

THE SCOTTISH
FUEL POVERTY
ADVISORY PANEL



**Exploring the ways fuel poverty and
public health policy interact within the
Scottish Government**

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August 2026

The views expressed in this report are those of the researcher and do not necessarily represent those of the Scottish Fuel Poverty Advisory Panel.

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Key Findings

This report explores the ways in which fuel poverty and public health policy interact within the context of the Scottish Government. Key findings are provided below.

Evidence From the Literature on the Link Between Health and Fuel Poverty

- Respiratory disease: Cold air and mould can irritate the airways and impair the immune system, making the body more susceptible to respiratory tract infections. It also increases the risk of developing or exacerbating symptoms of asthma and chronic obstructive pulmonary disease (COPD).
- Cardiovascular disease: Cold temperatures narrow blood vessels, raising blood pressure and strain on the cardiovascular system, which, in turn, increases the risks of stroke, heart attack, and hypertension.
- Mental Health: Depression and anxiety can be caused by residing in a cold home. It can also result in loneliness and isolation as people withdraw from their social lives.
- Other conditions: Cold homes increase the risks of falls and injuries as well as worsen arthritis and rheumatism. It can also disrupt the skin barrier, causing rashes, inflammation or allergic reactions on the skin.

Fuel Poverty

- Fuel poverty policy primarily focuses on net zero and economic factors. Only two out of 55 policy actions within the Fuel Poverty Strategy directly address health, focusing on general health rather than a specific condition. While other actions could have a possible indirect impact on health, this impact is currently not measurable.
- Energy efficiency measures, such as retrofitting, generally have a direct positive impact on health and are considered the most effective interventions in addressing fuel poverty-related ill health.
- Nevertheless, energy efficiency measures can have unintended negative health impacts that need to be taken into account.

Respiratory Conditions

- The Respiratory Care Action Plan references fuel poverty as a significant risk factor for the development and exacerbation of respiratory conditions. Subsequently, it emphasises the importance of collaboration between these policy areas to ensure optimal preventative care.
- Areas of potential include:
 - Using high quality data more effectively and identify whether new cases are linked to cold homes
 - Hospital to Home programme to consider social determinants of health
 - Tackling stigma through peer support

Cardiovascular Conditions

- The Heart Disease Action Plan and Stroke Improvement Plan do not mention fuel poverty (or poverty generally) as a risk factor for the development and exacerbation of cardiovascular conditions.
- Other factors, such as clean air and diet, are acknowledged, and their respective policies are complementary to these plans. Yet, a more explicit link is needed.
- Areas of potential include:
 - Community models of care including energy-focused third sector organisations to promote cardiovascular health
 - Use of telemonitoring to facilitate enquiries into underlying causes
 - Broader integration of multi-disciplinary approach

Mental Health

- Scotland's Mental Health and Wellbeing Strategy does not mention fuel poverty explicitly but acknowledges housing and poverty as drivers of poor mental health.
- Areas of potential include:
 - Intersectionality
 - Time, Space, Compassion Model
 - Tackling stigma through peer support

Diet & Nutrition

- Scotland's Diet & Healthy Weight Delivery Plan recognises poverty and deprivation as barriers to eating healthier.
- The Fuel Poverty Strategy primarily addresses diet through free school meals in primary school. Additionally, the Scottish Government's Islands Cost Crisis Emergency Fund handed out food vouchers to households in fuel poverty.
- Areas of potential include:
 - Expansion of free school meals
 - Expansion of food vouchers
 - Meals on Wheels

General Health

- The Housing to 2040 Plan and Population Health Framework recognise that adequate, affordable housing and living spaces can improve health.
- There is emphasis on building new homes in areas that already have health services to make it easier to access these (20-minute neighbourhoods).
- New regulation for zero emissions heating and energy efficiency will consider people's health and well-being.
- Greater involvement of the NHS in income maximisation (e.g., people who need income assistance can access support within the healthcare setting).

Policy Implications

- Even though the findings demonstrate the occasional overlap between health and fuel poverty policy, it is necessary to integrate these policy areas more closely with each other and foster collaboration.
- Health data needs to be used more effectively to improve care and treatment. For example, new cases of fuel poverty-related health conditions should be made attributable to fuel poverty, where possible.
- Staff might not necessarily be aware of the link between health and fuel poverty due to the current lack of integration between these areas. Thus, it is vital that staff working with those in or at risk of fuel poverty receive training on the interaction between health and fuel poverty.
- It should not be assumed that everyone will be aware of the health impacts of a cold home and the various ways in which symptoms can present. Awareness campaigns on these topics in accessible and inclusive formats will be necessary to educate the public and practitioners. These campaigns have the potential to be useful even for people who do not experience fuel poverty.

1. Introduction

The Scottish Fuel Poverty Advisory Panel committed to preparing the groundwork for a deep dive on the impact of fuel poverty on public health, as set out in their [2025-2026 workplan](#). This report forms part of the groundwork setting and is intended to inform the Panel's understanding of the interactions between fuel poverty and public health policies.

A literature review was conducted to understand the impact of fuel poverty on health, focusing on key physical and mental health conditions. The review was narrative in nature, rather than systematic, as several scoping reviews on the topic already exist (e.g., Champagne *et al.*, 2023), highlighting the well-established link between fuel poverty and health in the literature. Relevant academic and grey literature, published between 2015 and 2025, were sourced from Google Scholar and the Scottish Government's KanE (knowledge and evidence) service. The time range ensured that potentially outdated studies would not be included. Additionally, the studies needed to focus on the UK. Where possible, data on Scotland was included; however, data from England was occasionally used to supplement the lack of Scottish data. This decision was made under the assumption that, while not representative of Scotland, the two countries have a similar climate and housing stock, making it likely for English data to be applicable to Scotland to some extent.

Next, fuel poverty, health, and housing policies were identified in line with the health conditions established during the literature review. The relevant policies were reviewed for overlaps, gaps, and areas of potential regarding health and fuel poverty.

The following publications were considered:

- [Tackling Fuel Poverty in Scotland: Periodic Report 2021-2024](#)
- [Respiratory Care Action Plan 2021 – 2026](#)
- [Heart Disease Action Plan 2021](#)
- [Stroke Improvement Plan 2023](#)
- [Scotland's Mental Health and Wellbeing Strategy](#)
- [A Healthier Future – Scotland's Diet & Healthy Weight Delivery Plan](#)
- [Cleaner Air for Scotland 2](#)
- [Housing to 2040](#)
- [Scotland's Population Health Framework 2025-2035](#)
- [Heat in Buildings Strategy - Achieving Net Zero Emissions in Scotland's Buildings](#)

While it is recognised that there may be other policies (particularly poverty-focused policies) that have an indirect impact on fuel poverty and health, this report focuses solely on the link between fuel poverty and health. The policy selection intends to reflect this link.

The report starts out with [contextual information](#) on fuel poverty and health in Scotland, followed by a [literature review](#) outlining the key physical and mental health impacts of fuel poverty. Then, overlaps, gaps, and areas of potential are identified by [mapping out each policy area](#), and [policy implications](#) are discussed.

1.1 Fuel Poverty and Health – Setting the Context

According to the 2023 Scottish House Condition Survey (SHCS), fuel poverty affects around 34% of all households in Scotland, with around 19.4% of all households experiencing extreme fuel poverty (Scottish Government, 2025c). Households in social housing are more likely to experience fuel poverty (61%, compared to 25% in the private sector) despite their homes generally having higher energy efficiency ratings, as they cannot afford energy (Donkin and Marmot, 2024; Scottish Government, 2025c). As such, fuel poverty is strongly associated with low incomes, although it is worth noting that 31% of all households in fuel poverty would not be considered income poor (Scottish Government, 2025c), highlighting that poor housing can also cause fuel poverty.

Fuel poverty is primarily discussed through a net zero or economic lens. The impacts of fuel poverty on health are often overlooked in that conversation, despite the well-established link. Cold homes increase the risk of contracting respiratory tract infections as well as the development and exacerbation of respiratory conditions, such as asthma and chronic obstructive pulmonary disease (COPD). It is also known to cause cardiovascular conditions, such as heart attacks and strokes, and increase the likelihood of trips and falls in the house. Fuel poverty has significant impacts on mental health, causing social isolation, depression, and anxiety. As people in fuel poverty often have to choose between heating and eating, they are at greater risk of malnutrition.

