

Effectiveness of Domestic Energy- Efficiency Programmes

Fuel Poverty Action Research Report 2: Research Context and Methods



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Context and Rationale

Despite extensive literature in the UK and an increasing awareness of the issue, research into fuel poverty and domestic energy efficiency remains relatively scarce in Ireland. This is particularly the case for ex post analysis of domestic energy-efficiency programmes aimed at reducing fuel poverty among low-income households. To address this gap, Combat Poverty and Sustainable Energy Ireland developed a fuel poverty action research project to inform public policy on the merits of domestic energy-efficiency programmes.

The project involved an integrated and systematic ex post assessment of the energy, environmental, thermal comfort and health benefits of the SEI-administered 'Warmer Homes Scheme' which retrofits private homes with insulation and other energy saving measures. The study was set in Cork City and County Donegal.

Scope of the Study

The purpose of the study was to examine the impact of installing a range of energy efficiency measures on the thermal comfort and health status of households. The study also sought to gain some insight into the economic impacts of installing energy efficiency measures. The outcomes from this research are intended to offer direction to policy makers on the impact of energy efficiency measures and to identify areas for future research.

Given the resources available, the study is based on a relatively small sample of 600 households – 247 households who had energy efficiency measures installed under the Warmer Homes Scheme and a comparison group of 353 households who were not included in the initiative. It is important to state that the research has not been operationalised as a 'case control' study, given the problems in matching households on specific criteria.

The study is set within a community development context, with local organisations in Cork City (Northside Community Enterprises Ltd) and County Donegal (Meitheal Forbartha na Gaeltachta) contributing to study design and implementation, including the conduct of all survey fieldwork. Involving local communities in implementing the study was an important element of the implementation process, with the research providing an opportunity for these communities to further develop and build social value and capacity within their respective areas.

Fuel Poverty in Ireland

Boardman (1991) defines fuel poverty as 'the inability to heat one's home to an adequate (i.e. safe and comfortable) level owing to low household income and poor, energy inefficient housing and also the need to spend greater than 10 per cent of household income on fuel to achieve an acceptable level of comfort and amenity'.

This definition is commonly accepted and reflects the close relationship between low household income, poor energy efficiency and household comfort. Applying this expenditure method of measuring fuel poverty, research by the ESRI (2008) estimated that 19 per cent of Irish households (301,368) may have experienced fuel poverty in 2008. Fuel poverty can also be measured using self-reported subjective measures such as being able to heat your home to a temperature that is comfortable in winter. Again, using this measure, the ESRI (ibid) estimated that 3.6 per cent of Irish households (56,047) had experienced fuel poverty in 2007.¹

The Policy Response to Fuel Poverty

It is commonly recognised that three main factors influence the level of fuel poverty: fuel prices, household income, and energy efficiency of the housing stock. The relative importance of each factor depends on the period being examined, but by way of an example, the Scottish Executive (2008) reported that between 1996 and 2002 the reduction in fuel poverty was mainly attributable to increases in household income (50 per cent) and decreasing fuel prices (35 per cent), with energy efficiency improvements playing a lesser role (15 per cent).

At a policy level, there is strong evidence of an increased government commitment to tackling fuel poverty, reflected in a number of key policy documents including the National Action Plan for Social Inclusion (2007-2016), the Government White Paper Delivering a Sustainable Energy Future for Ireland (2007-2020), the National Energy Efficiency Action Plan (NEEAP) 2009-2020 and the Programme for Government. Specifically in relation to the Warmer Homes Scheme there has been an increased budget allocation to the initiative year-on-year since its commencement in 2000.

In acknowledging that fuel poverty has significant impacts on the lives of people affected (e.g. comfort, health status, quality of life etc), and a disproportionate impact on low-income households, SEI set up a Low Income Housing Programme to help establish and implement a national plan of action to systematically address the problem of fuel poverty. The Programme is based on the premise that low-income households are unable to afford the capital investment measures required to improve the energy efficiency of their homes. Allied to this point, SEI acknowledges that 'income supports and fuel allowances do not address this structural deficiency in this part of the housing stock'. To address these concerns the Warmer Homes Scheme was developed and implemented.

¹ *Note that these figures are estimates given that data on fuel poverty are not routinely collected by government in Ireland.*

The Warmer Homes Scheme

The Warmer Homes Scheme was set up as the core delivery vehicle for addressing fuel poverty within low-income households. The core aim of the scheme is:

... to improve the energy efficiency and comfort conditions of homes occupied by low-income households, and to establish the systems and growing the capacity in Ireland to install such measures.

The scheme is implemented through a social employment model, with regional community-based organisations appointed to carry out the remedial works which include: attic insulation, draught proofing, lagging jackets, energy-efficient lighting, cavity wall insulation and energy advice. Eligible homes are identified locally via networks drawn from the statutory and voluntary sectors. The scheme is directed at privately owned and rented homes, which are more diverse and difficult to access than local authority homes, with the latter catered for elsewhere. The scale of activity each year is dependent upon available funding and is targeted at specific geographical areas. By 2008, €10.93m had been allocated to the scheme which covered interventions in 17,662 households (source: Sustainable Energy Ireland).

Linking the Warmer Homes Scheme with the Study

The Warmer Homes Scheme was identified as an appropriate vehicle for identifying households to take part in the study. Given that community-based organisations had already been contracted to retrofit households as part of the Warmer Homes Scheme, it was agreed that involving these same organisations would be an efficient way of implementing the study given the close association between the organisations and the local communities (i.e. established credibility, local contacts, mitigating problems associated with accessibility etc).

Literature Review

Link between Ill-Health and Poor Housing

The link between ill-health and poor quality housing is well established, with people experiencing fuel poverty frequently living in cold, damp and thermally inefficient houses (Energy Research Group and Environmental Institute, 1999). For example, Byrne et al (1993) conclude that within the UK '... health improvements in Britain over the past 100 years have resulted far more from collective intervention in the environment than from the development, or even provision, of curative health care', with improvements in housing in particular associated with a broad range of health improvements.

Within health research, Byrne and Keithley (ibid) refer to two broad approaches:

- The medical approach of associating single causes with individual effects
- The public health approach of investigating causal systems, rather than single causal factors.

This current study is consistent with the public health approach which examines the impact of a range of causal factors on health status (i.e. the study attempts to assess the impact of installing a range of energy efficiency measures on the health status of households), rather than attempting to identify a single cause of an illness and then eliminate that cause.

The Centre for Sustainable Energy (CSE) in the UK (2009) states that the two approaches outlined require the application of different methodologies for investigating the link between housing and health. Whereas the medical model tends to emphasise individual behaviour as the main cause of ill-health, a public health approach places more emphasis on what Acheson (1999) calls 'general susceptibility' which is based on the premise that people are vulnerable to a variety of ills because of health inequalities brought about through the economic and social environment in which they live.

Although there are problems with applying the medical model to the links between health and housing (e.g. variation in diagnosis among doctors, the requirement of the patient to seek the services of a doctor which can lead to underestimating the extent of ill-health in a community, and medically diagnosed health being seen as a more reliable indicator compared with self-defined health), equally there are limitations with the public health approach. The Centre for Sustainable Energy (ibid) states that:

... while the public health model provides a more holistic approach to combating ill health, it is difficult to disentangle the relative importance of the mix of measures the approach entails. For example, a before and after study of the health impact of a major regeneration programme may find that the community's overall health improves significantly. However, the study will not be able to determine with

any degree of precision whether the improvement is due to improved housing, employment growth, income measures or improved social provision. Further, the health improvements may have arisen because of contemporary national policy initiatives, such as improved welfare benefits.

The challenges documented by the CSE can sometimes be overcome by using what it terms 'control areas with similar characteristics to the area under investigation'. However, the CSE also acknowledges the difficulty in identifying 'control areas with similar characteristics to the study area and to control for all possible causal factors'.

In pointing to the causes of fuel poverty, National Energy Action (2009) identifies a number of factors (e.g. low household income, prohibitive energy costs, inadequate thermal insulation and inefficient and uneconomic heating systems), although it concludes that energy efficiency is the 'only rational solution to fuel poverty'.

Specifically in relation to the impact of fuel poverty and health, Cheshire (2002) has put together a comprehensive review of the literature, with many studies focusing on either the effect of low indoor temperature (cold homes) on health or the effect of condensation, damp and mould (CDM) on health. In relation to cold homes, for example, the literature provides evidence of an increased risk of respiratory illness, increased blood pressure and risk of stroke, worsening arthritis, more frequent accidents in the home, social isolation, impaired mental health and adverse effects on children's education and nutrition (UK National Heart Forum, 2003).

Allied to the problems associated with cold homes, damp is one of the most common problems associated with poor housing and is largely the result of poor insulation and inadequately heated homes. International Energy Action (1991) suggests a causal link between dampness and mould growth in dwellings and ill-health among household occupants. Indeed the house dust mite thrives in damp conditions and is considered a causal agent for asthma and other allergic diseases. Dampness has also been associated with vomiting, headaches, anxiety and depression (Revie, 1998) and in Northern Ireland Blackman et al (1989) found that damp homes increased levels of ill health amongst householders. Finally a number of studies have found a significant association between damp in households and increased levels of childhood asthma and other respiratory conditions (e.g. Williamson et al, 1997).

