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**POOR HOUSING, UNEMPLOYMENT AND POVERTY:
THE EFFECTS ON CHILD HEALTH**

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Housing conditions have long been associated with ill-health; improvements in the health of the UK population this century owe much to public health measures which included better housing and sanitation (McKeown and Lowe 1966). Yet many people still live in damp, cold, poorly insulated dwellings on bleak estates. A tenants' group from one such estate in Edinburgh had long argued that dampness in their homes was a cause of much illness in their families. But housing department officials, government ministers and the medical profession seem reluctant to acknowledge the possible consequences of bad housing, preferring instead to focus on lifestyle and behavioural factors on the part of inhabitants -- blaming them both for causing the dampness in their first place and for causing their own health problems in other ways.

In the face of such opposition, the tenants' group asked a team from the Research Unit in Health and Behavioral Change and the Royal Edinburgh Hospital to carry out a study to investigate links between dampness and illness (see Martin 1987). The researchers could not guarantee the desired results but we felt that if we were to carry out a study it must be carefully designed and rigorous. We were aware that previous studies had suffered from methodological weaknesses.

A series of measures were taken in order to meet this requirement:

1. It was important to minimise possible reporting and measurement biases; if information about housing conditions and information about health are obtained from the tenant or resident at the same time, there is always the possibility that the respondent may exaggerate the extent of any housing or health problems, producing potentially spurious associations between the two.
2. Similarly, if the same researcher collects both sets of information, their knowledge of one set of information might influence the way they recorded the other set. (These problems are familiar in clinical research and underlie the need to conduct "double blind" trials.)
3. Those living in the worst housing are likely to be people experiencing other problems known to affect health such as unemployment (Fox and Shewry 1988). If we want to make a point about housing and health, such factors must be controlled.
4. Finally, behavioural factors, although they may have been overemphasized in previous studies, obviously cannot be ignored (for example, smoking).

The first study, published in 1987 in the *British Medical Journal*, found that children living in damp houses, particularly where there was also mould growth, had higher rates of respiratory symptoms than children living in non-damp dwellings. They were more likely, in addition, to have had aches and

pains, fever, and gastro-intestinal illness. These differences could not be attributed to smoking on the part of the adult respondent; nor were there any differences between the two groups in terms of rates of unemployment, income level, or duration of the tenancy (Martin et. al. 1987). However, the number of households in this study which included a child was quite small -- only 101 -- and it was not possible to assess fully the contribution of possible confounding factors.

A second, much larger study was therefore planned. Funding for a three-city investigation -- Edinburgh, Glasgow and London -- was obtained from Edinburgh and Glasgow District Councils, and from the London Research Centre. Independent structural surveys of each dwelling were carried out by the Technical Services Agency, a tenant-funded architectural organisation (in order to guard against the measurement biases mentioned above.)

METHODS

Random samples of tenanted local authority housing in discrete geographical areas of each city were selected. From these lists, only those households in which there was at least one child aged under 16 years were included. Interviewers were instructed to contact the adult respondent with the main responsibility for childcare.

The health survey covered, for each child and adult respondent, the following symptoms in the previous two weeks period: long-term illness, medical contacts, time off school or work because of illness, and the respondent's mental health.

Interviewers also obtained information about: the respondent's marital status, the size and structure of the household, the economic status and occupations of all adults in the household, sources of income, net weekly household income, fuel and food expenditure.

In addition, the study asked about cigarette smoking by all adults and children in the household, forms of heating used, method and location of clothes-washing and drying¹, what pets they had (if any), and, finally, about any problems with the house or neighbourhood.

Almost 900 interviews were completed; 455 in Glasgow, 274 in Edinburgh and 162 in London. A few days after the interviews, the households were visited by surveyors who made full assessments which included: the presence and severity of any dampness and mould in each room (measured on a 4-point scale of 0-

4); the building type, ventilation and insulation. They also took air samples from each room and, where present, wall mould samples. These were then sent for independent analysis by a microbiologist. Almost 600 structural surveys were carried out and the following data refer only to those households for which full information was available. Each of the three stages of data collection was carried out by separate teams, independently of each other. The data sets were not collated until each part had been completed and coded.

RESULTS

The sample was, generally, of low income, with half (49%) having a net weekly household income of less than £80; in 57% of households no-one was employed, and a similar proportion (56%) were in receipt of Supplementary Benefit. Almost a fifth (18%) were, according to standard criteria, overcrowded. Eighty percent of the households contained a current cigarette smoker. Two-thirds of the dwellings were independently assessed as having a dampness problem, and almost half (46%) of the houses or flat had mould growth. There were no differences between damp and non-damp dwellings with respect to any of the socio-demographic variables or in terms of whether they contained a smoker.

Respondents were asked, for each child, whether any of 16 symptoms in the previous two weeks had been experienced. These were: bodily aches and pains, diarrhoea, wheezing, vomiting, sore throat, irritability, tiredness, persistent headaches, earache, fever/high temperature, feeling down or unhappy, temper tantrums, bed wetting, poor appetite, persistent cough, runny nose.

Results were analysed in terms of whether the dwelling was totally free from damp and mould, whether there was damp but no mould or whether both damp and mould were present. Six of the symptoms -- persistent cough, wheeze, runny nose, sore throat, persistent headaches and fever -- were significantly higher for children living in damp and mouldy houses. The mean number of symptoms per child was also significantly higher in the damp houses (Table 1).

¹ Editorial note: Readers who are not familiar with epidemiology or "social medicine" may wonder why the researchers asked about clothes washing and drying. Strange as it may seem, there have been claims that damp housing is caused by people washing and/or drying their clothes inside.