Cold homes contribute to increased mortality rates during the winter season. Scotland reported 2,704 excess winter deaths in 2024/25; the leading causes of deaths were linked to respiratory and cardiovascular conditions (National Records of Scotland, 2026), which are caused and worsened by living in cold homes. Moreover, cold homes are linked to higher hospital admissions, increasing the strain on the NHS as well as health costs (Donkin and Marmot, 2024; Ruse, 2020). People in fuel poverty also miss more days at work/school due to illness; particularly children's academic attainment and educational outcomes can be impacted negatively as it is more difficult to study in a cold, often overcrowded home (Donkin and Marmot, 2024; Ruse, 2020).

There are certain groups who will be more vulnerable to the cold. For example, people with pre-existing health conditions may see their condition worsen due to the cold exposure. Similarly, people who have a disability may have higher heating needs, especially if they are unable to move around to stay warm. Young children and their carers, which are often women, as well as older people are disproportionately affected by cold homes as they spend longer hours indoors. Finally, minority ethnic groups are more likely to live in damp housing and experience fuel poverty (Donkin and Marmot, 2024; Lee *et al.*, 2022).

The impact of cold and mouldy housing conditions on health has recently received more attention within parliament and the media due to Awaab Ishak who died as a result of being exposed to mould in his home, leading to the introduction of [Awaab's Law](#) (Scottish Government, 2025a). The case of Awaab Ishak demonstrates the importance of drawing the connection between fuel poverty, cold homes, and health to prevent further harm.

2. Literature Review

Fuel poverty is associated with various negative health impacts. Most commonly, the respiratory system, the cardiovascular system, and mental health are affected by living in a cold and damp home (Champagne *et al.*, 2023). Babies, children, older adults, and people with pre-existing health conditions are particularly at risk of developing health issues due to residing in a cold home and experiencing fuel poverty (Ruse, 2020). Thus, the following reviews the key physical and mental health impacts of fuel poverty. It is vital to note that there is a dynamic interplay between these health impacts and fuel poverty, with fuel poverty both causing and exacerbating health conditions (Budria *et al.*, 2025).

2.1 Respiratory Disease

Respiratory diseases are conditions that affect the ability to breathe. Chronic obstructive pulmonary disease (COPD) and asthma are two common chronic respiratory diseases in children and adults (Scottish Government, 2025d). Both conditions make it hard to breathe due to inflammation and narrowing of the airways. While COPD is typically a result of long-term exposure to cigarette smoke, dust, and air pollution, with symptoms being persistent (Asthma + Lung UK, 2022), asthma can be triggered by various causes, e.g., exercise, smoking, cold air, infections or allergies, whereby symptoms may not always be present (Asthma + Lung UK, 2024). Additionally, poor nutrition, especially during early childhood, can increase the risk of developing COPD and asthma or exacerbating the conditions if already present (Collins *et al.*, 2019). Notably, individuals living in (fuel) poverty are more likely to develop and die a preventable death from respiratory diseases (Asthma + Lung UK, 2023). Both diseases are incurable and thus life-long conditions. Even though some children can outgrow asthma by the time they are adults, this outcome is unlikely for children who live in (fuel) poverty (Holden *et al.*, 2025).

It is well-established that humans become more susceptible to respiratory tract infections (RTI) during winter (Richards, 2024). Exposure to cold temperatures increases the production of stress hormones, which significantly impair the body's immune system (Wu *et al.*, 2022). As the body redirects its energy to focus on heat generation, the immune system is further weakened and, ultimately, becomes more susceptible to RTIs (Wu *et al.*, 2022). Additionally, breathing in cold air over extended periods can irritate airways and increase the production of mucus, which in turn can further the risk of developing RTIs, especially in patients with asthma and COPD (Ruse, 2020). Households in fuel poverty can then spread RTIs more easily to other household members due to overcrowding (Holden *et al.*, 2023). Research also suggests that early-life RTIs can substantially impact lung function and the development of asthma and COPD in later childhood (Bush, 2021; van Meel *et al.*, 2018). Similarly, RTIs can worsen an existing condition (Asthma + Lung UK, 2023). Consequently, people living in fuel poverty are at an increased risk of developing RTIs, which in turn may cause or exacerbate symptoms of asthma and COPD, due to prolonged exposure to cold temperatures.

Furthermore, food gives our bodies the energy we need to maintain basic bodily functions. However, people in fuel poverty often have to forego meals and spend less on food to afford energy (Lee *et al.*, 2022). Reduced food intake, especially of healthy foods and essential nutrients, as well as poor diets can lead to fatigue, lack of energy,

and more importantly, higher susceptibility to RTIs and subsequent respiratory diseases (Berthon and Wood, 2015; Tharumakunarahah *et al.*, 2024). Especially in early child development, poor nutrition can have detrimental effects on growth that will significantly impact a person throughout their lifetime (Alves and Alves, 2024; Hurley *et al.*, 2016). For example, research suggests that children who do not receive sufficient essential nutrients growing up can experience stunted lung growth and development, impairing lung function and increasing the risks of asthma and COPD (Arigliani *et al.*, 2018; Tharumakunarahah *et al.*, 2024). Similarly, a lack of proper nutrition can exacerbate COPD-related symptoms as COPD patients have increased nutritional needs and compromised nutritional intake (Collins *et al.*, 2019). If daily nutritional intake requirements are not met, patients lack energy to carry out daily activities, resulting in inactivity and reduced physical function. In turn, respiratory muscles get weaker, compromising respiratory function and ultimately worsening the condition (Collins *et al.*, 2019). As a result, patients experience increased emergency hospitalisations, putting further strain on the healthcare system and leading to poorer survival rates for patients (Collins *et al.*, 2019). Considering the overlap between fuel and food poverty, people experiencing fuel poverty are particularly at risk of poor nutrition and its negative impact on respiratory health (Champagne *et al.*, 2024).

Finally, respiratory diseases are linked to air pollution, which people in (fuel) poverty are disproportionately exposed to (Asthma + Lung UK, 2018). First, outdoor air pollution is highest in Scotland's deprived areas as well as rented accommodation within large, urban areas (Catalano and Congreve, 2025). As outdoor sources infiltrate the indoors, people experiencing (fuel) poverty deal with higher levels of indoor air pollution (Ferguson *et al.*, 2021). Second, indoor sources, e.g., cooking, showering, and smoking, produce harmful indoor air pollution (Ferguson *et al.*, 2021; Shrubsole *et al.*, 2016), negatively impacting on respiratory health (Holden *et al.*, 2023). Households in fuel poverty also spend more time indoors and are more likely to experience overcrowding due to high levels of occupant density and/or smaller floor areas, which has been linked to higher levels of indoor air pollution (Ferguson *et al.*, 2021). The resulting poor air quality can cause RTIs and exacerbate symptoms of asthma and COPD (Asthma + Lung UK, 2023).

Good ventilation, facilitated through extractor fans and opening windows, can help with eliminating pollutants from indoor sources. However, research has shown that only 11% of homes across Great Britain have minimum ventilation provisions installed that meet the building standards requirements and know how to use them (Van Rooyen and Sharpe, 2024). Moreover, households in fuel poverty might be less likely to open their windows to keep heat in (Lee *et al.*, 2022). As windows stay shut during winter, the lack of ventilation in a cold, damp home promotes mould growth and lets dust and other allergens (e.g., tobacco smoke) settle, which, when inhaled, can irritate airways or cause allergic reactions (Holden *et al.*, 2025; Lee *et al.*, 2022; Patella *et al.*, 2015). Especially prolonged exposure to mould can have negative respiratory health effects, causing and worsening conditions such as asthma and COPD (Asthma + Lung UK, 2023; Moorcroft *et al.*, 2025; Varga *et al.*, 2024). Thus, indoor air pollution poses a significant health risk for people in fuel poverty, whereby a cold, damp home contributes to the development and exacerbation of respiratory diseases, with children in fuel poverty disproportionately affected.

2.2 Cardiovascular Disease

Cardiovascular diseases generally refer to conditions relating to the heart and blood vessels, e.g., coronary heart disease and strokes. The cardiovascular system is affected by cold temperatures, specifically where indoor temperatures go below 12°C (Lee *et al.*, 2022), although the effect can already be noticeable below 18°C (Ruse, 2020). The cold narrows the blood vessels, increasing blood pressure and the blood's viscosity, which ultimately results in an increased risk of stroke, heart attack, and hypertension (Lee *et al.*, 2022). People who already are hypertensive have an even greater risk of stroke and heart attack when exposed to the cold (Li *et al.*, 2022). Additionally, Ruse (2020) points out that inflammation from RTIs can increase the risk of blood clots forming in arteries. Considering that people in fuel poverty often underheat their homes, they are at higher risk of developing cardiovascular conditions.

