

HOUSING AND HEALTH IN WORCESTER,
SOME ASSOCIATIONS FROM A LIFESTYLE SURVEY
OF RESIDENTS AGED 16-64 YEARS.

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ABSTRACT

Objective. To investigate the association between damp housing, health and health lifestyles.

Design. Cross-sectional postal survey of 2353 Worcester City residents aged 16 to 64 years.

Results. 9% of respondents lived in damp housing, with more females aged 16 to 44 years and single parent families than expected. There were more present smokers in damp housing 38% than acceptable housing 30%. For other lifestyle factors including ever smoking there was no difference. 52% of those in damp housing had a longstanding illness, disability or infirmity compared to 38% in acceptable housing, with an excess of high blood pressure, neurological problems and problems resulting from an accident or injury. There was also more self reported ill health in the sleep, energy and social isolation dimensions of the Nottingham Health Profile.

Conclusion. Damp housing conditions have an adverse effect on the health of Worcester City residents, and the way forward must include both social policy changes and specific health initiatives.

INTRODUCTION

Poor housing has been known to affect health for two centuries, principally because of an effect on infectious diseases. Because of the reduction in incidence of infectious diseases during this century this understanding has had to be defended in relation to more long term health problems, (Faculty of Public Health Medicine, 1991).

Surveys of housing conditions within Worcester City have shown approximately 10% of both private and council owned stock is in need of serious repair or is unfit for habitation, (Rand Associates 1989, and Worcester City Council 1989).

During the analysis of the Worcester City Health and Lifestyle Survey (Hughes, 1990) we had an opportunity to study the association between housing condition and the general health of residents.

Lifestyle is a term that usually includes aspects of behaviour that people have some control over, but in a wider sense also includes economic, environmental and cultural dimensions. The ways in which these different factors interact and influence health is complex, and the relative importance of each aspect is not easy to gauge.

At the present time there is still an undercurrent of opinion that health problems are the fault of the sufferer and that

adverse social conditions such as damp housing are the consequence and not the cause of those problems.

Therefore an important part of research must be to determine to what extent inequality in health is the failure of individuals to take responsibility for their health, and to what extent the result of circumstances.

The report of a large national interview and postal survey discussed this problem and concluded that circumstances, including social support, have been shown to carry more weight for health outcomes than behaviour. (Blaxter, 1990, p.230).

METHODS

A cross-sectional postal Health and Lifestyle Survey of Worcester City residents aged 16-64 years was undertaken by Worcester Health Authority in collaboration with Worcester City Council and Hereford and Worcester Family Health Services Authority. It was administered by the University of Bristol and funded by Worcester City Council.

Questionnaire.

The survey was based on previously validated questions such as those used in the Nottingham Health Profile, Heartbeat Wales Health Survey and the General Household Survey (GHS). The question on longstanding illness and disability in the GHS allows respondents to detail the conditions causing their disability. In a pilot study performed during the development of the questionnaire these answers were analyzed and 18 conditions accounted for the great majority of respondents answers. These 18 conditions were included in our survey as a checklist following the GHS question.

The Nottingham Health Profile is in two parts. The first part contains 38 statements about problems in six dimensions of health : energy, pain, emotional reactions, sleep, social isolation and physical mobility. For our analysis anyone answering "yes" to any question in a dimension of health was classified as positive for that dimension. A positive score therefore reflects some perceived ill health in a dimension.

The second part contains 7 questions about whether their present state of health affects a persons job of work, looking after the house, social life, home life, sex life, interests or hobbies and holidays.

A self completion question on social class was included along with new questions on accidental injury and housing conditions.

A question in the section on living conditions asked:

How often do you suffer from these problems in your home? For each sort of problem, tick one box for how often you have it.

	Almost always	Quite often	Not very often	Hardley ever/never
Heavy condensation				
Damp				
Draughts				
Mould				

If heavy condensation was said to occur almost always, or damp or mould quite often or almost always housing conditions were rated as "damp", remaining housing was rated as "acceptable".

