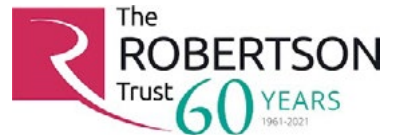




HEALTH, HOUSING AND FUEL POVERTY



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INTRODUCTION

FUEL POVERTY IN SCOTLAND

Fuel poverty is a widespread issue in Scotland with 613,000 households estimated to be in fuel poverty while 311,000 households are estimated to be in extreme fuel poverty (Scottish Housing Condition Survey, 2020). Scottish Government estimates (February 2022) indicated that, as a direct result of rapidly rising energy prices, that it is now estimated that almost 900,000 households are in fuel poverty, of which almost 600,000 are in extreme fuel poverty.

Fuel poverty is not experienced only in the most deprived parts of Scotland but is also common in rural areas, amongst older people, single occupant households, and those using electricity as their primary source of heating fuel (Scottish Housing Condition Survey, 2020). Fuel poverty is prevalent in many socio economic groups in Scotland and rates remain stubbornly high.

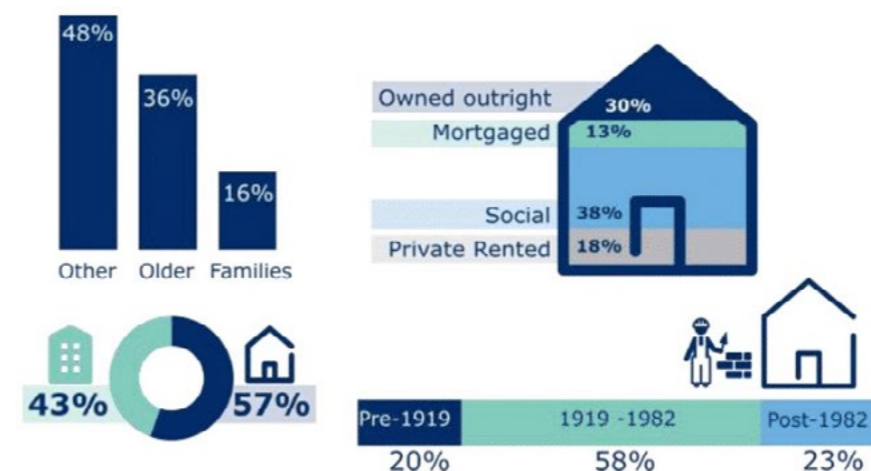
The issue of fuel poverty goes beyond ensuring households have adequate access to heating, but it is affected by the energy efficiency of their home and the affordability of energy itself. Where a person is unable to heat their home to a good comfort level it has a direct impact on their health. Even a slight decrease in indoor temperatures below 18°C could have a negative impact on health, it is not just at extremely cold temperatures health risks arise, but slight deviations have an effect as well (Gasparrini et al., 2015).

Fuel poverty has been associated in the development of early onset asthma in children, exacerbation of asthma, cognitive impairment, respiratory diseases, cardiovascular diseases, mental health issues, diseases amongst older groups and can have a number of other effects on the health of an individual (ScotPHN, 2016b).

Damp and mould conditions in households have also been linked to have negative health implications (WHO Europe, 2009). It seems vital that fuel poverty is eradicated as it negatively impacts the physical and mental health of all age groups but also corresponds to additional burden on NHS services through increased spending to deal with fuel poverty related health issues. It is estimated that fuel poverty costs Scotland £80 million annually (National Energy Action, 2020) and the National Housing Federation estimated that poor housing conditions costs the NHS £2.5 billion per annum (BRE, 2015). This is why much more resources are needed to tackle the monumental risks fuel poverty poses to people's lives, the health service and the economy.

PURPOSE OF REPORT

This report explores the different health impacts that arise due to fuel poverty including respiratory conditions, cardiovascular diseases, and mental health issues. This report considers the impact which fuel poverty has on different ages groups, the elderly, children, and students. Fuel poverty will be contextualised in terms of how it is linked to obesity, COVID-19, and winter mortality. The effects on health due to indoor dampness and mould will be examined. All these health issues identified will be connected through evidence present in research. The cost fuel poverty has on health-related issues will be discussed and its impact on the NHS reviewed. The report will consider how eradicating fuel poverty can relieve pressure on the health service and other tangible benefits.



