

Date Published: 12/07/2012

Next Refresh Date: 31/01/2015

Please read this chapter in conjunction with -

JSNA Chapters:

[Warrington Joint Strategic Needs Assessment Index](#)

[Warrington JSNA Socio-Economic Deprivation Chapter](#)

[Warrington JSNA Wider Environmental Context and Transport Chapter](#)

[Warrington JSNA Older People - Burden of Ill Health Chapter](#)

[Warrington JSNA Housing Chapter](#)

[Warrington JSNA Older People - Service Uptake Chapter](#)

JSNA Data Baskets:

[Fuel Poverty Index \(Warrington\)](#)

[Population Estimates and Projections \(Warrington\)](#)

[Warrington Deprivation \(Index of Multiple Deprivation 2010\)](#)

[Mental Health \(Warrington\)](#)

Contents

- [Warrington Joint Strategic Needs Assessment \(JSNA\) 2011 - Fuel Poverty Chapter](#)
- [Executive Summary](#)
- [1\) Who's At Risk and Why](#)
- [2\) The Level of Need in the Population](#)
- [3\) Current Services in Relation to Need](#)
- [4\) Projected Service Use and Outcomes in 3-5 Years and 5-10 Years](#)
- [5\) Evidence of What Works](#)
- [6\) \(Target\) Population/Service User Views](#)
- [7\) Unmet Needs and Service Gaps](#)
- [8\) Recommendations for Commissioning](#)
- [9\) Recommendations for Needs Assessment Work](#)
- [Key Contacts](#)
- [Appendix A](#)
- [References](#)
- [Signed Off By](#)

Warrington Joint Strategic Needs Assessment (JSNA) 2011 - Fuel Poverty Chapter



The Joint Strategic Needs Assessment (JSNA) considers a wide range of factors that affect the health and wellbeing of the people of Warrington. The objective of the JSNA is to involve partner organisations, such as the local NHS, local authorities, Police, Fire and third sector organisations in order to provide a top level, holistic view of current and future need within the borough. The JSNA is used to agree key priorities to improve the health and wellbeing of all our communities at the same time as reducing health inequalities.

[Return to chapter contents](#)

Executive Summary

Introduction

This analysis looks at the impact of fuel poverty¹ on health and builds on previous work included in the Warrington JSNA Fuel Poverty Supplement in 2009 (NHS Warrington and Warrington Borough Council, 2009).

A household in fuel poverty is one that cannot afford to keep adequately warm at reasonable cost. Adequate standards for warmth are defined as 21°C in the living room and 18°C in other occupied rooms. A fuel poor household is one that needs to spend more than 10% of its income on all fuel use to heat the home to an adequate standard of warmth (Department for Energy and Climate Change, 2011). Although the emphasis in the definition is on heating the home, fuel costs in the definition of fuel poverty also include spending on water heating, lights and appliance usage, and cooking costs.

Whether a household is classed as fuel poor depends on fuel consumption (which is dependent on the lifestyle of the household and the fuel-efficiency of the dwelling), the cost of fuel, and the household income.

The Government has commissioned Professor John Hills from the London School of Economics to undertake an independent review from first principles of the problem of fuel poverty and the way in which it is measured. The review focuses on 3 main issues:

- Is fuel poverty a distinct problem, or simply a manifestation of more general problems of poverty?
- If it is a distinct problem, how is it best measured, and does the current approach capture the problems most effectively?
- What are the implications for the way we understand the effectiveness of the range of policy approaches to reducing fuel poverty?

An interim report was released in October 2011 (Hills, 2011) and a final report was published in March 2012 (Hills, 2012). The report recommends that the current measurement of fuel poverty should not be the official measure of this problem and that the focus should change to concern about individuals in households who are "living on a lower income in a home that cannot be kept warm at reasonable cost". The report concludes that fuel poverty is a major social problem, causing considerable hardship and negative health impacts, as well as impeding efforts to reduce carbon emissions. It suggests that policies that improve the thermal efficiency of the housing stock tend to be the most cost-effective and have persisting benefits in reducing fuel poverty. However, upgrading of the stock would be a gradual process and other short term interventions, such as price subsidies may need to be continued as part of the overall policy mix. The Government has not yet made policy changes in response to this report.

Summary of Key Issues

Fuel poverty has damaging effects on health and quality of life. Research identifies that certain groups are particularly vulnerable with regards to fuel poverty and the adverse effects of cold housing. These include older people, particularly those living on their own, lone parents, young children, disabled people and families where adult members are either unemployed or working on a low income.

The number of fuel poor households has been rising since 2004. According to the Department for Energy and Climate Change's (DECC, 2011a) latest fuel poverty report, "In 2009, the number of fuel poor households in the UK was estimated at around 5.5 million, a rise of around 1 million when compared to 2008, and representing approximately 21 per cent of all UK households". In England alone, the estimates were 3.3 million in 2008 and 4 million in 2009 (Department for Energy and Climate Change, 2011). This rise is likely to continue, given the recent large increases in fuel prices.

Cold housing is a health risk. The health effects of cold, damp homes include hypothermia, cardio-vascular disease, increased blood pressure, respiratory illnesses, falls and non-intentional injuries (due to a reduction in mobility), social isolation and mental health issues (South East Public Health Observatory, 2009). Cold is believed to be the main explanation for the 'excess winter deaths' occurring between December and March. Excess winter deaths caused by the cold can be preventable.

Local analysis has highlighted that Warrington has similar levels of excess winter mortality (EWM) to England and the North West. As is the case nationally, older people (ages 75 and above) are at greater risk of winter mortality when compared to the rest of the population, especially older females.

In Warrington, the largest disease-specific cause of excess winter death was respiratory disease, a pattern observed at national levels. Whilst the influenza virus is only partially associated with EWM (Kinsella, 2009), ensuring high rates of annual influenza vaccine uptake amongst people aged over 65 years and those who are aged less than 65 years in at-risk groups, such as asthmatics, is an important public health measure.

Excess winter mortality does not appear to be strongly associated with socio-economic deprivation. There is a lower level of EWM in deprivation quintile 3 (the middle quintile, using national quintiles of the Index of Multiple Deprivation 2010) than in all other quintiles².

Recommendations for Commissioning

Improving the energy efficiency of the housing stock will improve living conditions and reduce fuel poverty, with fewer winter deaths and emergency hospital admissions, and better physical and mental health.

Continue to strongly promote applications for energy efficiency home improvement grants and schemes whilst they are still available (or before changes are introduced which will reduce the number of people eligible).

Continue to promote information on keeping safe and warm in winter.

In addition, the 'Department of Health (DH), Health Inequality National Support Team', has produced an advisory guide on *How to reduce the risk of seasonal excess deaths systematically in vulnerable people to impact at population level* (DH, 2010). This details 9 practical and effective interventions, as follows:

1. Assessment for affordable warmth interventions, including energy efficiency, household income and fuel cost.
2. Regular review of benefits and entitlement uptake.
3. Annual flu and pneumococcal vaccination.
4. Provision of an annual medication review (every six months if taking 4+ medicines).
5. Provision of an annual medicines utilisation review (MUR) and follow-up support for adherence to therapy.
6. Implementation of a personal brief health interventions plan that includes advice and support to stop smoking, sensible drinking, healthy eating, adequate hydration and daily active living.
7. Assessment and support programme to prevent falls.
8. Assessment for appropriate assistive technologies e.g. alarm pendants to call for help.
9. Help to develop a personal crisis contingency plan (e.g. a buddy scheme, for those with no close family or friends, to watch for danger signs and provide someone to call).

Footnotes

¹ Appendix A provides a description of the construction of the fuel poverty indicator.

² National Deprivation quintiles: all LSOAs in England are ordered by overall deprivation score, and then split into 5 evenly sized groups; quintile 1 the most deprived quintile.

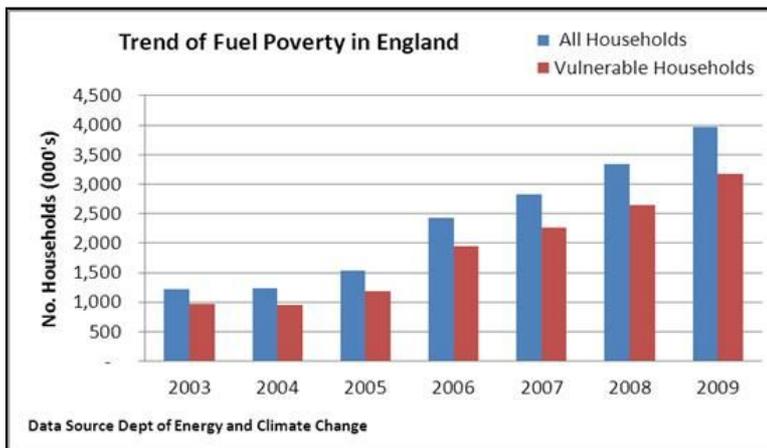
1) Who's At Risk and Why

1.1) Fuel poverty has damaging effects on health and quality of life. Research identifies that certain groups are particularly vulnerable with regards to fuel poverty and the adverse effects of cold housing. These include older people, particularly those living on their own, lone parents, young children, disabled people and families where adult members are either unemployed or working on a low income (The Eurowinter Group, 1997; Wilkinson et al., 2004; Kinsella, 2009).

Nationally, fuel poverty is increasing, with year on year increases apparent between 2003 and 2009, as a result of increasing fuel prices in the UK. The modelled average fuel price went up from £694 to £1,342 per annum, an increase of more than 90% (DECC, 2011b). Average income only rose by 20% during the same period.

Chart 1 presents the substantial increase in fuel poverty in England; from 1.2 million households in 2003 to 4 million in 2009 (around 18.4% of all households). Around 3.2 million of these fuel poor households are considered vulnerable. A vulnerable household is one that contains children, the elderly or someone who is disabled or who has a long term illness. This figure indicates that 20.7% of all vulnerable households in England are fuel poor. ([Fuel poverty data, charts and maps available here.](#))

Chart 1: Trend in Number of Fuel Poor Households in England, 2003 to 2009



(Source: DECC: Trends in Fuel Poverty 2003-2009)

Other social factors influence fuel poverty, including household occupancy and employment status.

Household Occupancy: Nationally, there was a 44% increase in the number of under-occupied households¹ between 2003 and 2009 (both in single person and multi-person households).

Employment Status: The number of fuel poor households, where the household reference person² is inactive, rose from 0.9 million in 2003 to 2.5 million in 2009. This rise is consistent with the rise in fuel poverty amongst households with at least one person aged 60 or over, since this group of people make up a large proportion of the inactive group.

1.2) Health Risks Associated with Cold: Cold housing is a health risk. Cold is believed to be the main explanation for the 'excess winter deaths' occurring each year between December and March.

Excess winter deaths and the morbidity caused by the cold are preventable. Other countries, in Scandinavia for example, where the winter temperatures are much more extreme than in the UK, levels of EWD are much lower.

A healthy indoor temperature is around 21°C, although cold is not generally perceived until the temperature falls below 18°C. A small risk of adverse health effects begins once the temperature falls below 19°C. Serious health risks occur below 16°C, with a substantially increased risk of respiratory and cardiovascular conditions. Below 10°C, the risk of hypothermia becomes appreciable, especially for the elderly. The health effects of cold, damp homes include:

1.2.1) Mild Hypothermia: A study showed peaks in incidence of hypothermia in A&E patients over 65 from relatively deprived postcodes, coinciding with periods of cold weather. Of the 5% showing core temperature below 35°C, 34% subsequently died.

