

# From Hearth To Health

An investigation into the health impacts of the Warm-Up New Zealand home insulation subsidy programme

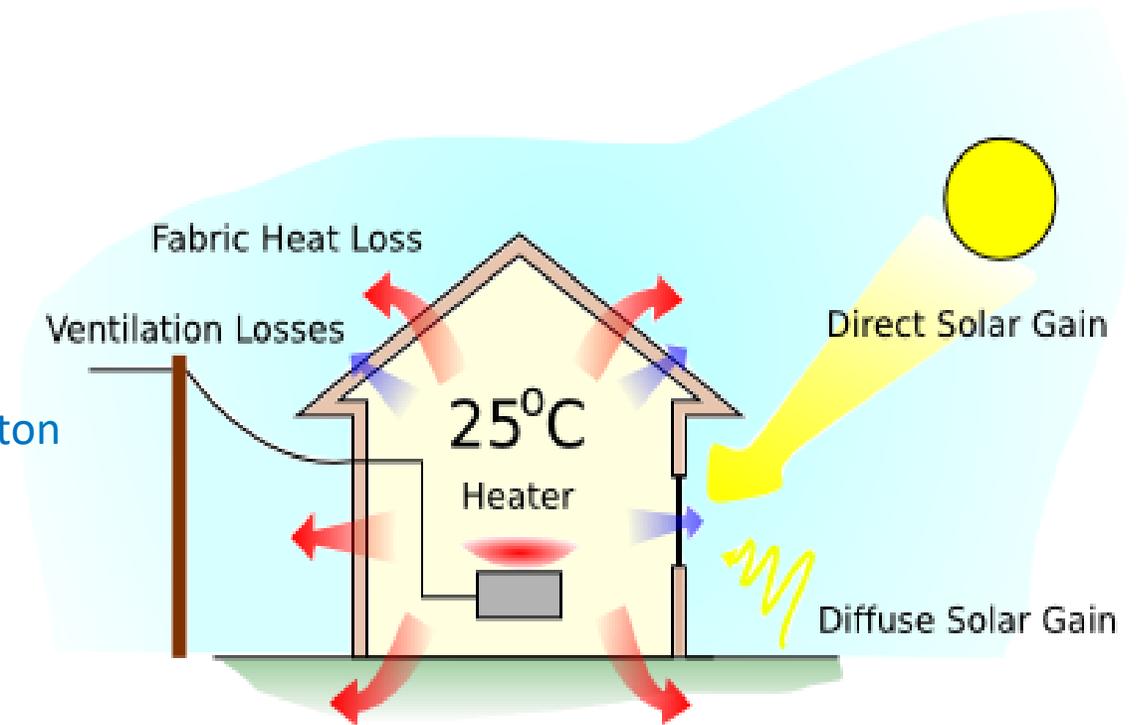
Caroline Fyfe, University of Otago Wellington

Lucy Telfar Barnard, University of Otago Wellington

Philippa Howden-Chapman, University of Otago Wellington

Jeroen Douwes, Massey University, Wellington

19<sup>th</sup> November 2021



# Presentation structure

- Study aim
- The conceptual framework
- Study design and methods
- Results
- Discussion of the study findings
- Strengths and limitations of the study design and execution
- Policy implications of the study findings
- Recommendations for future research

