

Towards a Just Transition: Delivering Healthy Net Zero Homes

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My hats

- **Lecturer in Indoor Air – University of Leeds:**
Research and teaching in the social and physical dimensions of indoor air quality (IAQ)
- **Co-Founder & CEO – NAQTS:**
Developing IAQ monitoring technologies and testing services
- **Regional Clean Air Champion:**
Working across engineering, atmospheric, medical and social science to develop practical and fair solutions for air quality issues



Housing transitions

- Decarbonising the UK housing stock is essential to meet climate mitigation targets: housing is responsible for ~20% of total UK GHG emissions (DESNZ, 2022)
- UK building stock is among the oldest in Europe: 26.4 million dwellings (ONS, 2023)
- A huge campaign of energy retrofitting is already underway
- **Housing quality is a significant determinant of mental and physical health**



‘Just’ transitions

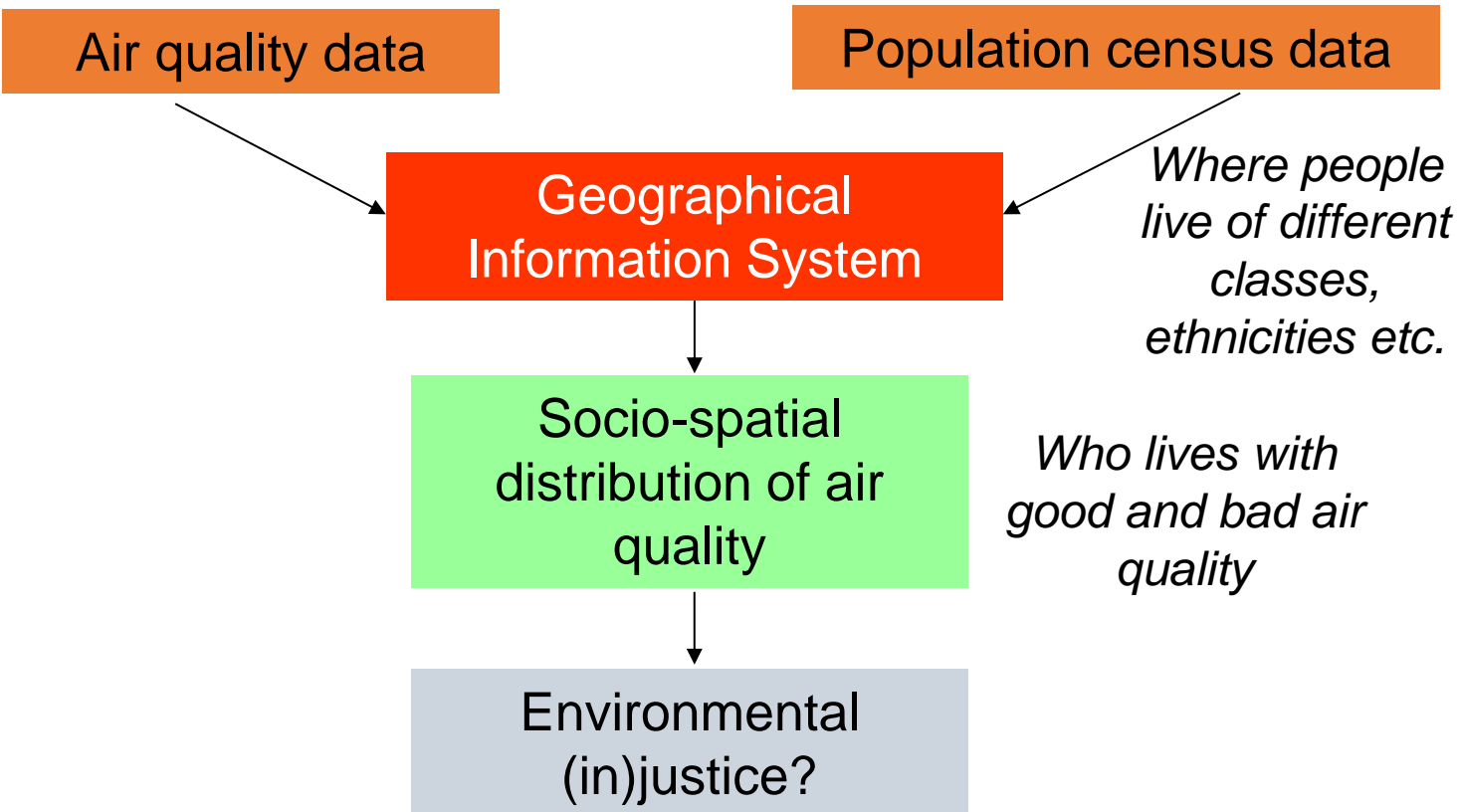
- “Ensuring no people, workers, places, sectors, countries or regions are left behind” in decarbonisation (IPCC, 2022)
- Several UK Government and devolved government administration commitments in place
- Some similarities with environmental justice?

