Findings from the Victorian Healthy Homes Program: A Randomised Controlled Trial

Sustainability Victoria

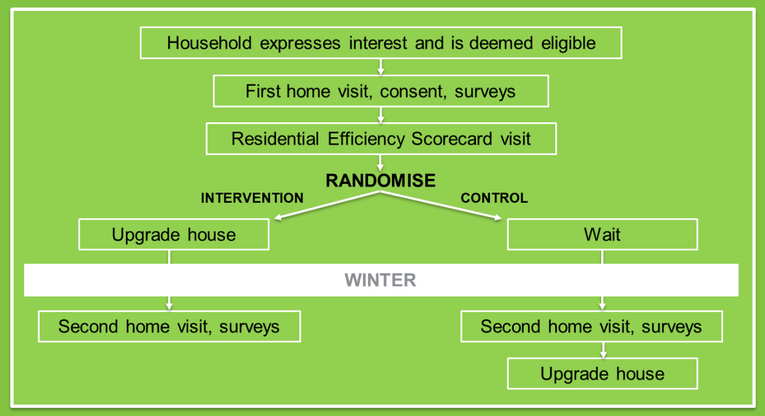
Introduction

» The VHHP delivered thermal comfort and energy efficiency upgrades to 1000 homes of low-income Victorians with a health or social care need.

» It ran over 3 study years (2018, 2019, 2020) across western Melbourne and the Goulburn Valley.

» Designed as a randomised controlled trial, with households randomised to either the intervention (upgraded before winter) or control (upgraded after winter) group.

» Purpose was to evaluate the difference between groups over winter on thermal comfort, energy use, healthcare utilisation, health, and quality of life.



Home upgrade

» Each household received a pre and post upgrade Victorian Residential Efficiency Scorecard assessment.

» This informed the choice of upgrades delivered to the home, prioritising energy efficiency and warmth.

» Range of upgrades included insulation (ceiling, underfloor), draught sealing, space heating (reverse cycle air conditioning or gas heater replacement), internal window coverings.

» Target average cost per upgrade was $3500.

Participants

» Sample: 1312 individuals across 984 households (493 randomised to control, 491 to intervention).

» Disruptions, notably COVID lockdowns during 2020, affected upgrade delivery: 488 control households and 276 intervention households received their allocated intervention as per protocol.

	Control	Intervention
Mean age (SD)	74.9 (11.8)	74.8 (11.7)
Female (%)	67.2	63.7
Mean floor area (m^2)	115.2	115.4
Mean pre-upgrade VRES rating	4.96	4.96
Solar PV (%)	26.4	27.1
Gas heater - pre-upgrade (%)	66.3	68.6

Results

» Regression results presented are from the primary, intention-to-treat analysis (analysing all households according to how they were randomised).

» Intervention households were significantly warmer over winter than control households. They also used significantly less gas.

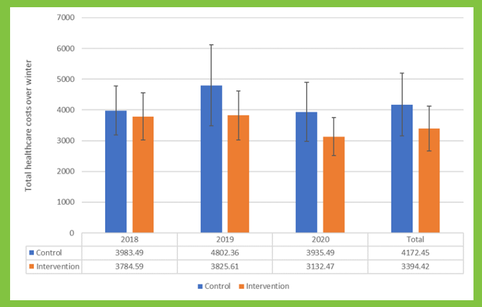
	Effect	95% CI	p
Indoor temperature	+0.33ºC	0.05, 0.60	0.022
Time spent <18ºC	-43 mins/day	-88, 2	0.060
Subjective ↑ warmth	x2.3	1.8, 3.0	<0.001
↓ condensation	x1.48	1.12, 1.95	0.006
Gas use	-7.1 kWh/day	-12.0, -2.2	0.005
Electricity use	-0.9 kWh/day	-2.3, 0.05	0.18

» Intervention group was 37% more likely to use main heater 'only when feeling cold' (p=0.052) and 20% less likely to use main heater 'all the time' (p=0.13).

» At night, intervention group was 57% less likely to use a portable electric heater (p=0.021) and 49% less likely to go to bed early (p<0.001) to stay warm.

» Social care related quality of life (ASCOT) was significantly higher in intervention group (p=0.009).

» Mental health related quality of life (SF-36) was also significantly higher in intervention group (p=0.026).



» Four datasets (MBS, PBS, hospital admissions, ED visits) were combined to quantify total healthcare usage and cost for each participant over the winter period.

» Intervention was associated with $887 less health cost (95% CI: -106, 1879; p=0.08).

» Average upgrade cost was $2809. Savings over winter period were $887 in health, $85 in energy.

» In cost-benefit analysis, over 10 years using a 4% discount rate, upgrade was cost-saving within 3 years.

Conclusion

A relatively minor thermal comfort and energy efficiency upgrade has multiple benefits over winter: higher indoor temperatures, less gas use, lower energy bills, reduced emissions, improved quality of life, and less healthcare utilisation. In cost-benefit analysis, the upgrade is cost-saving within 3 years.