Health implications associated with Fuel Poverty

CARDIOVASCULAR DISEASES

Low indoor temperatures could contribute to the development of cardiovascular diseases (CVD) due to vasoconstriction (WHO, 2018). Such health risks that may arise as a consequence are high blood pressure, stroke, ischaemic heart disease (IHD), heart attacks and in adverse conditions, mortality, especially during winter (WHO Europe, 2011).

An indoor temperature of above 18°C prevented 9% of hypertensive patients from developing high blood pressure in Scotland, whilst a temperature of below 16°C doubled the risk of high blood pressure in hypertensive patients and led to 4.5% of hypertension (Shiue and Shiue, 2014).

Moderately cold temperatures have shown to be when the highest mortality rates occur while extreme cold temperatures did not lead to as many deaths in the UK and other countries (Gasparrini et al., 2015). Even a slight deviation below the recommended indoor temperature of 18°C is considered to pose a threat to the health of individuals and contribute to higher mortality rates (Gasparrini et al., 2015).

As of 2018 it was estimated that 700,000 people lived with a Cardiovascular Disease (CVD) in Scotland, which is thought to have cost the NHS £800m in Scotland and cost economically £1.8bn (EHN, 2017). To alleviate pressure on the NHS and economy attributed to CVD, efforts should be made in ensuring that households do not have indoor temperatures below 18°C, while those living below such temperatures should be targeted to address this with measures such as insulation and heating upgrades to ensure energy efficiency and warmer homes, so that indoor temperatures are at an optimum level to prevent high blood pressure and other cardiovascular risks faced due to sub-optimum indoor temperature levels.

RESPIRATORY DISEASES

Mould and damp found in households have been associated to cause asthma, rhinitis, bronchitis, common cold, allergies, chronic obstructive pulmonary disease (COPD) and other respiratory diseases (WHO Europe, 2009). It is estimated that 368,000 people in Scotland are being treated for asthma, with a fifth being children (The Scottish Health Survey, 2020). Childhood asthma is a common chronic health issue in society, research shows that low temperatures, indoor damp, and mould exposure has a link to the development of childhood asthma (WHO Europe, 2011).

While the number of people with a COPD diagnosis is expected to rise to approximately 120,000 by 2030, as of 2011 this stood at 100,000 in Scotland (McLean et al., 2016). There are four times (8%) of adults with COPD living in the most deprived areas than compared to adults living in the least deprived areas (2%) in Scotland with COPD (The Scottish Health Survey, 2020).

Respiratory related infections are thought to cause a third of excess winter deaths (EWD) in England (Marmot, 2011), alongside the development of early onset asthma in children (WHO Europe, 2011). Furthermore, respiratory diseases pose a threat to the elderly population as a lack of indoor warm heating has been linked to respiratory symptoms developing (Marmot, 2011).

The cost of asthma in Scotland on the NHS is estimated to be £97.5m (Mukherjee et al., 2016), while the total costs excluding intangible costs of respiratory illnesses is estimated to be £1.1 billion in the UK (Mukherjee et al., 2016). The cost of treating COPD is estimated to rise to £207 million a year by 2030 in Scotland and stood at £182 million as of 2016 (McLean et al., 2016).

Better housing conditions can ultimately prevent the risk of respiratory diseases in children and the elderly. By tackling mould build-up and preventing dampness this would prevent asthma exacerbation or respiratory issues that are such a threat and prevalent in our society. This in turn could reduce the risk of exposure towards immunosuppressed or immunocompromised individuals and could reduce pressure on the NHS.

WINTER MORTALITY

Winter mounts a threat to fuel poor households as cold temperatures lead to a drop in household temperature and lead to a rise in household energy bills to have sufficient heating. In 2012, a third of Scottish households reported a lack of thermal comfort as their households were colder than they would have liked them to be during winter (ScotPHN, 2016a).