A question on accidents asked:

Have you personally suffered any accidental injury in the past 12 months? and if answered yes,

Where did the accident happen : in the home, outdoors near home eg. garden or garage, on a road or pavement as a pedestrian or cyclist, in a car, in the workplace, in a sports or recreational place or elsewhere.'

The questionnaire was 20 pages long with an intended reading age of 10 years.

Sample.

A random sample of 5347 names of Worcester City residents was drawn from the Family Health Services Authority register with a sampling fraction of 1 in 10. Sample size calculations were made on a predicted 50% response rate with the ability to detect differences of greater than 5% in a population parameter, with 95% confidence and a power of 90%.

The questionnaires were sent out in June 1990 with a covering letter from the Council's Environmental Health Sub-Committee, and local media publicity. A reminder letter and more publicity followed in July.

Age, sex and social class adjusted longstanding illness and disability rates were calculated by direct standardization.

Statistical analysis.

Data was analyzed using SPSS PC+ and Epi Info. Statistical testing was carried out by the Chi-squared test with Yates correction or Fisher's exact test for the comparison of two proportions, and the normal approximation to the binomial distribution for calculation of the 95% confidence intervals of the difference between two proportions.

We used a significance level cut off of 0.05, although we recognize that where multiple comparisons are made one in twenty may be significant by chance.

Later in the analysis relative risks are calculated directly from the adjusted rates and use fractions of whole expected numbers. The relative risk with 95% confidence intervals was calculated by Epi Info and required the prior deduction of observed numbers from the adjusted rate. This method precludes the use of fractions and resulted in some discrepancy between the two values of relative risk.

RESULTS

Response rate.

A few questionnaires were returned completed by recipients who had moved address. If the move took them outside Worcester City they were included in the response rate calculation but omitted from further analysis.

Of the 5347 questionnaires sent out, it was estimated that only 4526 were posted to valid, accurate names and addresses. This estimate used data from a follow-up study of non-respondents within the Avon County Health Survey, (Hughes A.O. 1989) which revealed that 17.6% of questionnaires had failed to reach the intended recipient because of an incorrect postal address supplied by the FHSA. This gave an adjusted response rate of 52%.

On initial comparison of the age and sex of respondents to the 1988 population estimates it became apparent that there was an adjusted response rate of over 98% for those aged 60-64 years. After investigation at the FPC it was concluded that there had been duplication of the sampling in the 55-64 year age group. Information from persons aged 55 and over was weighted by 0.5, so as not to discard data. This weighting gives the effect of a total 2020 respondents.

There was a higher response rate from females and from older people compared to younger people, this is a common finding in community based surveys. Table 1.

Demographic characteristics

A total of 175 (9%) respondents lived in damp housing, of these 122 (71%) were female and 50 (29%) male.

Young females were significantly more likely to live in damp housing, $p < 0.001$. Figure 1.

4.6% of owner occupied housing was damp, compared to 28% of council rented and 23% of private rented properties. Figure 2. Of those in damp owner occupied housing, 44% were females aged 16-44 years.

There were significantly different proportions of social classes between acceptable and damp housing, $p < 0.001$. With people from social classes IV and V more likely to live in damp housing. Table 2.

Over twice as many of those in damp housing were unemployed, seeking work (6.9%) as compared to those in acceptable housing (2.7%), with a difference of 4.2%, 95% CI of 0.4 to 8.0, $p = 0.004$. Twice as many were unemployed through sickness or disability 5.7% verses 2.4% $p = 0.022$.

Households with children or single adults or those with an older person, were no more likely to be in acceptable housing as in damp.

However the rate of single parent families was significantly higher in damp than in acceptable housing, 4.6% verses 1.6%, $p=0.016$. This finding of a greater proportion of single parent families in damp housing did not account for any significant differences between acceptable and damp housing found later in the analysis.

Lifestyle and physical condition of those in damp housing.

There was a significant association between respondents own rating of their physical condition and damp housing. Table 3.

