adjusted mortality from asthma in Italy increased by over fivefold (figure), and the rises were larger in middle and older age than in children and young adults.[3] This discrepancy therefore indicates that the rises in asthma mortality cannot simply be related to increased incidence or prevalence of severe asthma requiring hospital admission. Assuming that data on asthma mortality are satisfactorily reliable, and that the determinants of hospital admission have not dramatically changed, this would suggest that changes in the (pharmacological) management of the disease are also implicated in the recent unfavourable trends in mortality.[4–7 10 11]

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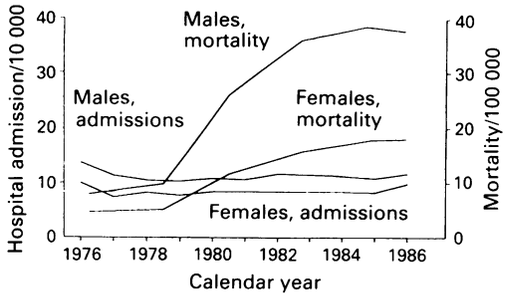

Trends in age standardised (on the European standard population) hospital admission rates for asthma in Lombardy and in mortality rates in Italy, 1976–1986.

Trends in age specific hospital admission rates from asthma in Lombardy, Italy, 1976–1986.

	Hospital admissions/1000 population									
Calender period	*0–4 years*		*5–14 years*		*15–44 years*		*45–64 years*		*>71 years*	
	Males	*Females*	*Males*	*Females*	*Males*	*Females*	*Males*	*Females*	*Males*	*Females*
1976–78	3·6	2·4	0·6	0·4	0·3	0·3	1·3	1·0	3·2	2·0
1979–81	3·7	2·6	0·8	0·4	0·3	0·3	1·0	1·0	2·6	1·8
1982–84	4·8	3·1	1·0	0·6	0·2	0·3	1·0	1·0	2·5	1·7
1985–86	5·2	3·4	1·1	0·7	0·3	0·3	0·9	0·9	1·9	1·6
Percent change	+44	+42	+83	+75	–	–	−31	−10	−41	−20

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Affluence, age, and motor neurone disease

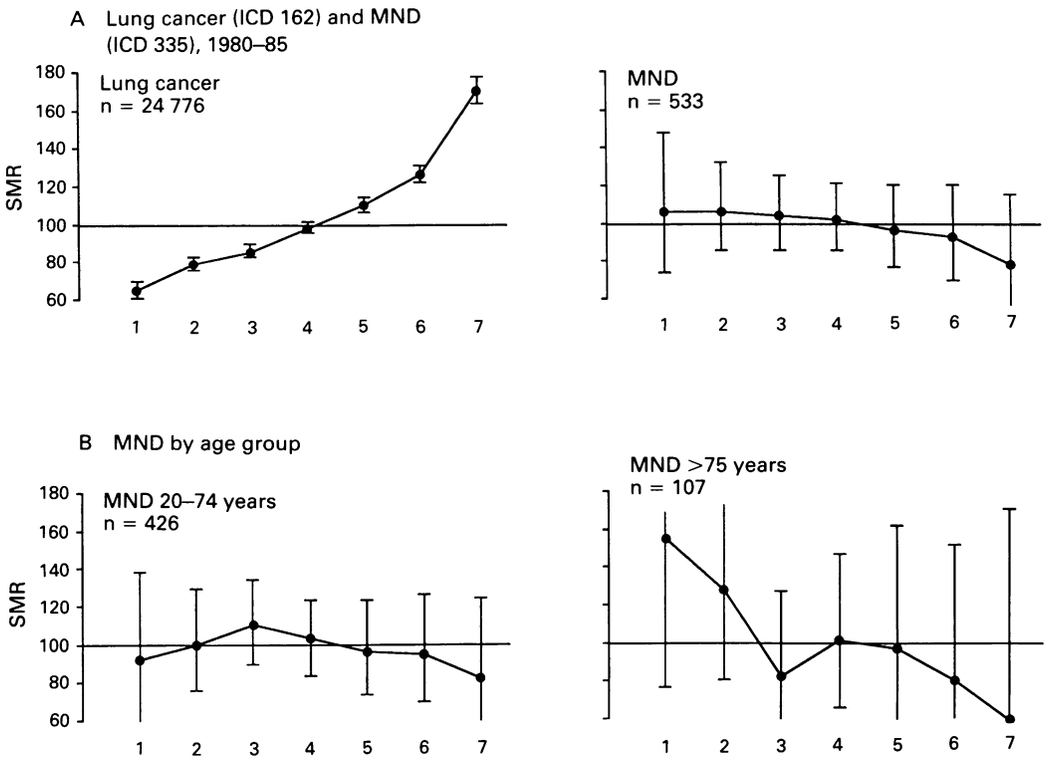
Motor neurone disease (MND), of which sporadic adult onset amyotrophic lateral sclerosis (ALS), with or without bulbar involvement, is the most common clinical subtype, is a disease of unknown cause.[1] One possibility is the interaction of aging with, as yet, unidentified environmental factors.[2] Support for this suggestion is derived from the study of the Western Pacific forms of motor neurone disease,[3] the low concordance observed in twin studies,[4] and reports of motor neurone disease or MND like diseases in relation to a variety of exogenous factors.