Table 2: Different scales of just transitions

POST (2023) What is a just transition for environmental targets?

LARGEST SCALE	
International	“Common but differentiated responsibilities” between richer vs poorer nations, or compensation to undertake climate adaptation ^{60–63}
National	Inequalities between a country’s regions, how a country’s Nationally Determined Contribution (NDC) to reducing carbon emissions may affect some parts of the country more than others ^{64,65}
Regions & Cities	Exacerbation of inequalities within areas, phasing away from major regional industries or consequences of major changes for rural and urban areas (such as heavy industry or agriculture) ^{14,64}
Communities	Consideration of whether transitions increase deprivation, or how communities, or socio-economic groups, can benefit ⁶⁶
Individuals & Households	Job security, household income and household dependents, value for consumers or human rights
SMALLEST SCALE	

What is environmental justice?



This article is more than 6 months old

Air we breathe in UK depends on race and income, studies show

It is vital we tackle the injustice that means black or mixed-race people and the poor face worst pollution



There are important differences in air pollution between the richest and least well-off areas. Photograph: Joe Giddens/PA

How are retrofitted homes affecting health inequalities, and claims of justice?

Unintended consequences: IAQ-energy-health nexus

- More energy efficient homes require higher levels of air tightness to prevent heat loss
- Fuel poverty may reduce BUT high levels of air tightness can result in a significant unintended consequence: poor IAQ
- “Air tight, ventilate right”

