

Fuel poverty at the end of life in the UK



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November 2024



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Key points

- Around 128,000 people a year experience fuel poverty at the end of life, using the criteria of a threshold of 10% of net income spent on energy and a resulting net income of at least 90% of MIS.
- For single people dying aged 20-64, the risk of being in fuel poverty in the last year of life is 33.9%, compared to 24.3% for others of this age - an increase of more than a third.
- Those in households that have pre-payment meters for gas are at greater risk of fuel poverty, with an increase of 6 percentage points for those in the last year of life.
- Those who are over 65 show a greater increase in energy spending in the last year of life compared to others in the same age group. In contrast, those dying aged 20-64 show a reduction in energy spending in the last year of life.
- A social tariff to reduce energy bills by 50% would see fuel poverty rates for those of working age fall by up to 5 percentage points; for those of pension age a larger reduction of 9 percentage points is estimated. However, some may see reduced energy costs as an opportunity to increase consumption and enjoy improved thermal comfort.

1 Introduction and overview

The aim of this research is to estimate the number of people living with terminal illness who experience fuel poverty, and to estimate the extent to which their energy bills change following diagnosis. It complements the research on Poverty at the End of Life (Stone, 2024) and forms part of a ‘deep dive’ into specific facets of poverty in relation to terminal illness.

These findings provide new insights into the risk and prevalence of fuel poverty in the last year of life in the UK. We estimate that every year around 128,000 individuals experience fuel poverty during the last 12 months of life. Hence, more people are impacted by fuel poverty than poverty in the generic sense. This is because the definition of fuel poverty incorporates a criterion based on household income adequacy after energy costs have been deducted, rather than on measures of relative poverty. However, regardless of the choice of fuel poverty metric, those in the last year of life experience increased rates of fuel poverty compared to those who are not at the end of life.

These headline estimates are likely to reflect two different issues of the experience of fuel poverty. On the one hand, we know that individuals who are terminally ill are more likely to need to heat their homes to a higher temperature because they feel the cold and need to their heating on for more prolonged periods due to increased time spent at home. On the other hand, those of working age simultaneously experience a loss of income, in addition to costs associated with terminal illness, and therefore move into fuel poverty as a consequence of their condition. However, regardless of the direction of causality the fact remains that experiencing fuel poverty makes an already challenging situation even more difficult for those at the end of life.

We explore the causal dynamics of fuel poverty in more detail in the later part of the analysis, disaggregating fuel poverty into the two criteria of the method – energy cost as a percentage of income and whether the income that is left is adequate to live with dignity. The results suggest interplay between both factors, with an increasing overlap in the last year of life.

We also investigate the change in energy spending in the last year of life. The results suggest that there are two conflicting narratives at play: for those who have the ability to pay, there is a higher annual percentage rise in energy spending in the last year of life than those who are not at the end of life, whereas, some demographics show a lower annual percentage rise in energy spending, suggesting restricted funds.

We complete our study with an analysis of the impact the introduction of a social tariff might have on fuel poverty rates at the end of life.

2 Background to the study

2.1 Context

Research relating to groups who are vulnerable to fuel poverty tends to focus on the elderly and those with an illness or disability. However, those who are terminally ill are in a unique position in that they will often simultaneously suffer from a reduced income *and* the increased need for heat, with both factors potentially driving them into fuel poverty. The role of cold homes in this situation forms a vicious circle, whereby living in a cold home further exacerbates health conditions.

2.2 Identifying fuel poverty

Put in its simplest form, fuel poverty means having inadequate income to heat your home to a reasonable temperature. Factors affecting fuel poverty include:

- High energy bills, potentially due to:
 - Living in poorly insulated housing
 - Expensive energy tariffs
 - Increased energy need.
- Living on an inadequate income.

2.3 Factors related to fuel poverty

2.3.1 Income and debt

There are multiple definitions of fuel poverty, with different measures used by the various UK nations (Hinson and Bolton, 2023). However, irrespective of the definition used, whether a household is in fuel poverty depends on their energy consumption, their energy tariff (which determines the unit price paid) and their income. The majority of those living in fuel poverty have an income less than two thirds of the UK median income. They are also more likely to have higher energy bills, either due to increased need (as a consequence of, for example, age or disability) or a more costly fuel type (such as oil). Furthermore, those experiencing fuel poverty are more likely to have a pre-payment meter (Friends of the Earth, 2023).

In 2019, Ofgem's report on vulnerable customers noted an increase in the number of customers in debt with a repayment plan. An additional concern was the increase in arrears without a repayment plan. Hence, the reporting in Sections 6 and 7 of this report includes analysis of two measures:

1. A subjective measure of how households are managing financially.
2. An indicator of whether they are in arrears on any household bills.

2.3.2 Pre-payment meters

Prepayment meters have historically been associated with increased costs and intermittency of supply due to credit running out (Doble, 2020). Prior to October 2023, the energy price cap was higher for pre-payment meter customers than for those on credit meters. Since then, the standing charge for pre-payment meters has been equalised and the average unit rate is now comparable to that for credit meters. However, this research examines historic data from 2011 to 2022, so the presence of a **pre-payment meter** for either gas or electricity will be included in our analysis.

In England and Wales, pre-payment meters are linked to fuel poverty and various socioeconomic and health deprivation indicators. Furthermore, there is a greater prevalence of pre-payment meters in those households who are vulnerable and already suffer high levels of health deprivation. The presence of pre-payment meters is also correlated with lower income, a higher number of children

or old people in a household, with social housing and ethnic minorities (Ding et al, 2023). Hence, the analysis will examine **age group, ethnic group, family type** and **housing tenure**.

The use of pre-payment meters is highly correlated with fuel poverty: 29% of English households with an electricity pre-payment meter and 36% of Scottish households with a pre-payment meter experience fuel poverty (NEA, 2021). Ofgem report that there are 7.8 million pre-payment meters in the GB energy market, so their use is widespread (Ofgem, 2019).

Furthermore, Scotland and Wales have disproportionately more pre-payment meters than England. Additionally, regional differences in weather conditions impact upon how much energy is needed to heat the home, hence, **region** needs to be part of the analysis.

The reporting includes analysis of:

1. Age group.
2. Ethnic group.
3. Family type.
4. Housing tenure.
5. Presence of a pre-payment meter.
6. Region.

2.3.3 Access to gas grid

Homes that are not connected to the gas grid are more likely to experience fuel poverty.

The use of oil for heating is typically in rural homes and these tend to have a lower energy efficiency rating and a larger floor area, hence, more energy is needed to achieve the same room temperature (Department for Business, Energy & Industrial Strategy, 2022). There are regional differences between the proportion of homes using oil for heating across the four UK nations. Northern Ireland has the highest proportion (49.5% in 2021) of homes using heating oil (Stewart and Bolton, 2024). However, homes that are not connected to the gas grid are not purely a rural phenomenon; urban homes in high-rise flats are unsuitable for gas connection due to the fire risk, so they tend to use electricity for heat (Stewart and Bolton, 2024). The unit price of electricity is more than three times that of gas, which will lead to increased energy bills for homes with the same heating needs.

The reporting in Sections 6 and 7 includes analysis of two measures:

1. Whether the household has gas available.
2. Whether the household uses oil for heating.

2.4 Fuel poverty metrics

A range of different fuel poverty metrics is used across the four UK nations. Northern Ireland uses a **10% threshold** definition of fuel poverty, which defines a household as experiencing fuel poverty if they need to spend more than 10% of their disposable income to achieve an adequate level of warmth. Details of the calculation method can be found in (Appendix E, Northern Ireland Housing Executive, 2016).

For statistical releases, the Welsh Government use the **10% threshold** definition, which considers a household in fuel poverty if they need to spend more than 10% of their disposable income to achieve an adequate level of warmth (Welsh Government, 2022). On the policy side, the Welsh government use a fuel poverty measure that combines the 10% threshold and a measure of low income of below 60% of the median (Welsh Government, 2021).

Scotland uses a variation on the **10% threshold** definition, with an additional condition that the remaining household income after deducting energy costs is sufficient to maintain an acceptable standard of living. This is measured by assessing whether household income achieves at least **90% of the Minimum Income Standard (MIS)**. Details of the method are available from UK Legislation (2019).

Since 2021, England has used the **Low-Income Low Energy Efficiency (LILEE)** definition of fuel poverty, which has criteria relating to both household income and the energy efficiency of the dwelling. Details of the methodology are available from Department for Energy Security and Net Zero (DESNZ), & BRE. (2023).

There are two aspects of the calculation:

- 1) Does the household have an income below the poverty line?
- 2) Does the home have an Energy Performance Certificate (EPC) rating of 'D' or worse?

A household is in fuel poverty according to the LILEE metric if both conditions are satisfied. Someone living in a home with an EPC rating of A to C, but who still finds their energy bills unaffordable due to inadequate income would not be counted as experiencing fuel poverty.

The **10% income threshold** definition of fuel poverty fails to fully address income adequacy: it can include those on a high income who are also high energy consumers.

The **10% threshold plus low-income** criterion helps to target households in fuel poverty due to income inadequacy. However, that does not consider whether the household's remaining income is adequate for their needs.

The **LILEE** measure of fuel poverty is designed to focus attention on those households that would benefit from home energy efficiency improvements, rather than the wider issue of inadequate income. It is intended to target those living in homes where energy efficiency improvements will lead to reduced bills as a route out of fuel poverty. However, for those who are in the last year of life, the invasive nature of retrofit work is too disruptive to be practical and will not deliver the benefits needed in a sufficiently timely manner.

In contrast, the criteria of a **10% income threshold and net income at least 90% of MIS**, seeks to assess whether the income that is left after paying for energy is adequate to live with dignity. The MIS threshold varies according to household composition and so the approach takes into account the variation in needs for different family types and sizes. Therefore, in the context of fuel poverty at the end of life, this metric is selected as the most appropriate.

2.5 Fuel poverty and mortality

Household energy consumption can be impacted by terminal illness, due to more time being spent at home. Furthermore, it has been estimated that someone with a terminal illness suffers a financial loss of up to £16,000 due to increased costs and loss of income (APPG for Terminal Illness, 2019). This can involve direct costs, including home or residential care, travel to hospital and home adaptations, indirect costs such as having to keep one's home warmer, potentially leading to fuel poverty (Marie Curie, 2020) and loss of earnings for the patient and/or a partner who is caring for them.

However, there is a lack of existing research on those who are terminally ill and experience fuel poverty. This research aims to address the gap in knowledge on this all too often overlooked vulnerable group.

3 UK statistics

3.1 Key findings

- Across both working age people and pensioners, those in the last year of life show increased rates of fuel poverty, regardless of the fuel poverty metric selected.
- Working age people show lower rates of fuel poverty for the 10% threshold metrics of fuel poverty than pensioners, but higher rates for the 10% of net income and 90% of MIS metric, reflecting the higher MIS budget needed for those with dependent children.
- Geographically, the analysis shows fuel poverty rates rise across all parts of the UK for those in the last year of life, with London, Northern Ireland and the northeast of England showing the highest rates of fuel poverty.

These statistics were produced by combining administrative data for the UK that provides information on mortality rates by age range, with estimates of fuel poverty at different ages.

Whilst it is acknowledged that the pension age is now equivalised at 66 for men and women, including those who are 65 in the working age group has negligible impact on poverty rates (Stone, 2024). Furthermore, the additional administrative data that we incorporate is available only in five-year age bands. Hence, the analysis presented here refers to those aged 65 and over as being of pension age, for ease of reporting.

An initial comparison is done of the contrasting fuel poverty metrics used across the four UK nations, by age range and mortality status. Our main indicator on which subsequent headline statistics are based uses the definition of fuel poverty used by the Scottish Government. Their measure of fuel poverty sets a threshold of more than 10% of household income (net of housing costs) being spent on energy bills. In addition, the net resulting income (after deducting disability benefits¹, housing and childcare costs and energy spend), must be less than 90% of the Minimum Income Standard (MIS).

A key benefit of using a 10% threshold plus an income of at least 90% of MIS is that it adapts to family type; for example, in 2023 the following weekly MIS budgets apply (excluding housing costs (Padley and Stone, 2023)):

- *Couple pensioner: £401.12 p/w*
- *Single adult: £309.15 p/w*
- *Couple with two children (one pre-school, one at primary school): £633.31 p/w*
- *Lone parent with two children (one pre-school, one at primary school): £519.26 p/w*

Table 3.1 shows a comparison by age group and mortality status between:

- The Low-Income Low Energy Efficiency metric.
- The 10% gross income plus low-income measure.
- The 10% net income plus 90% of MIS definition.
- The 10% gross income threshold metric.

Whichever metric is selected, the results show that those in the last year of life are more likely to be in fuel poverty than those who are not in the last year of life.

For those who are working age, the more simplified metrics of the 10% gross income threshold (plus low income) measure show much lower rates of fuel poverty compared to the more complex metrics

¹ Disability benefits are excluded because they are deemed necessary to offset the costs of the recipient's condition.

of LILEE and 10% net income plus 90% of MIS. This may be indicative of the fact that those of working age are more likely to still have dependent children, hence, their household has a higher MIS budget. Furthermore, in comparison to those of pension age, those of working age are less likely to own their own home outright, so once housing costs are deducted their disposable income is lower. There is a similar profile for pensioners, but the contrast is less pronounced.

