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ORIGINAL ARTICLE

Material and meaningful homes: mental health impacts and psychosocial benefits of rehousing to new dwellings

Ade Kearns · Elise Whitley · Phil Mason · Mark Petticrew · Caroline Hoy

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Abstract
Objective To establish whether rehousing people to new dwellings had impacts upon residents' mental health and psychosocial benefits derived from the home.
Methods A prospective controlled study across Scotland involving 723 householders (334 intervention; 389 control). Interviews were carried out just prior to the move, and 2 years thereafter.
Results Changes in self-reported psychosocial benefits were greater than changes in mental health. Respondents in family households appeared to have gained the most and those in older person households the least. For those in families, the most consistent effects flowed from improvements in space, privacy and change of location; for those in adult-only households, improvements in crime and safety mattered most. Gains in psychosocial benefits were associated with improved mental health (SF-36) scores.
Conclusions Rehousing has substantial impacts on residential conditions and on psychosocial benefits, and lesser (possibly indirect) impacts upon mental health. Housing is a complex intervention applied to a heterogeneous group for a range of reasons. Hence its impacts result from different aspects of residential change for particular types of household.

Keywords SHARP study · Rehousing · Mental health · Psychosocial benefits

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A. Kearns (✉) · E. Whitley · P. Mason
Urban Studies, School of Social and Political Sciences, University of Glasgow, 25 Bute Gardens, Glasgow G12 8RS, UK
e-mail: ade.kearns@glasgow.ac.uk

M. Petticrew
Public and Environmental Health Research Unit, London School of Hygiene and Tropical Medicine, London, UK

C. Hoy
NHS Health Scotland, Edinburgh, UK

Introduction

Reviews have tended to confirm that housing conditions are associated with adult mental health (Halpern 1995; Marsh et al. 1999; Wilkinson 1999; BMA 2003; Evans et al. 2003). This is usually ascribed to one or more of: living in flats; poor quality housing (including structural problems, poor repair and resident dissatisfaction); 'difficult-to-let' housing; overcrowding; and dampness. It is sometimes difficult to distinguish the effects of different factors, e.g. overcrowding and dampness (ODPM 2004). Often the research involved single-site studies (e.g. Hopton and Hunt 1996) where unique estate characteristics might account for variation in findings.

There is also a question about whether housing interventions impact upon mental health. A recent systematic review (Thomson et al. 2009a) reported that only the less rigorous studies found significant positive impacts upon mental health, whereas the few, more rigorous studies did not. A key factor was whether the research had utilised a control group in a prospective design.

Another key question is 'how and why' does housing relate to mental health? Indications have been provided by health research on the work-place psychosocial environment, where

issues of control, self-efficacy (people feeling they are making a contribution and experiencing control) and self-esteem (people experiencing belonging, approval and success) have been shown to be related to physical and mental health (Siegrist and Marmot 2004; Glass 2000; Egan et al. 2008). Studies of psychosocial processes in relation to housing have also had a focus on the issue of control (e.g. Dunn 2002). Evans et al. (2003) also highlighted psychosocial processes such that poor housing conditions might impact upon feelings of identity (with consequences for self-esteem), insecurity and risk (with consequences for anxiety and fear), and control (with consequences for self-efficacy). A later review (James 2008) similarly expounded on the impacts of poor housing in terms of powerlessness and stress, lack of privacy, reduced neighbourliness, lower self-image and lower confidence (see Halpern 1995, Hooper et al. 2007, Evans and Stecker 2004 and Cooper-Marcus 1995 for the underlying arguments).

In one of the more thorough studies using this approach, Thomas et al. (2005) identified three psychosocial pathways in or out of mental distress: 'restricted opportunity' or failure to achieve personal goals; powerlessness, loss and humiliation; and new hope or a fresh start on a pathway to better outcomes. Thomas et al. concentrated on the first of these in a study of housing improvements in the UK, finding housing improvements to be detrimental to mental health but better mental health to be associated with lower assessments of psychosocial risk.

We aim to take this work further by utilising a broader conception of the residential psychosocial environment ranging across Siegrist and Marmot's domains of self-efficacy and self-esteem. We take psychosocial processes to pertain to an individual's view of their own wellbeing and social position, perceived in relation to their interactions with others, involving both social comparisons and control over social relations (see Gibson et al. 2011 for further discussion). Psychosocial benefits from the home would therefore include not only aspects of autonomy and control, but also aspects of security and retreat, and aspects of status and identity (see Kearns et al. 2000).

