

Appendix 4

Health, Energy Efficiency & Affordable Warmth

Evidence Review

Contents

Introduction

Health effects of the cold

- Excess winter deaths:

Who is susceptible to health problems associated with living in cold / damp homes?

- The effects on the elderly

- Other Vulnerable Groups and the effects of cold homes

Evidence linking cold / damp housing to health problems

Comparison to colder countries

What are the costs associated with cold weather?

Comments on the statistics and what should be done about cold homes

Action being proposed

What is the Government Policy?

Conclusions

Introduction:

There is a well-documented and ever growing body of evidence that supports the view that living in a cold home causes negative impacts on physical and mental health (World Health Organisation, 2007; Wilkinson 2001; The Marmot Review, 2011, Liddell & Morris, 2010).

This report will highlight evidence which supports the importance of providing a holistic in house energy advice service which will deliver health and well-being benefits to our vulnerable, rural community and which will in turn, ease the burden on health and social services.

According to the Scottish Government, 2002, 'The definition of a **'satisfactory heating regime'** uses levels recommended by the World Health Organisation. For elderly and infirm households, this is 23°C in the living room and 18°C in other rooms, to be achieved for 16 hours in every 24. For other households, this is 21°C in the living room and 18°C in other rooms for a period of 9 hours in every 24 (or 16 in 24 over the weekend); with two hours being in the morning and seven hours in the evening.' <http://www.gov.scot/Resource/Doc/46951/0031675.pdf>

Those households in the UK who are unable to maintain these standards of thermal comfort and safety are considered as living in fuel poverty. Fuel poverty is measured using a complex algorithm – BREDEM-12 which calculates the cost of heating a home, taking into account, household income, current cost of heating fuel, and the energy efficiency of the house. Households which are required to spend 10% or more of their income in order to achieve the above mentioned heating regime are classed as being in fuel poverty. (Liddell & Morris, 2010). Significantly few households can afford to spend this proportion of their income on domestic heating and so a large proportion of fuel poor people live in persistently cold and damp homes (Liddell, 2008). [https://www.savethechildren.org.uk/sites/default/files/docs/The_Impact_of_Fuel_Poverty_on_Children_Dec_08\(1\)_1.pdf](https://www.savethechildren.org.uk/sites/default/files/docs/The_Impact_of_Fuel_Poverty_on_Children_Dec_08(1)_1.pdf)

'Living for long periods of time in such cold and damp conditions – rather than being fuel poor per se- is thought to generate significant health risks.' (Liddell & Morris, 2010).

Health effects from the cold:

Homes which are inefficient and unaffordable to heat can have serious health impacts: cold conditions worsen chronic lung disease and asthma, suppress the immune system and reduce the capacity to fight off infection, leading to an increased risk of bronchitis and pneumonia. Cold housing increases the level of minor illnesses such as colds and flu and exacerbates arthritis and rheumatism (Marmot Review, 2011). <http://www.instituteofhealthequity.org/projects/the-health-impacts-of-cold-homes-and-fuel-poverty>

Dampness can cause and exacerbate symptoms of allergies and respiratory disease as well as other health problems. A study by Platt et al., (1989) carried out in subjects homes in Glasgow, Edinburgh and London found that 'adult respondents

living in damp and mouldy dwellings were likely to report more symptoms overall, including nausea and vomiting, blocked nose, breathlessness, backache, fainting and bad nerves than respondents in dry dwellings. Children living in damp and mouldy dwellings had a greater prevalence of respiratory symptoms (wheeze, sore throat, runny nose) and headaches and fever compared with those living in dry dwellings.' They concluded – 'Damp and mouldy living conditions have an adverse effect on symptomatic health, particularly among children'.
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1836778/pdf/bmj00237-0021.pdf>

Excess winter deaths:

According to Chief Medical Officer Report 2009, extreme cold can kill, not only through **hypothermia** whereby organs fail to operate and heart stops beating, but more commonly, cold causes **thickening of the blood**, increasing risk of **coronary thrombosis** and **stroke**.

Cold weather causes a **rise in blood pressure** and causes the coronary blood vessels around the heart to **spasm**, together these can cause fatal diseases of the circulation which include **heart attack and stroke** and account for around **40% of excess winter deaths**.

Around **one-third of excess winter deaths** are due to **respiratory illness**. Infections spread, inhaling cold air affects the lung airways, causing them to narrow and produce phlegm. This worsens chronic lung disease and asthma. Exposure to the cold suppresses the immune system and cold air diminishes the lungs' capacity to fight infection, leading to an increased risk of bronchitis and pneumonia.

Cold weather deaths from heart disease increase almost immediately, reaching their highest just **two days after the coldest weather**. The steepest rise for **stroke** takes place later, at five days. It takes another week for deaths from respiratory illnesses to peak. After a cold spell, it takes over a month for death levels to return to normal. (Chief Medical Officer, 2009) http://www.sthc.co.uk/Documents/CMO_Report_2009.pdf

According to the Marmot Review (2011), each centigrade degree reduction below 18°C in temperature in the UK corresponds with an **extra 3500 deaths**.

Crawford et al., (2003) found that **Cardiovascular disease** is the major contributor to excess morbidity and mortality in winter.

-In **1926** the first correlation was noted between seasons and attacks of coronary thrombosis. Since then, seasonal variations in cardiovascular mortality have been documented in both northern and southern hemispheres, normally with an increase in winter.

- A seasonal trend in specific acute myocardial infarction (MI), peaking in winter and lowest in summer, has been observed extensively in the US and Europe

-Seasonal deaths from MI may be due in part to endogenous physiological rhythms in cardiovascular risk factors. For example, large annual blood pressure amplitude is observed, higher in winter than in the summer and seasonal variation is seen in blood measurements such as fibrinogen, haemocrit, white cell count, platelet count and hormones. Fibrinogen levels are associated with cardiovascular disease, and are known to be a major risk factor for both myocardial infarction and stroke, and to increase during infections. Low body temperature is also associated with increased

blood viscosity and platelets. These effects are associated with thrombus formation and may contribute to cardiovascular deaths in winter.

-They conclude that in Northern Ireland, while the rate of mortality from MI has declined from 1979 to 1998, the seasonal variation of the deaths remains, emphasizing the importance of recognising this phenomenon

<http://qjmed.oxfordjournals.org/content/96/1/45>

National Records of Scotland, Winter Mortality in Scotland 2014/15 -

-22,011 deaths were registered in Scotland in the four months of winter 2014/15 (Dec-March) compared with 18,675 in winter 2013/14

-Winter 2014 was unusually bad compared to the previous 14 winters and had the highest number of deaths registered since winter 1999/2000 (when there were 23,379)

-Seasonal increase in mortality for winter 2014/15 was 4,060

-This figure was 2,460 more than the corresponding value of 1,600 for the winter 2013/14 and also the largest since 1999/2000, when the seasonal increase was 5,190 <http://www.nrscotland.gov.uk/news/2015/winter-mortality-in-scotland-2014-15>

Association for the Conservation of Energy, in their research briefing, March 2015, calculated the number of cold home deaths during the last five years of parliament, they have taken the official figures (from Office for National Statistics (England and Wales) National Records of Scotland and Northern Ireland Statistics and Research) for Excess Winter Deaths for 2010/11 to 2012/13, used the provisional figure for winter 2013/14 and calculated an estimate for last winter 2014/15. They found that since the coalition Government came to power in 2010:

- 155,720 Excess Winter Deaths have occurred in the UK over the last five winters
- Around 46,700 of these deaths in the last five winters are due to people living in cold homes <http://www.ukace.org/wp-content/uploads/2015/03/ACE-and-EBR-fact-file-2015-03-Chilled-to-death.pdf>

The general conclusion is that direct exposure to cold and, probably respiratory cross infections are responsible for most excess winter mortality. Measures to reduce cold exposure therefore provide the clearest means of preventing IHD (ischaemic heart disease) and probably RES (respiratory disease) mortality in winter.' (Donaldson and Keatinge, 1997)

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1060561/>

Who is susceptible to health problems associated with living in cold / damp homes?