Regardless of age range, we see that being in the last 12 months of life is associated with an increased risk of fuel poverty across all measures.

Table 3.1 Estimated number and proportion of people in fuel poverty in the UK, by mortality status and age group

	<i>In last year of life</i>		<i>Not in last year of life</i>	
	<i>Number*</i>	<i>%</i>	<i>Number*</i>	<i>%</i>
Total population aged 20+				
Low Income Low Energy Efficiency	100,000	16.0%	6,831,000	13.3%
10% gross* income + low income	81,000	13.0%	4,116,000	8.0%
10% net* income + 90% of MIS	128,000	20.5%	9,690,000	18.8%
10% gross* income threshold	85,000	13.6%	4,352,000	8.5%
Working age (20-64 years)				
Low Income Low Energy Efficiency	12,000	14.8%	5,084,000	12.9%
10% gross* income + low income	7,000	8.6%	2,740,000	7.0%
10% net* income + 90% of MIS	18,000	21.6%	7,468,000	19.0%
10% gross* income threshold	7,000	8.9%	2,922,000	7.4%
Pension age (65+)				
Low Income Low Energy Efficiency	88,000	16.2%	1,747,000	14.3%
10% gross* income + low income	74,000	13.7%	1,377,000	11.3%
10% net* income + 90% of MIS	110,000	20.3%	2,223,000	18.2%
10% gross* income threshold	78,000	14.4%	1,430,000	11.7%

* Rounded to nearest 1000

** In this context, net income is net of housing costs, disability benefits, childcare and energy costs.

Figure 3.1 Estimated proportion of people in fuel poverty in the UK, by mortality status and age group

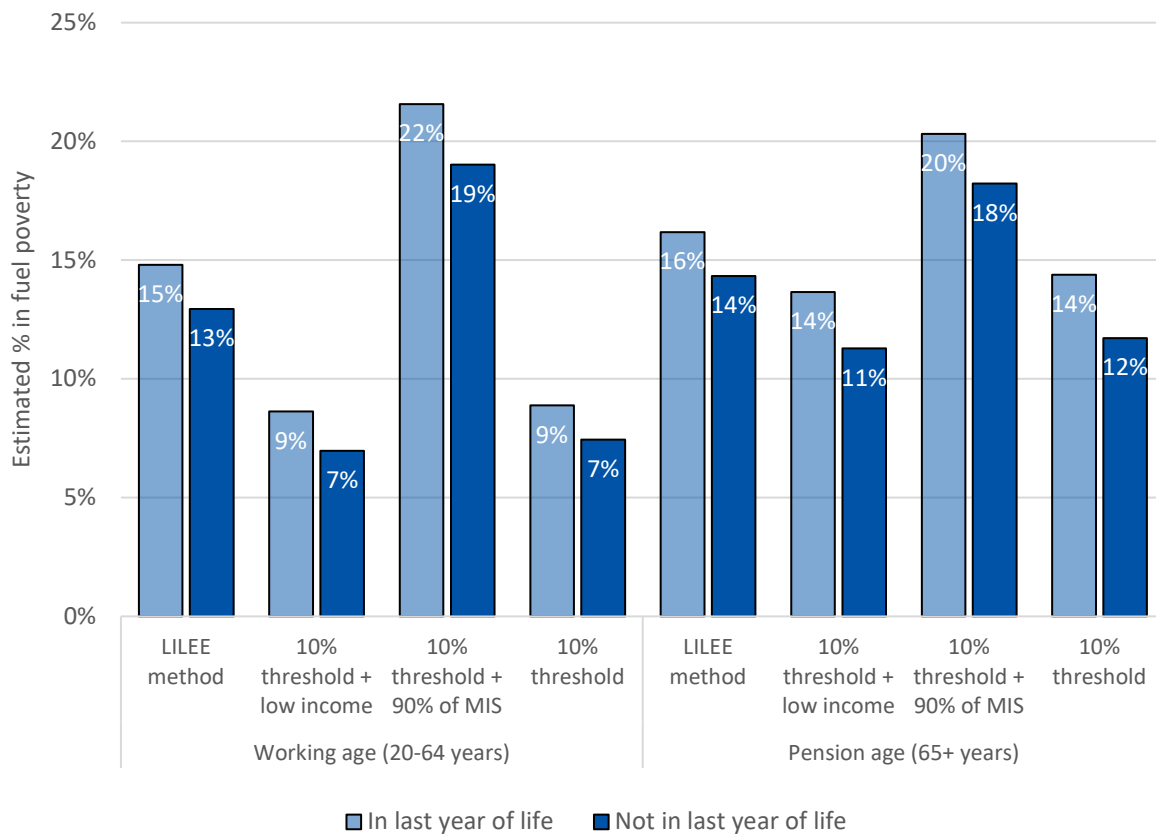


Table 3.2 shows that the pattern of higher fuel poverty rates in the last year of life is apparent across all of the UK countries and regions, regardless of age group. Fuel poverty rates are particularly high in London, Northern Ireland and the northeast of England among working aged people and pensioners. The North West, Yorkshire and the Humber, and the Midlands show higher rates of fuel poverty for those of working age than for pensioners, regardless of mortality status. Northern Ireland is the only area in which fuel poverty is more prevalent for those over 65, whether they are in the last year of life or not.

Table 3.2 Estimated number and proportion of people in fuel poverty in countries/regions of the UK 2011-2022, by mortality status and age group

Country/region	Working age (20-64)				Pension age (65+)			
	In last year of life		Not in last year of life		In last year of life		Not in last year of life	
	Number*	%	Number*	%	Number*	%	Number*	%
North East	1,000	24.4%	328,400	21.5%	5,900	24.1%	114,200	21.6%
North West	2,500	23.0%	877,200	20.3%	13,900	21.9%	264,900	19.6%
Yorkshire and the Humber	1,600	21.4%	600,600	18.9%	9,600	20.5%	186,200	18.3%
East Midlands	1,300	21.9%	546,400	19.3%	8,300	20.2%	168,400	18.1%
West Midlands	1,700	22.1%	668,000	19.5%	10,000	20.2%	197,700	18.2%
East of England	1,300	18.5%	593,900	16.3%	9,700	18.4%	201,100	16.5%
London	2,200	25.7%	1,288,300	22.6%	10,400	25.6%	236,500	23.0%
South East	1,800	17.9%	846,100	15.8%	12,200	16.3%	259,500	14.6%
South West	1,200	19.2%	545,900	16.9%	9,200	17.2%	192,100	15.4%
Wales	1,000	23.1%	358,900	20.4%	6,900	23.1%	133,600	20.7%
Scotland	1,900	20.7%	584,500	18.2%	10,100	20.2%	189,900	18.1%
Northern Ireland	800	23.8%	229,000	21.0%	3,800	27.2%	78,500	24.4%

* Rounded to nearest 100

Figure 3.2 Estimated proportion of working age people in fuel poverty in countries/regions of the UK, by mortality status

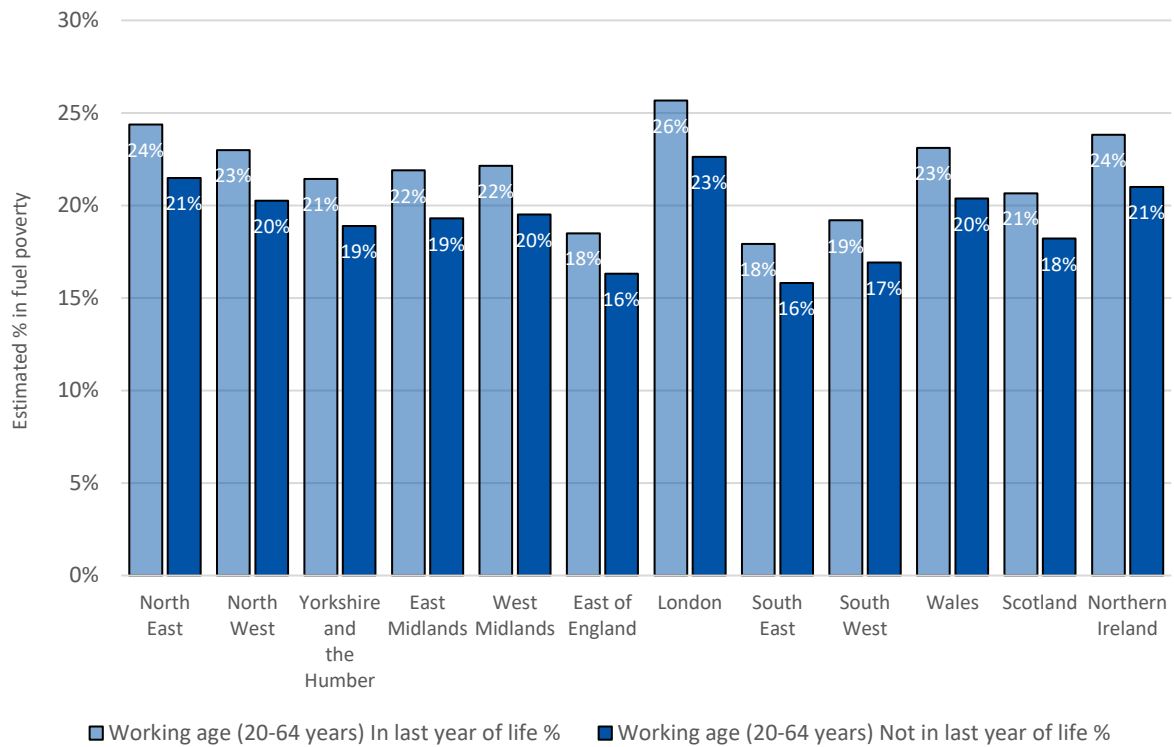
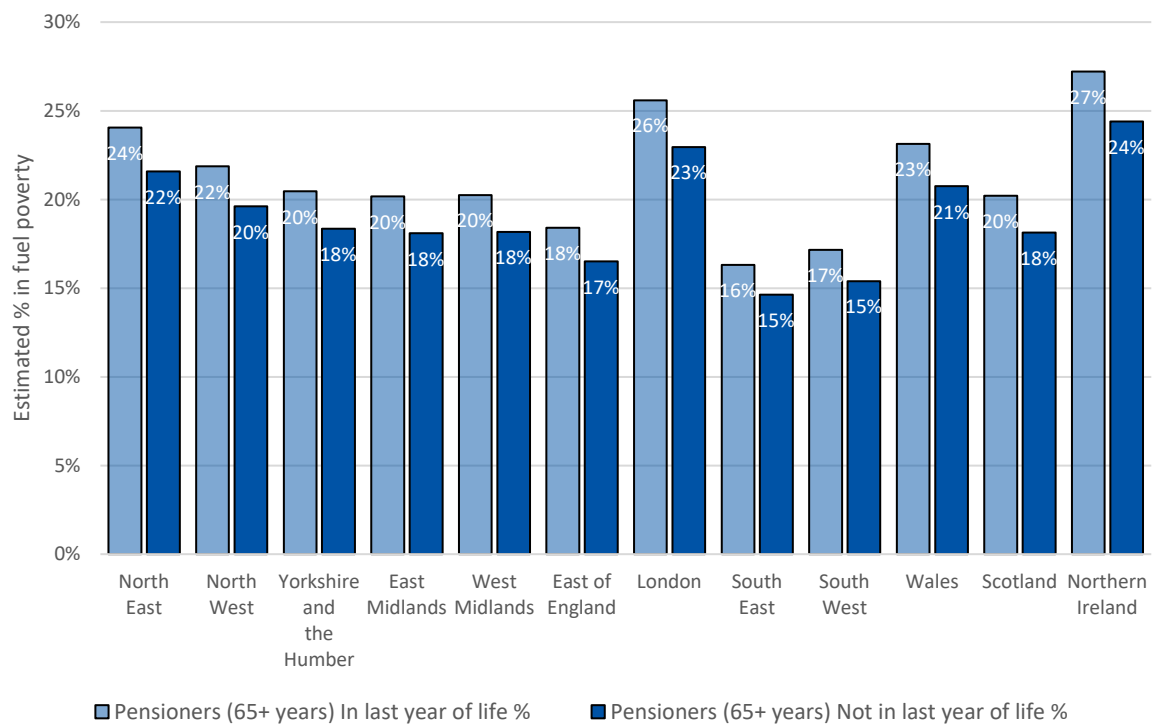


Figure 3.3 Estimated proportion of pension age people in fuel poverty in countries/regions of the UK, by mortality status



4 Subgroups at risk of fuel poverty at the end of life

The following section examines how the overall statistics outlined in the previous section vary for different groups of the population, some of whom may be particularly vulnerable to fuel poverty at the end of life.