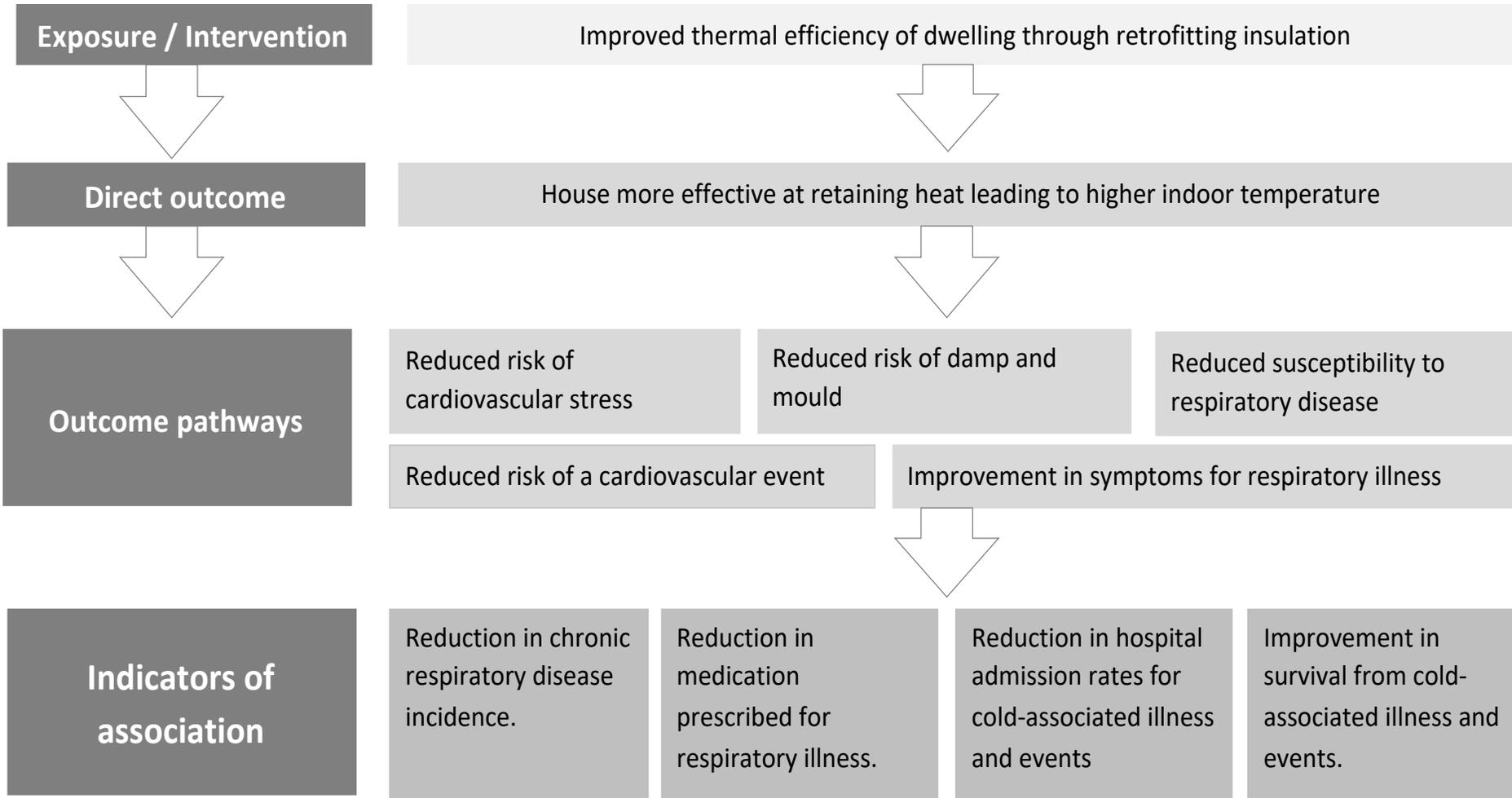
# Study Aim

To assess whether residents experience a reduction in the severity and frequency of cold associated ill health following the retrofitting of insulation into their homes.