Occupational groups or socioeconomic status might provide clues to possible environmental risks and it has been suggested that leather workers[5] or agricultural workers[6] may be at increased risk, but there is no consistently overrepresented group.[7]

Environmental factors may well be related not just with occupation but with social deprivation. Although there is some work relating motor neurone disease to social class, measurement of the latter is fraught with difficulty, particularly for women employed in the home. Large case-control studies have found no difference in socioeconomic status of men,[8] or any relationship to home space.[9] Two studies based on death certificates are conflicting; in Finland an increased risk in the lowest social class was noted but with no clear gradient, while Martyn *et al*[10] observed a stepwise trend of the proportional mortality ratio in England and Wales, which increased with higher social class.

To avoid some of these difficulties a measure of socioeconomic deprivation in Scotland has been devised[11] using information available from the last (1981) census which allocates a numerical score to individual postcode sectors (which contain an average of 6000 persons). Using the Z score technique to give a single score, the percentage values are combined for each post code sector based on the four variables of car ownership, degree of overcrowding, unemployment, and social class. The scores are distributed into seven categories within 0·3, 0·8, 1·5, and > 1·5 standard deviations (SD) either side of the mean (+0·3 SD to −0·3 SD as the middle category). One important advantage of this method is that it can be applied to males and females, regardless of occupation, whether working or not. When standardised mortality ratios based on this scale are calculated, a number of common causes of death (eg, cancer of the lung) show a highly significant trend (figure, A), with higher ratios from deprived areas.

In contrast the figure (A) also shows the standardised mortality ratios based on the 533 deaths from motor neurone disease (ICD 335),



Age standardised mortality ratios in Scotland by deprivation category (1 = affluent, 7 = deprived)

1980–85, male and female. This demonstrates the reverse trend, that is, higher standardised mortality ratios in individuals who live in areas of greater affluence. Confidence limits overlap with unity, and the χ^2 value for the Poisson regression is 2·21 (NS), but the graph does follow a "dose-response" relationship. Because of concern about accurate diagnosis of the cause of death in the elderly, particularly for a rare neurological disease, the total group has also been divided into those aged 20–74 years and aged >75 years (figure, B). It is then apparent that elderly people largely account for the overall trend in standardised mortality ratio with the χ^2 value for the regression being 3·2 ($p < 0·1$) for those >74 years. This observation *may* reflect a failure to diagnose motor neurone disease in elderly patients from deprived areas which probably are not so well supplied with medical services as affluent areas. By inference perhaps the decline in incidence rates for motor neurone disease in the very elderly, as reported in all but one[12] of 40 population based mortality and incidence studies since 1950, is due to a similar diagnostic artefact. Alternatively, if environmental factors associated with affluence *do* predispose to motor neurone disease, the reason for the difference in the two age groups may be that the elderly have benefited less than younger people from improvements in the standard of living since the second world war. Clearly however our observation argues strongly against factors associated with deprivation increasing the risk for subsequent motor neurone disease and our prospective register of patients with the disease in Scotland will allow us to explore this issue further.[13]

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