1.2.2) Cardio-Vascular Disease: Circulatory diseases are responsible for around 40% of EWD, equating to approximately 13,000 individuals in 2005-6.

1.2.3) Increased Blood Pressure: One study showed a 1°C lowering of living room temperature is associated with a rise of 1.3mmHg blood pressure. A rise in blood pressure during the cold increases the risk of heart attacks and strokes.

1.2.4) Respiratory illness causes around 1/3 of EWD (approximately 10,500 individuals in 2005-6). The cold lowers resistance to respiratory infections. Coldness impairs lung function and can trigger broncho-constriction in asthma and COPD. Dampness is associated with cold houses and damp increases mould growths, which can cause asthma and respiratory infections. Home energy improvements have decreased school sickness by 80% in children with asthma or recurrent respiratory infections.

1.2.5) Mobility: Cold houses affect mobility and increase falls and non-intentional injuries. Symptoms of arthritis become worse in cold and damp houses. Strength and dexterity decrease as temperatures drop, increasing the risk of non-intentional injuries. A cold house increases the risk of falls with the elderly.

1.2.6) Mental and Social Health: Damp, cold housing is associated with an increase in mental health problems. ([Mental health data, charts and maps available here.](#)) Some people become socially isolated as they are reluctant to invite friends round to a cold house. In cold homes where only one room is heated, it is difficult for children to do homework, affecting educational and long-term work and health opportunities.

Footnotes

¹ The Department for Communities and Local Government gives a definition of a very minimum standard in terms of the number of bedrooms required by a household: A standard number of bedrooms required is calculated for each household in accordance with its age/sex/marital status composition and the relationship of the members to one another. This standard is then compared with the actual number of bedrooms available for the sole use of the household. A household is deemed under-occupied if it has more bedrooms than this minimum standard.

² The household reference person (HRP) must be a person in whose name the accommodation is owned or rented. Where there are joint householders, the person with the highest income is selected. If two or more householders have exactly the same income the oldest is selected.

[Return to chapter contents](#)

2) The Level of Need in the Population

2.1) Fuel Poor Households in Warrington: Table 1 presents the estimates of fuel poor households in the region (DECC, 2010a). The latest available sub-national figures are for 2008. Across England as a whole, 2009 data shows that the percentage of households in fuel poverty increased substantially again in 2009 to 18.4%. Local and regional figures are likely to show similar rates of increase. ([Fuel poverty data, charts and maps available here.](#))

Table 1: Local, Regional and National Breakdown of Fuel Poverty, 2008

	Estimated no of households	Estimated no of households in fuel poverty	Percentage of fuel poor households
England	21,407,000	3,335,000	15.6%
North West	2,929,684	530,511	18.1%
Warrington	84,389	12,365	14.7%
Halton	50,430	7,957	15.8%
Cheshire East	155,906	25,154	16.1%
Cheshire West and Chester	139,094	22,381	16.1%

(Source: DECC: Sub-Regional Fuel Poverty levels, England 2008)

Fuel efficiency of dwellings is another factor affecting fuel poverty. The Housing Health and Safety Rating System (HHSRS) evaluates potential risks to health and safety arising from deficiencies identified in dwellings. It is based on the evaluation of the likelihood of an occurrence that could cause harm and the probable severity of the outcomes of such an occurrence. There are 29 hazards which can be identified by the system, including *excess cold*, which covers threats to health from sub-optimal indoor temperatures. The 65+ age range is the **most vulnerable group**.

If the application of HHSRS to dwellings results in category 1 hazards being found, then the local authority is obliged to take action to remedy these; it may also take action where category 2 hazards are found.

The percentage rise in deaths in winter is greater in dwellings with low energy efficiency (measured using Standard Assessment Procedure for Energy Rating of Dwellings (SAP)) ratings (Imperial College London, 2002), with the risk being greatest in dwellings built before 1850 and the least risk in more energy efficient buildings constructed after 1980. The energy efficiency of a dwelling depends on the thermal insulation of the structure, the fuel type, and the size and design of the means of heating and ventilation. Any disrepair or dampness to the building may affect its efficiency.

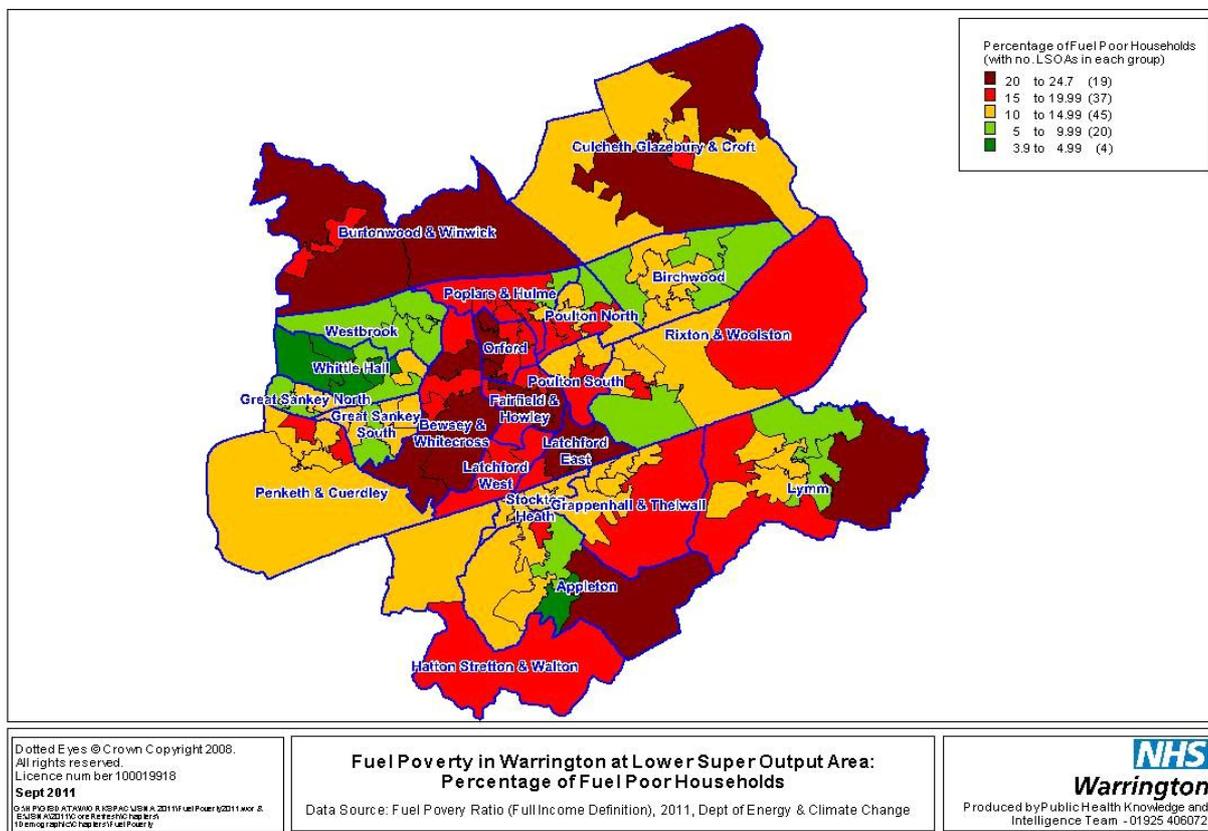
The most recent Private Sector Stock Condition Survey was undertaken on behalf of Warrington Borough Council in December 2008 (WBC, 2008). This covered all housing tenures except the Council's own stock (which has subsequently transferred to Golden Gates Housing Trust - GGHT). The survey showed that, of the 10.3% of dwellings with a category 1 hazard, 45.1% were identified to be *excess cold*. For category 2 hazards, this proportion rose to 91.4%.

2.1.1) Sub-Warrington Variation: Fuel poverty data can be obtained at very local area level. Aggregation of data at Lower Super Output Area (LSOA) level¹ means that variation in fuel poverty can be viewed at a very local level, thereby providing the means to target support and appropriate interventions at a sub-ward level.

Map 1 presents the distribution of fuel poor households across Warrington. Based on data for 2008, 14.7% of Warrington households experienced fuel poverty and this compared with 18.1% in the North West, 15.6% in England and 21% in the UK. The LSOA with the highest level of fuel poverty is in the Bewsey and Whitecross ward (24.7%) and the lowest is in Whittle Hall (3.9%). There are 19 LSOAs within Warrington in which it is estimated that 20% or more of households experience fuel poverty.

Map 1 shows high fuel poverty in affluent areas of Warrington such as Appleton and Lymm, as well as less affluent areas in and around central Warrington (the distribution of overall deprivation and of income deprivation is shown in Maps 2 and 3).

Map 1: Fuel Poverty Ratio: Percentage of Households in Fuel Poverty, 2008



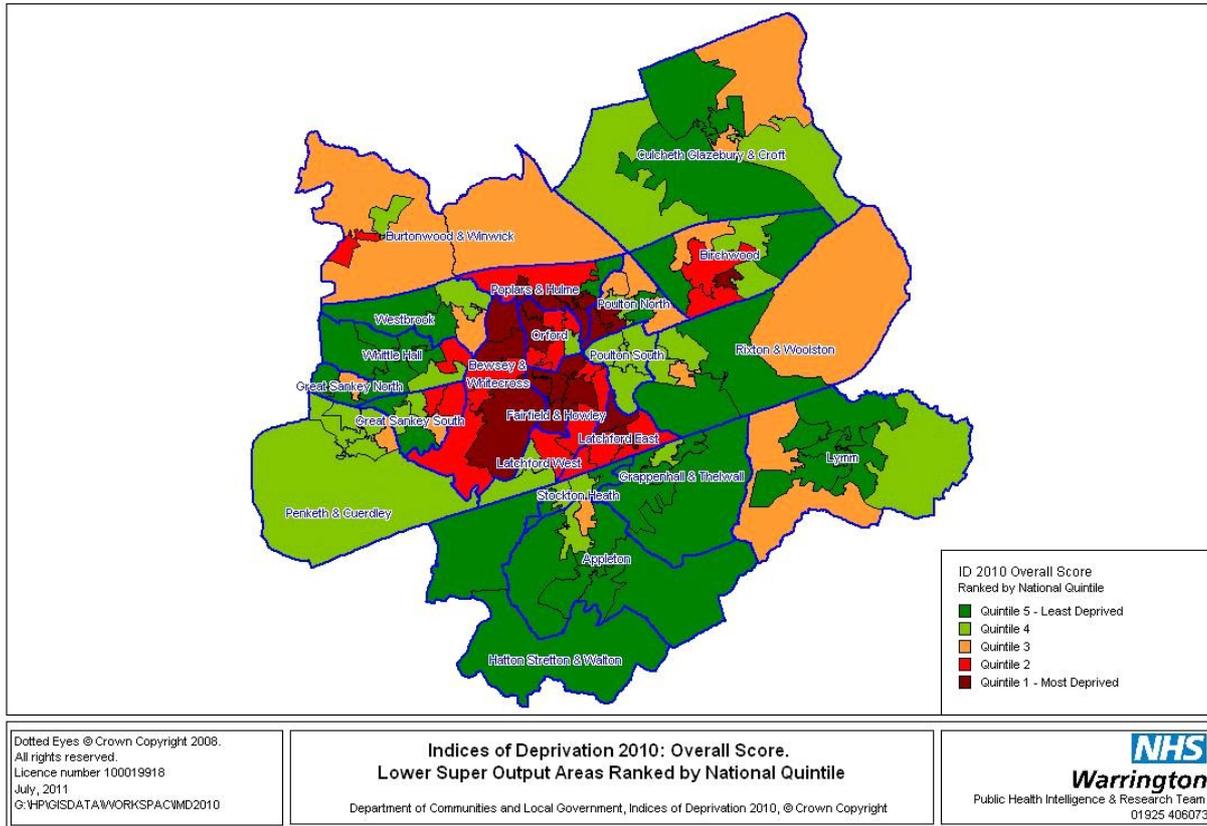
(Data Source: Fuel Poverty Ratio (Full Income Definition), 2011, Department of Energy and Climate Change)

2.2) Deprivation: Two factors affecting fuel poverty are income and living environment. These can be analysed at a sub-Warrington level using the Indices of Deprivation. The most up to date are the English Indices of Deprivation 2010 (ID 2010) (Department of Communities and Local Government, 2010). As with the Fuel Poverty Ratio, data is constructed at LSOA level. A summary of the Indices and results for Warrington is available in the Deprivation Chapter of the JSNA.

