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RACHEL'S HAZARDOUS WASTE NEWS #175

---April 4, 1990---

News and resources for environmental justice.

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**DIOXIN--PART 3: NEW EVIDENCE THAT DIOXIN CAUSES HUMAN
CANCERS AND OTHER DISEASES.**

Two recent studies, published in 1988 and 1989, have indicated a connection between exposure to dioxin and development of cancers in humans. Earlier studies had shown little evidence linking human cancers to dioxins, but these earlier studies have now been challenged by U.S. government officials as fraudulent. (See [RHWN #171](#).) One of the recent studies also reveals a connection between dioxin exposure and a variety of non-cancer health effects, including heart attacks (among men), and digestive diseases, cirrhosis of the liver, gall bladder and biliary tract diseases, and genitourinary diseases (among women).

Seveso, Italy

On July 10, 1976, an industrial disaster occurred at a chemical plant operated by the pharmaceutical giant, Hoffman-La Roche, in the town of Meda, Italy. A visible chemical cloud containing dioxin (2,3,7,8-TCDD and other dioxins) spread over several square miles of populated countryside; most heavily hit was the community of Seveso. More than 200,000 people aged 20 to 74 lived in towns near the accident. Nearly 31,000 people aged 20 to 74 lived in zones contaminated to some degree by the accident and about 200 individuals had such high exposures that they developed chloracne, an acne condition known to be caused by exposure to dioxins.

A team of Italian physicians and researchers has been studying health conditions, including death certificates, of 30,703 people aged 20 to 74 living in areas termed "exposed," comparing people's experience there against a larger population of 167,391 individuals aged 20 to 74 living nearby in non-exposed areas. A recent report in the AMERICAN JOURNAL OF EPIDEMIOLOGY [\[1\]](#) reveals several elevated disease rates among the exposed group.

The report covers the decade 1976 to 1986, which is a short period in which to find cancer occurrences. All cancers exhibit a "latency period" (or delay period) between the time a cancer-causing exposure occurs and a cancer actually develops; the latency period varies from 7 to 40 or 50 years. Thus a study of cancers occurring 10 years after an exposure to cancer-causing chemicals could only reveal the earliest evidence of cancers and should be understood to be preliminary in nature.

The results of the study are reported for people living in three areas, labeled zones A, B and R. Zone A is closest to the accident site and zone R extends several miles distant; zone B is between the two. The assumption is that people's exposure varied with distance from the accident.

In zone A, women had elevated cancers of the gall bladder and biliary tract. They also had elevated occurrences of circulatory diseases and of chronic rheumatic heart disease. Men in zone A had elevated occurrence of cerebrovascular disease (such as stroke). In zone B, men had elevated melanomas (serious skin cancers) and cancers of the lining of the chest cavity (pleura); women in zone B had elevated incidence of soft tissue sarcomas. In zone R, men had elevated incidence of cancers of the lining of the chest cavity (pleura), and they had increased incidence of all blood diseases, and of cerebrovascular disease; women in zone R had increased incidence of cancer of the uterus, as well as hypertensive vascular disease.

The results reported above are averages for the entire decade. In the case of cancers, which would only begin to occur after a latency period, the timeperiod of interest is the second five years of the decade, and, accordingly, the Italian researchers reported results for each half of the decade.

During the second half of the decade: In zone A there were no elevated cancer levels. In zone B, men showed elevated incidence of cancers of the lung, cancers of the lining of the chest cavity (pleura), serious skin cancers (melanoma), Hodgkin's disease (cancer of the lymph nodes), and leukemia. In zone B, women showed increased incidence of soft tissue sarcomas and of the thyroid gland. In zone R, men showed elevated incidence of leukemia, and women showed elevated incidence of cancer of the brain. It is perhaps relevant to note that two previous studies have implicated brain cancer with exposure to dioxins in weed killers. [\[2, 3\]](#)

This study of the people exposed to dioxin during the Seveso accident does not prove that dioxin exposure caused the cancers or the other serious ailments from which these people suffer in abnormally high numbers (mainly diseases of the heart, blood, and arteries). Nevertheless, this study confirms that it is definitely misleading and untrue when anyone says there is "no evidence" of cancer or other serious diseases among humans exposed to dioxins. (In addition, an earlier U.S. government study has shown that Vietnam veterans exposed to Agent Orange [a weed killer contaminated with dioxin] suffer from elevated incidence of cancers, liver damage, cardiovascular deterioration, and degeneration of the endocrine system. See [RHWN #73](#).)