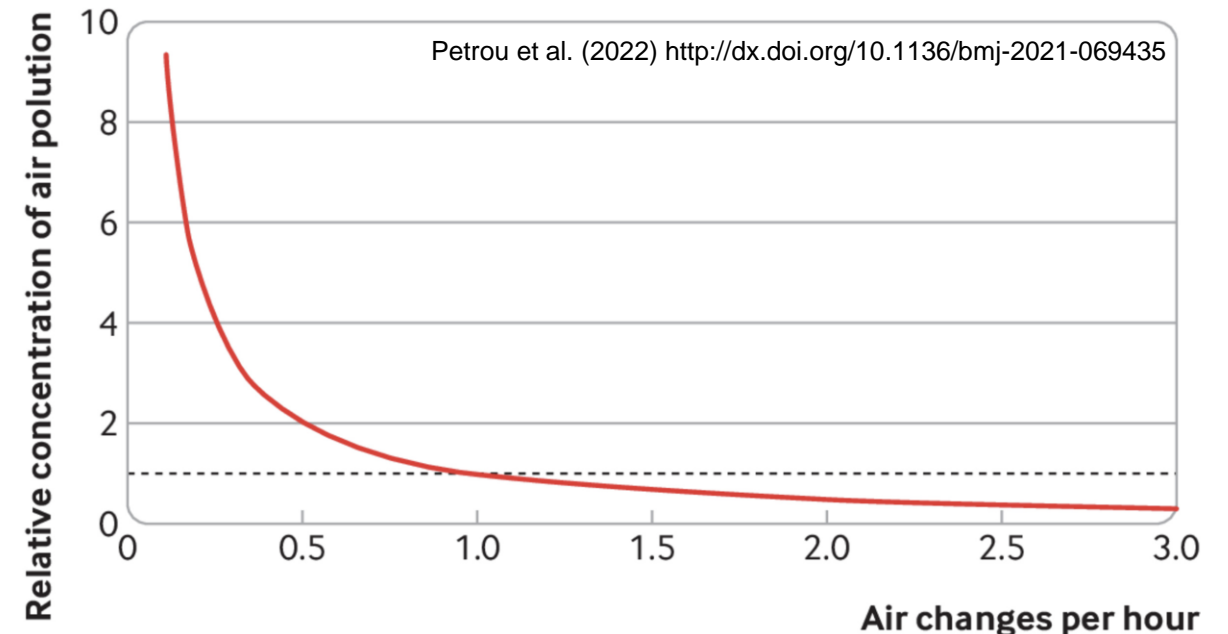
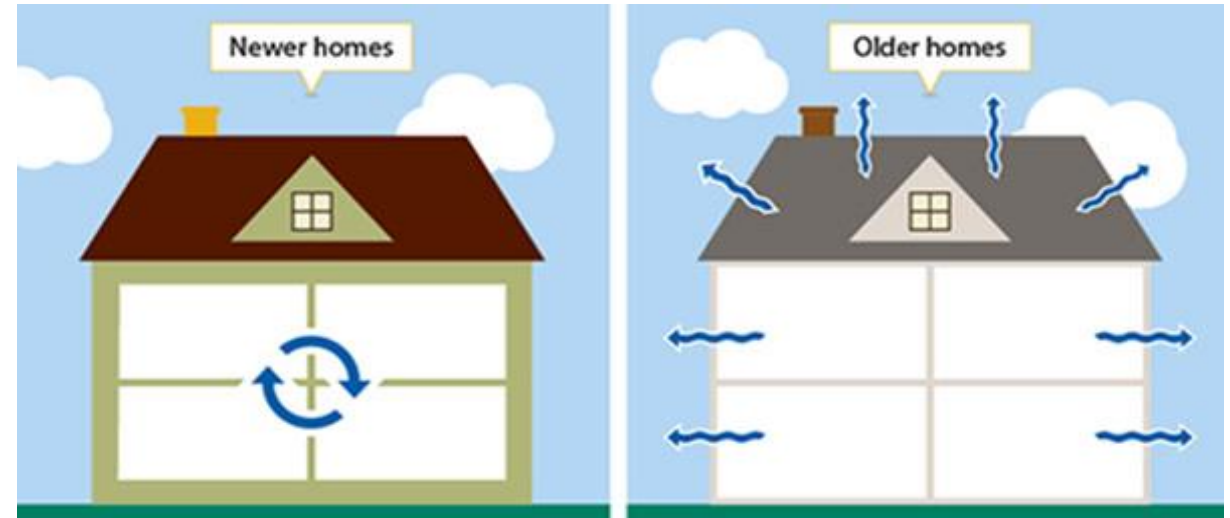
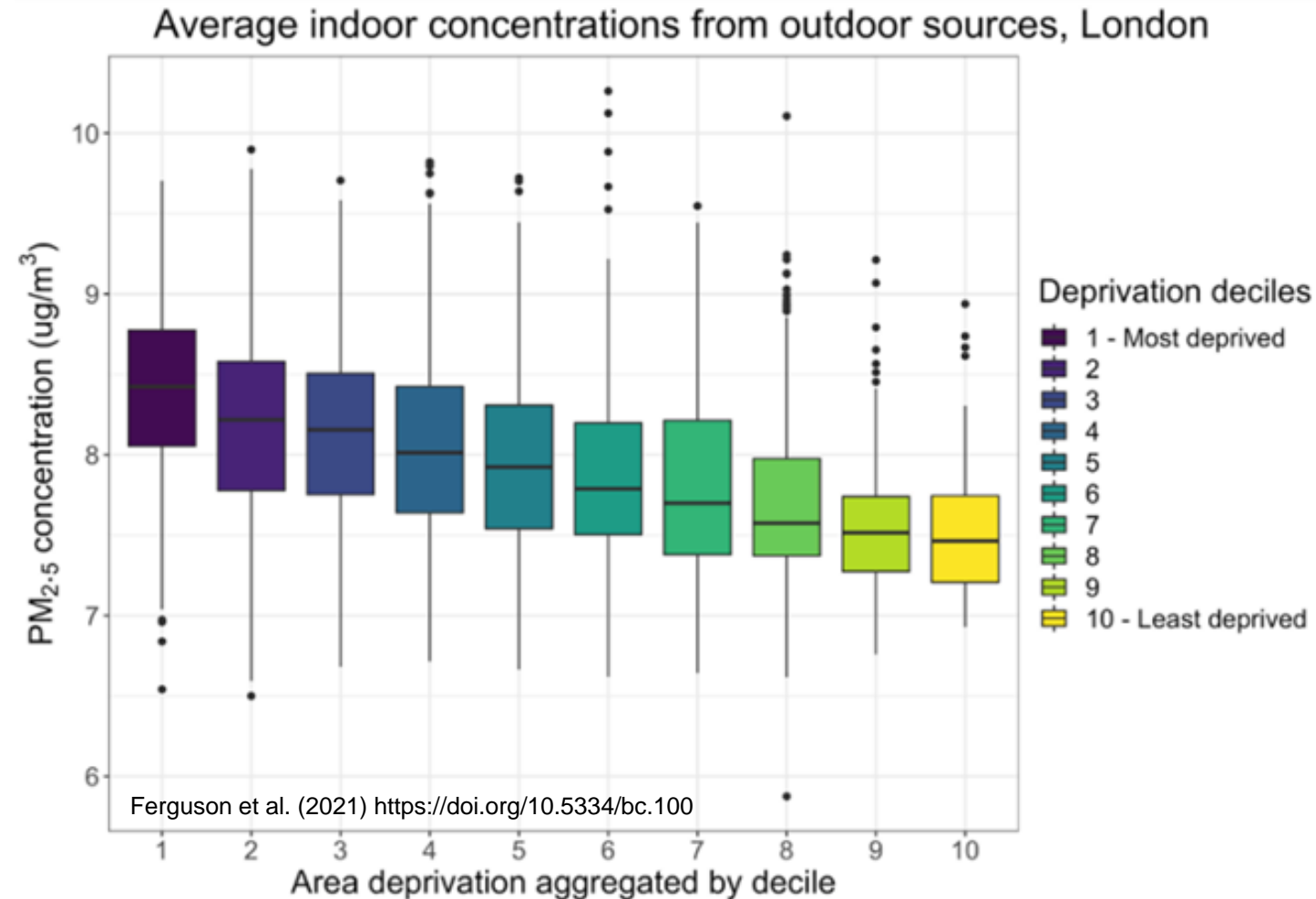


Fig 1 | Change in indoor pollutant concentration as a function of air exchange rate. Relative pollutant concentration=1 at 1 air change per hour (broken line)

Unequal adaptive capacities

- Ventilation alone may be insufficient to improve IAQ for some vulnerable households
- Higher local outdoor temperatures which magnify overheating risks / summer energy poverty
- Poor outdoor air quality
- Retrofitting needs to consider household circumstances and capabilities



Delivering Healthy Net Zero Homes

- We need to decarbonise housing while promoting healthy homes
- Beware unintended consequences on health, health inequalities, and just transitions
- What is a just transition for healthy net zero homes? Can we learn from the environmental justice movement?
- The future of residential indoor air quality and its environmental justice implications. Dr Amber Yeoman in the *Clean Air: The Need for Multi Sector Actions Panel Session* (Elgar 15:45-17:15)

