Preventing overheating

Investigating and reporting on the scale of overheating in England, including common causes and remediation techniques
Preventing overheating

• Good Homes Alliance
• The study
• The findings
• Some examples
• Recommendations
The Good Homes Alliance is a group of housing developers, building professionals and other industry supporters whose aim is to close the gap between aspiration and reality by showing how to build and monitor homes, which are sustainable in the broadest sense.

Recent priorities have focussed on:

- low energy use
- health and well-being
- proof of performance
Good Homes

The GHA considers the design and construction of good homes in terms of the following physical characteristics:

- Monitoring and feedback are crucial in order to gather evidence and learn what works and what does not.
The study

A DECC funded study into concerns about overheating in homes in England, both old and new. Support from Homes and Communities Agency (HCA), the National Housing Federation (NHF), the Chartered Institute of Environmental Health (CIEH), DCLG and members of the Good Homes Alliance (GHA).

The aim is to:

- Identify the factors present with known cases of overheating in England
- Build a picture of the problem
- Highlight the types of dwellings that could be at risk
- Investigate some of the solutions presently used to avoid and tackle overheating.
The working group

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### The study - First stage

Build a picture of the problem, and identify some common causes.

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<th>Approached</th>
<th>Method</th>
<th>Responses</th>
<th>Results</th>
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<tr>
<td>• 207 Environmental Health Officers and 400 Local Authorities through CIEH</td>
<td>Online survey with mandatory questions about the respondent, reporting procedure, number of overheating instances encountered</td>
<td>126 responses: • 77 Environmental Health Officers • 26 housing owners and managers • 9 Local Authorities • 14 consultants</td>
<td>• 47 respondents (37%) have a reporting procedure for overheating • 61 respondents (48%) reported between 1 and 6 instances of overheating, totalling 185 instances</td>
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<td>• 1,200 Housing providers, through NHF</td>
<td>Optional questions detailing the overheating instances: location, dwelling type, age, tenure, construction, services and occupants.</td>
<td>The optional questions were answered on up to 90 of the 185 instances identified by the mandatory questions</td>
<td>• 73% in urban locations • 78% flats • 24% pre 1919 and 48% post 2000 • 48% private rented and 43% Housing Association • 68% heavy weight construction • more than half rely on window opening • nearly half have communal hot water system • 89% occupied during the day.</td>
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<td>• 40 GHA members</td>
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![Good Homes Alliance Logo](image-url)
The study - Second stage

Investigate 12 instances in more depth, exploring the detail behind the problems and the solutions considered.

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| 12 of the overheating instances selected from those revealed by responses to the first stage survey. | Online survey, with further questions detailing the 12 instances of overheating, how they were reported, problems experienced by occupants, solutions found. | • Three converted flats in pre 1919 buildings  
• One disability access post 2000 house  
• 5 post 2000 purpose built flats  
• 3 post 2000 purpose built sheltered housing flats | A number of stories revealing common risk factors, solutions considered, lessons learnt and barriers encountered. |
1. Overheating is a problem

185 instances of overheating are identified by this study. Nearly half of the 126 survey respondents each identified between 1 and 6 instances of overheating in homes. These are mainly in two particular housing types, the majority of which are in urban locations and occupied during the day:

- Converted flats
- Newly built flats
2. The occupants experience significant discomfort

- 89% of instances are occupied during the day
- Those most vulnerable are the elderly, disabled, very young, plus those with chronic illness or on medication.
- Occupants contribute to internal heat gains, but their activities are nothing unusual for a modern lifestyle.
- Occupants need support to understand how to be comfortable in their homes during warm weather.
3. Urban flats are most at risk
3. Urban flats are most at risk
4. Overheating can be solved

Location, form and layout – difficult to change

Solutions

• Reducing heat gains from windows
• Reducing heat gains from hot water distribution
• Providing effective ventilation, even replacement of windows

Pre-1919 flats – insulating roof spaces
New flats – reducing glazed area, mechanical ventilation in flats and corridors

Prevention

• Use of design guidance
• Modelling and good design skills – think about possible unexpected consequences
5. The reporting process needs improvement

Only 47 of 120 respondents have a process in place for reporting and dealing with overheating.

