



University of  
**Southampton**

# **IMPROVING THE CLIMATE-RESILIENCE OF HOSPITALS IN ENGLAND**

**Insights from overheating incidents**



# EXECUTIVE SUMMARY

Climate-related hazards - including extreme heat, flooding, and air-quality deterioration - pose escalating risks to patient safety, staff wellbeing, and the resilience of NHS estates. While progress on decarbonisation has advanced, climate-adaptation measures have not kept pace.

Here we have used Hampshire Hospitals NHS Foundation Trust as a case study to investigate their current climate resilience and identify opportunities and barriers in increasing resilience in UK hospitals. We found that despite strong detection and response processes, current approaches remain reactive and constrained by ageing infrastructure, fragmented governance, and limited long-term investment.

These climate risks directly impact all elements of the NHS Triple Bottom Line:

**Environmental:** Increased energy demand, estate degradation, and higher emissions associated with emergency responses.

**Social:** Heightened risks to vulnerable patients, disruption to care pathways, and impacts on staff safety and wellbeing.

**Financial:** Rising operational costs, unplanned capital expenditure, and productivity losses linked to climate-related service disruption.

To safeguard care quality and operational continuity, the NHS must accelerate **proactive, anticipatory adaptation**. This requires clearer national expectations, stronger governance, multi-year funding mechanisms, with coordinated support to enable Trusts to upgrade estates, improve preventive controls, and prepare for extreme weather events before they occur.

**Decisive action now is essential to ensure a climate-resilient NHS capable of delivering safe, high-quality care in a warming world.**



# BACKGROUND & CHALLENGES

Climate change is reshaping the operating environment for healthcare providers within the NHS in the UK [1], with local impacts varying geographically, but with universally elevating risk. NHS Trusts now face a growing profile of climate hazards, including extreme heat, deteriorating air quality, flooding, coastal erosion and increased prevalence of vector-borne diseases, which threaten estate performance, service continuity, and patient safety.



## 1. Rising Exposure to Climate Hazards

Extreme heat and other acute weather events are becoming more frequent and more intense. These hazards undermine critical infrastructure, disrupt clinical operations, and increase the likelihood of estate failure [2]. For example, in the last 5 years, NHS hospitals, many of which lack adequate cooling infrastructure [3], have experienced a 50% rise in overheating incidents [4]



## 2. Growing Health Impacts on Patients and Staff

Climate-related health pressures are increasing service demand. Vulnerable groups face heightened risks of heat-related illness and mortality [5, 6], while climate-driven infectious disease patterns could add operational strain [7]. Rising summer peaks - now compounding traditional winter pressures - mean Trusts have less 'catch-up' capacity, further stressing the system. Staff will also be experiencing greater occupational heat stress, affecting wellbeing and productivity [8, 9], all of which have been recently identified to contribute directly and indirectly to patient harm by the Health Services Safety Investigations Body [10].



## 3. Increasing Estate and Community Vulnerabilities

Urban heat island effects, reduced air quality, and ageing estate infrastructure will make it harder to maintain safe internal environments [11]. Rising cooling demand increases energy use and operating costs, placing additional pressure on already stretched estate systems and budgets.



## 4. Reactive Approaches Are No Longer Sustainable

Many responses to climate impacts remain reactive, leading to higher operational costs, unplanned capital spending, and greater clinical risk. Anticipatory adaptation is essential to ensure continuity of care and protect critical infrastructure [12].

