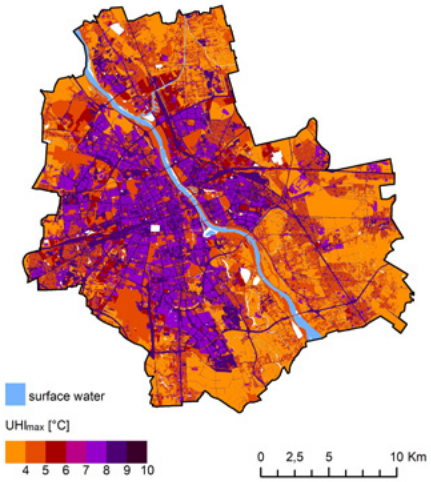
Extreme heat in Warsaw as a threat to older adults

Challenges and solutions

Urban heat is an increasing problem in Warsaw

Increasing heat is a global problem, caused by anthropogenically driven climate change. Heat in the cities is exacerbated by the Urban Heat Island (UHI) effect caused by the urban infrastructures. It means that temperatures in the city are higher than in the outskirts or outside of urban areas.

Maximum Urban Heat Island intensity in Warsaw, 2008–2018



Kuchcik, M., Czarnecka, K., Błażejczyk, K. (2024) „Urban heat island in Warsaw (Poland): Current development and projections for 2050" Urban Climate, 55, 101901.

The first European Climate Risk Assessment (EUCRA)[1] identified increasing heat as one of the main risks facing Europe. More than 60 000 people died due to heat stress in Europe in the summer of 2022[2]. More common and longer lasting heatwaves occur also in Warsaw. Warsaw, like many cities in central-eastern Europe, historically grappled more with cold, while now must adapt to extreme heat, with temperatures above 30°C becoming more and more common. The hot nights are especially problematic.

The experience of urban heat and its effects are influenced by the environment – the district in which one lives, the materials used in the building, the solar exposure of the apartment, the distance from UHI and green areas, the working conditions – but also by individual, physiological and psychosocial, predispositions and the socio-economic situation.

The consequences of extreme heat are not only uncomfortable but also dangerous. Extreme heat negatively affects our daily lives, physical and mental wellbeing and health. High temperatures can cause dehydration and heat-stroke, while UHI effects also trap pollution, which reduces air quality and leads to longer term health risks. Extreme heat exacerbates existing illnesses and even causes death, especially among groups most vulnerable to heat stress.

[1] European Climate Risk Assessment, EEA Report 01/2024.

[2] Ballester, J. et al. (2023) "Heat-related mortality in Europe during the summer of 2022". Nature Medicine 29, 1857–1866.

Groups particularly vulnerable to heat stress

Older adults are among the most vulnerable to heat stress

Due to a combination of biological and social factors, older adults (65+) are one of the most vulnerable to heat stress groups. With age, people feel less thirsty and their thermoregulation changes. Moreover, older adults are more likely to have chronic diseases, which combined with heat stress, put additional strain on their bodies and health[3]. Older adults are also often isolated, which means others rarely check on how they are doing during a heatwave, whether they drink enough water etc., leaving them more vulnerable.

In 2020 – 2025, we conducted research with older adults on their experiences of heat in Warsaw. The main problems related to summer heat reported by our research participants included:

- Weakness and bodily aches, discomfort, fatigue, problems with sleep
- Feeling mentally exhausted and tired
- Difficulties with cooling down their flats and finding respite from heat
- Feeling isolated and lonely, feeling stuck at home
- Problems with getting around the city, for instance when trying to access cooler spaces such as parks, lack of shade and lack of water supply
- Downplaying the problem, not perceiving themselves as members of a group especially vulnerable to heat stress

[3] Broczek, K. (2022) Health-Related Effects of Heat Exposure. Report prepared as part of the EmCliC project.

