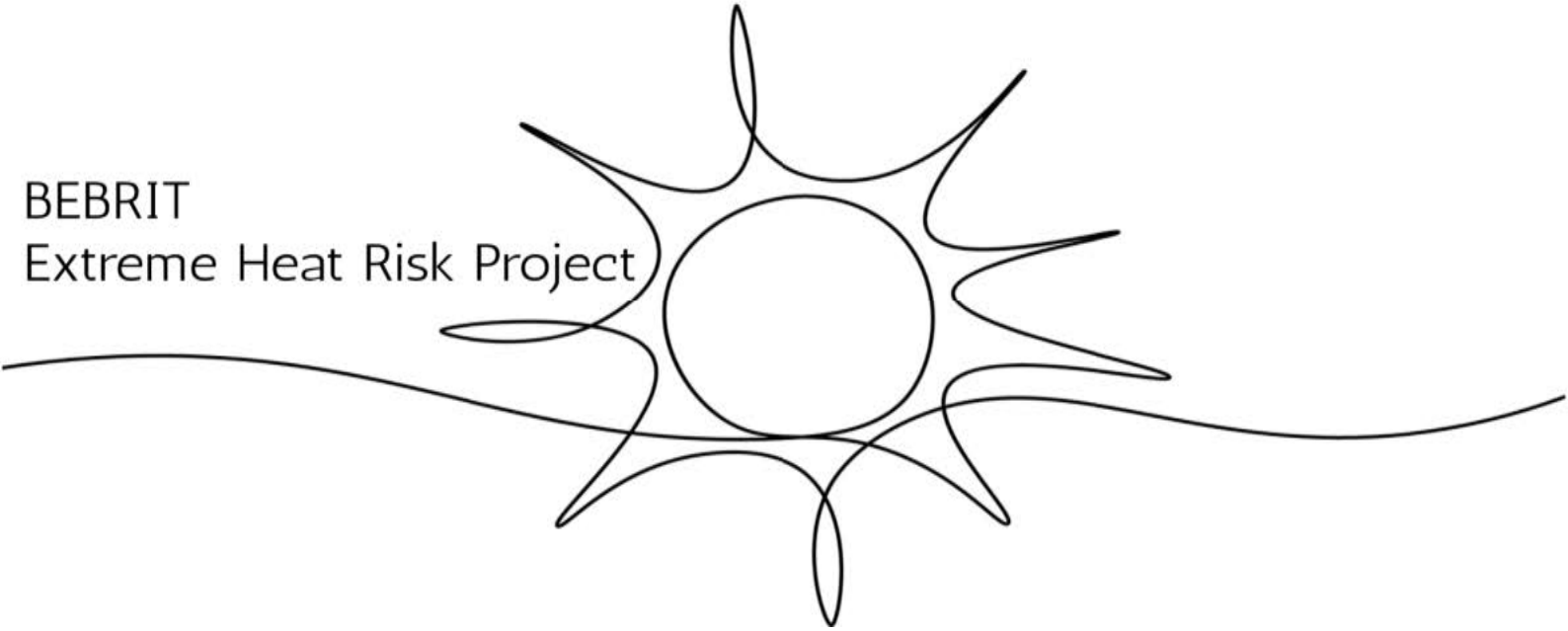
SILENTSPRING CONSULTANTS

BEBRIT
Extreme Heat Risk Project



Managing Extreme Heat in Urban Areas:

Recommendations for a National Heat Risk Strategy

POLICY BRIEF

March 2025

Main Authors

Andrea Armstrong, Silent Spring Consultants, UK, Vrije Universiteit Brussels (VUB), Belgium, Maastricht Sustainability Institute, Netherlands.

Candice Howarth, Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science, UK.

Andrew Kythreotis, Department of Geography and Lincoln Centre for Ecological Justice, University of Lincoln, UK.

Wim Pulinx, Silent Spring Consultants, UK.

Fien Serras, Department of Earth and Environmental Sciences, KU Leuven, Belgium.