There were also significantly more present smokers in damp housing (38.2%) than acceptable (30.2%), $p=0.038$. This was not affected by age, sex and social class. The difference between the rates of ever smokers in damp and acceptable housing was not significant. Table 3.

Drinking alcohol over the safe limit, of 14 units per week for females and 21 units per week for males, being overweight with a body mass index of 25 or more, taking moderate or strenuous exercise 3 or more times in a week and using lower fat milk was not associated with housing conditions.

Disability rates

The GHS question was used to calculate a disability rate for

those in acceptable and damp housing. These rates were adjusted for two age groups, 16-44 and 45-64 years, sex and three social class groups, 1) classes I and II, 2) IIINM, IIIM and IV, and 3) V and never worked. The social class groups were chosen after assessing the trends in disability rates with the social classes separate.

The adjusted disability rate for all respondents was 37.8%. For those in acceptable housing it was 36.3% and for those in damp housing 52.3%. This was a difference of 16% with a 95% CI of 8.3 to 23.7, $p < 0.001$.

The adjusted relative risk was 1.44, ie. a person in damp housing was 44% more likely to suffer from a disability or longstanding illness than a person in acceptable housing.

The attributable risk percent (AR%) using unadjusted rates implies that 25% of the disability suffered by people in damp housing was attributable to damp housing.

The population attributable risk percent (PAR%) using unadjusted rates shows that 3% of the disability suffered in the total population was as a result of damp housing.

Conditions causing disability.

The prevalence of conditions causing disability were adjusted by

age, sex and social class as appropriate. A significant difference in rates between acceptable and damp housing was found for high blood pressure, problems resulting from an injury or accident and neurological problems, which includes epilepsy, stroke and multiple sclerosis. Table 4 and Figure 3.

The attributable risk percent shows that 70% of neurological problems, over 50% of high blood pressure and almost 50% of problems resulting from injury, amongst those in damp housing were as a result of that damp housing.

Population attributable risk percent implies that over 16% of neurological problems, 8% of high blood pressure and 5% of problems resulting from injury, in the total population can be attributed to damp housing.

Accidental injury

The accident rates were found not to differ with age, sex or social class and were therefore unadjusted.

There were significantly more accidents suffered by those in damp housing, 26.3% as compared to acceptable housing 19.7%, $p=0.046$.

People in damp housing suffered a lower proportion of accidents in the home or outdoors near the home, and a higher proportion of accidents on the road or pavement as a pedestrian or cyclist than those in acceptable housing. Figure 4.

Nottingham Health Profile.

Each of the six dimensions of health were adjusted for age, sex and social class.

There was an association between dimensions of health and damp housing with people in damp housing scoring more in all dimensions of health, with a significant difference for energy, sleep and social isolation dimensions. Table 5.

The attributable risk percent implies that almost 50% of the social isolation scores, over 40% of energy scores and 30% of sleep scores for those in damp housing were attributable to that damp housing.

The population attributable risk percent suggests that 8% of the social isolation scores, almost 6% of energy scores and almost 4% of sleep scores in the population can be attributable to damp housing.

In the second part of the NHP the rates for key areas of life being affected by a persons health status were adjusted by age and sex as appropriate.

All the key areas of life except holidays were more likely to be affected by health status for those in damp housing than for those in acceptable housing, with larger significant differences for social life, sex life, job of work and interests or hobbies being affected. Table 6.

For health status affecting the job of work the rate for acceptable housing was 6.4% and for damp housing 12.6%, with a difference of 6.2% and 95% CI of 1.0 to 11.4, $p=0.004$. Table 6.

DISCUSSION

The overall response rate to the survey was disappointing, but there are some possible explanations for this. At the time of the survey the antagonism towards the Community Charge was very high and the surveys association with local government may have discouraged people from replying to something which required personal details and details of others in the household.

The address for replies was Bristol University, and this may have reduced the perceived local connections and caused confusion.

If the survey is repeated it would be advisable to try to have a General Practitioner or the District Health Authority sign the covering letter, and to have a local address for replies.

