

## **Psychosocial routes from housing investment to health: Evidence from England's home energy efficiency scheme**

### **Capturing the Multiple Benefits of Energy Efficiency**

Roundtable on Health & Well-being Impacts

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## Introduction

- Analysis undertaken as part of health impact evaluation of Warm Front
- Detailed study of processes by which occupant health might be improved through fuel poverty interventions
- Demonstrates the importance of psychosocial pathways to health – two pathways
- Energy efficiency most likely to improve health by reducing stress associated with struggle to afford adequate heating

## **Background: Fuel poverty and health**

- Recognition of links between energy efficiency , fuel poverty and health
  - Marmot Review, 2011
  - Hills Review of Fuel Poverty 2011/2012,
  - UK Fuel Poverty Strategy 2001
- Often studies demonstrate modest health impacts of tackling fuel poverty, more commonly impacts on mental health (Liddell and Morris, 2010)
- **Evidence on how fuel poverty interventions actually improve health unclear**

# | The Warm Front Scheme

Before *Warm Front* : spatial shrink



After *Warm Front* package



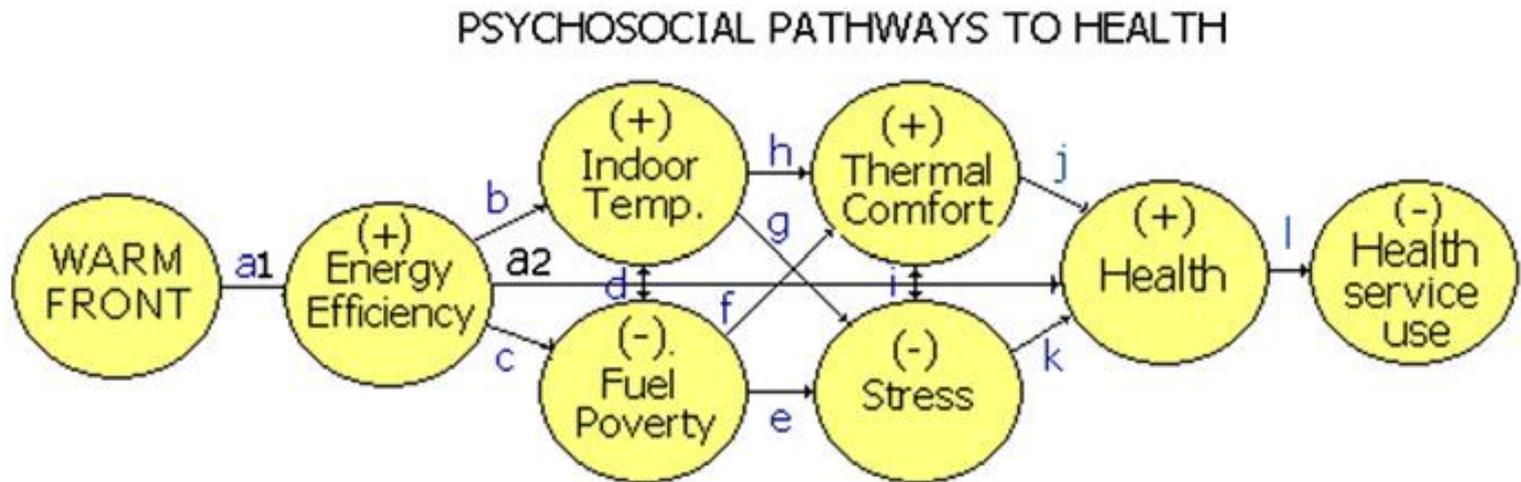
## Warm Front Health Impact Evaluation

- Commissioned by UK Government - scale of study to add to scientific evidence
- Property and household data for 2685 households in five urban areas of England: two waves winters 2001/02 and 2002/03
- Dwellings were scheduled for, or in receipt of, new heating systems or significant heating repairs under the Warm Front Scheme.
- Variety of research instruments