4.1 Key findings

- Female pensioners are more likely than male pensioners to experience fuel poverty regardless of mortality status.
- Fuel poverty rates are substantially higher overall among minority ethnic groups than in the white population, and this inequality persists at the end of life. Almost 1 in 4 working age people from a minority ethnic group are estimated to be experiencing fuel poverty at the end of life.
- For people in the last 12 months of life at either working or pension age, the risk of being in fuel poverty is 3 percentage points higher for those with cancer than with other diagnoses.

4.2 Sex

The proportion of people in fuel poverty is higher in the last year of life, regardless of sex or age group, although the difference is less pronounced for women.

Women of pension age experience higher rates of fuel poverty than those of working age and higher fuel poverty rates than male pensioners. In contrast, men are less likely to be in fuel poverty if they are of pension age and male pensioners are less likely to be in fuel poverty than those of working age in their last year of life.

Men of working age show a marked increase in fuel poverty of over 4 percentage points in the last year of life, whereas, for women of working age, the increase is more modest 0.6 percentage points.

This may be attributed to multiple factors:

1. During working life, women are more likely to be in lower paid and/or part-time work, hence the loss of income in the last year of life has a greater impact on men of working age than it does on women.
2. Women typically having lower pension income than men. Furthermore, women have a higher life expectancy than men, so female pensioners are more likely to be in a single person household (Office for National Statistics, 2024). Hence, they are more likely to experience fuel poverty after the age of 65.

Table 4.1 Estimated number and proportion of people in fuel poverty in the UK, by mortality status, age group and sex

	<i>In last year of life</i>		<i>Not in last year of life</i>	
	<i>Number*</i>	<i>%</i>	<i>Number*</i>	<i>%</i>
Men				
Working age	11,000	22.2%	3,460,000	18.0%
Pensioners	47,000	18.0%	806,000	14.5%
Women				
Working age	10,000	20.5%	3,970,000	19.9%
Pensioners	59,000	22.3%	1,408,000	21.2%

* Rounded to nearest 1000

4.3 Ethnicity

For ethnicity, limited sample sizes mean that we can only make a reliable comparison between white and minority ethnic groups (excluding white minorities).² There are likely to be important differences within these groups, but these broad estimates provide an initial insight into the importance of ethnicity in this context.

Table 4.2 shows the stark inequality in risk of fuel poverty associated with ethnic group. Regardless of mortality status, those from minority ethnic groups exhibit considerably higher rates of fuel poverty.

The risk of being in fuel poverty is over 7 percentage points higher in minority ethnic groups. However, in absolute terms this means that at least one in four adults from minority ethnic groups are estimated to be in fuel poverty, regardless of whether they are in the last year of life.

Table 4.2 Estimated number and proportion of people in fuel poverty in the UK, by mortality status and ethnic group

	<i>In last year of life</i>		<i>Not in last year of life</i>	
	<i>Number</i>	<i>%</i>	<i>Number</i>	<i>%</i>
White	103,000	19.4%	7,705,000	17.7%
Minority ethnic groups	25,000	26.5%	1,985,000	25.1%

* Rounded to nearest 1000

4.4 Diagnosis

The results in Table 4.3 show the proportion of people in the last year of life broken down by diagnosis (cancer or other condition). As for ethnicity, we are unable to provide more nuanced estimates with more detailed breakdowns of health conditions due to inadequate sample sizes.

While we cannot be certain that the condition reported by respondents in the survey was the cause of death, we make the assumption that it was in the majority of cases. The findings suggest that among those with a diagnosis of cancer (regardless of whether they are working age or pensioners), the risk of being in fuel poverty in the last 12 months of life is lower than for other conditions, and comparable to those not in the last 12 months of life.

Table 4.3 Estimated number and proportion of people in fuel poverty in the UK, by diagnosis and age group

	<i>In the last year of life</i>				<i>Not in last year of life</i>	
	<i>Cancer</i>		<i>Other condition</i>		<i>Number</i>	<i>%</i>
	<i>Number</i>	<i>%</i>	<i>Number</i>	<i>%</i>		
Working age	6,000	19.5%	13,000	22.3%	7,468,000	19.0%
Pensioners	24,000	18.2%	86,000	21.0%	2,223,000	18.2%
TOTAL	30,000	18.4%	98,000	21.2%	9,690,000	18.8%

* Rounded to nearest 1000

² The 'white' group includes white British, Northern Irish, Irish, gypsy/Irish traveller and 'any other white background'.

5 Local area variation

For those of working age in the last year of life, the majority (12) of local authorities in the twenty worst areas for fuel poverty are in London, followed by the North West (Manchester, Liverpool, Blackpool and Knowsley). Middlesbrough in the North East, Nottingham in the East Midlands and Derry City and Strabane in Northern Ireland also feature.

For those of pension age in the last year of life, the vast majority (15) of local authorities in the twenty worst areas for fuel poverty are in London, followed by Northern Ireland (3) and the North West urban areas of Manchester and Liverpool.

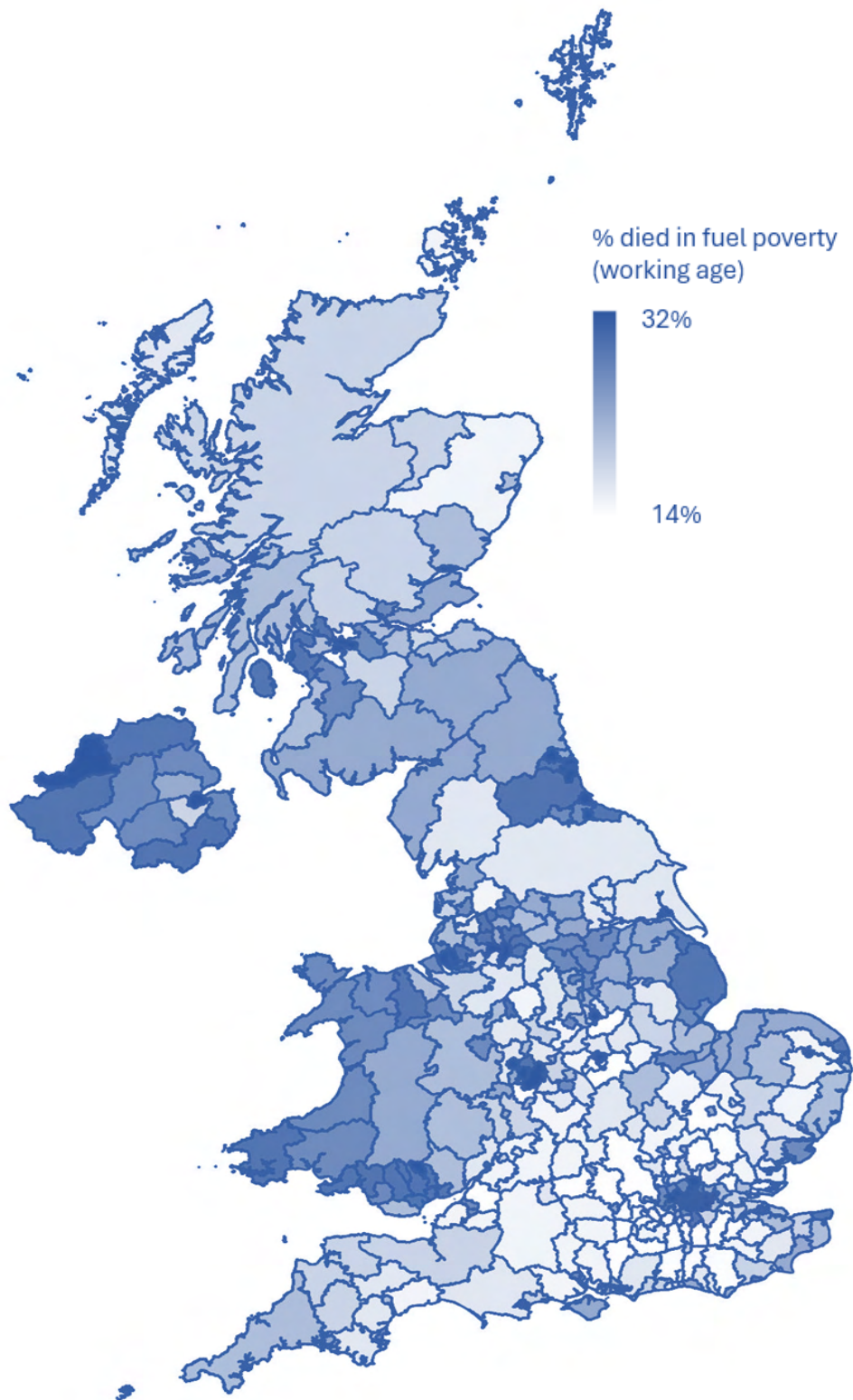
5.1 Working age

Table 5.1 Top 20 local authorities of working age people in fuel poverty

Local Authority	Area	<i>In last year of life</i>	
		<i>Number*</i>	<i>%</i>
Hackney	London	90	31.8%
Tower Hamlets	London	80	31.6%
Islington	London	80	31.3%
Southwark	London	90	29.7%
Lambeth	London	100	29.1%
Camden	London	60	28.9%
Westminster	London	60	28.9%
Manchester	North West	220	28.8%
Newham	London	110	28.6%
Hammersmith and Fulham	London	50	28.6%
Liverpool	North West	230	28.5%
Haringey	London	80	28.3%
Middlesbrough	North East	70	27.4%
Brent	London	90	27.3%
Blackpool	North West	80	27.2%
Nottingham	East Midlands	110	27.1%
Derry City and Strabane	Northern Ireland	120	27.1%
Kensington and Chelsea	London	30	27.0%
Lewisham	London	90	26.8%
Knowsley	North West	70	26.8%

* Rounded to nearest 10

Figure 5.1 Percentage of people dying who were in fuel poverty by local authority (working age)



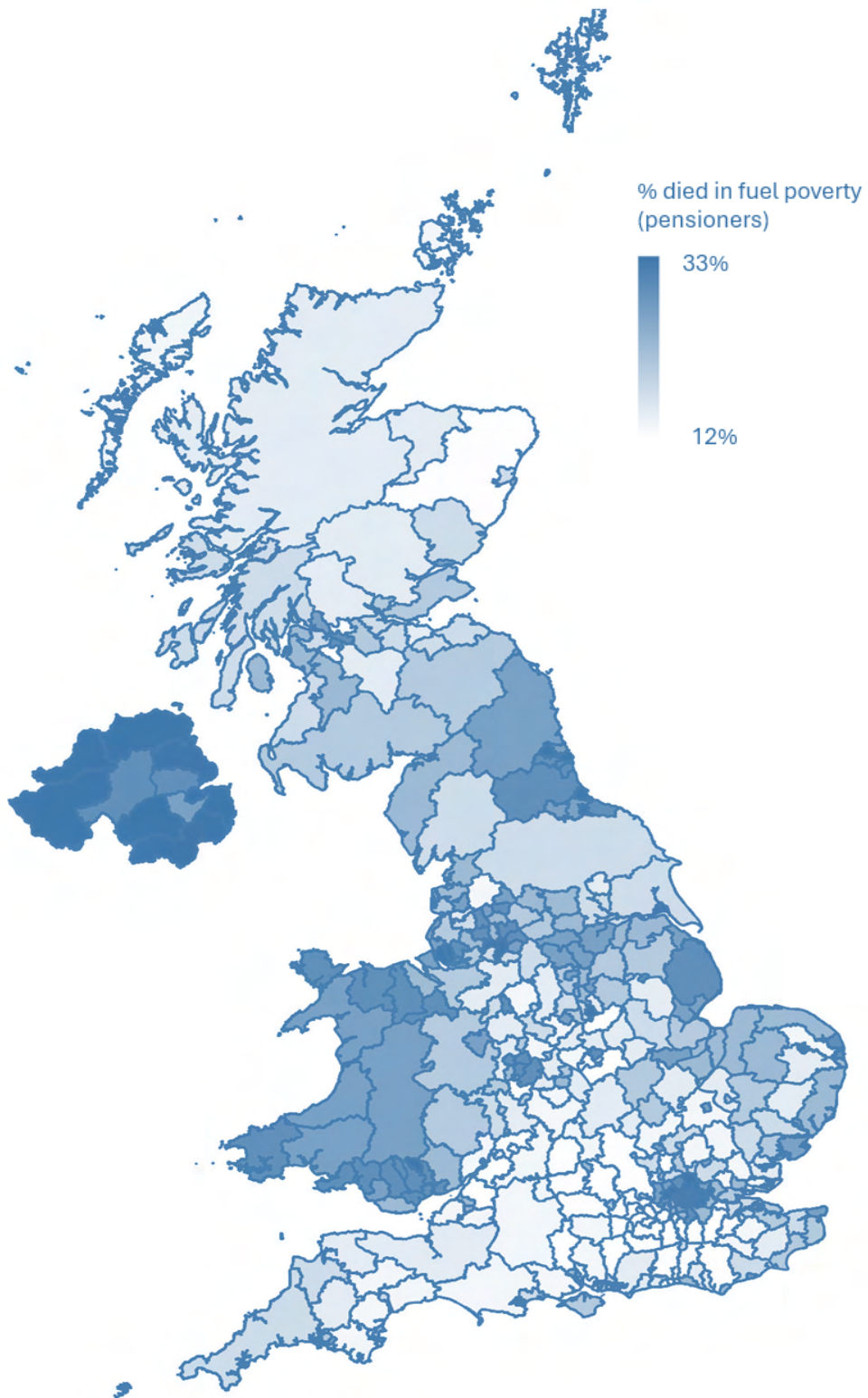
5.2 Pensioners

Table 5.2 Top 20 local authorities of pensioners in fuel poverty

Local Authority	Area	<i>In last year of life</i>	
		<i>Number*</i>	<i>%</i>
Hackney	London	280	32.7%
Tower Hamlets	London	270	32.5%
Islington	London	260	32.2%
Derry City and Strabane	Northern Ireland	780	30.8%
Belfast	Northern Ireland	1910	30.5%
Southwark	London	320	30.4%
Lambeth	London	350	29.7%
Camden	London	270	29.5%
Westminster	London	250	29.5%
Newham	London	290	29.2%
Hammersmith and Fulham	London	220	29.1%
Haringey	London	290	28.8%
Manchester	North West	770	27.8%
Brent	London	420	27.7%
Causeway Coast and Glens	Northern Ireland	770	27.6%
Liverpool	North West	1040	27.4%
Kensington and Chelsea	London	200	27.4%
Lewisham	London	340	27.1%
Barking and Dagenham	London	270	26.8%
Greenwich	London	350	26.8%