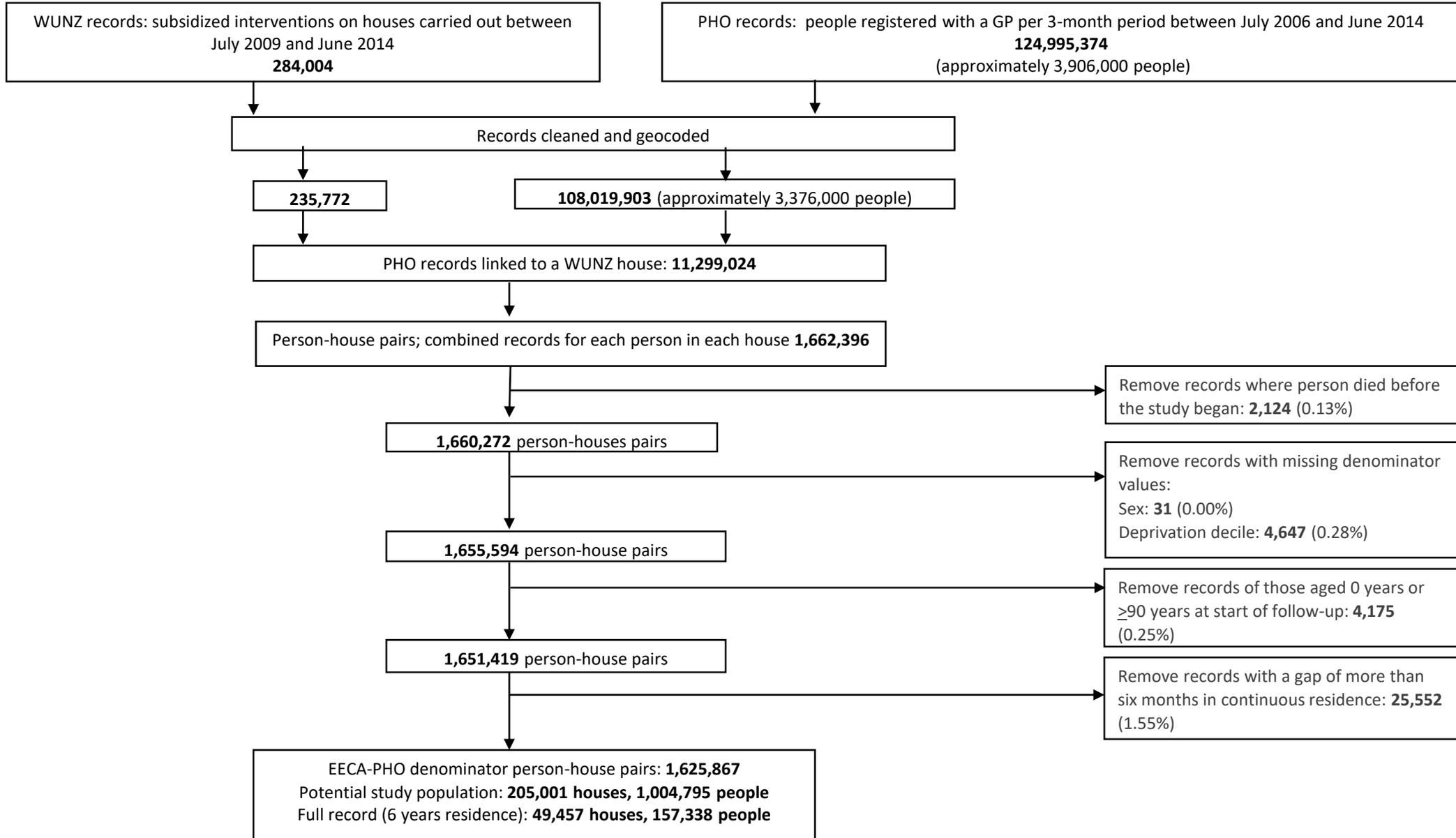
Frequency refers to rates of cold-associated disease within a population.

Severity refers to exacerbation of cold-associated disease symptoms that require greater levels of medical intervention.