This report looks at overall deprivation and at two specific sub-domains of ID 2010, the *income* domain and the *living environment* domain. The *living environment* domain of ID 2010 includes indicators which focus on both 'indoors' living environment, measuring housing in poor condition and without central heating, and the 'outdoors' living environment, which includes indicators such as air quality and road traffic accidents. The 'indoors' living environment indicators are more relevant in an analysis of fuel poverty, but unfortunately the domain cannot be disaggregated. Results show that 26 of Warrington's 125 LSOAs (i.e. just over one fifth, and therefore a similar proportion to England as a whole) are included within the worst quintile nationally² for the *living environment* domain. 11 of Warrington's 125 LSOAs (i.e. just under a tenth) are included within the worst quintile nationally for the *income* domain.

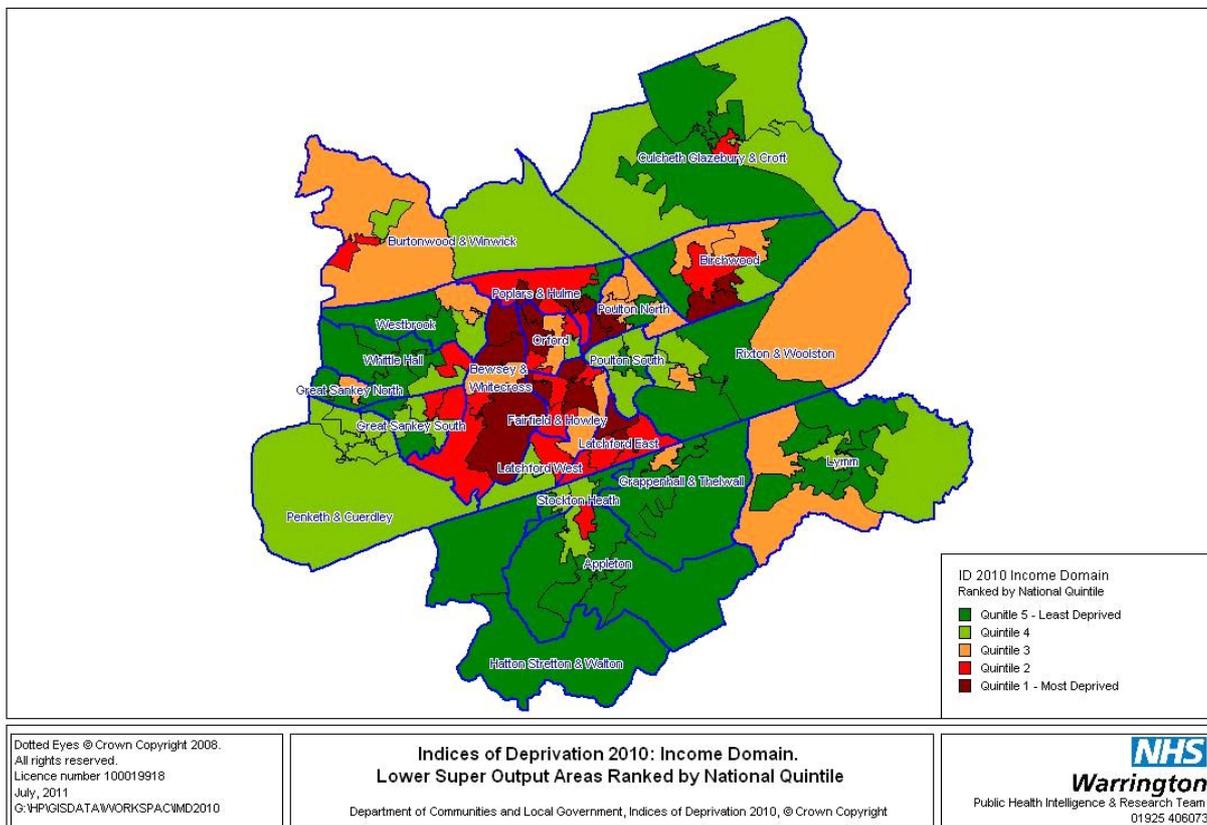
Maps 2, 3 and 4 show the distribution across Warrington of the Overall Index of Multiple Deprivation (IMD), the *income* domain, and the *living environment* domain. In general, all 3 maps show a similar pattern, with the most deprived areas being found mainly in inner Warrington areas. In addition, areas within Burtonwood, Rixton, and Lymm fall within the most deprived 40% nationally in the *living environment* domain. ([Deprivation data, charts and maps are available here.](#))

Map 2: Index of Multiple Deprivation 2010 Overall Score



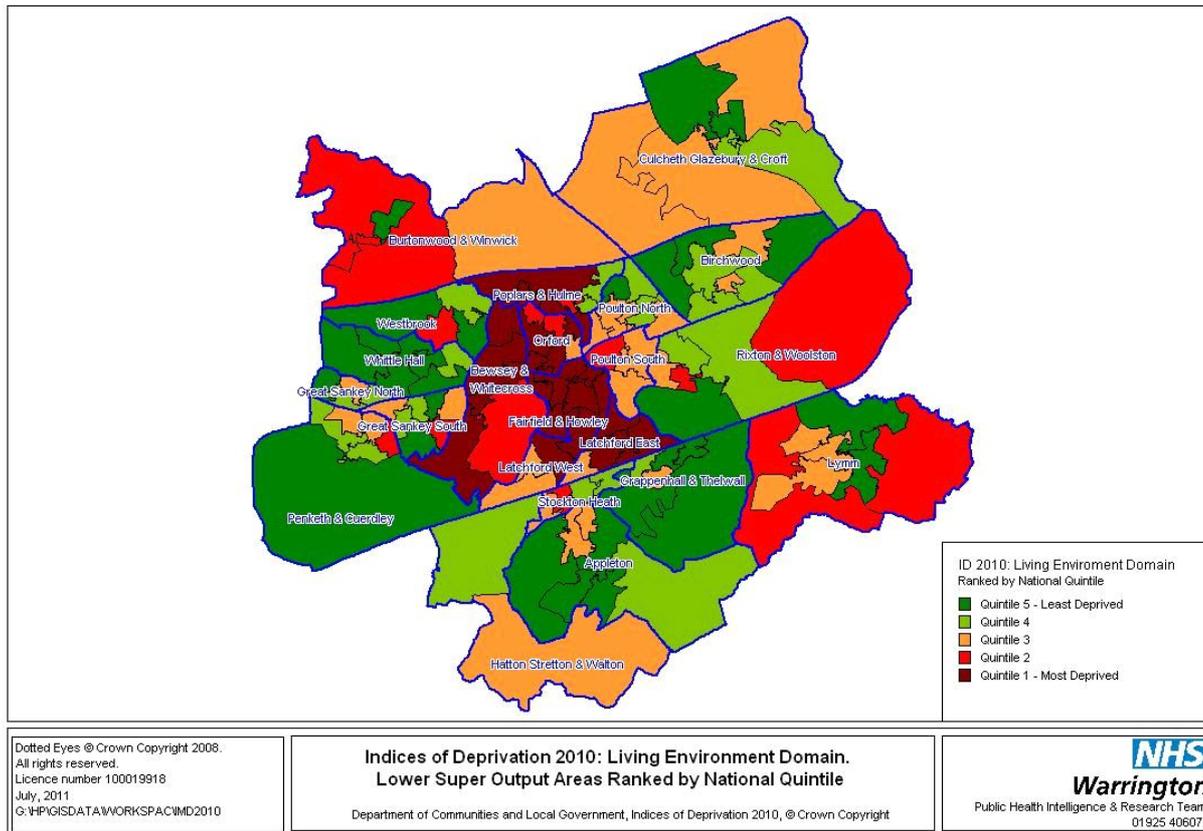
(Data Source: Department of Communities and Local Government, Indices of Deprivation 2010, © Crown Copyright)

Map 3: ID 2010: Income Domain



(Data Source: Department of Communities and Local Government, Indices of Deprivation 2010, © Crown Copyright)

Map 4: ID 2010: Living Environment Domain



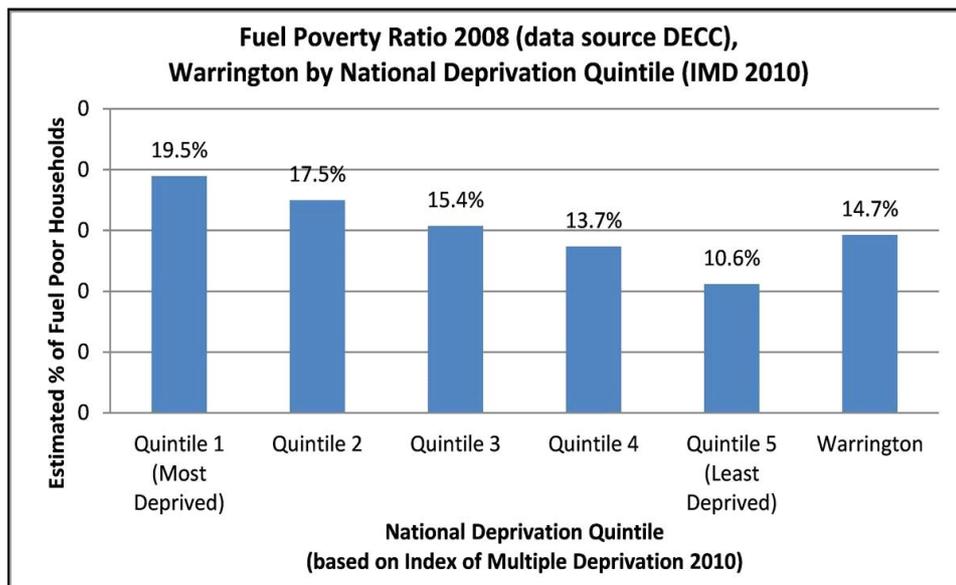
(Data Source: Department of Communities and Local Government, Indices of Deprivation 2010, © Crown Copyright)

At LSOA level, the pattern of fuel poverty across Warrington is not consistent with the maps of overall deprivation (Map 2) or income (Map 3). The living environment map is only a little more consistent, in that it is not only inner Warrington areas that fare worst. However, a pattern does appear when LSOAs are grouped into deprivation quintiles.