The poor response to the questionnaire will obviously reduce the applicablilty of our results to the total population of Worcester City, but it is almost the only detailed information we have about the lifestyles, housing conditions and health of some of our District residents. The information gained must be taken into account for future planning, provision and evaluation of health and housing services in the District.

The measure of damp housing used for this analysis was fairly simple, and intentionally did not include any measures of deprivation such as lack of use of a car or unemployment.

The finding that young females and single parent families were more likely to be in damp housing is relevant because at least 60% of single parents are on a low income (DHSS, 1986). Socio-economic and material deprivation is known to be associated with ill-health in both parents and children.

The finding of an association between present smoking and damp housing may partially explain our finding of an increase in high blood pressure in damp housing.

This association combined with that of no association between damp housing and ever smoking may reflect difficulties people in damp housing have in stopping smoking.

The use of ever smokers as a measure of tobacco use instead of present smokers, is relevant when looking at long term health problems because of the long term nature of some health effects of smoking.

The residents of damp housing are no more likely to be ever-smokers, heavy drinkers or obese. This implies that some of their inequality in health is not due to their lifestyle, but is due to other circumstances.

The finding that over half of those in damp housing suffer from a longstanding illness, disability or infirmity compared to a third for those in acceptable housing, after adjusting for age, sex and social class, supports the association between damp

housing circumstances and ill health.

Although the association between longstanding illness, disability or infirmity and damp housing seems strong, with 25% of the longstanding illness among those in damp housing being associated with the damp housing, it is difficult to prove a causal relationship.

There are a few possible mechanisms by which damp housing could be associated with illness, one is that the physical effects of dampness, such as cold, humidity and mould growth actually causes illness. This has been found to be the case for mould and symptomatic health particularly among children. (Platt et al, 1989).

Another mechanism is that people who have a longstanding illness are unable to maintain their houses and therefore allow damp to occur. A third method is that people who are ill gravitate to the lower end of the social housing scale where damp housing is common and are unable to get rehoused by the Council on health grounds.

The low population attributable risk percent (3% of disability in the population attributable to damp housing) compared to the 25% attributable risk percent is an indication that for individual health damp housing is very important but on a population basis the effects on the population's health are not so great.

The individual conditions associated with damp housing, high blood pressure, problems resulting from an injury and neurological problems were not the expected associations. It is possible that some of those suffering from chest problems, depression and arthritis have moved or been rehoused by the Council because of their health problems. Doctors in charge of allocating medical points for rehousing are more likely to recognise respiratory illness and arthritis to be the consequence of damp housing and therefore to allocate more points.

The importance to health of damp housing is reinforced by the findings from the NHP of more ill health suffered in the dimensions of energy, sleep and social isolation. Damp housing therefore has an affect on the mental wellbeing of residents.

Overall there must be considerable financial cost in treating the health effects of damp housing, and this combined with the long term economic advantages of a healthy population must stimulate public discussion about preventable causes of illness and help to promote changes in policy.

There seem to be two possible ways to improve the situation for those in damp housing. The first is to improve housing conditions and other deprivations, and the second is to introduce health initiatives to reduce the incidence of specific illnesses in deprived groups, without improving their living conditions. The social strategies would be ideally implemented together with the health initiatives as a short term bridging measure.

CONCLUSIONS

Damp housing conditions have an adverse effect on the health of Worcester City residents aged 16-64.

Over half the people in damp housing suffer from a longstanding illness, disability or infirmity. Notably high blood pressure, neurological problems and problems resulting from an accident or injury.

There are more present smokers, but not ever smokers, in damp housing, with all other lifestyle factors being equivalent between housing categories. This suggests that the way forward must include both social policy changes and specific health initiatives.