Temperature and Health Status

In Ireland in 2005 there were 1,950 extra deaths in the winter months compared with the summer months (Institute of Public Health, 2009). Excess winter mortality is relatively higher among older people and low-income groups, with the decline in UK winter mortality between 1977 and 1994 attributed to both the growth of central heating and improved health care (Wilkinson et al, 1998).

The close association between changes in temperature and excess winter deaths has been estimated by Alderson (1985) who found in the UK that 'for every degree change in the average winter temperature there is a rise or fall in the number of winter deaths by about 8,000'.

Curwen (1991) estimated that a third of 'excess winter deaths' are attributable to respiratory disease, with over half attributable to cardiovascular disease (mainly heart attacks and strokes). A key risk factor is blood pressure which increases significantly after 2 hours' exposure to temperatures below 12°C, and most notably among older people (Collins et al, 1985).

Although there is widespread agreement in the literature that temperature is the key causal factor explaining excess winter deaths (Alderson, *ibid*), there is less consensus on the influence of internal house temperatures and external temperatures. In relation to external household temperatures the concern is that people do not use adequate clothing in cold weather (Keatinge, 1986). From a policy perspective, therefore, should the focus be on internal temperatures as the main determinant of excess winter deaths (in which case there would be significant implications in relation to heating insulation or building standards), or should more emphasis be placed on prevention by changing individual behaviour?

The literature suggests that both factors are relevant. The Eurowinter (1997) study examined variations in excess winter death rates between different countries and concluded that differences may be explained by colder countries having better thermal-efficiency standards within their housing stock.

Collins' (*ibid*) study concludes that although it is widely accepted that cold, damp housing is unhealthy, the relative effects of cold, damp and mouldy living conditions are difficult to disentangle as they are correlated. Collins posits that there is a greater increase in winter mortality from respiratory disease than from circulatory, with respiratory health more related to indoor temperatures and circulatory more related to outdoor cold. However, the CSE contends that it is '... very difficult to show a definitive link between home temperatures and specific health outcomes, just as it is nearly impossible to identify the exact thermal conditions of the home after someone has died'.

Goodwin (2000), in a review of the evidence linking cold temperatures and circulatory disease, suggests a link between internal temperatures and cold external temperatures in the form of what is termed 'cold stress' which arises when the strain of a cold morning might cause too much cardiovascular strain, particularly if leaving a cold dwelling. Goodwin posits that the effect of 'cold stress' might be lessened through warmer indoor temperatures, i.e. older people would be less susceptible to 'cold stress', and less at risk of circulatory disease, if they lived in a warmer home.

Relationship between Home Temperatures and Health Impact

Energy Action Scotland (1998) and Raw et al (2001) developed a set of guidelines in relation to household temperature and health impacts.²

- 21°C is a comfortable temperature for the population, including older people
- 18°C is a 'minimum temperature for the population as a whole – little health risk although older and sedentary people may feel cold'
- Between 16°C and 12°C, '... respiratory problems become more common with some cardiovascular risk'
- Exposure to temperatures between 12°C and 9°C for more than two hours causes core body temperatures to drop, blood pressure to rise and an increased risk of cardiovascular strain
- Finally, temperatures of 5°C or less lead to a 'significant increase in the risk of hypothermia'.

Damp and Mould

The association between dampness and ill health has been well documented, with viruses which give rise to infections more common in damp houses (Hatch et al, 1979). Conversely there is research evidence to suggest that a certain level of damp may be beneficial, with upper respiratory tract illnesses increasing when relative indoor humidity is low (Henwood, 1997; Raw and Hamilton, 1995).

The research evidence from the UK suggests that the negative effects on health are associated with high rather than low levels of humidity. Hunt (1993) has documented the association between high levels of humidity and mould and dust mites. Mould growth is less common in homes that have a range of energy efficiency measures installed such as insulation, cavity walls, good ventilation, air circulation and good heating systems (Raw et al, 2001).

Mould is linked with a range of allergies, infections, toxic reactions, some cancers and psychological symptoms. Mould spores require a relative humidity of 70 per cent or more to grow. A study by Platt (1993) provided evidence that damp and mould do have an adverse impact on health, with the level of illness positively associated with increasing severity of dampness (dose response relation). Symptoms typically include nausea, breathlessness, backache, fainting and bad nerves among adults and respiratory symptoms (wheeze, sore throat, runny nose), headaches, fever, vomiting

² The levels are not absolute – people vary widely in their needs. It should not be assumed that ill health will inevitably result from failure to meet these criteria. The recommended levels are set on the basis that meeting them will normally protect against the adverse health effects of cold indoors conditions.

among children. Platt found that these effects were independent of income, smoking, unemployment, cooking and washing facilities or the presence of pets.

It is also likely that cold, damp housing has some impact on mental health status, although the CSE points to the difficulty in trying to disentangle the detrimental effect of this factor from general deprivation. A study by Khamano (quoted by the Centre for Sustainable Energy) found that poor housing does lead to depression, particularly due to worries about fuel bills and feelings of 'helplessness' about being unable to improve one's housing conditions. Henwood (1997) refers to research evidence showing the positive link between improved housing on psychological distress, whereas Raw et al (2001) points to the psychological distress suffered by the physical presence of fungal growth, the sometimes unpleasant smell and the difficulty of getting rid of mould. Raw also refers to the stigma associated with the presence of mould growth in one's home which can cause depression and stress.

Dust mites have been identified as a major contributor to asthma (Raw et al, 2001), due to their ability to trigger Type I allergic reactions. Dust mites thrive in conditions of 40 per cent or more humidity and at temperatures of between 17°C and 32°C (CSE, 2009). Although it is not clear what proportion of asthma in Ireland is partly or wholly attributable to dust mites, using Raw's conservative estimate of less than 5 per cent additional cases caused by dust mites could represent a substantial burden of disease, because asthma is one of the most common chronic conditions. Raw contends that 'even a weak causal link could thus generate many thousands of extra cases'.

Other research also points to an association between the presence of dust mites and health conditions such as perennial rhinitis and eczema (Carswell and Thompson, 1987; Howarth et al, 1997), with the Howarth study reporting that the severity of atopic eczema could be greatly reduced by effective dust mite avoidance and that the association may be causal.

In relation to energy efficiency interventions there is growing concern (Howieson, 2001) that some aspects, such as central heating and insulation measures, might be exacerbating the problems associated with dust mites, given that these measures tend to produce more humidity unless they are accompanied by sufficient ventilation measures. A Scottish study by Energy Action Scotland (1998) found some evidence that asthma rates are lower in cold and draughty homes. Conversely, a study in Cornwall (Somerville, 2000) found that asthma rates declined among asthmatic children following the installation of central heating.

Methodology

Research Approach

As noted previously this research study is based on pre- and post-intervention household surveys in Cork City and County Donegal. A total of 600 households participated in the study, with households designated as either 'intervention' (measures installed under the Warmer Homes Scheme) or 'comparison' (no measures installed) cases.

In comparison to other research (e.g. an evaluation of Warm Front in Wales [Green, 2004] was based on 2,454 households; and an evaluation of the Central Heating Programme in Scotland was based on 2,365 households [Scottish Government, 2008]) a sample size of 600 households is relatively small for this type of study. However, a number of factors influenced sample size, not least the resources available to the project particularly in relation to the budget available for fieldwork. A second consideration was the number of applicants to the Warmer Homes Scheme and the capacity among the community organisations to conduct the baseline survey, install the measures and conduct the follow-up survey within the period allocated for the study.

Sampling

Households applying to the Warmer Homes Scheme in both areas were invited to take part in the study. Intervention households were identified from the waiting lists of applicants in both areas. In Cork City comparison households were also identified from the waiting list, whereas in Donegal due to a lower level of demand for the scheme comparison households were identified from the public sector housing list held by Donegal County Council.

Although attempts were made to match the intervention and comparison households as close as possible, this proved more difficult in practice. In Cork City, for example, households identified via the application criteria as being priority were offered the interventions first which meant that households scoring lower on the criteria were more likely to fall into the comparison group. In Donegal because of the relatively smaller number of applications to the scheme prior to the baseline survey, comparison households had to be drawn from public sector stock rather than private sector stock. These difficulties in perfectly matching intervention and comparison households has to some degree compromised the initial intention of implementing the research as a 'case control' study where cases are perfectly matched on specific criteria. However, as Table 1.2 shows, the characteristics of both the intervention and comparison households, at baseline and follow-up, are remarkably similar even with the problems encountered with the matching process.

Initially it was intended to recruit 300 households from each locality (150 intervention households and 150 comparison households). However, within the timescale this proved more problematic in Donegal due to a more limited interviewer capacity within the community organisation (MFG). Given a higher level of staff resource within NCE in Cork City, it was agreed to increase the sample in Cork City to counteract the problem of a more limited interviewer capacity in Donegal. Cork also had a greater number of applicants to the scheme due to a higher population density. Table 1.1 shows that, at baseline, a total of 600 households were recruited to the study: 348 in Cork and 252 in Donegal.