We have focused on one of the other psychosocial pathways identified by Thomas et al. (2005), namely that of a 'fresh start'—in our case moving to a newly constructed home. There have been far fewer studies in the UK of this type of housing intervention compared with those of housing improvements. Two existing studies which utilised the SF-36 scale to measure change in health-related quality of life in an intervention and control group found no improvement in mental health from rehousing for the intervention group (Thomson et al. 2009b; Critchely et al. 2004). Two other studies based on self-reported mental health measures, found modest gains in mental health among those people rehoused to new dwellings, though both studies had design weaknesses such as an inability to accurately define those rehoused (Barnes 2004) and the lack of a comparison group (Ambrose 2000).

Only one of the existing UK studies of rehousing examined psychosocial benefits, reporting an increase in feelings of safety at home among the intervention group, though, again, this was not statistically significant (Barnes 2004). Similarly, only one UK study measured changes in housing conditions over time, and related these to changes in mental health: it found that a big increase in the energy efficiency of the home was associated with better emotional health and greater vitality, using SF-36 sub-scales (Critchely et al. 2004).

Given this weak (and, in some respects, absent) evidence base, our aim was to study the impacts of rehousing to a new dwelling on both mental health and psychosocial benefits from the home, and to do so utilising a quasi-experimental study design that included a control group for comparison, and which was multi-site rather than based on a single development. We also wished to open the 'black box' of housing intervention to see which aspects of rehousing and altered housing conditions mattered the most for change in mental health and psychosocial outcomes.

Our research questions were therefore:

- Does rehousing to a new dwelling in the social rented sector impact upon the mental health of residents?
- Does rehousing result in greater psychosocial benefits from the home?
- Which aspects of residential change are associated with changes in these outcomes?
- Are changes in psychosocial benefits associated with changes in mental health for those rehoused?

Methods

The SHARP study

The Scottish Housing, Health and Regeneration Project (SHARP) was established in 2001 to examine the health and wellbeing effects of rehousing people into newly constructed social sector dwellings. It sought to measure changes in residential conditions as well as changes in physical health, health behaviours and mental health and wellbeing and to explore how the two might be related. It also recognised that changes in outcomes may also be due to transitions in neighbourhood and landlord at the same time.

The study aimed to achieve a nationwide sample of new dwelling construction and made use of a comparison group [or control group (CG)] so that changes observed in those rehoused [the intervention group (IG)] could be more reliably attributed to the intervention itself. Further details of the study methods and the samples are given in Petticrew et al. 2008, 2009.

Recruitment and survey of the study groups

Forty-five social landlords (housing associations) participated in the study, involving a total of 57 new housing developments located in 21 local authority districts across Scotland. New occupants (householders) moving into these developments were invited to take part in the study by the housing staff. A comparison group was also recruited through door-to-door survey methods. The CG members were to be: living in the same locality as the IG would be living in after rehousing; living in rented housing, as were the IG; not recently rehoused or awaiting rehousing; of similar household type, based on three household structures: family households (with children under 16), older person households (of pensionable age), and adult households (all over 16).

The aim was to interview IG members within the 2 weeks before they moved into their new home and then again 2 years after they had moved in, and to interview CG members around the same times. The pre-intervention interviews took place between May 2002 and April 2004 and the post-intervention interviews from May 2004 to April 2006. At the pre-intervention stage, a total of 334 IG and 389 CG interviews were completed (response rates of 46 and 39% respectively). At the post-intervention stage, 262 IG and 285 CG interviews were achieved, giving retention rates of 78 and 73% respectively. The pre-intervention IG cohort represented a 10% sample of the annual, nationwide social rented housing sector output of new dwellings.

Measures used

Mental health and wellbeing were assessed using four of the SF-36 sub-scales (Ware et al. 2007): mental health (covering issues of anxiety and depression); vitality (having energy or feeling tired); social functioning (being impeded in normal activities by emotional problems); and role-emotional (being less effective as a result of emotional problems). Each of these sub-scales are constructed as indices ranging from 0 to 100, and then converted to norm-based scores where the population mean for each sub-scale is 50 with a standard deviation (SD) of 10. We examined changes in the mean SF-36 sub-scale scores over time.

Psychosocial benefits from the home were measured using a scale of ten items used in a previous study (see Kearns et al. 2000 and Appendix 1). The items cover a range of issues relating to feelings of autonomy and control, security and retreat, and status from the home. We examined changes in response to the individual PSB items over time, in particular the level of 'strong agreement' with each item, as well as changes in the aggregate PSB score (range 0–40).

Changes in residential circumstances were measured by asking respondents about problems with their home and problems in their neighbourhood, at both interviews. A list of 28 aspects of the home was used, covering aspects of condition (e.g. state of repair), safety (e.g. security of the dwelling), amenities (e.g. double glazing), space (e.g. size of rooms) and privacy (e.g. noise from neighbours). We examined the number of dwelling problems identified by respondents at each survey, and change in this number over time. In addition, for the IG, we recorded the changes experienced in dwelling type (e.g. flat to house) and elevation (e.g. from upper floor to ground floor).