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Age group and sex of respondents

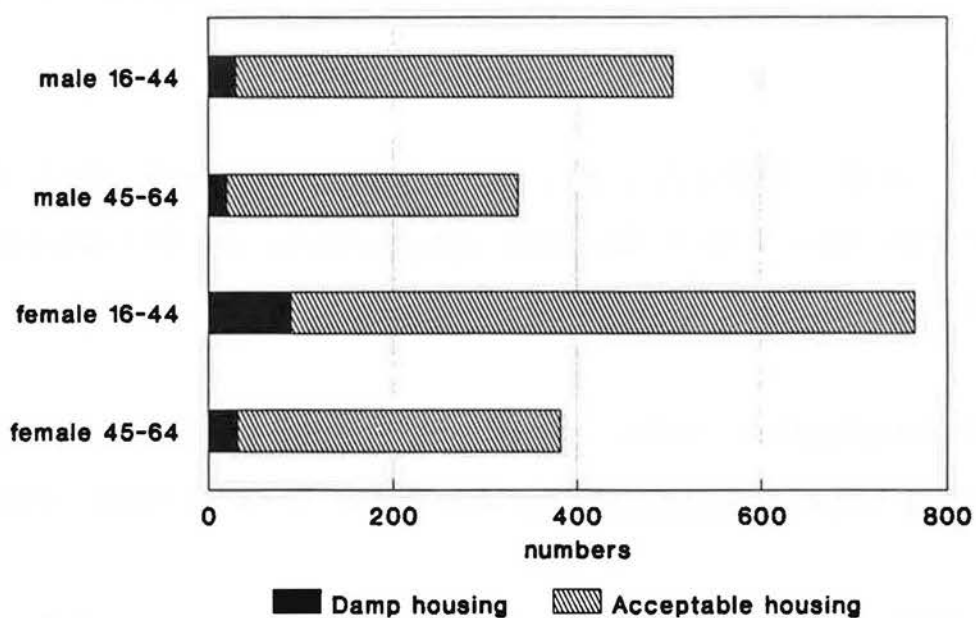


