Engineering and Physical Sciences Research Council Doctoral Landscape Award

PROJECT TITLE: Sensors to assess indoor environmental quality and impact on health in homes of asylum seekers and refugees

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Project details:
Background and motivation: Asylum seekers and refugees (ASRs) experience poor physical and mental health at higher rates than the general population [1, 2], and are housed in poor quality accommodation in the UK. Housing, including indoor environmental quality (IEQ), is a significant health determinant. While previous research has investigated environmental conditions and health impacts on ASRs in refugee camps, no research has focused on conditions in ASR housing in the UK, despite widely reported environmental risks. Domestic sensor systems (non-intrusive environmental sensors that measure indoor temperature, relative humidity, and carbon dioxide, and other IEQ measures, at high temporal frequency), can be used to collect high-quality data on IEQ. This project builds on several projects (including ESPRC-funded SenseWell) on using domestic sensor systems to support healthy homes and identify risks (e.g., damp and mould) [3,4], working in the novel setting of ASR housing to identify environmental risks and health impacts for a vulnerable population.

Vision and objectives: This project will focus on assessing the environmental conditions of ASR housing and their impacts on health, with objectives: Evaluate the overall condition of indoor environments and housing quality in UK ASR housing Explore the relationship between health and IEQ for ASRs in the UK Determine ASRs' perceptions of how IEQ impacts health, and their attitudes towards domestic sensor systems

Research programme and approaches: This project will work with refugee support organisations (e.g., Devon & Cornwall Refugee Support and Oasis Cardiff), to aid recruitment and signpost participants to support as needed.

This mixed-methods project will have 3 main elements:
National survey assessing domestic environmental quality, including ability to heat and presence of mould, for ASRs, compared with a national dataset.

Measurement of IEQ in both winter and summer (capturing seasons for damp, mould, and overheating) in up to 10 refugee homes; regular measurement of resident health. Time-series characteristics will be extracted for each IEQ measure, including descriptive statistics. Relationships between these characteristics and health will be assessed using methods such as multiple regression and lagged correlation. In addition, the IEQ measures will be compared with health guidelines and national measures where available.

Assessing the acceptability of sensors to monitor IEQ for ASRs, and the perceived impact of indoor environments on health, through interviews (qualitative analysis).

[1] E. J. Hadgkiss and A. M. N. Renzaho, "The physical health status, service utilisation and barriers to accessing care for asylum seekers residing in the community: A systematic review of the literature," 2014, CSIRO. doi:10.1071/AH13113.

[2] R. Blackmore et al., "The prevalence of mental illness in refugees and asylum seekers: A systematic review and meta-analysis," PLoS Med, vol. 17, no. 9, p. e1003337, Sep. 2020, doi:10.1371/JOURNAL.PMED.1003337.

[3] T. Menneer, M. Mueller et al., "Modelling mould growth in domestic environments using relative humidity and temperature," Build Environ, vol. 208, p. 108583, Jan. 2022, doi:10.1016/J.BUILDENV.2021.108583. [

4] T. Walker et al., "Indoor environment sensor systems for healthier homes: a feasibility study in social housing," Hous Soc, vol. 51, no. 3, pp. 260–286, 2024, doi:10.1080/08882746.2024.2386480/SUPPL_FILE/RHAS_A_2386480_SM5910.DOCX.

Project specific entry requirements: n/a

Potential PhD programme of study: PhD in Public Health

Department: Public Health and Sport Sciences

Location: Penryn Campus, Peter Lanyon Building

Please direct project specific enquiries to: Gesche Huebner, g.huebner@exeter.ac.uk

Please ensure you read the entry requirements for the potential programme you are applying for.

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