A list of 23 potential issues in the local area was also used. These neighbourhood problems were divided into two groups: twelve items that related to neighbourhood infrastructure, e.g. services and environmental quality; and eleven items related to neighbourhood crime and anti-social behaviour, e.g. vandalism, litter, etc. The responses to all items in each group were combined into a problem load index for each respondent ranging from 0 (no items a problem) to 100 (all items a serious problem). We examined the mean problem load at each survey, and change in the problem load over time. In addition, for the IG, we recorded whether the respondent had moved to a new neighbourhood, and whether they lived in a regeneration area after moving home.

A full account of all changes in residential circumstances recorded in the study is given in Kearns et al. 2008.

Analyses

Changes over time in residential, mental health and psychosocial benefit outcomes were compared between the IG and CG by examining differences in change in the mean scores between the groups. Differences in change in mean scores were also compared separately for each household type between the groups. For some analyses the IG were further divided into those who had moved neighbourhood as well as house (termed 'Relocators') and those who only moved house, i.e. within the same neighbourhood (termed 'House Movers'), a 52:48 split of the IG.

We then examined whether the outcome scores (four SF-36 sub-scale scores and the PSB score) for the IG at the post-intervention stage were associated with particular changes in residential and other circumstances. This was done separately for two household types: families with dependent children and adult households.

Least squares regression modelling was used to examine the change in outcome-measure score associated with a positive change in 21 residential circumstances. Changes in housing, neighbourhood and community circumstances were divided into four blocks (see Appendix 2): eight dwelling items (dwelling type, floor level, garden, fabric,

safety, amenities, space and privacy); five community items (belonging, cohesion, empowerment, safety and collective efficacy); four neighbourhood items (change of location, living in a regeneration area, neighbourhood infrastructure, and neighbourhood crime); and four local activity items (use of local amenities, local social networks, neighbouring, and participation in clubs).

In the first stage, the relationship between each of the individual 21 items and the outcome score in question was examined. In the second stage, each of the four blocks of independent variables was studied separately, with the effects of each constituent item on the outcome score examined, simultaneously controlling for all other items in the block (e.g. the effects of a change in space in the home, controlling for all other dwelling changes). The third stage included all (and only) those independent variables found to have a significant effect ($p < 0.05$) on the outcome score in the previous multivariate analysis. In the analysis of SF-36 sub-scale outcome scores, we additionally controlled for changes in the physical health of respondents: change over time in SF-36 Physical Functioning sub-scale score; change in the number of activities limited by health; and presence of long-standing illness at the post-intervention stage.

Finally, for each of the two household types within the IG, we assessed the strength of relationship between respondents' PSB scores and their SF-36 sub-scale scores. We investigated the size of change in SF-36 sub-scale scores associated with a 1 SD change in PSB score (pre- to post-intervention).

Results

Changes in residential circumstances

Whilst the proportion of the CG who lived in a house remained virtually unchanged (from 48.6% in the pre-survey to 51.8% in the post-survey), the proportion of the IG living in houses rose from 28.2 to 63.0%. The number of IG members with sole use of a garden increased from 41.0 to 78.2% and those without any access to outside space fell from 25.8 to 6.2%.

The IG had more than twice the number of dwelling problems per person as the CG pre-intervention, but fewer problems afterwards. A reduction of 59.2% in the number of dwelling problems per person for the IG contrasted with a 9.8% reduction for the CG (see Table EMS 1). Changes in neighbourhood quality were also greater for the IG, though the differences with the CG were not as great as in the case of housing. Thus, neighbourhood infrastructure problems fell by 19.2% for those IG members who moved neighbourhood, by 24.0% for those who moved house only, and by 9.5% among the CG who remained in the same house and neighbourhood. Similarly, neighbourhood crime and anti-social behaviour problems fell by 25.7% over time for 'relocators' and by 28.1% for 'house movers', compared with a reduction of 11.0% among the CG.

Changes in SF-36 mental health sub-scales

Both study groups had below average (i.e. <50) mental health scores, i.e. worse mental health than the general population, on all four SF-36 dimensions, both before and after intervention. Across all four dimensions, the mean changes in scores (all positive) were lower for the IG than for the CG, although none of the differences was significant (see Table EMS 2). Thus, rehousing to a new dwelling did not have any marked impact upon mental health as measured by the SF-36.

