Change in adult health following medical priority rehousing: a longitudinal study

Tim Blackman, Jan Anderson and Paul Pye

Abstract

Background Over 90 per cent of local housing authorities in England allocate medical priority for rehousing (MPR) to applicants with medical or care needs but very few studies have been undertaken to investigate the health effects of this practice. This longitudinal study compares the change in health status of adult applicants for MPR who were rehoused with applicants who were not rehoused.

Methods A total of 566 households applying for MPR were interviewed before any rehousing, and of these 253 households were re-interviewed between 9 and 12 months later. Data from initial and follow-up interviews were analysed for 227 adults, of whom 104 were rehoused. The rehoused and not rehoused groups were not significantly different in terms of health status, gender, education, income or housing conditions, but participants who were not rehoused were more likely to report mobility problems and to be aged over 50. Health data were collected by interview using the Short Form 36 (SF-36) questionnaire. Questions were also asked about housing conditions and the local neighbourhood, instrumental activities of daily living (IADL) and health-related behaviour.

Results The health status of adult applicants for MPR was very poor. Those who were not rehoused experienced a slight improvement in five dimensions of the SF-36 whereas those who were rehoused experienced much larger improvements in six dimensions. For those who were rehoused, significant net improvements occurred in reports of tiredness, feeling depressed, sleeplessness, use of prescribed medication, use of medical services and problems with IADL. No changes occurred in reports of respiratory problems, longstanding illness or disability, use of antidepressants, sleeping pills or tranquilizers, smoking or social support.

Conclusions MPR was associated with improvements in mental health status and mobility, and among respondents aged 50 years or under with a reduced use of prescribed medication and medical services. Whereas most applicants applied for MPR because of mobility problems, they were less likely than other applicants to be rehoused. The health improvements that appeared to occur should be qualified by the extent of unmet need for appropriately adapted housing and the high level of ill-health that persisted even among adults who were rehoused.

Keywords: housing, health, Short Form 36, medical priority rehousing

Background

Over 90 per cent of local housing authorities in England have systems in place to allocate priority for rehousing in the social rented sector to applicants regarded as needing to move on grounds of medical or care needs. Medical priority rehousing (MPR) is used to facilitate moves that are designed to be therapeutic, allocating properties on the basis of health and mobility needs. The system is based on the premise that ‘some houses are more conducive to good health than others’ and it is assumed that rehousing will lead to health improvements. This is the justification for giving applicants with health or care problems higher priority than many other applicants for rehousing.

A recent systematic review of the health effects of housing improvements identified just three studies of rehousing for medical priority needs. The only prospective study was a small-scale investigation with 28 participants in an intervention group (23 of whom were rehoused) and 11 in a comparison group. Participants who were rehoused had greater reductions in anxiety, depression and some physical health problems compared with the not rehoused group. Another study, using a retrospective cross-sectional design, found that 2–3 years after rehousing 38 per cent of the sample (n = 271) reported an improvement in their health, with the most common reason being reduced mobility problems. Finally, a large-scale study of MPR carried out in three metropolitan districts in the North, Midlands and South of England found that 61 per cent of medical priority movers (n = 349) associated their new dwelling with an improvement in their general health. Unfortunately, however, the absence of longitudinal data limited the extent to which conclusions could be made about any health improvements attributable to rehousing.

This paper presents findings from a longitudinal study carried out in Newcastle upon Tyne, United Kingdom. At the time...
of the study in 1997–1998, the city council’s housing department was receiving 6000–7000 applications annually for MPR and was rehousing around 2500 applicants per year, or about 40 per cent. Given the work involved in processing these applications, and the significance of medical priority as a route into the best of the council’s housing stock, the housing department wanted to establish the extent and type of health improvements to help guide its priorities for both allocations and housing investment.

Method

The main aim was to assess any health changes that occurred following rehousing, controlling for confounding variables. A quasi-experimental design was used, based on interviewing applicants for medical priority rehousing at the application stage and following up these applicants a year later. As discussed further below, some applicants were rehoused whereas others were not, so the rehoused group could be regarded as an ‘experimental’ group and those who were not rehoused as a ‘control’ group. Differences between the two groups in mobility and age were taken into account in the analysis. The design is not as robust as a randomized controlled trial but this was not considered acceptable for ethical reasons.