The overall response rate for the pre-intervention survey was 76.8 per cent, with a 96.7 per cent response rate recorded in Cork and 59.9 per cent in Donegal. Among intervention households, the response rate was 84 per cent overall (Cork 100 per cent and Donegal 73.8 per cent), with lower response rates recorded amongst those comparison households (72.2 per cent overall; 95 per cent in Cork and 48.7 per cent in Donegal).

Baseline Survey		Completed Interviews	Refusal	Total	Response Rate
		N	n	n	%
Cork	Comparison	229	12	241	95.0
	Intervention	119	0	119	100.0
	Total	348	12	360	96.7
Donegal	Comparison	114	120	234	48.7
	Intervention	138	49	187	73.8
	Total	252	169	421	59.9
Both Areas	Comparison	343	132	475	72.2
	Intervention	257	49	306	84.0
	Total	600	181	781	76.8
Follow-Up Survey					
Cork	Comparison	160	69	229	69.9
	Intervention	62	57	119	52.1
	Total	222	126	348	63.8
Donegal	Comparison	96	18	114	84.2
	Intervention	118	20	138	85.5
	Total	214	38	252	84.9
Both Areas	Comparison	256	87	343	74.6
	Intervention	180	77	257	70.0
	Total³	436	164	600	72.7

The post-intervention response is based on 436 completed interviews: 222 in Cork and 214 in Donegal. The overall response rate for the post-intervention survey was 73.0 per cent, with a 63.5 per cent response rate recorded in Cork and 84.9 per cent in Donegal. Among intervention households, the response rate was 70.8 per cent overall (Cork 52.1 per cent and Donegal 87.7 per cent). The response rate among households in the comparison sample was 74.6 per cent (69.9 per cent in Cork and 84.2 per cent in Donegal).

3 Note that data on 3 cases were missing

Sample Profiles

Table 1.2 presents an overview of the baseline and follow-up samples by area and other key socio-demographic characteristics such as respondent age, sex, marital status, income and educational attainment level. Other key variables include housing tenure, heating system, property type and age of property. Note that the demographic information refers to actual survey respondent at the time of interview and not necessarily head of household.

		Baseline			Follow-Up		
		Cork	Donegal	All	Cork	Donegal	All
Sex	Male	44	40	42	43	33	38
	Female	56	60	58	57	67	62
Age	<65	19	39	29	12	33	22
	65-69	30	17	24	28	16	22
	70-74	28	28	23	33	18	26
	75+	23	23	25	27	33	30
Marital Status	Single	9	17	13	8	15	12
	Married	57	44	51	67	44	56
	Widowed	30	34	32	22	36	29
	Other	4	5	5	3	5	4
Education	Primary	64	66	65	73	78	75
	Secondary (at least)	36	34	35	27	22	25
Housing Tenure	Owned Outright	97	87	92	100	89	95
	Other	3	13	8	-	11	5
Economic Activity	Inactive	96	86	91	98	86	92
	Active	4	14	9	2	14	8
Main Income Source	Pension Benefits	95	68	82	95	72	84
	Employment	4	24	14	3	18	10
		2	8	5	3	10	6
Heating System	Full Central	91	86	89	95	93	94
	Partial/Basic	9	14	11	5	7	6
House Type	Detached	8	96	51	11	95	53
	Semi-Detached	56	3	30	57	4	30
	Terraced	37	1	19	32	1	17
Age of Property	Pre-1960s	47	27	37	48	23	35
	Post-1960s	53	73	63	52	77	65

Sample Attrition

With all studies involving baseline and follow-up surveys, there is a degree of sample attrition as not all households participated in both survey phases. In this current study, the data analysis has been restricted to those intervention and comparison households who participated in both the baseline and follow-up surveys. Thus from an initial sample of 600 households, the sample was reduced to 436 cases or 73 per cent of the original sample (70 per cent of intervention households and 75 per cent of comparison households). A profile of households matched at both baseline and follow-up is presented in Table 1.3.

	n
Intervention Baseline	257
Intervention Follow-up	180
Comparison Baseline	343
Comparison Follow-up	256

Table 1.4 presents a profile of the intervention and comparison samples at both baseline and follow-up. While the response rate for the baseline survey in Donegal was lower than that for Cork City, this was counterbalanced at the stage of the follow-up survey when Donegal delivered an appreciably higher response rate. The net effect is that the final response rates for the two areas are equivalent. While there are differences between the baseline and follow-up samples, both samples are broadly similar in terms of the key variables. Additionally, the pattern of differences between the baseline and follow-up samples caused by sample attrition is broadly similar for both regions. Note that, with the exception of heating system, where one would expect that some households would have converted to central heating during the period between the surveys, the characteristics of the sample are broadly similar for both the intervention households and the comparison households. Note that the demographic information refers to actual survey respondent at the time of interview and not necessarily head of household. Note also that the analysis of data relating to individuals (e.g. self-perception of health status etc) is restricted to those individuals whose age and gender characteristics matched between baseline and follow-up.

		Intervention		Comparison	
		Baseline	Follow-Up	Baseline	Follow-Up
		%	%	%	%
Sex	Male	46	41	40	36
	Female	54	59	60	64
Age	<65	34	28	24	19
	65-69	22	18	25	25
	70-74	20	26	25	25
	75+	23	28	26	32
Marital Status	Single	14	14	12	10
	Married	48	55	52	56
	Widowed	30	26	34	31
	Other	8	5	2	3
Education	Primary	71	83	61	70
	Secondary (at least)	29	17	39	30
Housing Tenure	Owned Outright	93	94	91	95
	Other	7	6	9	5
Economic Activity	Inactive	89	90	92	93
	Active	11	10	8	7
Main Income Source	Pension Benefits	78	79	84	87
	Employment	18	14	11	8
Heating System	Full Central	86	92	91	96
	Partial/Basic	14	8	9	4
House Type	Detached	65	69	41	41
	Semi-Detached	14	14	42	41
	Terraced	21	16	18	17
Age of Property	Pre-1960s	39	33	36	37
	Post-1960s	61	67	64	63

At baseline 7 per cent of households had children aged 17 or under, compared with 5 per cent at follow-up. Table 1.5 presents a breakdown of the age profile of households with children at both stages.

		Baseline		Follow-Up	
		%	n	%	n
Age	0-4	29	18	28	12
	5-9	17	11	28	12
	10-14	29	18	21	9
	15-17	25	16	23	10
	All	100	63	100	43

Involving Local Communities

In recognising the 'action research' basis of the project, the fieldwork for the study was undertaken by local community-based installers who were part of the Project Steering Group within their respective localities. Using the local installers, rather than professional market research interviewers, was seen as an opportunity to build a research skill base within each community, with this approach also supporting employment within the two participating community organisations.

Prior to fieldwork, three individuals associated with each community organisation were trained as survey interviewers. This training focused on survey rationale, sampling and face-to-face interviewing techniques. The project purchased six laptop computers to allow the survey to be conducted using Computer Assisted Personal Interviewing (CAPI), with each interviewer trained in the use of survey software (NIPO). It was anticipated that using CAPI software would reduce the level of error within the final data set as well as minimising sample management problems. The data from interviews were communicated to a central server, although a problem with the server meant that a number of interviews in the post-intervention survey in Cork City was lost.

To address the problem of data loss in Cork City, it was agreed that households be interviewed again. This extended the fieldwork period in Cork by a further 2 months. All but 25 households were successfully re-interviewed and it is anticipated that the data loss associated with these households is unlikely to have affected the overall pattern of response among both intervention and comparison households in this area.

Using interviewers identified through the local community organisations provided a number of benefits to the project, with the most important being the high level of access to households within each of the areas. Over the study period interviewers were able to build a close rapport with households which was important given the length of the survey interview which took an average of 45 minutes to complete. Using local interviewers also contributed towards building a positive profile for the project over the survey period.

Fieldwork Period

Fieldwork on the pre-intervention survey was conducted between October 2006 and September 2007. Fieldwork on the post-intervention survey commenced in January 2008 and was completed in February 2009. Fieldwork was conducted by three interviewers within each location.

Questionnaire

The questionnaire was developed around a number of modules. Section A of the questionnaire included questions relating to home heating, comfort levels and occupancy within households, with household temperature being recorded for the room most commonly occupied. This section of the questionnaire also contained questions on awareness of what temperature rooms should be heated to, with the outcomes likely to inform future awareness campaigns around the importance of heating homes to an acceptable level.

Section B of the questionnaire included questions relating to energy use and efficiency as well as questions on the types of heating systems within respondents' homes. A number of questions on fuel expenditure was also included to assess whether or not there had been any change in household expenditure on fuel. This section of the questionnaire also included questions on the prevalence of damp, mould and condensation, again with the intention of assessing if there had been any change in reported problems between baseline and follow-up. Finally, Section B also included questions on whether or not a range of energy efficiency measures (e.g. hot-water-cylinder lagging jackets etc) had been installed in respondents' homes.

Section C in the questionnaire included questions to monitor change, if any, in respondent outdoor behaviour in winter such as use of particular clothing and length of time engaged in activities such as socialising, gardening and shopping. Again, these questions were included to assess change, if any, in outdoor activity between baseline and follow-up.