* Rounded to nearest 10

Figure 5.2 Percentage of people dying in fuel poverty by local authority (pensioners)



6 Risk of being in fuel poverty

6.1 Key findings

- Against the broader trend of increases in the risk of being in fuel poverty at the end of life, some groups have a lower risk of being in fuel poverty in the last year of life:
 - Individuals who remain in employment;
 - People who are finding their financial circumstances either quite or very difficult.
- Those who live in social housing are at higher risk of being in fuel poverty than other tenures and experience an increase in risk in the last year of life of over 5 percentage points.
- Working age single people suffer the greatest increase in the risk of being in fuel poverty in the last year of life in comparison to other household types.
- People living in households where there is a gas pre-payment meter are more likely to experience fuel poverty and the risk rises by 6 percentage points in the last year of life.

6.2 Demographic factors

This analysis seeks to investigate the demographic factors that relate to the risk of being in fuel poverty at the end of life. All analyses use data from Understanding Society household survey and are based on fuel poverty defined by households whose energy spending exceeds 10% of the household income after housing costs and where net household income is below 90% of MIS.

A summary of results is shown in Table 6.1.

There are key differences by age group:

- Those dying between the ages of 65 and 79 are less likely to be experiencing fuel poverty than other age groups (and less likely than those who are not at the end of life in the same age group). Whereas those over 80 are the most likely to experience fuel poverty at the end of life. Their risk of being in fuel poverty is almost 2 percentage points higher than those of the same age group who are not in the last year of life.
- For all age groups, those dying are more likely to experience fuel poverty than those in the same age group who are not in the last year of life; the difference is most pronounced for those in the 20 to 44 age group who experience an increased risk of fuel poverty of over 4 percentage points.

Those who are economically inactive or unemployed have only a marginal increased risk of 0.8 percentage points of experiencing fuel poverty in the last 12 months of life, compared to those who are not in the last 12 months of life. People who are long term sick or disabled see a rise in their risk of being in fuel poverty in their last year of life to almost 35%, from a high base of over 30% if they are not at the end of life. In contrast, those who can stay in work in the last year of life experience very low rates of fuel poverty, with a marginal improvement compared to those not in the last year of life. This highlights how the loss of income from work can impact upon those with a terminal illness. However, the sample size for those in employment and in the last year of life are small, so these results should be viewed with caution.

Working age single people have a high risk of fuel poverty where they are not in the last year of life, which increases sharply to over a third of individuals when in the last year of life.

Table 6.1 Risk of being in fuel poverty by demographic factors

	In last year of life	Not in last year of life
Age group		
20-44	22.8%	18.5%
45-64	21.5%	19.3%
65-79	17.7%	17.1%
80+	24.9%	23.0%
Economic activity		
In employment	8.6%	9.3%
Retired	22.8%	20.8%
Long-term sick/disabled	34.9%	30.5%
Unemployed/inactive	34.3%	33.5%
Housing tenure		
Owned outright	11.0%	8.4%
Owned with a mortgage	13.7%	9.2%
Social rented	46.1%	40.9%
Private rented	31.7%	30.7%
Family type		
Working age couple	15.7%	13.8%
Pension age couple	12.5%	9.7%
Couple with children	*	*
Lone parent	*	*
Working age single	33.9%	24.3%
Pension age single	28.3%	27.4%

* sample size too small for those in the last year of life

6.3 Energy specific aspects

This analysis seeks to investigate the energy specific aspects that relate to the risk of being in fuel poverty at the end of life. Again, all analyses use data from Understanding Society household survey and are based on fuel poverty defined by households whose energy spending exceeds 10% of the household income after housing costs and the net household income is below 90% of MIS.

A summary of results is shown in Table 6.2.

6.3.1 Pre-payment meters

Those people living in households where there is a pre-payment meter for gas are more likely to be living in fuel poverty, with an increased risk of 6 percentage points for those in the last year of life.

The pattern for electricity pre-payment meters sees a smaller increase in the risk of experiencing fuel poverty for those in the last year of life. This may be because most UK households use gas for heating and those in the last year of life may be prioritising the need for heating over other energy uses (DEZNZ, 2024).

6.3.2 Fuel type

Those who live in households that do not have a gas supply have an increased risk of being in fuel poverty; in the last year of life, this risk increases by over 4 percentage points. Households without a gas supply are broadly divided into two categories: urban apartments with electric heating and rural

dwellings using oil for domestic fuel (Stewart and Bolton, 2024). Individuals in households that use oil as domestic fuel show an increased risk of being in fuel poverty of 6 percentage points at the end of life, whereas those that do not use oil have a more modest increase in the risk of being in fuel poverty of 2 percentage points.

Table 6.2 Risk of being in fuel poverty by energy specific aspects

	In last year of life	Not in last year of life
Pre-payment meter gas		
No	20.2%	17.9%
Yes	29.9%	23.9%
Pre-payment meter electricity		
No	20.3%	17.8%
Yes	26.2%	23.9%
Whether has gas supply		
No gas supply	24.4%	19.8%
Has gas supply	20.1%	18.5%
Whether uses oil as		
Doesn't use oil	20.8%	18.9%
Uses oil	22.4%	16.5%
Whether behind on bills		
Up to date with all bills	20.4%	17.9%
Behind with some/all bills	28.4%	26.1%
Financially managing		
Comfortable/OK/Getting by	20.1%	17.2%
Quite or very difficult	25.2%	27.1%
Able to keep comfortably warm		
Yes	21.5%	17.3%
No	31.3%	29.0%

This may be linked to price volatility in domestic heating oil, which saw the cost of filling an oil tank treble in early 2022 (Brignall and Osborne, 2022). Also, houses that use fuels other than gas or electricity for heating (primarily oil and solid fuel) typically have lower energy efficiency ratings and larger floor areas and hence require more heat input to maintain the same room temperature (Department for Business, Energy & Industrial Strategy, 2022).

This links to the findings on country and regional risk of being in fuel poverty, described in Section 3, which highlighted high rates of fuel poverty experienced in Northern Ireland, where there is a high prevalence of oil for domestic fuel.

6.3.3 Financial situation

Understanding Society asks participants to give a subjective assessment of their financial situation. Intuitively, those who are finding it quite or very difficult to manage financially are at greater risk of being in fuel poverty, compared to those who are comfortable. However, for those who are finding it quite or very difficult financially, the risk of being in fuel poverty falls for those who are in the last year of life. One speculative reason might be that because this is a subjective measure, individuals may feel their condition puts previous financial concerns into perspective.

6.3.4 Ability to keep warm

Those who are unable to keep comfortably warm in their homes have a very high risk of experiencing fuel poverty. This is intuitive given that the accompanying survey notes for Understanding Society explicitly state that those whose reason is a lack of funds are to be included in this category. Those who are unable to keep comfortably warm in their homes have a dramatic 31.3% risk of being in fuel poverty if they are in the last year of life, compared to an already high risk of 29.0% risk for those not in the last year of life.

7 Changes in energy spend at the end of life

This section examines the annual percentage change in energy spend for those in the last year of life by demographic aspects and by factors relating to energy and behaviour.³

The reasons why more is spent on energy are more complex than simply increased need, leading to greater consumption and hence, more spending. The period covered by the data analysed for this research has seen the unit cost of energy rise year on year, which makes it difficult to separate the background of price increases from increased consumption. Furthermore, variation in weather conditions and outdoor temperature drive demand for heating, which forms the predominant part of energy spending. For these reasons, the analysis presented in this section compares the percentage change in energy spending for those who are in the last twelve months of life with those who are not.

In all analyses, there is an annual percentage increase in energy spending, indicative of rising prices.

7.1 Key findings

Two themes are apparent for those in the last year of life:

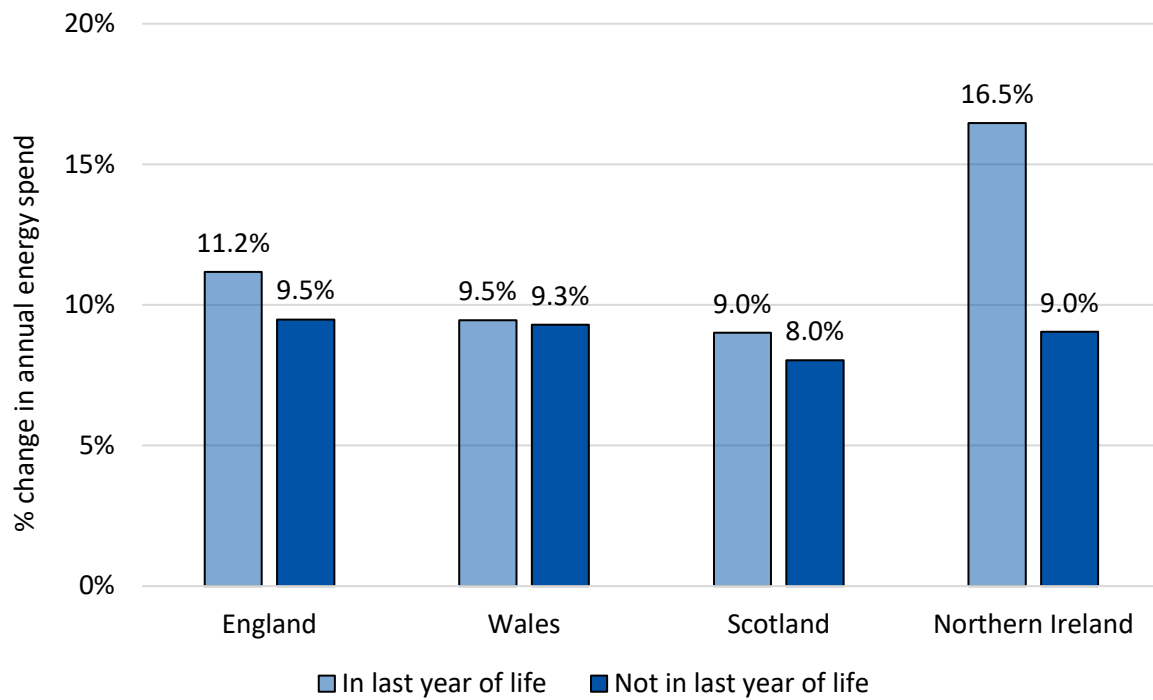
- People who have the ability to pay are spending more on energy.
- For some categories, spending is down, perhaps indicating a lack of adequate income. This is evident for those who are behind on some or all household bills: in the last year of life they show a smaller increase in energy spending compared to those not in the last year of life.

In some instances, the causal direction of changes in energy spending is difficult to determine: this is noticeable for those who are finding it quite or very difficult to manage financially: in the last year of life they show a smaller increase in energy spending compared to the background increase seen in those who are not in the last year of life.

³ Determining the underlying causes of a rise in energy bills among people with terminal illness is beyond the scope of the study. The survey data do not allow us to quantify the complex factors such as building fabrics, weather conditions and other external influences that affect household energy use.