The aggregate picture however hides important variation by household type within the IG (see Table EMS3). For IG respondents in family households (with dependent children), there was a positive mean change on all four SF-36 dimensions over time, with a higher mean score change in the IG than in the CG in each measure. At the same time, there was a negative mean change for IG respondents in older person households on all four dimensions, sometimes in contrast to their equivalent CG respondents. IG adult-only households ('families with non-dependent children' and 'adult households') had a more mixed experience, seeing positive changes on some dimensions and negative changes on others.

Three aspects of residential change stand out as having significant and positive impacts (at least at the first stage of analysis) on SF-36 dimensions for respondents in family households (Table 1): gains in space were associated with increases in all four SF-36 scores, and gains in privacy and a change of location were each associated with increases in three SF-36 scores. There were no marked effects of aspects of residential change on mental health outcomes for adult households.

Controlling for all other residential changes simultaneously (last column of Table 1), we see that: change of location produced a positive change in Mental Health and Vitality scores of around 0.4 SD, independent of other factors; gains in the suitability of space were associated with a 0.5 SD increase in Vitality scores; improved perceptions of community empowerment were associated with an increase in Social Functioning scores of 0.5 SD; and gains in privacy were associated with increases in Role-Emotional scores of 0.7 SD.

Changes in psychosocial benefits from the home

If we look at the level of agreement with each psychosocial benefit item (Table 2), we see that, apart from the

Table 1 Changes in SF-36 Scores associated with gains in residential circumstances, respondents in families with dependent children in the intervention group, SHARP, Scotland, 2004–2006

	First stage Univariate analysis[a]	Second stage Multivariate analysis within block[b]	Third stage Multivariate analysis across all blocks[c]
Dimension: mental health			
Block 1: dwelling changes			
Space	5.74 (1.37 to 10.11)*	4.41 (−0.18 to 9.00)	
Privacy	6.47 (2.07 to 10.87)**	4.71 (−0.02 to 9.43)	
Block 2: community changes			
Belonging	5.59 (1.06 to 10.12)*	2.87 (−2.12 to 7.86)	
Cohesion	6.15 (1.61 to 10.69)*	4.07 (−0.99 to 9.13)	
Safety	6.24 (1.69 to 10.79)*	4.96 (0.30 to 9.62)*	4.37 (−0.23 to 8.97)
Block 3: neighbourhood changes			
Change of location	5.06 (0.86 to 9.25)*	4.66 (0.15 to 9.16)*	5.12 (0.57 to 9.67)*
Dimension: vitality			
Block 1: dwelling changes			
Dwelling type	−4.30 (−8.19 to 0.41)*	−3.91 (−9.57 to 1.74)	
Garden	−4.24 (−8.13 to 0.34)*	−3.62 (−9.78 to 2.55)	
Space	6.42 (2.60 to 10.25)**	6.33 (2.40 to 10.27)**	5.67 (1.48 to q9.85)*
Privacy	4.43 (0.47 to 8.39)*	1.85 (−2.20 to 5.90)	
Block 2: community changes			
Safety	6.29 (2.21 to 10.36)**	6.28 (1.99 to 10.57)**	3.93 (−0.25 to 8.12)
Block 3: neighbourhood changes			
Change of location	5.56 (1.66 to 9.46)*	5.37 (1.13 to 9.61)*	4.90 (0.80 to 8.99)*
Dimension: social functioning			
Block 1: dwelling changes			
Space	5.15 (0.37 to 9.94)*	4.40 (−0.74 to 9.53)	
Block 2: community changes			
Empowerment	6.24 (0.94 to 11.54)*	6.14 (0.16 to 12.13)*	6.24 (0.94 to 11.54)*
Dimension: role-emotional			
Block 1: Dwelling changes			
Space	5.80 (0.48 to 11.1)*	3.44 (−2.12 to 9.01)	
Privacy	9.49 (4.24 to 14.74)**	8.43 (2.70 to 14.17)**	9.32 (4.07 to 14.56)**
Block 3: Neighbourhood changes			
Change of location	5.56 (0.46–10.66)*	6.09 (0.49–11.69)*	4.26 (−0.79 to 9.32)

$N = 139$

Changes in scores are followed by 95% confidence intervals (CIs) in parentheses

The mean (SD) SF-36 scores, post-intervention for respondents in family households were: Mental Health 43.0 (13.7); Vitality 43.6 (11.8); Social Functioning 44.8 (13.5); Role-Emotional 45.2 (13.2)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[a] Table shows only those variables significant in univariate analysis ($p < 0.05$)

[b] Adjusting additionally for all other variables in that block, whether significant in univariate analysis or not

[c] Including all those variables significant in any of the multivariate analyses ($p < 0.05$)

'security' item, for all nine positively phrased items, there was a marked increase in strong agreement over time in the IG compared with slight change in the CG. Controlling for level of agreement pre-intervention, there are two items where the likelihood of strong agreement post-intervention was nearly twice as high among the IG than the CG, namely status and identity benefits (last column of Table 2).