The Elderly:

Winter does not only bring an apparent increase in winter deaths but also a dramatic increase in associated health problems which in turn leads to an increase in winter hospital bed admissions – this according to Fullerton and Crawford, 1999. They found that 'a significant winter peak occurred for general medicine and orthopaedics together with a significant increase in 'take-in' days.

They also cite Douglas., et al. (1991), 'Winter pressure on hospital medical beds in Aberdeen between 1984 and 1988 was determined by cosinor analysis. No significant winter pressure was found for total admissions, but there were strong

seasonal effects for cardiovascular and respiratory admissions and for patients over 75 years. <http://qjmed.oxfordjournals.org/content/qjmed/92/4/199.full.pdf>

This point is reinforced by the Chief Medical Officer's Report (2009) who states that Older people, particularly women, are the most at risk as well as those living with underlying heart, circulatory or lung disease.

According to Age UK 'Some winters are worse than others and progress has been made with death rates falling since the 1950s, largely due to warmer homes. However, with tens of thousands of excess winter deaths still being recorded each year and many older people still living in cold homes, much more needs to be done'.

'Older people with an existing heart problem are particularly at risk in winter. Cold tends to increase blood pressure at all ages, but in older people this increase can last for many hours after being in the cold. This means that a short exposure to the cold, by getting up in the middle of the night, for example, or getting cold in bed in the small hours of the morning – can have a lasting impact on blood pressure levels for the rest of the day. Raised blood pressure is a risk factor for stroke and heart attack.' http://www.ageuk.org.uk/Documents/EN-GB/Campaigns/The_cost_of_cold_2012.pdf?dtrk=true

According to the Marmot Review (2011) – 'Older people are more likely to be vulnerable to cold weather, partly because they are more likely to have existing medical conditions. Further, their temperature control is weaker because of less subcutaneous fat, making them vulnerable to hypothermia.'

'In older people, a 1°C lowering of living room temperature is associated with a rise of 1.3mmHg blood pressure, due to cold extremities and lowered core body temperature (Woodhouse et al. (1993) cited in Marmot Review, 2011). Older people are more likely to be fuel poor, as they are likely to spend longer in their homes and therefore require their houses to be heated for longer periods (Burholt & Windle (2006) cited in Marmot, 2011).

Age UK make the point that how people behave during cold weather is important. Older people tend to be less active, meaning their bodies generate less heat. When outside in cold weather, they tend to walk more slowly, generating less heat and being exposed to cold weather for longer.

Many older people simply cannot afford to keep their homes warm. However, for others, cold homes result from lack of knowledge about the health risks of cold or beliefs about the value of fresh air. Learned behaviours such as sleeping with open windows cause further health problems. (Gasgoine et al, 2009) http://eprints.lincoln.ac.uk/2876/1/Health_risk_-_Severe_winter_weather.pdf

The elderly are not the only groups affected by fuel poverty and living in cold homes.

Other Vulnerable Groups and the effects of cold homes:

Staying warm saves lives. By failing to protect vulnerable people from the cold, tens of thousands of lives are endangered every winter. (Chief Medical Officer Report, 2009)

- children living in cold homes are more than twice as likely to suffer from a variety of **respiratory problems** than children living in warm homes
- **mental health** is negatively affected by fuel poverty and cold housing for any age group
- more than 1 in 4 adolescents living in cold housing are at risk of **multiple mental health problems** compared to 1 in 20 adolescents who have always lived in warm housing'
- **Cold housing negatively affects children's educational attainment, emotional well-being and resilience.'**
- Significant **negative effects** of cold housing are evident in terms of infants' **weight gain, hospital admission rates, development status, and the severity and frequency of asthmatic symptoms.'**
- Brambleby and associates estimated the **cost of asthma is at least £847 million per annum**, just under 1% of the NHS budget in 2008.

According to Marmot Review (2011)

The Children's Society produced a report called Show Some Warmth, Exposing the damaging impact of energy debt on children, January 2015 stated -
 'No child should be made to grow up in a cold, damp home that puts their health at risk because their family can't afford to turn the heating on and is living under the burden of energy debt.'

The report calls on energy companies to 'show some warmth to families struggling with energy debts and recognise the additional vulnerability that families with children face if they struggle with their energy bills.'

Their research uncovered a 'worrying association' connecting **disability** and energy debt. 'Families with a disabled adult, or child were significantly more likely to be in energy debt.'

'A shocking **36%** of families with a disabled child are in energy debt, compared to 14% of other families.'

http://www.childrenssociety.org.uk/sites/default/files/Show_some_warmth_full_report_1.pdf

According to a report by the University of Leicester - Over 10 million people have a limiting long term illness, impairment or disability in Britain, including an estimated 0.8 million disabled children. Many are at high risk of fuel poverty with potentially serious implications for their health, well-being and quality of life. This situation is likely to worsen in future as a result of rising energy prices and changes in the benefits system. Consequently, policy-makers should take concerted action to tackle fuel poverty among disabled people as a matter of urgency.

Higher than average rates of energy debt for families with disabled children may be related to higher energy use, with families affected by disabilities frequently requiring higher energy use (factors identified as contributing include increased laundry and use, use of essential equipment and aids which require energy, some illnesses and disabilities lead to people feeling colder, meaning that they require additional heating.

'Nearly 1 in 5 people living with cancer reported that they had to turn the heating off over winter due to money worries, and 6 out of 10 people with cancer had to use more fuel since their cancer diagnosis (Macmillan Cancer Support 2009). Recent Macmillan research showed that around **27,000 cancer patients** in the UK could be behind with paying their fuel bills and **owe their fuel providers as much as £2.8 million in overdue payments.**' (George et al., 2013)
<https://www2.le.ac.uk/departments/law/research/cces/documents/the-energy-penalty-disability-and-fuel-poverty-pdf>

The Children's Society, 2011, also found that 'four in 10 families with disabled children are living in fuel poverty'

'Four in 10 (40%) children in families trapped in energy debt found their bedroom too cold to sleep at night.'

'Being in energy debt is leaving family homes cold and damaging the health of both children and parents. Our results reveal that energy debt can have an effect on both children's and parent's health and well-being, resulting in many children becoming ill or too cold to sleep and parents experiencing anxiety and depression.' Thus leading to long term consequences.

'Most worryingly, we found that over 70,000 children with breathing problems are in families that struggle with their energy bills, according to our analysis of children's health problems using the English Housing Survey'

'There is a statistically significant link between children's breathing problems and not being able to keep warm. Our analysis of the English Housing survey found that over 20,000 children with breathing problems live in homes that cannot be kept warm due to the cost, making them twice as likely as other children to suffer these conditions. This supports previous research that has found children's respiratory conditions are associated with fuel poverty and cold homes (Marmot Review, 2011)'

'Over half (54%) of the families that we surveyed who have faced energy debt reported that they have suffered anxiety, stress or depression as a result of this. Nearly a third (29%) of families who have faced energy debt reported a strain on their family relationships as a consequence.' Research by the Mental Health Foundation has found that debt increases the risk of mental illness and this in turn increases the risk of getting into debt

Their research has found that many families living in energy debt live in cold, draughty homes with poor insulation, Improving energy efficiency of homes protects families from high bills in the long term.'

Cold conditions can have an aggravating effect on many health conditions, not only Cardiovascular (eg heart attacks) and respiratory diseases (eg asthma) which are most commonly associated with living in cold homes.