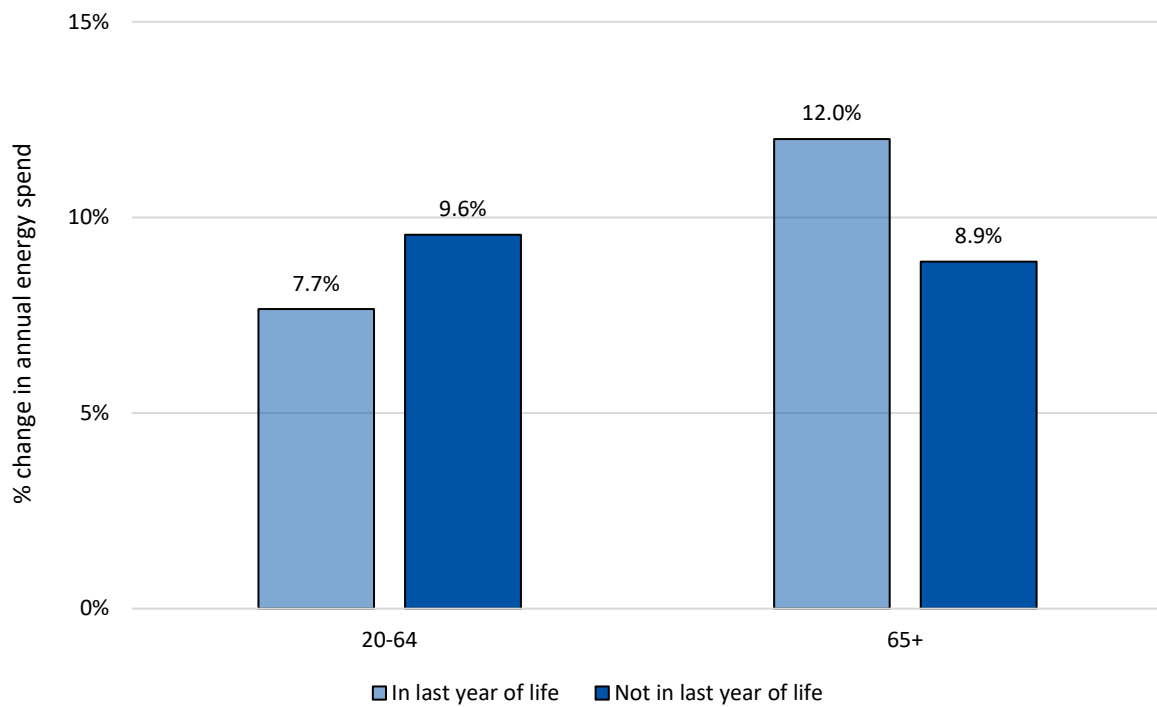
Across all four UK nations, the percentage change in annual energy spend is greater for those in the last year of life than those who are not, as illustrated in **Figure 7.1**. Northern Ireland shows the greatest difference between those at the end of life and those who are not, with annual energy spend rising by 16.5% in the last year of life. As discussed in Section 2, Northern Ireland is highly dependent on oil as fuel for domestic heating, with almost half of households using heating oil in 2021 (Stewart and Bolton, 2024).

Figure 7.1 Percentage change in annual energy spend by country and mortality status



Those who are pension age show a greater percentage increase in annual energy spend in the last year of life than those of working age, which may be related to their ability to spend more due to a more secure financial position or to the range of support with energy bills that is available to those over 65 (such as the Winter Fuel Payment worth between £250 and £600 per household⁴, Cold Weather Payments and the Warm Home Discount for those in a low income household). Those of working age may be cutting back on their energy spending because they are no longer able to work.

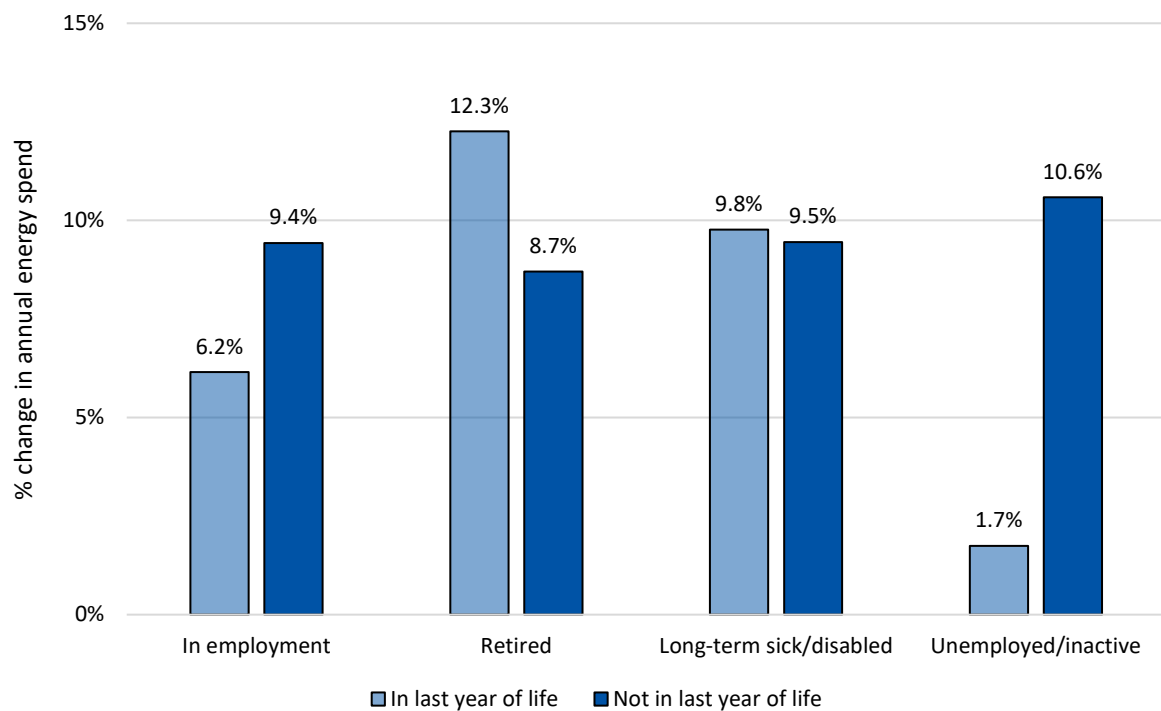
Figure 7.2 Percentage change in annual energy spend, by age group and mortality status



⁴ For winter 2023-24, including an additional 'Pensioner cost of living payment' <https://www.gov.uk/government/statistics/winter-fuel-payment-statistics-for-winter-2023-to-2024/winter-fuel-payment-statistics-for-winter-2023-to-2024#:~:text=their%20heating%20bills,-,It%20is%20an%20annual%20tax%2Dfree%20payment%20of%20between%20%C2%A3,the%20regular%20Win ter%20Fuel%20Payment.>

Those who are retired and those who are long-term sick or disabled show an increase in energy spend in the last year of life. The greatest percentage increase is seen in the retired, which reflects the findings on age range. It is concerning that the unemployed show a much smaller percentage rise in energy spending for those at the end of life compared to those who are not in the last year of life, which reflects their lack of funds and may be due to concern over leaving debt for dependents. It is worth reflecting on findings from previous research on poverty at the end of life which found that the group with the highest risk of moving into poverty in the last year of life were those who had exited the labour market (Stone and Hirsch, 2022).

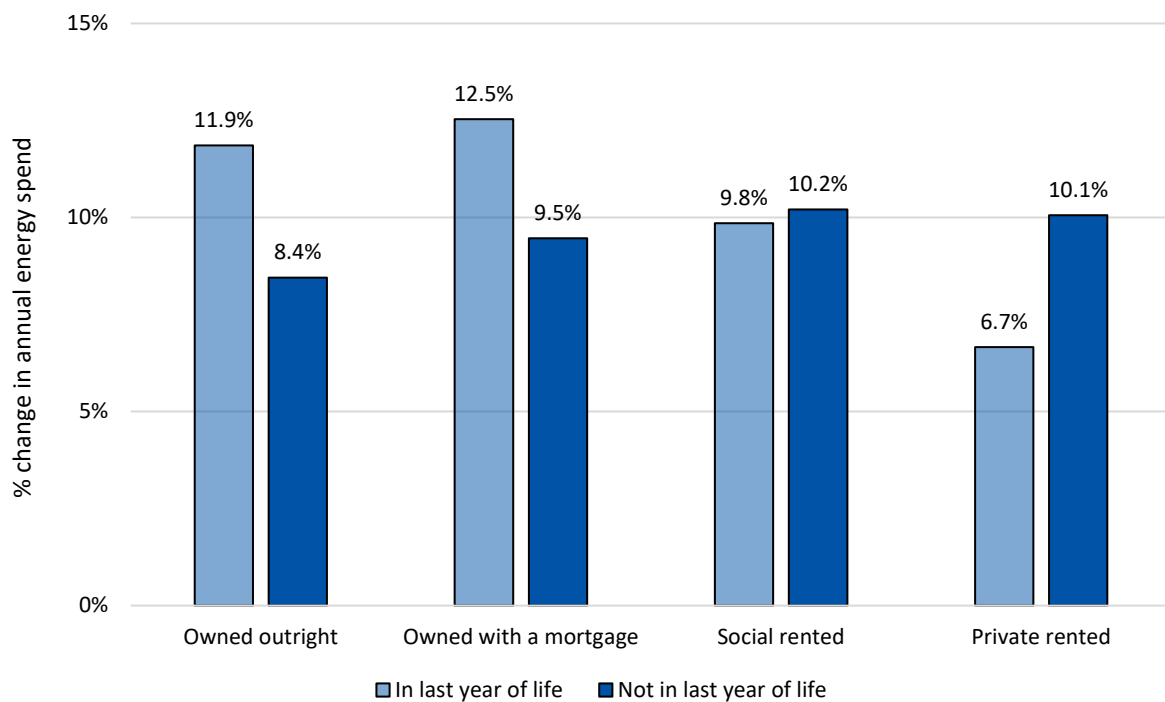
Figure 7.3 Percentage change in annual energy spend, by economic activity and mortality status



Owner occupiers show the greatest percentage increase in energy spend in the last year of life, which may be an indicator of their financial ability to spend more on energy. Furthermore, those who own their home outright are more likely to be pensioners and hence have access to a range of support with energy bills.

In contrast, those in social or private rental properties showed a smaller rise in their energy spending in the last year of life compared to those who are not in the last year of life, which suggests that they are economising on energy use.

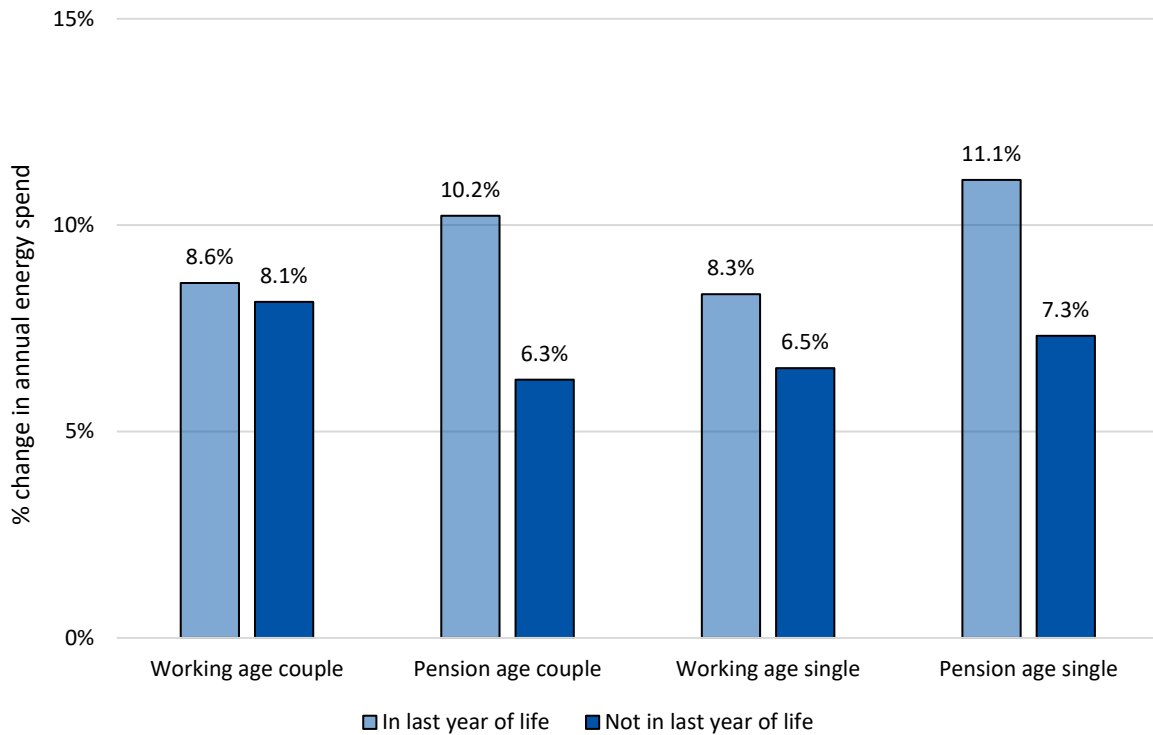
Figure 7.4 Percentage change in annual energy spend, by household tenure and mortality status



Again, those of pension age (whether single or part of a couple) show a greater percentage rise in annual energy spend in the last year of life.

