# The Nature of Fuel Poverty in New Zealand

Rob Lawson* *University of Otago* rob.lawson@otago.ac.nz

John Williams *University of Otago* john.williams@otago.ac.nz

**Keywords**: energy consumption, fuel poverty, basic needs and consumer rights

## Abstract

Access to basic needs is defined as a consumer right in all international consumer charters but over the last twenty years there has been increasing concern expressed about the ability of many households, even in developed economies, to afford adequate fuel with which to maintain their dwellings at a healthy temperature and humidity. The major aims of this paper are to (a) consider the most appropriate measure of fuel poverty; (b) report on the level of fuel poverty in New Zealand; and (c) describe the nature of households who report having experienced fuel poverty.

Using a national sample of New Zealand households, we find that a widely used definition of fuel poverty, spending more than 10% of household income on fuel, has only a weak relationship with fuel poverty measured as responses to the question "Have you ever gone without heating/power because you felt unable to afford it?". We argue that the latter measure is more meaningful from both an analytical and policy-making perspective. However by either measure, we found that over 20% of respondents had experienced fuel poverty. While income is a significant factor in explaining this deprivation, there is an interesting relationship between **the two variables**. Although fuel poverty declines with income a number of higher income families are forced to go without fuel on some occasions. Of the top fifth of households in terms of per-capita income, 12% have experienced fuel poverty. The nature of households who experience fuel poverty is also described in detail.

* Corresponding author.

## Introduction

Access to basic needs was recognised as one of eight consumer rights within the United Nations framework in the 1970s (Larsen and Lawson 2012). Furthermore, Article 25 of the general framework on Human Rights deals with access to resources for a standard of living required to maintain health and well-being (United Nations 2012). One area in which access to basic needs is increasingly problematic is that of energy. This is a concern recently echoed in New Zealand by the Member of Parliament for Te Tai Tokerau, Hone Harawira who described access to power as a basic human right while calling for an independent inquiry into power price rises in the Far North of New Zealand (Radio New Zealand, 5 July 2012). In 2012 consumers in the Far North

are coping with electricity price increases of around 25% and there are many reported instances of people going without hot water and space heating, and even lighting. In the wider literature two energy related deprivations are recognised. Energy poverty is defined as an insufficient economic basis to provide the infrastructure for a population to have access to the energy systems required to support a modern economy. This is recognised as a societal condition that is prevalent in many undeveloped and would-be developing economies. The second deprivation, known as fuel poverty, relates to the situation where the individual household is unable to afford the fuel required to maintain health and a reasonable standard of living. With rising energy prices it has been discussed as a significant issue for consumers across Europe, North America, parts of Australia and New Zealand (e.g. Boardman 2010, Healy 2004, Lloyd 2006, Richardson and Travers 2002). In this paper we examine the measurement and prevalence of fuel poverty in New Zealand, and the characteristics of households affected by it.

## Literature Review

The indicator of fuel poverty that has become most accepted over the years is where a household spends more than 10% of their income on fuel (Boardman 1991) and most of our understanding of fuel poverty is derived from studies using this statistic based on analysis of aggregate data on income levels, prices and power industry statistics. Other studies of fuel poverty have been motivated particularly be concern over health issues ranging from chronic conditions such as asthma rates in children through to increased winter morbidity in the elderly (e.g. Healy 2003, Shortt and Rugkasa 2007. Apart from income and prices, the standard of housing, climate and special needs for health are the other factors identified with fuel poverty. The 10% measure has been called into question as to whether it is actually a good indicator of deprivation (Healy and Clinch 2004). It is problematic at both ends of the scale. It is possible that there are high income earners who voluntary spend more than 10% of income on fuel maintaining expensive items such as heated swimming pools, while the poor may maintain their expenditure at under 10% in order to balance their budget with other required expenditure. Consequently, in this research we focus on self reported incidences where households report that they had gone without power some period in the previous twelve months because they could not afford the cost.

## Method

Data was gathered from a large-scale national survey of New Zealand householders. The sample was obtained from the commercial provider Smile City, and is broadly representative of the New Zealand population in demographic terms, albeit with under-representation of Pacific peoples, as is very common with this type of general public research in New Zealand. The questionnaire was administered online, and comprised around 100 items that explored:

- The physical aspects of the dwelling (when built, external wall construction, insulation etc.)