The samples were obtained by contacting all new applicants to the council’s MPR waiting list over two 6-week periods in February–March 1997 (winter sample) and July–September 1997 (summer sample). Applicants were sent a letter inviting them to participate and, if they consented, were visited by a trained interviewer. A maximum of five call-backs were made. In total, 1054 applications were sampled in this first phase and 566 households were interviewed, giving a response rate of 54 per cent. Follow-up interviews were conducted during the second phase of the fieldwork in March–April 1998 (winter sample) and June–September 1998 (summer sample), and 253 households were re-interviewed from the original 566, giving a response rate of 45 per cent. Among households who moved, only those that moved within 3 months of the application stage interview were sampled for a follow-up interview, to allow time for any change in housing circumstances to have an effect on health status. Thus, at the time of their follow-up interview all rehoused respondents were in their new property for between 9 and 12 months, whereas non-rehoused respondents stayed in the same property throughout the period.

This paper reports results from the analysis of data for all adults in the achieved samples. From the 253 households that took part in both phases, 188 were identified where adults were applying for MPR; the remaining 65 applications were MPR requests for children only. As some households had more than one adult applying for medical priority, data were collected for 227 individual adults. Of these, 104 adults were rehoused (46 per cent) and 123 were not rehoused (54 per cent), similar proportions to total housing department figures at the time of the study. The two seasonal samples were compared using χ² and unrelated t-tests, and no significant differences in demographic composition or health status were apparent. The samples were therefore merged into one dataset for analysis. Participants who were not rehoused but received in situ adaptations (n = 17) were not included in the analysis as the study was concerned with the effects of rehousing and this group was too small to analyse separately.

Self-reporting has been found to be reliable for measuring health status, although careful attention needs to be given to questionnaire design. The study used the Short Form 36 (SF-36) questionnaire as validated and adapted for use in the UK, where it has been used extensively, and results from the Oxfordshire Healthy Living Survey (OHLS) are available as community norms for social class, gender and age. Questions were also asked about smoking, use of medication and medical services, and social support. The person mainly responsible for the household was interviewed, and other adult household members were asked to complete a questionnaire.

This paper reports results for individual health-related factors, such as the prevalence of one or more acute respiratory problems, sleeplessness, smoking and use of medical services, and problems with instrumental activities of daily living (IADL). IADL data were based on specific questions about difficulty with climbing stairs or steps, operating door handles or knobs, operating light or power switches, getting in and out of the bath, and getting on and off the toilet. Results are also presented for seven dimensions of the SF-36: physical role limitation, emotional role limitation, pain, energy and vitality, mental health perception, social functioning and general health perception. Each dimension includes several questions and the answers were used to derive overall scores according to formulae described in the user manual.

Damp, draughts, appearance of the area, crime, neighbour problems and vandalism have all been shown in the literature to be associated with worse health status for residents reporting these problems. Respondents were therefore asked whether any of these were a problem. In addition, they were asked if there was a problem with the distance to local health services.

Results

The phase 1 samples (before any rehousing) had an age range of 18–92, with 59 per cent (133) being aged 50 years or older. Sixty-seven per cent (151) were female and, largely reflecting the ethnic composition of Newcastle’s council housing tenants generally, only four participants were black or Asian. Eighty per cent of participants (181) had no formal educational qualifications and 74 per cent (167) lived in households with a net annual income of less than £9500. Seventy-four per cent (169) rented their home from the local council at the application stage, with most of the remainder renting from private landlords.

The health status of participants in phase 1 was very poor, as might be expected given the degree of low income and educational achievement, although the extent of ill-health is striking. The general health perception score had a mean of 48.6
(\(s^{10.6}\)), representing much worse general health than the mean of 70.3 (\(s^{21.2}\)) for participants in the OHLS who were in social class 5. The mental health perception score for the Newcastle MPR participants had a mean of 42.6 (\(s^{27.8}\)), compared with the OHLS social class 5 mean of 70.9 (\(s^{20.0}\)).

There were no significant differences in health status between the rehoused and not rehoused groups with the exception of mobility problems, which were experienced by 77 per cent (174) of participants. This group was significantly less likely to be rehoused: only 40 per cent (70) moved compared with 64 per cent (34) of those who did not report a mobility problem (\(x^2 = 9.36, p < 0.01\)). Taking rehousing and \textit{in situ} adaptations together, 50 per cent (87) of participants with a mobility problem benefited, still significantly less than the proportion of participants without mobility problems that were rehoused (\(x^2 = 5.01, p < 0.05\)).