Given that a key objective of the research was to assess the impact, if any, of installing a range of energy efficiency measures on the health status of householders, a range of questions (Section D) was included to monitor health status between baseline and follow-up. These questions related to both physical and mental health as well as uptake of health services such as visits to GPs, attendance at accident and emergency services and use of inpatient and outpatient services. It was anticipated that the findings from these questions would inform an economic impact assessment of the scheme. Also, a range of questions was included to track health behaviours (e.g. smoking, alcohol consumption, physical activity etc) between baseline and follow-up.

Finally, Section E of the questionnaire included questions aimed at generating data on respondent and household socio-demographic characteristics such as age, sex, income and employment status. The questionnaire was programmed as a Computer Assisted Personal Interview. (Note that a copy of the questionnaire is included as an Appendix to this report.)

Reflections on Methodology

Initially it was intended that setting the study in Cork City and Donegal would provide an urban/rural contrast in relation to outcomes. However, on reflection both counties are demonstrably different on a range of characteristics such as housing type (e.g. a greater number of detached properties in Donegal etc), with a greater proportion of younger respondents and a lower level of home ownership in Donegal. Other possible confounding factors include ambient external temperature, which is likely to be higher on average in Cork City. The survey captured internal temperature of the household but not external temperature which is likely to have had a significant impact on outcomes.

Other possible confounding factors include the impact of energy efficiency campaigns which had been run in the study period such as the 'Power of One' campaign which promotes the efficient use of energy. A secondary objective of the 'Power of One' campaign is to promote SEI grant schemes such as the 'Warmer Homes Scheme'. Within the context of this study it is possible that both intervention and comparison households may have been exposed to these schemes, thus influencing household behaviour regarding energy efficiency. This is evidenced by the significant increase in the average number of energy efficiency measures installed in comparison households between baseline and follow-up.

It is also possible that using a small number of local interviewers within each area may have accentuated the 'interviewer effect', particularly in relation to communicating knowledge of energy efficiency measures to comparison households. It is likely that the interviewers and respondents will know each other, given that they live in the same community, whereas this would be less likely to be the case if professional market research interviewers had conducted the fieldwork. Although we cannot quantify these effects, they have the potential of influencing knowledge and behaviour, particularly among comparison households who were not receiving any of the energy efficiency measures available as part of the Warmer Homes Scheme.

Fieldwork for the baseline survey was conducted between October 2006 and September 2007 (Donegal: October 2006 to August 2007; Cork City: November 2006 to September 2007). In relation to the follow-up survey, fieldwork started in January 2008 and ran until February 2009 (Donegal: March 2008 to September 2008; Cork City: January 2008 to February 2009). The time periods in both areas are reasonably consistent, with households surveyed in each month of the year. On reflection, and with additional interviewer resource, it may have been possible to condense the fieldwork period within a tighter timescale which could potentially have minimised the impact of confounding factors such as exposure to other energy efficiency campaigns during both baseline and follow-up fieldwork periods.

It is also worth reflecting on the issue of whether or not the timeframe between baseline and follow-up could have been extended given the evidence from the literature that some tools used to measure health status (e.g. the SF-36) maybe be insensitive to changes in health status in such a confined time period. This should be considered in designing future studies of this nature.

Although the study did record internal temperature using a temperature strip with colour codes to highlight the recorded temperature, on reflection the study would have benefited from using more sophisticated technology to continuously monitor both internal and external ambient air temperature (and even internal humidity levels). However, it should be acknowledged that this would have added significant extra cost to the project in relation to both the purchase of the equipment and the investment in expertise required to be able to operate the equipment. The study would also have benefited from monitoring energy usage in the homes and perhaps even producing pre- and post-intervention building energy rating certificates.

In summary, although the methodology has proved effective at generating a body of evidence on the impact of the Warmer Homes Scheme, it is likely that the positive outcomes documented within the comparison households may be explained by a range of compounding factors such as household exposure to other campaigns and interventions, and the interviewer effect. Specifically in relation to the interviewer effect it is possible that interviewers may have

communicated advice on energy efficiency measures to the comparison control group. It is also possible that the questionnaire content may have had an 'educative effect' on comparison households, thus encouraging them to install energy efficiency measures within their households. In hindsight, it would have been possible to quantify this by asking comparison households at follow-up if being exposed to the subject matter via questionnaire content had any impact on their energy efficiency behaviour. Likewise at follow-up comparison households could have been asked to explain why they had installed energy efficiency measures in the intervening period.

Furthermore, operationalising the study via the Warmer Homes Scheme made it difficult at the sampling stage to match households on exactly the same criteria which compromised the 'case control' intention at the study design stage. However, on a positive note, using community organisations to conduct the fieldwork element of the study generated a significant level of social value to the study, particularly in respect of providing employment and building skills and capacity at a local level.

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Appendix (Questionnaire)

Fuel Poverty Action Research

Household Survey

Introduction

Thank you very much for agreeing to take part in this survey. I am going to ask you a number of questions. Please answer them as honestly and as accurately as you can. This survey is TOTALLY confidential and voluntary. All of your answers will be treated with complete confidence. The purpose of this survey is to find out about home heating and health. The survey is taking place across a large number of randomly-selected households in different locations around the country.

There are five sections to this survey. The first looks at home-heating patterns. The second looks at energy use in the home and the dwelling itself. The third section looks at outdoor risk factors. The fourth asks questions about your health and that of your family. The last section asks some questions about the household itself. The survey should not take more than 45 minutes, and please remember that your answers are important, so please reply as accurately and truthfully as you can.

Interviewer: Place temperature strip on a surface away from windows, doors and heaters.

SECTION A – HOME HEATING, COMFORT LEVELS & OCCUPANCY

- A1. Does your household have the following rooms? **CIRCLE ALL THAT APPLY.** (Interviewer Note: the codes for each room run throughout this section)

Living-room	01
Dining-room/Study	02
Kitchen	03
Master bedroom	04
Bedroom 2	05
Bedroom 3	06
Bedroom 4	07
Bedroom 5	08
Bedroom 6	09
Other bedrooms	10
Bathroom(s)	11
Conservatory / Sun-room	12

- A2. **INTERVIEWER NOTE:** Take reading on the temperature strip and record below. **CIRCLE ONE ONLY** and leave temperature card with respondent

14°C	16°C	18°C	20°C	22°C	24°C	26°C
1	2	3	4	5	6	7

- A3. During **WINTER**, when are the following rooms usually occupied: **CIRCLE FOR EACH**

	Morning only	Evening only	Morning & evening	All day	Through the night	All day & all night	Never	N/A
Living room (01)								
Dining room/Study (02)								
Kitchen (03)								
Master bedroom (04)								
Bedroom 2 (05)								
Bedroom 3 (06)								
Bedroom 4 (07)								
Bedroom 5 (08)								
Bedroom 6 (09)								
Other bedrooms (10)								
Bathroom(s) (11)								
Conservatory/Sun-room (12)								

- A4. During **WINTER**, which rooms do you heat and for how many hours on average? **CIRCLE FOR EACH AND WRITE IN NUMBER OF HOURS IF APPLICABLE**

	Morning only	Evening only	Morning & evening	All day	Through the night	All day & all night	Never	N/A	No. of hours	N/A
Living room (1)	1	2	3	4	5	6	7	8		8
Dining room/Study (2)	1	2	3	4	5	6	7	8		8
Kitchen (3)	1	2	3	4	5	6	7	8		8
Master bedroom (4)	1	2	3	4	5	6	7	8		8
Bedroom 2 (5)	1	2	3	4	5	6	7	8		8
Bedroom 3 (6)	1	2	3	4	5	6	7	8		8
Bedroom 4 (7)	1	2	3	4	5	6	7	8		8
Bedroom 5 (8)	1	2	3	4	5	6	7	8		8
Bedroom 6 (9)	1	2	3	4	5	6	7	8		8
Other bedrooms (10)	1	2	3	4	5	6	7	8		8
Bathroom(s) (11)	1	2	3	4	5	6	7	8		8
Conservatory / sun-room (12)	1	2	3	4	5	6	7	8		

A5 Again during **WINTER**, please rate the level of comfort in **terms of the temperature** of each room? **CIRCLE FOR EACH**

	Hot	Too warm	Slightly too warm	Neutral (comfortable)	Slightly too cool	Too cool	Cold	N/A (don't have this type of room)
Living room (1)	3	2	1	0	-1	-2	-3	8
Dining room/Study (2)	3	2	1	0	-1	-2	-3	8
Kitchen (3)	3	2	1	0	-1	-2	-3	8
Master bedroom (4)	3	2	1	0	-1	-2	-3	8
Bedroom 2 (5)	3	2	1	0	-1	-2	-3	8
Bedroom 3 (6)	3	2	1	0	-1	-2	-3	8
Bedroom 4 (7)	3	2	1	0	-1	-2	-3	8
Bedroom 5 (8)	3	2	1	0	-1	-2	-3	8
Bedroom 6 (9)	3	2	1	0	-1	-2	-3	8
Other bedrooms (10)	3	2	1	0	-1	-2	-3	8
Bathroom(s) (11)	3	2	1	0	-1	-2	-3	8
Conservatory/Sun-room (12)	3	2	1	0	-1	-2	-3	8

A6. Again can I ask which room you or other householders would spend most time in? (**CIRCLE ONE ONLY**)