There was a significant increase in the mean aggregate PSB score for the IG over time (equivalent to around 1 SD) compared with no change in the CG score (Table 3). Among the IG, there was an increase in aggregate PSB

Table 2 Change in psychosocial benefits (strong agreement), SHARP, Scotland, 2004–2006

	Pre-intervention		Post-intervention			
	N	% strong agreement	*N*	% strong agreement	Change in %	Odds ratio adjusted for pre-intervention response[a]
Privacy						
Control	389	40.9	284	36.3	−4.6	1.00
Intervention	333	16.5	262	36.6	20.1	1.28 (0.88, 1.86)
p		<0.001				0.20
Retreat						
Control	389	33.3	284	30.3	−3.0	1.00
Intervention	333	13.0	262	30.9	17.9	1.22 (0.83, 1.80)
p		<0.001				0.31
Freedom						
Control	389	37.1	284	33.5	−3.6	1.00
Intervention	333	15.6	262	34.0	18.4	1.13 (0.78, 1.64)
p		<0.001				0.51
Status						
Control	389	24.5	284	23.2	−1.3	1.00
Intervention	333	7.5	262	31.7	24.2	1.90 (1.26, 2.96)
p		<0.001				0.002
Control						
Control	389	34.5	284	31.3	−3.2	1.00
Intervention	333	9.3	262	31.3	22.0	1.23 (0.83, 1.82)
p		<0.001				0.31
Progress						
Control	389	24.0	284	24.4	0.4	1.00
Intervention	333	3.3	262	24.1	20.8	1.29 (0.84, 1.99)
p		<0.001				0.25
Security						
Control	389	11.1	284	13.7	2.6	1.00
Intervention	333	15.9	262	13.4	−2.5	0.93 (0.56, 1.54)
p		0.06				0.78
Routine						
Control	389	30.2	284	27.8	−2.4	1.00
Intervention	333	11.2	262	23.3	12.1	0.93 (0.62, 1.40)
p		<0.001				0.73
Safety						
Control	389	28.9	284	30.0	1.1	1.00
Intervention	333	21.7	262	32.8	11.1	1.24 (0.85, 1.79)
p		0.03				0.26
Identity						
Control	389	24.0	284	20.4	−3.6	1.00
Intervention	333	7.8	262	24.1	16.3	1.81 (1.15, 2.85)
p		<0.001				0.01

[a] Comparing odds of strong agreement in intervention versus control group, adjusting for differences in responses pre-intervention

score of at least 1 SD for respondents in family and adult households, with little change in the mean score for their CG equivalents (EMS Table 4). However, the change in mean score was far smaller for IG older person households, and not markedly different from the CG.

For IG respondents in family households (see Table 4), the two residential changes with the greatest impact upon PSB scores were improvements in dwelling amenities and in dwelling privacy, each of which was associated with a rise in PSB scores of 0.7 SD. The suitability of dwelling

Table 3 Change in mean psychosocial benefits score (0–40), SHARP, Scotland, 2004–2006

	Pre-intervention		Post-intervention		
	N	Mean psychosocial benefits score	*N*	Mean psychosocial benefits score	Change in mean psychosocial benefits score
Control	383	29.3	278	29.2	−0.1
Intervention	328	22.7	257	29.7	7.0
p		<0.001		0.67	<0.001

Table 4 Changes in psychosocial benefit scores associated with gains in residential circumstances, respondents in families with dependent children in the intervention group, SHARP, Scotland, 2004–2006

	First stage Univariate analysis[a]	Second stage Multivariate analysis within block[b]	Third stage Multivariate analysis across all blocks[c]
Block 1: dwelling changes			
Safety	3.54 (0.15 to 6.93)*	1.97 (−1.44 to 5.37)	
Amenities	5.05 (2.31 to 7.78)***	5.13 (2.13 to 8.12)**	4.34 (2.28 to 6.41)***
Space	4.68 (1.92 to 7.44)**	2.85 (0.14 to 5.57)*	2.38 (0.16 to 4.60)*
Privacy	6.68 (4.01 to 9.35)***	5.14 (2.35 to 7.94)***	4.29 (1.96 to 6.61)***
Block 2: community changes			
Belonging	5.00 (2.08 to 7.92)***	2.18 (−1.01 to 5.36)	
Cohesion	6.14 (3.28 to 9.00)***	4.44 (1.24 to 7.64)*	1.91 (−0.15 to 3.96)
Safety	4.56 (1.60 to 7.53)**	3.19 (0.26 to 6.13)*	2.53 (0.44 to 4.61)*
Block 3: neighbourhood changes			
Change of location	4.19 (1.46 to 6.92)**	3.94 (1.15 to 6.73)*	1.66 (−0.32 to 3.63)
Infrastructure	5.75 (3.10 to 8.40)***	4.61 (1.77 to 7.45)**	1.26 (−0.84 to 3.36)
Crime	3.87 (1.11 to 6.62)*	1.75 (−1.26 to 4.75)	
Block 4: activity changes			
Neighbouring	3.46 (0.66 to 6.25)*	3.68 (0.80 to 6.57)*	0.69 (−1.39 to 2.73)

