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## Editorials

# Housing and health

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Heating improvements may hold most promise for developing healthy housing policy

It has been known for centuries that housing and health are inextricably linked. However, most of the evidence so far comprises cross sectional studies, which can only assess the relation between housing and health outcomes rather than provide convincing evidence that better housing improves health. A systematic review of intervention studies (carried out in 2001) found that housing improvement may lead to small improvements in self reported physical and mental health and reductions in some symptoms, but adverse effects on health are also possible.<sup>1</sup> However, the evidence is patchy and robust study designs are rare. Of the 18 studies identified in the review, six were prospective controlled studies and only one was a randomised controlled trial.<sup>1</sup>

In this week's *BMJ*, Howden-Chapman and colleagues report a large randomised controlled trial from New Zealand assessing whether insulating older houses increases indoor temperatures and improves occupants' health and wellbeing.<sup>2</sup> The relevance of such studies to decision making in public health is emphasised in the UK government's Wanless report, which examined the cost effectiveness of taking action to improve the health of the whole population and to reduce health inequalities.<sup>3</sup> The report highlighted the almost complete lack of an evidence base for the effectiveness and cost effectiveness of public health and social interventions. The report also identified the need to collect better evidence of the effects of interventions in the housing sector.

The trial by Howden-Chapman and colleagues directly addresses this need. Their study included a cost-benefit analysis.<sup>4</sup> The findings suggest that improving the indoor environment may lead to improved self rated health (adjusted odds ratio 0.50, 95% confidence interval 0.38 to 0.68), fewer visits to a general practitioner (0.73, 0.62 to 0.87), fewer days off work (0.62, 0.46 to 0.83), and fewer days off school (0.49, 0.31 to 0.80).

In addition to the use of a randomised controlled trial design, the strengths of the study include retention of more than 75% of the original participants and a large final sample size (>3000). This in a field in which studies are small (rarely more than 200 participants) and retention is rarely more than 50%, if reported at all.<sup>1</sup> Funding, personal commitment, and expertise are likely to explain much of this study's

success, but the research team also ensured the commitment of the housing agencies that delivered the intervention.<sup>5</sup>

The lack of consistent health impacts detected in previous prospective controlled studies may partly be explained by variation in the actual intervention delivered and the varying potential to benefit from the investment. In the New Zealand trial, just under 30% of the intervention group received the full intervention package for a variety of reasons, such as inadequate room or rubbish in the roof space preventing the installation of the ceiling insulation.<sup>25</sup> However, area based programmes may deliver improvements regardless of individual need at baseline. In one recent controlled non-randomised study of housing led neighbourhood regeneration, about two thirds of residents reported no housing problems at baseline, so limiting the potential to improve conditions.<sup>6</sup> The small sample sizes in previous studies often preclude further analysis of subgroup effects according to the extent of improvements. The New Zealand trial, however, may be large enough to allow investigation of a dose-response effect, taking into account the range of improvements delivered.

Heating and energy efficiency measures can improve the indoor environment and also alleviate fuel poverty (when a household spends more than 10% of its income on fuel). The combination of greater warmth and reduced household expenditure may be a key mechanism through which health effects occur. Previous studies indicate that warmer and less humid living conditions may improve health, but they also suggest that the health benefits disappear if housing costs increase.<sup>1</sup>

Several studies assessing the impact on health of heating improvements are now near completion, including a large quasi-experimental evaluation of the Scottish Executive's central heating programme.<sup>7</sup> These and the New Zealand study suggest that heating improvements may hold most promise for the development of an evidence base to inform healthy housing policy.

This new trial emphasises the benefits of investing in housing, which are not limited to health, as reductions in work and school absences were also seen. This evidence and emerging evidence from other housing studies should inform policies linking housing investment to impacts on health.

## Footnotes

- [ARTICLE](#)
- **Competing interests:** None declared.
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## References

1. ↪Thomson H, Petticrew M, Morrison D. Health effects of housing improvement: systematic review of intervention studies. *BMJ* 2001;**323**:187-90. [Abstract/FREE Full Text](#)
2. ↪Howden-Chapman P, Matheson A, Crane J, Viggers H, Cunningham M, Blakely T, et al. Effect of insulating existing houses on health inequality: cluster randomised study in the community. *BMJ* 2007 doi: [10.1136/bmj.39070.573032.80](https://doi.org/10.1136/bmj.39070.573032.80)
3. ↪Wanless D. *Securing good health for the whole population*. London: HM Treasury and Department of Health, Stationery Office, 2004.

4. ↪Chapman R, Howden-Chapman P, O'Dea D, Viggers H, Kennedy M. *Retrofitting houses with insulation: a cost-benefit analysis of a randomised community trial* . Wellington, New Zealand; Housing and Health Research Programme, 2004. [www.maarama.co.nz/Insulation\\_Benefits\\_feb07.doc](http://www.maarama.co.nz/Insulation_Benefits_feb07.doc).
5. ↪Howden-Chapman P, Crane J, Matheson A, Viggers H, Cunningham M, Blakely T, et al. Retrofitting houses with insulation to reduce health inequalities: aims and methods of a clustered, randomised community-based trial. *Social Sci Med* 2005;**61**:2600-10. [CrossRef](#)
6. ↪Thomson H, Morrison D, Petticrew M. The health impacts of housing-led regeneration: a prospective controlled study. *J Epidemiol Community Health* [in press].
7. ↪Walker J, Mitchell R, Platt SD, Petticrew M, Hopton J. Does usage of domestic heating influence internal environmental conditions and health? *Eur J Public Health* 2006;**16**:463-9. [Abstract/FREE Full Text](#)

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