It is possible that many more complaints of overheating never reach the right person, or go unreported.

The processes for dealing with overheating and other hazards are difficult to access and apply, and at a time of cuts in Local Authority staffing levels, this is likely to become more difficult.
Examples

1. Converted flat above a shop

Problem
- Large south-facing windows and 98% unopenable
- Elderly woman, home all day
- Disturbed sleep

Solutions
- Heavy curtains on south-facing windows
- The provision of larger opening windows; Passive ventilation; Reduction in glazed areas.
- As this was in a conservation area changing its appearance would be difficult.

Process
- Complaint to council from tenant.
- 9 months
Examples

2. Converted first floor flat

Problem
• Faulty heating system and inadequate ventilation
• Occupants unable to open windows

Solutions
• Repairs to heating and hot water system, so that heating doesn’t have to be on to provide hot water.
• Repairs to windows, which were painted shut, so that they can be opened and provide ventilation; Extract ventilation provided to kitchen and bathroom.

Process
• HHSRS inspection and enforcement action against landlord
• 10 months
Examples

3. Converted top floor flat

Problem
• Bedsitting room in uninsulated loft space with large areas of glazing but no means of ventilation.
• Disturbed sleep and discomfort

Solutions
• Insulation fitted to roof
• Dormer windows fitted to provide ventilation.

Process
• Council inspection for HMOs
• Statutory notice and grant assistance
• 2 years
Examples

4. New build end terrace wheelchair accessible house

Problem
• Large southern aspect, insufficient roof insulation only lower half of windows openable.
• Avoiding use of rooms, children missing school due to lack of sleep.

Solutions
• Window opening, ceiling fans, portable air conditioning.
• Change halogen lights for LEDs – small improvement
• Plans to add external shading, insulation to sloping ceiling, solar glazing film, and possible extra internal thermal mass.

Process
• HA ‘Green Team’ contact visit
• Immediate and ongoing
Examples

5. New build high-rise flat

Problem
• Large areas of south facing glazing, plus insufficient and flawed ventilation.
• Occupant unable to sleep or use the flat properly, having to stay away for weekends in sunny weather.

Solutions
• External shades fitted.
• Existing windows replaced with openable ones (NB The architect did not originally want opening lights as it "would have spoiled the aesthetics of the building lines")

Process
• Request for inspection from occupant
• Negotiation with landlord and threat of enforcement action
• 8 weeks
Examples

6. New build sheltered flats

Problem
• Solar gain from windows, only 10% of which are openable.
• Corridors are also overheated due to heating distribution pipes.

Solutions
• Educating residents on how to control their heating and hot water system.
• Solar reflective film on the windows.
• Caretaker now opens the windows at either end of corridors
• Vertical mechanical ventilation ducts from the corridors to the roof – top floor residents now complain about the fan noise

Process
• Resident complaints and refused tenancies
• Recommendations from surveyors and engineers
• 3 years
Examples

7. Purpose built sheltered flats

Problem

• Centrally controlled communal heating and hot water, timed in a way that does not match lifestyles of the residents.
• Residents less able to control the system, or open windows.
• Uncomfortable living conditions and poor sleeping patterns

Solutions

• Wardens hold coffee mornings with residents and health visitors, to encourage better practice. (Little refurbishment due to cost and upheaval).
• Opening communal windows, and provision of drinks machines.

Process

• Reports from scheme wardens and housing teams
• Team meeting and concerns raised by health professionals
• No effective solution found yet
Examples

8. Sheltered housing

Problem
• Excessive heat and poor ventilation in corridors, stairwells and communal areas. Long corridors with only one window (openable 100mm) at one end. The hot water pipes and heating pipes run through the ceiling void over the ground floor corridor, then run through risers between each flat.
• Uncomfortable conditions in the circulation areas.