Adaptation to extreme urban heat

The main solutions to extreme heat implemented in cities rely on the combination of mitigation and adaptation activities – reducing greenhouse gas emissions while increasing resilience to heat extremes. According to the European Commission's Joint Research Centre[4], such actions include:

- Resurfacing dark asphalt roads with lighter colored materials to reflect rather than absorb sunlight.
- Integrating and enhancing green infrastructure such as promoting green walls and roofs, and increasing the number of trees and vegetated surfaces.
- Introducing blue infrastructure, water features and flowing water in public areas, and providing drinking water to the population.
- Retrofitting and renovation of buildings with insulation and shutters, as well as using reflective materials, such as white paint, on streets and buildings.
- Promoting urban farming.
- Providing timely healthcare measures, for instance warning systems to guide the population during extreme heat events or displaying the location of shelters and drinking water points.

Despite various city-wide mitigation and adaptation activities, that are implemented also in Warsaw, our research shows that in older adults' experiences adaptation to extreme heat is highly individualized and their needs are overlooked. To manage extreme heat, they have to rely almost solely on their own capacities to cool down their bodies and their flats. Many people have limited means to do so. There is a need for more city-wide, accessible adaptation solutions and for collective action to protect the most vulnerable groups from the impacts of extreme heat.

In February 2025, we organized a series of workshops with older adults in Warsaw. With the use of participatory tools and drama techniques, we worked together on identifying the main challenges they face during extreme heat and creating ideas for accessible urban adaptation. Their ideas included:

- Cooling centers
- More water in the city, including access to drinking water
- More shaded areas for resting
- Organized heat-breaks to the outskirts of the city
- More greenery, especially trees
- Cooling at public transport stops
- Better temperature regulation in public transport
- Shading at local food markets
- Financial support for house retrofitting and adaptation to heat

[4] Iodice, S. et al. (2024) EU cities and heat extremes. European Commission, Ispra, JRC137891.

Cooling centers

A cooling center is a place where one can cool down as well as spend time in a nice atmosphere and meet people, or read a book. The participants indicated they need communal places outside of their homes where they could cool down. Cooling shelters would provide a respite from heat, possibly with the use of A/C or greenery. They could be inside or outside. Open during the day, or 24/7 if outside, and accessible to everyone free of charge. Existing venues, such as cultural centers, libraries or church facilities, could be used to serve as such cooling centers. For people with mobility issues, access to such places should be organized by the city council. Moreover, there should be information about where such cooling centers are located and that they are free of charge. Such information could be displayed on local bus stops and near building entrances.

”It will be a place for everyone! You can meet up with a friend there or go alone. But in fact, everyone will benefit, age doesn’t matter. Even when you’re shopping you can take a break there. Or it could be great for kids. Everyone needs to hide from the heat.” (Anna, 75-year-old)

Organized heat–breaks to the outskirts of the city

The city itself becomes a problem during heat. Older adults indicated that it is nice to leave the city to take a break. However, not everyone has the means to do so on their own. Hence the idea of organizing daily excursions outside of the city, to find a respite, enjoy nature and spend time with others. The transport should be provided by the city council, while the participants would take care of food and activities during the day.

”This could be especially great for people who are alone, don’t have families or have them far away, and don’t have the means to leave the city on their own. This would be great for people in a more difficult financial situation, and without their own means of transport. But many older adults would find this beneficial, there would probably be queues to sign up.” (Katarzyna, 80-year-old)

More water in the city, including access to drinking water

Older adults emphasized their appreciation for water fountains and mists located across the city, which enable cooling down. They indicated the need for more of such water features. They also noted that there is a need for easier access to drinking water. There should be more drinking water fountains and clearer information about where they are. Places such as pharmacies, which offer drinking water, could also promote information about free of charge access to drinking water.

”Even if I take a bottle of water with me, I usually drink it all up before I get to my destination. It would be great if I could easily refill my bottle when I’m out in the city. For myself, but also for my grandchildren when they play in the park ”
(Barbara, 68-year-old)

More shaded areas for resting

Older adults indicated that scorching sunlight is highly problematic, and they need a respite from sunlight and heat when they are commuting across the city. They need more shade, which could be provided at bus stops. They also need to sit down and rest, hence the need for shaded benches in local neighborhoods, in parks and in general across the city. Shade might be provided by trees, bushes and pergolas, but also by other means, such as umbrellas or shading art installations.

