Co-benefits of retrofitting insulation

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[www.healthyhousing.org.nz](http://www.healthyhousing.org.nz)
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Outline

• Comparative New Zealand context
• Fuel poverty
• Summary of research base
• Co-benefits of retrofitting insulation
• Policy implications
Local context

• NZ houses on average 90 years old
• Only a third even minimally insulated
• Private rental housing in poorer condition than state housing or owner-occupied houses
• Indoor environment key health exposure
• Most of our time indoors, for infants and older people ~90%
• Cost of housing most pressing political issue
We spend most time at home.

From: NZ Travel Survey
Fuel poverty

• Fuel poverty (more than 10% of household expenditure required to heat home to WHO recommended, temperatures)

• Estimated 25% of NZ households in fuel poverty

• Younger and older people most vulnerable to indoor environment

Effects of fuel poverty on children

• 25% or 270,000 children living in households in poverty

• In *Growing Up in NZ* parents of 9-month old babies
  – 18% put up with feeling cold to save on heating
  – 11% used no heating

• Parents of children under 15 admitted to hospital
  – 52% lived in housing colder than they would like
  – 14.2% had been unable to pay their electricity bills on time
  – 7.5% had experienced disconnection due to late or non-payment of bills (4x national rate)

Households in 2013 Census

• 50% children below the poverty live in private rental housing, 19% Housing NZ homes

• 33% of Pacific peoples lived in crowded households, 20% Māori, 18% Asian, 4% European.

• 9% no form of heating.
Emma-Lita Bourne is dead. Now will anything change?

A coroner has sparked a political and media storm by saying a cold state house contributed to a toddler's death. But who takes notice of what coroners say? And does anything ever change? By Adam Dudding.

Otara toddler Emma-Lita Bourne, who died last August after being hospitalized with pneumonia. The coroner said cold, damp housing may have contributed to her death.

This pretty little girl who was ill one day and dead the next -- that's every parent's nightmare.

Prof Philippa Howden-Chapman

recommendations but cases such as Emma-Lita Bourne's demonstrate the symbiotic relationship between customer and media, and a coroner's ability to create waves with a few carefully chosen sentences.

It's not news, of course, that poverty is a killer.

As Nelson paediatrician Nick Baker, former chair of the Health Quality and Safety Commission, put it, "growing up in deprivation you're more likely to die", not only because of poor housing but because of access to resources, income, the safety of cars, riskier behaviour and numerous other factors.

Commission figures show that in 2009-2013, death rates in those aged 28 days to 24 years were dramatically skewed by neighbourhood wealth. When split into decades of deprivation, the death rate of those young people living in the poorest areas was nearly three times greater than that of those in the richest areas.

Somehow, though, says Otago public health professor Philippa Howden-Chapman, this case has sparked a much bigger reaction than any statistical table could.

That may be because housing -- from the Auckland bubble to National's rethinking of state provision -- is a hot topic.

It is possible because of the mess of coroners and the fact that Shortland District's named housing conditions as a "contributing factor". But it is also because Emma-Lita struck a chord. "Unless people are empathetic or have got imagination, they can easily partition what other people's lives are like from their own daily experience. But this pretty little girl who was ill one day and dead the next -- that's every parent's nightmare, so people find that easier to empathise with, it's a specific tragic piece of evidence that helps us to see the costs of having really poor-quality housing for low-income households," Howden-Chapman says.

Shortland made it clear those involved -- especially the mother and the medical stuff -- managed Emma-Lita's life impeccably.

"He says, 'I can see no fault here except that this child was in terrible housing', and that's very unusual," says Howden-Chapman. She thinks it will be "very interesting" if other coroners mention housing as a "contributing factor" in future reports. A coroner can whisper and trigger an avalanche, or shout at the top of their voice with no effect.

When former chief coroner Neil Maclean was asked at the 2013 Dunedin coroners' conference how frustrating it was to be in a room with 20 others, he spoke of how frustrating it was to be in a room with 20 others. "I can still imagine the world being a lot better if people knew the truth about our community in the first place."

Baker says whether it's housing or housing, drivers of deaths or coroners, "we have a lot of work to do". The reality is that coroners have proved "incredibly strong allies of our public discussion on the right thing to do by our kids".

He says a coroner can make a recommendation or drop hints -- but after that someone else has to take the next steps.

Coronial hits and misses

Highlighting risks and making recommendations to reduce them are part of a coroner's job, but they don't have enforcement powers. Some findings have a major impact, others sink without trace.

Huffing

After two Dunedin teenagers ignited a roomful of gas while heating LPG in 2012, chief coroner Neil Maclean trawled coronial records and found at least 63 people had died while "huffing" butane since 2000. Major stories voluntarily restricted sales of butane and there has been a dramatic reduction in deaths since.

Quad bikes

Coronial recommendations to reduce fatal quad bike accidents have included bans on child riders and compulsory rollcages, but nothing much changes. In February outgoing chief coroner Maclean lamented the lack of action, which he blamed partly on "powerful industry groups".