Solutions
• Fit LED lighting in corridors.
• Bespoke passive ventilation system with mechanical fresh air intake assistance to cool corridors. The three fire stair cases at each end of the corridors have been used to generate stack effect and drive ventilation.

Process
• Reports from occupants followed by inspections.
• 3 years.
Examples

9. New ground floor flat

Problem
• Insecure and inadequate window opening in south facing lounge and bedroom.
• Unable to use lounge and child’s sleep disturbed

Solutions
• Provision of new window to lounge, as an alternative to the glazed door
• Opening restrictors to new lounge window and bedroom window
• Trickle vents to new lounge and bedroom windows
• Passive ventilators within partition walls or doors to improve air movement through the flat.

Process
• Complaint from occupant followed by HHSRS inspection
• 8 months
Examples

10. New build low-rise flats (multiple) – unoccupied

Problem
• Long internal corridors with heating pipes running throughout and no access to natural ventilation.
• Many flats on the south side have no shading.
• Windows only 10% openable
• Not occupied yet, but already complaints from visiting housing managers

Solutions
• Investigating a system that works by evacuating excessive heat through the fire safety smoke ducts
• May need to consider a lot of external passive shades.

Process
• Visits by housing managers who reported back.
• Temperatures in the flats can be remotely checked.
• Ongoing
Examples

11. New build high-rise flat

Problem
• Single aspect flats with south facing unventilated winter gardens.
• This affects social housing units on first two floors of 12-storey block – the remaining private flats are provided with cooling.
• Tenants with health problems suffering discomfort and disturbed sleep.
• One tenant overrode restrictors on in winter garden - still not effective, and health and safety risk due to weight of casements.

Solutions
• Recommend fully openable windows in winter garden, to allow heat built up to be ‘dumped’.

Process
• Occupant complaints and enforcement action.
• No action yet taken since complaint in Aug 2011
Examples

12. New build low-rise flats (multiple)

Problem
• Large areas of un-shaded south-facing glazing.
• Lack of window opening, due to location on busy road.
• Lack of sleep, due to heat or noise/fumes if they open windows.
• Occupants avoid flat during the day, and avoid cooking

Solutions
• Solar film and opaque panels applied to some windows
• Bespoke ventilation system ducting cooler air from the North facing courtyard elevation into hallways and extracting hot air from living rooms/bedrooms.

Process
• Complaints from occupants to EH
• Modelling and specialist consultants
• 8 years - Ongoing monitoring
Recommendations

Significant risk of overheating in certain types of urban flats:

- Housing for vulnerable people should be prioritised.
- Any flat that has large areas of un-shaded glazing facing south, east or west.
- Any naturally ventilated flat where the windows are not opened, either because:
  - They are sealed
  - They are not fully openable (restricted to prevent falling)
  - Or where security, noise or outdoor pollution concerns prevent occupants from opening windows
- New blocks of flats having a single-aspect, leading from a central corridor, and where heating and hot water is distributed around the building.
- Older buildings that have been converted into small flats or houses of multiple occupancy. Particular attention should be paid to south and west facing flats and those on the top floors or attics.
Recommendations

Further work is needed on the following:

- A larger statistical study to identify those most at risk
- Development of a risk matrix relating to this and other performance risks
- Occupant surveys and calibration of perceptions with temperatures
- Improvements to reporting process
- Other dwelling types – sheltered housing, student accommodation, refurbishments
- Other measures – adaptation measures such as external shading, security grilles for windows; treatment of surroundings such as planting, noise barriers etc
- Design process – decision making processes, modelling assumptions particularly for small flats.
- Policy review – The role of planning and building regulations in preventing or driving overheating problems (high density and communal heating)
More information

Download the report from the GHA website:
www.goodhomes.org.uk

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