The estimated percentage of fuel poor households in each LSOA was aggregated up to deprivation quintile level³ (using IMD 2010) to calculate the estimated percentage of fuel poor households in each deprivation quintile. Aggregating data to this level enables any association with deprivation to be more reliably assessed, as the number of households within each grouping is greater. As Chart 2 shows, there is a smooth gradient across deprivation quintile: as deprivation increases, so does the proportion of fuel poor households.

The relationship between deprivation and fuel poverty is not straightforward. Although income is generally greater in the less deprived quintiles, a large proportion of homes in the more deprived quintiles are local authority or housing association owned, which are generally well maintained and insulated. Conversely, housing found in quintile 5 may be large and difficult to heat (Hajat et al., 2007). This is still likely to affect some individual households within Warrington, despite the clear gradient in Chart 2.

Chart 2: Percentage of Fuel Poor Households, 2008, by Deprivation Quintile



(Source: DECC: Sub-Regional Fuel Poverty Levels, England 2008)

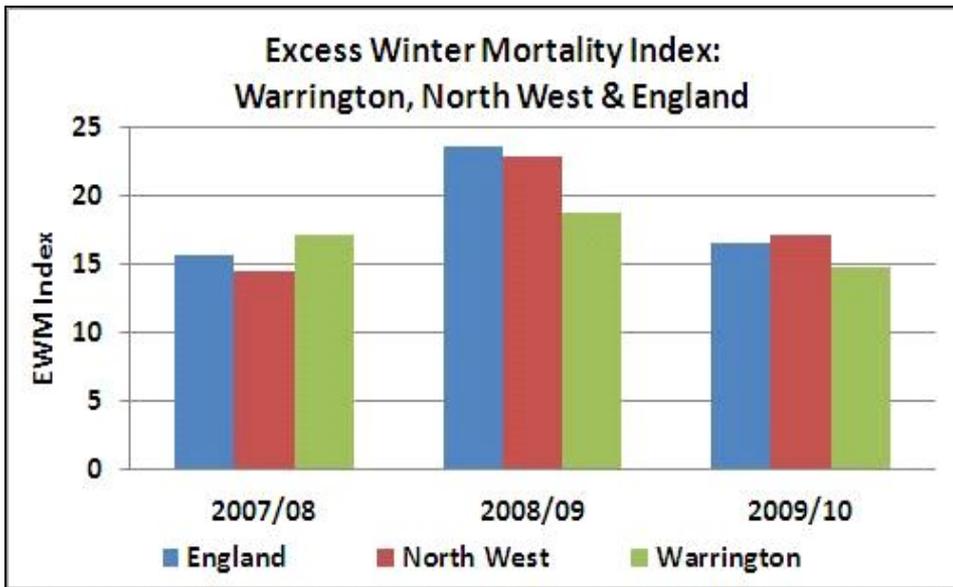
2.3) Excess Winter Mortality (EWM) in Warrington: The most significant potential consequence of fuel poverty is excess winter mortality (EWM) which is defined as: the average number of deaths that occur between December and March minus the average number of deaths that occurred in the previous August to November and the following April to July (i.e. the number of 'excess' deaths in winter compared to the rest of the year). To allow for comparisons between areas, an EWM Index is calculated by dividing the EWM number of deaths by the average number of non-winter deaths and multiplying by 100 to create a percentage (Office for National Statistics, 2010a).

Excess winter mortality is not only related to fuel poverty or indoor temperature. Studies have found that although cold housing contributes to deaths from respiratory problems in winter, exposure to outdoor cold contributes to deaths from heart disease.

EWM in Warrington has been analysed by age-band, gender, cause of death and deprivation level, and has been compared to national and regional figures⁴. **Between August 2007 and July 2010 there were 5,350 deaths in Warrington and, of these, 285 deaths were classed as 'excess winter deaths.'**

As Chart 3 shows, nationally, regionally and locally, the EMW Index fluctuates annually and there is no consistent pattern between Warrington and national/regional comparators. Current rates in Warrington appear to be in-keeping with national and regional averages. Excess winter mortality increased quite substantially in 2008/09, nationally and regionally, and there was a smaller increase apparent locally.

Chart 3: Trend in Excess Winter Mortality Index, 2007/08 to 2009/10

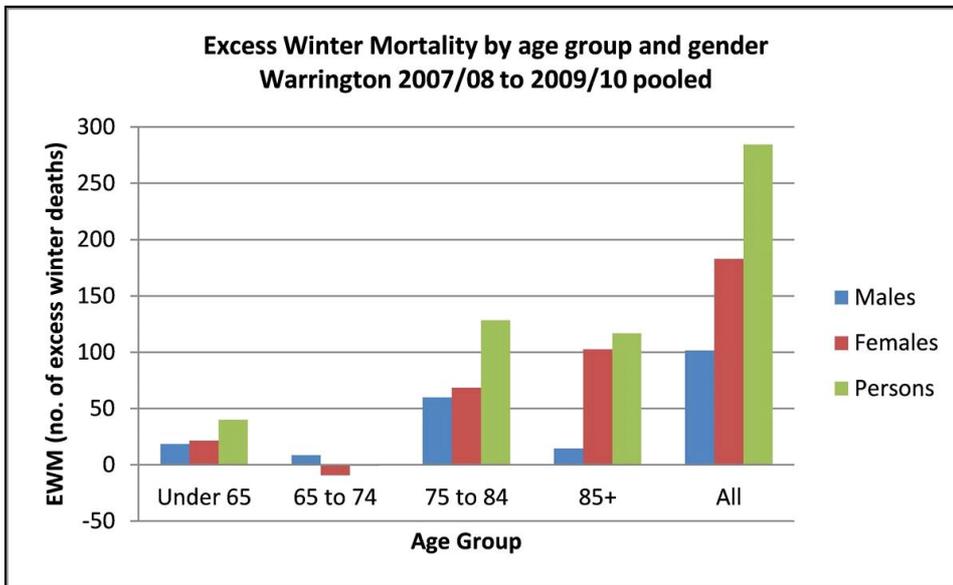


(Source: Office of National Statistics, 2010a) Data for 2009/10 is provisional.

Charts 4 and 5 present values for EWM and EWM Index for Warrington by age-band and gender.

Chart 4 shows that the number of excess winter deaths was similar for men and for women in all age groups under 85 years. However the number of EWM for females aged 85+ was much higher than men (this is not unexpected, as there are more women than men aged 85+ in the population).

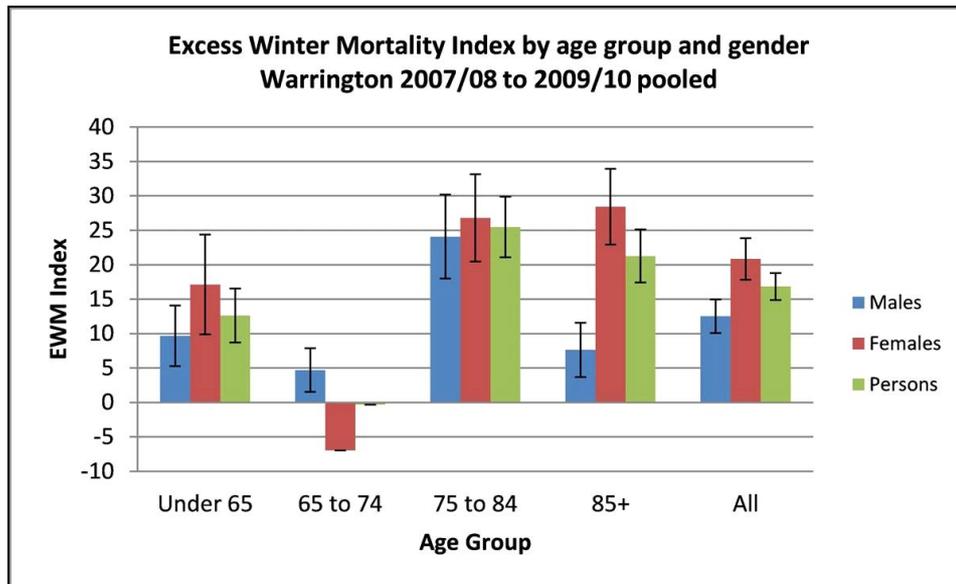
Chart 4: Numbers of Excess Winter Deaths in Warrington, by Age Group and Sex



(Source: Locally calculated (NHS Warrington) from Public Health Mortality Files)

Chart 5 compares the EWM index by age group. As the chart illustrates, EWM is particularly high for the 75-84 and 85+ age groups. Also, the EWM Index is significantly higher in women than men; this difference is highly significant in the 85+ age group. This is also found at a national level⁴.

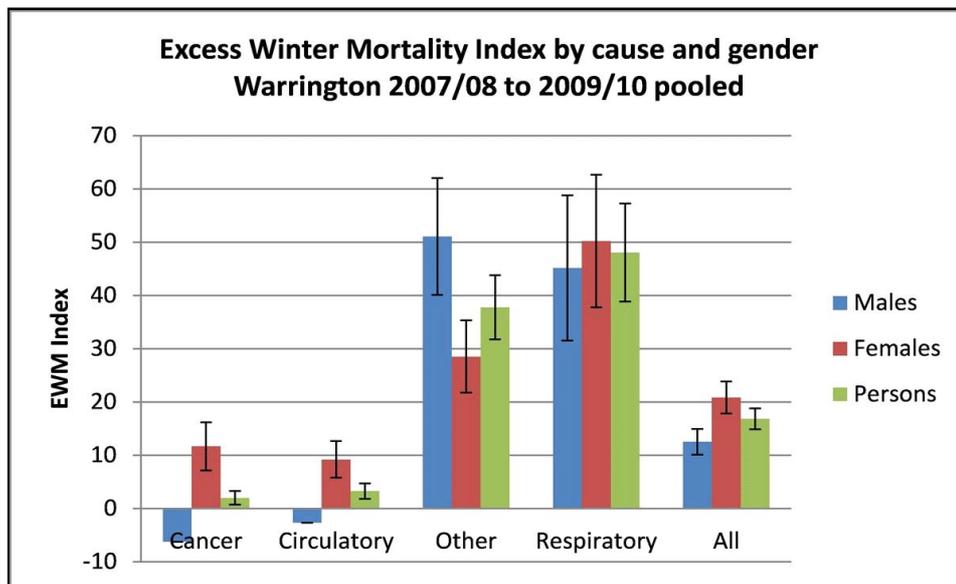
Chart 5: Warrington Excess Winter Mortality Index, by Age Group and Sex



(Source: Locally calculated (NHS Warrington) from Public Health Mortality Files)

Chart 6 shows the EWM Index by cause of death. For both men and women, respiratory-related causes of death clearly account for the highest EWM Index compared to circulatory and cancer. Whilst the 'Other' category is high, it covers the many causes of death other than respiratory, circulatory and cancer and so is difficult to draw conclusions about.