Figure 1

Tenure of accommodation

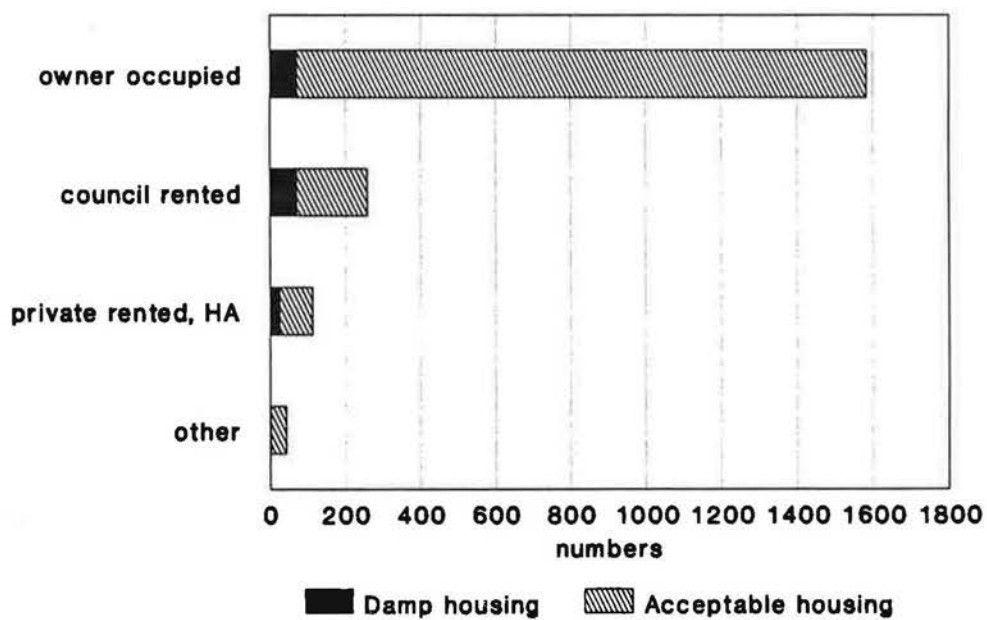
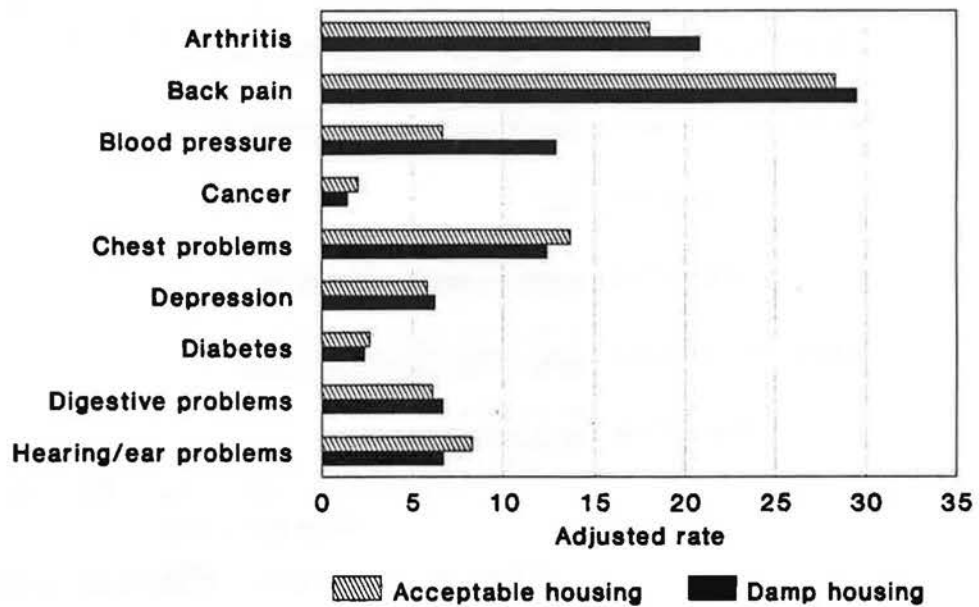