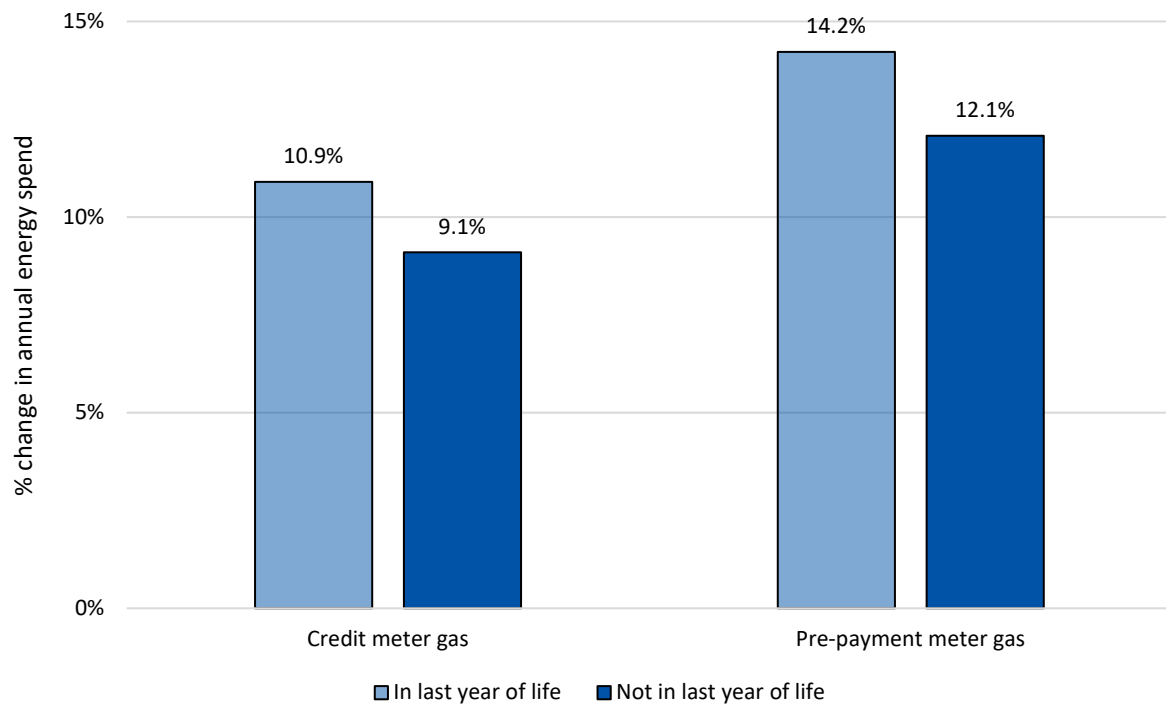
Couples with children and lone parents are not reported because sample sizes in the last year of life were too small (those in the last year of life are much more likely to be older and no longer have dependent children).

Figure 7.5 Percentage change in annual energy spend, by family type and mortality status



Those individuals living in households with pre-payment meters for gas saw their energy spending increase by more than those households with a credit meter, regardless of mortality status⁵. Those households with a pre-payment meter for gas saw their energy spending increase 14.2% in the last year of life, whereas those with a credit meter saw theirs rise by 10.9%. This greater cost is indicative of the further disadvantage placed upon those on pre-payment meters discussed in Section 2, which highlighted that the data used for this study predate reforms to the structure of the pre-payment meter price cap.

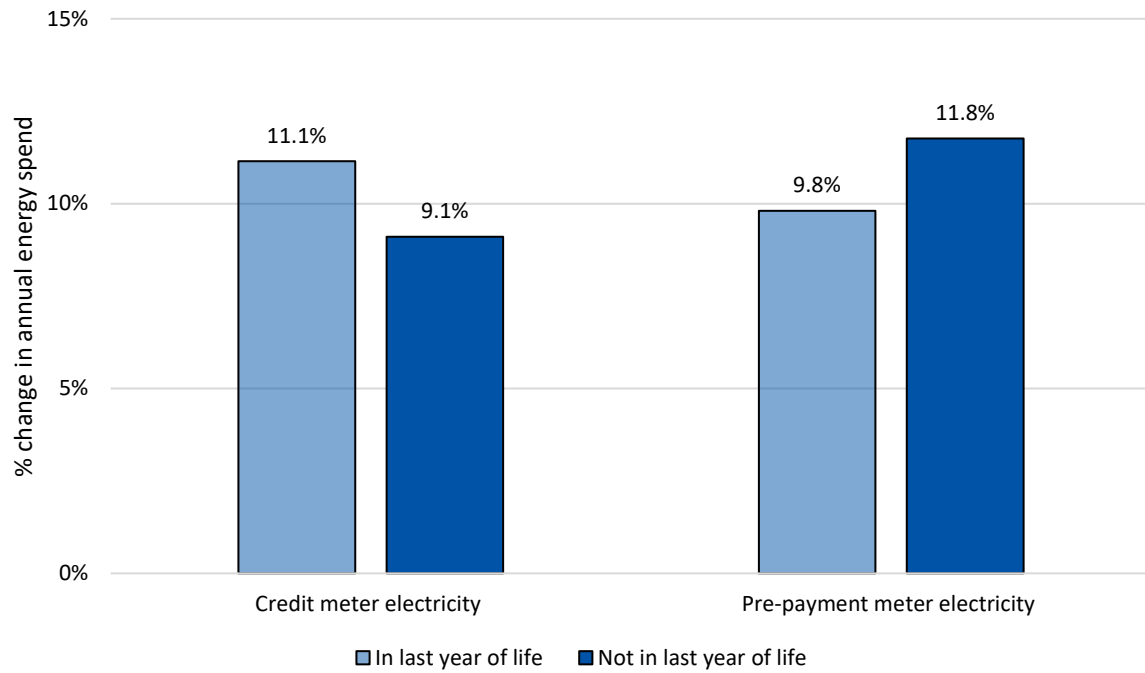
Figure 7.6 Percentage change in annual energy spend, by whether household has a prepayment meter for gas and mortality status



⁵ The data used for this research pre-dates the changes to pricing rules for pre-payment meters and at this time standing charges and unit rates for pre-payment meters were typically higher than for credit meters.

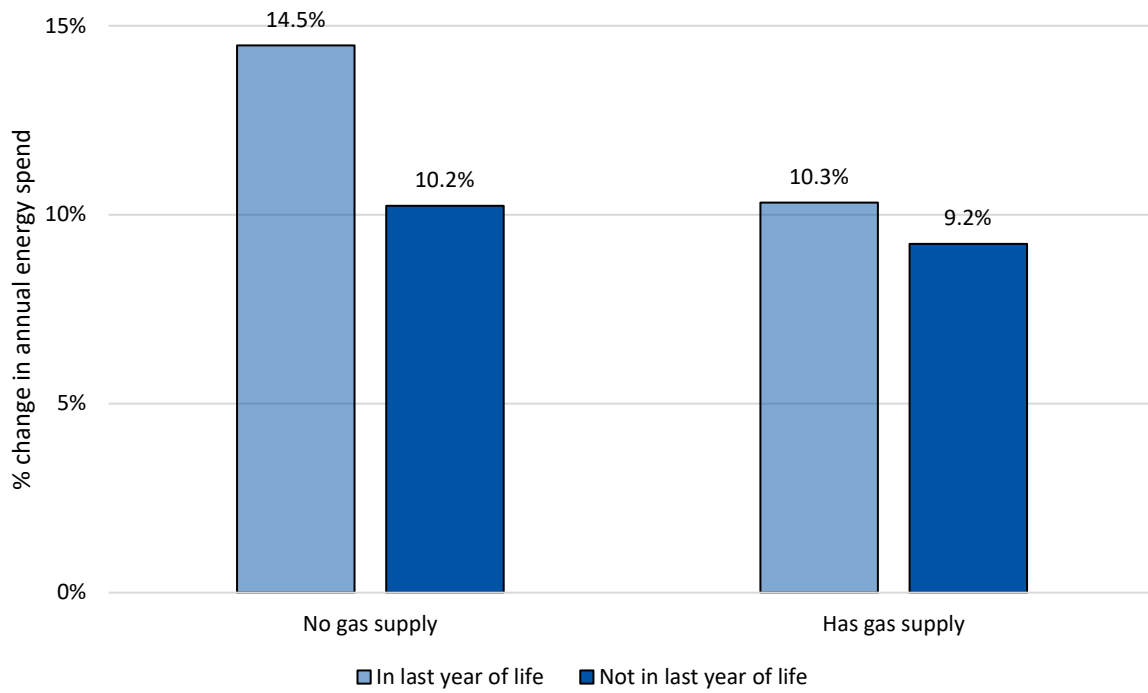
Pre-payment meter gas spending increases more for those in the last year of life compared to those who are not in the last year of life. Whereas pre-payment meter electricity spending shows a smaller increase for those in the last twelve months compared to those who are not. This aspect may be explained by the fact that the majority of UK households use gas for heating and domestic hot water. Hence, those in the last year of life may be prioritising gas and compromising on electricity consumption.

Figure 7.7 Percentage change in annual energy spend, by whether household has a pre-payment meter for electricity and mortality status



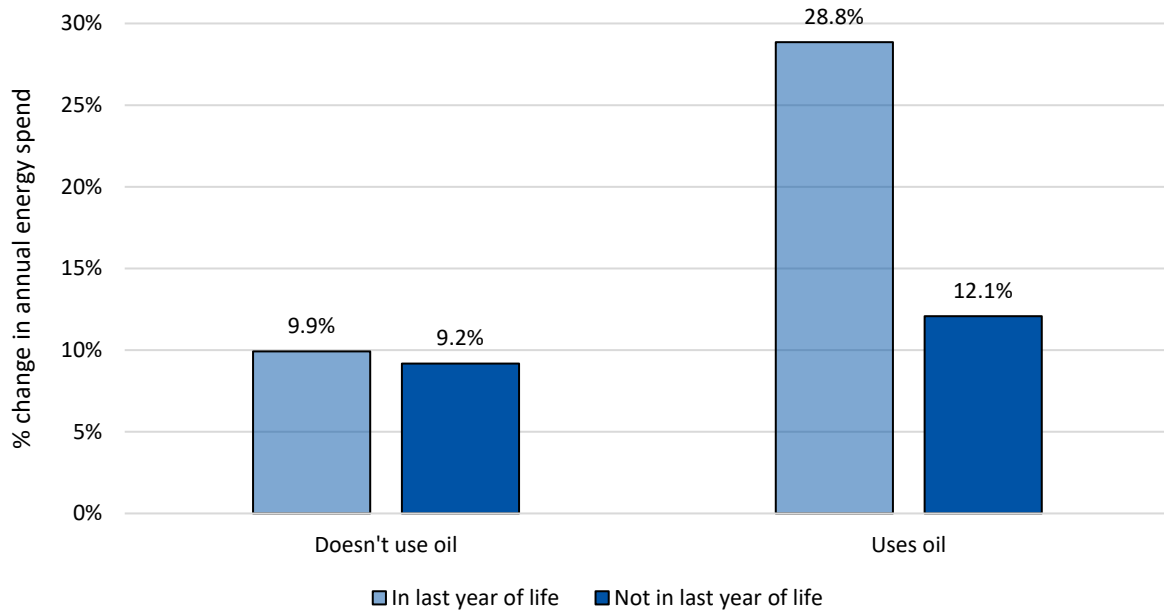
The absence of a gas supply is related to a greater percentage rise in energy spending. Some of these will be rural households using oil for domestic heating, which tend to be less energy efficient dwellings, whereas, others will be urban households in apartments, where electricity is used for heating due to fire risk concerns (Stewart and Bolton, 2024). Note that: electricity is typically priced at over three times the unit rate of gas.

Figure 7.8 Percentage change in annual energy spend, by whether household has a gas supply and mortality status



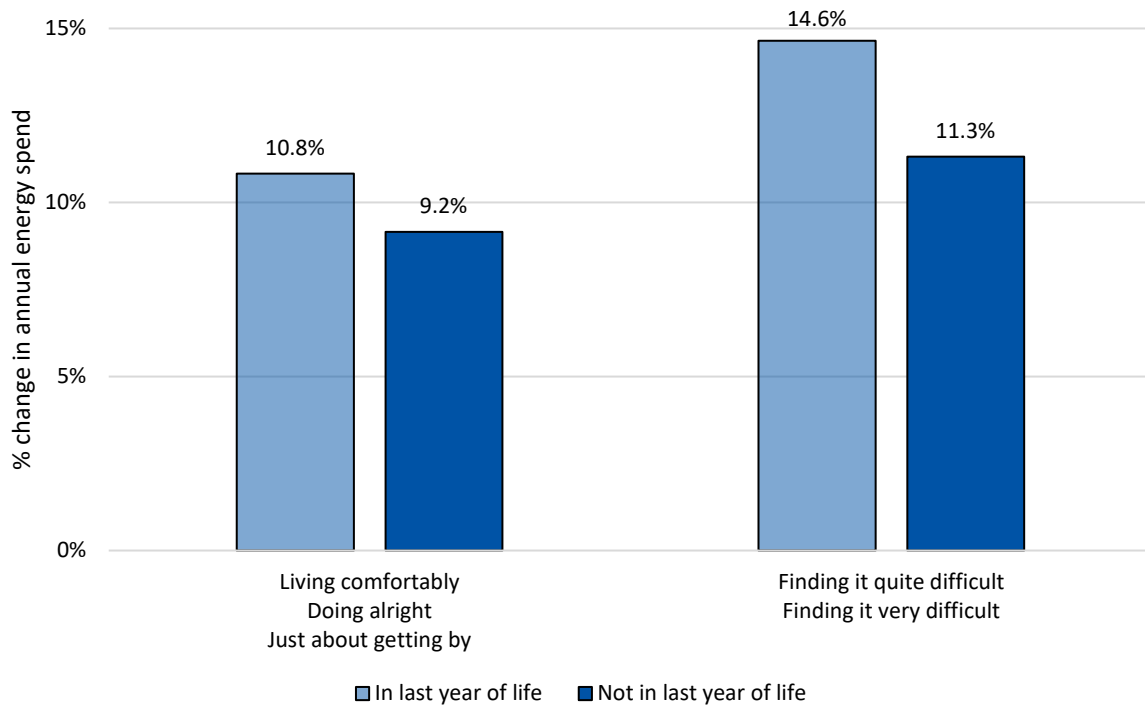
Those households which use oil for domestic heating saw a dramatic 28.3% increase in energy spend in the last year of life. The nature of how domestic heating oil is purchased may be a factor: purchasing in bulk in advance may lead to stockpiling if people are worried about their ability to keep warm. This relates back to the energy spending increases seen in Northern Ireland, where almost half of all households depend on oil for their heating. Also, the period covered by the data used in this study includes a period of rapidly rising prices for domestic heating oil (Brignall and Osborne, 2022).