When exposed to the cold, the body engages in heat generation to stay warm. While crucial for survival, this process puts increased strain on the cardiovascular system, which can be detrimental for people with pre-existing cardiovascular conditions (Ikäheimo, 2018). Older adults also have an impaired ability to maintain the body's core temperature in cold environments; combined with the cardiovascular strain caused by heat generation, they are particularly susceptible to hypothermia and frostbite (Sun and Cheng, 2025). Hence, they need to keep their homes at a higher temperature, which increases their heating costs. Still, despite the need for higher temperatures, older adults are more likely to undertake self-rationing (Jenkins and Eatwell-Roberts, n.d.), increasing the risk of developing cardiovascular conditions.

Additionally, exercise and physical activity are recommended for general good health but can be a crucial part of the treatment plan for respiratory and cardiovascular conditions outlined above, such as asthma, COPD, and hypertension. However, research indicates that exercise in cold environments can add even more strain on the cardiovascular system, especially in people with pre-existing conditions and poor nutrition (Ikäheimo, 2018). As individuals in (fuel) poverty often cannot afford expensive gym memberships (Higgerson *et al.*, 2018), they either have to risk exercising in a cold home or be physically inactive, both of which are detrimental to their cardiovascular health. Physical inactivity, obesity and resulting cardiovascular diseases are already an issue among lower socio-economic groups (Higgerson *et al.*, 2018; Paudel *et al.*, 2023), particularly children (Goisis *et al.*, 2016), with fuel poverty potentially worsening it.

2.3 Mental Health

Apart from the physical health consequences, fuel poverty can also have detrimental effects on a person's mental health (Champagne *et al.*, 2023). Khavandi *et al.* (2024) identify four pathways that interact between fuel poverty and mental health; these are social, economic, environmental, and behavioural. Each will be explored in more detail in the following. It is vital to note that these factors do not exist in isolation but rather occur concurrently.

2.3.1 Social

Households experiencing fuel poverty will often resort to heating only one commonly shared room, e.g., living rooms, in the entire home to try and save on energy costs, which is also known as “spatial shrink” (Grey *et al.*, 2017; Mohan, 2022). As a result, damp and mould is caused in the unheated rooms, which has negative health consequences. Additionally, household members will spend most of their time in the heated room, leading to overcrowding and reduced privacy (Mohan, 2022). A lack of privacy can be particularly detrimental for children and teenagers as the ability to retreat to their own (warm) private spaces is crucial for the maturation process, including establishing their identity and becoming independent (Mazzei, 2022; Reid, 2012). Thus, privacy plays a vital role in a household unit and a lack thereof, thus, can deteriorate home relationships.

Furthermore, people who experience fuel poverty may withdraw from social life as fuel poverty is highly stigmatised (Sawyer *et al.*, 2022). This withdrawal can manifest itself in not inviting friends and family over due to the cold temperatures and state of the building (Grey *et al.*, 2017; Sawyer *et al.*, 2022). People may also withdraw from social activities due to not being able to afford the associated costs (Grey *et al.*, 2017). As a result, they feel ashamed, isolated, and lonely. Particularly older people, who may also have a long-term health condition, disproportionately suffer from loneliness (Age UK, 2024), which could be exacerbated if they also experience fuel poverty.

2.3.2 Economic

The effects of poverty and economic hardship on mental health have been well documented. Similarly, they apply to people living in fuel poverty, too. For example, worries about debt, money, and energy bills can present significant stressors for individuals in fuel poverty (Liddell and Guiney, 2015). Specifically, they experience considerable stress and anxiety around receiving bills and the unknown costs these entail (Longhurst and Hargreaves, 2019). Additionally, individuals, particularly primary caregivers, often have to choose between a warm home or a meal; this problem is nowadays widely known as the “heat or eat” dilemma (Grey *et al.*, 2017; Lee *et al.*, 2022). Consequently, they often choose to forgo meals in favour of heating their homes, in turn leading to a poor diet. Facing these difficult decisions daily can worsen one’s mental health.

2.3.3 Environmental

The environmental component primarily refers to the living spaces people inhabit and the subsequent impacts on mental health. An environmental factor that people experiencing fuel poverty are often affected by is thermal discomfort. Thermal discomfort is a subjective and objective dissatisfaction with the ambient temperature (Ormandy and Ezratty, 2015). Research indicates that the physical discomfort of being cold can worsen one’s mental health and contribute to stress, anxiety, and depression (Champagne *et al.*, 2023).

Finally, concerns about the building’s deterioration can negatively impact the inhabitants’ mental health. According to Liddell and Guiney (2015), these concerns present twofold: First, individuals are aware of the negative physical health impacts of a cold, damp, and mouldy home. Consequently, they are worried about the damage

to their physical health, causing stress and anxiety. This effect is especially noticeable among disabled individuals and parents of children with long-term health conditions (Mohan, 2022). Second, potential and real damage to possessions as a result of dampness and mould can similarly cause anxiety and depression in individuals.

2.3.4 Behavioural

People living in fuel poverty often make significant changes to their behaviour to try and mitigate the impact of fuel poverty (Khavandi *et al.*, 2024). For example, energy use for appliances, such as ovens, washing machines and heaters, is carefully planned and restricted as part of daily budgeting activities (Longhurst and Hargreaves, 2019; Middlemiss and Gillard, 2015). Even where washing machines are used, households still face the challenge of adequately drying clothes in a cold home, with the added moisture from the clothes further contributing to the dampness and mould production in the house (Whitehead *et al.*, 2022). Additionally, showers are greatly reduced or completely foregone to save energy. As a result, people may appear unkempt, which carries further social stigma and ostracization from society; especially children are at risk of being bullied (Whitehead *et al.*, 2022). Overall, these behavioural changes can take a significant toll on people and worsen their mental health.

2.4 Other Conditions

Cold temperatures can negatively impact other parts of the body, too. For example, exposure to the cold can worsen arthritis and rheumatism (Ruse, 2020). Similarly, it can impact strength and dexterity, leading to increased risks of falls and injuries in older people (Ruse, 2020). Engebretsen *et al.* (2016) further posit that cold temperatures can disrupt the skin barrier, causing the skin to react more intensely towards irritants and allergens. Combined with the poor air quality, people in fuel poverty are arguably more likely to experience rashes, inflammation or allergic reactions on their skin.

3. Mapping Fuel Poverty and Public Health Policy

The Scottish Government has outlined strategies to tackle fuel poverty as well as the various health conditions mentioned in the previous chapter. However, it is unclear to which extent the Fuel Poverty Strategy interacts with the public health policy landscape. Considering the need to explore fuel poverty through a public health lens, it is vital to understand the current interactions between these policy areas. The following identifies any overlaps, gaps, and areas of potential by mapping out each policy area. Table 1, below, summarises these findings.

Table 1 – Summary of main findings

Health Condition	Relevant Health Policy	Relevant Fuel Poverty Policy	Do policies overlap?	Are there any gaps?	Areas of potential
COPD & Asthma	Respiratory Care Action Plan	Fuel Poverty Strategy; Cleaner Air for Scotland 2	Direct	- Respiratory health (RH) is not mentioned in fuel poverty (FP) policy - FP is recognised as a driver of poor RH - Unintended negative impact of energy efficiency measures on indoor air quality	- Using high quality data more effectively and identify whether new cases are linked to cold homes - Hospital to Home programme to consider social determinants of health - Tackling stigma through peer support - Using ventilation systems to improve indoor air quality
High Blood Pressure & Heart Disease	Heart Disease Action Plan; Stroke Improvement Plan	Fuel Poverty Strategy; Cleaner Air for Scotland 2	No overlap	- Cardiovascular health (CH) is not mentioned in FP - FP (and poverty more broadly) is not mentioned in CH - Unintended negative impact of energy efficiency measures on indoor air quality	- Community models of care including energy-focused third sector organisations to promote cardiovascular health - Use of telemonitoring to facilitate enquiries into underlying causes - Broader integration of multi-disciplinary approach - Using ventilation systems to improve indoor air quality
Mental Health	Scotland's Mental Health and Wellbeing Strategy	Fuel Poverty Strategy	Indirect	- Mental health (MH) is not mentioned in FP - MH does not mention FP but recognises poverty as a driver of poor MH	- Intersectionality - Time, Space, Compassion Model - Tackling stigma through peer support

Diet & Nutrition	A Healthier Future – Scotland's Diet & Healthy Weight Delivery Plan	Fuel Poverty Strategy	Indirect	- FP covers free school meals and food vouchers - Diet & Nutrition does not mention FP but recognises poverty as a driver of poor diet and malnutrition	- Expansion of free school meals - Expansion of food vouchers - Meals on Wheels
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3.1 Fuel Poverty

The [Fuel Poverty Strategy](#) covers several policy areas, with the focus largely being on net zero and economic factors. Conversely, health has received only little attention, with only two out of the 55 policy actions outlined in the Fuel Poverty Strategy directly addressing health. Notably, health is addressed more broadly instead of focusing on specific health conditions. While some actions may have a possible indirect impact on health, this impact is currently not measurable. Hence, the focus will remain on the actions that directly address health.