- The composition of the household (number of people and the sex, age, employment status and ethnicity of each)
- Household income
- Expenditure on various sources of energy (electricity, wood, gas, coal, petrol)
- Ownership vs. Renting the dwelling
- Requirements for extra energy for health reasons
- Self reported deprivation of power through inability to payand other questions not directly related to this paper.

Because we have (self-reported) estimates of the amount of money spent on all sources of energy during both summer and winter, we were able to construct a variable that captures the proportion of household income spent on energy. From this variable we then constructed a binary indicator that represented energy poverty as defined by Boardman (1991, 2010). Hence we have two measures of energy poverty: the self-reported cognitive measure and a more "objective" measure, albeit also based on self-reported estimates.

## Analysis and Results

The self-reported measure of 'going without' results in approximately 24% of the sample being classified as experiencing fuel poverty, while the proportion-of-income measure ranged from 1% to 52%, with the median proportion being 5.5%. By this measure, approximately 20% of the sample would be classified as experiencing fuel poverty. More interestingly the association between these items, although statistically significant ($p < 0.000$ on the $\chi^2$ test) is low to moderate ($\varphi = 0.125$). In other words, although the two measures give similar overall population proportions, *different respondents* are classified as being fuel-poor by each measure. They are not parallel indicators of the same construct.

We took the self-reported measure of whether the respondent had gone without energy because they could not afford it as being the more direct and *valid* measure of fuel poverty. Based on this, we examined in what ways respondents who self-identify as experiencing energy poverty are different from those who don't. In what follows we present the results of multiple Mann-Whitney tests (used because many of the items tested were either ordinal or highly skewed five-point rating scales). Because of the relative disparity in group size we elected to be guided by Monte Carlo, as opposed to asymptotic, *p*-values when judging whether to report "significant" differences. Also, because we have a sample of over 2,000 and are reporting multiple tests, we use the 1% level of significance. The table below summarizes these tests.

| Question | Median response category | |
|---|---|---|
| | **No fuel poverty** | **Some fuel poverty** |
| Reduce heating in unoccupied rooms | Sometimes | Always |
| Wait for a full load before using the washing machine | Often | Always |
| Put on more clothing before turning the heat up | Often | Always |
| Keep household heating low to save energy | Sometimes | Often |
| Taking shorter showers | Sometimes | Often |
| Doing dishes by hand | Sometimes | Always |
| Only buy appliances with high energy-efficiency ratings | Sometimes | Often |
| I don't pay much attention to what my energy bill is each month | Disagree | Strongly disagree |
| It's difficult to know what information to trust in regards to energy efficiency | Disagree | Neutral |
| Plants and animals exist primarily to be used by humans | Neutral | Disagree |
| Exploitation of the Earth's natural resources should be stopped | Agree | Neutral |
| How long have you live in your current dwelling? | 5 years | 4 years |
| Rental status | Own debt free | Rent |
| Family life cycle stage | Full nest 3, Empty nest 1 & 2 | Full nest 1 or Solitary survivor |
| Type of dwelling | Separate house | Flat/apartment |
| Age of dwelling | Built after 1978 | Built before 1978 |
| Heat pump | Have and use | Do not have |
| Open fire | Do not have | Have and use |
| Portable gas heaters | Do not have | Have and use |
| Dishwasher | Have and use | Do not have |
| Separate deep freeze | Have and use | Do not have |
| Clothes dryer | Have and use | Do not have |
| LED or LCD large screen monitor | Have and use | Do not have |
| CRT Television | Have and use | Do not have |
| Set top box | Have and use | Do not have |
| Heated towel rail | Have and use | Do not have |
| Electric blanket | Have and use | Do not have |
| Income | $75,000 | $45,000 |
| Income ÷ household size | $25,000 | $17,500 |
| Proportion spent on energy | 6% | 7% |

## Discussion and Conclusion

From the overall pattern of results presented above, it seems clear that fuel poverty is strongly related to overall poverty. We found more evidence of this when we examined the relationship between 'going without' and a crude measure of disposable income: household income divided by household size.[1] Dividing the sample into five groups of approximately equal size based on that measure, the percentage of respondents who report 'going without' in each group (starting from the lowest income group) are 38, 30, 22, 16 and 12.

