

Rachel's Environment & Health News

#274 - Chemicals Cause Cancer In Workers And Nearby Residents, 9 More Studies Show

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When citizens attend public hearings to learn about a new dump planned for their neighborhood, they often encounter a hired consultant with a college degree in science or engineering who ridicules the idea that chemicals harm humans. Such a person, wearing an expensive three-piece suit, will stand at the microphone and look over the top of his spectacles, putting on his best "expert" look, and say something like, "We know you little ladies are concerned, and you have a right to be, but if you could just study the scientific literature, as I have done, you would realize that there is no evidence of harm to humans from chemical exposures."

The question to ask such a person is, "Are you merely uninformed or are you lying?" for in reality there are numerous scientific studies showing that exposure to chemicals harms humans. Last week we reviewed 10 such studies. This week we briefly report on nine more.

The dozen chemicals found most often at toxic waste sites are trichloroethylene (TCE), lead, chromium, toluene, benzene, tetrachloroethene, trichloroethane, chloroform, arsenic, polychlorinated biphenyls (PCBs), cadmium, and zinc.[1] If you look at a list of the top 200 chemicals found at hazardous waste sites, you quickly see that these dozen are representative: a few metals, and many chlorinated compounds made from petroleum. Petroleum products and chlorine can be combined in a host of interesting ways to make "chlorinated hydrocarbons," which do not ordinarily occur in nature, which tend to be toxic, which tend to persist in the environment once they are created, and which enter food chains and concentrate as they move from small plants to small animals and then into bigger animals. In general, the bigger the animal (fish, bird, or mammal), the more chlorinated hydrocarbons can be found in its flesh.

It seems natural, therefore, to ask ourselves what is known about health effects from exposure to hydrocarbons (petroleum products) and especially to chlorinated hydrocarbons.

A study[2] of 8418 white male workers in rubber factories in Akron, Ohio, revealed an excess of deaths from cancers of the stomach, the respiratory system, the lymph system (lymphosarcomas), and leukemias (cancer of the blood-forming cells). In addition, the researchers found excess deaths from diabetes (a disorder of the immune system), cerebrovascular disease (stroke), arteriosclerosis (hardening of the arteries), and suicide.

A study[3] of 1015 male workers at a Canadian oil refinery revealed an excess of cancers of the brain, bone, skin, kidneys, lymph system, and blood-forming cells (leukemia), as well as fatal diseases, including cancer, of the digestive tract.

A study[4] of 2509 active and retired workers at three oil refineries in Beaumont/Port Arthur, Texas, revealed an excess of brain cancer, stomach cancer, leukemia, multiple myeloma (cancer of the bone marrow) and lymphomas.

A study[5] of 1099 white males exposed to tetrachloroethane in the manufacture of clothing to protect soldiers against mustard gas in World War II revealed an overall cancer rate 26% higher than among the general populace of white males of the same ages.

A study[6] of British pathologists revealed an excess of deaths by suicide, and brain cancers which the authors of the study attributed to exposure to solvents, or possibly to an infectious agent.

A study[7] of 501 North Carolina men who died of non-Hodgkin's lymphoma showed an increased risk associated with occupation in the rubber, plastics and synthetic chemicals industries.

A study[8] of 184,641 people listed in the New Jersey cancer registry between 1979 and 1984 found several associations between specific cancers and specific occupations. For example, in the printing industry where people are exposed to ink (carbon black and

oil) and to solvents cleaning the presses, white males show an excess of cancers of the rectum and large intestine, black females show an excess of breast cancer, and white females show an excess of lymphomas and of Hodgkin's disease. White female workers in the petroleum products industry show an excess of stomach cancers. The chemical industry produces an excess of mesothelioma (a cancer of the lining of the chest cavity associated with asbestos exposure) among white workers of both genders, breast cancer among black females, prostate cancer among white males, lymphocytic leukemia among black males, and lymphomas and Hodgkin's disease among white females. The rubber and plastic products industries produce an excess of cervical cancers among white females, cancers of the urinary bladder among black males, and liver cancer among white males.