The first action addresses strengthening partnership working between income maximisation services and health settings. These partnerships could be extended to other organisations that address fuel poverty, leading to a more holistic approach.

The second action is targeted at those who face the greatest fuel poverty-related health risks, ensuring they continue to receive support through the Warmer Homes Scotland scheme. This support is vital as energy efficiency measures, such as retrofitting, can create indirect positive co-benefits for health-related outcomes (Wang *et al.*, 2022). Studies have shown that energy efficiency measures can reduce respiratory symptoms and blood pressure as well as improve general health; anxiety and depression symptoms as well as feelings of isolation are lessened (Wang *et al.*, 2022). These effects are attributable to the fact that energy efficiency measures make it easier and cheaper to warm the home and maintain ambient temperatures (Wang *et al.*, 2022). Hence, energy efficiency measures are vital for promoting good health. Despite these positive co-benefits for health-related outcomes, energy efficiency measures often take a long time to install and are costly to implement. Immediate support needs to be available, not only for those who face the greatest health risks, but also those who already live with long-term health conditions that may be exacerbated by fuel poverty. Hence, it is necessary to make the connection between poor health and poor housing, and to incorporate health more broadly into fuel poverty policies and vice versa. Health needs to play an essential, encompassing role within the fuel poverty policy landscape.

3.2 Air Quality

The [Cleaner Air for Scotland 2 \(CAFS 2\) Strategy](#) addresses outdoor and indoor air quality and recognises the negative impact of pollution on health. It is complementary to the Respiratory Care Action Plan and Heart Disease Action Plan, which both reference the CAFS 2. Moreover, it acknowledges that almost half of households in Scotland that use solid mineral fuels experience fuel poverty, highlighting that households in fuel poverty will have overall worse indoor air quality. The emissions from burning solid mineral fuels will also impact outdoor air quality negatively. It emphasises energy efficiency measures as essential interventions to combat air pollution and, thus, improve health, calling for a coordinated effort with related policy areas.

However, it is vital to recognise that there can be unintended negative health outcomes of energy efficiency measures. For example, thermal wall insulation can help with keeping heat in and blocking outdoor air pollution by making the building more airtight. At the same time, research has shown that these energy-efficient measures can increase exposure to indoor radon and other pollutants as improved wall insulation can make it easier to trap polluted matter in the house, leading to poor air quality and

posing a significant risk to health (Wang *et al.*, 2022). Similarly, there is a link between increased airtightness and higher levels of relative humidity, resulting in a higher presence of mould and dust mites, which could particularly promote and exacerbate respiratory conditions (Shrubsole *et al.*, 2014). This problem can be mitigated through the installation of mechanical ventilation systems (Wang *et al.*, 2022). However, research estimates that only 11% of all households across the UK had the minimum mechanical ventilation systems installed in line with established building standards and had received information on how to operate these systems (Van Rooyen and Sharpe, 2024). Similarly, these ventilation systems often do not perform in line with building standards due to poor installation and a lack of maintenance (Shrubsole *et al.*, 2014). As a result, homes could experience heat losses and exposure to outdoor air pollution due to increased ventilation and airflow, rendering energy efficiency gains redundant and increasing fuel bills (Shrubsole *et al.*, 2014; Wang *et al.*, 2022).

Accordingly, it is necessary to ensure that households have mechanical ventilation systems that are installed correctly and regularly maintained, and they receive information on their operation in order to avoid unintended negative health impacts. Generally, this suggestion also applies to other energy efficiency measures. For example, poor installations of new heating systems can cause more damage to a person's health, while a lack of knowledge on how to operate these systems efficiently offsets the intended benefits, such as lower fuel bills and emissions (Shrubsole *et al.*, 2014). Hence, it is vital that sufficient skilled heating and energy efficiency installers are available, with proper training and good working conditions.

Notably, there are no regulations for indoor air pollutants in domestic settings in the UK, although several guidelines have been published (Scottish Government, 2021). Still, it is unclear whether households are aware of these and to which extent they adhere to these and keep them in mind. A study by Pollard *et al.* (2019) demonstrates that, once thermometers were supplied to households in fuel poverty (who already received other assistance), they maintained a higher average temperature in their homes. Similarly, households could be provided with monitors that, in addition to temperature, also measure humidity and carbon dioxide concentrations, which can be vital indicators for a home's indoor air quality and subsequent impacts on health. The existing guidance can assist households in assessing whether their indoor air quality is adequate. Where it is inadequate, guidance should be given on the steps that households can take to improve the indoor air quality.

3.3 Heat in Buildings

The [Heat in Buildings Strategy](#) explicitly references fuel poverty; however, similarly to the Fuel Poverty Strategy, this reference is mainly in the context of net zero, climate change and economic impacts. Hence, energy efficiency measures are seen as interventions that primarily drive climate change targets and lowering fuel poverty. The positive as well as unintended negative health impacts of energy efficiency measures are not addressed. While the strategy commits to introducing energy efficiency and zero emissions regulations that will consider people's health and wellbeing, this statement is broad and vague. A more explicit link to health is necessary to ensure positive health outcomes for people in fuel poverty.

3.4 Respiratory Conditions

The [Respiratory Care Action Plan](#) explicitly references cold homes as a significant risk factor for the development and exacerbation of respiratory diseases. It acknowledges the vital role of eliminating fuel poverty in the prevention of respiratory conditions. Similarly, it links to poor air quality and poor diets as risk factors for respiratory diseases. As these are deeply interwoven with fuel poverty as well, a well-rounded preventative care strategy is presented that could benefit people in fuel poverty. A commitment was made to work with these relevant policy areas to ensure preventative measures related to cold homes, poor air quality and poor diets are embedded in respiratory care.

Yet, areas of potential remain. The plan commits to using high quality data more effectively to understand areas for improvement. As of the writing of this report, current data does not identify whether a new asthma or COPD case is linked to residing in a cold, mouldy home. While this data could help assess the effects of fuel poverty on health nationally, it could also target health interventions more effectively. Arguably, if a person receives respiratory care without addressing the underlying causes and exacerbations (e.g., cold and mouldy homes), the treatment will not be as effective as it could be. Moreover, asking patients about their housing conditions as potential risk factors could ensure that it does not fall through the gaps and point them to the appropriate services.

The plan supports a service by Chest, Heart, Stroke Scotland called Hospital to Home, which helps people in the transition period after returning home from the hospital. This service focuses entirely on medical care but could be expanded to consider the social determinants of health, such as housing, as these can impact health outcomes in a person's recovery (Cheetham *et al.*, 2025; Snigdha *et al.*, 2022). Even before a person is discharged from the hospital, it should be ensured that they are not returning to a cold home to avoid rehospitalisation. This suggestion is in line with the Rehabilitation and Recovery Plan, of which the Respiratory Care Action Plan has also been supportive.

3.5 Cardiovascular Conditions

Both the [Heart Disease Action Plan](#) and [Stroke Improvement Plan](#) – which is an extension of the former – do not mention fuel poverty as a risk factor. Other factors, such as clean air, diet and nutrition, which are inextricably connected to fuel poverty, are acknowledged, whereby their respective policies are considered to be complementary to the Heart Disease Action Plan. Notably, the plan discusses heart-related risk factors, such as high blood pressure and high cholesterol, exclusively, which are caused by the aforementioned factors. However, considering the impact of cold, damp homes on these heart-related risk factors and cardiovascular conditions more broadly, it is vital to have fuel poverty policy inform the Heart Disease Action Plan. While the Cleaner Air for Scotland 2 strategy emphasises the need for energy efficiency measures to improve health, the link needs to be made more explicit in the Heart Disease Action Plan. Similarly to the respiratory conditions, if a person receives cardiovascular care without addressing the underlying causes and exacerbations, the treatment will not be as effective as it could be.

