

SERUM DIOXIN CONCENTRATIONS AND CANCER RISK IN THE SEVESO WOMEN'S HEALTH STUDY

Marcella Warner, *University of California, United States*

Paolo Mocarelli, *University of Milano-Bicocca, Italy*

Steven Samuels, *State University of New York, United States*

Larry Needham, *Centers for Disease Control and Prevention, United States*

Donald Patterson, *EnvironSolutions Consulting, Inc, United States*

Paolo Brambilla, *University of Milano-Bicocca, Italy*

Brenda Eskenazi, *University of California, United States*

Background and Aims: 2,3,7,8-Tetrachlorodibenzo-para-dioxin (TCDD), a widespread environmental contaminant, disrupts multiple endocrine pathways. The International Agency for Research on Cancer (IARC) classified TCDD as a known human carcinogen, based upon predominantly male occupational studies of increased mortality from all cancers combined.

On July 10, 1976, as a result of a chemical explosion, residents of Seveso, Italy, experienced the highest levels of TCDD in a human population. In 1996, we initiated the Seveso Women's Health Study (SWHS), a retrospective cohort study of the reproductive health of the women. We previously reported a non-significant increased risk for all cancers combined with individual serum TCDD level, based on 21 cases. Herein we report results for risk of cancer from a subsequent follow-up of the cohort in 2008.

Methods: In 1996, we enrolled 981 women who were 0 to 40 years in 1976, resided in the most contaminated areas, Zones A and B, and had adequate archived sera collected soon after the explosion. For each woman, TCDD concentration was measured in the archived serum by high-resolution mass spectrometry. A total of 833 women (85%) participated in the 2008 follow-up study. All cancer cases were confirmed by medical record. We examined the relation of serum TCDD with cancer incidence using Cox proportional hazards models.

Results: In total, 66 (6.7%) women had been diagnosed with cancer. The average age at diagnosis was 48.8 (± 11.3) years and geometric mean serum TCDD level was 95.3 (± 4.0) ppt, lipid-adjusted. The adjusted hazard ratio for cancer associated with a ten-fold increase in serum TCDD levels (\log_{10} TCDD) was 1.80 (95% C.I. 1.29-2.52).

Conclusions: Individual serum TCDD is significantly positively related with cancer incidence in the SWHS cohort, more than 30 years after exposure. This all-female study adds to the epidemiologic evidence that TCDD is a multi-site carcinogen.