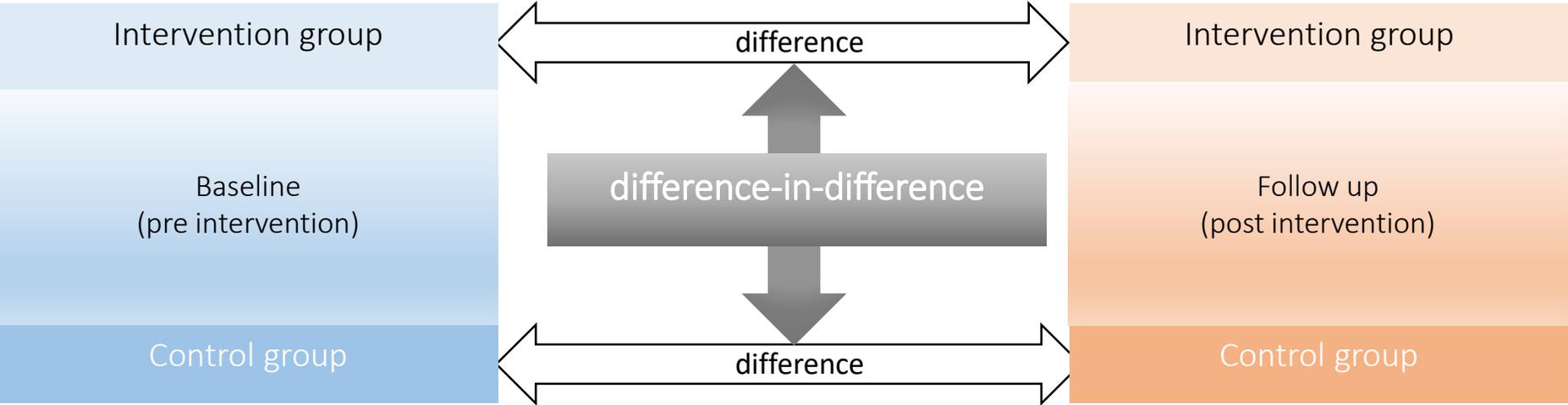
# The conceptual framework



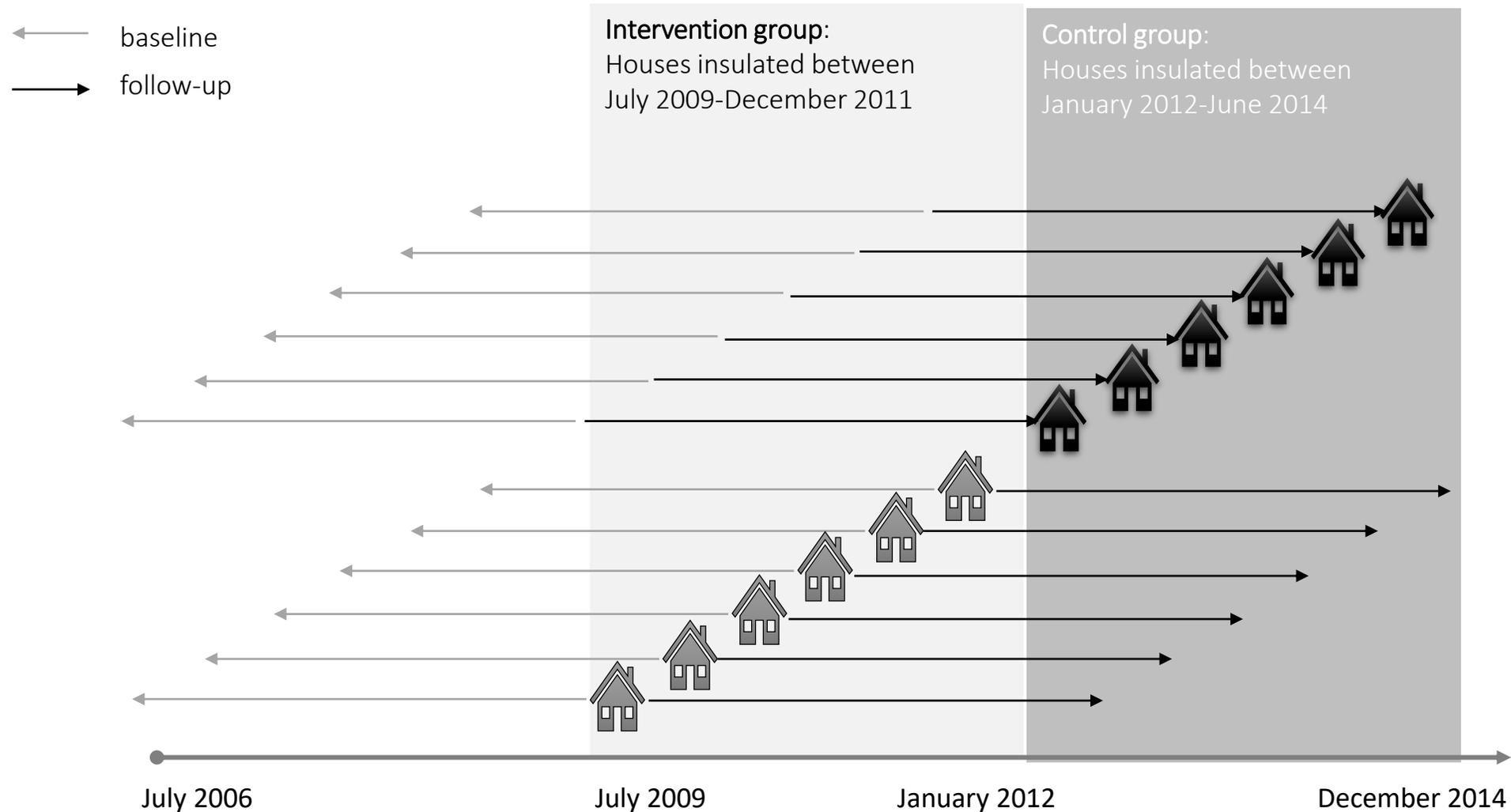
# Identifying the study population



# The difference in difference model