Even though fuel poverty is not directly mentioned, the Heart Disease Action Plan offers areas of potential. For example, the plan proposes a community model of care be implemented in Scotland whereby cardiovascular health is promoted through close partnership with primary care, third sector organisations, and community pharmacists, among others. This model of care can help reach people who may face higher barriers within the healthcare system. When working with third sector organisations, energy-focused organisations could be included in the promotion of cardiovascular health. Even though research posits that people in fuel poverty are concerned about their physical health (Liddell and Guiney, 2015), it is possible that they do not know the specific ways in which cold, damp homes affect their health and the symptoms they may cause. As energy-focused organisations may be their first point of contact, these organisations could highlight potential health impacts and direct them to the appropriate services.

Furthermore, people with suspected high blood pressure are provided with a blood pressure monitor and asked to check their blood pressure regularly, known as telemonitoring. If the blood pressure is too high, they are advised to contact their doctor or nurse. This contact could provide an opportunity for the medical team to inquire further about the patient's general wellbeing and underlying causes (e.g., cold homes), redirecting them to the appropriate services.

Finally, the plan emphasises the importance of developing a multi-disciplinary assessment tool for cardiac rehabilitation, which is in line with the [Rehabilitation and Recovery Plan's](#) suggestion of including physical, mental and social assessments (including housing) in any rehabilitation setting. This multi-disciplinary approach could be integrated more broadly across the Heart Disease Action Plan, from prevention to rehabilitation. Considering housing and energy needs throughout the plan could help identify underlying causes early on, ensuring better health outcomes for people in fuel poverty.

3.6 Mental Health

[Scotland's Mental Health and Wellbeing Strategy](#) does not explicitly mention fuel poverty as a risk factor of poor mental health. However, it acknowledges housing as a key policy area for improving mental health. Similarly, poverty is seen as the single biggest driver of poor mental health and social isolation. While fuel poverty is not explicitly mentioned, the outlined policies could still have an indirect benefit for people in fuel poverty. For example, this strategy takes an intersectional approach, recognising that people have multiple intersecting identities and thus experience varying needs for care. It particularly focuses on marginalised people who experience discrimination and stigma based on protected characteristics and highlights that these groups often face barriers to accessing effective care. Consequently, it aims to remove those barriers by adopting a whole person approach to care.

The Fuel Poverty Strategy could stand to benefit from a similar intersectional, whole person approach. While factors like age, disability and other forms of poverty (e.g., food poverty) are considered, the focus needs to go beyond that. For example, research indicates that ethnic minorities and women are disproportionately affected by fuel poverty and face higher barriers to accessing support (Champagne *et al.*, 2023; Lee *et al.*, 2022). As a result, these groups might slip through the gaps and not receive

the proper support suited to their needs. Consequently, an intersectional approach can help us understand the complexities of fuel poverty better and effectively deliver better support.

Furthermore, both the mental health and fuel poverty policies focus on tackling stigma associated with their respective areas. Reducing the stigma for both mental health and fuel poverty, while acknowledging that they interact with each other, could enable vital conversations and ensure that people receive the help they need without escalation. One way in which stigma can be combatted is through peer support, which is also suggested in the Respiratory Care Action Plan. Research suggests that peer support can combat isolation and loneliness while creating hope and community (Stefancic *et al.*, 2021), ultimately breaking down barriers that would have kept people from seeking support. Thus, providing tailored peer support for people in fuel poverty might have positive effects on their mental health.

The Mental Health Plan outlines a policy whereby support for people in mental health crisis is expanded and improved through Scotland's national approach on Time, Space and Compassion (TSC). Even though TSC is primarily for people experiencing suicidal crisis, the [core principles](#) could be extended to people experiencing fuel poverty, ensuring better and more positive outcomes for those seeking support.

Table 2 – Core Principles of TSC

TSC Principle	Explanation
Time	- Taking time to listen to people, making them feel validated and understood - Replying in a timely manner - Offering continued support over time and ways back in if they are in need again
Space	- Offering safe spaces, including emotionally and psychologically - Making places where people seek help accessible - Applying these principles to all shared places, i.e., in person, online, and on the phone
Compassion	- Showing kindness, respect, and sensitivity - Understanding how crisis and trauma can affect behaviour - Offering people who support others time and space to take care of themselves, so they can provide continuous and better support

3.7 Diet & Nutrition

[Scotland's Diet & Healthy Weight Delivery Plan](#) outlines policies that are primarily focused on population-wide interventions rather than individual behavioural changes. The plan does not explicitly mention fuel poverty, but it recognises poverty and deprivation as barriers to eating more healthily. Despite the well-known 'heat or eat' dilemma, the Fuel Poverty Strategy primarily addresses this problem through universal free school meals in primary and special schools. Consequently, this area could be

expanded on. For example, free school meals could be extended to eligible secondary pupils. The Diet & Healthy Weight Delivery Plan's focus on tightening nutritional standards for school meals would ensure that students eat healthy, nutritious food throughout their academic career. The Scottish Government started a trial phase for free school meals for S1 to S3 pupils who receive the Scottish Child Payment in eight local authorities in August 2025 (Scottish Government, 2025b). Consideration could be given to both expanding this programme to the remaining local authorities and extending free school meals to eligible S4 to S6 pupils.

Furthermore, the Scottish Government's Islands Cost Crisis Emergency Fund handed out food vouchers to households affected by fuel poverty. This scheme could be expanded across Scotland to help households in fuel poverty avoid the 'heat or eat' dilemma and ensure they have access to fresh, healthy food. Similar to the Best Starts Food scheme and other policy actions outlined in the Diet & Healthy Weight Delivery Plan (particularly Action 4.4 to 4.7), it could enable and support people to make healthier decisions. This type of support could be essential, especially for people living with long-term health conditions that may be exacerbated by fuel poverty.

Many councils offer a service called 'meals on wheels' to provide nutritious, healthy meals to older and/or disabled individuals who cannot leave their homes to go shopping or cook for themselves anymore. Beyond the nutritional benefits of the meals, this service can also improve mental health through regular social connections, reducing loneliness and isolation, and promote a sense of independence (Papadaki *et al.*, 2023). However, this service is typically associated with a charge per meal. Older and disabled individuals in fuel poverty may not be able to afford this additional charge and resort to cheaper, unhealthy foods. Expanding this service to provide free meals – or at least at a discounted rate – to older and disabled people in fuel poverty could help significantly to ensure they eat well.

3.8 General Health

The [Population Health Framework \(PHF\)](#) does not refer to fuel poverty but supports the contribution of better housing to health. Specifically, it argues for cross-government collaboration to ensure that health outcomes are maximised. Strengthening the partnership between health and housing can have benefits for people who are at risk of ill health due to fuel poverty. Similarly, it advocates for progressing the Housing (Scotland) Bill, particularly rent control, and providing more affordable housing. Both rent control and affordable housing can ensure that people can spend more of their income on keeping their homes warm, ultimately combatting the negative health impacts of cold indoor temperatures. Furthermore, the PHF mentions social prescribing, which serves as a vital connection between the NHS, local government and the voluntary sector. It ensures that more people can access health support within their communities. Especially people who might otherwise face higher barriers to accessing care would benefit from social prescribing. Finally, it calls for a greater involvement of the NHS in income maximisation. Essentially, people who need income assistance should be able to access support within the healthcare setting. Enabling this support could further reduce barriers and complexities of navigating the welfare system.

[Housing to 2040](#) references fuel poverty explicitly and recognises that adequate housing and living spaces can improve physical and mental health. It further mentions that new regulation for zero emissions heating and energy efficiency will consider people's health and well-being, which is also outlined in the Heat in Buildings Strategy. Additionally, the strategy proposes an integrated approach of housing, social care and health services to enable independent living through accessibility retrofits for old and/or disabled people. There is also emphasis on building new homes in areas that already have health services to make it easier to access these (20-minute neighbourhoods). These interventions could significantly benefit people in fuel poverty.

3.9 Fairer Scotland Duty

The [Fairer Scotland Duty](#) requires public bodies to consider how to reduce inequalities of outcomes created by socio-economic disadvantages when making strategic decisions. Out of the policies mentioned above, only the Fuel Poverty Strategy, Heat in Buildings Strategy, and Scotland's Diet & Healthy Weight Delivery Plan explicitly reference the Fairer Scotland Duty. Notably, the Heart Disease Action Plan and CAFS 2 mention having conducted an Equality Impact Assessment, while the PHF utilises the Population Health Dashboard to carry out assessments, including socio-economic indicators. Housing to 2040 notes conducting equality impact assessments on individual policies associated with the strategy. The other policies do not mention impact assessments.