Figure 7.9 Percentage change in annual energy spend, by whether household uses oil for domestic fuel and mortality status



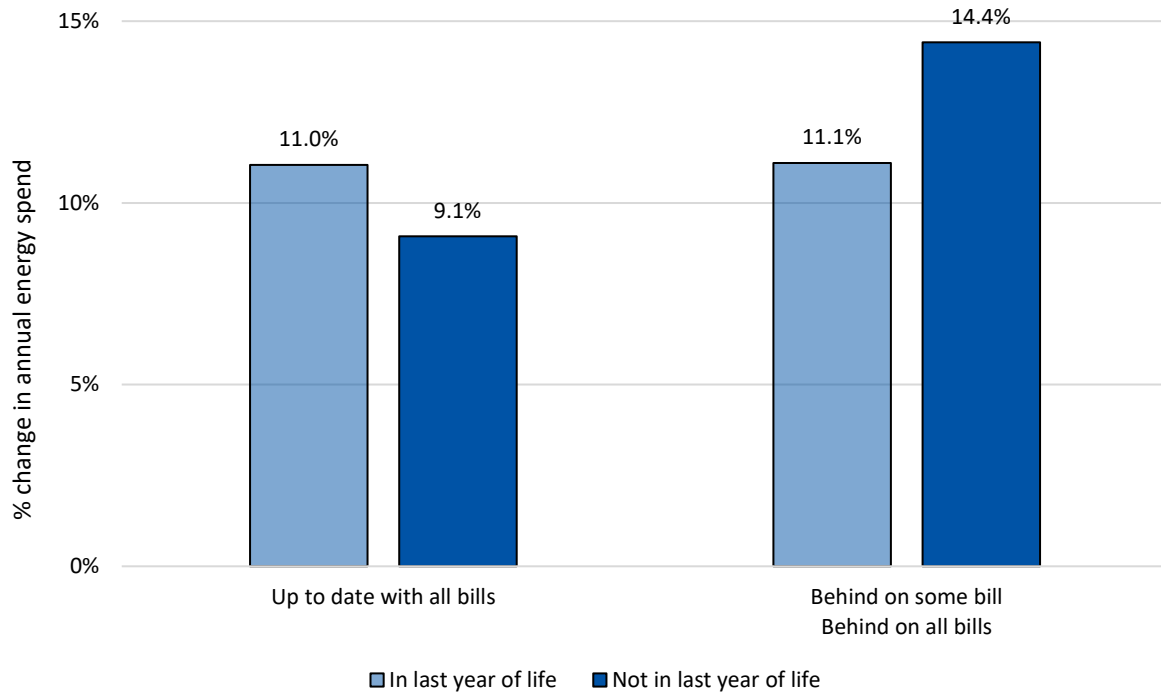
Understanding Society asks participants to give a subjective assessment of their financial situation. Those who said they were finding it quite or very difficult financially saw a greater percentage rise in energy spending, regardless of mortality status. It is not possible to determine whether they are finding it difficult financially because they are spending more on energy or whether they were already in a challenging financial situation. Those who were finding it quite or very difficult financially, experienced an even greater percentage increase in energy spend if they were in the last year of life.

Figure 7.10 Percentage change in annual energy spend, by subjective financial situation and mortality status



Those who are behind on some or all household bills had a lower percentage rise in energy spending if they were in the last year of life. This may be driven by a concern about leaving debt for dependents.

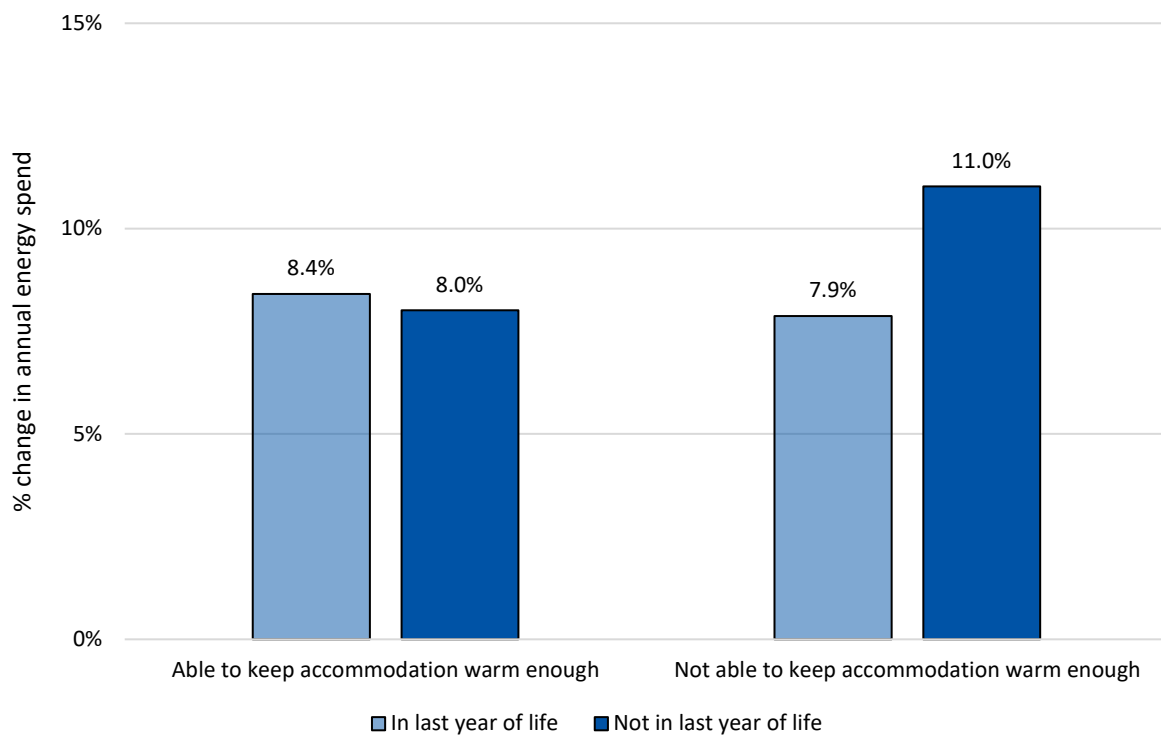
Figure 7.11 Percentage change in annual energy spend, by whether the household is behind on any bills and mortality status



For those who were in the last year of life, those who could keep their accommodation warm enough had a higher percentage increase in energy spend than those who were unable to adequately heat their home. The logical implication is that the latter need to spend more to keep their home warm enough⁶.

Those not in the last year of life had a higher percentage increase in energy spending, if they were unable to keep their accommodation warm enough, implying that they were struggling to heat an energy inefficient home.

Figure 7.12 Percentage change in annual energy spend, by ability to keep accommodation comfortably warm



⁶ Understanding Society includes those who cannot afford to keep their home warm enough in this category.

8 Scenario analysis

This section analyses the number of individuals in fuel poverty by each criterion of the selected fuel poverty metric, then looks more closely at the extent of fuel poverty and ends with the role of a social tariff as a potential policy response.

8.1 Disaggregating fuel poverty

Figure 8.1 and **Figure 8.2** illustrate how the fuel poverty metric used in our analysis can be disaggregated into the percentage of individuals who live in households where:

1. Fuel costs are more than 10% of net income.
2. Net income is less than 90% of MIS.

Table 8.1 Proportion of people in disaggregated fuel poverty criteria

	<i>Not in last year of life</i>		<i>In last year of life</i>	
	Net income below 90% MIS		Net income below 90% MIS	
	No	Yes	No	Yes
Fuel cost over 10% net income				
No	75.20%	3.9%	59.20%	3.00%
Yes	3.70%	17.20%	8.50%	29.30%

The proportion of people living in households that spend more than 10% of their net income on fuel increases from 20.9% for those not in the last year of life to 37.8% for those in the last year of life. This aspect may indicate increased spending on energy in the last year of life or a loss of income, hence the same energy spend takes up a greater proportion of net income.

The proportion of people living in households that have a net income of less than 90% of MIS increases from 21.1% for those not in the last year of life to 32.3% for those in the last year of life. This aspect illustrates the loss of income in the last year of life.

The overlap between the fuel poverty criteria increases from 17.2% for those not in the last year of life to 29.3% for those in the last year of life.

Figure 8.1 Proportion of people in disaggregated fuel poverty criteria, for those not in the last year of life

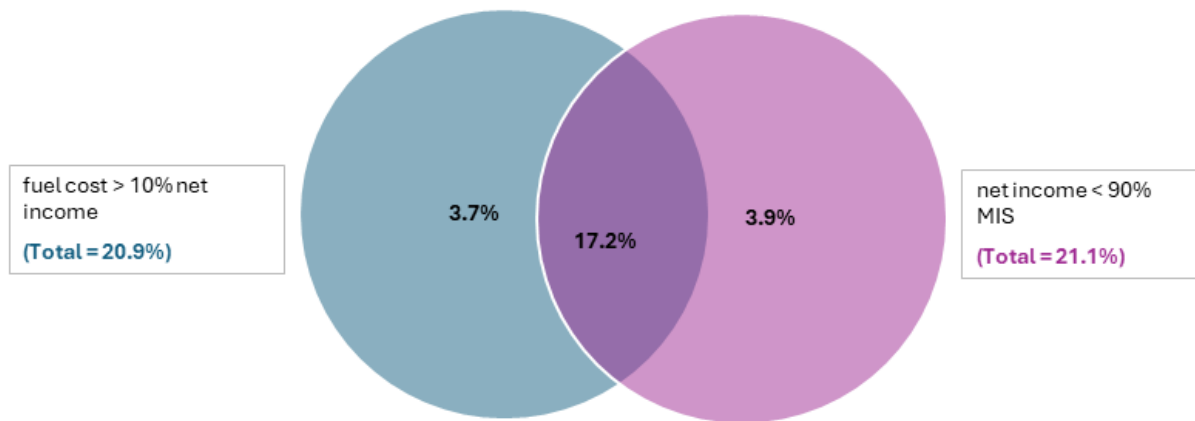
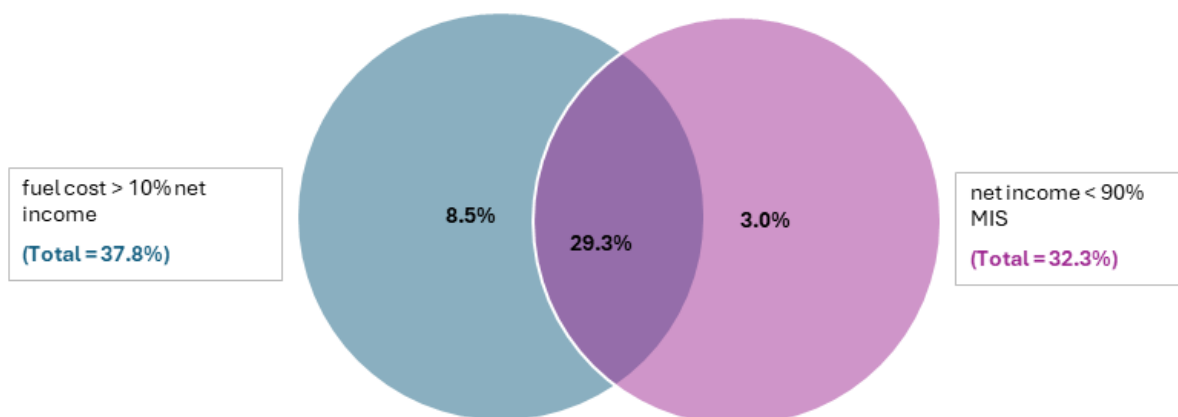


Figure 8.2 Proportion of people in disaggregated fuel poverty criteria, for those in the last year of life



8.2 Extent of fuel poverty

This section estimates the number of people who spend between 10 and 20% of their net income on energy and have a resulting income net of energy spending of less 90% of MIS and compares it with the data from Section 3.