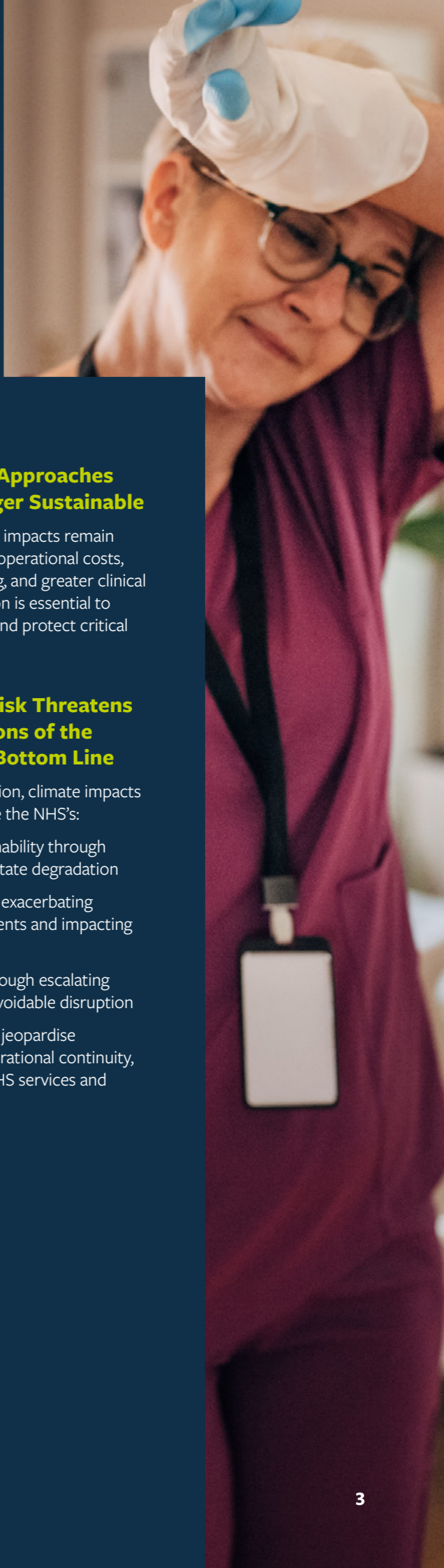


## 5. Climate Risk Threatens All Dimensions of the NHS Triple Bottom Line

Without proactive adaptation, climate impacts will increasingly undermine the NHS's:

- 1. Environmental** sustainability through higher emissions and estate degradation
- 2. Social** responsibility by exacerbating risks for vulnerable patients and impacting staff wellbeing
- 3. Financial** resilience through escalating operational costs and avoidable disruption

Together, these challenges jeopardise long-term care quality, operational continuity, and the sustainability of NHS services and healthcare workforce.



# CASE STUDY: HAMPSHIRE HOSPITALS NHS FOUNDATION TRUST

## Key Findings

- 1) The dominant climate change related threat likely to impact the local area of Hampshire Hospitals NHS Foundation Trust are rising temperatures, including more frequent heatwaves, with predicted temperature increases of ~30C by 2070 [13].
- 2) Adaptation to enhance climate resilience is the least progressed element of the Hampshire Hospitals NHS Foundation Trust Environmental Action Plan, with only 6% completion compared with an average progression of 53% across all other elements (Figure 1).



## Key:

- Green**  
Deliverables complete
- Yellow**  
Deliverables in progress
- Red**  
Deliverables not started

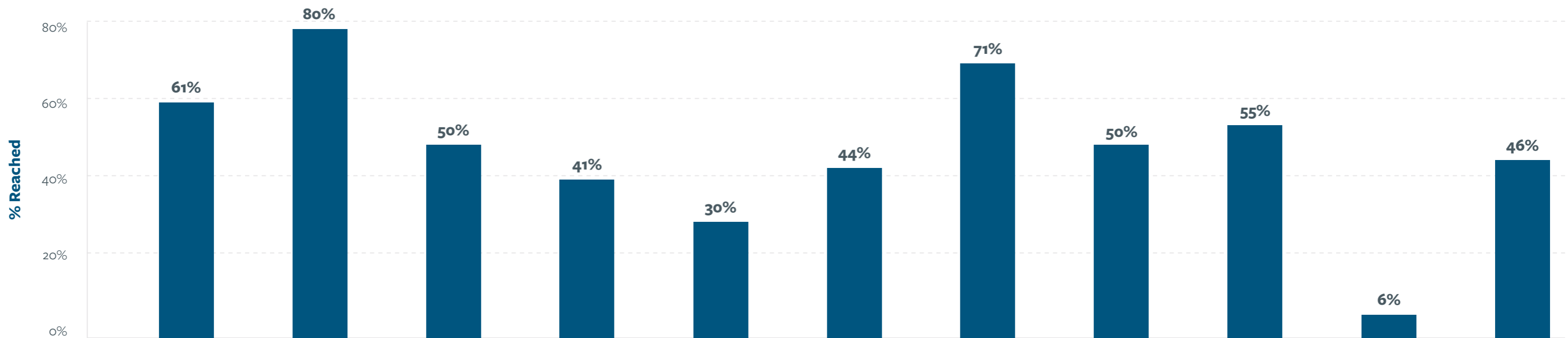
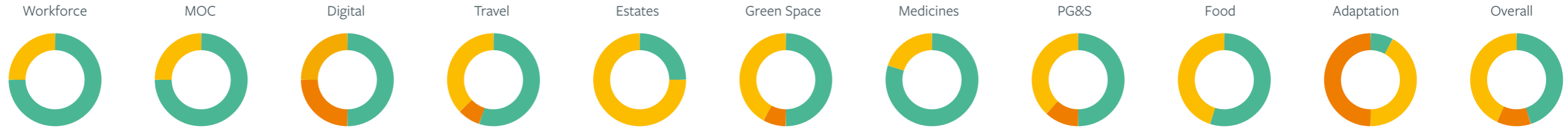


Figure 1. Percentage progress of the the Hampshire Hospitals NHS Foundation Trust Environmental Action Plan.