Central Highway

In 2001 coroner Garry Evans recommended a median barrier on Wellington's Central Highway, after eight deaths in a year. A barrier was built in 2004. By 2014 the barrier had been hit more than 20 times, saving, it's estimated, up to 50 lives.

Coca-Cola warnings

It was arguably New Zealand's most famous death of 2013. An Invercargill woman who drank up to 10 litres of Coca Cola a day died of a heart condition. The bizarre case was reported worldwide, but coroner's David Frier's recommendation -- tougher label warnings on carbonated beverages, and less caffeine in Coke -- appears to have been ignored.
Mother on an oxygen lifelines dies after energy firm cuts the power over £61 arrears

A woman on an oxygen machine died after an energy firm switched off her power supply because of unpaid bills, her family claims.

The 61-year-old mother of four died after a fault on the machine, her family say.

Police in New Zealand were last night investigating the circumstances of a woman's death in a hospital in the North Island.

New Zealand police say that a woman, who was on oxygen, died after the power to her home was cut off.

The woman's family says she died as a result of the power cut.

A family member said that the power was cut off because of an unpaid bill.

They are appealing for information to help them understand what happened.

The woman's family says she was on oxygen for many years due to a lung condition.

They say the power was cut off because of an unpaid bill.

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MERCURY ENERGY MAKE A FATAL ERROR
Structural and market inequalities underlie cold houses

• Rising electricity prices disproportionately affect those on low incomes
• Households on low incomes > renting
• Half the population now renting
• Rental properties older so built to lower BC
• Many landlords rely on capital gains, little incentive to maintain or improve properties
• Poor uptake of subsidised insulation schemes

Real electricity price trends for residential consumers: New Zealand compared with nine other developed economies

Source: IEA statistics

Percentage of Income spent on Household Fuel by Income Decile

Source Data: Statistics New Zealand
After figure 34 'Market Design Review - Options Paper' Electricity Commission
Physical + biological pathways

• Cold indoor air is harder to heat
• Mould grows better in damp air
• Viruses survive for longer on cold surfaces
• Cold stresses immune system
• Blood (liquid) thickens when cold & more likely to form plaques
Research evidence from robust community trials

• Housing, Insulation & Health Study
• Housing, Heating & Health Study
• Housing, Crowding & Health Study
• Housing, Injury Prevention Intervention (HIPI)
• Warm Homes for Elderly New Zealanders
• Social Housing Outcomes Worth Study (SHOW) & national roll-out
• Warm Up NZ: Heat Smart Evaluation
Housing, Insulation & Health Study

- 1400 households where one member had chronic respiratory symptoms
- Winter 2001 baseline measures taken
- Randomly assigned intervention houses insulated over summer
- Winter 2002 follow-up measures taken
- Control group houses insulated
- Carried out with trained community workers
Results

- Occupants in insulated houses used 23% less energy.
- Occupants of insulated houses exposed to cold temperatures (< 10°C) for ¾ hour /day less.
- Occupants of insulated houses exposed to high humidities (> 75%) for almost 1.5 hours / day less.
Better housing improves health

• Significant improvement in self-reported housing conditions (less cold & dampness)
• Significantly fewer symptoms of wheeze & colds
• Improved mental health
• Fewer visits to GPs & hospital admissions
• Fewer days of school


Cost-benefit analysis

• Co-benefits of improving housing on health, energy efficiency, school attendance and carbon mitigation to reduce climate change

• Housing insulation 2:1 benefits/costs

Housing Heating and Health Study

- Randomised community trial
- Retrofitted insulation & sustainable heating in 409 households where children with asthma
- Aims
  - Increase temperature to WHO minimum 18°C
  - Lower relative humidity
  - Reduce NO₂
  - Reduce symptoms of children with asthma
we’re your heater headquarters

$139.99 ea
Gascraft Black Pelino Gas Heater
- Flame failure device
- Oxygen depletion device and tilt switch
- Three heat settings
- Rotary control knob
- Piezo ignition
- EziLock gas connection system
- Castors
- Dimensions: 400mm W x 350mm D x 690mm H.
#200000916934 Gas cylinder sold separately.

$45.86 ea
9kg LPG Cylinder Model CYL9KGOPD
This cylinder has an overfill protection device and complies with NZ safety standards.
#9419695622045

$299.99 ea
Or pay from $2.95 pw*
Evantair Dehumidifier 16L Model WDH-520HB
- 24 Month warranty
- Variable control
- 4 Litre water tank capacity
- 16 Litre per day extraction capacity
- Full tank warning signal.
#9421009505708

The Warehouse
where everyone gets a bargain

TWL9492
Intervention in 409 households

Previously:
X electric heaters (2kW)
X unflued gas heaters (4kW)

Replaced with:
√ 320 heat pumps (4-7kW)
√ 55 wood pellet burners (10kW)
√ 11 flued gas heaters
Results

Average living rooms 1.1°C warmer
People felt warmer
Condensation reduced
Less mould & mouldy smells reported
Levels of nitrogen dioxide halved
Levels of wheezing & coughing halved
Effects more marked in low-income families
Summary of heating results

• More effective heaters increased the indoor temperature & reduced NO\textsubscript{2}
• Improved children’s asthma symptoms
• Fewer days off school and fewer visits to GPs.