The pattern of consumer behaviour suggested in the results presented above is that households experiencing fuel poverty take a lot of steps to reduce the use of energy in their homes and they own many fewer appliances that draw on energy in the home. They live in smaller, older houses which are often rented and of course they have a lower income. The commonly accepted "objective" measure of energy poverty, i.e. proportion of household income spent on energy, is only moderately related to self-identified instances of energy poverty, and the objective measure suffers from the obvious defect that it is based on household income, not household *disposable* income.[2] However the relationship with income is interesting. The median proportion spent on fuel across the two groups shown above is only 1% more for those respondents declaring fuel poverty. Looking more closely at the incomes of those reporting 'going without', we see that ⅓ of respondents actually have household incomes above the national median of $60,000. In future research we wish to investigate this group in more detail to see exactly what might be behind their reported fuel deprivation.

It is certainly the case that, in many Western societies, households that have high incomes may in fact have very low disposable incomes due to the heavy burden of debt servicing that many households face. Conversely some households with a lower level of income who choose to lead a less lavish lifestyle may in fact have higher disposable incomes.

It is also worth considering that some low-income households may have a low proportion spent on energy because of two reasons: they have already taken all the steps they can to reduce their energy bill in *absolute* terms, yet because there is no money left at all at the end of each pay-period for discretionary spending, *any* unexpectedly large expense will incur hardship.

Based on these considerations it is our opinion that research into energy poverty needs to move away from reliance on simple ratios of spending to overall income. A step forward would be to use a more focussed measure of disposable income but even this is still not likely to prove to be satisfactory. While fuel poverty appears closely related to overall poverty we believe that is it worth pursuing as a separate and measurable construct because it is clear that certain negative health outcomes (e.g. asthma) can be directly attributed to insufficient access to energy sources. As such there are specific issues that need to be considered by both policy makers and by energy companies who are responsible for supplying the market. Adjusting product mixes and supplying a needed service to a proportion of the population to those who cannot afford to take it up properly presents special issues from a marketing perspective. Reputation management and corporate responsibility become even more critical and need to be informed by a better understanding of fuel poverty than we currently have.

---

[1] Although this measure is obviously very crude, we cannot do better with the data available to us.

[2] Even though expenditure on energy is usually regarded as non-discretionary when take as an all-or-nothing decision, energy spending include expenditure on certain uses that some might deem non-essential.

## References


Boardman, B. (1991). *Fuel Poverty: From Cold Homes to Affordable Warmth*. London, Belhaven Press.

Boardman, B. (2010). *Fixing Fuel Poverty*. London, Earthscan.

Healy, J.D. (2003). Excess winter mortality in Europe: a cross country analysis identifying key risk factors. *Journal of Epidemiology and Community Health* 2003; 57, 784-789 doi:10.1136/jech.57.10.784

Healy, J.D. (2004). *Housing, Fuel Poverty and Health: a pan-European Analysis*. Aldershot, Ashgate.

Healy, J.D & Clinch, J.P. (2004). Quantifying the severity of fuel poverty, its relationship with poor housing and reasons for non-investment in energy saving measures in Ireland. *Energy Policy*, 32 (2), 207-220.

Larsen, G. & Lawson, R. (2012). Consumer rights: an assessment of justice. *Journal of Business Ethics*, DOI 10.1007/S10551-012-1275-01 (online first)

Lloyd, B. (2006). Fuel poverty in New Zealand. *Social Policy Journal of New Zealand*, 27, 142-155.

Radio New Zealand (2012) http://www.radionz.co.nz/news/political/110002/mp-says-pensioners-turning-off-hot-water-to-save-money, July 5.

Richardson, S. & Travers, P. (2002) *Fuel Poverty: a concept with power in South Australia*. Adelaide, National Institute of Labour Studies, Flinders University.

Shortt, N. & Rugkasa, J. (2007). *"The walls were so damp and cold*" fuel poverty and ill health in Northern Ireland: Results from a housing intervention. Health & Place, Volume 13, Issue 1, 99–110

United Nations (2012). *The Universal Declaration of Human Rights*. http://www.un.org/en/documents/udhr/.