Table 1 compares the rehoused and not rehoused groups’ mean scores and standard deviations before any rehousing for the seven dimensions of the SF-36. The lower the mean score, the poorer the health status; \(t\)-tests reveal no significant differences between the two groups.

There were also no significant differences between the rehoused and not rehoused groups with regard to gender, educational achievement, benefit dependence or income, nor problems with damp, draughts, the general appearance of the area, general levels of crime in the area, neighbours, vandalism or distance to local health services. However, rehoused applicants were more likely to be aged 50 years or under; 65 per cent (60) of participants aged 50 or under were rehoused, compared with 32 per cent (43) of applicants aged over 50 (\(x^2 = 22.86, p < 0.001\)).

Participants were asked the reasons why they had applied for MPR. By far the most common reason was a problem with the stairs, given by 36 per cent (81) of respondents (81). This was reported almost twice as often as the next most frequent reason, that the present dwelling was too large, which was given by 19 per cent of respondents (43 cases). Less frequently mentioned were bad/poor area (29 cases), problems with neighbours (27 cases), needing adaptations (26 cases), wanting to be nearer other family members (27 cases), heating problems (16 cases), harassment (13 cases) and vandalism (11 cases). Thus, rehousing was most likely for participants aged 50 or under with no mobility problems, despite most applicants being aged over 50 years old and giving mobility problems as their reason for requesting MPR.

As might be expected for the group that was not rehoused, their housing and environmental conditions showed little net change between phase 1 and phase 2, although conditions for

\begin{table}[h]
\centering
\caption{Means and standard deviations before rehousing for seven dimensions of the SF-36: not rehoused and rehoused groups}
\begin{tabular}{lcccrr}
\hline
Dimension & \multicolumn{2}{c}{Not rehoused (\(n = 106\))} & \multicolumn{2}{c}{Rehoused (\(n = 104\))} & Difference \\
 & \(x\) & \(s\) & \(x\) & \(s\) & \(t\) & \(p\) \\
\hline
Role limitations owing to physical problem & 24.52 & 37.01 & 20.67 & 35.26 & 0.77 & 0.44 \\
Role limitations owing to emotional problem & 37.50 & 44.71 & 30.44 & 43.85 & 1.15 & 0.25 \\
Pain & 37.14 & 30.84 & 24.17 & 21.67 & 0.53 & 0.60 \\
Energy and vitality & 25.76 & 21.79 & 24.17 & 21.67 & 0.53 & 0.60 \\
Mental health perception & 44.83 & 28.71 & 38.17 & 25.72 & 1.76 & 0.08 \\
Social functioning & 39.47 & 33.47 & 31.93 & 31.33 & 1.68 & 0.10 \\
General health perception & 48.06 & 10.94 & 49.81 & 10.38 & -1.18 & 0.24 \\
\hline
\end{tabular}
\end{table}

\begin{table}[h]
\centering
\caption{Housing and environmental conditions: not rehoused, change between phase 1 and phase 2}
\begin{tabular}{lccccccc}
\hline
Condition & \multicolumn{2}{c}{No. (%) changing from no problem to no problem (np/np), no problem to problem (np/p), problem to no problem (p/np), problem to problem (p/p)} \\
& \(n\) & np/np & np/p & p/np & p/p & & \\
\hline
Damp & 106 & 53 (50) & 13 (12) & 19 (18) & 21 (20) & 0.38 & \\
Draughts & 106 & 24 (23) & 9 (8) & 23 (22) & 50 (47) & 0.02 & \\
General appearance of area & 104 & 37 (36) & 13 (12) & 16 (15) & 38 (37) & 0.71 & \\
General levels of crime & 102 & 24 (24) & 10 (10) & 21 (20) & 47 (46) & 0.07 & \\
Problems with neighbours & 106 & 35 (33) & 12 (11) & 10 (9) & 49 (47) & 0.83 & \\
Vandalism to own property & 106 & 37 (35) & 13 (12) & 13 (12) & 43 (41) & 1.00 & \\
Distance to local health services & 106 & 26 (25) & 22 (39) & 24 (23) & 34 (32) & 0.09 & \\
Difficulty with one or more IADL & 106 & 8 (8) & 8 (8) & 9 (9) & 81 (75) & 1.00 & \\
\hline
\end{tabular}
\end{table}