People with disabilities are much more likely to be unemployed than able-bodied people and are therefore likely to spend more time at home.

Fuel poverty can worsen people's health conditions, which in turn impacts on demand for health and social care services. It is also likely to lengthen recovery

times of people with certain conditions and make existing problems worse. There are the mental health effects of living in a cold home to, from stress and anxiety through to more severe mental health issues.’ (Energy Bill Revolution, 2014) http://www.energybillrevolution.org/fuel-poverty/#section_health

The NHS advises that the best ways to avoid ill health in winter is to;

Keep your home warm

- If you have reduced mobility, are 65 or over, or have a health condition such as heart or lung disease, you should heat your home to at least 18C. It's a good idea to keep your bedroom at this temperature all night if you can. During the day you may prefer your living room to be slightly warmer. Make sure you wear enough clothes to stay warm.
- If you're under 65 and healthy and active, you can safely have your house cooler than 18C, if you're comfortable.
- You can also use a hot water bottle or electric blanket (but not both at the same time) to keep warm while you're in bed.’

Stay active

We all know that exercise is good for your overall health - and it can keep you warm in winter. If you can stay active, even moderate exercise can bring health benefits. If possible, try not to sit still for more than an hour or so. <http://www.nhs.uk/Livewell/winterhealth/Pages/KeepWarmKeepWell.aspx>

For people living with disabilities or living in fuel poverty this can be near impossible.

The example below of a study carried out by eaga Charitable Trust, perfectly highlights the plight of individuals and families suffering the effects of poor health and cold homes.

eaga Charitable Trust, June 2010 found that ‘Differences in interviewees’ perceptions of how warm their homes should be were not just matters of personal subjectivity. They also reflected very real differences in need. In particular, older interviewees and those coping with chronic illness or disability tended to have a greater need for warmth, not least because they were less mobile than younger people. Joyce desperately wanted to be warm but had to suffer under the strict budget of her husband, whose own perception of an adequate temperature may well have been quite different to hers:

“For myself I'm disabled and I've actually got arthritis. My hands get pretty cold so I have to try and heat them up. I put the fire on for five minutes then I've got to turn it off again because it costs too much... if I put it on my husband goes mental because we have to pay the electricity and gas.” (Joyce, middle-aged couple with son)

They found that the health and well-being of children was always the priority of mothers living in cold homes. Several in depth interviewees described how they would endure greater cold personally in order to ensure that their children were warm and well fed. The psychological impact of failing to achieve this goal was substantial:

“My daughter, she's got a low immune system and she's prone to infection. So, if it's cold, she's going to catch a cold. It sounds ridiculous, but anything that's going, she catches it. And I feel guilty. It's awful. I feel guilty that I can't put the heating on to keep her warm. But I don't know, it's really hard and it makes you depressed. You know, you see other people, and you go into other people's houses, and it's lovely and warm and they've got the heating on all the time and you think to yourself, I wish I could do that. Just to keep the house warm. Not for myself, because I could cope with it, you do, but children can't.” (Lucy, not working, single, living with 12 year-old granddaughter).

Households who cannot afford to heat their homes adequately **endure** the winter months as best they can, using their heating intermittently or only when it is most needed, limiting their domestic lives to only one or two rooms, and wrapping up in extra clothes and blankets. **All too often, life becomes a misery, physical health problems worsen and social isolation is exacerbated.**
https://www.cse.org.uk/downloads/reports-and-publications/fuel-poverty/you_just_have_to_get_by.pdf

Persistent cold + financial worry of being unable to afford adequate heating, can cause **depression**. People in fuel poverty are 2.5 times more likely report high or moderate stress than those able to afford their heating (Chief Medical Officer's report 2009)

To date, sufficient evidence exists to conclude that:

- cold and damp homes are associated with sub-optimal mental well-being;
- the association comes about through the stressors associated with being unable to afford solutions to these adverse living conditions;
- these stressors are multiple and diverse, and usually include low income, fear of debt, damage to possessions from mould and damp stains, stigma, and social isolation;
- equally diverse are the risks to well-being that they generate, encompassing both positive and negative aspects of mental health. (Liddell & Guiney, 2014)
http://uir.ulster.ac.uk/31059/1/mental_health_framework_paper.pdf

Professor Christine Liddell also reports in the University of Ulster News Release (March 2013), that figures for the Office for National Statistics (2011/12) show that in people over 75 who have dementia or Alzheimer's – 40% more die in winter. For people under 75 the figure increases to 56%. She states this is because younger people are less likely to be living without a full package of care and support. She stresses that more needs to be done to help people with mental health problems during cold winter months – especially those living alone.
<http://news.ulster.ac.uk/releases/2013/6869.html>

'Being unable to afford a warm home (or fuel poverty) has been a known human health risk for some time, but it is only recently that the extent of risk has become

evident. And she goes on to state that 'lack of affordable warmth is a primary contributor of health inequalities' (Christine Liddell, 2008).

Middlemiss & Gillard, 2015, identified six key challenges to energy vulnerability for the fuel poor – quality of dwelling, energy costs and supply, stability of household income, tenancy relations, social relations within the household and outside, and ill health.

'Establishing who is in most need of help, and why and where that help is needed, is critical to addressing problems of vulnerability.'

Their research recruited households through housing associations and health workers, who were asked to recommend respondents that they suspected to be experiencing fuel poverty.

Fabric

'most respondents acknowledged that without sufficient funds, technical information and control over their dwelling they could not make any significant or lasting improvement. Therefore, with a static deteriorating level of thermal efficiency some households' level of **comfort and warmth is at the mercy of the climate.**'

'For those households where investment in energy efficiency was forthcoming, **improvements lead to greater comfort at home and an increase in disposable income, in effect giving them more flexibility and control** over their energy consumption practices.

Ill health

'It is important to note how **ailing health is not just an effect but also a cause of fuel poverty**. Certain conditions require an increase in fuel consumption to treat symptoms and maintain adequate comfort and warmth, thereby driving up household energy costs:

"My husband's health has got worse. So we spend a lot in the winter with him being housebound and the heating being on 24/7." (Mildred).

Other **conditions are exacerbated** by the cold or heat. Within this cohort health problems lay at the intersection of several public and private services and were sometimes not being resolved as a result. A story from Duncan exemplifies this complexity:

"When we first moved here we were told we were going to get new bathrooms put in. And I moved in on the pretence that I was going to get a shower because sometimes I have to wash myself two or three times a day...I don't know how far down the road the council is with getting this sorted." (Duncan)

While it is clear from Duncan's case that recognition that someone suffers from ill-health is in itself not enough, others in our sample were unable to secure formal recognition that their health condition merited help. Kelly's teenage son, for instance, who suffered from **Reynaud's syndrome**, a condition which requires him to keep warm, was **not registered disabled, but still had extensive energy needs.**'

Others were intensely aware of their own vulnerability, pointing out that the **slightest change in circumstance** could leave them unable to keep the heating on. The individual experience of fuel poverty is extremely important, because if families feel that they are not warm enough, not able to afford energy, 'they begin to see more extreme coping mechanisms as legitimate, which may lead to other health and social problems.'

'It is clear from our work on key challenges to energy vulnerability that a number of social, economic and political structures shape the daily lives of the fuel poor. Understanding the lives of the fuel poor in such a structural way, should help to explain why policies are more or less successful. The Green Deal Energy Company Obligation, for instance, are unlikely to engage households that have precarious tenancy relations (when either tenant or landlord is unwilling to 'commit' in the longer term), unstable incomes (when the household cannot guarantee a steady income to pay back debt), or other markers of vulnerability (lack of social support which makes such a financial 'risk' difficult to take; being in debt with an energy supplier). (Re)designing policy with an eye to the lived experience is likely to make it more appropriate and ultimately more successful.'