Recommended Citation: Armstrong, A., Howarth, C., Kythreotis, A., Pulinx, W., Serras, F. (2025) *Managing Extreme Heat in Urban Areas: Recommendations for a National Heat Risk Strategy*, Silent Spring Consultants, UK. https://doi.org/10.5281/zenodo.15006573

Acknowledgements

This Policy Brief has been produced with the support of the Brussels Centre for Urban Studies (BCUS) as part of the BeBrit Extreme Heat Risk Project https://www.bebritproject.com/

We thank all the participants of the BeBrit Extreme Heat Risk event held on the 26 September 2024 in Brussels for their insights in making the policy brief practical and relevant.

Table of Contents

Executive Summary

Effective adaptation in urban areas to climate risks such as extreme heat requires a cohesive, unified response involving multiple stakeholders representing all sectors affected – local, regional, and national government; health (public health, social services, nursing homes, and hospitals); transport (road, rail, and air); emergency services/first responders; utilities (energy and water); building and architecture; food and agriculture; and digital infrastructure providers. Heat must also be considered as a year-round issue, particularly in (1) certain buildings designed to retain heat during winter, which can inadvertently overheat even in milder temperatures, and (2) settings that house vulnerable populations, such as schools, care homes, and prisons. Only then can resilience to climate shocks such as extreme heat be ensured for the future. In this policy brief, we provide six recommendations for a National Heat Risk Strategy that offers a unified framework for preparedness, response, and adaptation, ensuring that resources are distributed equitably, vulnerabilities are addressed systematically, and best practices are shared across the country.

Who is the policy brief for? The policy brief is for decision-makers in cities and countries around the world who are trying to devise and implement ways to improve preparedness to extreme heat. We envisage that stakeholders involved in climate change, environment, planning, ecology, health, transport, food and agriculture, energy, water, ICT, infrastructure, building and architecture will find the recommendations useful.

Introduction

Extreme heat events are no longer rare occurrences but are rapidly becoming the norm during summer months across Europe and beyond. With 40-degree heatwaves, prolonged droughts, water shortages, and devastating wildfires increasingly common, the need for cities and towns to adapt and prepare for these challenges is urgent. Yet, despite the growing frequency and intensity of such events, most urban areas remain underprepared to manage their impacts (Howarth et al. 2024).

Therefore, emergency planning exercises play a critical role in enhancing preparedness for extreme heat events. These simulations are essential for testing and refining response strategies, ensuring that public authorities, emergency services, and communities can effectively mitigate the risks associated with extreme heat. Cities such as Paris and London have conducted detailed emergency drills, revealing both the challenges and opportunities in managing heat-related crises (Goar, 2023; Mayor of London, 2024).

In Paris on the 13 October 2023, a crisis drill simulated a 50°C heatwave to evaluate the city's ability to protect residents, maintain critical infrastructure, and manage cascading failures such as transport disruptions and energy shortages (Box 1). Similarly, on the 27 June 2024, London's *Operation Helios* explored the consequences of a five-day extreme heat event, bringing together over 80 participants from diverse sectors to assess the potential impacts on health services, transportation, utilities, and vulnerable populations (Box 2). Both exercises highlighted the importance of coordination, communication, and scenario planning in addressing the multifaceted risks of extreme heat.

While these localized efforts provide invaluable lessons, they highlight a larger, under-explored gap: the absence of cohesive national heat risk strategies. Extreme heat is not confined to individual cities; it affects entire regions and requires a unified, national response. The BeBrit Extreme Heat Risk Project builds on these insights, focusing on how nations can strengthen their resilience to extreme temperatures. The project emphasizes the importance of pre-emptive action, cross-sector collaboration, and inclusive strategies to address the multifaceted risks posed by extreme heat. A national heat risk strategy would provide a unified framework for preparedness, response, and adaptation, ensuring that resources are distributed equitably, vulnerabilities are addressed systematically, and best practices are shared across the country.