TABLE 1: Children's Health and Damp/mould

	None (n=184)	Damp (n=139)	Damp & mould (n=274)
	%	%	%
Wheeze	16	19	27
Sore throat	30	25	27
Persistent cough	31	37	43
Runny nose	39	40	51
Headaches	13	14	21
Fever	11	18	25
Mean no. sympts/child	3.73	4.39	5.44

* n=number of households

Logistic statistical techniques (GLIM) were then used to see whether the other factors -- particularly cigarette smoking, the number of children in the household, unemployment, and income could "explain" these differences in illness rates between the children living in damp and non-damp houses. The mother's GHQ score, a measure of psychological health, was also included in this analysis, and also whether the house was perceived by the inhabitants to be "cold". Even after controlling for all these factors a strong significant effect of dampness and mould on childrens' symptoms remained.

These initial analyses only looked at whether there was a dampness or mould problem and did not consider the severity of the problems. A severity score was then calculated for each dwelling, based on the measures for each room. It was found that, in general, the more severe the damp or mould in the house, the greater the likelihood that the house would contain a sick child. That is, there was a significant "dose-response" relationship.

Although factors such as unemployment were treated in the main analysis as possible confounders, they were not themselves unimportant in terms of their independent effect on childrens' health.

TABLE 2: Childrens' illnesses and social conditions

Symptom type	Social conditions			
	Damp	Crowding	Non-employment	Smoking [§]
Respiratory	***	ns	**	ns
Infection	***	ns	ns	ns
Gastro-intestinal	ns	**	***	ns
Emotional	ns	**	***	*

* p<0.05 ** p<0.01 *** p<0.001 ns=not significant

§ smoking by anyone in the house

Thus, while dampness was associated with respiratory illness and infection rates, overcrowding was significantly related to gastro-intestinal illness and also with emotional distress in the children living in such conditions. In those households where no adult was in employment, the emotional health of children was seriously affected. Physical health was also poorer among these children. Of course, these may in part be indirect as well as material effects, in the sense that the psychological well-being of parents can influence the children. But this should not be trivialised. It implies that the effects of unemployment in the family are widespread and profound.

A concern to illustrate the independent effects of social conditions is not intended to suggest uni-causal mechanisms. Although some specificity of effect is demonstrated, there is rarely a single factor responsible for all, or even most, ill-health. Many of the children in this study were existing under conditions of multiple adversity, and the data also show that those bearing the greatest "load" suffer the greatest ill-health.

In order to demonstrate the cumulative effect of different factors, two extremes in terms of living conditions were defined: the "best", i.e. those households in which at least one adult is in employment, net weekly household income is more than £80 and the house is not damp; and the "worst", in which there was no employed adult, income was under £80 per week, and the home was damp. Only 71 households (12%) fell into the "best" category, including 140 children. Almost 30% of the sample fell into the "worst" category, and these households contained 305 children.

Table 3: Multiple adversity and childrens' health

Symptom category	The "Best" versus the "Worst"	
	The "Best" (n=71)	The "Worst" (n=166)
Respiratory	5	72
Infection	35	51
Gastro-intestinal	17	34
Emotional	35	54
ANY SYMPTOM	76	91
Mean syapts/child	3.1	5.6

The illness rates for children living in the "worst" households can be seen to be significantly and markedly higher. Overall, the children living in these conditions had twice the number of symptoms experienced by those in the "best" conditions. Only 9% of households in the "worst" category were free from illness and the time of the survey, compared with a quarter of the "best".

It should be borne in mind that the "best" was hardly good. If the most deprived children of these council tenant families had been compared with a groups living in affluent suburbs, the differences would have been greater.

Table 4: Multiple Adversity
The consequences of ill health

	The "Best" versus the "Worst"	
	The "Best" (n=71)	The "Worst" (n=166)
<u>In past 2 weeks</u>		
Medication	29	46
GP/Hospital contact	31	44
Time off school	15	24

In addition to the distress that constant illness brings, it has other serious short and long term consequences. As table 4 shows, the children living in the worst conditions were more likely to have had medication in the previous two weeks, to have had contact with medical services, and to have had time off school because of their health. Social, emotional and intellectual development are all likely to be affected.

Discussion

Much of this excess illness is preventable. Inequalities in health do not just become apparent in adulthood, but are present at almost all ages, from birth onward (West 1986). The higher premature mortality rates of the lowest socio-economic groups are the end-product of years of deprivation, stress and adversity.

This study was the product of discussion between a number of different groups: researchers, tenants groups and professionals in housing and environmental health. The research team aimed to break down barriers and encourage dialogue. The tenant and parent groups did not wish to be portrayed as "poor victims" but as communities determined to do something about their living conditions and their health. They aimed to bring pressure to bear in the most effective manner possible. They therefore wished to find out about the extent of the problems and their effects, and are not having informed and constructive discussion with those who might be in a position to initiate policy change. The different professional groups are also learning new ways of operating and of co-operating with each other and with the tenant groups.

Let a member of one of the tenants' groups have the last word:

"My children would love to 'Be All They Can Be'. But the powers that be won't let them."

She continues --

"I used to think I was daft, but when I started to realise that the people who designed our living conditions must have been insane ... The fear facing the experts is that the truth must be told. They are not daft either and deep down they must know the misery and suffering they have caused other people." (McCormack 1988).

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² "Be all you can be" is a slogan used by the Scottish Health Education Group in its campaign to encourage healthier lifestyles.