

LETTER TO THE EDITOR

**Diagnostic Bias in Occupational
Epidemiologic Studies**

Key words: vinyl chloride exposures, mortality study, emphysema, brain cancer

The study of vinyl chloride workers by Wong et al. [1991] is an important contribution to our knowledge of the health of people occupationally exposed to this substance. However, the discussion of findings with respect to two causes of death does not include some results that affect their evaluation.

One is the apparent excess of brain cancer. There is a good deal of data in the literature showing that diagnostic bias is important when one tries to attribute death to brain cancer [Greenwald et al., 1981; Helseth et al., 1988; Kurland et al., 1982]. In particular, Greenwald et al. [1981] have shown that an excess of brain cancer in Kodak employees was associated with more thorough diagnostic studies and access to comprehensive medical care, rather than with chemical exposure history. The study by Wong et al. [1991] does not discuss diagnostic bias as a possible explanation of special importance, all the more so since there is no firm confirmation of this finding in other studies [Doll, 1988].

The second finding, the significance of which is affected by other factors, is the excess in emphysema mortality. This is a finding with an inverse dose-response relationship based on duration of employment and an ambiguous relationship with latency, accompanied by a complementary deficit of an almost equal magnitude for deaths due to other nonmalignant respiratory diseases (which can be confused with emphysema). In 1988, Sir Richard Doll dismissed this excess emphysema mortality as not being an effect of vinyl chloride exposure because of such inconsistencies.

Readers who do not know the literature would not be able to put those findings from the Wong et al. [1991] study in perspective without this kind of information.

Hasmukh C. Shah, PhD
Chemical Manufacturers Association
Washington, DC

Address reprint requests to Dr. H.C. Shah, Manager, Vinyl Chloride Panel, Chemical Manufacturers Association, 2501 M Street, NW, Washington, DC, 20037.
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REFERENCES

- Doll R (1988). Effects of exposure to vinyl chloride. An assessment of the evidence. *Scand J Work Environ Health* 14:61-78.
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REFERENCES

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