Figure 2

Conditions causing disability



Conditions causing disability

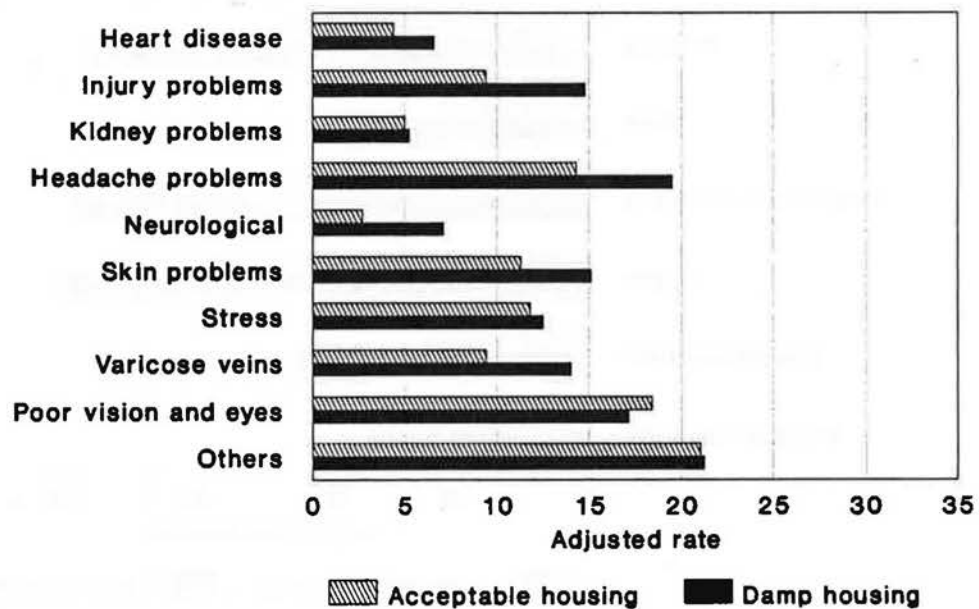


Figure 3

Place of accidental injury

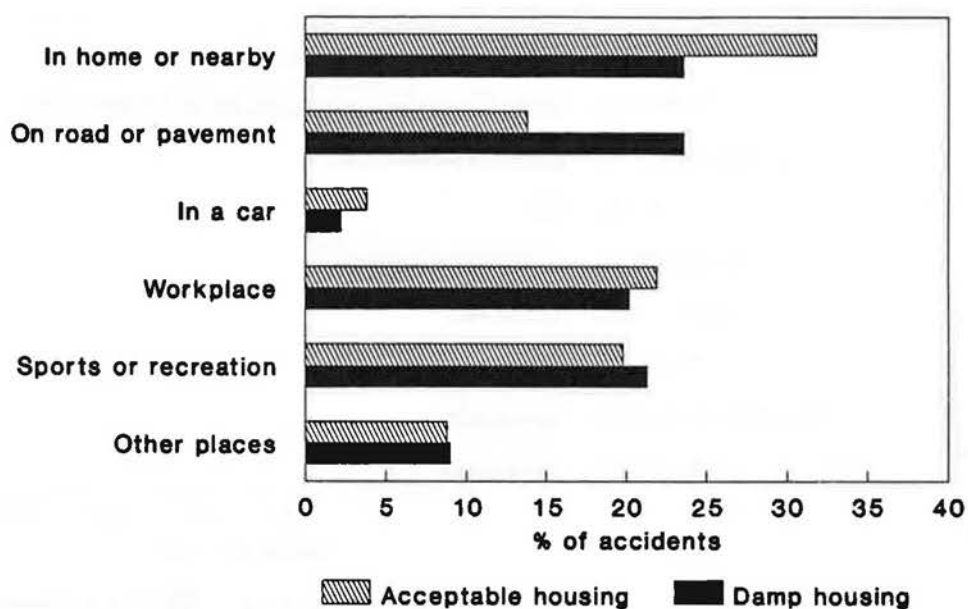


Figure 4

Adjusted positive score rates for NHP

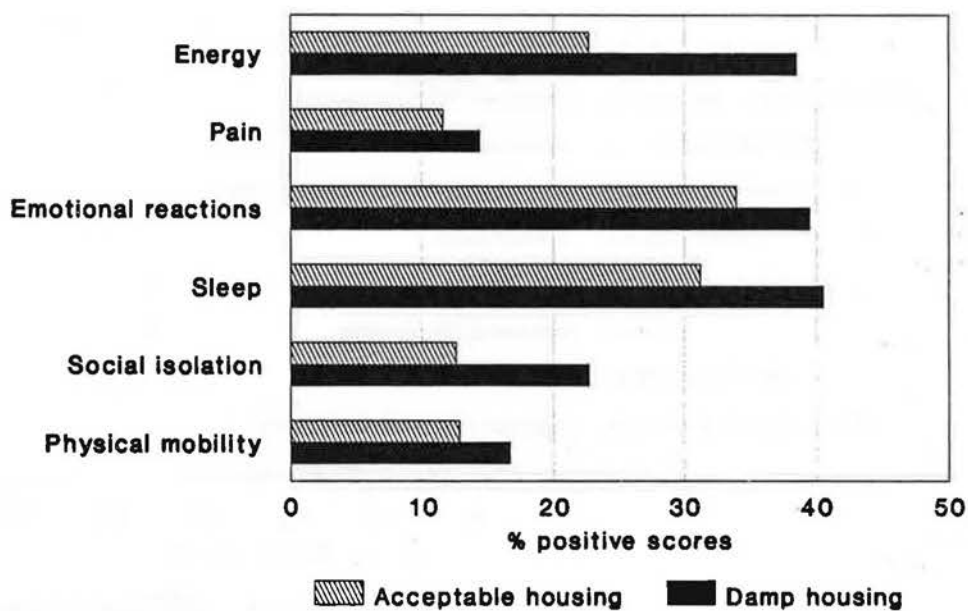


Figure 5

Table 1

Age and sex of respondents and 1988 population estimates.