<http://www.sciencedirect.com/science/article/pii/S2214629615000213>

Link to cold housing:

People living in under-heated housing are in danger of creating conditions which are harmful to their health and wellbeing.

Old, badly insulated properties offer significantly less protection against the risks of the cold than modern, warmer dwellings. Heating matters. Not having central heating is strongly correlated to a greater risk of death (Chief Medical Officer, 2009).

According to Norbäck et al. (2013) – there is a relationship between dampness and indoor moulds in dwellings and an increase in incidence of asthma in adults. Around '5–15% of adult onset asthma could be attributed to dampness-related exposure at home'. They state that there is a clear need for improvements of housing conditions in order to reduce the dampness-related exposure to counteract the increase of asthma in adults. <http://oem.bmj.com/content/70/5/325.long>

Report by The World Health Organisation, 2007, recognises the potentially detrimental effect that cold housing has on health. They cite evidence from The Warm Front project which installed measures of thermal insulation and heating improvements and its findings supported the hypothesis that improving the energy efficiency of housing does reduce fuel poverty; advance thermal comfort, improve health, and thus provides less demand on health services.

They argue that there is clear evidence that excess winter mortality is temperature related, especially in regards to the elderly, and that the risk is widely distributed and not closely related to **socio-economic status**. They state that in the UK, the problem is much more linked to the **age of the houses** – the older the house, the less energy efficient, and so greater the risk. As well as reducing the threat to physical health, improving energy efficiency has **psychological benefits**, one of

which is to make the whole of the house available (**comfortable**) for use by making heating affordable in all rooms. http://www.euro.who.int/_data/assets/pdf_file/0008/97091/E89887.pdf

Lawlor et al. (2000) further supports the view that there is no link between excess winter deaths and **socio-economic deprivation** - 'results suggest excess winter mortality is not strongly associated with deprivation. We would recommend that policies to reduce excess winter mortality, such as improving house heating efficiency and persuading individual to dress appropriately and keep active whilst outside in the cold, should be **aimed at the whole population**'. <http://pubhealth.oxfordjournals.org/content/22/2/176.full.pdf+html>

Wilkinson et al. (2004), further reinforces this view - the observed lack of socioeconomic gradient suggests that the risk of excess winter death is quite widely distributed in elderly people, which therefore may limit the potential health impacts of initiatives that are targeted only at low income households. <http://www.bmj.com/content/bmj/329/7467/647.full.pdf>

Older, badly constructed houses are difficult and expensive to heat. Wilkinson et al. 2001, analysed 80,331 deaths from **cardiovascular disease** in England, between 1986-96 linked by postcode of residence to data from the 1991 English House Condition Survey. Deaths from cardiovascular disease were 22.9% higher in winter months than the average for the rest of the year. There was a **statistically significant excess winter mortality seen with the age of the property** (28.8% in properties built before 1850 compared to 15% in properties built after 1980) and with poor thermal efficiency ratings, where a gradient can be seen with SAP rating.

There was also a **strong association between excess winter deaths and lower indoor temperatures** with residents of the 25% coldest homes having around 20% greater risk than those in the warmest.

They conclude that 'the results provide evidence that the substantial winter-summer **difference in mortality is indeed related to indoor temperature and to dwelling characteristics that are determinants of indoor temperature**. Further, indoor temperatures predicted from household and dwelling characteristics appear to influence seasonal pattern of mortality and, more specifically, the strength of association between low outdoor temperature and cardiovascular death. **People living in dwellings that are intrinsically cold had a substantially larger seasonal swing in death rates and a greater percentage rise in mortality for each degree Celsius fall in outdoor temperature**.

Although not conclusive, these findings suggest that indoor temperature and markers of the thermal efficiency of dwellings, including property age, are determinants of vulnerability to winter death from cardiovascular disease. **This suggests that substantial public health benefits can be expected from measures that improve the thermal efficiency of homes and the affordability of heating them.**' <https://www.jrf.org.uk/report/cold-comfort-social-and-environmental-determinants-excess-winter-deaths-england-1986-1996>

Housing investment which improves thermal comfort in the home can lead to health improvements, especially where the improvements are **targeted** at those with inadequate warmth and those with chronic respiratory disease. Best available

evidence indicates that housing which is an **appropriate size** for the householders and is **affordable to heat** is **linked to improved health** and may promote improved social relationships within and beyond the household. In addition, there is some suggestion that provision of adequate, affordable warmth may reduce absences from school or work (Thomson et al., 2013). <http://www.ncbi.nlm.nih.gov/pubmed/23450585>

Sheffield Hallam University, 2014, found that older and vulnerable participants who received a range of energy efficiency interventions, small as well as large, reported benefits in terms of increased temperature, warmth, comfort and physical and mental wellbeing. The interventions ranged from large scale (new central heating) to small scale (draught proofing and fitting TRVs). They found that the smaller measures often generated bigger impacts.

They found that participants living in cold homes reported feelings of isolation and in some cases reclusiveness. They stated that because of the vulnerability experienced by the participants it is possible to suggest that they would have struggled to access other services, especially those that are outside of their community or have complex processes attached e.g Green Deal and ECO..

A small intervention such as installing a TRV resulted in increased control over heat in the participant's home and this was an important theme in the results. **The participants reported that they were warmer and more comfortable in their homes and this impacted on their health** by improving their ability to cook, eat a healthy diet, relax in a safe and comfortable environment and enjoy a good night sleep – this was especially precious for those with chronic and complex illnesses. <https://www.shu.ac.uk/~media/home/research/cresr/eval-filt-warm-homes.pdf>

Research sought to systematically quantify the impact of household energy efficiency measures on health and wellbeing. 33,000 participants were meta-analysed. Their results found that on average household energy efficiency interventions led to a small but significant improvement in the health of residents (Maidment et al. 2013). <http://www.sciencedirect.com/science/article/pii/S030142151301077X>

The damp or mould that can accumulate in cold homes has been shown to affect allergic or respiratory conditions including asthma with an approximately 30% to 80% increase (Fisk et al., 2007) <http://www.osti.gov/scitech/servlets/purl/924852>

In general, stress, depression, and low levels of wellbeing have all been linked with cold or damp housing (Shortt and Rugkasa, 2007).

Household energy efficiency measures like insulation double glazing and heating improvements aim to reduce energy demand, making it more affordable to keep homes warm. Given the evidence linking cold homes to ill health, it could be assumed that energy efficiency measures should beneficially affect the health of householders (Thomson et al., 2009, 2013) <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2774202/>

Indirect evidence was also provided by Sandel and Wright (2006), who noted that stress caused by housing problems, including damp and mould, can exacerbate asthma in children. <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2082962/>

Thomson et al. (2013) concluded that despite the increasing evidence base in this area, potential improvements to data collection and reporting still exist, as do key knowledge gaps, for example, in relation to the relative impacts of interventions on particular population subgroups and/or from particular measures.

Comparison to colder countries:

Chief Medical Officer, Annual Report (2009) states that cold weather kills and this should not be the case, which can be seen by comparing the UK with other places such as Finland. The difference appears to be that the population in colder countries are protected from the effects of cold weather by strong cultural norms of well-heated homes and warm outdoor clothing. Finland has 45% fewer winter deaths than the UK which suggests that staying warm both indoors and outside is essential for winter health.

The Eurowinter Group in their 1997 Lancet article reported on data gathered from 1988 to 1992, analysing men and women aged 50-59 and 65-74 in north Finland, South Finland, Baden-Württemberg, the Netherlands, London, and North Italy (24 groups).