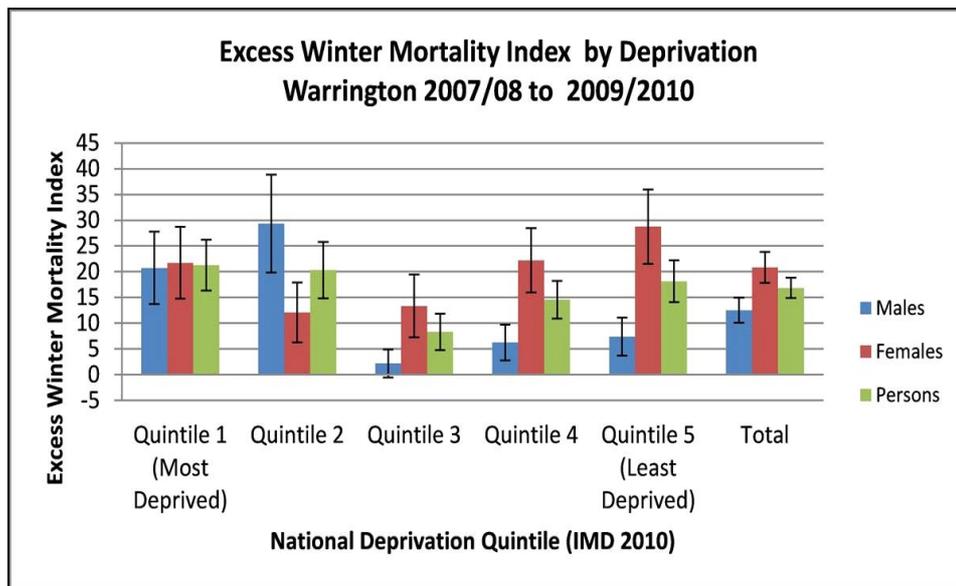
Chart 6: Warrington Excess Winter Mortality Index, by Cause



(Source: Locally calculated (NHS Warrington) from Public Health Mortality Files)

2.3.1) EWM by National Deprivation Quintile (IMD 2010) in Warrington, 2007/08 to 2009/10: Chart 7 shows that, for persons (i.e. all people), the EWM Index was highest for quintiles 1 and 2, and that quintile 3 is significantly lower than all other quintiles. There are some statistically significant differences when comparing males and females. Quintile 1 (most deprived) shows no difference between men and women. Quintile 2 shows a significantly higher EWM Index for males. Quintiles 3, 4 and 5 show significant and increasingly higher values of EWM Index in females.

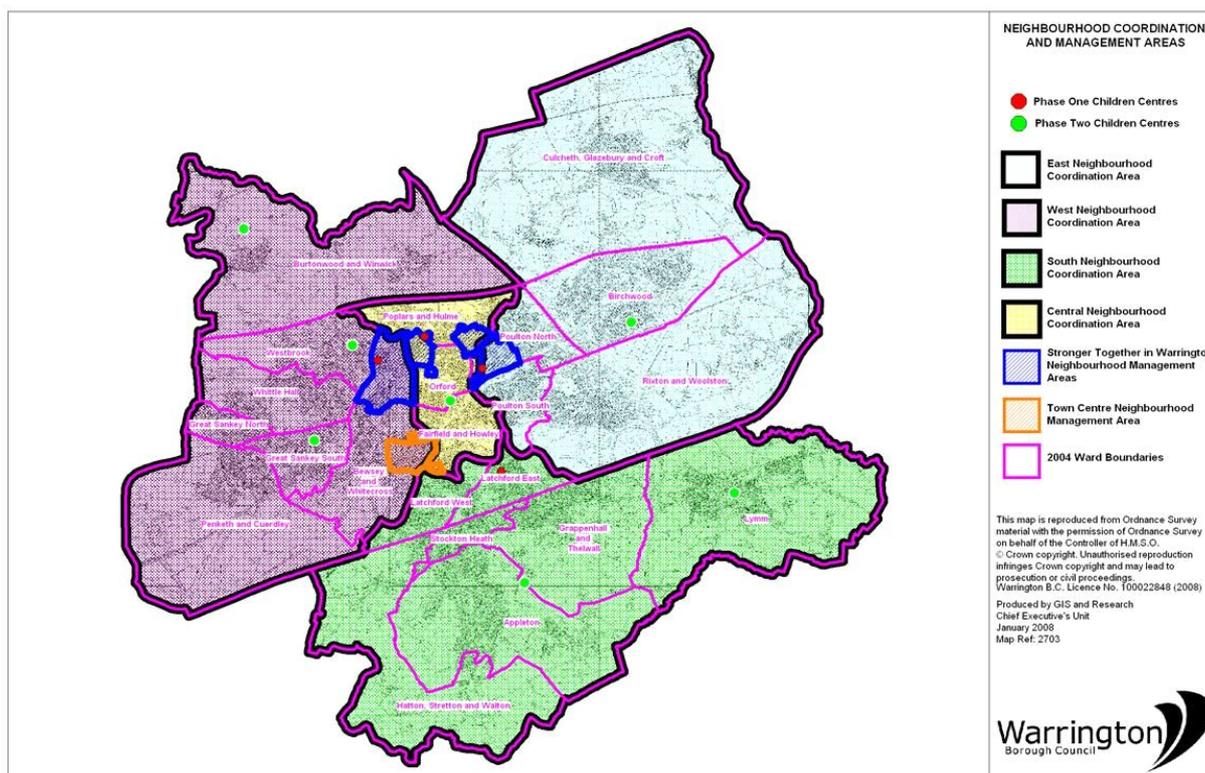
Chart 7: Warrington Excess Winter Mortality Index, by Deprivation Quintile



(Source: Locally calculated (NHS Warrington) from Public Health Mortality Files)

2.3.2) EWM by Neighbourhood in Warrington, 2007/08 to 2009/10: Warrington has been divided into neighbourhood areas, as shown in Map 5.

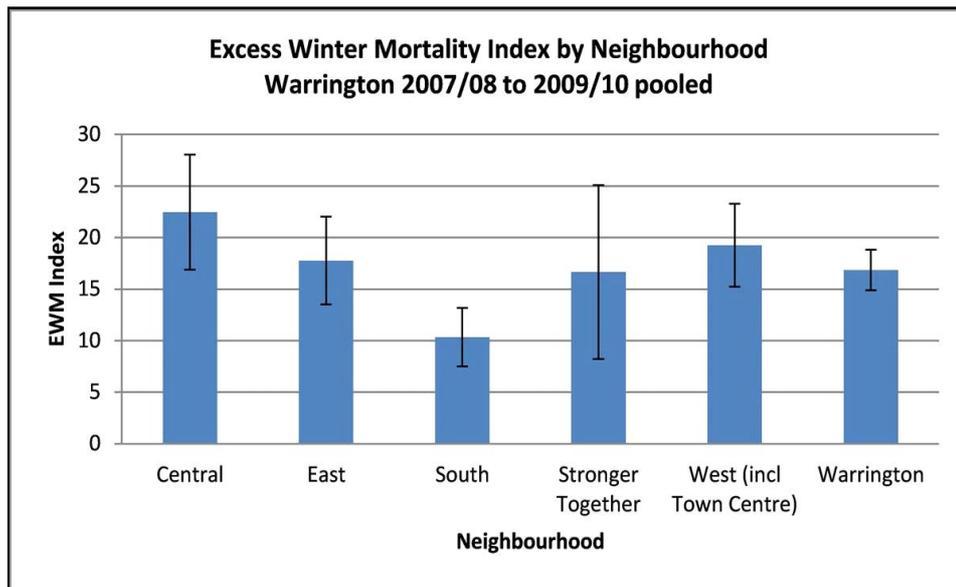
Map 5: Warrington Neighbourhood Areas



(Data Source: Ordnance Survey, © Crown Copyright)

Chart 8 shows that the South Neighbourhood has a significantly lower EWM Index compared to the Central, East and West Neighbourhoods. (The very wide confidence interval on the Stronger Together area⁵ is a reflection of it being a much smaller geographical area than the other Neighbourhoods, with a much smaller population. The Town Centre is too small to give robust figures, and so has been combined with West.)

Chart 8: Excess Winter Mortality Index, by Warrington Neighbourhood Coordination Area

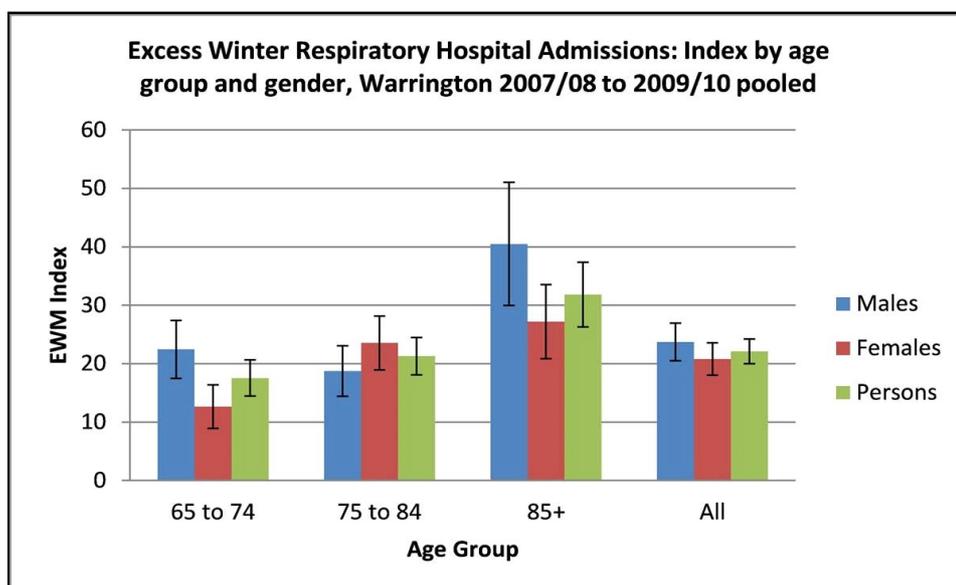


(Source: Locally calculated (NHS Warrington) from Public Health Mortality Files)

2.4) Excess Winter Respiratory-Related Hospital Admissions: As may be expected, given the excess in winter mortality, there is also a higher number of emergency admissions to hospital amongst older people during the winter months for specific conditions.

Data on emergency hospital admissions in over-65s, involving influenza, pneumonia and other acute lower respiratory infections, and chronic lower respiratory diseases (ICD10 codes J1, J2 & J4), has been analysed. For the purposes of this report, the methodology used to calculate excess winter mortality has been applied to the hospital admissions data. Chart 9 shows admissions by age and gender. Within Warrington, over the winters 2007/08 to 2009/10, for the specified conditions, there were 22% (423) excess admissions during the winter months. The index is particularly high (32%) in the 85+ age group.