*McNemar test.
some respondents improved whereas for others they deteriorated (see Table 2). There were two exceptions. Problems with draughts showed a net improvement significant at the 0.05 level, although the improvement was confined to respondents aged over 50 ($p = 0.03$ compared with 0.69 for respondents aged 50 or under) and respondents with one or more mobility problems ($p = 0.03$ compared with 0.69). Problems with the general level of crime also showed a net improvement for respondents aged over 50, whereas for those aged 50 or under there was no significant change ($p = 0.01$ compared with 0.73). Because problems with instrumental activities of daily living reflect the extent to which the dwelling is adapted to disability, it is included in Table 2 as a feature of the dwelling rather than of the individual respondent. However, participants who received in situ adaptations were not included in the analysis, so it is likely that the small number of non-rehoused respondents who either improved or deteriorated on this measure reflected a change in their individual level of impairment.

Table 3 is a striking contrast to Table 2 and shows overall that rehousing was associated with net improvements in housing and environmental conditions. Although for some respondents conditions deteriorated, this was significantly outweighed by improvements for others. However, significant net improvements in both damp and draughts were confined to the over-50 age group, whereas there was no significant change for respondents aged 50 or under (damp: $p = 0.04$ compared with 0.08 for respondents aged 50 or under; draughts: $p = 0.001$ compared with 0.25 for 50 or under). A significant net improvement in appearance of the area was confined to respondents aged 50 or under ($p = 0.01$ compared with 0.15 for over 50) and those with one or more mobility problems ($p = 0.01$ compared with 0.12). There were no net changes for any group in problems with neighbours, vandalism and distance to local health services.

Table 4 shows that for respondents who were not rehoused, no individual health-related factor showed any significant net improvement. This was also the case when the data were analysed by age and mobility status. In contrast, Table 5 shows that for respondents who were rehoused, significant net improvements occurred in reports of tiredness, feeling depressed, sleeplessness, use of prescribed medication and use of medical

### Table 3 Housing and environmental conditions: rehoused, change between phase 1 and phase 2

<table>
<thead>
<tr>
<th>Condition</th>
<th>n</th>
<th>np/np</th>
<th>np/p</th>
<th>p/np</th>
<th>p/p</th>
<th>$p^*$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damp</td>
<td>104</td>
<td>55 (53)</td>
<td>12 (12)</td>
<td>30 (29)</td>
<td>7 (7)</td>
<td>0.01</td>
</tr>
<tr>
<td>Draughts</td>
<td>100</td>
<td>15 (15)</td>
<td>11 (11)</td>
<td>39 (39)</td>
<td>35 (34)</td>
<td>0.001</td>
</tr>
<tr>
<td>General appearance of area</td>
<td>100</td>
<td>39 (39)</td>
<td>9 (9)</td>
<td>29 (29)</td>
<td>23 (23)</td>
<td>0.002</td>
</tr>
<tr>
<td>General levels of crime</td>
<td>99</td>
<td>29 (30)</td>
<td>7 (7)</td>
<td>37 (37)</td>
<td>26 (26)</td>
<td>0.001</td>
</tr>
<tr>
<td>Problems with neighbours</td>
<td>104</td>
<td>22 (21)</td>
<td>20 (19)</td>
<td>18 (17)</td>
<td>44 (42)</td>
<td>0.87</td>
</tr>
<tr>
<td>Vandalism to own property</td>
<td>104</td>
<td>39 (38)</td>
<td>19 (18)</td>
<td>19 (18)</td>
<td>27 (26)</td>
<td>1.00</td>
</tr>
<tr>
<td>Distance to local health services</td>
<td>104</td>
<td>32 (31)</td>
<td>19 (18)</td>
<td>17 (16)</td>
<td>36 (35)</td>
<td>0.87</td>
</tr>
<tr>
<td>Difficulty with one or more IADL</td>
<td>104</td>
<td>31 (30)</td>
<td>3 (3)</td>
<td>24 (23)</td>
<td>46 (44)</td>
<td>0.001</td>
</tr>
</tbody>
</table>

*McNemar test.