According to the World Health Organisation, 30% of winter deaths are attributable to cold indoor temperatures (WHO Europe, 2011) while about 10% or more of all winter mortalities are likely to be caused by fuel poverty (PHE, 2014).

30% of cold related deaths are due to respiratory diseases

40% of cold related deaths are due to cardiovascular diseases

(Marmot, 2011)

The impact of fuel poverty on health services is significant and measurable. For example, for every degree that the temperature drops below 5 degrees, there is a 19% increase in older people attending GP for respiratory infections (Marmot, 2011). This has serious consequences for primary care services both in areas with a high proportion of older people and also where the weather is colder, e.g. in remote rural locations.

The seasonal increase in mortality in Scotland during winter 2019/20 was estimated to be between 2,200 and 3,000 which excluded the impact of the COVID-19 pandemic (NRS, 2020). Chronic lower respiratory disease (350 deaths), pneumonia (230 deaths), coronary heart disease (210 deaths), other cardiovascular (160 deaths) and respiratory diseases (170 deaths) accounted for a large amount of winter deaths (NRS, 2020). Despite the UK not having as adverse winter conditions compared to Sweden, the UK experienced a 23% higher rate of excess winter deaths (PHE, 2014).

Due to the complexity of factors, it is difficult to conclude the clear and direct relationship between indoor heating and the prevention of winter mortality. However achieving adequate heating at the recommended indoor temperature may contribute to reducing the health risks linked to colder seasonal temperatures on all age groups, especially those facing fuel poverty. This is particularly true for those where it has been determined that there is a need for them to have an enhanced heating regime, e.g. older people, people with certain disabilities, people suffering for or recovering from cancer and other conditions where the immune system is compromised or families with very young children.

Indoor Dampness and Mould

Exposure to damp and mould results in the growth of various bacterial species, dust mites and fungal spores which can be toxic, triggering different immunological responses most commonly inflammation and continuous immune responses (WHO Europe, 2009), resulting in autoimmunity, causing asthma and other allergic conditions (WHO Europe, 2009).

Dampness and mould have been associated with compelling evidence in the worsening of childhood asthma. Evidence also shows that dampness is linked to respiratory infections especially in the upper respiratory tract like coughing, wheezing, allergic alveolitis, rhinitis, aspergillosis, bronchitis, and an array of health issues have been suggested to be linked to indoor dampness and mould (WHO Europe, 2009).

Early onset development of asthma is also linked to the presence of damp and mouldy conditions (WHO Europe, 2011). Building dampness and mould is considered to lead to a 30-50% increase in causing a range of respiratory and asthma related cases (Fisk, Lei-Gomez and Mendell, 2007).

The presence of moisture caused by water leakage, rainfall, condensation or flooding also contributes to bacterial growth. To prevent damp and mouldy conditions remediation should be carried out on households by proper wall and floor ventilation to avoid water leakage and that necessary action is taken to prevent the development of mould. Good standards of building maintenance are needed to reduce and reverse the harmful health implications which poor housing conditions can have on a household.

OLDER GROUPS AND FUEL POVERTY

The elderly population are particularly vulnerable to the effects of fuel poverty and the negative impacts that come with it. This is due to the likelihood of older groups suffering from underlying health conditions which can be exacerbated by low indoor temperature. Inadequate heating conditions can be detrimental to older groups as they can spend significantly more time in their homes, and this time is likely to increase over time (WHO, 2015).

In the UK during winter there was a 30% increase in mortality in those aged over 75 years old or older which could be linked to household cold-related deaths (Wilkinson et al., 2004). COPD in older groups (aged 65-74) had a prevalence of 11% compared to just 1% prevalence in younger groups (aged 16-44) (The Scottish Health Survey, 2020). Older groups are likely to benefit from living in warm households, as could the NHS as it may reduce hospitalisations, re-admissions or GP appointments by the elderly, preventing exposure to health risks that are associated with fuel poverty.