A study[9] by the National Cancer Institute in the mid-1970s revealed a pattern of excess cancers in white males in 139 U.S. counties where the chemical industry is clustered. Cancer of the urinary bladder showed a strong association with exposure to dyes, dye intermediates, and organic pigments, pharmaceutical preparations, perfumes, cosmetics and other toilet preparations, industrial gases, soaps and detergents, paints, glue, gelatin, and "chemicals not elsewhere classified." Lung cancer was associated with the manufacture of industrial gases, pharmaceutical preparations, soaps and detergents, paints, inorganic pigments, and synthetic rubber.

Liver cancer was associated with the manufacture of synthetic rubber, soaps and detergents, cosmetics and other toilet preparations, and printing ink.

Besides cancers of the bladder, liver and lung, white male residents of the 139 heavy-chemical counties showed excesses of cancers of the nasal sinuses, larynx (voice box), skin, and bone. In those counties, white females showed excesses of cancers of the nasopharynx (where the nasal passages join the throat), the uterus, the cervix, and skin.

A study[10] of lung cancer in all U.S. counties revealed a pattern of excessive cancers associated with four manufacturing industries: paper, chemicals, petroleum, and transportation (in which workers are exposed to solvents and paints).

Is there valid evidence that exposure to chemicals can harm humans? Is the Pope Catholic?

--Peter Montague

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[1] Anthony B. Miller and others, ENVIRONMENTAL EPIDEMIOLOGY; PUBLIC HEALTH AND HAZARDOUS WASTES (Washington, DC: National Academy of Sciences, 1991), pgs. 144-146.

[2] Dragama Andjelkovic and others, "Mortality Experience of a Cohort of Rubber Workers, 1964-1973," JOURNAL OF OCCUPATIONAL MEDICINE Vol. 18 (June, 1976), pgs. 387-394.

[3] Gilles Theriault and Lise Goulet, "A Mortality Study of Oil Refinery Workers," JOURNAL OF OCCUPATIONAL MEDICINE Vol. 21 (May, 1979), pgs. 367-370.

[4] Terry L. Thomas and others, "Mortality Patterns Among Workers in Three Texas Oil Refineries," JOURNAL OF OCCUPATIONAL MEDICINE Vol. 24 (February, 1982), pgs. 135-[141.]141.

[5] James E. Norman, Jr., and others, "The Mortality Experience of Army World War II Chemical Processing Companies," JOURNAL OF OCCUPATIONAL MEDICINE Vol. 23 (December, 1981), pgs. 818-822.

[6] J.M. Harrington and D. Oakes, "Mortality Study of British Pathologists 1974-1980," BRITISH JOURNAL OF INDUSTRIAL MEDICINE Vol. 41 (1984), pgs. 188-191.

[7] Mary Catherine Schumacher and Elizabeth Delzell, "A Death-Certificate Case-Control Study of Non-Hodgkin's Lymphoma and Occupation in Men in North Carolina," AMERICAN JOURNAL OF INDUSTRIAL MEDICINE Vol. 13 (1988), pgs. 317-330.

[8] Nancy E.L. Hall and Kenneth D. Rosenman, "Cancer by Industry: Analysis of a Population-Based Cancer Registry With an Emphasis on Blue-Collar Workers," AMERICAN JOURNAL OF INDUSTRIAL MEDICINE Vol. 19 (1991), pgs. 145-159.

[9] Robert Hoover and Joseph F. Fraumeni, Jr., "Cancer Mortality in U.S. Counties with Chemical Industries," ENVIRONMENTAL RESEARCH Vol. 9 (1975), pgs. 196-207.

[10] William J. Blot and Joseph F. Fraumeni, Jr., "Geographic Patterns of Lung Cancer: Industrial Correlations," AMERICAN JOURNAL OF EPIDEMIOLOGY Vol. 103 (1976), pgs. 539-550.

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