## Health Measurement

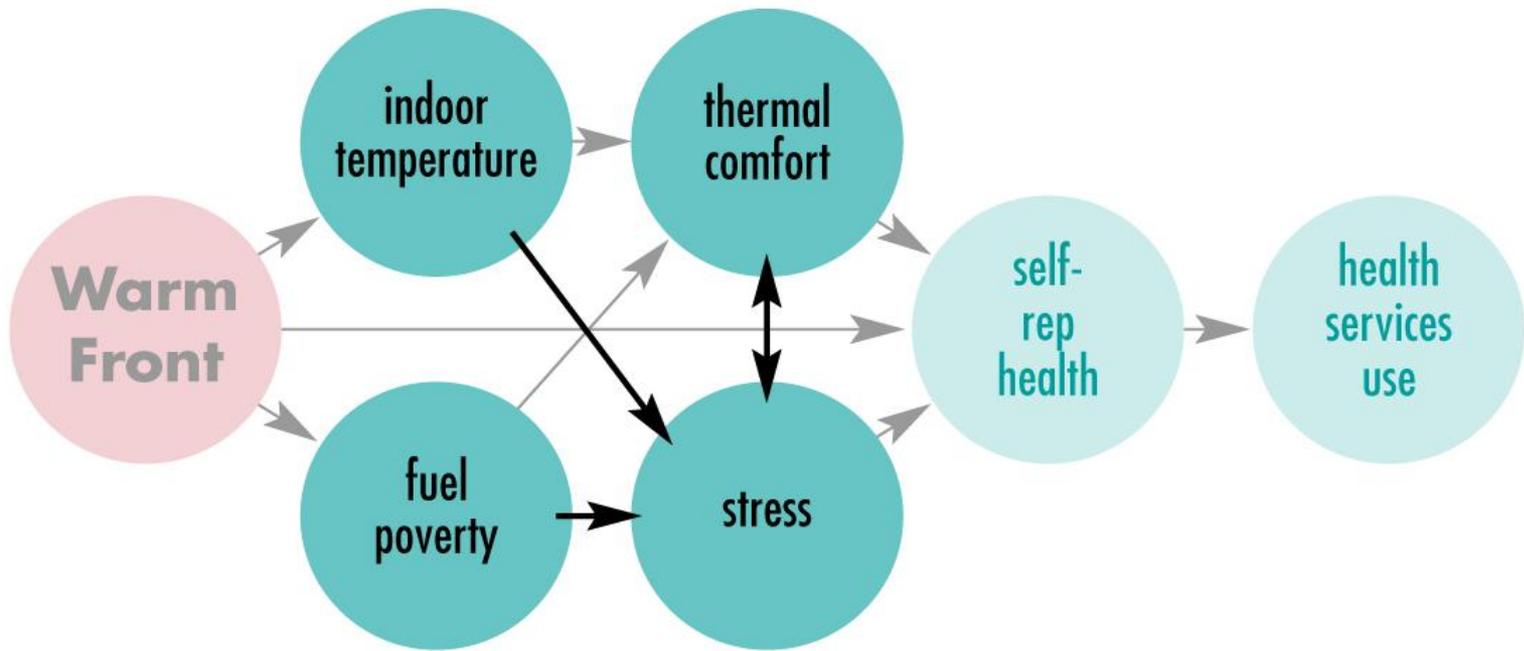
- General Health Questionnaire (GHQ-12)
- Five item European Quality of Life Questionnaire (EuroQuol 5D, EQ-5D)
- 36 item Short Form Questionnaire (SF-36)
- **Pathways to health explored in detail**