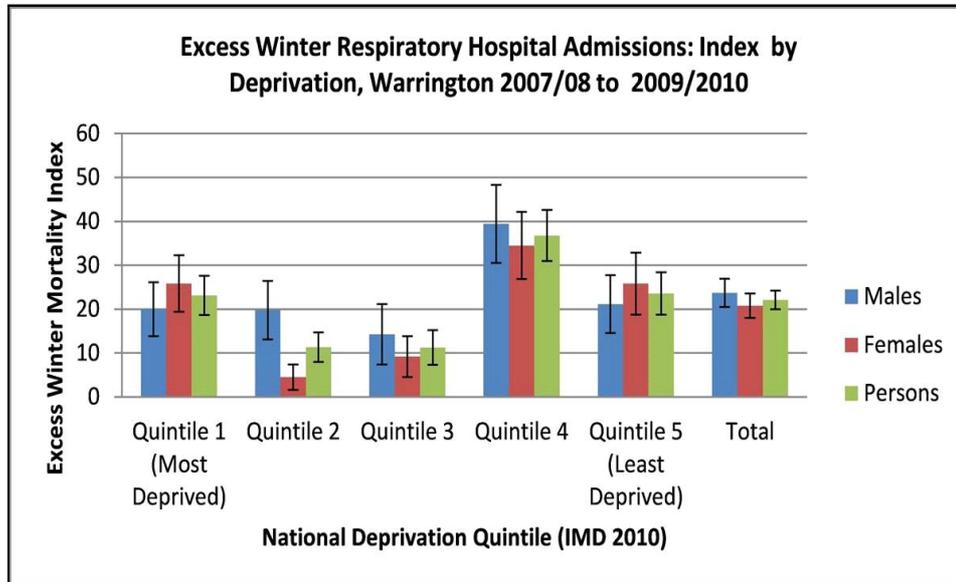
Chart 9: Excess Winter Respiratory Disease Hospital Admissions of Warrington Residents: Index, by Age Group and Sex



(Source: Locally calculated (NHS Warrington) from Warrington Inpatient Activity Data (Bridgewater Data Warehouse))

Chart 10 shows the excess winter admissions index by deprivation quintile and gender. As the chart illustrates, there does not appear to be any association between excess winter admissions for respiratory diseases and deprivation. Deprivation quintile 4 has the highest index value of excess winter admissions (37%; 154 admissions) and is significantly higher than all other quintiles.

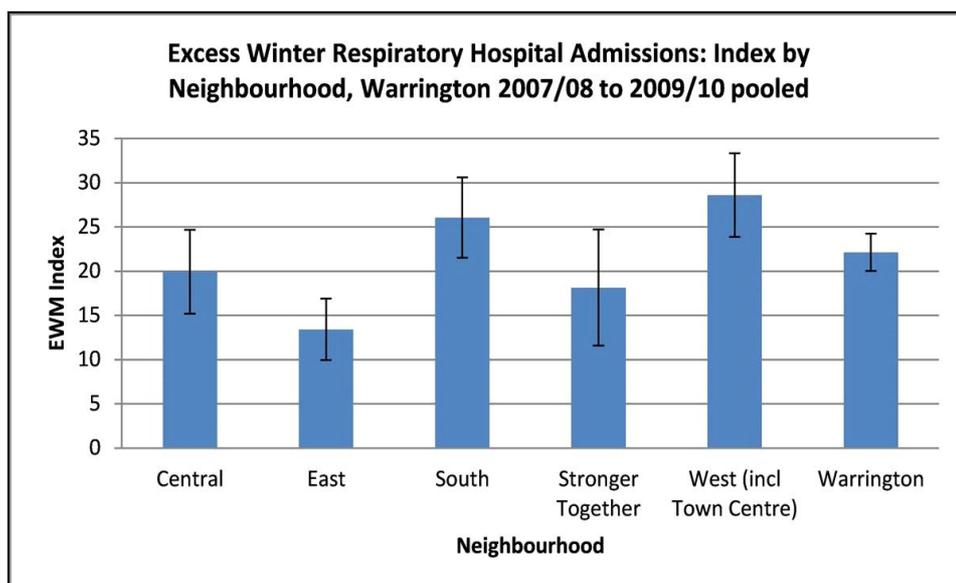
Chart 10: Excess Winter Respiratory Disease Hospital Admissions of Warrington Residents: Index, by Deprivation



(Source: Locally calculated (NHS Warrington) from Warrington Inpatient Activity Data (Bridgewater Data Warehouse))

At Neighbourhood level, as Chart 11 illustrates, the excess winter admissions index for East Neighbourhood is significantly lower than South and West, and than Warrington as a whole. Town Centre is too small to give robust figures and so has been combined with West.

Chart 11: Excess Winter Respiratory Disease Hospital Admissions of Warrington Residents: Index, by Neighbourhood



(Source: Locally calculated (NHS Warrington) from Warrington Inpatient Activity Data (Bridgewater Data Warehouse))

Footnotes

¹ LSOAs are small geographical areas, which in Warrington 'nest' within electoral wards.

² National Deprivation quintiles: all LSOAs in England are ordered by overall deprivation score, and then split into 5 evenly sized groups; quintile 1 comprises the most deprived group.

³ Deprivation quintiles group the 32,482 LSOAs in England into fifths according to the deprivation ranking. Analysis presented here aggregates the 125 LSOAs in Warrington according to the quintile grouping they fall into nationally.

⁴ Data has been extracted from the locally held Warrington Public Health Mortality File, and analysed using the methodology adopted by the Office of National Statistics to ensure comparability.

⁵ The Stronger Together areas of Warrington include parts of Bewsey, Dallam, Greater Blackbrook, Longford, Orford, Grasmere and Greenwood. Stronger Together aims to ensure local people can influence decisions about their neighbourhood. It ensures that service providers like the council, NHS and Police co-ordinate their activities to address local priorities and help individuals, service users and groups to tell us what works best in their area.

[Return to chapter contents](#)

3) Current Services in Relation to Need

There are currently a number of national and local schemes which are targeting householders with assistance on energy efficiency matters and home improvements, particularly those who are elderly, vulnerable or in potential fuel poverty. More information is available on the Directgov website (see References). Nationally, these schemes include:

3.1) The Warm Front scheme is targeted at households (owner-occupiers and private tenants only) on certain means-tested benefits and living in properties that are poorly insulated and/or do not have a working central heating system. Currently, the grant is up to £3,500 (or £6,000 where oil central heating or alternative technologies are recommended). In addition, the SAP rating of the property must be less than 55 (SAP is a measure of the energy rating of residential properties, the higher the number, the better the energy efficiency of the dwelling).

Table 2 shows the total number of households in Warrington receiving any Warm Front measure, along with the number and percentage of these households which received each measure.

Table 2: Warrington Households Receiving Warm Front Measure, 2007/08 to 2009/10

Measure Installed	Households 2007/08		Households 2008/09		Households 2009/10	
	No.	%	No.	%	No.	%
Cavity Wall Insulation	265	24.7%	360	23.89%	231	21.21%
Compact Fluorescent Light Bulbs	1,069	99.63%	1,503	99.73%	1,084	99.54%
Draught Proofing	86	8.01%	149	9.89%	156	14.33%
Electric Storage Heating	5	0.47%	13	0.86%	17	1.56%
Emergency Heaters	Nil	-	3	0.2%	8	0.73%
Gas Central Heating	92	8.57%	87	5.77%	61	5.60%
Gas Wall Heaters	2	0.19%	3	0.2%	4	0.37%
Loft Insulation	384	35.79%	457	30.33%	318	29.20%
Material Supply	513	7.81%	748	49.64%	635	58.31%
New Gas Supply	Nil	-	4	0.27%	4	0.37%
Oil Central Heating	Nil	-	Nil	-	3	0.28%
Repair & Replacements	11	1.03%	750	49.77%	651	59.78%
Tank Jackets	102	9.51%	60	3.98%	40	3.67%
New Tanks With Foam Jackets	Nil	-	2	0.13%	Nil	-
Total No. Households Receiving any Warm Front Measure	1,073		1,507		1,089	

(Source: Warrington Borough Council)

3.2) The Winter Fuel Allowance is a tax-free, non means-tested payment “intended to help older people keep warm during the winter”. It is paid to men and women who have reached the minimum age at which a woman can receive a state pension. For 2010/11, the winter fuel allowance was set at up to £250 for the over 60s, and up to £400 for the over 80s. The winter fuel allowance is paid directly to residents from the Department for Work and Pensions (DWP). Table 3 provides figures on recipients of the payment for 2010/11. As the figures illustrate, the rate of payments in Warrington was lower than that of the North West and Great Britain as a whole, reflecting the relatively younger population in Warrington.

Table 3: Winter Fuel Allowance: Recipients Winter 2010/11

	Number of WFA Recipients	Crude rate per 1,000	Amount					
			£125	£200	£250	£275	£400	
Great Britain	12,710,110	210.2	Number	5,375,120	565,450	4,723,810	292,200	1,753,530
			Percentage	42.3%	4.4%	37.2%	2.3%	13.8%
North West	1,480,370	213.4	Number	Not available				
			Percentage	Not available				
Warrington	41,280	207.5	Number	19,220	1,580	14,750	760	4,980
			Percentage	46.6%	3.8%	35.7%	1.8%	12.1%

(Source: Department for Work and Pensions <http://statistics.dwp.gov.uk/asd/index.php?page=wfp>)

For winter 2011/12, these figures were reduced to a minimum of £100 and up to a maximum of £300 per household, depending on age of the oldest occupant.

3.3) Cold Weather Payments are automatically paid to qualifying recipients, in receipt of certain means-tested benefits, for weeks of very cold weather (0°C or below) for a period of 7 days between 1st November and 31st March. Statistics are not available by local authority, but some information is available from DWP based on the estimated number of benefit units linked to each weather station that are eligible for Cold Weather Payments. However, DWP stress that this information is not quality assured to the same extent as official national statistics.

3.4) The Carbon Emissions Reduction Target (CERT) requires all domestic energy suppliers with a customer base in excess of 50,000 customers to make savings in the amount of CO₂ emitted by householders. Suppliers meet this target by promoting the uptake of low carbon energy solutions to household energy consumers both in the Able to Pay [non priority groups] and Priority Group [people over 70 years or those in receipt of a qualifying means tested benefit] sectors of the community, which, in turn, will assist them to reduce the carbon footprint of their homes, maximise income and help to reduce fuel poverty. The CERT scheme will run until December 2012, when it will be replaced by the **Green Deal**. The primary aim of CERT is to make a contribution to the UK’s legally binding target under the Kyoto protocol (United Nations Framework Convention on Climate Change, 1997), to cut greenhouse gas emissions by 12.5% below 1990 levels by 2008-2012, and the Climate Change Act 2008 requirement to cut emissions of greenhouse gas emissions by 80% below 1990 levels by 2050. However, CERT will also help to reduce energy demand, enhance the UK’s security of supply, reduce energy bills for those who have received energy efficiency measures, reduce fuel poverty, and secure jobs in energy efficiency industries.

3.5) Local services include:

3.5.1) The Winter Warm, Well & Safe Campaign is enabled by the Primary Care Trust (PCT) and runs through the winter months from October to March to raise awareness of health issues around the cold weather, particularly amongst older people and those most vulnerable to the adverse effects of the cold. The campaign is now into its fifth year, and the theme for 2011-12 is fuel poverty. Details of the campaign and its evaluation are available on the Warrington PCT website (NHS Warrington, 2010).