$N = 136$

Changes in scores are followed by 95% CIs in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[a] Table shows only those variables significant in univariate analysis ($p < 0.05$)

[b] Adjusting additionally for all other variables in that block, whether significant in univariate analysis or not

[c] Including all those variables significant in any of the multivariate analyses ($p < 0.05$)

space, and improved feelings of safety in the community were also associated with increases in PSB scores, though of a lower magnitude (0.4 SD).

For respondents in adult households (Table 5), fewer aspects of residential change had significant impacts upon PSB scores. The two aspects that had effects on PSB scores in multivariate analysis were both safety-related, namely improved feelings of safety in the community, and reduced perceptions of neighbourhood crime.

Relating psychosocial benefits with mental health in the intervention group

Within the IG at the post-intervention stage, psychosocial benefits were positively associated with SF-36 Mental Health scores for respondents in both family and adult households, and also with SF-36 Vitality and SF-36 Social Functioning scores for respondents in family households alone (Table 6). The relationship was strongest in the case of SF-36 Mental Health scores, where, for respondents in both types of household across the IG, an increase of 1 SD in the post-intervention PSB score was associated with a rise in the SF-36 Mental Health score of around 0.33 SD.

For IG respondents in family households, there were also significant effects arising from the change in PSB scores over time (from pre- to post-intervention stage): a 1-SD increase in the change in PSB score over time was associated with increases in the change in SF-36 Dimension scores of <0.2 SD for Social Functioning, 0.25 SD for Vitality and 0.33 SD for Mental Health.

Table 5 Change in psychosocial benefit scores associated with gains in residential circumstances, respondents in adult households in the intervention group, SHARP, Scotland, 2004–2006

	First stage Univariate analysis[a]	Second stage Multivariate analysis within block[b]	Third stage Multivariate analysis across all blocks[c]
Block 1: dwelling changes			
Fabric	5.25 (1.95 to 8.54)**	4.37 (−0.23 to 9.08)	
Safety	4.44 (0.75 to 8.14)*	2.95 (−0.93 to 6.83)	
Privacy	5.57 (1.68 to 9.45)*	3.90 (−0.14 to 7.95)	
Block 2: community changes			
Safety	3.27 (0.04 to 6.50)	3.60 (0.14 to 7.08)*	2.26 (−1.25 to 5.77)
Block 3: neighbourhood changes			
Crime	4.69 (1.47 to 7.92)*	5.46 (1.43 to 9.49)*	3.55 (0.01 to 7.09)

$N = 78$

Changes in scores are followed by 95% CIs in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

[a] Table shows only those variables significant in univariate analysis ($p < 0.05$)

[b] Adjusting additionally for all other variables in that block, whether significant in univariate analysis or not

[c] Including all those variables significant in any of the multivariable analyses ($p < 0.05$)

Table 6 Relating post-intervention mental health scores with psychosocial benefits in the intervention group, SHARP, Scotland, 2004–2006

	SF-36 Mental Health		SF-36 Vitality		SF-36 Social Functioning		SF-36 Role-Emotional	
	Change in score	% SD	Change in score	% SD	Change in score	% SD	Change in score	% SD
Change in SF-36 dimension scores associated with an SD increase in psychosocial benefit score at post-intervention								
Families	3.87 (1.77 to 5.98)**	28.2	2.32 (0.47 to 4.16)*	19.7	1.73 (−0.43 to 3.88)	12.8	1.26 (−0.85 to 3.37)	9.3
Adult households	4.32 (1.70 to 6.95)**	33.2	1.82 (−0.36 to 4.00)	17.5	0.86 (−1.82 to 3.55)	6.8	2.19 (−0.50 to 4.89)	17.1
Change in change in SF-36 dimension scores associated with an SD increase in change in psychosocial benefit score from pre- to post-intervention								
Families	4.70 (2.59 to 6.81)***	33.8	3.50 (1.48 to 3.52)**	27.1	2.45 (0.07 to 4.83)*	16.7	2.46 (−0.16 to 5.07)	15.1
Adult households	4.14 (0.93 to 7.35)*	29.2	0.63 (−1.99 to 3.25)	5.6	−0.20 (−3.57 to 3.18)	−1.4	−0.79 (−4.53 to 2.94)	5.0

$N = 143$ families; 90 adult households

* $p < 0.05$, ** $p < 0.01$ *** $p < 0.001$

Discussion

Our study is one of very few UK studies of the effects of rehousing that makes use of a prospective, quasi-experimental design employing a control group, and the only one examining programme-level effects across a multi-site intervention.

