

## EPIDEMIOLOGY OF LONG-TERM HEALTH EFFECTS OF DIOXIN EXPOSURE IN THE SEVESO POPULATION

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### Introduction

The 1976 Seveso industrial accident exposed a large population to substantial amounts of relatively pure 2,3,7,8-tetrachlorodibenzo-para-dioxin (TCDD). Extensive soil levels monitoring, and measurements of a limited number of human blood samples, allowed classifying the exposed population in three categories, A (highest exposure), B and R (lowest). Early health investigations including liver function, immune function, peripheral neurology and reproductive effects, yielded inconclusive results. Chloracne was the only undoubtedly established effect, with a definite exposure dependent pattern.(1)

### Materials and Methods

The risk to human health entailed by exposure to TCDD was examined by means of long-term mortality and morbidity studies conducted in the population living in the contaminated areas, using the large population living in the surrounding non-contaminated territory as reference. Detailed individual residential histories have been collected. Information on vital status and cause of death is obtained on individual basis by the Population and Health statistics office of the town of subject's last residence. For the cancer incidence study, the population database was linked to hospital discharge records data for the entire Lombardy Region (nearly 9 million inhabitants). Potentially relevant cases were ascertained blind of the exposure status by reviewing original medical records in all interested hospitals. Data were analyzed to estimate standardized RR's (rate ratios) and 95% confidence intervals using Poisson regression techniques. (2,3)

### Results and discussion

The mortality study has been extended to 1996. An excess mortality from cardiovascular and respiratory diseases was noted, especially in the most contaminated zones, possibly related to the psycho-social consequences of the accident, in addition to the chemical contamination. A suggestive excess of diabetes was also found.

Results of cancer mortality follow-up in the most contaminated areas (A+B), showed an almost twofold statistically significant increased occurrence of cancer of the lymphatic and hematopoietic tissue in both males and females. Males also exhibited an increased lung cancer and rectum cancer mortality. Cancer incidence results after 15 years are in agreement with these results.

Experimental and epidemiological data, as well as mechanistic knowledge, support the hypothesis that the observed effects are associated with dioxin exposure (4-7).

The study is continuing in an attempt to overcome the existing limitations (few individual exposure data and small exposed population size for certain cancer types). And molecular epidemiology investigations have been initiated to clarify mechanistic aspects of TCDD effects.

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