	Number	Percent	1988 population estimate
Male	846	42.3%	49.0%
Female	1154	57.7%	51.0%
Not stated	20		
Total	2020	100%	
16-29 years	620	30.7%	36.2%
30-44 years	650	32.2%	32.0%
45-59 years	560	27.7%	24.1%
60-64 years	166	8.2%	7.7%
Not stated	24		
Total	2020		

Table 2

Social class of respondents.

	Acceptable housing	Damp housing	Total respondents
I+II	38.3%	18.1%	36.7%
IIINM	18.2%	21.2%	18.5%
IIIM	23.3%	25.3%	23.5%
IV	9.1%	10.2%	9.2%
V	7.0%	18.1%	7.9%
never worked	1.4%	4.2%	1.6%
Total	100%	100%	100%

Table 3

Physical condition and lifestyle factors of respondents.

	Acceptable housing rate	Damp housing rate	Difference with 95% CI	p value
rating of good physical condition	58.1%	48.0%	10.1% 2.4 to 17.8	0.013
present smokers	30.2%	38.2%	8.0% 0.4 to 15.6	0.038
ever smokers	56.2%	63.2%	7.0% -0.5 to 14.5	0.087
semi-skimmed or skimmed milk	47.8%	40.0%	7.8% -0.3 to 15.9	0.075
exercise 3 x in last week	18.2%	15.4%	2.8% -2.8 to 8.4	0.416
BMI > 25	32.4%	34.2%	1.8% -5.6 to 9.2	0.674
alcohol over limit	14.4%	14.3%	0.1% -5.3 to 5.5	0.932

Table 4

Conditions causing a significant difference in adjusted disability rates with housing condition.

	Acceptable housing rate	Damp housing rate	Difference with 95% CI	Relative risk 95% CI	p value
High blood pressure	6.7%	12.9%	6.2% 1.1 to 11.3	1.97 1.3 to 2.99	0.003
Injury problems	9.4%	14.8%	5.4% 0 to 10.8	1.58 1.08 to 2.31	0.03
Neurological problems	2.7%	7.1%	4.4% 0.5 to 8.3	2.54 1.38 to 4.68	0.005

Table 5

Adjusted positive NHP score rates for dimensions of health and relative risk.

	Acceptable housing rate	Damp housing rate	Difference with 95% CI	Relative risk 95% CI	p value
Energy	22.7%	38.5%	15.8% 8.3 to 23.3	1.96 1.47 to 2.61	<0.001
Social isolation	12.6%	22.7%	10.1% 3.7 to 16.5	1.90 1.36 to 2.63	<0.001
Sleep	31.2%	40.5%	9.3% 1.7 to 16.9	1.45 1.09 to 1.93	0.014
Pain	11.6%	14.4%	2.8% -2.6 to 8.2	1.24 0.83 to 1.85	0.36
Emotional reactions	33.9%	39.5%	5.6% -2.0 to 13.2	1.24 0.93 to 1.66	0.16
Physical mobility	12.8%	16.7%	3.9% -1.8 to 9.6	1.32 0.9 to 1.92	0.19

Table 6

Adjusted rates for areas of life affected by health, and relative risk.

	Acceptable housing rate	Damp housing rate	Difference with 95% CI	Relative risk 95% CI	p value
Social life	7.8%	19.6%	11.8% 5.8 to 17.8	2.49 1.77 to 3.5	<0.001
Sex life	8.1%	19.9%	11.8% 5.8 to 17.8	2.48 1.77 to 3.48	<0.001
Job of work	6.4%	12.6%	6.2% 1.0 to 11.4	1.93 1.28 to 2.91	0.004
Interests hobbies	9.0%	14.7%	5.7% 0.3 to 11.1	1.66 1.13 to 2.45	0.017
Home life	7.7%	12.3%	4.6% -0.4 to 9.6	1.62 1.07 to 2.46	0.036
Looking after the home	6.9%	11.7%	4.8% -0.1 to 9.7	1.64 1.06 to 2.53	0.040
Holidays	8.1%	11.7%	3.6% -2.3 to 8.5	1.41 0.91 to 2.18	0.169