Findings showed that 'high indices of cold-related mortality were associated with high mean winter temperatures, low living room temperatures, limited bedroom heating, low proportions of people wearing hats, gloves and anoraks and inactivity and shivering when outdoors at 7°C.'

'Mortality increased to a greater extent with given fall of temperature in regions with warm winters, in populations with cooler homes, and among people who wore fewer clothes and were less active outdoors.'

'the associations shown in the results between mortality and protection against cold stress strongly suggest that excess winter mortality could be reduced substantially by improved protection from cold – particularly in countries with warm winters where the need for cold avoidance was less obvious, and measures taken against it less effective'. <http://www.ncbi.nlm.nih.gov/pubmed/9149695>

J D Healy (2002) supports this view - 'Countries with comparatively warm all year climates tend to have poor domestic thermal efficiency. Because of this, these countries find it hardest to keep their homes warm when winter arrives'...'conversely countries with severe climates – such as those in Scandinavia have to maintain high levels of thermal efficiency, as temperatures demand that houses must retain warmth.'

'Sweden, Norway, and Finland have very high energy efficiency standards in their homes to combat the comparatively severe outdoor environments experienced in these countries.'

'If the ability of a population to protect themselves from cold spells is a key factor in such pronounced seasonality in southern and western Europe, as it has been mentioned previously, then it would seem that improving the thermal standards of

housing could be an effective preventative intervention in curbing excess deaths. Such a healthy strategy would also assist in the alleviation of fuel poverty, which, this study shows, is also highest in those countries in Southern and Western Europe with the poorest energy efficiency.'

Although the study does not prove causality – 'the strong, positive relation with environmental temperature and the equally strong associations with the thermal efficiency of housing in southern and western Europe could play a strong part in reducing the large seasonal variations in mortality found in these countries. <http://jech.bmj.com/content/57/10/784.full>

What are the costs associated with cold weather?

As discussed, residing in cold homes can be damaging to the physical and mental wellbeing of the occupants. The personal cost to those affected and their families is incalculable, but then there can also be massive financial costs associated with winter deaths and illness. Older people who suffer from heart attacks or strokes as a result of winter cold can become permanently disabled. They may need care at home or full-time residential care thus leading to substantially increased demands and costs on care services. Age UK, 2012.

A report called, for Consumer Futures Scotland, states that the benefits of energy efficient homes go beyond simple carbon emission arguments and can improve the health and well-being of residents, thereby reducing excess winter deaths and lowering social care costs and the burden on the NHS.

The report also goes on to quote the cost of fuel poverty in the UK to the NHS as being in the region of £600m to £1bn per annum and even this is likely to be a 'conservative estimate'. They state that this would equate cost for Scotland to be between £48m - £80m per annum, using population as the basis of working out an indicative share of the burden on NHS. This does not provide a conclusive figure but does give an idea of the potential savings that can be made to NHS spending from investing in energy efficiency measures. <http://www.cas.org.uk/system/files/publications/economic-impact-of-energy-efficiency-investment-in-scotland.pdf>

Fuel poverty charity National Energy Action (NEA) advised on 26th February 2016 that nationally, cold homes cost the NHS £3.6 million per day and in the last four years alone over £5 billion of tax payers' money has been wasted whilst 117,000 people have died needlessly due to the cold. <http://www.nea.org.uk/cold-homes-claiming-needless-lives-and-costing-the-nhs-3-6million-per-day-in-england/>

The Chief Medical Officer Report, 2009, estimated that for every £1 spent on reducing fuel poverty, a return of 42 pence can be seen in savings for the NHS. http://www.sthc.co.uk/Documents/CMO_Report_2009.pdf

A study by Howden-Chapman, et al., 2007, found that insulating existing communities of houses in New Zealand led to a significantly warmer, drier indoor environment and resulted in improved self rated health, self reported wheezing, days off school and work, and visits to general practitioners as well as a trend for fewer hospital admissions and respiratory conditions.

'A conservative cost-benefit analysis of this intervention trial indicated that the tangible health and energy benefits outweighed the costs by a factor approaching 2, when calculated in present value terms at a 5% real discount rate over 30 years, and that the energy savings component covered around half the cost of the insulation.' They concluded that fitting insulation is a cost effective intervention for improving health and wellbeing. <http://www.bmj.com/content/bmj/334/7591/460.full.pdf>

The International Energy Agency (2014) reinforces this view. They state, energy efficiency retrofits in buildings (e.g. insulation retrofits and weatherisation programmes) create conditions that support improved occupant health and well-being, particularly among vulnerable groups such as children, the elderly and those with pre-existing illnesses. The potential benefits include improved physical health such as reduced symptoms of respiratory and cardiovascular conditions, rheumatism, arthritis and allergies, as well as fewer injuries. Several studies that quantified total outcomes found benefit cost ratios as high as 4:1 when health and well-being impacts were included, with health benefits representing up to 75% of overall benefits.

They also found that improved mental health (reduced chronic stress and depression) has, in some cases, been seen to represent as much as half of total health benefits. Realised health improvements generate downstream social and economic impacts, including lower public health spending. Addressing indoor air quality through energy efficiency measures could, in a high energy efficiency scenario, save the European Union's economy as much as USD 259 billion (EUR 190 billion) annually.' http://www.iea.org/publications/freepublications/publication/Captur_the_MultiplBenef_ofEnergyEfficiency.pdf

Age UK argue 'The poor energy efficiency of the UK's housing stock means that many older people are put at risk every winter. This is preventable: simple home energy-efficiency measures such as double-glazing or loft insulation would make a big difference. The average cost of making a property energy efficient is just £7,500, whereas the cost of keeping an older person in hospital is estimated at (£1,750 - £2,100 per week.

While the new green Deal and ECO schemes may fund home insulation in some properties, Age UK believes that these programmes will not be sufficient to address the sheer numbers of cold energy-inefficient homes in this country.

Many older people express serious concerns about taking on debt. While technically the Green deal loan would be secured on the property, with interest rates expected to be around 6-8 per cent, it is unlikely to be attractive to many older people.

They go on to state that The Hills Review into fuel poverty made projections about future levels of fuel poverty and has shown that these policies would only reduce fuel poverty by one-tenth compared to what it would otherwise be in 2016. Between 2.6 and 3 million households can still be expected to be in fuel poverty by then – meaning that millions of older people would still be at risk of serious illness or death in winter. They conclude by saying that to make cold-related deaths and ill-health a thing of the past, the Government must provide substantial new investment to make the UK's housing stock energy efficient and warm.

According to Health & Social Care: Winter in Scotland in 2014/15 report, In 2014/15, £10 million was allocated to health boards for winter resilience. This is in addition to £10 million made available for **delayed discharge** and £9.4 million for local unscheduled care plans to support NHS Boards over winter.'

The pressures from respiratory illness were the highest seen in the last ten years... Compared to the same period last year, there was 22.5 per cent significant increase, with this year seeing high levels sustained for many weeks.'