### Table 4 Health-related factors: not rehoused, change between phase 1 and phase 2

<table>
<thead>
<tr>
<th>Factor</th>
<th>n</th>
<th>no/no</th>
<th>no/yes</th>
<th>yes/no</th>
<th>yes/yes</th>
<th>$p^*$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute respiratory problem(s) during previous 2 weeks</td>
<td>106</td>
<td>17 (16)</td>
<td>10 (9)</td>
<td>8 (8)</td>
<td>71 (67)</td>
<td>0.82</td>
</tr>
<tr>
<td>Longstanding illness or disability</td>
<td>106</td>
<td>6 (6)</td>
<td>10 (9)</td>
<td>8 (8)</td>
<td>82 (77)</td>
<td>0.82</td>
</tr>
<tr>
<td>Tiredness during the previous 2 weeks</td>
<td>105</td>
<td>4 (4)</td>
<td>17 (16)</td>
<td>19 (18)</td>
<td>65 (62)</td>
<td>0.87</td>
</tr>
<tr>
<td>Feeling depressed during the previous 2 weeks</td>
<td>106</td>
<td>17 (16)</td>
<td>12 (11)</td>
<td>16 (15)</td>
<td>61 (58)</td>
<td>0.57</td>
</tr>
<tr>
<td>Sleeplessness during the previous 2 weeks</td>
<td>106</td>
<td>14 (13)</td>
<td>12 (11)</td>
<td>18 (17)</td>
<td>62 (59)</td>
<td>0.36</td>
</tr>
<tr>
<td>Antidepressant, tranquilizer or sleeping tablet use over last 3 months</td>
<td>106</td>
<td>66 (62)</td>
<td>10 (9)</td>
<td>8 (8)</td>
<td>22 (21)</td>
<td>0.82</td>
</tr>
<tr>
<td>Other prescribed medication over the last 3 months</td>
<td>106</td>
<td>8 (8)</td>
<td>12 (11)</td>
<td>8 (8)</td>
<td>78 (73)</td>
<td>0.50</td>
</tr>
<tr>
<td>Smoker</td>
<td>106</td>
<td>60 (56)</td>
<td>3 (3)</td>
<td>6 (6)</td>
<td>37 (35)</td>
<td>0.51</td>
</tr>
<tr>
<td>Used medical services during last 3 months</td>
<td>106</td>
<td>7 (7)</td>
<td>10 (9)</td>
<td>13 (12)</td>
<td>76 (72)</td>
<td>0.68</td>
</tr>
<tr>
<td>Availability of social support during last 4 weeks</td>
<td>103</td>
<td>7 (7)</td>
<td>10 (10)</td>
<td>20 (19)</td>
<td>66 (64)</td>
<td>0.10</td>
</tr>
</tbody>
</table>

*McNemar test.
services. However, significant net improvements in tiredness, prescribed medication and use of medical services were confined to respondents aged 50 or under (p values 0.03, 0.01 and 0.004, respectively, compared with 0.09, 1.0 and 0.18 for respondents aged over 50). The net improvement in use of prescribed medication was also confined to respondents without a mobility problem (p 0.049 compared with 0.15 for those with mobility problems). Overall no net improvements occurred in reports of one or more acute respiratory problems (persistent cough, wheezing, blocked nose or breathlessness), longstanding illness or disability, use of antidepressants, tranquillizers or sleeping tablets, smoking or availability of social support.

Table 6 shows results for the seven dimensions of the SF-36. There was a significant difference in the extent of change between the rehoused and not rehoused groups for all dimensions except general health perception. The not rehoused group experienced a slight improvement in all except two dimensions. Role limitation as a result of physical problems deteriorated slightly, whereas general health perception deteriorated more sharply. The only exception was that there was no significant change in general health perception among respondents with no mobility problems. The rehoused group experienced much larger improvements, and in all dimensions except general health perception, but this deteriorated less than for the not rehoused group. There were exceptions by age and mobility: there was no significant change in role limitations as a result of emotional problems among respondents aged over 50 and no significant change in pain or general health perception among respondents with no mobility problems. However, although the improvements following rehousing are striking, the mean scores for the rehoused group are still substantially worse than for the social class V group in the OHLS. For example, whereas the rehoused group’s mental health perception score improved to 61.45, the equivalent Oxfordshire value is 70.9. The mean score for general health perception among the rehoused group is 27.39, far worse than the Oxfordshire social class V mean of 70.3.