Living Room	1
Dining Room	2
Kitchen	3
Living room/kitchen combined	4
Other (specify)	5

A7. And do you know at what temperature the room you would normally spend most time is normally kept at? (**CIRCLE ONE ONLY**)

Yes	1	-> go to A8
No	2	-> go to A9

A8. If yes, ask which of the following temperatures is most accurate (note this should be checked with first question in this section, i.e. reading on the card) (**CIRCLE ONE ONLY**)

14°C / 57°F	16°C / 61°F	18°C / 64°F	20°C / 68°F	22°C / 72°F	24°C / 75°F	26°C / 79°F
	2	3	4	5	6	7

A9. During the **WINTER**, or more generally when it is cold outside, do you heat your home to a temperature that is comfortable? (**CIRCLE ONE ONLY**)

Yes, I heat the house when it's cold	1
No, I don't heat the house much at all	2

A10. During the **WINTER**, or more generally when it is cold outside, do you feel that you can **afford** to heat your home to a temperature that is comfortable? (**CIRCLE ONE ONLY**)

Yes, without any problems	1
Usually, with occasional difficulties	2
Usually not	3
No, not at all	4

A11. For how long (if at all) do you shiver from the cold when indoors on a cold winter's night? (**CIRCLE ONE ONLY**)

Not at all	1
For a few minutes (e.g. 1-10mins)	2
For a short while (e.g. 10-30 mins)	3
For a time (e.g. 30 mins-1 hour)	4
For at least an hour (1-2 hours)	5
For a few hours (>2 hours)	6

A12. And during **WINTER** would your home be occupied during the following periods?
CIRCLE FOR EACH

	Yes	No
Early morning (6.30am – 9.30am)		2
Late morning (9.30am – noon)		2
Afternoon (noon – 6pm)		2
Evening (6pm – 12pm)		2
At night (12pm – 6.30am)		2

A13. Who would spend the **MOST** time in the house? **CIRCLE ONE ONLY**

Married woman over 65 years	1
Married woman less than 65 years	2
Married man over 65 years	3
Married man less than 65 years	4
A child/children (<less than 18 yrs)	5
Single male (less than 65 yrs)	6
Single female (less than 65 yrs)	7
Single male(s) over 65 years	8
Single female(s) over 65 years	9
Other, please specify	10

A14. When not sleeping, in which room does this person spend most of their time?
(CIRCLE ONE ONLY)

Living room (1)	1
Dining room/Study (2)	2
Kitchen (3)	3
Master bedroom (4)	4
Bedroom 2 (5)	5
Bedroom 3 (6)	6
Bedroom 4 (7)	7
Bedroom 5 (8)	8
Bedroom 6 (9)	9
Other bedrooms (10)	10
Bathroom(s) (11)	11
Conservatory	12

A15. Are there rooms which are occupied for at least 10 minutes of the day but are unheated even in cold weather? **(CIRCLE ONE ONLY)**

Yes	1
No	2

A16. Are there rooms in the house which are unoccupied because they are not heated and are too cold?
(CIRCLE ONE ONLY)

Yes	1	-> go to A17
No	2	-> go to A18

A17. If so, does this result in some rooms being over-crowded? **(CIRCLE ONE ONLY)**

Yes	1
No	2

A18. Are there any children in your household aged under 18? **(CIRCLE ONE ONLY)**

Yes	1	-> go to A19
No	2	-> go to section B

A19. At what time do the children (<18), or the first child, normally come home from school?
(CIRCLE ONE ONLY)

Around noon	1
Between 1 & 3pm	2
Between 3 & 4pm	3
Between 4 & 6pm	4
After 6pm	5

A20. When do the children normally do their homework: **(CIRCLE ONE ONLY)**

Early Afternoon	1
Late afternoon	2
Evening	3
Night time	4

A21. And in which room do the children (<18) normally do their homework?
CIRCLE ONE ONLY

Living room (1)	1
Dining room/Study (2)	2
Kitchen (3)	3
Master bedroom (4)	4
Bedroom 2 (5)	5
Bedroom 3 (6)	6
Bedroom 4 (7)	7
Bedroom 5 (8)	8
Bedroom 6 (9)	9
Other bedrooms (10)	10
Bathroom(s) (11)	11
Conservatory / sun-room	12

A22. Which bedrooms do the children sleep in? **CIRCLE ALL THAT APPLY**

Room	
Master bedroom (04)	04
Bedroom 2 (05)	05
Bedroom 3 (06)	06
Bedroom 4 (07)	07
Bedroom 5 (08)	08
Bedroom 6 (09)	09
Other bedrooms (10)	10

A23. How many waking hours (apart from when in bed) do the children (<18) spend in the house normally each day? **CIRCLE ONE ONLY**

Between 1-2 hours	1
Between 3-4 hours	2
Between 5-6 hours	3
Between 7-8 hours	4
More than 8 hours	5

GO TO NEXT SECTION

SECTION B – ENERGY USE, ENERGY EFFICIENCY

B1(a) Do you have full, partial or basic central heating in your home? (*Select one only*)

	Yes	
Full Central Heating – radiator every room	1	Go to question B3
Partial Central Heating – e.g. on ground floor only/not every room	2	Go to question B3
Basic – Open fire in living rooms, electric/gas heaters in other rooms	3	Go to question B2
Don't know	8	Go to question B4A

B1(b) What type of heating do you have in your home? (*For each select one only*)

	Yes	No	
Solid fuel open fire without radiators	1	2	Go to question B4A
Electric storage heating	1	2	Go to question B4A
Other (please specify)	1	2	Go to question B4A

B2 What type of heating do you have in your home? (*For each select one only*) **CIRCLE FOR EACH**

	Yes	No	D/K	N/A
Solid fuel open fire back boiler and radiators	1	2	8	0
Glass fronted fire with radiators	1	2	8	0
Gravity fed solid fuel boiler with radiators	1	2	8	0
Range (with boiler and radiators)	1	2	8	0
Range (no boiler or radiators)	1	2	8	0
Oil fired boiler with radiators	1	2	8	0
LPG boiler with radiators	1	2	8	0
Gas Canister	1	2	8	0
Electric heating (incl. with radiators)	1	2	8	0
Other form of electric heating (include ceiling under/floor)	1	2	8	0
Mains Natural Gas	1	2	8	0
District Heating (Council-controlled)	1	2	8	0
Other (please specify)	1	2	8	0

B3 Do you have free access to fuels (e.g. your own turf supply)?

Yes	No
1	2

B4A. How much did you spend on the following home-heating fuels in the last 12 months: **WRITE IN COST AND QUANTITY**

	Cost (€):	
Central heating oil		Qty: (litres):
Anthracite		Qty: (Kgs)
Turf		Qty: (cwt)
Briquettes		Qty: (cwt)
Coal		Qty: (tonnes)
LPG		Qty: (Litres)
Gas Canister		Qty: (Kgs)
Fire Lighters		Qty: (Kgs)
Wood and Kindling		Qty: (Kgs)
Other home-heating fuel		Qty: (specify)

FOR HOUSEHOLDS WHO USE GAS OR ELECTRICITY CENTRAL (INTERVIEWER SEE B2 – OPTIONS IN BOLD) GO TO B4B, OTHERWISE GO TO B4F

B4B. Typically, how much would your highest home-heating bill be **IN WINTER** (not including HP repayments, maintenance or repairs)? **WRITE IN AMOUNT**

€				
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B4C How long a period does this cover? **INTERVIEWER NOTE: RECORD IN WEEKS.**

--	--

B4D. Typically, how much would your lowest bill be **IN SUMMER** (not including HP repayments, maintenance or repairs)? **WRITE IN AMOUNT**

€					
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B4E. How long a period does this cover? **INTERVIEWER NOTE: RECORD IN WEEKS.**

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B4F. Over the past 12 months, did you avail of any fuel subsidies (e.g. fuel allowances)? **(CIRCLE ONE ONLY)**

Yes	1	-> go to B4G
No	2	-> go to B5

B4G. How much did you receive in fuel subsidies? **WRITE IN AMOUNT**

€					
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B5. How easy do you find it to pay your utility bills on time?

Very easy	Fairly easy	Occasional difficulties	Quite hard	Very hard
1	2	3	4	5

B6(a). Is your table salt ever damp?

