

### Ten-Year Update of a Cohort Mortality Study of Workers with Potential Exposure to Higher Chlorinated Dioxins

K.M. Bodner (1), L.J. Bloemen (2), J.M. Ramlow (1), B. L. Jammer (1), J.B. Cartmill (1) M.L. Chau (3), M. L. Carson(4)

1) The Dow Chemical Company, Epidemiology, Midland, MI 48674, USA

(2) Dow Benelux N.V., Technical Services, Neely Building, 4530 AA Terneuzen, The Netherlands

(3) Computer Horizons Corporation, Troy, MI 48098, USA

(4) The Dow Chemical Company, EH&S Health Services, Midland, MI 48674, USA

#### Introduction

With 2187 members and 100% follow-up, the Dow cohort it is the single largest component of of IARC's 36 cohorts as well as the 12 plants in the NIOSH Dioxin Registry, of which it comprises 37 per cent. Job assignment and duration information was complete, and Dow's Michigan Division analytical and industrial hygiene data were the most comprehensive of any in the Registry, allowing us to test a number of exposure models. Substantial dioxins exposure was further corroborated by clinically confirmed chloracne documented among at least 11 per cent of the cohort.

#### Results and discussion

The third update of the Dow cohort adds 10 years of observations, including 249 deaths, and affords a maximum of 55 years and an average of 30 years of followup per member, the longest of the 36 cohorts reported in the IARC multinational cohort study (Kogevinas et al., 1997).

During the study period, 1940 through 1994, total mortality was significantly less than expected (Standardized Mortality Ratio [SMR] = 88). There were 168 deaths due to malignant neoplasms compared with 171.0 expected. In contrast to published research, respiratory cancer mortality was somewhat reduced in this cohort (SMR = 86), with even larger deficits among employees diagnosed with chloracne. Mortality from cancers of *a priori* interest (stomach, liver, connective and soft tissues, lymphohematopoietic system) did not differ significantly from expected numbers. No additional deaths from connective and soft-tissue cancers were reported during the update period. Stomach cancer mortality was seen to increase with increasing cumulative dioxins exposure, but was not elevated in any sub-cohorts. Prostate cancer was significantly elevated in the highest cumulative exposure category and displayed an upward trend with duration but not intensity of TCDD exposure. This finding was not corroborated by published reports, but continued surveillance of the cohort is warranted.

In aggregate, the results do not support a recent conclusion by the International Agency for Research on Cancer that TCDD is a generalized human carcinogen.

