

Why are we asking these questions?

Motivations for questions in the Heatwise_{Sweden} online survey

In HEATWISE_{Sweden}, we study how indoor heat affects health and sleep, but also why some homes become particularly hot during heat waves. To be able to understand this, we need information about both the individual, the home, and the surroundings. Below we explain why we ask different types of questions in the online survey.

Background questions

We know from previous research that heat does not affect all people equally. Social, economic, and demographic factors can affect both exposure to heat and the ability to protect oneself.

Marital status

Marital status can affect how the home is used and how decisions are made about, airing, cooling, and sun protection. Single-adult households may have different opportunities and limitations than households with multiple adults. These differences are important for understanding variation in heat exposure and adaptation.

Country of birth

People who grew up in warmer climates may have different experiences with heat and have developed different strategies for dealing with high temperatures. Through this question, we can study whether previous climate experiences affect how heat is experienced and handled in Swedish homes.

Annual earned income

Financial resources affect the ability to invest in housing adaptations, for example in sun protection, cooling systems, or better ventilation. The data helps us analyse social differences in heat sensitivity and identify groups that may find it more difficult to protect themselves during heat waves.

Number of persons in the household

More people in the household often means more internal heat from bodies and household activities. At the same time, overcrowding can limit the possibility of choosing cooler rooms for

rest and sleep. The information is needed to distinguish between building effects and effects of how the home is used.

Level of education

Educational attainment may be related to housing conditions, occupation, income, and access to information. The question helps to understand whether some groups are more exposed to heat than others, even in similar housing conditions.

Health and lifestyle

Heat can affect people differently depending on their health condition, physiology and habits. Information about health and lifestyle helps us understand the relationship between temperature and health.

Time indoors

The amount of time a person spends in the home determines how high the exposure to indoor heat will be. Two people living in the same home can have very different heat exposure depending on their work, leisure time and habits.

Self-rated health

People with poorer health may be more sensitive to heat. The question makes it possible to analyze whether heat has different effects depending on the individual's health status.

Body measurements (height, weight, waist circumference)

The body's ability to regulate temperature varies between individuals and can be affected by body composition. This data helps us understand physiological differences in heat resistance.

Diagnoses and Medications

Certain diseases and medications can impair the body's ability to regulate temperature, for example by affecting fluid balance or blood circulation. The information is central to identifying groups with an increased risk of heat-related ill health.

Alcohol and tobacco habits

Alcohol and nicotine can affect fluid balance, blood vessels, and the body's thermoregulation. These habits can therefore enhance the effect of heat and must therefore be considered in the analyses.

Living environment and building characteristics

This part is central to identifying which homes are heat-sensitive and why.

Type of dwelling, living space, ceiling height and floor plan

The size and design of the building affect how heat is stored, dissipated, and emitted. This information is necessary to be able to model differences between different types of housing.

The bedroom floor?

Bedrooms on higher floors often get warmer. Since sleep is a key health outcome in the study, this information is important.

Year of construction and renovations

The year of construction reflects differences in building codes, materials, insulation, and ventilation, which affects how the home handles heat. Renovations can both improve and deteriorate a home's thermal properties. The information is needed to correctly interpret the actual performance of the building.

Ventilation and Mandatory Ventilation Control (OVK)

Ventilation is of great importance for indoor temperature and air quality. Data on OVK helps us identify homes where ventilation may be poorer, which can contribute to higher indoor temperatures.

Perceived draughts

Draughts may indicate leaks or lack of insulation, which can affect the temperature stability of the home.

Energy class

Energy class provides an overall picture of the building's energy performance and can be related to how well the home can withstand both cold and heat.

Façade material

Façade materials affect how the building absorbs and stores heat. For example, brick, and concrete can retain heat longer than wood, which can make indoor temperatures higher during heat waves. The information helps us understand how the building's construction affects the indoor climate.

Cooling, windows and solar radiation

This part of the survey focuses on how solar radiation, windows, and technical solutions for cooling affect the indoor temperature in the home. Solar radiation is one of the main causes of high indoor temperatures during heat waves, and small differences in window design or sun shading can lead to large differences in how hot it gets indoors.

Access to and use of cooling systems

Cooling systems such as air conditioning and air source heat pumps can greatly affect indoor temperature. The data helps us understand how different households handle heat.

Location of portable air conditioner

The placement of portable air conditioners affects how heat is stored and dispersed in the home. By mapping where air conditioning is used, we can analyze how people prioritize cooling in their homes during heat waves.

Rooms where air conditioning is used

The information helps us understand how cooling is prioritized in the home.