Child Health and Fuel Poverty

Children exposed to cold, damp housing conditions and inadequate levels of thermal comfort are also at risk of negative health consequences as they are still undergoing physical development. At a young age, fuel poverty can have varying effects on children such as asthma development, cognitive impairment, respiratory issues, poor mental health, unhealthy diet, slower physical growth, and many other direct or indirect consequences impacting child development.

In a study conducted in New Zealand examining the impact of low indoor temperatures on asthmatic children, it was revealed that low bedroom temperatures had more of a negative impact compared to living room temperatures in terms of children's lung function. In addition, a slight change in temperature led to changes in lung function, while temperatures below 12°C were shown to have the most adverse effects on children's lung function (Pierse et al., 2013).

In a pilot study conducted using NHS budgeting to examine the impact of improving energy efficiency through insulations on children's health, the interventions showed a reduction in respiratory symptoms displayed (Somerville et al., 2000). There was also an increase in school attendance after central heating installation as number of sick days reduced by 80% in children that showed respiratory issues (Somerville et al., 2000).

Children aged 3-5 years old living in inadequately heated accommodations or in poor state of repair were more than twice as likely (15%) to have chest, breathing, asthma or bronchitis problems than compared to children that did not live in cold, damp housing conditions (7%) (Liddell, 2009). Children living in cold housing conditions are 1.5 to 3 times more likely to develop asthma in comparison to children living in warm homes, while children living in cold homes are more than twice likely to have respiratory problems (Marmot, 2011).

It is of utmost importance that children live in conditions with the recommended indoor temperature and households without damp and mould as these factors are known to contribute to causing health problems. In addition to these considerations, what remains unknown is the indirect impact that fuel poverty has on a child such as on their mental wellbeing, stigmatisation, educational attainment, and other factors that may be because of fuel poverty. Fuel poverty can affect the health and growth of a child which is why urgent attention is needed in ensuring the most vulnerable households facing fuel poverty are supported to prevent the risks posed that affect their not only day to day lives but their future wellbeing.

IMPACT OF FUEL POVERTY ON STUDENTS

Fuel poverty is experienced by students living in private rented accommodations, but this is often overlooked. A survey conducted by National Union of Students (NUS) revealed that 38% of respondents had experienced mould or damp on walls or ceilings in their accommodation which lead to cold and coughs (NUS, 2018).

11% of respondents said they had heaters for 12 hours or more but still did not feel warm enough in their accommodation

30% of respondents experienced draughty windows and doors

33% of respondents said their accommodations had condensation (NUS, 2018).

These inadequate living conditions reported in the survey could impact the physical and mental health of students which may in turn impact them academically, socially, financially and in other aspects of student lives. There has been little research devoted to the impact fuel poverty has on students. But logically poor housing conditions are likely to increase pressure on student health and welfare services and may negatively impact on levels of academic attainment.

COVID-19 AND FUEL POVERTY

The COVID-19 pandemic meant an unprecedented number of households were spending more on their energy bills due to spending more time at home, leaving fuel poor households in an even more vulnerable situation. The full extent of COVID-19 in relation to fuel poverty is still not clearly known but early evidence seems to suggest that it had a detrimental effect.

Prior to the pandemic those in fuel poverty were already exposed health risks because of low indoor temperatures, damp, and mould present in households, making them vulnerable but with the added risk mounted by COVID-19 meant those suffering from underlying health conditions were at even more risk of catching COVID-19. Addressing the issue of fuel poverty and devotion of more resources towards tackling fuel poverty might ultimately reduce the health risks.

Scottish Government Experimental Analysis of the Impact of COVID19 on Fuel Poverty Rates

OBESITY AND FUEL POVERTY

Households living in fuel poverty can be face hard choices between spending money on energy bills or on other essentials like cooking hot food. At times the financial burden and inflated costs associated with energy usage results in a deficit in caloric uptake to save on costs as during winter months. Caloric intake reduces by 200 in winter months to save costs for energy bills, also low-income households are more likely to consume foods with highly saturated fats and sugars due to how much cheaper they are compared to food with high nutrients (Bhattacharya et al., 2003).