4. Policy Implications

The findings highlighted various overlaps, gaps, and areas of improvement. The current fuel poverty policies primarily focus on retrofitting houses in order to alleviate fuel poverty and reach net zero targets. These interventions can also have a positive effect on health, arguably addressing ill health caused by fuel poverty most effectively. While they should remain a priority, it is vital to acknowledge that implementing these interventions is costly and will take time. As a result, the following policy implications focus more on mitigating health impacts in the meantime.

4.1 Broader Integration of Health and Fuel Poverty Policy

Even though the findings demonstrate the occasional overlap between health and fuel poverty policy, **it is necessary to integrate these policy areas more closely with each other and foster collaboration.**

Energy efficiency measures are vital for promoting good health and reducing the impacts of fuel poverty on health. Hence, health policy needs to recognise fuel poverty as a driving factor of ill health and consider fuel poverty policy in their approaches going forward. Similarly, fuel poverty policy needs to consider health in their planned actions. While energy efficiency measures may be the most effective way to combat fuel poverty-related ill health, they can have unintended negative health impacts that can be damaging to a person's health. Additionally, energy efficiency measures are costly and take long to implement; as people are waiting on these measures, it is vital to mitigate any health impacts caused by fuel poverty. Going forward, these policy areas should work on a joint strategy.

To facilitate collaboration between these areas, there could be a single point of contact referral service combining housing and health. This service could involve local housing and health providers, advice services, and community organisations which could work together to provide solutions to people in fuel poverty. Anyone should be able to refer themselves to this service; however, it will be important for health and social care staff, heating and energy efficiency installers, as well as anyone else who may encounter individuals in fuel poverty to be able to refer them to this service. Additionally, the referral service should provide tailored support as individuals will have varying needs depending on their situation and background.

While intersectionality must be embedded across all areas in any approach taken, it is especially vital to ensure its implementation in this referral service and the tailored support it offers. Staff need to take into account that certain groups are disproportionately affected both by negative health outcomes and fuel poverty (along with other types of poverty) and work together to ensure that everyone receives the support they need, so their situation can be improved. Advice will primarily focus on energy efficiency measures programmes and grants, effectively managing energy within the home to prevent fuel poverty-related ill health, information on the health impacts of fuel poverty, claiming entitled benefits, and arranging repairs, e.g., the removal of mould. Where individuals rent their homes, they could also receive legal advice on ensuring that their landlords adhere to their responsibilities regarding the home's minimum housing standard.

An example of such a collaboration between health and fuel poverty can be observed in the [Warm Home Prescription® 2022-2026 trial](#). Healthcare staff and local energy advisors work together to deliver practical help to patients in fuel poverty who have health conditions that are worsened by the cold, enabling them to keep their homes warm.

4.2 Effective Use of Data

Health data needs to be used more effectively to improve care and treatment.

For example, new cases of fuel poverty-related health conditions should be made attributable to fuel poverty, where possible.

Linking fuel poverty with health will help us understand the extent of the problem on a national level but also ensure that treatment remains effective. If the connection is not made and people return to cold homes, the treatment will become ineffective. Symptoms may worsen, resulting in increased hospitalisations and further strain on the NHS (Donkin and Marmot, 2024; Ruse, 2020). However, when cases are attributable to fuel poverty, the underlying causes can be addressed, improving health outcomes. Additionally, this data could help us understand the impact of fuel poverty-related ill health on the NHS as well as the potential savings and benefits of energy efficiency measures for the NHS. Hence, it is vital to connect health and fuel poverty data.

Furthermore, data sharing between public services should be enabled. For example, when a person receives fuel poverty support, this data should be made available to their primary care physician who can then arrange appointments for health check-ups for fuel poverty-related health conditions. Similarly, when a person is diagnosed with

a fuel poverty-related health condition, enquiries about their housing condition, energy usage behaviour and heating needs should take place. House visits could be arranged to assess the situation further. Where appropriate, this information should be shared with the relevant welfare services so people can receive fuel poverty support and claim benefits they may be entitled to. Generally, it could become good practice to enquire about heating needs during yearly health check-ups, offering opportunities to identify individuals who may be struggling to warm their home and sharing this data with the appropriate services.

4.3 Staff Training

Staff might not necessarily be aware of the link between health and fuel poverty due to the current lack of integration between these areas. Thus, **it is vital that staff working with those in or at risk of fuel poverty receive training on the interaction between health and fuel poverty.**

Health and social care staff need to be trained on how to identify and help people in fuel poverty. When people go to their primary care team with fuel poverty-related health symptoms, the team needs to consider fuel poverty as an underlying cause and effectively rule it out. Where people are experiencing ill health due to fuel poverty, the team can play a vital role in ensuring people get the help they need. Accordingly, staff need to be trained on the local systems and services available. Finally, this training should be included in medical education to ensure that healthcare professionals learn about this intersection as early as possible.

Similarly, heating and energy efficiency installers need to receive training on fuel poverty and its impact on health. When entering someone's home to conduct work, they need to be aware of how cold indoor temperatures can negatively impact a person's health and should be able to assess whether an individual may struggle with warming their home adequately, adjusting their behaviour and how they approach the situation accordingly. Additionally, they should be able to explain the work they are conducting in an easily understandable manner, highlighting the resulting benefits to the residents' health. A quick assessment could be made about the additional work that could be done to improve the home's energy efficiency, and information about it should be provided to the resident.

This training could form part of wider health and safety training as even short exposures to cold indoor temperatures can already pose a health risk to heating and energy efficiency installers (Ruse, 2020). For the sake of their own health, they need to be aware of the cold's potential impact and be able to minimise any risks while conducting their work. Especially as the cold can affect dexterity and strength (Ruse, 2020), it is vital to ensure that installers have protections in place to prevent work accidents or poor installations that could potentially further damage the residents' health.

All staff should be trained in line with the Time, Space and Compassion (TSC) framework. When they are suspecting an individual of residing in a cold home, they need to be able to raise the issue sensitively, especially as people may want to hide the fact that they are struggling. Care needs to be taken not to further stigmatise

individuals experiencing fuel poverty. Advice should be given in a non-judgemental manner, and individuals should be offered to be referred to the appropriate services.

4.4 Awareness Campaigns

It should not be assumed that everyone will be aware of the health impacts of a cold home and the various ways in which symptoms can present. **Awareness campaigns on these topics in accessible and inclusive formats will be necessary to educate the public and practitioners.** These campaigns have the potential to be useful even for people who do not experience fuel poverty.

Campaigns could include information on how the cold can affect a person's health and specify how symptoms may present, focusing on respiratory, cardiovascular and mental health conditions. While these are most commonly impacted, it is also vital to focus on lesser-known associations, e.g., higher prevalence of trips and falls among older adults. Additionally, information could be provided about what is considered a safe indoor temperature and how to keep the home warm to prevent ill health. Given that many people do not open their windows during winter to avoid heat escaping, unintentionally promoting poor indoor air quality, guidance on efficient window-opening could be given. Similarly, it will be essential to debunk common misconceptions people may have about cold temperatures, e.g., drinking alcohol can help keep you warm (Drinkaware, 2024) or closing vents prevents heat loss (Shokar, 2025). These misconceptions can result in negative health outcomes, highlighting the need for public awareness campaigns to combat misinformation.

Moreover, campaigns could focus on the support and advice services available. Experiencing fuel poverty can be overwhelming and it may not be immediately obvious where support is available but also what kind of support they can receive. Pointing people to the appropriate services where they can get help and advice could significantly reduce stress and overwhelm. The campaign could also highlight peer support groups to try and tackle the stigma associated with fuel poverty. These support groups could be further involved in promoting the available support and advice services.

Furthermore, information about the different types of energy efficiency measures should be made available in an easily digestible format. Research has shown that people do not always know which options are available and what the best investment would be (Van Rooyen and Sharpe, 2024). Similarly, funding options, particularly governmental financial support, loans, and grants, should be laid out clearly. Additionally, when explaining the different options, people need to be made aware of the ventilation systems required as well as their maintenance and operation to mitigate any unintended negative health impacts of energy efficiency measures. Homeowners should receive advice on how they can find out the energy rating of their home. People living in rented homes should be encouraged to approach their landlord and ask for details about the energy rating of their homes, any energy efficiency measures already implemented, and the current state of their ventilation systems. Additionally, research shows that some landlords attempt to evict tenants when reporting repairs, resulting in tenants not reporting repairs due to fear of eviction (Citizens Advice Scotland, 2025). As a result, people live in cold, mouldy houses due to disrepair, negatively impacting

their health. Hence, tenants should be informed about their rights regarding repairs and maintaining a minimum housing standard, and be pointed to legal advice services.