The cost curve provides a “map” of abatement opportunities.

Cost of abatement in 2030, €/tonne CO₂e.

Source: Enkvist et al. (2007).
THE POLITICIAN

I WANT EVERY HOUSE IN THE COUNTRY FULLY INSULATED!

THEN I WON'T BE ABLE TO HEAR THE PEOPLE COMPLAINING ABOUT THE WAY I'M HANDLING THE FINANCIAL CRISIS!!!
Is your home one of the 900,000 houses with sub-standard insulation?
You could get 1/3 off the cost to upgrade.
Warm Up NZ: Heat Smart Programme

- 100,000 houses in first 2 years of programme
- $320 million, not targeted to low income
- Quasi-experimental study, detailed anonymised matching of first 46,655 houses
- Small but significant drop in metered energy
- Significant health outcomes in pharmaceutical usage, length of hospitalisation, avoidable mortality for over 65s

• Benefit/cost ratio for adults - 3.9:1
• Benefit/cost ratio for children - 6:1
• Benefit/cost ratio for people over 65 - 6:1
Retrofitting Provides Multiple Rewards

An energy efficiency project about to begin in Taranaki is likely to improve health and housing as well as create jobs...

The project, modelled on successful pilots in Opotiki and Thames, involves making homes more energy-efficient.

Support and assistance for the Taranaki Local Employment Co-ordination committee project has come from a number of sources, including the Community Employment

visions into action. We are also linking these speakers into our local schools. A leadership-focused programme has been established in one primary school.

Members, who pay $20 to join the academy and $10 each session, have also been given opportunities to improve their public speaking.

Sessions planned for the rest of 2000 include life skill planning, body language and interpersonal skills.

The aim is to help young people find employment for 100 homes free for low income people in Waitara. The LEC hopes that it will be able to secure further funding for another 100 homes in Stratford.

People wanting their homes retrofitted will be assessed under a number of criteria, including whether they have a Community Services Card, health problems, the number of children in the family, and whether they are elderly or disabled.

Elaine says that where homes are rented, the LEC will expect some financial contribution from landlords.

In Opotiki local unemployed Maori were trained to do the work. More than 600 houses were retrofitted in the first year -- with grants from the Bay of Plenty Electricity Consumer Trust -- at an average cost of less than $1350. Up to 12 jobs were created. The retrofitting can involve insulating under floors and in ceilings, lagging waterpipes, wrapping cylinders, installing energy-efficient light bulbs and draft exclusion around windows and doors.

"Not everything is needed in every house," says Elaine. "We will be filling the gaps -- literally and metaphorically."

Each house can save up to $250 a year in power costs once the house is made energy-efficient. "That money is then available to spend locally on other things."

Community Employment Group adviser Susan Lucas says that one of the significant benefits of this project is the employment opportunities for those involved. "It is good to see employment opportunities becoming available in this community which has been hard hit by the

Retrofitted insulation until targeted (HH) & non-targeted policy (HS)

Summary Graph: Any Interventions

Healthy Homes

Heat Smart

No. of homes

NZDep06

Produced from Andrew Crowley from EECA data
Co-benefits of retrofitting insulation

- Increases energy efficiency
- Reduces fuel poverty
- Reduces carbon emissions
- Improves health and well-being
- Underpins the green economy
- Increases social capital

OECD Environmental Performance Review criticises roading: public transport funding split (90:10)

- Notes absence of environmental taxes
- Critical of sprawl
- Critical of fragmented legislation relating to cities

- Notes with approval WUNZ calls for higher standards
Strategic Partnerships to advance agenda

- Housing New Zealand
- Taranaki 10,000 houses in 10 years
- Te Tai Tokerau 2,000 houses
- Hamilton
- EECA
- District Health Boards
- Regionally & city governments
- Internationally IEA, WHO & ICSU
WUNZ programme being phased out

• Government announces in 2016 Budget that WUNZ programme will be phased out in mid-2018
• Only 30% of houses insulated
• Between 600,000-900,000 houses still to be insulated
• Contradicts premise of social investment

http://www.radionz.co.nz/national/programmes/ninetonoon/audio/201836134/health-benefits-of-insulation-'massive'
Rating tool links health and building science
Measures respiratory and injury hazards, energy efficiency & earthquake resilience

WHAT IF IT'S A BIG HOAX AND WE CREATE A BETTER WORLD FOR NOTHING?

- ENERGY INDEPENDENCE
- PRESERVE RAINFORESTS
- SUSTAINABILITY
- GREEN JOBS
- LIVABLE CITIES
- RENEWABLES
- CLEAN WATER, AIR
- HEALTHY CHILDREN
- ETC. ETC.

CLIMATE SUMMIT
Conclusions

• NZ context specific
• Poor housing used to spear-head public health concerns, particularly for young and older people
• Strong community & institutional support
• Robust science provides strong evidence base for policy nationally & internationally
• Co-benefits framework strengthens economic case
• Outrage powerful catalyst
• Politics trumps policy