

Housing and public health: a review of reviews of interventions for improving health

Evidence briefing summary

Introduction

This briefing aims to:

- Identify all relevant systematic reviews, syntheses, meta-analyses and review-level papers on public health interventions relating to housing
- Review these papers and highlight what housing-related interventions work to promote health for all population groups, but with particular reference to disadvantaged and vulnerable groups
- Identify cost-effectiveness data for housing-related interventions to promote health for all population groups
- Highlight any gaps in the evidence and provide recommendations for future research.

This briefing is intended to inform policy and decision makers, NHS providers, housing officials, public health physicians and other public health practitioners in the widest sense.

Housing and health

The association between housing conditions and physical and mental ill health has long been recognised and there are a broad range of specific elements relating to housing that can affect health outcomes (reviewed by Bonnefoy et al., 2004). These include:

- Agents that affect the quality of the indoor environment such as indoor

pollutants (eg asbestos, carbon monoxide, radon, lead, moulds and volatile organic chemicals)

- Cold and damp, housing design or layout (which in turn can affect accessibility and usability of housing), infestation, hazardous internal structures or fixtures, and noise
- Factors that relate more to the broader social and behavioural environment such as overcrowding, sleep deprivation, neighbourhood quality, infrastructure deprivation (ie lack of availability and accessibility of health services, parks, stores selling healthy foods at affordable prices), neighbourhood safety, and social cohesion
- Factors that relate to the broader macro-policy environment such as housing allocation, lack of housing (homelessness, whether without a home or housed in temporary accommodation), housing tenure, housing investment, and urban planning.

However, the housing-health relationship is complex and the nature of causal links between the different housing dimensions can operate at a number of interrelated levels. Furthermore, poor housing conditions often coexist with other forms of deprivation (poor education, unemployment, ill health, social isolation etc), making it difficult to isolate, modify and assess the overall health impact of housing conditions.

This briefing presents an overview of the findings from a review of reviews of public health interventions relating to housing. It was undertaken by the Health Development Agency (HDA) but published after the functions of the HDA were transferred to NICE on 1 April 2005. Neither this summary nor the full report represent NICE guidance. The full report – NICE (2005) *Housing and public health: a review of reviews of interventions for improving health* – is available at www.publichealth.nice.org.uk

Introduction (cont.)

Housing and health inequalities

The government's report, *A new commitment to neighbourhood renewal: national strategy action plan* (Social Exclusion Unit, 2001), is viewed as a central focus for addressing the multiple aspects of deprivation experienced in the poorest areas. A recent review of this strategy by the Prime Minister's Strategy Unit stated that poor quality housing, badly maintained local environments, problems with anti-social behaviour, and crime and disorder including drug and alcohol misuse can cause instability in many deprived areas. This exacerbates local economic problems, as residents who are generally better skilled and educated move out, leaving behind increasing concentrations of deprivation (Strategy Unit, 2005).

Areas of low housing demand are more likely to suffer crime, vandalism and litter and those living in social housing estates are five times more likely to perceive local disorder and antisocial behaviour as a problem. These problems are often compounded by social housing policies in

which housing allocations can lead to further concentration of the most deprived in a particular area (Strategy Unit, 2005).

The government's commitment to promoting health and tackling health inequalities through policies concerned with housing, regeneration and sustainable development is clearly defined in *Tackling Health Inequalities: a programme for action* (Department of Health, 2003). This document lays the foundation for achieving the Public Service Agreement (PSA) target to reduce health inequalities, as measured by infant mortality and life expectancy at birth, by 10% by 2010. It states that actions likely to have the greatest impact over the long term include improving social housing conditions and reducing fuel poverty among vulnerable populations.

The *English House Condition Survey* (ODPM, 2003a) is undertaken every five years and assesses the overall condition of the housing stock. For 2001, the survey reported that of 21.1 million dwellings in England, 7 million do not provide decent homes and it is the most vulnerable people – households that

rent privately, people who live alone, ethnic minorities and households with no-one in full-time employment – who are more likely to be living in non-decent homes.

The government's key framework for securing a 'decent home' for all is set out in the Communities Plan (*Sustainable Communities: Building for the future*, ODPM, 2003b). The corresponding PSA target aims to bring all social housing into a 'decent condition' by 2010.

To be considered 'decent' a dwelling must:

- Meet the statutory minimum standard for housing (ie be fit)
- Be in a reasonable state of repair
- Have reasonably modern facilities and services
- Provide a reasonable degree of thermal comfort.

Review methodology

This briefing seeks to answer the following research question:

What housing interventions are effective at improving health outcomes?

We defined the 'house' as the usual residential home of an individual or family. All housing interventions acting at either the macro- or micro-policy level were included. Papers were included if they reviewed housing interventions in which health-related outcomes or the economic costs of health-related outcomes were assessed.