# Distribution of baseline and follow-up for intervention and control groups



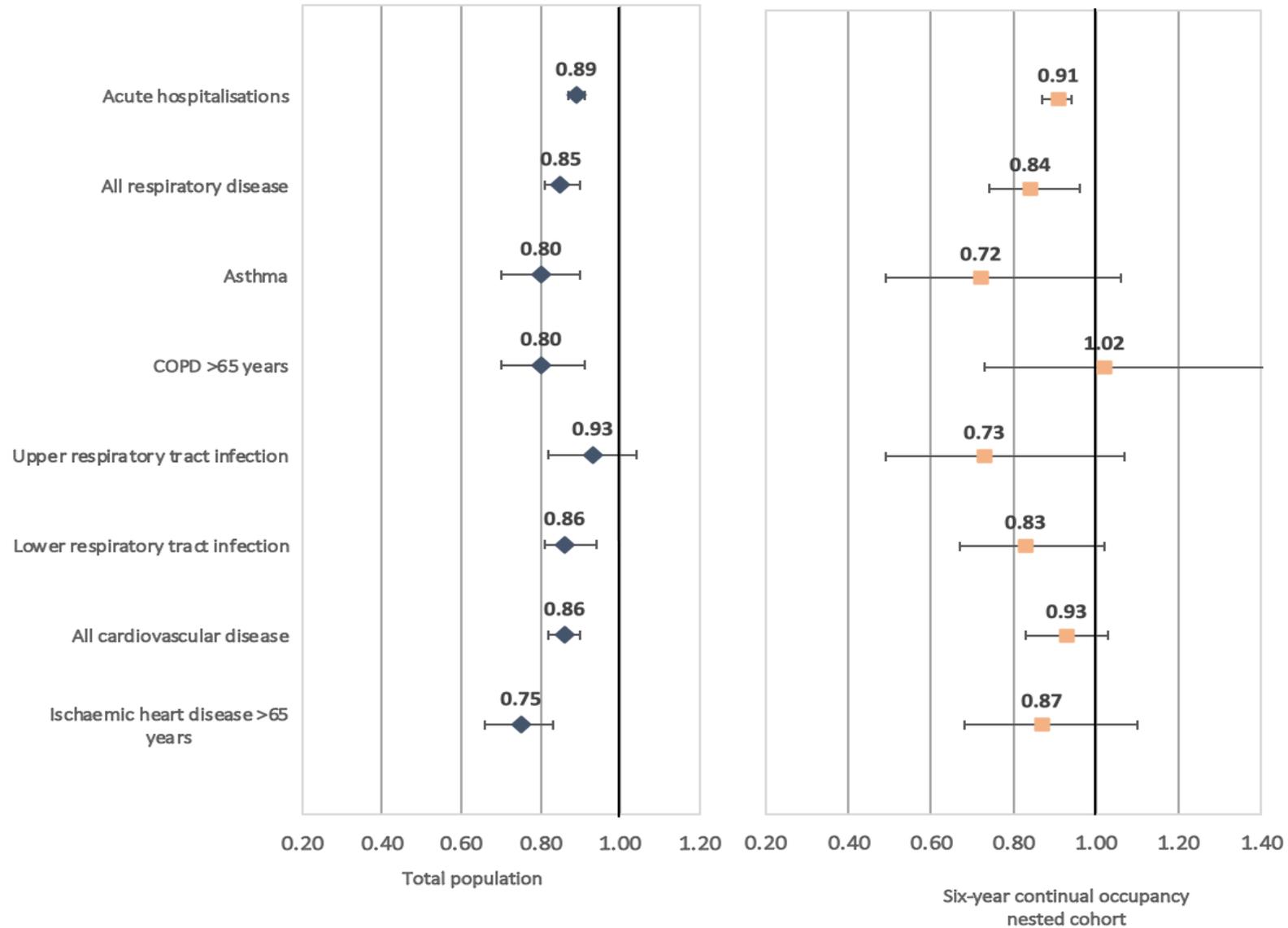
# Relative rates of prescription dispensed for respiratory disease

