

Chemists score well in new cancer epidemiology study

Among the worries about potential hazards in the workplace, there has been a particular concern about chemists because of the nature of their jobs. Some epidemiological studies in the U.S., Sweden, and the U.K. have suggested that chemists are at a greater risk from certain types of cancer than are others.

A new study has been made that attempts to avoid some of the sources of possible inaccuracy in previous studies. The study was made by Sheila K. Hoar, now of the environmental epidemiology branch at the National Cancer Institute, Bethesda, Md., and Sidney Pell of the epidemiology section in the medical division at Du Pont, Wilmington [J. Occup. Med., 23, 485 (1981)].

What the study finds is that for the chemists and the period studied, male chemists at Du Pont experienced lower overall mortality than did nonchemist workers at the same company who were at relatively the same socioeconomic level. There were large deficits in numbers of deaths from lung cancer and arteriosclerotic heart disease.

The male chemists appear to be at slightly higher risk for death from malignancies of the colon and from cerebrovascular disease. The incidence rates of melanoma and of cancer of the prostate are slightly higher than ex-

pected. Among female chemists, deaths from all causes combined and from suicide occurred more frequently than expected.

In devising their study, Hoar and Pell noted that the designs of some previous studies had some limitations. They note that the populations studied weren't restricted to persons employed as chemists. American and British studies of chemical society members, they point out, may include persons who weren't occupationally exposed to chemicals. In addition, several of the studies were based on proportional mortality rates and not on absolute mortality rates, so that apparent excesses in proportional mortality from cancer may reflect deficits in other causes of death. Also, they point out, the Swedish study, which was based on absolute mortality and attempted to identify subjects who worked in a laboratory, included too few deaths to be conclusive.

To better zero in on the issue, Hoar and Pell turned to Du Pont records. Du Pont maintains a computerized personnel file that includes records of all salaried persons who were active employees on or after Jan. 1, 1964. It contains demographic information and work histories retroactive to 1959.

Using the file, Hoar and Pell identified 3713 men and 75 women who were

employed in 1959 as chemists, chemical engineers, or research associates, or in occupations with similar titles. Nonwhites were only a small number, so the two researchers restricted their cohort to 3686 male and 75 female white chemists.

For comparison, 19,262 male and 673 female white nonchemists who were active salaried employees in 1959 were identified in the same file. The researchers excluded from the non-chemist group any persons ever employed by Du Pont as chemists.

Hoar and Pell point out that the low overall mortality rate among the male chemists resulted in a larger than expected proportion of deaths due to cancer. They note that the cancer excesses in the previous proportional mortality reports on chemists also may reflect low absolute mortality and not absolute excesses.

Anticipated excesses of certain types of cancers weren't observed, they say, possibly because of the use of absolute mortality rates, inadequate length of followup, exposure to hazardous chemicals by the comparison group, or restriction of case identification to active employees. Deficits in overall mortality rates and in lung cancer rates may have been due, they say, to lower prevalence of smoking among the chemists, or to disparate socioeconomic status or other factors.

Site of cancer incidence	Observed	Expected ^a	Expected ^b	Site of cancer incidence	Observed	Expected ^a	Expected ^b
All sites	61	86.5	112.0	Bladder	3	2.0	6.6
Buccal cavity	1	2.1	8.5	Kidney	4	3.7	3.6
Stomach	2	2.4	3.8	Brain	2	3.0	3.4
Small and large intestine	7	11.6	9.9	Endocrine glands, excluding thyroid	1	0.5	0.3
Rectum	3	4.4	5.7	Lymphosarcoma	3	2.1	2.7
Liver and biliary passages	1	0.9	1.6	Hodgkin's disease	2	1.6	2.1
Pancreas	2	1.1	3.7	Other lymphomas	1	1.5	1.0
Lung	8	20.0	28.4	Multiple myeloma	1	0.9	1.2
Melanoma	8	8.3	3.3	Leukemia	3	3.5	3.3
Prostate	7	4.5	5.6	All other sites ^c	2	—	17.1

^a Based on nonchemist cohort rates. ^b Based on the Third National Cancer Survey, 1969-1971. ^c Observed incidence is for other neoplasms of the lymphoproliferative system and compares to 0.4 expected based on nonchemist cohort rates (all other sites than being observed, 0, and expected, 12). Note: Data are for observed and expected cancer cases, excluding nonmelanotic skin cancer, among male chemists at Du Pont, aged 20 to 64, diagnosed in 1964 to 1977.

industrial products and of medicines, contribute relatively little to the total picture.

"That does not, of course, imply that some of them are not of immense importance to sections of the population on whom the risks are concentrated, but it does mean that their control will have relatively little effect on the total incidence of cancer in the whole country," they say. "Once recognized, occupational hazards usually can be reduced or eliminated by immediately practicable means, which

makes their identification particularly valuable."

Thus they recommend that more effort be put into systematically observing workers who are being exposed to potential risks. They suggest that such observation might be of more value than the current emphasis on laboratory testing of chemicals.

That recommendation grows naturally out of Doll and Peto's admitted preference for the epidemiologic approach over what they call the "mechanistic" strategy. "The epide-

miologic approach, of course, should be influenced by laboratory discoveries," they say, "but the dangers of too great a commitment to a mechanistic approach are obvious, especially since the mechanisms underlying the international and other differences between populations in today's common cancers may not yet be understood." They argue that the epidemiologic approach is advantageous because its starting point is more relevant: a look at deaths from cancer in the human population. □

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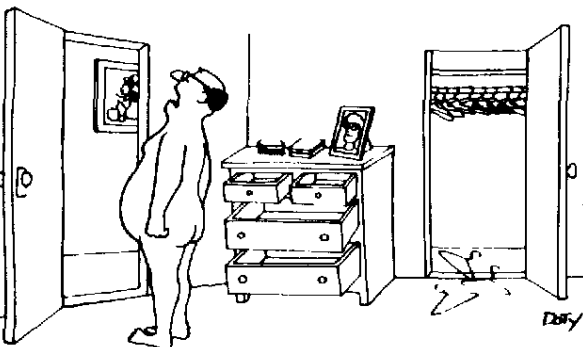
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