Yes	1
No	2

B6(b). Are there patches of damp / mould in your home? **(CIRCLE ONE ONLY)**

Yes	1	-> go to B7
No	2	-> go to B9

B7. In which room(s) are there damp / mould patches? **CIRCLE ALL THAT APPLY**

Living room (1)	01
Dining room/Study (2)	02
Kitchen (3)	03
Master bedroom (4)	04
Bedroom 2 (5)	05
Bedroom 3 (6)	06
Bedroom 4 (7)	07
Bedroom 5 (8)	08
Bedroom 6 (9)	09
Other bedrooms (10)	10
Bathroom(s) (11)	11
Conservatory / Sun-room (12)	12

B8. Are these damp / mould patches on the... **CIRCLE FOR EACH**

	Yes	No
Floors	1	2
Walls	1	2
Ceilings	1	2
In wardrobes	1	2

B9. Do you experience condensation in your home? **(CIRCLE ONE ONLY)**

Yes	1	-> go to B10
No	2	-> go to B11

B10. How often do you experience condensation in each of the rooms in your home?
CIRCLE FOR EACH

	<u>All the time</u>	<u>Occasionally</u>	<u>never</u>
Living room (1)		2	3
Dining room/Study (2)		2	3
Kitchen (3)		2	3
Master bedroom (4)		2	3
Bedroom 2 (5)		2	3
Bedroom 3 (6)		2	3
Bedroom 4 (7)		2	3
Bedroom 5 (8)		2	3
Bedroom 6 (9)		2	3
Other bedrooms (10)		2	3
Bathroom(s) (11)		2	3
Conservatory / Sun-room (12)		2	3

B11. To the best of your knowledge, does your house/apartment have any of the following energy-saving measures and can you say if these measures were installed when the house was constructed or did you install them yourself at a later date? **CIRCLE FOR EACH**

	Do you have this energy-saving measure?			When was it installed?		
	Yes	No	Don't know	When Constructed	By Us	N/A
Hot-water cylinder lagging jacket		2	3		2	8
Floor insulation		2	3		2	8
Roof/attic/loft insulation		2	3		2	8
Wall insulation		2	3		2	8
Double-glazing		2	3		2	8
Draught-proofing on doors		2	3		2	8
Draught-proofing on windows		2	3		2	8
Low energy light-bulbs		2	3		2	8
Timer/central-heating controls		2	3		2	8

B12. The benefits of installing energy-saving measures are high. Installing items like hot water cylinder lagging jackets and roof insulation reduces your need for energy in the home and so will reduce your heating bills. In addition to the potential for savings, there are also other potential benefits such as increased comfort from a warmer house, possible reduced sickness from cold- and damp-related illnesses (such as asthma, bronchitis) and the reduced likelihood of serious illness from cold- and damp-related diseases (e.g. heart attacks, strokes and pneumonia). In a recent study undertaken by UCD, these benefits were quantified and they amount to savings of over €250 per household each year.

Having heard this information, in your opinion what do you feel is the main reason(s) as to why you have not installed such energy-efficiency measures in your home.

DO NOT PROMPT – RECORD MAIN REASON BELOW (**CIRCLE ONE ONLY**)

Not aware of the existence of these measure(s)	1
Not aware of the benefits of these measure(s)	2
Can't afford it	3
I have more pressing priorities for using household finances than to buy insulation measure(s)	4
Don't want the hassle and disruption of getting builders to install these measures	5
If I had to borrow money to buy and install these measures, the cost of doing so (interest, etc.) would outweigh the benefits	6
I don't feel it's my responsibility to do so, as I rent (and therefore don't own) the accommodation	7
I don't feel I am authorised to do so, as I rent (and therefore don't own) the accommodation	8
I asked my landlord but he hasn't done it yet	9
I just don't see the need to do so	10
Other (specify)	0

B13. Do you have a smoke-alarm fitted in your home? (**CIRCLE ONE ONLY**)

Yes, battery operated	1
Yes, mains operated	2
No	3

B14. Can I ask you when was your house built? **CIRCLE ONE ONLY**

Pre-1900	1901-1910	1910s	1920s	1930s	1940s	1950s	1960s	1970s	1980s	1990s	1990-2000	Don't Know
1	2	3	4	5	6	7	8	9	10	11	12	13

B15. And how many habitable rooms are there in your household, including kitchen(s), excluding bathroom(s), toilet(s) and garage(s) **CIRCLE ONE ONLY**

1	2	3	4	5	6	7	8	9	0
1	2	3	4	5	6	7	8	>8	Don't know

B16. *Is your house:*

Detached	Semi-detached	Terraced	Apartment in a Block of under 8 units	Apartment in a block of 8 or more units	Mobile	Other
1	2	3	4	5	6	7

GO TO NEXT SECTION

SECTION C – OUTDOOR BEHAVIOUR

- C1. During the winter, when you go about your daily business during the week e.g. travelling to work, going shopping, visiting friends, do you normally: **(CIRCLE ONE ONLY)**

Walk	1
Cycle	2
Get a bus	3
Get a train	4
Drive	5
Get a lift	6
Take a community bus service	7
Take a taxi-cab	8

- C2. During the winter, how long, on average, would you spend out in the open air on a typical day doing such things as working, socialising, gardening, shopping, etc.? **(CIRCLE ONE ONLY)**

Virtually no time at all	1
Less than 10 minutes	2
Between 11-20 minutes	3
Between 21-30 minutes	4
Between 31-40 minutes	5
Between 41-50 minutes	6
Between 51-60 minutes	7
More than 1 hour	8
About 2 hours	9
half a day	10
the whole working day (9-5pm)	11

- C3. When you do go out in the open air in the winter, which of the following statements most reflects your experience? **(CIRCLE ONE ONLY)**

<input type="checkbox"/> I feel I wrap up well and rarely shiver	1
<input type="checkbox"/> I feel cold and often shiver	2

- C4. For how long (if at all) do you shiver from the cold when outdoors on a cold winter's day? **(CIRCLE ONE ONLY)**

Not at all	1
For a few minutes (e.g. 1-10mins)	2
For a short while (e.g. 10-30 mins)	3
For a time (e.g. 30 mins-1 hour)	4
For at least an hour (1-2 hours)	5
For a few hours (>2 hours)	6

- C5. Do you wear the following items of clothing on a cold day?

Item of clothing:	Yes	No
Hat	1	2
Scarf	1	2
Warm overcoat	1	2
Gloves	1	2
Strong, waterproof shoes	1	2

- C6. Do you need to go outside your home to get fuel, feed pets or shop on a daily basis?

Yes	1
No	2

GO TO NEXT SECTION

SECTION D – HEALTH STATUS

THE FOLLOWING QUESTIONS ASK FOR ***YOUR VIEWS*** ABOUT YOUR HEALTH, HOW YOU FEEL AND HOW WELL YOU ARE ABLE TO DO YOUR USUAL ACTIVITIES.

IF YOU ARE UNSURE ABOUT HOW TO ANSWER ANY QUESTION, PLEASE GIVE THE BEST ANSWER YOU CAN.

D1. In general, would you say your health is... **CIRCLE ONE ONLY**

Excellent	Very Good	Good	Fair	Poor
1	2	3	4	5

D2. **COMPARED TO ONE YEAR AGO**, how would you rate your health in general now?
CIRCLE ONE ONLY

Much better now than one year ago	Somewhat better now than one year ago	About the same	Somewhat worse now than one year ago	Much worse now than one year ago
1	2	3	4	5

D3. The following questions are about activities you might do during a typical day. DOES YOUR HEALTH LIMIT YOU IN THESE ACTIVITIES? If so, how much? – CIRCLE FOR EACH

	Yes, limited a lot	Yes, limited a little	No, not limited at all
Vigorous activities , such as running, lifting heavy objects, participating in strenuous sports?	1	2	3
Moderate activities , such as moving a table, pushing a vacuum cleaner, bowling or playing golf?	1	2	3
Lifting or carrying groceries?	1	2	3
Climbing several flights of stairs?	1	2	3
Climbing one flight of stairs?	1	2	3
Bending, kneeling or stooping?	1	2	3
Walking more than a mile ?	1	2	3
Walking half a mile ?	1	2	3
Walking 100 yards ?	1	2	3
In bathing and dressing yourself?	1	2	3

D4. During the **PAST 4 WEEKS**, have you had any of the following problems with your work or other regular daily activities as a result of your **PHYSICAL HEALTH**? **CIRCLE FOR EACH**

	Yes	No
Cut down on the amount of time you spent on work or other regular (everyday) activities as a result of your physical health?	1	2
Accomplished less than you would like as a result of your physical health?	1	2
Had difficulty performing the work or other everyday activities that you did (e.g. it took extra effort) as a result of your physical health?	1	2

D5. During the **PAST 4 WEEKS**, have you had any of the following problems with your work or other regular daily activities as a result of **EMOTIONAL PROBLEMS** (such as feeling depressed or anxious)? **CIRCLE FOR EACH**

	Yes	No
Have you cut down on the amount of time you spent on work or other activities as a result of emotional problems?	1	2
During the PAST 4 WEEKS , have you accomplished less than you would like as a result of emotional problems?	1	2
During the PAST 4 WEEKS , did you not do work or other everyday activities as carefully as usual as a result of emotional problems?	1	2

- D6. During the **PAST 4 WEEKS**, to what extent have your physical health or emotional problems interfered with your normal social activities with family, friends, neighbours or groups? **CIRCLE ONE ONLY**

Not At All	1
Slightly	2
Moderately	3
Quite A Bit	4
A Lot/Extremely	5

- D7. How much **BODILY PAIN** have you had during the **PAST 4 WEEKS**? **CIRCLE ONE ONLY**

None	1
Mild	2
Moderate	3
Severe	4
Very Severe	5

- D8. During the **PAST 4 WEEKS**, how much did **PAIN** interfere with your normal work (including both work outside the home and housework)? **CIRCLE ONE ONLY**

Not At All	1
Slightly	2
Moderately	3
Quite A Bit	4
A Lot/Extremely	5

YOUR FEELINGS

- D9. These questions are about how you feel and how things have been with you during the **PAST MONTH**. For each question please indicate the one answer that comes closest to the way you have been feeling? **CIRCLE FOR EACH**