## Hypothesis: Two distinct routes to health?



## Direct health impact limited

Figure 18: **Pathways to stress**

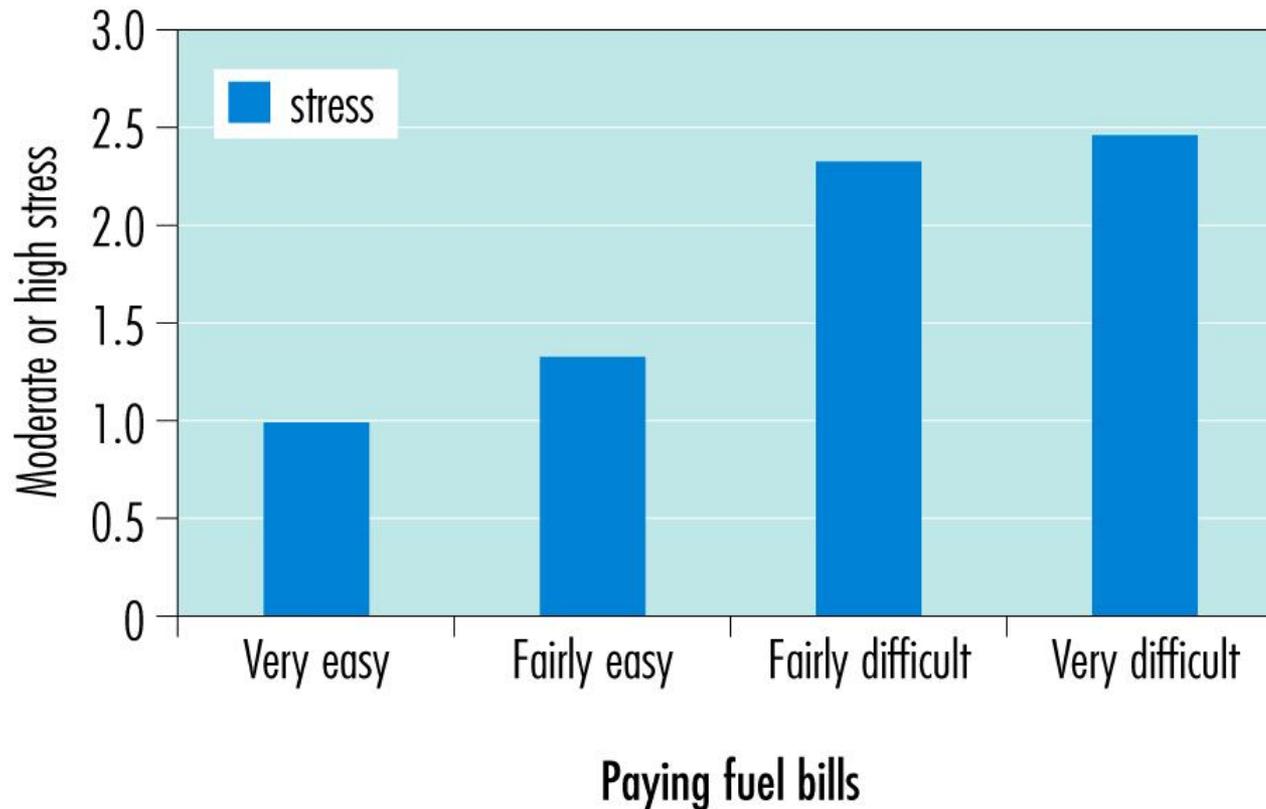


## **Warm Front intervention and intermediary variables FP, temperature, comfort, stress**

- *Complex interplay between these intermediary variables*
- **Significant association with respondents' living conditions and moderate to high stress levels**
- Reporting **difficulty paying fuel bills, co-varied with stress levels, with those in greatest difficulty reporting the highest levels.**
- **Greater comfort, significantly associated with lower stress levels, (pathway (a<sup>1</sup>)>(b)>(h)>(i)).** Respondents whose living room and/or bedroom was much too cool reported higher stress levels; those very dissatisfied with heating reported higher stress levels

## | Fuel Poverty > More Stress

Figure 20: **Fuel poverty and stress**

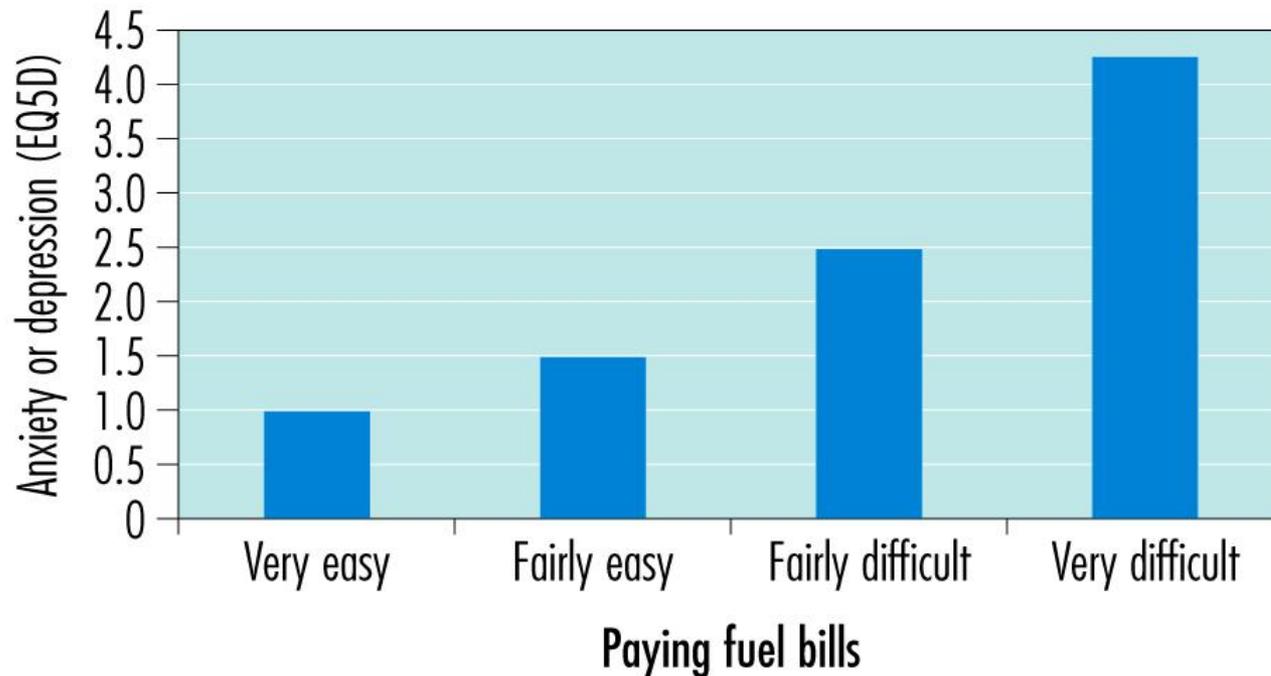


## Intermediary variables and self reported health

- Those living in cold or draughty homes score on average significantly higher on the GHQ-12 index, as do those reporting problems with condensation.
- **Those reporting the most difficulty paying fuel bills are on average four times more likely to have poorer mental health than those who find it easy, a consistent pattern revealed by the three mental health indices, GHQ-12, EuroQuol 5D and SF-36. Fuel poverty increases depression!**
- Payment difficulties strongly associated with the three indicators of general health