We also included measures of outcomes that relate to the wider, underlying determinants of health, which can include social, economic, cultural and environmental factors (Dahlgren and Whitehead, 2001). The following process was applied:

- Systematic searching of all English language literature from January 1996 to October 2004
- Selection of relevant reviews
- Critical appraisal of the reviews (transparency, systematicity, quality and relevance)

- Analysis and synthesis of the evidence for different topic areas and population groups.

A total of 15 review-level papers passed the critical appraisal process. Papers were compared and top-level findings were collated and presented in the following core themes:

A – Rehousing and neighbourhood regeneration

- Medical priority rehousing
- Rehousing plus relocation from slum or socially isolated areas
- Rehousing or housing improvement plus neighbourhood regeneration
- Housing subsidy programmes for low-income families

B – Refurbishment and renovation

- General refurbishment
- Improvement in housing energy efficiency measures
- Accidental injury prevention
- Smoke alarms
- Prevention of allergic respiratory disease

Evidence statements were derived from each paper based on these categories:

- **Evidence of effectiveness:** derived from the review-level literature where the results were all in agreement
- **Currently, a lack of evidence of effectiveness:** applied to interventions in the review-level literature that currently showed no impact on outcomes
- **Conflicting evidence:** derived from the review-level literature where the interpretation and/or conclusions of the review papers and/or primary studies within review paper/s were not in agreement.

Findings

Listed below are all the review-level evidence statements for the two core themes.

A – REHOUSING AND NEIGHBOURHOOD REGENERATION

Medical priority rehousing

- There is review-level evidence that anxiety and depression scores are reduced in people who are rehoused on the basis of medical need.

Rehousing plus relocation from slum or socially isolated areas

- There is review-level evidence that rehousing people from slum areas can improve self-reported physical and mental health outcomes in the longer term (18 months).
- There is also review-level evidence that rehousing people from slum areas can adversely affect self-reported health outcomes in the short term (9 months)
- Currently, there is a lack of review-level evidence on the effectiveness of rehousing from a socially isolated area or substandard housing in improving health.

Rehousing or housing improvement plus neighbourhood regeneration

- Currently, there is a lack of review-level evidence of the effectiveness of interventions involving rehousing or housing improvement combined with neighbourhood regeneration initiatives in improving health outcomes.

Housing subsidy programmes for low-income families

- There is review-level evidence from the US that rental voucher programmes can improve household safety by providing families with the choice to move to neighbourhoods with reduced exposure to violence.
- Currently, there is a lack of review-level evidence on the effectiveness of rental voucher programmes in improving other health-related outcomes.
- Currently, there is a lack of review-level evidence on the effectiveness of interventions involving mixed-income housing developments in improving health outcomes.

B – REFURBISHMENT AND RENOVATION

General refurbishment

- Currently, there is a lack of review-level evidence of the effectiveness of interventions involving general refurbishment initiatives in improving health outcomes.

Improvement in housing energy efficiency measures

- There is review-level evidence that housing interventions involving improvements to energy efficiency measures, such as installation of new windows, can positively affect health outcomes.

Accidental injury prevention

Children and young adults

- There is review-level evidence that home visits to people in lower socioeconomic areas plus provision of advice on home hazards, combined with health education and media campaigns, are effective in encouraging parents to make physical changes to the home environment to ensure their homes are safer.
- There is review-level evidence that the provision of free or discounted home safety equipment and/or educational campaigns may lead to behavioural and environmental change.
- There is conflicting review-level evidence on the effectiveness of interventions comprising healthcare counselling or education, provision of safety information or free thermometers in encouraging people to use safe hot water temperatures.
- Currently, there is a lack of review-level evidence on the effectiveness of provision of home safety equipment and/or educational campaigns in reducing physical injuries in children and young adults through modification of the home environment.

Older people

- There is review-level evidence to suggest that home hazard modification interventions that seek to remove and repair safety hazards are effective in reducing falls in older people. This effect was strongest for people with a history of falling prior to intervention and men aged ≥ 75 years.

- There is a lack of review-level evidence on the effectiveness of home modification in reducing the risk of injurious falls in older people.

Smoke alarms

- There is review-level evidence that community based provision of free smoke alarms (with or without installation) may reduce fire-related injuries.
- There is review-level evidence from the US that smoke detector legislation can reduce the number of fire-related deaths compared with communities without smoke detector legislation. However, there was no difference in the number of smoke detectors installed between communities.
- There is conflicting review-level evidence of the effectiveness of education-based interventions combined with provision of discounted smoke detectors in increasing the proportion of people that install smoke detectors.
- Currently, there is a lack of review-level evidence to demonstrate effectiveness of community based injury or burn prevention education programmes.