How much during the PAST MONTH...	All of the time	Most of the time	Some of the time	A little of the time	None of the time
Did you feel full of life?	1	2	3	4	5
Have you been a very nervous person?	1	2	3	4	5
Are you so down-in-the-dumps that nothing could cheer you up?	1	2	3	4	5
Have you felt calm and peaceful?	1	2	3	4	5
Have you felt downhearted and low?	1	2	3	4	5
Have you been a happy person?	1	2	3	4	5
Did you feel tired?	1	2	3	4	5
Has your health limited your social activities (like visiting friends or close relatives)?	1	2	3	4	5

HEALTH IN GENERAL

- D10

Can I ask you:	Yes	No
Are you basically satisfied with your life?	1	2
Do you feel your life is empty?	1	2
Are you afraid something bad is going to happen to you?	1	2
Do you feel happy most of the time?	1	2

D11. Please choose the answer that best describes how TRUE or FALSE each of the following statements is for you. CIRCLE FOR EACH

	Definitely True	Not Sure	False
I seem to get ill more easily than other people	1	2	3
I am as healthy as anybody I know	1	2	3
I expect my health to get worse	1	2	3
My health is excellent	1	2	3

D12.(a) How often have **you** visited your doctor for any reason in the **PAST YEAR**? CIRCLE ONE ONLY

> 6 times	4 – 5 times	2 – 3 times	Once only	never
1	2	3	4	5

If the respondent has stated they have children, continue to part (b)

(b) How often have **your children** visited your doctor for any reason in the **PAST YEAR**? CIRCLE ONE ONLY

> 6 times	4 – 5 times	2 – 3 times	Once only	never
1	2	3	4	5

D13. (a) In the **LAST 3 MONTHS**, have you attended the Outpatients' Department of a hospital as a patient? (*Do not include routine ante- or post-natal check-ups*). CIRCLE ONE ONLY

Yes	1
No	2

If the respondent has stated they have children, continue to part (b)

(b) In the **LAST 3 MONTHS**, have your children attended the Outpatients' Department of a hospital as a patient? (*Do not include routine ante- or post-natal check-ups*). CIRCLE ONE ONLY

Yes	1
No	2

D14.(a) In the **LAST 3 MONTHS**, have you attended the Casualty (Accident & Emergency) department of a hospital as a patient? CIRCLE ONE ONLY

Yes	1
No	2

If the respondent has stated they have children, continue to part (b)

(b) In the **LAST 3 MONTHS**, have your children attended the Casualty (Accident & Emergency) department of a hospital as a patient? CIRCLE ONE ONLY

Yes	1
No	2

D15.(a) In the **LAST YEAR**, have you been admitted to hospital as a day-case, overnight or longer? CIRCLE ONE ONLY

Yes	1
No	2

If the respondent has stated they have children, continue to part (b)

(b) In the **LAST YEAR**, have your children been admitted to hospital as a day-case, overnight or longer? **CIRCLE ONE ONLY**

Yes	1
No	2

If the respondent has stated they have children, continue to D16, otherwise go to D17(a)

D16. If the answer to the above was 'Yes', please indicate the number of nights you and/or your children spent in hospital.

You	
1 Child	
2 children	
3 children	
4 children	
5 children	

D17.(a) In the **LAST 3 MONTHS**, have you asked the advice of a pharmacist/chemist? **CIRCLE ONE ONLY**

Yes	1
No	2

If the respondent has stated they have children, continue to part (b)

(b) In the **LAST 3 MONTHS**, have you asked the advice of a pharmacist/chemist on your children's behalf? **CIRCLE ONE ONLY**

Yes	1
No	2

D18.(a) Do you suffer from any long-standing disorders/diseases/illnesses? **CIRCLE FOR EACH**

Yes	1	-> go to D18(b)
No	2	-> go to D20

If the respondent has stated they have children, continue to part (b)

(b) Do your children suffer from any long-standing disorders/diseases/illnesses? By long-standing I mean anything that has troubled you over a period of time or is likely to trouble you over a period of time? **CIRCLE FOR EACH**

Yes	1	-> go to D19
No	2	-> go to D20

D19.(a) What long-standing disorders, diseases or illnesses do you suffer from and if so, what medication (if any) do you take for that illness (include strength)? **DO NOT PROMPT RESPONDENT – CIRCLE ALL MENTIONED – PROBE IF NECESSARY(E.G. “ANYTHING ELSE?” ETC). WRITE STRENGTH IN MILIGRAMS (MG).**

	Yes	No	Medication / strength
Heart attack	1	2	
Stroke	1	2	
Pneumonia	1	2	
Asthma	1	2	
Emphysema	1	2	
High blood pressure/hypertension	1	2	
Other heart/circulation problems	1	2	
Other respiratory problems	1	2	
Problems with joints/arthritis	1	2	
Depression	1	2	
Headache	1	2	
Disability (physical or mental)	1	2	

D19 (b) What long-standing disorders, diseases or illnesses do your CHILDREN suffer from and if so, what medication (if any) do THEY take for that illness (include strength)? **DO NOT PROMPT RESPONDENT – CIRCLE ALL MENTIONED – PROBE IF NECESSARY(E.G. “ANYTHING ELSE?” ETC). WRITE STRENGTH IN MILIGRAMS (MG).**

	Yes	No	Medication / strength
Heart attack	1	2	
Stroke	1	2	
Pneumonia	1	2	
Asthma	1	2	
Emphysema	1	2	
High blood pressure/hypertension	1	2	
Other heart/circulation problems	1	2	
Other respiratory problems	1	2	
Problems with joints/arthritis	1	2	
Depression	1	2	
Headache	1	2	
Disability (physical or mental)	1	2	

D20. How many other persons in your household have a long-standing illness, disability or infirmity?

D21. Please could you tell me the age and gender of each of the persons with a long-standing illness, disability or infirmity?

	Age	Gender	
		Male	Female
Person 1		1	2
Person 2		1	2
Person 3		1	2

D22. For each person, can you please tell me the nature of their disability/infirmity? **CIRCLE FOR EACH**

	Physical	Learning	Sensory (vision/hearing)	Age-related	Other please state
Person 1	1	2	3	4	5
Person 2	1	2	3	4	5
Person 3	1	2	3	4	5

D23. And for each person (above), please tell me how many days a week they spend in this house/apartment? **WRITE IN NUMBER OF DAYS**

	Days
Person 1	
Person 2	
Person 3	

D24. How often do you worry about **EACH** of the following... **CIRCLE FOR EACH**

	Never	A little	Sometimes	All the time	Not applicable
Your physical health	1	2	3	4	
Your mental/emotional health	1	2	3	4	
Your children's health	1	2	3	4	8
Your personal safety	1	2	3	4	
Money	1	2	3	4	
Work/Job security	1	2	3	4	8
Housing	1	2	3	4	

D25. Does a home help or public nurse call regularly to your home?

No	1
Yes, occasionally	2
Yes, regularly	3

D26 Do you currently smoke? **CIRCLE ONE ONLY**

No	1	-> go to D28
Yes, occasionally	2	-> go to D27
Yes, regularly	3	-> go to D27

D27. Did you ever smoke cigarettes in the past? **CIRCLE ONE ONLY**

No, never	1
Current smoker	2
Occasionally (usually less than one cigarette a day)	3
Yes, regularly	4

I now want to ask you about your activity in your leisure time, around the house and at work.

D28. Considering a 7-day period (a week), how many times on average do you do the following kinds of exercise for more than 20 minutes during your free time? **WRITE IN NUMBER**

	Times per week
STRENUOUS EXERCISE (HEART BEATS RAPIDLY) (e.g. running, jogging, hockey, football, soccer, squash, basketball, judo, roller skating, vigorous swimming, vigorous long-distance cycling)	
MODERATE EXERCISE (NOT EXHAUSTING) e.g. fast walking, tennis, badminton, easy swimming, easy cycling, volleyball, baseball, popular and folk dancing, heavy gardening)	
MILD EXERCISE (MINIMAL EFFORT) e.g. yoga, golf, easy walking, fishing from river bank, bowling, light gardening)	

D29. Do you do light household work? (e.g. dusting, washing dishes, repairing clothes) **CIRCLE ONE**

Seldom / never	1-3 times per month	Once per week	3-4 times per week	Most days
1	2	3	4	5

D30. Do you do heavy household work (e.g. washing floors and windows, carrying rubbish bags, vacuuming / hovering, light farming or gardening)? **CIRCLE ONE ONLY**

Seldom / never	1-3 times per month	Once per week	3-4 times per week	Most days
1	2	3	4	5

D31. If you go out shopping, what kind of transport do you normally use? **CIRCLE ONE ONLY**

Car (own)	walk	bicycle	Public transport	I never go out shopping	Friend/ neighbour's car	Taxi/cab	Community bus service
1	2	3	4	5	6	7	8

D32. Thinking about your life in general would you say that you are..... **CIRCLE ONE ONLY**

Very physically active	Fairly physically active	Not very physically active	Not at all physically active
1	2	3	4

D33. How long ago did you last have an alcoholic drink? **CIRCLE ONE ONLY**

During the last week	1
One week to one month ago	2
Over 3 months ago	3
Never had alcohol beyond sips or tastes	4

D34. Thinking about your drinking in the last year, did you usually drink alcohol in a typical week? **CIRCLE ONE ONLY**

Yes	1
No	2

D35. On how many days during a typical week did you usually drink alcohol, on average?