Box 1: Paris, 13 October 2023
Crisis drills were conducted in two Paris districts on Friday 13 October 2023 to prepare the city and its residents for extreme heatwaves. These drills were part of an exercise organized by Paris City Hall, aimed at preparing residents and emergency services for a heatwave exceeding 50°C. A mock TV news clip was produced to simulate the experience of a city suffering from an intense heatwave lasting ten days. On a virtual Twitter feed, fake parent profiles expressed concern about schools evacuating to naturally cooled "safe havens." Unexpected events, such as the simulated failure of a generator, were incorporated into the scenario.

Box 2: Operation Helios, London, 27 June 2024
Operation Helios simulated an extreme heat scenario involving five consecutive days of high temperatures that scientists warned could affect Londoners by 2027. The exercise was led by the Greater London Authority's London Resilience Unit, which supports the city's preparedness for emergencies and coordinates diverse organizations during a response. More than 80 participants from sectors including emergency responder organizations, local government, public health, environmental agencies, transport services, utilities, businesses, and voluntary and faith groups took part. The exercise aimed to support longer-term strategies for managing the risk of extreme heat, including developing a regional plan for adapting to higher temperatures. The full-day exercise involved a dynamic scenario with updates and warnings issued by agencies such as the Met Office and the UK Health Security Agency (UKHSA). Participants had to assess the impacts of these updates on individuals, communities, and services and respond accordingly.

Method

On the 26 September, the BeBrit Extreme Heat Risk project held their 2024 event in Brussels called 'What can we do to move from coping to preparedness?'. In the afternoon, there was a facilitated group activity. Participants were divided into three pre-selected groups to ensure a balanced mix of expertise and perspectives (Table 1). Each group was tasked with discussing the necessary elements for a National Heat Risk Strategy and the barriers, with a focus on governance, resources, and communication. Key questions were provided to prompt discussion on governance responsibilities, financial mechanisms, and effective communication with vulnerable groups. Additionally, participants were encouraged to utilize their prior knowledge, posters provided at the BeBrit 2024 event, and insights gained during the previous sessions that day.

Table 1: Summary of pre-selected groups to ensure a mix of numbers, geographical locations, sector representation and expertise.

Group	Number	UK	Belgium	Other	Sector	Expertise
1	8	2	6		Academic, First Responder, Private Sector, Public Sector, NGO	Heat policy & governance, health[1], built environment, emergency response, climate modelling, adaptation
2	5	3	1	1	Academic, Health Service	Heat communication, local climate action, health, climate modelling
3	6	1	3	2	Academic, Public Sector, Private Sector	Climate governance & politics, local climate action science, climate modelling, engineering, ecology

[1] Participant from the HIGH Horizons project which focuses on the impact of heat on health, in particular on pregnant and postpartum women and their basis, and on the health workers in maternal and newborn health settings/clinics.

The group discussions involved a facilitated scenario activity asking the question: 'Are we prepared for extreme heat?' A vision statement was read out (Box 3) and the aim was to explore how a comprehensive strategy could address the growing threat of extreme temperatures, focusing on the key components required to make this vision a reality.

Box 3: Vision Statement
We envision a future where communities thrive in harmony with the realities of extreme heat. In this world, every place is a heat-resilient sanctuary, built on principles of justice, equity, and sustainability. Through innovative policies, cutting-edge technologies, and community empowerment, we are fully prepared for extreme temperatures, ensuring that no lives are lost to heat. In this future, excess mortality due to extreme weather is a thing of the past, as we've created systems and structures that protect the most vulnerable, enabling everyone to live with dignity, safety, and well-being.

The emergency planning exercises in Paris and London provided practical examples of the steps needed to develop effective national strategies. The activity linked directly to this by identifying essential policies, tools, and community-driven approaches that must be included in a National Heat Risk Strategy to minimize risks like excess mortalities, especially as global temperatures rise.