Window alignment and sun protection

Window orientation contributes a lot to the indoor temperature. Solar radiation varies greatly with the direction of the window and is an important factor for indoor temperature.

What is the most common type of window in your home?

The construction of the window affects both the insulating capacity and how much heat is let in through solar radiation. By collecting information about window type, we can analyze how the building's technical standard affects the indoor climate during both cold and hot periods, and identify homes that are particularly vulnerable to overheating.

View and shading from the living room window

What you see outside the window can provide important information about your home's exposure to direct sunlight. Vegetation such as trees and shrubs can contribute to shading and thus cooler indoor temperatures, while hardened or reflective surfaces such as asphalt and nearby buildings can amplify the heat load. This information helps us understand how the surrounding environment affects the indoor climate.

Possibility to open windows and balcony doors

The ability to open windows or balcony doors affects the ventilation in the home and thus how effectively residents can adjust the indoor temperature. Restrictions on the ability to ventilate can lead to higher and more persistent indoor temperatures, especially during hot nights.

Sun protection in the living room

Sun protection, both internal (e.g. curtains and blinds) and external (e.g. awnings), plays an important role in regulating indoor temperature. Exterior sunshades are particularly effective because they stop solar radiation before the heat reaches the home. The information is used to analyse which households have better technical opportunities to protect themselves against high temperatures.

Skylight in the bedroom

Skylights can have a major impact on indoor temperatures, especially in bedrooms, as they are often exposed to direct sunlight for much of the day. At the same time, skylights can contribute to improved ventilation if they can be opened. Through these questions, we can better understand how the design of the building affects both temperature and sleep environment.

Dimensions of bedroom windows

The size of bedroom windows affects how much solar radiation reaches the room and thus how hot it gets. By collecting information about window size, we can analyze how different housing designs contribute to variations in indoor temperature during heat waves.

Number of people in the bedroom

The number of people sleeping in a bedroom affects indoor temperature, as body heat helps to raise the temperature in a confined space. Small children can also affect the quality of sleep regardless of the temperature. This information helps us distinguish between the effects of heat and other factors that affect sleep.

Behaviors and adaptation strategies

This part of the survey focuses on how people's behaviors and everyday routines affect indoor temperatures. Even in the same type of home, behaviours can make a big difference to how warm it gets indoors.

Habits around using sunscreen

Using sunscreen on hot days can reduce solar radiation and thus prevent the home from heating up. Through these questions, we can analyze the extent to which this behavior is used and how effective it is in keeping indoor temperatures down.

Habits around window opening and cooling

Keeping windows and doors closed during the hottest hours of the day and opening them at night is an established strategy for cooling homes. The information helps us understand how common this behavior is and how it affects indoor temperatures in practice.

Sleeping habits and window opening at night

Sleeping with the window open can contribute to better ventilation and cooler indoor temperatures on hot summer nights. At the same time, noise, safety, allergies, or other factors can affect the decision to keep windows open. The question helps us understand what obstacles exist for night-time ventilation.

Use of heat-generating appliances

Household appliances such as stoves, ovens, and washing machines generate heat that can contribute to higher indoor temperatures. This information is used to analyze how everyday behaviors affect heat load in the home.

Questions about your residential area

This part of the survey is about how the area around the home can affect the ability to adapt to high temperatures.

Perceived safety in the residential area

Security can affect whether residents dare to have windows or balcony doors open, especially at night. People who do not feel safe may therefore have poorer opportunities to ventilate their home effectively, which can increase exposure to heat.

Experience of noise in and around the home

Noise from traffic, neighbors, or other sources can limit the ability to keep windows open, especially during the night when sleep is important for recovery. Through these questions, we can better understand how noise affects strategies for managing heat exposure.

Experience of air pollution in and around the home

Air pollutants such as car exhaust, dust and smoke can affect the willingness to ventilate, even though ventilation is important for cooling the home. Air pollution can also have direct health effects, especially for people with respiratory problems. The information helps us understand how these factors interact with heat exposure and the possibility of heat adaptation.

Thank you for your participation!


We are very grateful that you take part in HEATWISE Sweden. Your participation is crucial for us to be able to increase our knowledge about how indoor environments affect health during hot summer months. You are always welcome to contact us if you have any questions.

About the research project

- **Ethical approval:** The study has been approved by the Swedish Ethical Review Authority. **Reference number:** 2023-06091-01
- **Research principal:** Institute of Environmental Medicine (IMM), Karolinska Institutet
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 **Information about your rights**

Read more about your rights as a study participant, how we handle your personal data and what participation entails:

 **"Research subject information HEATWISE Sweden"** can be found on the website ki.se/en/imm/heatwise-sweden