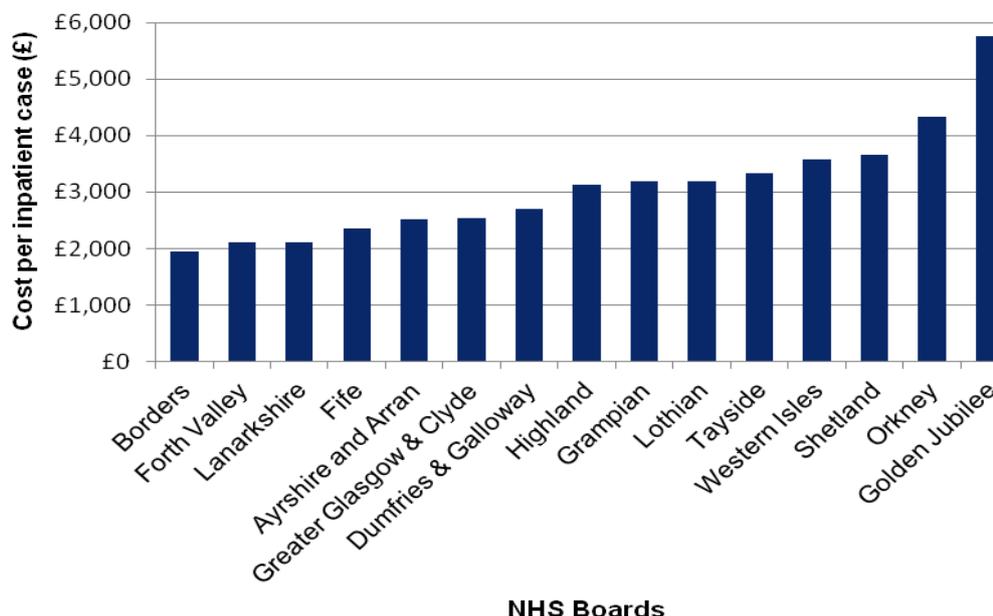
'Bed days occupied by **delayed discharge patients** continued to increase through to December 2014 to over 55,000 bed days. <http://www.gov.scot/Resource/0048/00482968.pdf>

Targeting energy efficiency measures to the most vulnerable households and those most in need, will produce the maximum benefit-cost ratios and will also contribute to improving social equality, increasing individual feeling of control and self-worth (International Energy Agency, 2014) http://www.iea.org/publications/freepublications/publication/Captur_the_MultiplBenef_ofEnergyEfficiency.pdf

According to the publication report, Scottish Health Services Costs for the year ended 31 March 2015 – 'the cost of inpatient treatment varies across NHS Boards in Scotland (see table below). In 2015, the cost per inpatient case ranged from £2091 per case in Glasgow Royal Infirmary to £5267 in Mull & Iona Community Hospital, £5850 in Uist & Barra Hospital and £4558 Portree on the Isle of Skye. <http://www.isdscotland.org/Health-Topics/Finance/Costbook/index.asp#Hospital-Sector>

The higher cost per case at the Golden Jubilee reflects the complex nature of cases treated within that hospital. However, a very large difference in price per case can be seen in comparison to the rural locations, as it costs more to treat a patient in an Island board (NHS Shetland, NHS Orkney, and NHS Western Isles). See table below, taken from <https://isdscotland.scot.nhs.uk/Health-Topics/Finance/Publications/2015-11-24/2015-11-24-Costs-Report.pdf?75104922057>

Figure 5: Cost per Inpatient Case by NHS Board, 2015



All the costs set out above could be offset by tackling the problems of cold homes and taking preventative action in keeping people, warm and well in their homes.

Comments on the statistics and what should be done about cold homes:

Healthcare providers should identify people vulnerable to harm from cold weather and refer them for appropriate help (**Chief Medical Officer Report**, 2009).

‘Cold housing is one of a number of important issues for public health and safety. Focusing more resources on tackling this crisis does **not** mean taking resources away from tackling other health problems, such as those mentioned...in fact it may free up resources to address them.’ **Association for the Conservation of Energy, Research Briefing**, March 2015) <http://www.ukace.org/wp-content/uploads/2015/03/ACE-and-EBR-fact-file-2015-03-Chilled-to-death.pdf>

Marmot Review, 2011 – ‘Improving the energy efficiency of housing has to occur in all communities, across the social gradient and not just where it might be ‘easy’. At times the households in most urgent need are those who are least likely to access support, such as tenants in the private rental sector, or who live in homes that are hardest to upgrade such as older rural housing.’

Theresa Fyffe, Scotland’s director for Royal College of Nursing (RCN) stated: “It’s indefensible that cold, hard-to-heat homes continue to leave the most vulnerable in our society at the mercy of cold weather each winter. Nurses are on the frontline of caring for patients and are all too familiar with the stories behind these winter mortality statistics. Ending cold homes and cutting fuel bills through improving the energy efficiency of Scotland’s homes should be a priority for political parties coming in to next year’s Scottish Parliament election.”

http://www.wwf.org.uk/about_wwf/press_centre/?unewsid=7703

WWF Scotland director Lang Banks stated: “Despite our Nordic neighbours having even chillier climates, their better quality housing means that they have less of a problem with increased winter mortality. Improving the energy efficiency of Scotland’s homes would make a significant contribution to reducing the number of vulnerable people who die each winter from the effects of cold homes. In addition to improving public health, insulating all homes to a ‘C’ standard would also create up to 9,000 jobs a year, cut fuel bills and help tackle climate emissions. We urge all the political parties to commit to eliminating the scourge of cold, energy-wasting, hard-to-heat homes in Scotland.”

http://www.wwf.org.uk/about_wwf/press_centre/?unewsid=7703

Faculty of Public Health of the Royal College of Physicians of the United Kingdom, (2006):

-It is vital that the NHS works in partnership with colleagues in other primary care services, social services departments, the voluntary sector, and grant giving bodies to ensure that contact is made and maintained with those identified at risk of experiencing fuel poverty.

-The NHS has much to gain by tackling fuel poverty. Not only will the overall health of the residents be improved but, by decreasing the excess winter mortality and morbidity, both primary and secondary care will suffer less in terms of winter

pressures on their resources. It is therefore imperative that initiatives to tackle fuel poverty are mainstreamed within the NHS.'

-The most effective and sustainable means of making homes less expensive to heat (aside from keeping energy costs low) is to improve the energy efficiency of the home, such as installing central heating, or cavity wall and loft insulation – which may cut fuel bills by up to 35% and 20% respectively.

-NHS is ideally placed to implement any strategies, particularly at local level.
http://www.fph.org.uk/uploads/bs_fuel_poverty.pdf

National Heart Forum et al 2003, - created a toolkit to improve the quality of life, to reduce morbidity and avoidable winter deaths, to reduce winter strain on NHS by 'encouraging strategic planners and health professionals, should work in partnership with local authorities, to devise and implement well targeted local strategies to reduce fuel poverty.

-Collaboration between housing and health is often poor, easy local contact, simple referral mechanisms needed

- In the future, society should protect vulnerable people so that they are not forced to live in miserable, cold, damp, poorly ventilated houses that they cannot afford to heat adequately to protect their health.

-Living in warm, dry, well ventilated homes rather than cold, damp homes can not only reduce mortality, but also reduce illness and promote faster recovery from illness, prevent unnecessary hospital admissions, support timely discharge and maximise independent living. Ensuring warmth at home is therefore an essential part of integrated care. Action to eliminate cold, damp homes could lessen the winter pressure on the NHS and help achieve national targets for coronary heart disease.

-people with the greatest need, particularly old people are the hardest to reach

-health professionals see the effects of bad housing- particularly cold, damp housing – on their patients – they have the most contact with vulnerable, isolated, old people.

'Involving the NHS therefore provides the opportunity to target programmes to those most in need and most likely to benefit, but who are unlikely to apply on their own.

http://www.fph.org.uk/uploads/toolkit_fuel_poverty.pdf

What is the Government Policy?

SPICEe (Scottish Parliament Information Centre) Briefing, 21 July 2015, The Climate Change (Scotland) Act 2009 requires a reduction in greenhouse gas emissions in Scotland by at least 80% by 2050.

The briefing states that Scottish Government has support for improving the energy efficiency of homes due to recognising the combined benefits of reducing emissions and eliminating fuel poverty and puts forward the following evidence in support of the benefits for health:

-home energy efficiency of all Scottish housing stock will affect the ability to meet emission abatement targets.

- health benefits come from concentrating funding and efforts towards the subset of these households which are also fuel poor.