Finally, the benefits of energy efficiency measures could be reframed through a public health lens to encourage uptake. The current approach primarily focuses on net zero and climate change. While many likely understand the need to implement these measures to combat climate change, climate change is often considered an abstract concept that will not impact people until far in the future (Duan *et al.*, 2019). Research further suggests that chronic health conditions are seen as a bigger threat to health than climate change, although it is worth noting that Scottish people are concerned about climate change's impact on health (The Health Foundation, 2021). Thus, reframing the benefits related to health might create an immediate urgency that is more concrete and easier for people to relate to, increasing uptake of energy efficiency measures.

Research on current knowledge of health impacts and energy usage behaviour within the home, specifically focusing on the Scottish context, may provide further avenues for awareness campaigns. Importantly, this additional information will allow the campaigns to be more targeted at the Scottish public, ultimately making them more effective.

5. References

Adesibikan, A., Williams, P. J., Cumella, A., Francis, A., Lavery, A., Hopkinson, N. S. and Philip, K. E. J. (2025) 'Relationship of material deprivation with emergency or unplanned healthcare utilisation in adults with chronic obstructive pulmonary disease: analysis from an Asthma+Lung UK survey', *BMJ Open Respiratory Research*, 12(1). doi:10.1136/bmjresp-2025-003199.

Age UK (2024) *You are not alone in feeling lonely: Loneliness in later life*. Available at: [you-are-not-alone-in-feeling-lonely.pdf](#) (Accessed: 1 December 2025).

Alves, J. G. B. and Alves, L. V. (2024) 'Early-life nutrition and adult-life outcomes', *Jornal de Pediatria*, 100(Suppl 1), pp. S4-S9.

Arigiani, M., Spinelli, A. M., Liguoro, I. and Cogo, P. (2018) 'Nutrition and Lung Growth', *Nutrients*, 10(7), 919.

Asthma + Lung UK (2018) *Indoor air pollution*. Available at: [Indoor air pollution downloadable PDF.pdf](#) (Accessed: 30 November 2025).

Asthma + Lung UK (2022) *COPD in the UK: Delayed diagnosis and unequal care*. Available at: [COPD survey 2022](#) (Accessed: 25 November 2025).

Asthma + Lung UK (2023) *Breathing Unequal*. Available at: [Breathing unequal](#) (Accessed: 30 November 2025).

Asthma + Lung UK (2024) *What is asthma?* Available at: [What is asthma? | Asthma + Lung UK](#) (Accessed: 30 November 2025).

Berthon, B. S. and Wood, L. G. (2015) 'Nutrition and Respiratory Health—Feature Review', *Nutrients*, 7(3), pp. 1618-1643.

Budria, S., Li Donni, P. and Zucchelli, E. (2025) 'Sick and Cold? Evidence on the Dynamic Interplay between Energy Poverty and Health', *IZA Institute of Labor Economics*, 17678. Available at: [Sick and Cold? Evidence on the Dynamic Interplay between Energy Poverty and Health](#) (Accessed: 20 November 2025).

Bush, A. (2021) 'Impact of early life exposures on respiratory disease', *Paediatric Respiratory Reviews*, 40, pp. 24-32.

Catalano, A. and Congreve, E. (2025) 'Air Pollution and Inequality in Scotland: Examining differences in pollutant concentrations across Scottish neighbourhoods', *The Scottish Health Equity Research Unit (SHERU)*. doi:https://doi.org/10.17868/strath.00092933.

Champagne, S. N., Phimister, E., Macdiarmid, J. I. and Guntupalli, A. M. (2023) 'Assessing the impact of energy and fuel poverty on health: a European scoping review', *European Journal of Public Health*, 33(5), pp. 764-770.

Champagne, S. N., Macdiarmid, J. I., Olusola, O., Phimister, E. and Guntupalli, A. M. (2024) 'Heating or eating? The framing of food and fuel poverty in UK news media', *Social Science & Medicine*, 360, 117297.

Cheetham, N. J., Bowyer, V., García, M. P., Bowyer, R. C. E., Carpentieri, J. D., Guise, A., Thompson, E. J., Sudre, C. H., Molteni, E., Antonelli, M., Penfold, R. S., Harvey, N. R., Canas, L. S., Rjoob, K., Murray, B., Kerfoot, E., Hammers, A., Ourselin, S., Duncan, E. L. and Steves, C. J. (2025) 'Social determinants of recovery from ongoing symptoms following COVID-19 in two UK longitudinal studies: a prospective cohort study', *BMJ Public Health*, 3, e001166.

Citizens Advice Scotland (2025) *Left in the cold*. Available at: [left in the cold report.pdf](#) (Accessed: 29 January 2026).

Collins, P. F., Yang, I. A., Chang, Y. C. and Vaughan, A. (2019) 'Nutritional support in chronic obstructive pulmonary disease (COPD): an evidence update', *Journal of Thoracic Disease*, 11(Suppl 17), pp. S2230-S2237.

Donkin, A. and Marmot, M. (2024) *Left Out in the Cold: The Hidden Health Costs of Cold Homes*. Available at: [Left out in the cold full report v3.pdf](#) (Accessed: 7 January 2026).

Drinkaware (2024) *Alcohol and cold weather*. Available at: [Alcohol and cold weather | Drinkaware](#) (Accessed: 5 February 2026).

Duan, R., Takahashi, B. and Zwickle, A. (2019) 'Abstract or concrete? The effect of climate change images on people's estimation of egocentric psychological distance', *Public Understanding of Science*, 28(7), pp. 828-844.

Engelbrechtsen, K. A., Johansen, J. D., Kezic, S., Linneberg, A. and Thyssen, J. P. (2016) 'The effect of environmental humidity and temperature on skin barrier function and dermatitis', *Journal of the European Academy of Dermatology and Venereology*, 30(2), pp. 223-249.

Ferguson, L., Taylor, J., Zhou, K., Shrubsole, C., Symonds, P., Davies, M. and Dimitroulopoulou, S. (2021) 'Systemic inequalities in indoor air pollution exposure in London, UK', *Build Cities*, 2(1), pp. 425-448.

Goisis, A., Sacker, A. and Kelly, Y. (2016) 'Why are poorer children at higher risk of obesity and overweight? A UK cohort study', *European Journal of Public Health*, 26(1), pp. 7-13.

Grey, C. N. B., Schmieder-Gaite, T., Jiang, S., Nascimento, C. and Poortinga, W. (2017) 'Cold homes, fuel poverty and energy efficiency improvements: A longitudinal focus group approach', *Indoor and Built Environment*, 26(7), pp. 902-913.

Higgerson, J., Halliday, E., Ortiz-Nunez, A., Brown, R. and Barr, B. (2018) 'Impact of free access to leisure facilities and community outreach on inequalities in physical activity: a quasi-experimental study', *Journal of Epidemiology & Community Health*, 72(3), pp. 252-258.

Holden, K. A., Lee, A. R., Hawcutt, D. B. and Sinha, I. P. (2023) 'The impact of poor housing and indoor air quality on respiratory health in children', *Breathe*, 19(2), 230058.

Holden, K. A., Hawcutt, D. B. and Sinha, I. P. (2025) 'Socioeconomic determinants of outcomes in childhood asthma', *Paediatric Respiratory Reviews*. doi:<https://doi.org/10.1016/j.prrv.2025.03.001>.

Hurley, K. M., Yousafzai, A. K. and Lopez-Boo, F. (2016) 'Early Child Development and Nutrition: A Review of the Benefits and Challenges of Implementing Integrated Interventions', *Advances in Nutrition*, 7(2), pp. 357-363.

Ikäheimo, T. M. (2018) 'Cardiovascular diseases, cold exposure and exercise', *Temperature*, 5(2), pp. 123-146.

Jenkins, K. and Eatwell-Roberts, F. (n.d.) *Energy rationing an increasing coping mechanism for dealing with fuel poverty*. Available at: [Energy rationing an increasing coping mechanism for dealing with fuel poverty - Fuel Poverty Scotland](#) (Accessed: 8 December 2025).

Khavandi, S., Mccoll, L., Leavey, C., McGowan, V. J. and Bennett, N. C. (2024) 'The Mental Health Impacts of Fuel Poverty: A Global Scoping Review', *International Journal of Public Health*, 69, 1607459.

Lee, A., Sinha, I. Boyce, T., Allen, J. and Goldblatt, P. (2022) *Fuel poverty, cold homes and health inequalities*. London: Institute of Health Equity.

Li, T., Wang, Q. and Cheng, C. (2022) 'Effect of aging on cardiovascular responses to cold stress in humans', *Frigid Zone Medicine*, 2(3), pp. 149-157.

