**University of Leicester**

**Future 50 PhD Scholarship**

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| **Project Reference** | RI EF Cai |

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**Section 2 – *Project Information***

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| **Project Title** | *Feeling the heat*: a mixed-methods investigation into the impacts of indoor temperature during heatwaves on populations with chronic health conditions  |
| **Project Highlights:** | 1. | Establishing a maximum indoor temperature threshold to protect vulnerable people and manage heat-related immediate health risks for future heatwaves;  |
| 2. | Using a holistic approach to investigating a wide range of factors that affect indoor temperature, from home outdoor environment, demographical profiles to personal perceptions and behavioural changes toward high temperature;  |
| 3. | Providing excellent inter-disciplinary training for the candidate on epidemiology, exposure/climate science, and qualitative research methods and producing robust evidence for policy discussion on the health impacts of climate change as well as approaches for heat disaster response |
| **Project Summary**  |
| As the climate changes, periods of high temperature (i.e. heatwaves) will become more frequent and more intense in the coming decades in the UK.The current Heatwave Plan for England is primarily informed by epidemiological evidence of outdoor temperature (as a proxy of individual exposure) to issue heatwaves alerts. It does not, however, consider the nuanced relationships between home outdoor and indoor temperature; the immediate health impacts of high indoor temperature; and differential perceptions and behavioural changes toward high temperature among individuals. There is currently no agreed threshold on indoor temperature in residential settings to protect health from heatwaves. Research is particularly needed among people with heat-sensitive health conditions, as they are more likely to stay at home and at higher risks to be hospitalised. The key question: does it exist a threshold of indoor temperature at which immediate heat-related symptoms start to emerge so both health professionals and at-risk groups can take actions to minimise the risk of hospitalisation or death? This study will use a sub-sample from the Leicester-based EXCEED cohort, consisting of 500-600 participants with chronic heart, lung, kidney diseases and diabetes. Thermometer will be installed in participants’ homes (living room and bedroom) in early 2024 and indoor temperature will be recorded on a daily basis (at hourly resolution) from May-September 2024. In different outdoor temperature periods (18–22°C, 22–26°C, 26–30°C, 30–34°C, >34°C), a telephone follow-up with questionnaires will be conducted to collect data on heat-related symptoms, perception towards indoor thermal comfort and behavioural changes. These data will then be analysed for three objectives: 1. To characterise the relationship between home outdoor and indoor temperature, and whether such relationship is modified by different housing types, socioeconomic positions and green/blue infrastructures nearby (e.g. parks, rivers, tree-lined streets);
2. To establish the exposure-response curves between indoor temperature and several immediate health outcomes of heat (e.g. anxiety, dry mouth, cramps, fatigue, nausea, headache, loss of consciousness, breathlessness, trouble sleeping, etc) in different disease groups;
3. To understand the varying perceptions and behavioural changes toward high temperature and qualitatively summarise possible routes for future interventions.
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