| Respiratory disease type                                       | Total population  |   | Six year continual occupancy nested cohort                      |   |
|--|---|---|---|---|
|  | Relative rate ratio RRR:<br>RR intervention<br>RR follow to up) | Absolute difference<br>number of pharmaceuticals<br>dispensed per 100 person<br>years | Relative rate ratio RRR:<br>RR intervention<br>RR follow to up) | Absolute difference<br>number of pharmaceuticals<br>dispensed per 100 person<br>years |
| Infectious respiratory disease medication                      | <b>0.98 (0.98-0.99)</b>   | <b>-0.47 (-0.47--0.47)</b>  | <b>0.98 (0.98-0.99)</b>   | <b>-0.74 (-0.73--0.75)</b>  |
| Chronic respiratory disease: prevention medication             | 1.00 (0.99-1.00)  | -0.02 (-0.02--0.02)   | 1.00 (0.99-1.02)  | 0.12 (0.12-0.12)  |
| Chronic respiratory disease: exacerbation sensitive medication | <b>0.96 (0.96-0.97)</b>   | <b>-1.72 (-1.72--1.74)</b>  | <b>0.97 (0.96-0.98)</b>   | <b>-1.34 (-1.33--1.35)</b>  |

# Chronic respiratory disease incidence

|                               | Risk ratio   |   |
|-------------------------------|--|---|
|                               | Prevention of symptoms medication indicator ( $\geq 1$ prescription) | Exacerbation sensitive medication indicator ( $\geq 3$ prescriptions) |
| All                           | <b>0.92 (0.89-0.98)</b>  | <b>0.88 (0.83-0.92)</b>   |
| Young person: $\leq 15$ years | 0.99 (0.87-1.13)   | <b>0.85 (0.75-0.98)</b>   |
| Adult: 15-64 years            | <b>0.91 (0.85-0.98)</b>  | <b>0.87 (0.81-0.93)</b>   |
| Old person: $\geq 65$ years   | 0.92 (0.85-1.01)   | <b>0.90 (0.83-0.97)</b>   |

# Disease specific hospital admissions

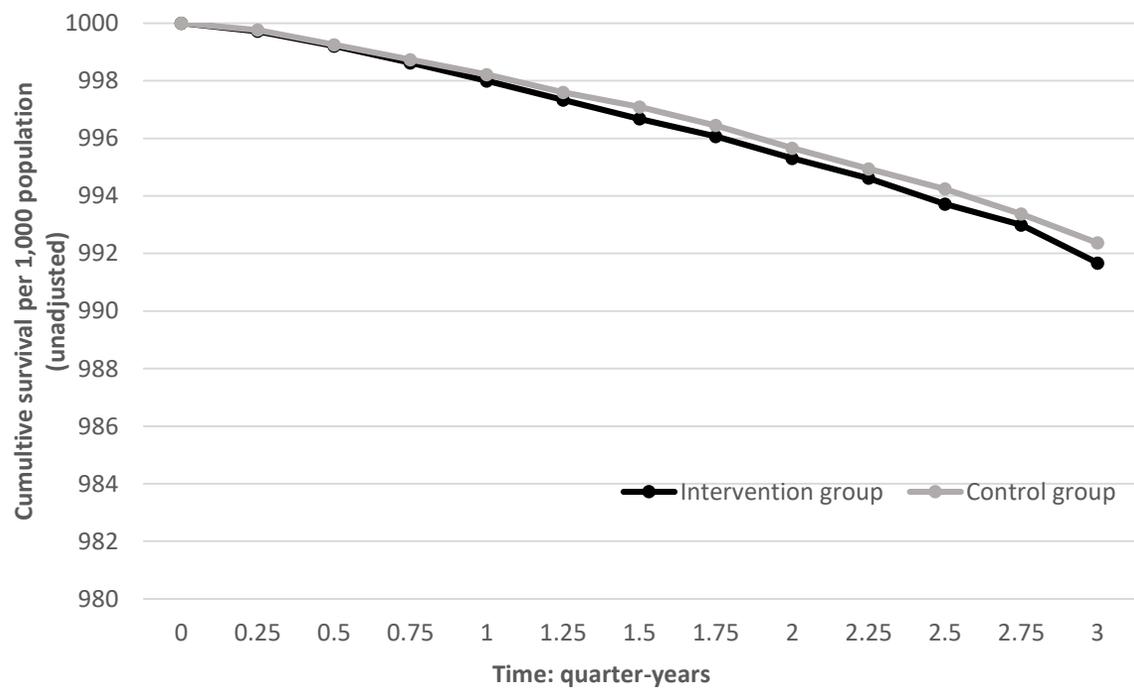


# Mortality

Cold-associated mortality in the cumulative exposure population, all intervention types

Cumulative exposure group: adjusted hazard ratio 1.00 (0.93 - 1.06)