To investigate the mental health issue in more detail, a new variable was computed that identified a mental health problem if two or more of the following were reported in the past 2 weeks: bad nerves, feeling depressed or sleeplessness. Before any rehousing there was no significant difference between the two

<p>| Table 5 | Health-related factors: rehoused, change between phase 1 and phase 2 |</p>
<table>
<thead>
<tr>
<th>Factor</th>
<th>n</th>
<th>no/no</th>
<th>no/yes</th>
<th>yes/no</th>
<th>yes/yes</th>
<th>p*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute respiratory problem(s) during previous 2 weeks</td>
<td>104</td>
<td>24 (23)</td>
<td>14 (14)</td>
<td>20 (19)</td>
<td>46 (44)</td>
<td>0.39</td>
</tr>
<tr>
<td>Longstanding illness or disability</td>
<td>104</td>
<td>14 (14)</td>
<td>7 (7)</td>
<td>11 (11)</td>
<td>72 (69)</td>
<td>0.48</td>
</tr>
<tr>
<td>Tiredness during the previous 2 weeks</td>
<td>104</td>
<td>34 (33)</td>
<td>9 (9)</td>
<td>33 (32)</td>
<td>28 (27)</td>
<td>0.001</td>
</tr>
<tr>
<td>Feeling depressed during the previous 2 weeks</td>
<td>104</td>
<td>16 (15)</td>
<td>8 (8)</td>
<td>46 (44)</td>
<td>34 (33)</td>
<td>0.001</td>
</tr>
<tr>
<td>Sleeplessness during the previous 2 weeks</td>
<td>104</td>
<td>13 (12)</td>
<td>5 (5)</td>
<td>39 (37)</td>
<td>48 (46)</td>
<td>0.001</td>
</tr>
<tr>
<td>Antidepressant, tranquilizer or sleeping tablet use over last 3 months</td>
<td>104</td>
<td>15 (14)</td>
<td>7 (7)</td>
<td>22 (21)</td>
<td>60 (58)</td>
<td>0.01</td>
</tr>
<tr>
<td>Other prescribed medication over the last 3 months</td>
<td>104</td>
<td>54 (52)</td>
<td>12 (12)</td>
<td>18 (18)</td>
<td>19 (18)</td>
<td>0.36</td>
</tr>
<tr>
<td>Smoker</td>
<td>104</td>
<td>54 (52)</td>
<td>8 (8)</td>
<td>5 (5)</td>
<td>37 (36)</td>
<td>0.58</td>
</tr>
<tr>
<td>Used medical services during last 3 months</td>
<td>104</td>
<td>7 (7)</td>
<td>7 (7)</td>
<td>27 (26)</td>
<td>63 (61)</td>
<td>0.001</td>
</tr>
<tr>
<td>Availability of social support during last 4 weeks</td>
<td>103</td>
<td>3 (3)</td>
<td>11 (11)</td>
<td>12 (12)</td>
<td>77 (74)</td>
<td>1.00</td>
</tr>
</tbody>
</table>

*McNemar test.

<p>| Table 6 | Means and standard deviations after rehousing, and changes in mean between phases 1 and 2, for seven dimensions of the SF-36: not rehoused and rehoused groups |
|---|---|---|---|---|---|</p>
<table>
<thead>
<tr>
<th>Dimension</th>
<th>Not rehoused (n = 123)</th>
<th>Rehoused (n = 104)</th>
<th>Change in x</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Role limitations owing to physical problem</td>
<td>23.58</td>
<td>38.70</td>
<td>–1.42</td>
<td>45.63</td>
<td>25.00</td>
</tr>
<tr>
<td>Role limitations owing to emotional problem</td>
<td>38.73</td>
<td>46.94</td>
<td>2.69</td>
<td>58.25</td>
<td>27.38</td>
</tr>
<tr>
<td>Pain</td>
<td>42.43</td>
<td>27.16</td>
<td>5.13</td>
<td>55.12</td>
<td>11.64</td>
</tr>
<tr>
<td>Energy and vitality</td>
<td>30.14</td>
<td>21.67</td>
<td>4.50</td>
<td>38.59</td>
<td>14.70</td>
</tr>
<tr>
<td>Mental health perception</td>
<td>49.23</td>
<td>21.44</td>
<td>4.88</td>
<td>61.45</td>
<td>23.60</td>
</tr>
<tr>
<td>Social functioning</td>
<td>41.58</td>
<td>33.44</td>
<td>2.56</td>
<td>54.39</td>
<td>22.54</td>
</tr>
<tr>
<td>General health perception</td>
<td>35.63</td>
<td>21.59</td>
<td>–12.55</td>
<td>43.08</td>
<td>–6.50</td>
</tr>
</tbody>
</table>
groups: 72 per cent (76) of the not rehoused group experienced a mental health problem, compared with 74 per cent (77) of the rehoused group. At follow-up, the prevalence of mental health problems among the rehoused group fell sharply to 42 per cent (44), whereas among the not rehoused group prevalence fell only slightly to 67 per cent (71), opening up a significant difference between the two groups ($\chi^2 = 12.89, p < 0.001$).

