



Editorial

Social Inequalities in Asthma: The Cold Facts



There are stark inequalities in asthma outcomes for children in the UK. Children growing up in the UK in disadvantaged circumstances are 70% more likely to develop persistent asthma,¹ more than two times more likely to suffer severe asthma² and more than three times more likely to be admitted to hospital for their asthma.² These inequalities are greater in the UK than in many other European countries. Asthma itself also contributes to a substantial proportion of missed school and work days, and can reduce school attainment, impacting health and life chances in adulthood. In the context of a perfect storm of crises for child health in the UK,³ what are the implications of the fuel poverty crisis for childhood asthma?

Fuel Poverty in the UK

Rising costs are increasing fuel poverty in the UK. A household is said to be fuel poor when families cannot afford to heat their home to an adequate temperature. The UK has been particularly affected by the energy crisis due to its high dependence on gas for energy production. What's more, four out of five homes in the UK are still heated by gas boilers and the UK's housing stock has the lowest energy efficiency in Western Europe.

The metrics used to define fuel poverty vary across the four UK nations, making it difficult to obtain a summary measure for fuel poverty in the UK. In England, a household is considered fuel poor if they are living in a home with a low energy efficiency rating and they are left with a residual income below the official poverty line after heating their home. According to this definition, 13.4% of households were estimated to be in fuel poverty in 2022, up from 13.1% in 2021 and predicted to increase further to 14.4% in 2023.⁴ However, since this definition does not allow households living in reasonably energy efficient homes to be classified as fuel poor, the true burden of fuel poverty in England is likely to be higher. For instance, 30.3% of homes in England spent more than 10% of their income on energy costs in 2022.⁴ In Scotland, where a more inclusive definition of fuel poverty is employed – a household must spend 10% of its income on fuel and its remaining income must be insufficient to maintain an adequate standard of living – 25% of homes were estimated to be in fuel poverty in 2019 and this is predicted to have increased to 35% in 2022.⁵

Disadvantaged children in the UK are particularly vulnerable to the impact of fuel poverty. For example, according to the government's definition, 42.3% of all fuel poor households in England in 2022 had one or more dependent children (which corresponds to 1.4 million households and 19.6% of all households with children); 26.4% of single parent households were fuel poor.⁴

Cold Homes and Social Inequalities in Asthma

Cold homes contribute to social inequalities in asthma, whereby individuals from socio-economically disadvantaged backgrounds are both more likely to develop asthma and to suffer worse asthma outcomes. Growing up in disadvantaged circumstances in the UK almost doubles the risk of children developing persistent asthma, with most of the inequality explained by early years perinatal and environmental factors.^{1,6} From a life course perspective, the impact of the cold is particularly harmful in early life, in part due to impacts on immature respiratory and immune systems.

Cold homes can directly contribute toward social inequalities by increasing respiratory symptoms, particularly among individuals with asthma.⁶ They can also contribute toward inequalities by increasing susceptibility to respiratory tract infections. Lower temperatures increase the transmissibility and viability of viruses,⁷ and potentially also affect host susceptibility and impair innate immune responses to respiratory viral infections.⁸ Not only are respiratory viral infections a major trigger for asthma exacerbations,⁹ early-life respiratory infections, particularly lower respiratory tract infections, are also associated with an increased risk of both the development of asthma and lower lung function in childhood.¹⁰ Furthermore, lower lung function during childhood has itself been associated with an increased risk of chronic obstructive pulmonary disease (COPD) by middle age,¹¹ and early-life lower respiratory tract infections with an almost two times increased risk of premature adult death from respiratory disease.¹²

Since cold air is able to absorb less moisture, cold homes also contribute to social inequalities in asthma by encouraging mould and damp. Visible mould and mould odour have been associated with an increased risk of the development and exacerbations of asthma.¹³ Measures to retain the heat in homes, such as keeping windows shut, may also encourage mould and levels of other indoor pollutants by reducing ventilation. Even measures to improve the energy efficiency of homes, for example insulation, can encourage mould and levels of other indoor pollutant if ventilation is inadequate.¹⁴ The tragic death of 2-year-old Awaab Ishak in the UK in 2020 caused by a severe respiratory condition as a result of prolonged exposure to mould in his family home highlights the serious health effects associated with living in a mouldy damp home.¹⁵ There is evidence that remediation of mould-damaged houses decreases asthma-related symptoms, the use of asthma medication and respiratory infections.¹⁶

Multiple Pathways to Inequalities

As British households struggled to cope with the effects of the energy crisis this winter, they were often advised by money saving experts to “heat the human, not the home”. However, the simplistic notion that fuel poverty can be tackled by practical measures

to keep the body warm overlooks the clustering of multiple risks associated with poverty that impact the health of children growing up in cold homes. This includes, for instance, poorer nutrition and housing conditions, exposure to ambient air pollution and tobacco smoke, maternal mental health and access to services. These pathways do not act independently, but are intertwined, and often interact to further exacerbate risks.¹⁷ For example, poverty, poor housing conditions and cold homes negatively impact mental health. Maternal and childhood stress and anxiety have been associated with an increased risk of developing asthma and evidence suggests that early-life and chronic psychological stress increases inflammatory reactivity to environmental stressors such as indoor and outdoor air pollution.

Supporting Fuel Poor Homes

Although families with asthma may be aware of the risks associated with cold, damp homes, they often face considerable barriers to mitigate those risks. These barriers were highlighted in a qualitative study called Warm Well Families conducted in the winter of 2012/2013 among families living in Northern England facing fuel poverty and with children with asthma.¹⁸ The study highlighted the conflicting priorities many households have, such as the need to prioritise paying the rent or mortgage over heating the home. In addition, there were also fears of debt, which led some families to limit their use of heating and/or use more costly prepayment meters. Furthermore, although there was some awareness of the effect of air quality and mould on asthma, there was a lack of knowledge regarding temperature and asthma. Families also received conflicting information from professionals. For example, a family may receive advice from one professional to open windows to improve ventilation, air quality and reduce mould, but advice from another professional to close windows to avoid exposure to allergens. Furthermore, professionals were often unaware of the challenges families faced in managing their household budget. These findings highlight the need for more targeted, easy to understand and accurate information and support for households, which considers the trade-offs households facing fuel poverty experience.

Addressing inequalities in childhood asthma in the UK will require concerted efforts to improve the structural and social determinants of childhood respiratory health, including fuel poverty and cold homes. The fuel poverty crisis is solvable with governmental policies. Scandinavian countries have some of the lowest levels of fuel poverty in Europe despite having some of the coldest winters. This is due to a mixture of high energy efficiency of the housing stock, district heating, energy costs often being included as a fixed component of monthly rent, and a strong social support system, with regulations to ensure a minimum indoor temperature for all households.¹⁹ Unfortunately though, there is little evidence of the same political will in the UK. For example, in England, the move toward net zero carbon includes an ambition to improve the energy efficiency of all fuel poor homes by 2030, but the government is not currently on track to reach this target. In fact, recent analysis based on data released from the Department for Business, Energy and Industrial Strategy and a revised estimate of the number of fuel poor homes in the UK, suggests that 95% of fuel poor homes will remain fuel poor in 2030.²⁰ Moreover, the non-governmental organizations (NGOs) National Energy Action and Energy Action Scotland have warned that unless lower income families are provided with more support to move toward net zero, there is a real danger that the UK will fail to reach its target of net zero by 2050, lower income households will be left behind, and inequalities will widen.

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Conflict of Interests

The authors state that they have no conflict of interests.

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