3.5.2) The Eco Hut is Warrington Borough Council’s domestic energy efficiency advice centre in Warrington Retail Market which offers free and impartial advice to residents. The Eco Hut also provide energy awareness talks to schools, professionals and volunteers working with vulnerable residents, as well as promoting energy efficiency information through a series of road-shows and events with the public to encourage installation of cavity wall and loft insulation before the CERT Scheme ends in 2012.

Table 4 provides an indication of the numbers of clients who have been given advice by the Energy Efficiency Officer at the Eco Hut in previous years. The figures provide an indication only, as clients will have also received advice in community surgeries that are not reflected in the figures provided here.

Table 4: Energy Efficiency Advice Provided, April 2009 – March 2012

Year	Number of Clients Receiving Advice
2009/10	1434
2010/11	662
2011/12	643

(Source: WBC Eco Hut)

The Eco Hut is unique to Warrington and, therefore, it is not possible to make comparisons with other LAs. The figures are only an indication of the numbers of people seen, as less information is now recorded than previously due to the reluctance of clients to disclose personal information. In addition, the Eco Hut is only manned on a part time basis due to the increasing importance of other projects, such as community surgeries to promote the uptake of cavity wall and loft insulation in homes.

3.5.3) Solar Panels: The Council is working with a number of registered providers, including Golden Gates Housing Trust (GGHT), to install solar PV (photovoltaic cells which capture the sun’s energy and convert it into electricity, which can be used to run household appliances and lighting) on the roofs of 600 dwellings in Longford and other areas, thus providing residents with free electricity during daylight hours. It is estimated that tenants will save in the region of £112 per year on energy costs. GGHT, the largest social housing provider in Warrington (almost 8,700 units), also has an extensive refurbishment programme to upgrade windows and central heating systems, as well as ensuring that all properties have 300mm of loft insulation and cavity wall insulation, where appropriate, by 2013 (Golden Gates Housing Trust, 2011). In addition, all customers will be offered ‘one to one’ energy advice, including a fuel comparison cost evaluation.

3.5.4) Local Authority New Build Programme: The Council has built 32 two-bed bungalows over 7 sites across Warrington using funding of £1.95m from the Homes and Communities Agency. This has enabled local elderly tenants to move into more suitable accommodation that meets their needs and releases a family home for those on the housing register. These homes are among the first in Warrington built to meet Code for Sustainable Homes Level 4. This means they meet new Government targets for cutting carbon emissions and are 44% more energy efficient than a typical home built in 2006.

[Return to chapter contents](#)

4) Projected Service Use and Outcomes in 3-5 Years and 5-10 Years

4.1) National projections suggest that fuel poverty in England is likely to increase to 4.1 million in 2011, as the increase in fuel prices begins to impact on households.

As analysis has shown, older people are at greater risk of fuel poverty and its impact. The population is ageing and the proportion of over 65's is projected to increase substantially in future years, as Table 5 illustrates ([data and charts for population projections are available here](#)). This is likely to impact on the total number of people experiencing fuel poverty.

Table 5: Population Projections for Warrington¹

		2010	2015	2020	2025	2030	Percentage increase, from 2010 to 2030
Males	65-69	4600	5600	5200	5900	6800	48%
	70-74	3900	4200	5100	4800	5400	38%
	75-79	2700	3200	3500	4400	4100	52%
	80-84	1700	2000	2500	2800	3600	112%
	85-89	900	1000	1300	1800	2100	133%
	90+	300	500	700	1000	1400	367%
	All 65+	14100	16500	18300	20700	23400	66%
Females	65-69	5100	6100	5500	5900	7300	43%
	70-74	4300	4800	5700	5200	5600	30%
	75-79	3200	3900	4400	5200	4800	50%
	80-84	2600	2600	3300	3800	4600	77%
	85-89	1700	1800	1900	2600	3000	76%
	90+	900	1100	1300	1600	2200	144%
	All 65+	17800	20300	22100	24300	27500	54%
People	65-69	9,800	11,700	10,700	11,800	14,100	44%
	70-74	8,200	8,900	10,800	9,900	11,000	34%
	75-79	5,800	7,100	7,900	9,700	9,000	55%
	80-84	4,200	4,600	5,900	6,600	8,200	95%
	85-89	2,600	2,800	3,300	4,400	5,000	92%
	90+	1,200	1,600	2,000	2,600	3,600	200%
	All 65+	31,800	36,700	40,600	45,000	50,900	60%

(Source: Office for National Statistics, 2010b)

4.2) Local Housing Allowance: In addition to demographic changes, recent Government changes to Local Housing Allowance, for households living in private sector accommodation, could have a substantial effect on the levels of fuel poverty, as benefit rates have been reduced from April 1st 2011. Rates are now based on the 30th percentile for average rents in an area, rather than the 50th percentile. The abolition of the current range of benefits, which will be replaced by universal credit, will result in a less generous benefit for most people. In addition, the Council Tax benefit system is being overhauled and fewer people will be entitled to support for Council Tax. As a consequence, tenants must contribute more towards their rent and tax, thus having less disposable income to pay for fuel, food and other essentials, with the consequent effects on health.

4.3) The Green Deal (DECC, 2011d) is the Government's flagship carbon emissions reduction project, which is due to start in late 2012, that replaces the CERT Scheme detailed previously. The purpose of the Green Deal is to encourage as many people as possible to take measures to make their homes more energy efficient and it will achieve this by providing all of the upfront finance for such measures by way of a loan. The Green Deal will include a financial framework that enables energy saving measures to be paid for in instalments via energy bills. The 'golden rule' of the Green Deal is that "*The expected financial savings must be equal to or greater than the costs attached to the energy bill*" (DECC, 2010b, pg. 5).

The domestic Green Deal model will be supplemented by a new Energy Company Obligation from the end of 2012, which will focus particularly on those householders (e.g. the poorest and most vulnerable) and those types of domestic property (e.g. the hard to treat) that cannot achieve financial savings without a measure of additional support on top of the Green Deal finance.

4.4) Pilot Scheme - New Build Energy Efficient Affordable Homes: Warrington Borough Council are working in partnership with Arena Housing Association, and the Council is funding a new build scheme which will build to the specification for Code for Sustainable Homes Level 5, or possibly 6. These will be the most energy efficient homes ever built in Warrington and are a pilot to identify the actual costs involved in providing the highest levels of energy efficiency and renewable energy sources.

Warrington Housing Association is making heating improvements to some properties in Orford and is installing solar thermal panels in its all electric properties in Grappenhall. This will provide additional hot water for residents and help reduce electric bills, as part of the Planned Maintenance Programme 2011-12 (Warrington Housing Association, 2011).

4.5) Health and Housing 2011: Warrington Home Information and Improvement Agency (WHiA) is running a pilot project from July 2011 to June 2012 called Health and Housing 2011, which involves working with GPs to target assistance to older people with health issues which may be affected by their housing conditions. A maximum of £50,000 is being made available to fund the project. Patients are identified by factors such as: housebound, over 75 years old, or specific health problems, including COPD, heart conditions, mobility problems and respiratory problems. There are 30 GP practices in Warrington, with a total of 13,764 patients registered who are aged 75 and over². WHiA is working with individual practices to target relevant clients. WHiA case workers will be offering home assessments, to assess for energy efficiency, disrepair, dampness, potential for falls etc. With the agreement of the patient, appropriate referrals for insulation measures, income maximisation and repairs of up to £120 will be organised through WHiA.

Footnotes

¹ Data source: www.poppi.org.uk Figures may not sum due to rounding. Crown copyright 2010. Figures from Office for National Statistics (ONS) subnational population projections by sex and 5-year age bands age. Latest data, published May 2010, based on 2008 mid-year population estimates. These are trend-based projections based on data from the previous 5 years.

² Data source: Cheshire Health Agency, August 2010.

[Return to chapter contents](#)

5) Evidence of What Works

Several studies have been undertaken that link poor health with poor housing conditions. There are several projects underway between local authorities and PCTs to remedy some of the issues. In particular:

- **Better Housing, Better Health in Leeds: Cost Benefit Analysis of Improving Living Conditions** Sheffield Hallam University (Green et al., 2011).

The report suggests that remedying thermal comfort failure¹ in the 51,400 dwellings (identified in the Leeds Stock Condition Survey) by installing or upgrading central heating systems and installing loft and cavity wall insulation measures, where appropriate, will both improve living conditions and reduce fuel poverty. The programme will reduce the hazard of excess cold and the incidence of heart disease, respiratory infections, bronchitis and strokes. Up to 104 excess winter deaths will be prevented annually, adding up to 1,560 over the estimated 15-year life of the energy efficiency measures. Older people are the main beneficiaries.

Since thermal comfort failure and resulting low temperatures are the primary cause of mould and damp, investment in energy efficiency will reduce this hazard and improve the health of up to 235 occupants who would previously have sought medical attention. The main beneficiaries are children who previously visited their General Practitioner for coughs and wheezes. Improvements in energy efficiency will reduce the number of households in fuel poverty by 10%, from 43,600 to an estimated 39,200, and will also reduce the number of occupants seeking medical attention for anxiety and depression by up to 2,183 annually. Over 15 years there will be an estimated reduction in consultations of up to 32,745.

- The **Liverpool Healthy Homes Programme** (Liverpool City Council and Liverpool Primary Care Trust, 2011) is a project set up between Liverpool City Council and Liverpool PCT which is aiming to reduce health inequalities caused by poor quality housing conditions in the private sector and to improve access to health related services. It operates in targeted areas with poor housing conditions, large numbers of category 1 hazards (HHSRS), high levels of fuel poverty and excess winter deaths. The programme will cover around 25,000 homes, of which 4,000 will be assessed for category 1 hazards. The removal of hazard exposure is designed to reduce premature deaths by up to 100, reduce GP consultations and hospital admissions by over 1,000 cases, and reduce reliance on secondary and tertiary treatment.

- In addition, the 'Department of Health (DH), Health Inequality National Support Team', has produced an advisory guide on How to reduce the risk of seasonal excess deaths systematically in vulnerable people to impact at population level (DH, 2010). This details 9 practical and effective interventions, as follows:

1. Assessment for affordable warmth interventions, including energy efficiency, household income and fuel cost.
2. Regular review of benefits and entitlement uptake.
3. Annual flu and pneumococcal vaccination.
4. Provision of an annual medication review (every six months if taking 4+ medicines).
5. Provision of an annual medicines utilisation review (MUR) and follow-up support for adherence to therapy.
6. Implementation of a personal brief health interventions plan that includes advice and support to stop smoking, sensible drinking, healthy eating, adequate hydration and daily active living.
7. Assessment and support programme to prevent falls.
8. Assessment for appropriate assistive technologies e.g. alarm pendants to call for help.
9. Help to develop a personal crisis contingency plan (e.g. a buddy scheme, for those with no close family or friends, to watch for danger signs and provide someone to call).

People who work with older people, such as social services, health professionals, health improvement officers or volunteers, should be aware of EWM and promote public health messages to keep warm during the winter months. For example, through the promotion of influenza vaccinations, how to stay healthy through winter, and ensuring that one room in a house is kept warm if it is unaffordable to heat a whole house.

