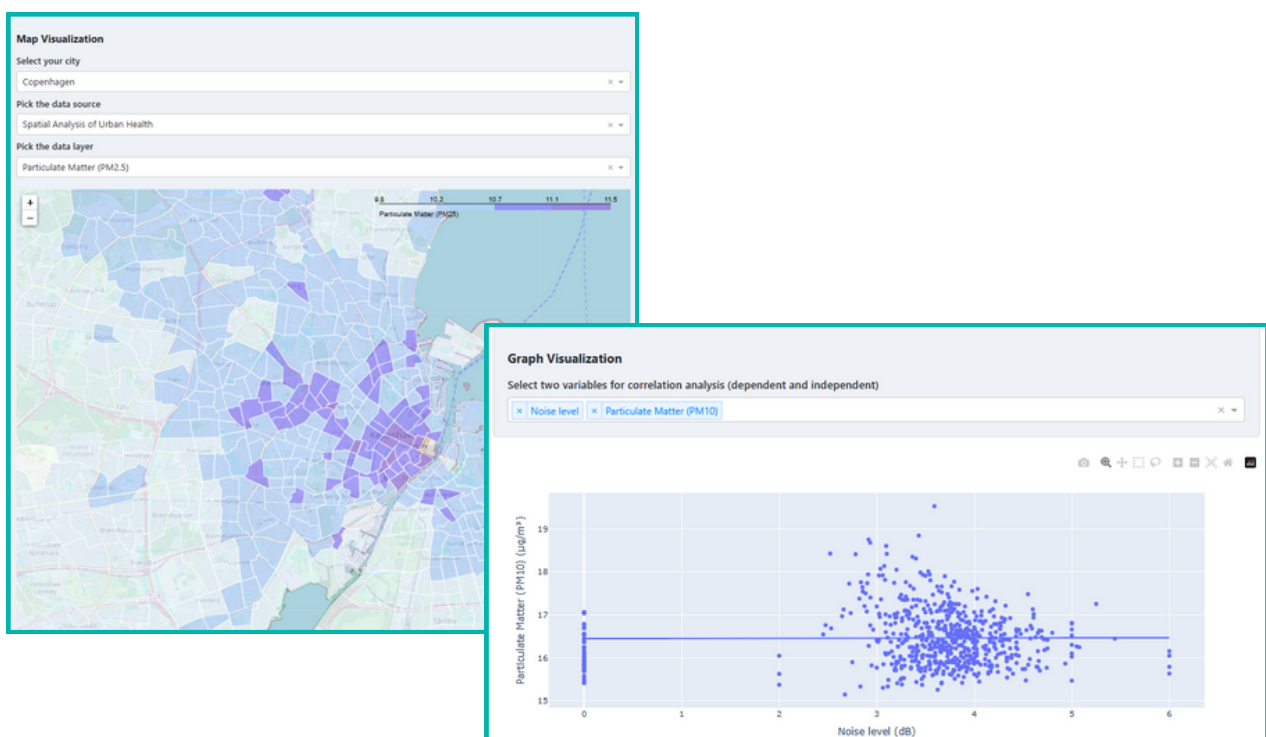
2. Data Analysis and Visualisation

✓ Digital platforms and dashboards facilitate urban health management by visualising key metrics, environmental exposures, and decision-making tools. Ensuring public access to integrated, continuously updated datasets enhances transparency and informed decision-making. User-friendly interfaces enable stakeholders to explore data effectively, while openness and interoperability ensures continuous updates and data-driven decision-making to enhance well-being and community engagement.

✓ AI and machine learning, including natural language processing and agent-based models, provide personalised health insights by analysing data, predicting trends, and identifying links between demographics, environment, and health outcomes.

✓ Promote transparency and progress tracking through public repositories for dataset integration and dashboard enhancement.

EXAMPLE CASES



Source: eMOTIONAL Cities - Geo-visualisation dashboard by CLIMATEFLUX and contributions by IGOT-Lisboa

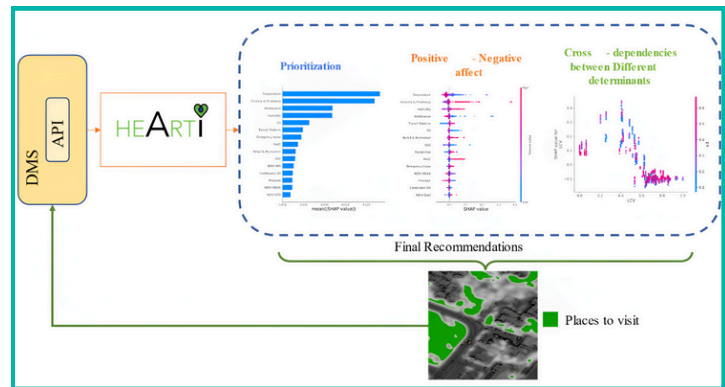
Geo-visualisation Dashboard

The eMOTIONAL Cities project developed advanced data analysis and virtualisation tools to explore links between the built environment, behaviour, and public health. Its **Spatial Data Infrastructure (SDI)** provides open access to environmental, demographic, and health datasets, ensuring seamless integration.

The geovisualisation dashboard consolidates data into interactive maps and charts, enabling real-time and historical analysis to identify risks, predict trends, and offer personalised recommendations.