-The Scottish Government's Fuel Poverty Evidence Review (2012) made an important distinction between fuel poverty and cold homes. According to the review, evidence available did not suggest direct links between fuel poverty and physical

health or winter mortality in Scotland, but instead that cold homes were the basis of most available evidence for impacts on health

- They did find some evidence of a link between fuel poverty and mental wellbeing particularly for young people and for the link between heating costs and stress
- and evidence that for children, the risk of physical and mental health problems increases the longer they live in cold homes.

They also cite the UK Health Forum (2014) which describes the health impacts of cold homes and fuel poverty in the UK. The main areas of morbidity being affected by cold and damp homes are circulatory diseases and respiratory illnesses. This affects all ages, particularly children and the elderly and can also result in low infant weight gain. The report estimates that there were over 9,000 excess winter deaths in the UK due to cold housing in 2012/13. They also recognise that there is strong and growing evidence for the impact of fuel poverty and cold homes on mental health and wellbeing – with a cycle that appears to form between fuel poverty, stress, physical health problems and increased health-risk behaviours such as alcohol consumption.

From their analysis of studies examining health benefits of energy efficiency interventions it could be found that small but significant positive benefits are seen, with more recent studies showing greater benefits (Maidment 2014). Indoor air quality was also considered and whether materials used or reduced ventilation could have an adverse effect on health. The greatest health benefits were seen for interventions targeted at children and those with poor health and focussed on single measures where specific problems were addressed.

The Government has set two complementary targets: “to ensure, so far as reasonably practicable, that people are not living in fuel poverty in Scotland by November 2016” and by 2020 “to reduce total final energy consumption in Scotland by 12% (against a baseline of the average final energy consumption in 2005-7)” (Scottish Government., 2014j).

Outcome two of the Scottish Planning Policy identifies that “planning can support the transformational change required to meet emission reduction targets and influence climate change. Planning can also influence people’s choices to reduce the environmental impacts of consumption and production, particularly through energy efficiency and the reduction of waste”. Paragraph 110 goes on to confirm that the planning system should enable the provision of energy efficient housing. According to the Scottish Government’s Fuel Poverty Progress Report (2014e) energy standards for new buildings to begin in 2015 “will result in emissions that are 45% lower than the 2007 standards and 21% lower than the current 2010 standards”.

The Scottish Government’s Sustainable Housing Strategy (2013e) sets out the 2030 route-map for sustainable housing and describes the Home Energy Efficiency Programme for Scotland (HEEPS). An aim of HEEPS is to follow the Fuel Poverty Forum’s suggestion of a move to Area Based Schemes, implemented by local councils, to tackle fuel poverty but for **national schemes to provide for the most vulnerable**. The Affordable Warmth Scheme looks to get support from the UK-wide ECO Home Heating Cost Reduction Obligation for all eligible Scottish households. A two year extension of the Energy Assistance Scheme is to ensure the most

vulnerable and poor households who were eligible for the Affordable Warmth Scheme will still receive assistance.

‘The Energy Efficiency Standard for Social Housing (ESSH) sets a minimum energy efficiency rating of social housing in Scotland to be achieved by 2020. The SHCS showed that private housing efficiency standards are currently lagging behind social sector housing. A Scottish Government consultation beginning in 2015 is looking to create a standard for all privately owned homes. The rented sector of private homes in England and Wales is now under new regulations to improve energy efficiency by 2018. As well as minimum energy efficiency standards coming into place, tenants have been given extra power to make landlords take up existing government schemes for energy efficiency (Department of Energy and Climate Change, 2014.)’

‘A draft Heat Vision puts energy efficiency and fuel poverty alongside complementary proposals in community and renewable heating (Scottish Government 2013f). Included is the target to achieve “11% of heat demand from renewable sources by 2020”. They state that support for district heating can help these properties not served not served by the mains gas network to secure affordable heating infrastructure. The Scottish Government’s Heat Mapping Programme looks to identify, on local scales, demand for heat and low carbon supply opportunities.

The briefing cites the report on the 2015-16 draft budget by the Infrastructure and Capital Investment committee (2015) who conclude:

- “the Scottish Government [should] continue to fund measures to enhance the future sustainability of all new houses built”
- “Given the potential carbon savings from upgrading existing homes, the Committee strongly believes that improving the energy efficiency of homes should be a national infrastructure priority”
- “The Scottish Government should explore ways of valuing the holistic benefits of home energy efficiency and balance these benefits with the investment costs”

The UK Committee on Climate Change (2015) recommends that Scottish Government:

- Carry out an evaluation of current energy efficiency programmes (especially area-based schemes)
- Make energy efficiency schemes for multi-tenanted properties
- Ensure that policies effectively target electrically-heated homes both in terms of energy efficiency improvement and incentives for low carbon heat

The briefing references Energy Action Scotland (2014) which details barriers to tackling fuel poverty and improving energy efficiency. It concludes that in rural off-grid areas ECO and HEEPs are not working as intended and that the single-access point for public advice and the area-based schemes are working well.

http://www.parliament.scot/ResearchBriefingsAndFactsheets/S4/SB_15-40_Good_for_climate_good_for_health.pdf

Scottish Government has implemented legislation to provide new joint boards at local level to facilitate the integration of health and social care services for adults. 'Although housing services were not included in the original plans, the Scottish Government realised that this omission was a serious potential weakness. There have since been discussions about how best to build effective links between housing and health and social care services.' (Commission on Housing & Wellbeing, 2015) <http://housingandwellbeing.org/assets/documents/Commission-Final-Report.pdf>

'There is a strong and clear preference by older households to live independently in the community for as long as possible. This was clearly recognised in the Scottish Government's Reshaping Care for Older People programme, which noted that institutional options such as residential care and nursing homes were very expensive as well as being seen as very much a last resort by older people themselves. It also noted that emergency admissions to hospital by older people cost £1.4 billion each year (Scottish Government, 2011, Reshaping Care for Older People) <http://www.gov.scot/resource/0039/00398295.pdf>

Action being proposed:

National Institute for Health and Care Excellence (NICE) have introduced a quality standard, published on 4 March 2016 which aims to prevent excess winter deaths and ill health as a consequence of living in cold homes and has been created for commissioners, managers, health, social care and voluntary sector practitioners who deal with vulnerable people of all ages.

The standard focuses on health and social care commissioned **locally**. They have introduced the standard because they recognise the direct link between cold weather and increased chance of heart attack, stroke, respiratory disease, flu, falls and injuries, mental health and excess winter deaths.

The Quality Standard was designed to improve:

- Excess winter death rates
- Morbidity
- Fuel Poverty
- Exacerbations of current health problems
- Timely discharge
- Rates of hospital admissions and readmissions

The Standard should be coordinated across all relevant agencies, creating an integrated approach which is person centred. According to the Social Care Act 2012 the care system in England and Wales should consider NICE Quality Standards in planning and delivering services.

The Quality Standard is based on the following statements:

Statement 1 – Local populations who are **vulnerable** to health problems associated with a cold home are **identified through year-round planning** by local health and social care commissioners and providers.

Statement 2 – Local health and social care commissioners and providers **share data to identify people who are vulnerable** to the health problems associated with a cold home.

Statement 3 – People who are vulnerable to the health problems associated with a cold home received **tailored support** with help from a local **single point of contact** health and housing referral service.

Statement 4 – People who are vulnerable to the health problems associated with a cold home are **asked at least once a year whether they have difficulty keeping warm** at home by their primary or community healthcare or homecare practitioner.

Statement 5 – Hospitals, mental health services and social care services **identify people who are vulnerable to health problems** associated with a cold home **as part of the admissions process**.