Sweden

Phenoxyacetic acids (for example, the weed killers known as 2,4,5-T and 2,4-D) are almost always contaminated with dioxins during manufacture. During the late 1970s, Swedish researchers studied workers who had been exposed to phenoxyacetic acids and found increased incidence of soft tissue sarcomas (rare cancers of the connective tissues). [4, 5] During the mid'80s, several additional studies confirmed the relationship between soft tissue sarcomas and exposure to phenoxy herbicides, while other studies failed to confirm such a relationship. Now a new study has once again shown a three-fold increase in soft tissue sarcomas among workers exposed to phenoxy herbicides. [6] This is the tenth study that we know of showing a positive relationship between exposure to phenoxy herbicides and soft tissue sarcomas. [7] Five studies have failed to confirm such a relationship. [8]

How can one make sense out of conflicting reports, when 10 studies show that certain chemicals cause cancer and 5 studies show that those same chemicals do not cause cancer? How can the public know what policies make sense to pursue?

In our experience, people who make money manufacturing, or using, such chemicals prefer to argue that "we just don't know," and "until all the facts are in, we should not make any changes." Unfortunately, all the facts will never be in. People, including consumers buying phenoxy herbicides at the lawn-care store and politicians making laws, will always have to make decisions based on incomplete information.

From our viewpoint, the key question is this: Is it more important to protect people and the environment from damage, or to protect chemicals from regulation, control and outright bans?

--Peter Montague, Ph.D. ===== [1] Pier Alberto Bertazzi and others, "Ten-year Mortality Study of the Population Involved in the Seveso Incident in 1976," AMERICAN JOURNAL OF EPIDEMIOLOGY, Vol. 129 (1989), pgs. 1187-1200.."

[2] A. Bair and others, "Lung Cancer and Other Causes of Death Among Licensed Pesticide Applicators," JOURNAL OF THE NATIONAL CANCER INSTITUTE Vol. 71 (1983), pgs. 31-37.

[3] D. Coggon and others, "Mortality of Workers Exposed to 2-methyl-4-chlorophenoxy-acetic acid." SCANDINAVIAN JOURNAL OF WORK, ENVIRONMENT AND HEALTH Vol. 12 (1986), pgs. 448-454.

[4] Olav Axelson and others, "Herbicide Exposure and Cancer Mortality," SCANDINAVIAN JOURNAL OF WORK, ENVIRONMENT AND HEALTH Vol. 6 (1980), pgs. 73-79.

[5] Lennart Hardell and others, "Malignant Lymphoma and Exposure to Chemicals, Especially Organic Solvents, Chlorophenols, and Phenoxy Acids: A Case-Control Study." BRITISH JOURNAL OF CANCER Vol. 43 (1981), pgs. 169-176.

[6] Lennart Hardell and others, "The Association Between Soft Tissue Sarcomas and Exposure to Phenoxyacetic Acids--A New Case-referent Study," CANCER Vol. 62 (1988), pgs. 652-656.

[7] Nine of the studies are listed in footnotes 1 through 9 of the Hardell study we cited in our footnote 6 (above), and the tenth study is the Hardell study itself cited in our footnote 6 (above).

[8] The five studies are listed in footnotes 10 through 14 of the Hardell study we cited in our footnote 6 (above).

Descriptor terms: seveso, italy; dioxin; gender; male; female; cancers; gall bladder; circulatory; heart disease; herbicides; agent orange; phenoxyacetic; hodgkins; lung; skin; pleural; sarcomas; uterine; leukemia; brain cancer;

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