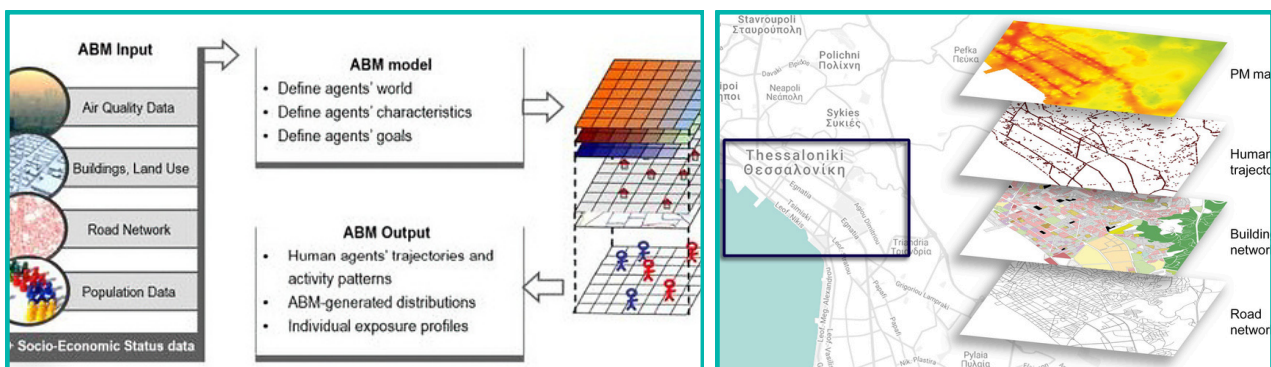
HEARTI Framework

HEART uses HEARTI, a framework consist of ML and AI models, to predict health levels that directly affect the four disease groups (respiratory, cardiovascular, metabolic and mental) that are studied in the HEART project.



Source: HEART - D5.1 Deployment of the ICT tools to the demonstration sites

Based on several input/measurements HEARTI investigates how atmospheric, weather, environmental and other indicators such as socio-economic ones affect/are related to the various health indicators. As input, HEARTI acquires data describing, for each patient's trajectory, the environmental and other conditions. HEARTI also interprets how conditions such as vegetation levels influence the model's behaviour and provides insights and guidelines for suggested areas with positive influence in patient's health.



Source: URBANOME - Agent-based modelling: A stochastic approach to assessing personal exposure to environmental pollutants – Insights from the URBANOME project

Agent-Based Modeling of exposure to environmental stressors

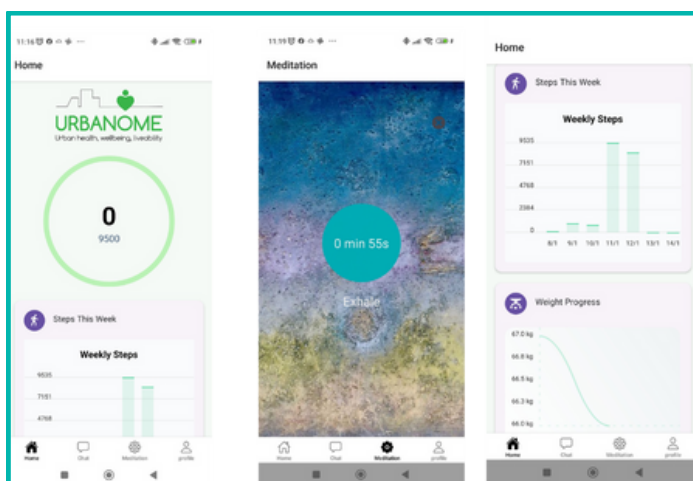
Measuring personal exposure to environmental stressors like air pollution and noise is often limited by time, cost, and ethical constraints. The URBANOME project tackled this using **Agent-Based Modeling (ABM)**, informed by local sensor data, to estimate exposure for broader populations based on limited individual data. By integrating agent data into a Geographic Information System (GIS) and using a geographically explicit ABM architecture, URBANOME tracked and projected the trajectories of "human agents" onto a single layer.

This layer was then superimposed onto urban air quality maps, which detail pollutant concentrations across different areas. The integration enables to capture individual spatio-temporal behaviors and assess exposure levels over time and space with fine-grained precision. A key focus was Socio-Economic Status (SES), which influences exposure through factors like income, lifestyle, and transport choices. By incorporating SES data, the model generated distinct exposure profiles, highlighting disparities and informing targeted interventions for equitable urban health policies.

3. Community Engagement through Technology

- ✓ Mobile apps facilitate real-time feedback, issue reporting, and health updates, enhancing transparency, trust, and community engagement in urban health policies
- ✓ Gamification makes health promotion interactive, motivating behaviour change and increasing community engagement.
- ✓ Adaptive technologies adjust to individual or contextual needs. Smart lighting uses sensors, real-time analytics, and automation to optimize lighting based on environment and activity.

EXAMPLE CASES



URBANOME Gamification App

The URBANOME Gamification app is an innovative tool designed to promote health and well-being through a serious game aimed at addressing issues like sedentary behaviour, cognitive decline, and mental health.

Source: URBANOME - D3.4 URBANOME Gamification app

The app offers personalised feedback and strategies to help users, particularly vulnerable populations, improve their health by encouraging the users to get involved in outdoor activities, social interactions, and wellness practices. Key features include a dynamic chat module for educational content on mindfulness, stress management, and healthy eating, biometric data tracking for health progress, and interactive gamification for an engaging experience.



Source: ENLIGHTENme - D2.2 Outdoor Lighting Design Report

Adaptive Lighting Systems

Adaptive lighting systems have been implemented in Bologna, Amsterdam, and Tartu as a part of the ENLIGHTENme project. The lighting system can be controlled by mobile app to enable real time adjustments to light levels and colour temperature to accommodate different lighting settings depending on the use of public spaces and aesthetic goals. In Bologna the control of the lighting was put in the hands of the community as an urban common to administrate at community level.

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