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Recordkeeping on occupational exposures and cancer.

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Recordkeeping on occupational exposures and cancer

Table 1. Asbestos dust concentration associated with the removal of sprayed crocidolite. [These data have been taken from Harries (1).]

	Sample location ^a					
	Deck 7 stripping area	Hatchway of deck 6 leading from deck 7	Hatchway of deck 5 leading from deck 6	Passage-way to shower	During removal of suits after shower	Workmen's dining room
Asbestos concentration (fibers/cm ³)	311	109	30	25	16	0.05

^a Long-running Hunt samplers were used.

Occupational exposure registers are proliferating. Some for well-defined needs, some just for record-keeping in case someone may need the data one day. Whatever the case, the data to be stored must be well defined, and, in doing so, one has to make a choice considering the complexity of the information and the need for output. Exposure to carcinogens presents a problem of its own. Let me give some examples.

Registers are not established for known but for not proven or unknown carcinogens. Such a register will become useful 10–40 years from now. During the same time, the intensive research on “in vitro” and “in vivo” tests may have sorted out the strong carcinogens. What is left will possibly be weak carcinogens that give rise to a few extra cancers. Standardized mortality ratios (SMR) can then only be determined with wide confidence intervals. In any model with a curvilinear relationship between SMR and total dose this situation will imply that the precision in determining the dose need not be great. Knowledge of length of employment and of whether a substance is present or not may suffice.

One can only store data on concentrations and work processes that have been monitored. This problem is probably the greatest restriction in the usefulness of an exposure register. The complexities one may encounter has been illustrated for the rubber industry (2).

The apparently simple problem of relating data on man-made mineral fiber exposure and cancer mortality, etc, has led to intensive fiber concentration measurements since 1976. It is now an open question whether other substances should have been monitored. At present, efforts are being made to determine past uses of oils, binders, etc (W Linander, personal communication).

Unknown exposure to known carcinogens, ie, bystanders' exposure, is also a problem. The new classical asbestos fiber measurements during delagging on board ships (1) clearly show the importance of the problem (table 1). Other solid or liquid carcinogens may spread in a similar manner.

Suppose that over the years air samples have been taken and analyzed for some specified components. If it later turns out that another component is relevant, it will then be possible to extrapolate from an analyzed to a nonanalyzed or nonsampled component. In order to evaluate the problem, my colleagues and I have analyzed our exposure data for industrial spray painters. It turned out, not very surprisingly, that the exposures varied. However, the between-plant variation in the relative concentration of three chosen solvents (toluene, xylene, and ethanol) was as large as their within-plant variation. This finding indicates that it is as important to know the composition of the materials used as it is to know some of the actual exposures when the exposure for a whole occupational group is being characterized.

I think that all these examples point in one direction regarding recordkeeping on occupational exposure and cancer. What is needed is a register of the actual users of chemical substances and materials. This type of information is needed before priorities can be set for improving conditions for work with chemical substances and materials of all types, and to establish a register, if only for that reason, is worth the effort. As a spin-off, such a register can be used in the future for linkage with cancer registers.

References

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2. Spiegelhalter B. Carcinogens in the workroom air in the rubber industry. *Scand J Work Environ Health* 9 (1983): suppl 2, 15–25.

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