CORRESPONDENCE

Mortality and disability among cotton mill workers

Sir,—The report by Koskela *et al* (1990;47:384-91) is of interest but it is distressing that an earlier and much larger mortality study of ours (Elwood PC, Thomas HF, Sweetnam PM, Elwood JH. Mortality of flax workers. *Br J Ind Med* 1982;39:18-22) is incorrectly referenced (given as ref 23 in the paper) and two major studies of ours of disability in ex-cotton and ex-flax workers are ignored altogether.^{1,2}

The report is of interest, however, as the approach used in the estimation of disability (follow up of a cohort of workers) differed from that used by us (the retrospective questioning of a random sample of residents in areas in which cotton or flax had been a major source of employment). Both approaches have limitations but had they been considered together more valid conclusions as to the long term effects of exposure might have been drawn. One of the most serious sources of bias, and one on which Koskela *et al* make no comment, is whether workers, when questioned, were "blind" as to the nature of the enquiry. It is inconceivable that the answers of ex-textile workers to questions about respiratory symptoms will not be biased if they know that the enquiry relates to their previous exposure to dust.

The huge odds ratio for tuberculosis is of interest and makes one wonder if the social and living conditions of the cotton workers had been different in earlier years. In our own studies we found that ex-textile workers were consistently and significantly less tall than other workers and we postulated that this may have reflected poorer nutrition and living conditions in childhood, both of which are predictors of respiratory disease later in life.

It also seems strange that the possible confounding effects of smoking were not considered appropriately in the statistical analysis, rather than dismissed as of probable irrelevance.

As we have argued in our own papers we regard the data on mortality as giving the best evidence on the prevalence of significant respiratory disease. It is therefore interesting that Koskela *et al* are now the fifth group to report an absence of any excess. Granted, there may be a healthy worker

effect though it is most unlikely that this effect could be operating to any great extent in the study of Koskela *et al* as their comparisons are with another group of workers. It is fatuous, however, for them to argue that bronchial asthma and chronic bronchitis are non-fatal and hence "... excess morbidity (from these conditions) may decrease the mortality (in the cotton workers) from respiratory diseases."

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- 1 Elwood PC, Sweetnam PM, Bevan Carole, Saunders MJ. Respiratory disability in ex-cotton workers. *Br J Ind Med* 1986;43:580-6.
- 2 Elwood JH, Elwood PC, Campbell MJ, Stanford CF, Chivers A, Hey Iris, Brewster L, Sweetnam PM. Respiratory disability in ex-flax workers. *Br J Ind Med* 1986;43:300-6.

Authors' reply

Elwood is right in correcting our erroneous reference (23), which should be Elwood PC, Thomas HF, Sweetnam PM, Elwood JH. Mortality of flax workers. *Br J Ind Med* 1982;39:18-22. We have not cited the studies on disability among ex-cotton and ex-flax workers by Elwood and co-workers because the concept and measurement of disability in those studies differ totally from those applied in our study on disability among cotton mill workers. Elwood *et al* assessed disability by means of questionnaire data and lung function tests of residents in areas where flax and cotton factories were located. We studied a cohort of cotton mill workers who had been exposed for at least five years, using register based disability data obtained from the national disability pension register. Clinical tests were not made for this study, nor were questionnaire data used to estimate disability.

We consider our results on long term effects of exposure unbiased. Firstly, the disability data were not acquired by questionnaire. Secondly, we did not ask about symptoms, we asked about certain diseases diagnosed by a doctor. Thirdly, our questionnaire asked not only about respiratory diseases but also about different types of cardiovascular diseases, musculoskeletal diseases, neoplasms, renal

diseases, and diabetes (see table 5 in our article). The main purpose of the questionnaire was to collect data on complete occupational histories and factors confounding analyses of disability and mortality. Fourthly, the same questionnaire was sent to the comparison group.

The cotton mill workers in our study reported previous diagnosis of tuberculosis more often than the comparison group. One of the selection criteria for the comparison population was similar social state. Altogether, 28 cotton mill workers reported having had tuberculosis, 19 cases of which were diagnosed during or after the exposure to cotton dust; four of the remaining nine cases were diagnosed during the second world war. Thus we are inclined to conclude that, like other workers exposed to dust (such as granite workers or foundry workers) persons exposed to cotton dust are more liable to catch infectious diseases.

Controlling for the confounding effects of smoking was not excluded in the statistical analysis or dismissed as an irrelevant issue. We used the eligible epidemiological methods to control for smoking; these methods have been assessed and discussed thoroughly by O Axelson (*Br J Ind Med* 1989;46:505-7). As we have reported in the discussion, the smoking habits of the cotton mill workers were similar to those of Finnish female workers and to those of the comparison population of paper box assembly workers. Also, only 45% of all cases of cancer were verified smokers. Lung cancer would have been the most interesting disease type, but the small number of cases did not allow any detailed analysis of the confounding effect of smoking (one of the three cases had never smoked, one had smoked 20-29 cigarettes a day for more than 20 years, and data for one case were not available).

Cancers of the digestive organs were another group of cancers with potential work related aetiology. Nine of the 13 persons who had died from gastrointestinal cancer had never smoked (four of the six stomach cancer cases had never smoked). Furthermore, in the case-referent analysis of rheumatoid arthritis, bronchial asthma, and renal diseases, the smokers in the case series were not associated with any particular score for exposure to cotton dust.

The last comment relates to the