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CALL FOR PAPERS: special issue

Health Inequalities and Indoor Environments

Guest editors:

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Deadline for abstracts: 12 July 2023

Aims

The aim of this special issue is to enhance our understanding of the roles that indoor environments play in creating, exacerbating or ameliorating the underlying socioeconomic and health inequalities in the context of climate change. It seeks optimum pathways to fulfil the societal need of access to healthy indoor environments for all (e.g. homes, workplaces, schools, etc).

Background / context

The indoor environment is a key modifier of environmental exposures, for example, to heat/cold and air pollutants, and a magnifier of existing inequalities and inequities in energy, fuel, resources, health and wellbeing worldwide (Vardoulakis *et al.* 2015). A key focus for indoor environments is factors related to indoor environmental quality (IEQ), such as temperature, air quality, sound, light etc. Whilst the relationship between the social determinants of health and environmental conditions has been widely recognised in recent decades, thus far most research and policy efforts have focused on the outdoor environment, in particular ambient air pollution mitigation.

The Covid-19 pandemic is a stark reminder of the pressing social imperative to create healthy indoor environments, especially for those most at need, and exposed structural disadvantages faced by the most at-risk groups (Rosenthal *et al.* 2020). The 2020 Marmot Review stressed the need to bring together the agendas of climate change resilience, air pollution mitigation and social determinants of health and health equity (Marmot *et al.* 2020), which has also been reflected in the work of other authors at different scales (AlWaer *et al.* 2021, McPhearson *et al.* 2022). Given their complex interrelationships, IEQ factors (*i.e.* thermal, visual, acoustic, air quality characteristics) should not be viewed and studied in isolation. It is also important that we reflect on the historical evolution of concepts of health and wellbeing in relation to the built environment (at various scales), how these have changed over time (Rohde *et al.* 2020).

Globally, a positive association exists between social deprivation and exposure to harmful air pollutants (Hajat *et al.* 2015). This could be due to lower income households living in higher outdoor pollution areas, using solid fuels for cooking or heating particularly in the Global South, and substandard housing characterised by dampness and mould, lack of hygiene and sanitation, high smoking rates, overcrowding (Tunstall 2015), furnishings that off-gas dangerous contaminants, and limited ventilation potential due to design and/or perceptions of an unsafe neighbourhood (Ferguson *et al.* 2021).

Global climate change projections predict increases in the frequency and severity of extreme weather events (heatwaves, storms, flooding, etc) which will exacerbate inequalities and inequities worldwide, both across and within countries. Other climate change-driven changes in temperature and precipitation could also deteriorate ambient air pollution (ozone and particulate matter), in turn potentially increasing the ingress of heat and air pollutants indoors. The countries that have been least responsible for historically producing greenhouse gas emissions, many of them located in the Global South, are likely to be worst hit by climate change effects, such as excess heat (Althor *et al.* 2016). A vicious circle exists whereby underlying inequalities result in disproportionate climate change induced adverse effects for socially and geographically disadvantaged groups, thus further aggravating inequalities (Ebi and Hess, 2020). Socially deprived households are more likely to live in regions facing drought and water scarcity, flood prone areas and colder, damp homes they are unable to

heat (winter fuel poverty), have limited access to energy retrofit opportunities (retrofit poverty), live in overheating prone homes in urban heat island hotspots with lower quantity and quality of green and blue infrastructure (Hsu *et al.* 2021), and have limited cooling means (summer fuel poverty). Low-income individuals are also likely to be exposed to heat stress due to their occupation or daily tasks they routinely perform (*e.g.* outdoor labour).

In order to mitigate climate change, building stocks and neighbourhoods are expected to undergo significant transformations in order to improve their energy efficiency, reduce their heating/cooling needs and associated carbon emissions. However, there are significant knowledge gaps around the optimum pathways for equitable and effective building retrofit that does not compromise occupant health and wellbeing.