Statement 6 – People who are vulnerable to the health problems associated with a cold home who will be **discharged to their own home** from hospital, or a mental health or social care setting **have a discharge plan that includes ensuring that their home is warm enough**.

They define those **vulnerable** to the associated health problems of living in cold homes as the following:

- People with cardiovascular conditions
- People with respiratory conditions (in particular, chronic obstructive pulmonary disease and childhood asthma)
- People with mental health conditions
- People with disabilities
- Older people (65 and older)
- Young children (under 5)
- Pregnant women
- People on a low income
- People who move in and out of homelessness
- People with addictions
- People who have attended hospital due to a fall
- Recent immigrants and asylum seekers

<https://www.nice.org.uk/guidance/ng6>

The Energy Bill Revolution (2014) states that ‘the only permanent solution to the problems of ill health and cold homes is to make all UK homes much more energy efficient – making them so easy and cheap to heat they effectively become fuel poverty proof. But to make this happen the Government must give much more financial support to energy efficiency programmes.’ http://www.energybillrevolution.org/fuel-poverty/#section_health

Age UK – key aim is to help older people keep themselves and their homes warm. They promote the simple things we can all do to keep warm and well in winter. But they are also campaigning for action from local and national government. They state

that the issue of cold homes must be prioritised and funding directed to preventative services and interventions that will enable people to keep warm.

‘At the root of many winter deaths are cold, badly insulated homes. With rising fuel prices, more and more older people cannot afford to heat their homes adequately. Investment in home energy efficiency measures for older people is vital.’

‘While the new Green Deal and ECO schemes may fund home insulation in some properties, these programmes will not be sufficient to address the sheer numbers of cold, energy inefficient homes in this country. To make cold-related deaths and ill health a thing of the past, the Government must provide substantial new investment to make the UK’s housing stock energy efficient and warm.’
http://www.ageuk.org.uk/Documents/EN-GB/Campaigns/The_cost_of_cold_2012.pdf?dtrk=true

The Remote Rural Situation

NHS Highland Board. The Highland Care Strategy, 2014. On NHS Highland published their vision for future delivery of health and social care services for people of Highland for the next 10 years. They stated that -

‘Changing demography, increasing complexity of illness in an increasingly elderly population, increasing use of technology, developments in diagnosis and treatment and financial constraints are among the many substantial drivers for change in health service provision for Highland, Scotland and across the developing world.’

NHS Highland aims to provide ‘Safe, effective and person-centred care which supports people to live as long as possible at home or in a homely setting’.

They state that health and social care professionals should work holistically, flexibly and imaginatively to adapt services to patients’ needs, building on their strengths and assets.

‘Our services are not always organised in the best way for patients; we need to ensure it is as easy to access support to maintain people at home, when clinically appropriate setting; as it is to make a single phone call to send them to hospital.’

‘We need to do more to make sure that care is always provided in the most appropriate setting; particularly recognising the challenges of providing high quality accessible health and social care in remote and rural settings’

<http://www.nhshighland.scot.nhs.uk/Meetings/BoardsMeetings/Documents/Board%20Meeting%2012%20August%202014/5.5%20Highland%20Care%20Strategy.pdf>

NHS Highland. The Annual Report of the Director of Public Health 2014. NHS Highland, 2014.

With increasing service provision in the community, there will be a reduction in hospital bed numbers and hospital-based staff across Highland.’

–‘Scottish housing quality standards are enforced by local authorities and monitored through the Scottish House Condition Survey. In general, the condition of housing stock in Scotland is fairly good but in older, particularly rural, houses poor energy efficiency and the high costs of heating often mean that occupants cannot afford to keep warm.’

-The Scottish Housing Quality Standard (SHQS) was met by 46% of homes surveyed across Scotland in 2012. Failure to meet the SHQS was most commonly due to poor energy efficiency. The majority of homes (69%) met the National Home Energy Rating (NHER) for 'good' with respect to energy efficiency, but older houses and dwellings in rural areas were more likely to be rated as NHER 'poor'. Furthermore, 27% of households were identified as fuel poor. Households living in other dwellings, those in rural areas and those with lower energy efficiency were more likely to be classified as fuel poor.

-Fuel poverty was also associated with householder characteristics such as low income and older age.

-'There have been on average, 130 excess winter deaths per year over the last 10 years in NHS Highland. Of these, 75% were over 75 years of age which is similar to the rest of Scotland.'

- 'Using the current definition, NHS Highland has one of the highest proportions of households in fuel poverty in Scotland with 39% of households in both Highlands and Argyll and Bute described as fuel poor compared to 27% across Scotland as a whole.'

-Remote and rural areas are particularly vulnerable as households tend to rely on more expensive fuels such as solid fuel, liquid petroleum gas (LPG) and oil, the prices of which have risen substantially in recent years. Home energy efficiency measures alone are now considered insufficient for eliminating fuel poverty although they can provide longer-lasting protection compared to the variability over time of income or fuel pricing.

'However, Highland Council's Affordable Warmth Partners Group has concerns over the implications of the new scheme for remote and rural areas given the specific challenges facing these areas such as being off the mains gas grid and having poorer housing stock. According to the Scottish House Conditions Survey more than half of all households in rural areas are not on the gas grid which has implications for heating costs as gas is currently the cheapest of the major commercial fuels. The provision of funding should reflect the higher costs of installing heating systems in older rural houses and the potential additional costs of replacing or relocating oil tanks. Both these costs are currently excluded from the scheme and their absence has prevented some applicants from upgrading their homes.'

'Fuel poverty is predicted to increase as a result of an ageing population, the impact of climate change legislation on fuel bills, changes to the benefit systems and an increasing number of single person households. Strategies suggested to reduce fuel poverty include targeting households with residents over retirement age without access to the gas grid and using social landlords to identify fuel poor social tenants. Ideas for future programmes include widening the focus from heating to other energy-saving improvements and from individual households to communities.

'Ensuring that energy efficiency schemes provide adequate ventilation and information on maintaining adequate air exchange is essential if improving housing and reducing fuel costs is to improve health.'

<http://www.nhshighland.scot.nhs.uk/Publications/Documents/Director%20of%20Public%20Health%20Annual%20Report%202014.pdf>

Conclusions

'Despite causing many thousands of deaths each year, the health risks of cold homes are not well-known to the public, and receive relatively little attention from the

media and from policy-makers. Yet cold homes are estimated to burden the NHS with costs of £1.6 billion per annum (Fuel Poverty Advisory Group, 2015). This evidence provided, highlights the opportunity to save on clinical health spending by tackling cold homes as a cause of ill-health and mortality.

Ensuring people are able to keep warm at home has multiple benefits, with positive impacts on respiratory and heart conditions, mental health and well-being, and also on how children's education (Howden-Chapman et al., 2008; Marmot Review Team, 2011). This is now recognised by the National Institute for Health and Care Excellence (NICE). Its new guidance, published (2016), states that Health and Wellbeing Boards should develop a strategy to address the health consequences of cold homes.

The World Health Organisation, 2007, concluded that the UK and Ireland based evidence is more than sufficient to justify action by countries aimed at reducing the likelihood of households being exposed to low indoor temperatures. The health costs to the populations justify action, and housing intervention will reduce those costs. http://www.euro.who.int/_data/assets/pdf_file/0008/97091/E89887.pdf

Wilkinson et al. 2001 findings suggest that 'substantial public health benefits can be expected from measures that improve thermal efficiency of homes and the affordability of heating them'. Also housing investment which improves thermal comfort which is targeted at those who are most vulnerable or have the most chronic health issues can lead to health improvements (Thomson et al. 2013). It was also found that the small measures often generated the bigger impacts. <https://www.shu.ac.uk/~media/home/research/cresr/eval-filt-warm-homes.pdf>

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