Number of days ____

D36. On the days that you drank alcohol, how many drinks did you have on average?

(A drink (unit) is: a half pint / glass of beer, lager, stout or cider
a single measure of spirits (whiskey, rum, vodka or gin)
a single glass of wine, sherry or port

Number of drinks _____

D37. How often do you eat any of the following? **CIRCLE FOR EACH**

	More than once a day	Once a day	A few times a week	rarely	never
Fruit	1	2	3	4	5
Vegetables	1	2	3	4	5
Sugary Food	1	2	3	4	5
Fried Food	1	2	3	4	5
Whole wheat or Rye Bread	1	2	3	4	5
Meat, chicken or fish	1	2	3	4	5

D38. What is your weight without shoes?

.....stonespounds	(or kilos.....)
-------------	-------------	-----------------

D39. What is your height without shoes?

.....feetinches	(or cms.....)
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D40. Do you have a long-standing illness, disability or infirmity? By long-standing I mean anything that has troubled you over a period of time or is likely to trouble you over a period of time? (**CIRCLE ONE ONLY**)

Yes	1	-> go to D41
No	2	-> go to D42

D41. Please tell me the nature of your disability (may be more than one) (**CIRCLE ALL THAT APPLY**)

Physical		
Learning		
Sensory (vision/hearing)		
Age-related		
Other (please state)		

D42. Please tell me do you: (**CIRCLE ONE ONLY**)

Walk unaided	1
Walk with a stick/crutches/frame	2
Walk with help but without an aid	3
Use a wheelchair sometimes	4
Use a wheelchair all the time	5

D43. Which areas of your life have been most affected by the long-standing illness/disability?
SHOW ANONYMISED CARD and ask respondent their answer for each code number – CIRCLE ALL THAT APPLY

Code	Very much	A lot	Somewhat	Not much	Not at all
1	1	2	3	4	5
2	1	2	3	4	5
3	1	2	3	4	5
4	1	2	3	4	5
5	1	2	3	4	5
6	1	2	3	4	5
7	1	2	3	4	5
8	1	2	3	4	5
9	1	2	3	4	5
10	1	2	3	4	5
11	1	2	3	4	5
12	1	2	3	4	5

D44. And what has been the effect of this long-standing illness, disability or infirmity on your personal health? **CIRCLE ALL THAT APPLY**

Physical	Pain	1
	Treatment side-effects	2
	Tiredness, lack of energy, lethargy	3
	Change in appetite	4
	Nausea/vomiting	5
	Other physical effects/symptoms	6
	Ability to get our and about/mobility	7
	Ability to do housework/clean/carry things/shopping/gardening	8
	Other restrictions on activities	9
	Dietary restrictions	10
	Trouble communicating	11
Mental	Depression/worry/anxiety/unhappiness	12
	Other emotional or mental health problems	13

Other (specify)		14
------------------------	--	----

D45. Thinking about your long-standing illness, disability or infirmity, do you feel that you are better off, worse off or about the same as you were a year ago? **(CIRCLE ONE ONLY)**

Better off	About the same	Worse off	Don't know
1	2	3	4

D46. Are there any other persons living in your household who have a long-standing illness, disability or infirmity? By long-standing I mean anything that has troubled them over a period of time or is likely to trouble them over a period of time? **(CIRCLE ONE ONLY)**

Yes, and respondent has a disability	1	-> go to D47
Yes, and respondent does not have a disability	2	-> go to D47
No, but respondent has a disability	3	-> go to E1
No, and respondent does not have a disability	4	-> go to E1

D47. Thinking about the different times of the day, on average which room(s) would you / the person(s) with a disability normally occupy at the following times? **CIRCLE FOR EACH TIME OF DAY**

	Early morning (6:30-9am)	Late morning (9.30-noon)	Afternoon (noon-6pm)	Evening (6pm-12pm)	At night (12pm-6.30am)
Living room (1)	1	1	1	1	1
Dining room/Study (2)	2	2	2	2	2
Kitchen (3)	3	3	3	3	3
Master bedroom (4)	4	4	4	4	4
Bedroom 2 (5)	5	5	5	5	5
Bedroom 3 (6)	6	6	6	6	6
Bedroom 4 (7)	7	7	7	7	7
Bedroom 5 (8)	8	8	8	8	8
Bedroom 6 (9)	9	9	9	9	9
Other bedrooms (10)	10	10	10	10	10
Bathroom(s) (11)	11	11	11	11	11
Not in the house	12	12	12	12	12

D48. Who in your household provides most of the care to you/ the person / people with the disability?

	Respondent	Person 1	Person 2	Person 3
Spouse	1	1	1	1
Mother	2	2	2	2
Father	3	3	3	3
Son	4	4	4	4
Daughter	5	5	5	5
Other family member	6	6	6	6
Friend	7	7	7	7
Other (specify)	8	8	8	8
Do not have care	9	9	9	9
Not applicable	88	88	88	88

GO TO NEXT (FINAL) SECTION

SECTION E – SOCIO-DEMOGRAPHICS

Finally, can I ask you some details about yourself?

E1 (a) What age are you?

--	--

E1(b) What age are the other persons in your household?

	Relation to you	Age
Person 1		
Person 2		
Person 3		
Person 4		
Person 5		
Person 6		
Person 7		
Person 8		
Person 9		
Person 10		

E2. Sex of respondent:

Male	1
Female	2

E3. What is your Marital Status?

Single (never married)	1
Married	2
Co-habiting	3
Separated	4
Divorced	5
Widowed	6

E4. What is your highest educational qualification (one only)

Primary education	1
Lower secondary (junior/group/Inter)	2
Upper Secondary	
- Technical or Vocational	3
- Leaving Cert	4
- Both technical/vocational and leaving Cert.	5
Third Level	
- Non-degree qualification	6
- Primary degree	7
- Professional qualification (of at least primary degree status)	8
- Primary degree and professional qualification	9
- Postgrad. degree (excluding postgrad. diplomas)	10
No formal qualification	11

E5. At what age did your full-time formal education cease?

--	--

E6 Which Local Authority area do you live in?

Cork City	1
Cork County	2
Donegal	3

E7 Number of Dependent Children (if any)?

--	--

(N/A = 88)

E8 What is the age of your youngest dependent child?

--	--

(N/A = 88)

E9 Is the home you live in:

Owned outright	1
Owned with a mortgage	2
Rented from private landlord	3
Rented from the Local Authority	4
Rented from a Housing Association	5
Part owned, part rented (shared ownership)	6
Provided rent-free	7
Other (specify)	8
Don't know	9

E10 What is your Employment Status

Self-employed	1
Working full-time	2
Working part-time	3
Seeking work for first time	4
Unemployed (having lost or given up job)	5
Home (domestic) Duties	6
Unable to work due to permanent illness / disability	7
Not working (seeking work)	8
Not working (Not seeking work)	9
On a Government Training /education Scheme	10
On Government Employment scheme(CE, Jobs-option etc.)	11
Retired	12
Student (Further Education)	13
Volunteering work	14
Other (please specify)	15

E11 Have you ever had a paid job?

Yes	1
No	2

E12A. If at work (either self employed or employee) what is your main occupation OR

If unemployed, retired, engaged in home duties or on government training scheme and previously employed, what is the main occupation you previously held (obtain as full a description as possible).

--

E12B. What is the occupation of the Head of your household/

--

E13. **INTERVIEWER NOTE: CODE SOCIAL CLASS OF HOUSEHOLD**

A	B	C1	C2	D	E
1	2	3	4	5	6

- A = Professional workers
- B = Managerial and technical
- C1 = Non-manual
- C2 = Skilled manual
- D = Semi-skilled
- E = Unskilled

E14 What is your household's total gross income before tax and social insurance (PRSI) contributions?
Include all income from employment and benefits.

Under €7,000 per annum (less than €135 per week)	1
€7,000 - €9,999 per annum (€135 - €192 per week)	2
€10,000 - €14,999 per annum (€193 - €288 per week)	3
€15,000 - €19,999 per annum (€289 - €384 per week)	4
€20,000 - €24,999 per annum (€385 - €481 per week)	5
€25,000 - €29,999 per annum (€482 - €577 per week)	6
>€30,000 per annum (>€578 per week)	7

E15 Do you have a full GMS medical card?

Yes	1
No	2

E16 Do you have a GP-only medical card?

Yes	1
No	2

E16. What is your *main* source of household income?

Wages from employment	1
Earnings from self-employment	2
Pension	3
Unemployment/Social Assistance Benefits	4
One Parent Family Payment	5
Carers' Allowance	6
Disability Allowance	7
Other	8

Record length of time the survey has taken in minutes: _____

**THANK RESPONDENT FOR PARTICIPATING IN THE SURVEY AND CLOSE INTERVIEW –
LEAVE TEMPERATURE CARD WITH THEM**

ASK THEM IF THEY WOULD BE WILLING TO BE SURVEYED AGAIN IN A YEAR'S TIME