Suggested topics

This Special Issue will present state-of-the-art research across geographic and climate contexts, both in the Global South and Global North, on the positive or negative role that the indoor environment (*e.g.* home, workplace or school) plays in social equity and human health and wellbeing. We welcome multi- and trans-disciplinary perspectives that offer an in-depth understanding of complex sociotechnical dynamics that drive inequalities and inequities in the built environment, whilst maintaining a robust foundation in engineering-led indoor environment science. Contributions should enable fundamental advances in the scientific understanding of:

- a) the main factors affecting inequalities and inequities in indoor environmental exposures, and their effects on human health and wellbeing, under a changing climate
- b) systems for identifying and monitoring areas of high risk
- c) optimum pathways and policies to create healthy, safe indoor environments for all

Potential topics could focus on a specific scale of the indoor environment (building scale, neighbourhood scale and the indoor/outdoor interface, regional scale) or examine cross-cutting areas. They include but are not limited to:

Exposure assessment at the indoor/outdoor continuum

- Understanding the complex and variable nature of human exposures to harmful environmental factors, *e.g.* excess temperature (heat/cold) and pollutants at the indoor/outdoor continuum
- Novel synthesis and data linkages of existing indoor-outdoor environmental and population datasets

IEQ assessment at the building level

- New data or analysis, in the context of inequalities, of indoor environmental exposures across or within building types, geographic regions, in relation to characteristics that stratify health opportunities and outcomes (*e.g.* place of residence, socioeconomic status, demographic data, etc.)
- Development of novel monitoring, metrics and frameworks for IEQ or fuel poverty assessment that embeds socioeconomic characteristics and inequalities
- Risk perception, awareness and behaviour change in relation to indoor environmental exposures across vulnerable groups
- Tensions between environmental sustainability and health agendas

Regional analyses

- Comparative studies and statistical analysis of inequalities and environmental exposures as modified by indoor settings at the regional level, and with a focus on vulnerable groups
- Comparative studies of spatial variations in inequalities and environmental exposures across and within geographic areas
- Building stock levels analysis of different types of inequalities/inequities related to the built environment: space inequalities (*e.g.* overcrowding) and the ways these may intersect with IEQ, winter and summer fuel poverty, access to green infrastructure

Meta-analyses and identification of knowledge gaps

- Critical analysis of the ways in which indoor environments/buildings, are incorporated in existing reviews on inequalities, including in systematic reviews of health-driven primary research
- Reframing environmental exposure factors, such as building quality, as environmental inequality

Policies, tools, instruments and frameworks

- Policy-relevant tool development for the identification and assessment of built environment factors affecting inequalities, including the development of IEQ or fuel poverty indicators
- Asset and portfolio management tools to identify key issues with IEQ parameters across several buildings (*e.g.* homes, workplaces or schools), and thus prioritise interventions to reduce inequalities accordingly.
- Policies and strategies (including financial mechanisms and planning assessments) aiming to reduce inequalities related to indoor environments
- Policy evaluation studies
- Case studies, for example on grassroots initiatives such as community-led housing design and retrofit schemes, or nature-based solutions, through an equity lens

Briefing note for contributors

You are invited to submit an abstract for this special issue. Please send a **500 word (maximum) abstract** to editor **Richard Lorch** richard@rlorch.net by **12 JULY 2023**. Your submission must also include these 3 items:

- the author's and all co-author's names, institutional & departmental affiliations and contact details
- the specific question(s) in this Call for Papers that the abstract and intended paper address
- the abstract (500 words maximum) defining the research question(s), scope, methods and (expected) results

Abstracts will be reviewed by the editors to ensure a varied, yet integrated selection of papers around the topic. Authors of accepted abstracts will be invited to submit a full paper (6000-7500 words), which undergoes a double-blind review process.

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Questions?

If you have a question, please contact: **Richard Lorch** richard@rlorch.net, **Anna Mavrogianni** a.mavrogianni@ucl.ac.uk or **Marcella Ucci** m.ucci@ucl.ac.uk

Timeline

Deadline for abstract submission	12 July 2023
Full papers due	12 Jan 2024
Referees' comments to authors	15 April 2024
Revised papers due	13 May 2024
Publication	July 2024

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