By exploring barriers, the activity sought to align with the vision of adapting to extreme heat. It highlighted that achieving the vision requires coordinated policy interventions, infrastructure upgrades, and fostering public engagement, all of which are critical to building national resilience. Thus, the National Heat Risk Strategy becomes the mechanism through which the vision can be realized, outlining concrete steps for both short-term emergency responses and long-term adaptations to extreme heat. The six recommendations for a National Heat Risk Strategy are highlighted next.

Recommendations for a National Heat Risk Strategy

All three groups concluded that while some progress has been made, Belgium, the UK and other nations are not yet adequately prepared for prolonged periods of extreme temperatures. There is a need for a whole-systems approach that addresses governance, financing, communication, and the built environment. Based on insights from the group discussions, the following six recommendations were identified as crucial when designing a comprehensive National Heat Risk Strategy:

Recommendation 1. Effective Governance and Coordination

Effective governance and coordination are essential to ensure accountability, coordination, and implementation of heat risk strategies at all levels. A National Heat Risk Strategy should include:

Central Leadership: Appoint a Heat Action Officer or an equivalent entity at the national or regional level to oversee extreme heat preparedness and response.

This ensures clear ownership of heat risk governance, centralizes coordination across different sectors and scales, and enhances accountability.

Multi-Stakeholder Governance: Establish a multi-stakeholder governance framework that includes representatives from government, emergency services, private sectors (such as insurance), civil society, and vulnerable communities. Collaborative governance can help align objectives, harmonize adaptation plans, and pool resources.

Regulatory Framework: Create or update regulations that address the growing challenge of indoor heat, workplace safety, and infrastructure resilience. Ensure that there is no conflict between energy regulations and heat risk mitigation, adaptation and heat stress.

Emergency Planning and Exercises: Conduct regular national-level emergency exercises, like those in Paris and London, to test preparedness for extreme heat. Ensure that these exercises involve various sectors and communities, including emergency services, health sectors, and vulnerable populations.

Recommendation 2. Adaptation of the Built Environment

Adapting urban infrastructure and buildings to withstand extreme heat is a long-term but critical element of heat resilience. Key subcomponents include:

Nature-Based Solutions: Increase green spaces (parks, green roofs, and corridors) and use drought-tolerant, heat-resilient species to provide shading and reduce urban heat islands. However, there needs to be a deeper understanding of heat comfort during nighttime heat.

Retrofitting Buildings: Retrofit and renovate old buildings with insulation, passive cooling systems, and heat-resistant materials. Encourage urban planners to consider heat-resilience in new infrastructure projects, ensuring that roads, railways, and electricity networks can withstand prolonged exposure to high temperatures.

Smart Urban Design: Incorporate heat-resilient designs in public spaces and homes. This includes using sustainable cooling systems, natural ventilation, and smart materials that regulate indoor temperatures effectively.

Useful BeBrit resources on adapting the built environment:

- **Outdoor cooling solutions** poster, available for download **here**
- **Buildings** poster, available for download **here**
- **Regulations to keep building cool** poster, available for download **here**

Recommendation 3. Adequate Resource Allocation and Clear Financial Planning

Adequate resources are vital for the implementation and sustainability of a heat risk strategy. This requires a clear financial plan that includes:

Investment in Adaptation: Develop business cases for investing in heat resilience. Seed funding from the government and private sector investment should be directed towards key projects, including infrastructure upgrades, retrofitting buildings, and implementing nature-based solutions.

Workforce Flexibility and Protection: Implement policies that allow for workforce flexibility during heatwaves, including hiring temporary staff, promoting remote work options, and equipping workers with cooling technologies (e.g., cooling jackets). These measures are crucial to maintaining productivity and minimizing health risks in extreme heat.

Support for Vulnerable Groups: Ensure resources are allocated to protect vulnerable groups, such as the elderly, homeless, and those with limited access to cooling. Strategies could include providing emergency cooling centres, distributing cooling blankets, and installing air conditioning in communal spaces such as care homes.