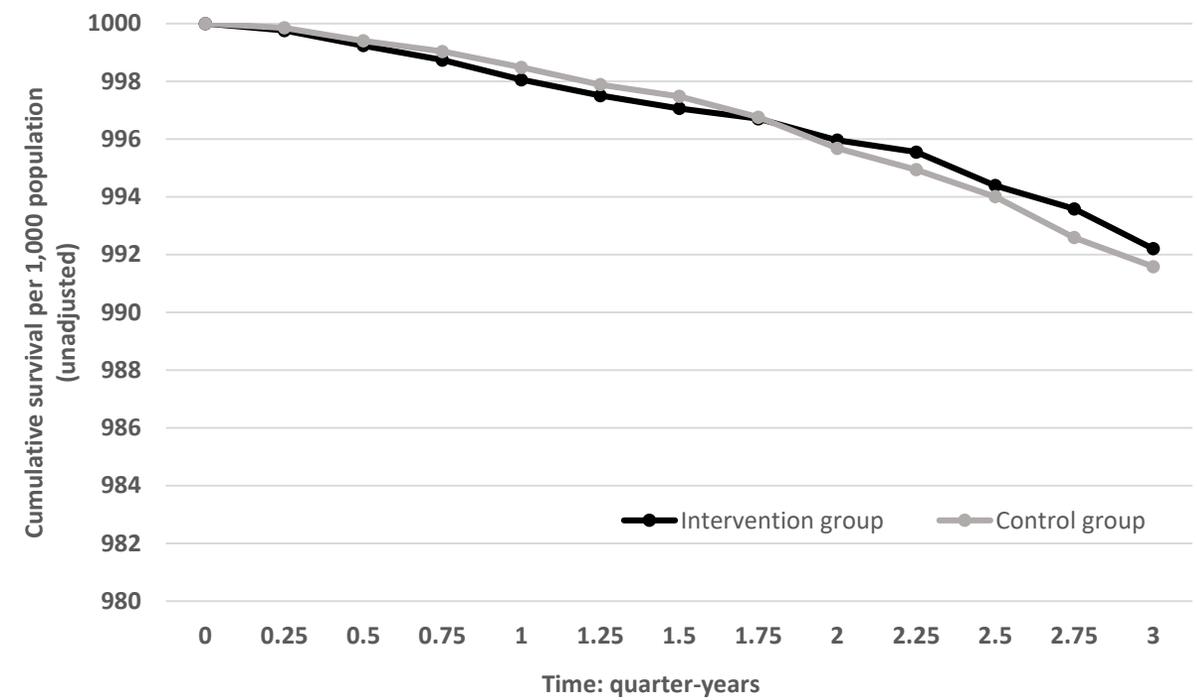
Single occupancy nested cohort: adjusted hazard ratio 1.00 (0.93 - 1.09)



Cold-associated mortality in the cumulative exposure population who received a heater alongside insulation

Cumulative exposure group: adjusted hazard ratio **0.77 (0.61 - 0.97)**

Single occupancy nested cohort: adjusted hazard ratio 0.79 (0.60 - 1.04)



# Discussion summary

Statistically significant improvements in the health of the intervention group compared to the control group three out of the four health outcome measures.

Health effects from the intervention were not evenly distributed across all groups within the population:

- The effect on incidence of chronic respiratory disease decreased with age
- Positive health effects were stronger for Pacific People's but weaker for Māori
- Installing a heater alongside insulation increased the effect size for two of the four health outcomes measured.

# Strengths and limitations:

## Strengths

- The quasi-experimental study design
- Data linkage: large study population, longer follow-up
- Use of Primary Health Organisation records:
- Use of a control group to act as a counter-factual
- The six-year continual occupancy nested cohort

## Limitations

- Data linkage: potential for type 1 and type 2 errors
- Use of administrative datasets limited information available
- Structural and behavioural influences
- Phasing out of the heater subsidy
- Study power and sensitivity
- Available health indicators

# Policy implications and future research:

## **Policy implications:**

- Housing improvement subsidies
- A targeted approach
- Standards for rental housing

## **Future research:**

- Use of the IDI to control for lifestyle factors and comorbidities
- Updating cost-effectiveness analysis
- Further examination of the effectiveness of heating alongside insulation
- Equity of access to and equity of outcomes from housing interventions for Māori



Wrapping up houses,  
Helps to keep them warm and dry  
And people healthy.