Lack of nutrition and a healthy diet contributes to issues like obesity, coronary heart disease, and other adverse health problems. It is estimated NHSScotland spends £600 million every year in costs relating to excess weight and overall, economically it costs £4.6 billion (VHS, 2018). However, energy efficiency and provision of sufficient support for fuel poor households could mean that money saved on bills is devoted to food leading to more caloric uptake, healthier diet and prevention of health risks associated with unhealthy food consumption. This alleviates the burden on families in fuel poverty so that they can supply food and cook but also could result in less of a strain on the health service by preventing cases of obesity or any other related dietary issues.

[Scottish Government Experimental Analysis of the Impact of COVID19 on Fuel Poverty Rates](#)

MENTAL HEALTH AND FUEL POVERTY

Fuel poverty does not solely impact physical health but can also have an indirect long-term impact on mental health in all age groups. Mental health issues like depression and anxiety can stem from fuel poverty due to the financial pressures due to energy bills linked to cost of heating, especially during winter months. Also, it can also lead to a feeling of discomfort due to damp and mould conditions in a household causing social isolation as those suffering with fuel poverty may not want others to know or see the conditions they live in.

There is often social stigma attached to dwelling in poor housing conditions which further amplifies issues. Young people living in cold houses have more than a 1 in 4 chance of having mental health issues than compared to young people living in warm homes having a 1 in 20 chance (Marmot, 2011). According to a study conducted by Warm Front and the Scottish Health & Social Care Partnership it found that households with a bedroom temperature at 21°C were 50% less likely to have depression or anxiety compared to those living in 15°C (Marmot, 2011).

In addition to this, 10% of children living in cold homes reported that they had felt unhappy than compared to only 2% of children feeling unhappy that lived in warm homes (Kwak, 2003). In a report carried out by Marie Curie it had shown that 40% of nurses that had cared for patients experiencing fuel poverty felt that it affected their mental wellbeing (Marie Curie, 2020).

Eradicating fuel poverty is likely to result in better mental health and remove the negative stigmas attached to living in fuel poverty, although it is difficult to directly link the cost that mental health by fuel poverty has on the NHS as there is insufficient recognition and categorisation in existing data sets to confirm this.

DISCUSSION

Urgent attention and action is needed to eradicate fuel poverty in Scotland as it is clear that fuel poverty has a direct relationship to health risks arising such as respiratory issues, cardiovascular diseases, excess winter mortality and mental wellbeing in people of all age groups and backgrounds. But certain groups are much more vulnerable to the conditions associated with fuel poverty, increasing the likelihood of such health vulnerabilities developing or worsening.

Younger and older people tend to spend more time at home. It is important to ensure that they are able to achieve the levels of thermal comfort consistent with achieving good levels of health and wellbeing. Those same levels of thermal comfort ensure that homes are largely free from mould or dampness. This will reduce associated higher levels of winter mortality. (Liddell, 2009).

As well as acute financial pressures, cold related morbidity places an unwelcome strain on our stretched health and social care staff. Public Health Wales (PHW) has identified that for every £1 spent on improving warmth in vulnerable households, there is a resultant £4 of health benefits. PHW identified that there could be close to 40% fewer hospital admissions for some cold related illnesses in those with upgraded homes meeting higher energy efficiency standards EPC 'C' and higher. It identified that for every £1 spent on housing adaptations prior to hospital discharge this results in £7.50 of cost savings for health and social care services (Making a Difference Housing and Health: A Case for Investment by Watson, MacKenzie, Woodfine, Azam)

Those that are most vulnerable should be targeted to ensure their basic needs for adequate housing are met. Beyond this it is important that the individual circumstances of each household are understood by surveying and assessing individual households. This can only be achieved by further government funding in Scotland to fight against fuel poverty, evidence led solutions will deliver the best results. Schemes should be created with the consideration of the health implications that fuel poor households experience and connections made to NHS budgets and professional expertise so that resources can be more effectively deployed.