We have shown that rehousing people to newly built social sector dwellings in Scotland results in substantial improvements in residential conditions for those rehoused, in both housing and neighbourhood terms. However, this is not reflected in any substantial improvements in indicators of mental health in all households combined when compared with a control group. This may be due to a number of reasons relating to both the intervention and the intervention group. The intervention—being allocated a new house—is provided for people for a range of reasons including housing, personal and social circumstances, any or all of which may relate to mental health status. It is clear that mental health gain is not a primary purpose for providing new housing. The regulatory requirements for social landlords stipulate that housing should be allocated in ways which 'give reasonable preference to those in greatest housing need; makes best use of available stock; maximises choice; and helps to sustain communities' (Communities Scotland 2006).

Furthermore, the intervention group—those getting new housing—are very variable in characteristics and needs, and this may affect the scope for mental health impact across the treatment group as a whole. This was reflected in

our findings on mental health by household type, where we found consistent increases in mental health scores for respondents in families with dependent children, a mixed picture for those in adult-only households and consistent decreases in mental health scores after rehousing for respondents in older households. Thus, the mental health impacts of rehousing appear to be contingent on the household type involved.

In contrast, we found that rehousing led to significant increases in psychosocial benefits from the home, encompassing status-related and control-related items. Again, the effects varied by household type, with the largest gains for respondents in families, slightly lesser gains for those in adult-only households, and the smallest gains for older persons. Thus, there is a degree of consistency across mental health and psychosocial benefits in terms of the scope for positive impacts for different households.

Importantly, we also found that individual gains in psychosocial benefits were related to gains in mental health scores for respondents in family and adult households in the intervention group. Thus, although rehousing did not directly affect mental health across the intervention group as a whole, there is evidence that via psychosocial benefits, rehousing can indirectly impact positively upon mental health for individual beneficiaries, in particular in relation to feelings of happiness and calmness (Mental Health score) and feeling full of energy (Vitality score).

Finally, we have managed to unpack the nature of rehousing as an intervention and shown that different aspects of rehousing affect different households, for different outcomes. Thus, we begin to see why rehousing might impact on mental health and psychosocial benefits for those in receipt of a new dwelling. For those in families with dependent children, the most important aspects of rehousing, for both sets of outcomes, are gains in space and privacy in the home. This is an important message since the regulation of social housing tends to place a strong emphasis on the 'efficient use of the stock', serving to limit potential space gains for occupants; we also know that space standards in the UK are among the lowest in Europe for new construction (Drury et al. 2006).

In addition, gains in perceived community empowerment are important for social functioning scores for respondents in families, and gains in dwelling amenities and community safety for psychosocial benefits. Change of location seemed particularly significant for improvements in mental health dimensions. This is important given that changes in area of residence due to housing allocations or renewal processes are often viewed in detrimental terms (e.g. due to loss of social connections), yet our findings suggest such change can be beneficial.

For those in adult households, it is issues of safety that matter the most, so that where people made gains in perceived safety in the community and reductions in neighbourhood crime, this supported their attainment of psychosocial benefits. We think this may be because adult-household respondents feel particularly vulnerable to risks of crime and anti-social behaviour in deprived areas where much social housing is located in the UK.

The study shows that rehousing is a multi-faceted intervention with differential impacts according to the characteristics of the receiver. Particular aspects of the residential change—ranging across the dwelling, neighbourhood and community—matter for different mental health and psychosocial outcomes. The larger impacts of rehousing are on psychosocial benefits, but via these, the provision of a new house can indirectly impact upon measures of mental health.

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Appendix 1: Psychosocial benefit items

Respondents were presented with a series of ten statements and asked to declare their level of agreement with each on a 5-point scale, from 'strongly disagree' to 'strongly agree'.