Prevention of allergic respiratory disease

Asthma

- Currently, there is a lack of review-level evidence of effectiveness of air filtration systems in improving health outcomes in people with asthma.
- Currently, there is a lack of review-level evidence on the effectiveness of interventions that aim to reduce exposure to house dust mite allergen in the home in improving health outcomes in people with mite-sensitive asthma.

Asthma and allergic rhinitis

- There is review-level evidence to suggest that the use of physical (intensive home cleaning, vinyl mattress covers, daily wet cleaning of floors, boiling of top bedding covers and removal of soft furnishing) and/or chemical measures (air filters loaded with Enviracaire and acaricide spray and cleaning products) may lead to a reduction in allergen load for those with house dust mite-provoked respiratory disease when combined with maintenance drug treatments. However, the magnitude of the effect cannot be reliably isolated from that of the maintenance drug treatment.

Gaps in the evidence base

Although we have not systematically searched for gaps in the primary research, we have identified a number of gaps in the review-level evidence either from our observations or those made by the authors of the Evidence Base papers.

Inequalities and vulnerable groups

The Evidence Base papers report that there is review-level evidence of effectiveness for the following housing-related interventions that specifically targeted socio-economically deprived or vulnerable groups:

- Rehousing people from slum areas can improve self-reported physical and mental health outcomes in the

longer term (18 months). But it is important to note that rehousing people from slum areas can also adversely affect self-reported health outcomes in the short term (nine months)

- Rental voucher programmes in the US can improve household safety by providing lower socio-economic families with the choice to move to neighbourhoods with reduced exposure to violence
- Home visits to people in lower socio-economic areas plus provision of advice on home hazards, and combined with health education and media campaigns, are effective in encouraging parents to make physical changes to the home environment to ensure their homes are safer.

However, overall, very few studies found evidence of effectiveness of housing interventions in improving health outcomes in these groups and further research needs to be undertaken to address this important gap in the evidence base.

Cost effectiveness

There is an urgent need for primary research to be undertaken to examine the cost effectiveness of housing-related interventions to improve health outcomes in both the general population and disadvantaged and vulnerable groups.

Research recommendations

- The effectiveness or cost effectiveness of interventions that target specific housing elements that are known to affect health outcomes needs to be determined. These include interventions that seek to minimise exposure to indoor pollutants (such as asbestos, carbon monoxide, radon, lead and volatile organic chemicals); infestation; hazardous internal structures or fixtures; noise; and cold or damp.
- Similarly, the effectiveness of housing-related interventions that seek to address problems in the broader social and

behavioural environment such as overcrowding, sleep deprivation, neighbourhood quality, infrastructure deprivation (ie lack of availability and accessibility of health services, parks, stores selling healthy foods at affordable prices); neighbourhood safety; and social cohesion also needs to be determined.

- Finally, there is a lack of evidence of effectiveness of housing-related interventions that relate to the broader macro-policy environment such as housing allocation, lack of housing,

housing tenure, housing investment and urban planning. Further research will be required in each of these areas to more comprehensively inform the policy making process.

In their recent review, Thomson et al. (2001, 2002) identified 14 ongoing studies in the UK that aim to assess health outcomes from housing interventions. Findings from these studies will be key in informing a relatively depleted evidence base.

References

Bonnefoy, X. E., Annesi-Maesano, I., Aznar, L. M. et al. (2004). *Review of evidence on housing and health*. Background document to the Fourth Ministerial Conference on Environment and Health, Budapest, Hungary, June 23-25, 2004. www.euro.who.int/document/HOH/ebackdoc01.pdf

Dahlgren, G. and Whitehead, M. (2001). *Policies and strategies to promote social equity in health*. Stockholm: Institute for Futures Studies.

Department of Health (2003). *Tackling Health Inequalities: a programme for action*. London: Stationery Office.

ODPM (2003a). *English House Condition Survey Key Findings 2003*. London: Office of the Deputy Prime Minister.

ODPM (2003b). *Communities Plan (Sustainable communities: building for the future)*. London: Office of the Deputy Prime Minister.

Social Exclusion Unit (2001). *A new commitment to neighbourhood renewal: national strategy action plan*. London: Cabinet Office.

Strategy Unit (2005). *Improving the prospects of people living in areas of multiple deprivation in England*. London: Cabinet Office.

Thomson, H., Petticrew, M. and Morrison, D. (2001). Health effects of housing improvement: systematic review of intervention studies. *British Medical Journal* 323 (7306): 187-90.

Thomson, H., Petticrew, M. and Morrison, D. (2002). *Housing improvement and health gain: a summary and systematic review*. Occasional Paper 5. University of Glasgow: MRC Social and Public Health Sciences Unit.

Authors of this review:

Nichole Taske, Lorraine Taylor, Caroline Mulvihill and Nick Doyle

with Joanna Goodrich and Amanda Killoran

Contact:

website: www.publichealth.nice.org.uk

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