More research is needed to understand the extent which fuel poverty directly has on the health of households. There has been no large-scale study recently conducted in Scotland examining the impact low indoor temperature, mould and damp conditions have on the health of those experiencing fuel poverty compared to those that are not. A better estimation is needed to understand how much fuel poverty costs NHS Scotland by directly looking at the link of poor housing conditions and health with the overall economic impact considered. Studies should be carried out to illustrate how taking steps to get people out of fuel poverty improves their quality of life both physically and mentally in Scotland. There is a clear lack of evidential experience in this area.

CONCLUSION

The issue of fuel poverty goes beyond solely supplying power for equipment and the achievement of warm indoor temperatures. The factors that cause fuel poverty are reflective of inequalities in other aspects of people's lives. Fuel poverty leads to reduction in people's physical health and mental health which can impact on their ability to learn or work. It can create a vicious spiral of decline.

Fuel poverty has a direct impact on our vital health service. It leads to greater amounts of visits to GPs, to hospital admissions and to enhanced care requirements in the community.

Much more action is required by government to lay out a clear framework of how the issue of fuel poverty is to be eradicated in Scotland, more funding and investments for targeted fuel poverty reduction measures are needed. With a clear plan and pathway implemented this can lead to less pressure on finite NHS resources, reducing waiting times, hospitalisations, GP practice visits and broadly negate the economic and environmental cost that fuel poverty has.

Final remarks from Energy Action Scotland Robertson Trust Intern, Francis Ahanonu

Undoubtedly fuel poverty is a complex issue which will take years to eradicate in Scotland, but my hope is for a future where people will no longer face any of the incredibly damaging consequences associated with being in fuel poverty.

My report tries to highlight the association between low indoor temperatures, damp and mouldy conditions and the effects on one's health due to fuel poverty and inadequate housing conditions.

That is why I'd propose that it should be mandatory for all households in Scotland to be able to achieve have indoor temperatures of 21°C to prevent development of cardiovascular or respiratory issues. In achieving this, the costs to do so must be affordable for households. A social guarantee that enshrines this requirement is needed.

Better building insulation measures are needed. We need to deliver draughtproofing, wall insulation, loft insulation and other appropriate measures based on the households needs to reduce consumption whilst not compromising comfort. Energy efficiency is vital in making sure households are warm enough for longer periods of time, to reduce the cost of energy bills for fuel poor households.

Ventilation is often overlooked yet is vital in preventing moisture build up causing mould and damp development by presence of mites, microbes and fungal spores that could be pathogenic.

There needs to be greater fairness in terms of energy billing so that households are paying what they can afford. No household should find it difficult to heat their homes during winter nor should they have to compromise their thermal comfort for other essentials, as warm, dry housing must be a meaningful fundamental human right. Not just warm words.

Finally, it is important that the NHS considers the housing conditions of an individual to help in accurately diagnosing a person or to prevent future development of health issues. Fuel poor households that are facing health issues or at risk of developing health issues should be prioritised by the government so that they are no longer faced with devastating consequences that are related to fuel poverty.

I believe that taking on board these recommendations and prioritising fuel poverty reduction with ambition and scaled response that we can eradicate fuel poverty in Scotland. More importantly, in so doing, this will increase the quality of life, health and life outcomes for hundreds of thousands of households.



Energy Action Scotland CEO, Frazer Scott said

“In summer 2021 Francis Ahanonu joined Energy Action Scotland as our first ever Robertson Trust Intern. He came to help us with our communications, research, and policy work. He helped us, by questioning and challenging, to sharpen our social media and to frame some of our existing work. Francis’s contribution to our work was incredibly valuable. This was more impressive as we were all working remotely and our opportunities to spend real time together were few and far between.

We are grateful of the support of the Robertson Trust for providing us with the opportunity. We are particularly grateful to Francis for an impressive piece of research which he has completed into health and fuel poverty. It is a stark but fascinating read.

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