Benefit	Statement
Privacy	I feel I have privacy in my home
Retreat	I can get away from it all in my home
Freedom	I can do what I want, when I want in my home
Status	Most people would like a home like mine
Control	I feel in control of my home
Progress	My home makes me feel that I'm doing well in life
Security	I worry about losing my home
Routine	My home life has a sense of routine
Safety	My home feels safe
Identity	My home expresses my personality and values

Appendix 2: Definition of residential gains for the intervention group

Dwelling gains

Dwelling	Moving from a flat to a house
Floor level	Moving from above ground level to ground level
Garden	From having no garden to having use of own garden after moving

Fabric	Reduction in the number of 'serious problems' identified from five items: damp; condensation; draughty/leaky windows; poor state of repair; unclean, unsafe or cold wall surfaces and floor coverings
Safety/ security	Reduction in the number of 'serious problems' identified from four items: level of security; accidents inside the home; accidents outside the home; getting in and out of the home
Amenities	Reduction in the number of 'serious problems' identified from four items: keeping home warm in winter; drying clothes; number of baths/showers; extent of double glazing
Space	Reduction in the number of 'serious problems' identified from four items: too few rooms; too many rooms; rooms too small; rooms too large
Privacy and quiet	Reduction in the number of 'serious problems' identified from four items: not enough privacy; noise from neighbours; noise from other household members; noise from street or area

Gains in sense of community

Belonging	Increases in a combined score (0–12) derived across three questions with 5-point Likert scale response categories from 'agree a lot' to 'disagree a lot': 'The friends and associations I have with other people in my neighbourhood mean a lot to me' 'I feel that living in this neighbourhood gives me a sense of community' 'I don't feel like I belong to this area'
Cohesion	Increases in a combined score (0–20) derived across five questions with 5-point Likert scale response categories from 'agree strongly' to 'disagree strongly': 'People around here are willing to help their neighbours' 'This is a close-knit community' 'People in this neighbourhood can be trusted' 'People in this neighbourhood do not share the same values' 'People in this neighbourhood generally don't get along with each other'
Empowerment	Increases in a combined score (0–16) derived across four questions with 5-point Likert scale response categories from 'agree strongly' to 'disagree strongly': 'The community in this neighbourhood is generally effective in influencing the authorities and achieving what it wants' 'I can have a say in local matters if I want' 'If the people in my community were planning something I would say that "we" were doing something rather than "they" were doing something' 'I'd be happy to work with others to do something for the community'
Safety	Increases in a combined score (0–12) derived across three questions (two questions for non-family households) with 5-point Likert scale response categories from 'agree a lot' to 'disagree a lot': 'I feel safe walking around my area after dark' 'This is a safe place to live' -and for respondents in family households: 'I would be happy for my children to be out after dark'
Collective efficacy	Increases in a combined score (0–16) derived across four questions with 5-point Likert scale response categories from 'very likely' to 'very unlikely': 'How likely is it that neighbours around here could be counted on to do something if… 'Children were skiving off school' 'Children were spraying graffiti on a wall' 'Children were showing disrespect to an adult' 'A neighbour was dumping rubbish in the street'

Neighbourhood improvements

Change of location	Those who answered yes to the following post-intervention question: 'Are you living in the same neighbourhood as before you moved?'
Regeneration area	Post-intervention location within one of the Scottish Government's social inclusion partnership areas. determined by postcode unit
Neighbourhood infrastructure	Reduction in the number of 'serious problems' identified from 12 items: security level of houses, closes, courts and gardens; level of police presence or response speed; general appearance of the area; air quality or pollution; adequate street lighting; noise, e.g. factories, traffic, shouting; speeding traffic or amount of traffic; uneven or dangerous pavements; public transport services; safe children's play areas; facilities for teenagers and young people; reputation of the area
Neighbourhood crime and ASB	Reduction in the number of 'serious problems' identified from 11 items: disturbance by children or youngsters; vandalism/graffiti; litter and rubbish; assaults and muggings; burglaries; people drinking alcohol in public places; nuisance from dogs; people hanging around; drug dealing/taking; the people around here; domestic abuse

Increased local activity

Use of amenities	Increase in the number of amenities used in the local area from a list of 11 items: general grocer or supermarket; leisure facilities, e.g. bingo, social club, pub; sports facilities; local park; post office; bank including ATM; doctors' surgery/health centre; church/chapel/temple; adult education classes; library; schools/nurseries (for families only)
Social networks	Increase in the number of close contacts living nearby (within 10–15 min walk of the home) including: immediate family, close friends or other relatives
Neighbouring	Increase in the number of neighbouring behaviours engaged in from a list of five items: 'I visit my neighbours in their homes' 'If I needed advice, I could go to someone in my neighbourhood' 'I borrow things and exchange favours with my neighbours' 'I rarely have my neighbours over to my house to visit' 'I regularly stop and talk with people in my neighbourhood'
Participation	Increase in the number of organizations people 'join in the activities of' with in the local area, from a list of ten items: political parties, trade unions, pressure groups; parent-teacher association; tenants' or residents' groups; youth groups, scouts, guides or similar; church or other religious group; charitable organization; education, arts or music group, or evening class; social groups; sports club, gym or exercise class; other groups or organizations or informal groups

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