MOC = Sustainable Models of Care. PG&S = Procured goods and services.



3) The main challenges to effective adaptation strategies, as outlined by The Climate Change Committee [14] and the Extreme Heat Risk Governance Toolkit [15] are:

- Limited and disconnected financial mechanisms that do not facilitate multi-year financial planning
- Fragmented, uncoordinated policies, and lack of enabling legislative or regulatory support
- Reactive, short-term management approaches
- Lack of clear roles and responsibilities
- Data gaps and lack of information integration and a clear and common taxonomy
- Inequitable impact on vulnerable populations

4) An exploratory thematic analysis was conducted by the THERMOCARE team on Hampshire Hospitals NHS Foundation Trust overheating incident data recorded across the Trust estate during Summer 2025. Incident reports were examined and risk implications were highlighted. The main themes identified are summarised in the table below:

Key Theme	Situation	Risk Implication
<b>Risk predictability</b>	Overheating incidents cluster in summer periods with clear seasonality.	Overheating is predictable and recurrent, requiring anticipatory action.
<b>System vulnerability</b>	Frequent incidents where internal temperatures reach $\geq 30^{\circ}\text{C}$ in clinical and treatment rooms.	Confirms significant estate vulnerabilities and increased patient safety risks.
<b>Monitoring &amp; detection</b>	Incidents triggered through recorded temperatures, alerts, or staff observations.	Monitoring works but early warning may still be constrained by local capacity.
<b>Preventive controls</b>	Recurring incidents in similar rooms indicate inconsistent control effectiveness.	Preventive measures insufficient under sustained heat, raising operational risk.
<b>Response &amp; escalation</b>	Actions are mainly local and reactive (fans, ventilation, estates escalation).	Reactive approaches raise risk of delayed escalation during severe heat events.
<b>Staff &amp; patient welfare</b>	Environmental issues recorded; welfare actions not consistently visible in data.	Data gaps may mask patient/staff welfare impacts during heat events.
<b>Learning &amp; debrief</b>	Recurring overheating incidents suggest only partially closed learning loops.	Persistent risks without full integration of learning into estate processes.

### Take Home Message

Overall, the case study highlights that Hampshire Hospitals NHS Foundation Trust has strong detection and response processes in place, but sustained heat events repeatedly expose structural and systemic limitations - underscoring the need for more proactive, long-term adaptation supported by clearer national governance, mandated expectations for heat-risk management, and sustained top-down investment to ensure the estate remains safe, resilient, and able to withstand future climate pressures.

### Key Recommendations

#### Strengthen NHS Climate Adaptation Support and Guidance

- Provide clearer, more detailed national guidance on climate adaptation beyond the high-level commitments in the NHS Green Plan, with financial mechanisms to support action.
- Embed adaptation requirements into core health policies, annual planning guidance, and Integrated Care System (ICS) assurance processes to increase organisational buy-in.
- Clarify roles, responsibilities, and minimum standards for Trust-level adaptation planning, supported by practical tools for risk assessment and anticipatory action.

#### Establish Dedicated, Ring-Fenced Funding for Adaptation

- Create multi-year, ring-fenced funding streams for climate-resilient estates and overheating mitigation to reduce reliance on reactive, high-cost interventions.
- Enable innovative financing models (e.g., public-private partnerships, matched funding) to accelerate large-scale estate upgrades.

#### Enhance Workforce Preparedness for a Changing Climate

- Integrate climate-risk management, heat-health awareness, and adaptation competencies into clinical and non-clinical training pathways.
- Prioritise Estates, Risk, and Emergency Preparedness, Resilience and Response (EPRR) teams in adaptation training to ensure ageing buildings are upgraded and new builds avoid overheating risks.
- Strengthen workforce resilience to protect patient safety, maintain service continuity, and reduce productivity losses during climate-related events.
- Formalise reporting and benchmarking across Trusts to support consistent data collection and measurement of the impact of corrective actions.

Compiled by the University of Southampton

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### Find out more:

[www.southampton.ac.uk/research/projects/thermocare-cost-effective-interventions-to-improve-heat-resilience-of-healthcare](http://www.southampton.ac.uk/research/projects/thermocare-cost-effective-interventions-to-improve-heat-resilience-of-healthcare)

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