Recommendation 4. Communication and Building Public Awareness

Building awareness and promoting behavioural change among the public, especially vulnerable groups, is a crucial component of heat risk reduction. A successful strategy should include:

Targeted Communication: Develop clear, targeted communication strategies to reach vulnerable populations, such as the elderly, low-income families, and outdoor workers. Messages should focus on specific and simple actions that reduce heat-related risks, such as staying hydrated, seeking shade, and recognizing heat stroke symptoms.

Use of Technology and Social Media: Leverage modern communication tools, such as social media, apps, and text messaging systems, to disseminate timely information about upcoming heatwaves, protective measures, and access to cooling centres.

Behaviour Change Campaigns: Implement long-term behaviour change campaigns based on "nudge theory," similar to flood risk messaging, to encourage heat-resilient behaviours. This should include education in schools, government outreach programs, and regular public advisories during heatwaves.

Use of Storylines: Incorporate storytelling techniques, such as tales of future heatwaves, to help different sectors (elderly care, firefighting, healthcare) understand the potential impacts and motivate proactive awareness and steps.

Useful BeBrit resources on communication and building public awareness:

- **Communication** poster, available for download **here**
- **Tools** poster, available for download **here**

Recommendation 5. Health and Social Services Preparedness

The health sector plays a central role in managing the impacts of extreme heat. A National Heat Risk Strategy must focus on:

Hospital and Care Home Preparedness: Equip healthcare facilities and care homes with necessary cooling technologies and protocols to handle surges in heat-related illnesses. Ensure that hospitals have heat-specific emergency protocols in place and that care homes provide adequate cooling for residents.

Mental Health and Heat-Related Stress: Incorporate mental health services into heat risk strategies, acknowledging that prolonged exposure to high temperatures can exacerbate mental health issues, particularly for marginalized and vulnerable groups.

Response Hubs and Community Engagement: Develop community-level resilience and response hubs in both urban and rural areas. These hubs can serve as focal points for distributing cooling resources, offering medical assistance, and disseminating information about heat risks.

Recommendation 6. Continued Research to Fill Knowledge Gaps

Continued research is needed to fill gaps in understanding and to improve heat risk management strategies. Areas for focus include:

Heat Risk Assessments: National and regional heat risk assessments should be conducted regularly, identifying vulnerable regions, social groups, and infrastructure sectors most at risk. The use of scenario planning (e.g., storylines) can help predict future impacts and inform policy decisions.

Compound Effects and Systems Thinking: A comprehensive heat risk strategy should consider the compound effects of extreme heat on other sectors (e.g., transportation, housing, supply chains). Systems thinking should guide policy, ensuring that heat adaptation is integrated into broader climate resilience efforts.

Learning from Other Countries: Nations should draw from the experiences of cities like Paris and London, which have conducted anticipatory planning exercises and have developed successful models for multi-sector coordination and public communication.

References

Fournet, F., Simard, F. and Fontenille, D. (2024) Green cities and vector-borne diseases: emerging concerns and opportunities. *Eurosurveillance*, 29(10), p.2300548.

Goar, M. (2023) *Paris conducts crisis drills to prepare for 50°C heat peaks*, Le Monde, https://www.lemonde.fr/en/environment/article/2023/10/16/paris-conducts-crisis-drills-to-prepare-for-50-c-heat-peaks_6178880_114.html

Howarth, C., McLoughlin, N., Armstrong, A., Murtagh, E., Mehryar, S., Beswick, A., Ward, B., Ravishankar, S. and Stuart-Watt, A. (2024) *Turning up the heat: learning from the summer 2022 heatwaves in England to inform UK policy on heatwaves*, Grantham Research Institute on Climate Change and the Environment, London School of Economics and Political Science, London.

Mayor of London (2024) '*Operation Helios' to test London's response to extreme heat*, https://www.london.gov.uk/%E2%80%98Operation%20Helios%E2%80%99%20to%20test%20London%E2%80%99s%20response%20to%20extreme%20heat