A summary of results is shown in Table 8.2.

The minority of the working aged people who are in fuel poverty in the last year of life spend between 10 and 20% of income on energy, implying that the greater portion are in severe fuel poverty, spending more than 20% of their net income on energy.

Just over half of pensioners who are in the last year of life spend between 10 and 20% of their income on energy, implying that they are more likely to be lifted out of fuel poverty by energy price reductions.

Table 8.2 Estimated number and proportion of people in fuel poverty in the UK, by mortality status and age group

	In last year of life		Not in last year of life	
	Number	%	Number	%
Total population aged 20+				
Between 10% and 20% net income on energy	62,000	9.9%	3,475,000	6.8%
Over 10% net income on energy	128,000	20.5%	9,690,000	18.8%
Working age (20-64 years)				
Between 10% and 20% net income on energy	6,000	7.0%	2,474,000	6.3%
Over 10% net income on energy	18,000	21.6%	7,468,000	19.0%
Pension age (65+)				
Between 10% and 20% net income on energy	56,000	10.4%	1,003,000	8.2%
Over 10% net income on energy	110,000	20.3%	2,223,000	18.2%

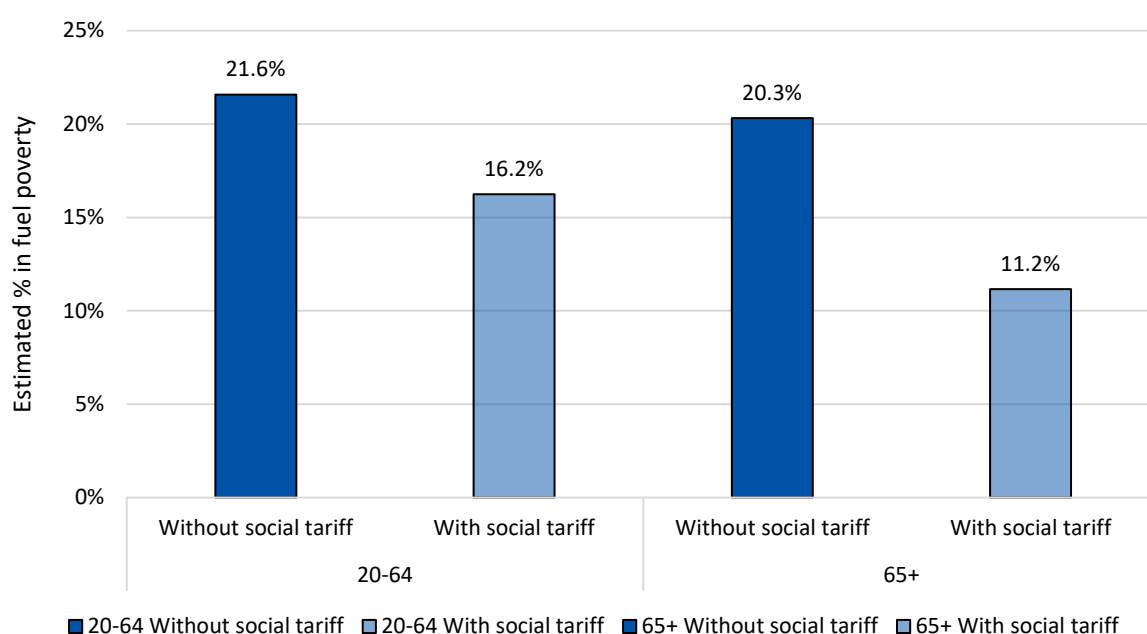
* Rounded to nearest 1000

8.3 Social tariff

One possible solution to help those in fuel poverty at the end of life is the introduction of a social tariff, where those who are vulnerable are offered a lower rate for their energy. The indicative analysis conducted here, applies a 50% reduction to the entire energy spending (applied to the standing charge and unit rates for all fuel types – gas, electricity, oil and solid fuel) for each household that includes someone in the last year of life. This approach is based on research commissioned by Age UK (Age UK, 2023).

Figure 8.3 shows that a 50% social tariff would result in a reduction in fuel poverty for both working age and pension age people in the last year of life. A greater proportion of those who are of pension age would be lifted out of fuel poverty, resulting in the fuel poverty rate almost halving from 20.3% down to 11.2%.

Figure 8.3 Estimated proportion of people in fuel poverty in the last year of life by age group, with and without a social tariff



However, it must be noted that a change in tariff to reduce energy bills by 50% will not necessarily lead to a reduction in fuel poverty; those who were previously underheating their homes may see it as an opportunity to consume more energy to achieve greater thermal comfort. This rebound effect is seen when an expected cost reduction is eroded by people enjoying a warmer home, which would in itself be a positive outcome for those at the end of life.

Hence, the numbers published here show those that might be lifted out of fuel poverty, but our results assume no change in behaviour; hence, this estimate is likely to be over optimistic.

Alternatives to a social tariff include structural reform of the UK's energy billing system. NEF's proposal for a National Energy Guarantee based on a rising block tariff is one such example. A basic allowance of essential energy usage is provided free of charge. A price premium is then paid by high consumers of energy, which is used to cross-subsidise. Targeted allowances provide additional support for vulnerable groups. The approach pivots towards a more progressive pricing structure (Chapman and Kumar, 2023).

9 Conclusions

This report provides, for the first time, an estimate of the number of people who die experiencing fuel poverty in the UK. Overall, they show the ways in which people at the end of life can face a higher risk of fuel poverty, forcing them to choose between financial hardship or exacerbating their condition by living in an inadequately heated home, at a time when they are most vulnerable. Furthermore, the analysis was conducted using data that predates the cost-of-living crisis and energy price hikes of recent years. It is anticipated that the high inflation and fuel costs that we have seen since 2022 will have already made a bad situation much worse.

The report also highlights substantial inequalities in the risk of living and dying in fuel poverty for different sub-groups of the population. Single working aged people experience a substantial increase in their risk of being in fuel poverty in the last year of life, perhaps because there is no second income to rely upon if they are unable to work at the end of life. Those living in homes that have a pre-payment meter have a greater risk of being in fuel poverty. This is consistent with existing research linking pre-payment meters with households on a lower income, with a higher number of children or old people in the household and with social housing. Those living in social housing have the highest risk of being fuel poor (41%), rising even further in the last year of life.

Building on these findings, it is important to consider the specific experiences of those groups who are already disadvantaged even if not at the end of life, such as people from minority ethnic groups. While inequalities in fuel poverty risk between white and minority ethnic groups are no greater for those who are at the end of life than those who are not, the sheer extent of fuel poverty in minority ethnic groups is a major cause for concern and suggests that more targeted support is necessary to mitigate against this situation.

There are key differences between the findings of this study and previous research on poverty at the end of life (Stone and Hirsch, 2022). For example, the contrast in fuel poverty rates between those of working age and pensioners is less pronounced. Pensioners typically have a fixed income, hence they do not experience the loss of income working aged people do if they need to give up work due to terminal illness, so based on absolute income alone, they are less likely to fall into fuel poverty. However, the fuel poverty metric in our analysis uses the Minimum Income Standard (MIS), which focuses on income adequacy. Despite the state pension being more generous than working age benefits, and the range of support measures in place to help with winter energy bills, income adequacy is still an issue for those of pension age. This shows that despite this group being the least likely to be below MIS compared to other age groups, an increasing proportion of pensioners have fallen below MIS in recent years.

Any metric that seeks to analyse fuel poverty and terminal illness needs to be mindful of the dynamic role of reduced income, increased living costs and higher energy needs, all of which drive those at the end of life (deeper) into fuel poverty. The measure used here identifies people in fuel poverty as those individuals whose household energy spending exceeds 10% of income, who also have an income (net of energy costs) less than 90% of MIS. The MIS budget reflects what is needed to participate in society and is adapted to specific household compositions. Hence, unlike other measures of fuel poverty it considers whether one can live a civilised life on the income remaining after energy bills have been paid. Furthermore, it is updated over time to take inflation into account, so it reflects the impact of the increased cost of other household outgoings. Hence, the definition of fuel poverty used in this analysis is complex with several moving parts. In the context of terminal illness, the only practical options to lift people out of fuel poverty are boosting the income support offered in the last year of life or energy tariff reform. The prospect of a social tariff was explored and a simple 50% reduction in charges was seen to reduce the estimated proportion of those

experiencing fuel poverty by between 6 and 9 percentage points, depending on age range. However, this estimate does not account for behaviour change and the introduction of a social tariff may see those at the end of life continue with the same level of energy spending and choose to benefit from improved thermal comfort due to increased room temperature or more prolonged hours of heating. Such an outcome would be beneficial in itself in helping those at the end of life to live with dignity.

At the time of writing, the new Labour chancellor's statement of 29th July 2024 made changes to the Winter Fuel Payment so that it will be available only to those who receive pension credit. From this year, only poorer pensioners will receive help with their energy bills. On the surface, this may appear to have little effect on pensioner fuel poverty rates, however, poor take up means more than 1 in 3 people entitled to pension credit do not receive it. For some who do not qualify for pension credit, but are close to the threshold, the loss of the Winter Fuel Payment may push them into fuel poverty. Age UK estimate that as many as 2 million pensioners will struggle to keep warm this winter as a result of no longer receiving the Winter Fuel Payment, some of whom are seriously ill and need a higher room temperature to protect their health (Age UK, 2024). The vast majority of those in the last year of life are of pension age, so if the risk of pensioner fuel poverty increases, so does the overall fuel poverty rate for those at the end of life. Unless action is taken to improve the uptake of pension credit, there will be impact on those at the end of life and their ability to keep their homes adequately warm.

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Appendix Methods in brief

Data sources

Survey data

To estimate the relationship between fuel poverty and mortality, we used the **Understanding Society** household survey, for the years 2011-2023. This panel survey included an initial sample of over 40,000 households, who are followed up annually and provide detailed information about a wide range of sociodemographic characteristics, including, income, employment and health.

At each wave, the survey provides information on the current interview outcome for anyone enumerated in the last interview wave. This includes information on those who were not interviewed, and records if a respondent had died since the previous wave. While this is unlikely to capture every death during follow-up, this is the best and largest available source of data that provides longitudinal information on mortality and other sociodemographic characteristics for the same people over time.

Understanding Society's data on income and energy spending is used to estimate fuel poverty for different groups of the population; initial analysis is based on the different definitions used across the UK nations, with subsequent detailed analysis using the 10% of net income spent on energy and an income net of energy costs less than 90% of MIS.

Vital Statistics

Mortality rates for the UK were obtained from the Office for National Statistics (ONS; England and Wales), National Records of Scotland (NRS), and the Northern Ireland Statistics and Research Agency (NISRA). This includes mortality rates and number by age group, sex, ethnicity, region, and diagnosis.

UK statistics

The UK-level estimates are produced by combining data from different sources, as described above. The analysis used fuel poverty rates and mortality rates for four broad age groups (20-44; 45-64; 65-79; 80+), and the estimates were then aggregated into two categories for working age and pensioners.

Combining the two sources of population-level data required slight adjustment of the numbers in fuel poverty at the initial stage of analysis, as the mortality statistics use mid-year estimates at their denominator.

The relationship between fuel poverty and mortality was estimated based on the Understanding Society data, by calculating, for each of the four age groups, the proportion of individuals who were in fuel poverty for two sub-groups: 1. Those in the last 12 months of life 2. Those not in the last 12 months of life. These estimates were then used to produce a ratio (rate for those in the last year of life/ rate for those not in the last year of life) that could then be applied to the population-level data to adjust the estimates for people who died/did not die.

The analysis was conducted in four stages:

1. Calculate revised fuel poverty numbers based on mid-year estimates for each age group
2. Working under the temporary assumption that the fuel poverty rate among those who did not die is identical to the overall fuel poverty rate, calculate the number in fuel poverty.
3. Use ratios from Understanding Society to estimate the number and % in fuel poverty for those who died
4. Calibrate the numbers to the actual totals in fuel poverty for each age group, based on the FRS estimates.

Subgroups

The subgroup analyses for sex and ethnicity used the same approach as described above, but with each data source broken down by the relevant categories. However, the analysis by diagnosis was slightly different in that it was looking *within* the group who died. For this analysis, we therefore used the Understanding Society data to calculate the ratio of fuel poverty rates among those who were in the last 12 months of life for those with cancer versus those with other conditions. These ratios were then used to weight the overall statistics for people who died at population level.

Local area variation

The estimates by local authority were produced by combining local area data with the survey data in Understanding Society. We replicated the indicators that were available at local authority level (IMD income domain, ethnicity, housing tenure, household composition) at an individual level for survey respondents, and carried out a regression analysis to estimate the relationship between these indicators and being in fuel poverty, for those in the last 12 months of life/ not in the last 12 months of life. The regression coefficients were then applied to the full local authority level data to predict the fuel poverty rate by mortality status, for working age people and pensioners.