Vandalism to property significantly increased the likelihood of mental health problems, with 79.4 per cent of respondents who reported this as a problem experiencing poor mental health, compared with 66.7 per cent of respondents who did not report a problem with vandalism ($\chi^2 = 4.32, p < 0.05$). Problems or disputes with neighbours were also associated with poor mental health, but in the opposite direction to that expected: 66.9 per cent of respondents who reported a problem with neighbours experienced poor mental health, compared with 80.9 per cent of respondents who did not report a problem with neighbours ($\chi^2 = 5.41, p < 0.02$). Damp and general appearance of the area tended to increase the likelihood of mental health problems, but these relationships were not significant at the 0.05 level ($p = 0.07$ for both variables). There was no significant relationship between mobility problems and mental health problems.

**Discussion**

MPR was associated with improvements in mental health status and mobility. No improvements in acute respiratory problems or the prevalence of long-term illness or disability were detected. The improvements relate to the main reasons why people applied for rehousing. Problems with stairs and size of the dwelling, needing adaptations and wanting to be nearer other family members were common reasons that reflect the large group of applicants reporting one or more mobility problems.

The response rate for the longitudinal sample was 45 per cent, a reasonable achievement given the difficult-to-reach nature of this very deprived population, but it is possible that the results are subject to response bias. The sample broadly reflects the overall proportion of MPR applicants rehoused by the council at the time of the study, suggesting there was no sampling bias towards either rehoused or not rehoused households. However, within these groups it is possible that, for example, respondents who felt much better following rehousing or who felt aggrieved about not being rehoused were more likely to respond. Interviewers recorded the reasons for non-responses and in only a few cases was this connected with dissatisfaction, either because rehousing had not taken place or because the first interview was felt to be too long. Some of the attrition rate was due to restricting the follow-up interview to rehoused households that had moved within 3 months of the first interview. The remaining reasons were households moving out of the local authority area, hospitalization, death or moving address without informing the housing department. Without being able to rule out bias from any of these sources the results need to be treated with caution, although there is supporting evidence from other studies.

Mobility problems were the commonest reason for requesting MPR, but many applicants requested rehousing because of problems with a bad/poor area, neighbours, harassment or vandalism. Several studies have established links between mental health problems and appearance of the area, community safety, damp and drapery. Given the type of housing and neighbourhood improvements that occurred following rehousing, it is likely that MPR contributed to an improvement in mental health, but it was not possible to establish the independent variables behind this improvement from our data. Indeed, it is possible that the reasons are complex and interactive in ways difficult to capture through survey research, including the placebo effect that may follow the experience of simply succeeding with a rehousing request.

Although rehousing appeared to help improve mobility problems, participants with one or more mobility problems were significantly less likely to be rehoused compared with other participants in the study. Discussions with the housing department confirmed that this was most likely to be due to the local shortage of accommodation without stairs and with adaptations.

Overall, our study suggests that there is an important role for MPR in improving mobility problems and reducing the prevalence of mental health problems. There was also evidence of a lower use of prescribed medication and less frequent use of medical services, although significant change occurred only among the group aged 50 and under.

However, in many localities the MPR system is frustrated by a shortage of appropriately designed and adapted housing for people with mobility problems, an issue that an Audit Commission report recently identified as a major factor in some older and disabled people drifting into residential or nursing home care. The high level of health problems among even rehoused applicants who experienced some improvement is also a cause for concern. MPR may alleviate health problems disproportionately experienced by people who are generally on very low incomes and have experienced, often over a lifetime, a range of adverse social circumstances. However, the extent to which it may be able to do so is severely constrained by the limited availability of appropriate social housing, and it is far from being a cure for the health effects of poverty.

**Acknowledgements**

We thank Newcastle City Council, which mainly funded this study, together with support from Oxford Brookes University and the University of Teesside. We are grateful for the assistance of Paul Keenan, Michael Berridge and Marty Lawrence, and for the time and co-operation of the study participants. Two anonymous referees contributed important comments.
References


*Accepted on 13 August 2002*