## Fuel poverty > Depression

Figure 22: **Fuel poverty increases depression**



## **Intermediary variables and self reported health: Stress and Comfort**

- Of all the four hypothesised intermediate determinants (i.e., indoor temperature, thermal comfort, fuel poverty and stress), **stress has much the strongest association with poor health, with a clear gradient running up from no to high stress, through low and moderate levels**
- Comfort displays a similar pattern. Again the strongest links are with mental health.

## Routes to Self Reported Health

- **Financial security/lower stress route to health (c)>(e)>(k) is much more significant** than the living conditions/thermal comfort route (b)>(h)>(j).
- **Poor health outcomes increase with the intensity of fuel poverty and stress.**
- Those with low stress are 36 per cent more likely to report a low SF-36 General Health score with moderate stress levels over three times more likely and with high levels over four times more likely
- **There tends to be stronger association between fuel poverty/stress and SF-36 dimensions which include an element of mental health.**

## The impact of energy efficiency improvements on City Populations: Triangulating the evidence

- 43,000 households in the City of Leeds in Fuel Poverty (source; Leeds stock condition survey. LSCS. 2007)
- Proposed combination of energy efficiency improvements will reduce households in fuel poverty to 39,200. (LSCS + Warm Front Study).
- Estimated prevalence of common mental disorder between 2199 - 3959 individuals (Housing, Health and Safety Rating System, 2004/Health, Mental Health and Housing, NatCen,2010)
- Estimated reduction in common mental disorder, 1760 annually, 26,400 over 15 year life of investment.

## The impact of improvements on city populations: Triangulating the evidence

Figure 3.10: Leeds private sector stock: reduced likelihood of harm from fuel poverty

	<i>Likelihood of an occurrence of harm in 43,600 households</i>	<i>No. of dwellings where a person suffers harm</i>	<i>Spread of health outcomes</i>			
			<i>Class I</i>	<i>Class II</i>	<i>Class III</i>	<i>Class IV</i>
		<i>Between</i>	<i>0.0%</i>	<i>0.1%</i>	<i>9.1%</i>	<i>90.8%</i>
Fuel poverty before improvement	1 in 10–18 of 43,600 households	2422–4360	0	24–43	220–397	2199–3959
Fuel poverty after improvement	1 in 10–18 of 39,200 households	2177–3920	0	21–39	200–357	1977–3559
Reduction 1 year		0–2183	0	0–22	0–23	0–210
15 years		0–32,745		0–330	0–2955	0–26,400

## Investment Costs and Social Benefits of reducing households in fuel poverty

- *Applying QALYs for individual health gains*
- *Monetising QALYs*
- *Estimate of cost of working days lost via report of Home Office (2005)*
- *Utilising HHSRS and NHS reference costs.*

Figure 6.3: Warmth Programme: Social costs and benefits

Costs £ million	Discounted present value of lifetime benefits (15 years) £ million
<i>Energy efficiency measures</i>	<i>Reduced cold</i>
<i>Improved heating systems plus insulation</i>	Health gains £31.8
	Reduction in working days lost £16.9
	Reduction in NHS costs £10.2
	<b>Total £58.9</b>
	<i>Reduced damp and mould</i>
	Health gains £7.9
	Reduction in working days lost £0.06
	Reduction in NHS costs £1.5
	<b>Total £9.5</b>
	<i>Reduced fuel poverty</i>
	Health gains £25.7
	Reduction in working days lost £0.2
	Reduction in NHS costs £0.9
	<b>Total £26.8</b>
<b>Total £74.0</b>	<b>Total £95.2</b>

## Key Messages

- Analysis shows possible pathways via which FP interventions may help alleviate mental health problems particularly, and promote well being. ***Stress emerges as the key variable*** strongly associated with poor mental health but also with physical dimensions of health.
- **Alleviation of fuel poverty and the reduction of stress associated with greater financial security most likely route to health.**
- Monetised benefits to health and wider society of investing in energy efficiency measures are greater than the costs.
- UK Government's Warm Front Scheme is more successful than implied by a limited analysis relating indoor temperature and property characteristics to physiological health outcomes.