Good practices from other cities

Maps of local climate shelters

Starting from 2020, the Barcelona City Council (Spain) created a map of the city's Climatic Shelters. It is an online map, where you can find public places, local facilities ("equipaments de proximitat") and other available spaces that can serve as a refuge from the heat. The shelters provide a refuge from the heat in the summer, and cold in the winter. They are open to everyone and must meet certain criteria: maintain a temperature of around 26–27°C in summer and 21°C in winter, provide access to water, places to sit, and public restrooms. In case of outdoor places, they must have a minimum of green and shaded areas, defined by the Council.

Where to take refuge from the heat this summer: the map of 350 climate shelters

Green roofs and spaces

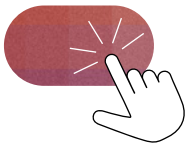
In Basel (Switzerland), the city's green revitalization program has been in operation since the 1990s. As decided by the local citizens, all new roofs in the city with a slope of less than 10 degrees are covered with vegetation. Green roofs cool the air during extreme heat, store water during storms, reduce noise pollution and filter air pollutants. Similar green roof solutions – but less developed than in Basel – have been introduced in many cities, including Amsterdam, Salzburg, Budapest, Ostrava, Helsinki, Thessaloniki, Athens and Berlin.

European Federation Green Roofs & Walls

Cooling pavements

Starting in 2020, the city of Phoenix (Arizona, USA) has been implementing a cooling pavement project, a reflective coating applied to roads that increases surface reflectivity (albedo), lowering surface temperatures while potentially reducing the Urban Heat Island effect.

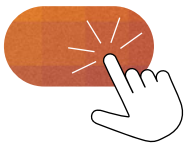
According to a 2023 study, the cool pavement effectively lowers surface temperatures, reducing urban heat storage, but has little effect on air temperature, providing the cooling effect mainly after sunset. The effectiveness of this solution is relative – it can make perceived conditions hotter at midday due to increased exposure to thermal radiation but improve comfort at night. The effectiveness of this solution depends on location – it is more suitable for low-traffic areas and places where traditional green solutions (such as tree planting) are not viable.



Evidence-based guidance on reflective pavement for urban heat mitigation in Arizona

Assistance to populations vulnerable to heat stress

A “Heatwave Plan” has been implemented in Brussels (Belgium) since 2022. This program enables people from vulnerable groups registering via phone at their local community centers. When the temperature exceeds 28°C, the staff at the community center contacts the registered people. The main goal of the program is to counter the loneliness and isolation of people from vulnerable social groups, although it assumes that people will identify themselves as vulnerable to heat, which is not always the case. In addition, the employees of community centers have regular contact with the registered people to care about their wellbeing; distribute food and drinks; and check the living conditions in their apartments.

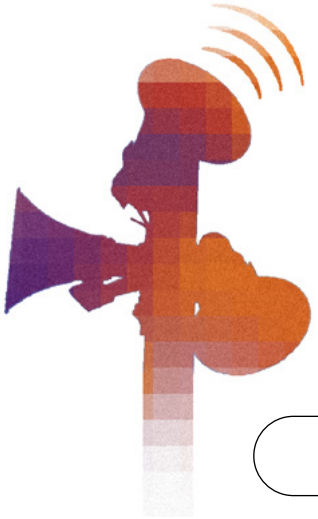


Heat Wave Plan

Heat Health Early Warning System

Early heat warnings are an important element of urban adaptation to extreme heat. For instance, in 2022, the Bangladesh Red Crescent Society (BDRCS), in collaboration with other organizations and government agencies, developed a data-driven early warning system to respond to heatwaves. This system sets specific temperature thresholds that trigger preventive actions. It proved to work well in April 2024, when Dhaka faced its longest heatwave on record. Prepared in advance, the authorities distributed 3,500 umbrellas, supplied water to 30,000 individuals, and established three cooling stations that provided relief for 15,000 residents.

Bangladesh: Heatwave EAP. Early Action Protocol Summary



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More information about the research can be found on the website: www.emclic.com