Liddell, C. and Guiney, C. (2015) 'Living in a cold and damp home: frameworks for understanding impacts on mental well-being', *Public Health*, 129(3), pp. 191-199.

Longhurst, N. and Hargreaves, T. (2019) 'Emotions and fuel poverty: The lived experience of social housing tenants in the United Kingdom', *Energy Research & Social Science*, 56, 101207.

Mazzei, M. (2022) *Teens and privacy*. Available at: [Teens and privacy | Research Starters | EBSCO Research](#) (Accessed: 1 December 2025).

Middlemiss, L. and Gillard, R. (2015) 'Fuel poverty from the bottom-up: Characterising household energy vulnerability through the lived experience of the fuel poor', *Energy Research & Social Science*, 6, pp. 146-154.

Mohan, G. (2022) 'The impact of household energy poverty on the mental health of parents of young children', *Journal of Public Health*, 44(1), pp. 121-128.

Moorcroft, C., Whitehouse, A. and Grigg, J. (2025) 'Damp and mouldy home: impact on lung health in childhood', *Archives of Disease in Childhood*, 110, pp. 419-421.

National Records of Scotland (2026) Winter Mortality in Scotland 2024/25. Available at: [Winter Mortality in Scotland 2024/25 - National Records of Scotland \(NRS\)](#) (Accessed: 3 February 2026).

Ormandy, D. and Ezratty, V. (2015) 'Thermal discomfort and health: protecting the susceptible from excess cold and excess heat in housing', *Advances in Building Energy Research*, 10(1), pp. 84-98.

Papadaki, A., Wakeham, M., Ali, B., Armstrong, M. E. G., Cameron, A. and Willis, P. (2023) "The Service, I Could Not Do without It...": A Qualitative Study Exploring the Significance of Meals on Wheels among Service Users and People Who Refer Them to the Service', *Health & Social Care in the Community*, 2023(1), 6054895.

Patella, V., Bocchino, M. and Steinhilber, G. (2015) 'Asthma is associated with increased susceptibility to infection', *Minerva Medica*, 106(4 Suppl 3), pp. 1-7.

Paudel, S., Ahmadi, M., Phongsavan, P., Hamer, M. and Stamatakis, E. (2023) 'Do associations of physical activity and sedentary behaviour with cardiovascular disease and mortality differ across socioeconomic groups? A prospective analysis of device-measured and self-reported UK Biobank data', *British Journal of Sports Medicine*, 57(14), pp. 921-929.

Pollard, A., Jones, T., Sherratt, S. and Sharpe, R. A. (2019) 'Use of Simple Telemetry to Reduce the Health Impacts of Fuel Poverty and Living in Cold Homes', *International Journal of Environmental Research and Public Health*, 16(16), 2853.

Reid, J. (2012) "MY ROOM! PRIVATE! KEEP OUT! THIS MEANS YOU!": A BRIEF OVERVIEW OF THE EMERGENCE OF THE AUTONOMOUS TEEN BEDROOM IN POST-WORLD WAR II AMERICA', *Journal of the History of Childhood & Youth*, 5(3), pp. 419-443.

Richards, L. (2024) *Why winter makes you more vulnerable to colds – a public health nurse explains the science behind the season*. Available at: [Why winter makes you more vulnerable to colds – a public health nurse explains the science behind the season](#) (Accessed: 25 November 2025).

Ruse, J. (2020) 'Fuel Poverty and Cold-Related Ill Health', in J. Matheson, J. Patterson and L. Neilson (eds.) *Tackling Causes and Consequences of Health Inequalities: A Practical Guide*. CRC Press.

Sawyer, A., Sherriff, N., Bishop, D., Darking, M. and Huber, J. W. (2022) "It's changed my life not to have the continual worry of being warm" – health and wellbeing impacts of a local fuel poverty programme: a mixed-methods evaluation', *BMC Public Health*, 22, 786.

Scottish Government (2021) *Cleaner Air for Scotland 2 - Towards a Better Place for Everyone*. Available at: [Cleaner Air for Scotland 2 - Towards a Better Place for Everyone - gov.scot](#) (Accessed: 12 December 2025).

Scottish Government (2025a) *Awaab's Law to come to Scotland*. Available at: [Awaab's Law to come to Scotland - gov.scot](#) (Accessed: 27 January 2026).

Scottish Government (2025b) *Free school meals expansion*. Available at: [Free school meals expansion - gov.scot](#) (Accessed: 12 January 2026).

Scottish Government (2025c) *Scottish House Condition Survey: 2023 Key Findings*. Available at: [Scottish House Condition Survey: 2023 Key Findings - gov.scot](#) (Accessed: 3 February 2026).

Scottish Government (2025d) *The Scottish Health Survey 2024 - volume 1: main report*. Population Health Directorate. Available at: [The Scottish Health Survey 2024 - volume 1: main report - gov.scot](#) (Accessed: 30 November 2025).

Shokar, S. (2025) *Winter energy myths busted - what actually saves energy in winter*. Available at: [Winter energy and heating myths busted - save money and stay cosy | EDF](#) (Accessed: 5 February 2026).

Shrubsole, C., Macmillan, A., Davies, M. and May, N. (2014) '100 Unintended consequences of policies to improve the energy efficiency of the UK housing stock', *Indoor and Built Environment*, 23(3), pp. 340-352.

Shrubsole, C., Taylor, J., Das, P., Hamilton, I. G., Oikonomou, E. and Davies, M. (2016) 'Impacts of energy efficiency retrofitting measures on indoor PM2.5 concentrations across different income groups in England: a modelling study', *Advances in Building Energy Research*, 10(1), pp. 69-83.

Snigdha, J., Hauschildt, K. and Scheunemann, L. P. (2022) 'Social determinants of recovery', *Current Opinion in Critical Care*, 28(5), pp. 557-565.

Stefancic, A., Bochicchio, L. and Tuda, D. (2021) 'Peer Support for Mental Health', in J. D. Avery (ed.) *Peer Support in Medicine*. Springer, Cham, pp. 31-48.

Sun, S. and Cheng, W. (2025) 'Physical and physiological differences in thermal comfort and regulation among older adults: A systematic review', *Building and Environment*, 284, 113424.

Tharumakunarah, R., Lee, A., Hawcutt, D. B., Harman, N. L. and Sinha, I. P. (2024) 'The Impact of Malnutrition on the Developing Lung and Long-Term Lung Health: A Narrative Review of Global Literature', *Pulmonary Therapy*, 10, pp. 155-170.

The Health Foundation (2021) *Public perceptions of climate change and health (September 2021)*. Available at: [Public perceptions of climate change and health \(September 2021\) | The Health Foundation](#) (Accessed: 29 January 2026).

van Meel, E. R., den Dekker, H. T., Elbert, N. J., Jansen, P. W., Moll, H. A., Reiss, I. K., de Jongste, J. C., Jaddoe, V. W. V. and Duijts, L. (2018) 'A population-based prospective cohort study examining the influence of early-life respiratory tract infections on school-age lung function and asthma', *Thorax*, 73, pp. 167-173.

Van Rooyen, C. and Sharpe, T. (2024) 'Ventilation provision and use in homes in Great Britain: A national survey', *Building and Environment*, 257, 111528.

Varga, M. K., Moshhammer, H. and Atanyazova, O. (2024) 'Childhood asthma and mould in homes—A meta-analysis', 137(3-4), pp. 79-88.

Wang, C., Wang, J. and Norbäck, D. (2022) 'A Systematic Review of Associations between Energy Use, Fuel Poverty, Energy Efficiency Improvements and Health', *International Journal of Environmental Research and Public Health*, 19(12), 7393.

Whitehead, M., Taylor-Robinson, D. and Barr, B. (2022) 'Fuel poverty is intimately linked to poor health', *BMJ*, 376.

6. Glossary

Energy Efficiency Measures – Energy efficiency measures reduce the amount of energy needed to heat a home and keep it at a warm, comfortable temperature. These typically include wall insulation, heat pumps, mechanical ventilation systems, and heating system upgrades.

Mechanical Ventilation Systems – Mechanical ventilation systems use extract fans and ducts to remove pollutants, excess moisture, and allergens while providing fresh air.

Radon – Radon is a colourless, odourless, radioactive gas. It occurs naturally as a result of decay of uranium in soil and water, and poses a health risk as it can cause lung cancer.

Solid Mineral Fuels – Solid mineral fuels are solid materials that can be burnt to provide heat. These typically include wood, charcoal, pellets, and coal.