Footnotes

¹ *In physiological terms, thermal comfort is what we experience when the body functions well, with a core temperature of around 37°C and skin temperature of 32-33°C. The Environmental Change Institute at Oxford University.*

[Return to chapter contents](#)

6) (Target) Population/Service User Views

Several surveys have been undertaken by the Council (Private Sector Housing) in relation to the funding support offered to clients as part of the Housing Renewals Policy 2003 (Discretionary Renewals Assistance for Owner-Occupiers Consultation, 2005-07; Discretionary Grant Assistance Customer Survey Report, 2007). Feedback has been generally positive amongst the majority of clients who had received financial assistance to install energy efficiency measures or central heating. Approximately 70% felt that their fuel bills had reduced and, in relation to those who had received assistance to undertake repairs or improvements to their homes, 97% said that the work had improved their health and wellbeing.

The Winter Warm, Well & Safe Campaign is run annually and aims to reduce unplanned hospital admissions by ensuring older people remain warm, well and safe during the winter months. The campaign works with local organisations to disseminate appropriate information, such as room thermometers, health fact sheets, an older people's service directory and calendar. The campaign reaches over 4,000 older people. The Winter Warm, Well and Safe Campaign is evaluated annually and user views sought; some comments received following the last campaign include:

"The winter calendar contained some very useful information."

"The thermometer was useful."

"I was unaware of all the help available."

[Return to chapter contents](#)

7) Unmet Needs and Service Gaps

Need to develop more links and 'joined-up' working between the relevant Council and NHS teams and other agencies working with vulnerable people.

Co-ordinated action between such agencies to target poor housing conditions and health interventions where appropriate. This could be assisted by the development of the Single Point of Delivery for Housing at the Gateway (plans in progress with the Council, Warrington Housing Association and other major housing providers within the Borough).

[Return to chapter contents](#)

8) Recommendations for Commissioning

Improving the energy efficiency of the housing stock will improve living conditions and reduce fuel poverty, with fewer winter deaths and emergency hospital admissions, and better physical and mental health.

Continue to strongly promote applications for energy efficiency home improvement grants and schemes whilst they are still available (or before changes are introduced which will reduce the number of people eligible).

Continue to promote information on keeping safe and warm in winter.

In addition, take into consideration the 9 specific interventions suggested by the *Department of Health, Health Inequality National Support Team* (detailed in Section 5).

[Return to chapter contents](#)

9) Recommendations for Needs Assessment Work

No recommendations.

[Return to chapter contents](#)

Key Contacts

Carolyn Haining
Private Sector Housing Manager
chaining@warrington.gov.uk

David Cowley
Housing Standards and Options Services Manager
dcowley@warrington.gov.uk

Carole Boyle
Public Health Analyst
cboyle@warrington.gov.uk

Key Commissioning Groups: NHS Warrington, GPs, Warrington Borough Council, Registered Providers (Social Landlords).

[Return to chapter contents](#)

Appendix A

Technical Description of Fuel Poverty Indicator Construction

The Department for Energy and Climate Change (DECC, 2011a) produced a fuel poverty ratio (FPR) which predicts the incidence of fuel poverty at local area level across England and is calculated using the following formula:

$$\text{Fuel poverty ratio} = \frac{\text{Fuel costs (usage x price)}}{\text{Income}}$$

If this ratio is greater than 0.1 then the household is **fuel poor**.

Whether a household is classed as fuel poor depends on fuel consumption (which is dependent on the lifestyle of the household and the fuel-efficiency of the dwelling), the cost of fuel, and the household income.

The data used to construct the indicator comes from three sources: the English Housing Survey (EHS), energy price information and household income. DECC identifies two ways of defining the income factor that contributes to the calculation of the fuel poverty ratio; 'basic income' and 'full income'. For this analysis, the FPR based on 'full income' has been used (DECC, 2011c).

[Return to chapter contents](#)

References

Centre for Sustainable Energy (CSE). *Fuel Poverty Indicator (FPI)*.
www.fuelpovertyindicator.co.uk

Communities and Local Government Survey of English Housing Live Tables: Definitions and terms. [Available at:
<http://www.communities.gov.uk/housing/housingresearch/housingsurveys/surveyofenglishhousing>

Department of Communities and Local Government (DCLG). *The English Indices of Deprivation 2010*. <http://www.communities.gov.uk/publications/corporate/statistics/indices2010>

Department for Energy & Climate Change (DECC, 2010a). *Fuel poverty sub-regional statistics*. [2008 data available to download, including at LSOA and Local Authority level, at:
http://www.decc.gov.uk/en/content/cms/statistics/fuelpov_stats/regional/regional.aspx]

Department of Energy and Climate Change (DECC, 2010b). *The Green Deal: A summary of the Government's Proposals*. [Available at:
<http://www.decc.gov.uk/assets/decc/legislation/energybill/1010-green-deal-summary-proposals.pdf>]

Department for Energy & Climate Change (DECC, 2011a). *Annual Report on Fuel Poverty Statistics 2011*. [Available at:
http://www.decc.gov.uk/en/content/cms/statistics/fuelpov_stats/fuelpov_stats.aspx]

Department for Energy & Climate Change (DECC, 2011b). *Trends in fuel poverty England: 2003 to 2009*. [Available at
http://www.decc.gov.uk/en/content/cms/statistics/fuelpov_stats/fuelpov_stats.aspx]

Department for Energy & Climate Change (DECC, 2011c). *Fuel Poverty Methodology Handbook*. [Available at:
http://www.decc.gov.uk/en/content/cms/statistics/fuelpov_stats/fuelpov_stats.aspx Accessed 27/9/11]

Department of Energy and Climate Change (DECC, 2011d). *Energy Bill: Green Deal*. [Available at <http://www.decc.gov.uk/assets/decc/legislation/energybill/543-energy-security-bill-brief-green-deal.pdf>]

Department of Health (2010). *Health Inequalities National Support Team. How to reduce the risk of seasonal excess deaths systematically in vulnerable people to impact at population level*. [Available at: http://www.dh.gov.uk/prod_consum_dh/groups/dh_digitalassets/@dh/@en/@ps/documents/dig

Department for Work and Pensions. *Winter Fuel Payments*. [Available at: <http://statistics.dwp.gov.uk/asd/index.php?page=wfp>]

Direct.gov. *Environment and Greener Living: Energy Grants*. [Available at <http://www.direct.gov.uk/en/Environmentandgreenerliving/Energyandwatersaving/Energygrants>

The Eurowinter Group (1997). *Cold exposure and winter mortality from ischaemic heart disease, cerebrovascular disease, respiratory disease, and all causes in warm and cold regions in Europe*. *The Lancet*, 349, 1341–1346.

Greater Norwich Housing Market Assessment (2007). *Under-occupation of Housing*. [Available at: http://www.south-norfolk.gov.uk/housing/media/gnhp_under-occupation_report.pdf]

Green, G. Stafford, B. and Pugh, P. (2011). *Better Housing Better Health in Leeds: Cost-Benefit Analysis of Improving Living Conditions*. Sheffield Hallam University. [Available at: <http://www.shu.ac.uk/assets/pdf/hsc-better-housing-better-health-leeds.pdf>]

Golden Gates Housing Trust. *Your Guide to Improvements in Your Home*. [Available at: http://www.gght.org.uk/tenantserviceslive/documents/GGHT_Investment_Programme_Tenants

Hajat, S., Kovats, R.S., and Lachowycz, K. (2007). *Heat-related and cold-related deaths in England and Wales: who is at risk?* *Occupational and Environmental Medicine*, 64, 93-100.

Hill, J. (2011). *Fuel poverty, the problem and its measurement: Interim Report of the Fuel Poverty Review*. Department for Energy & Climate Change (DECC). [Available at: http://www.decc.gov.uk/en/content/cms/funding/fuel_poverty/hills_review/hills_review.aspx]

Hill, J. (2012). *Getting the measure of fuel poverty: final report of the Fuel Poverty Review*. Department for Energy & Climate Change (DECC). [Available at: http://www.decc.gov.uk/en/content/cms/funding/Fuel_poverty/Hills_Review/Hills_Review.aspx]

Imperial College London (2002). *Elevated risk of high blood pressure: climate and the inverse housing law*. *International Journal of Epidemiology*, 31, 831-838. [Available at: <http://www.imperial.ac.uk/college.asp?P=3565>]

Kinsella, S. (2009). *Excess Winter Deaths: Review of the Evidence*. [Available at: http://info.wirral.nhs.uk/document_uploads/evidence-reviews/ExcessWinterDeathsReview_4080b.doc]

Liverpool City Council and Liverpool Primary Care Trust (2011). *Liverpool Healthy Homes News: Healthier Homes, Healthier Lives*. Newsletter Issue 2. [Available at www.liverpoolpct.nhs.uk/Library/Your_Health/healthy%20homes%20january%202011.pdf]

NHS Warrington (2009). *Warrington JSNA 2009 Supplement to Section 2: Fuel Poverty and Winter Health*. [Available at http://www.warrington-pct.nhs.uk/default.asp?page=About_Us/JSNA.asp]

NHS Warrington (2010). *Winter Warm and Well Campaign 2009/10 Evaluation Report*. (http://www.warrington-pct.nhs.uk/dl.asp?file=../data/Health_and_wellbeing/Winter_health/Winter_Warm_Calendar_Directory_2012.pdf)

Office of National Statistics (2010a). *Statistical Bulletin: Excess winter mortality in England and Wales, 2009/10 (provisional) and 2008/09 (final)*. [Available at <http://www.ons.gov.uk/ons/rel/subnational-health2/excess-winter-mortality/excess-winter-mortality-in-england-and-wales--2009-10--provisional--and-2008-09--final-/index.html>]

Office for National Statistics (2010b). *Sub National Population Projections 2008-based projections*. [Available at: <http://www.ons.gov.uk/ons/rel/snpp/sub-national-population-projections/2008--based-projections/index.htmlv>]

South East Regional Public Health Group (Dec, 2009). *Health and Winter Warmth: Reducing Health Inequalities*. [Available at: <http://www.warmerhealthyhomes.org.uk/images/stories/documents/health%20and%20winter%20warmth%20factsheet%20dec%202009.pdf> Accessed 27/9/11]

Warrington Borough Council (2008). *Private Sector House Condition Survey 2008*. [Available at: http://www.warrington.gov.uk/home/residents/housing/private_sector_housing_stock_condition]

Warrington Housing Association (WHA). *Planned Maintenance Programme 2011/12*. Newsletter. [Available at: http://www.wha.org.uk/files/ART99_Newsletter%20Summer%202011.pdf]

Wilkinson, P., Pattenden, S., Armstrong, B., Fletcher, A., Kovats, R.S., Mangtani, P., and McMichael, A.J. (2004). *Vulnerability to winter mortality in elderly people in Britain: Population based study*. *British Medical Journal*, 329, 647. [Available at: <http://www.bmj.com/cgi/content/full/329/7467/647>]

United Nations Framework Convention on Climate Change (1997). *Kyoto Protocol*. [Available at: http://unfccc.int/essential_background/kyoto_protocol/items/1678.php]

[Return to chapter contents](#)

Signed Off By

Peter Taylor
Assistant Director, Environment and Regeneration, Warrington Borough Council
Email: ptaylor@warrington.gov.uk

[Return to chapter contents](#)