

ANALYSIS OF LUNG CANCER INCIDENCE NEAR CHROMIUM-CONTAMINATED SITES IN JERSEY CITY: A Citizen's Guide

Jersey City, Hudson County, NJ

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Background

Jersey City was at one time a major center for chromium ore processing and manufacturing. During much of the twentieth century, tons of waste from this processing was used as fill material on building lots for residential and commercial sites in Jersey City and other parts of Hudson County.

Investigation of this waste material determined that there are high concentrations of total chromium. Some of the chromium was in the hexavalent form, which is known to pose a risk of lung cancer in humans when breathed in. Lung cancer is the second most common cancer diagnosed in both males and females, and is the leading cause of cancer mortality for both sexes in New Jersey and the country. Recent trends indicate that the incidence and mortality rates have been declining nationwide for males, but are continuing to rise for females. The largest known cause of lung cancer is smoking; however, certain contaminants in the environment also contribute to lung cancer rates.

Although the New Jersey Department of Environmental Protection (NJDEP) has been working with responsible parties to contain and clean up these chromium waste sites, community members in Jersey City were concerned about historical exposure to the chromium and wanted to learn whether lung cancer incidence was higher in areas of the city near chromium waste sites. The NJDEP and the New Jersey Department of Health and Senior Services (NJDHSS) conducted this investigation in response to community requests.

How did the agencies conduct the investigation?

Using the New Jersey State Cancer Registry (NJSCR), the NJDHSS compared the incidence of lung cancer in Jersey City residents living near waste sites to incidence of cancer in people where there were no sites. A total of 3,249 lung cancer cases were included in this investigation. All cases of lung cancer that occurred in the Jersey City population from 1979 through 2003 were considered.

The NJDEP determined which parts of the Jersey City population were potentially at risk of exposure to hexavalent chromium, based on locations of residential areas in relation to the boundaries of chromium sites and



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Consumer and Environmental Health Services
Public Health Services Branch
PO Box 369
Trenton, NJ 08625-0369
(609) 584-5367

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A Citizen's Guide to the Health Consultation: continued

the estimated concentrations of hexavalent chromium on the sites. Low and high exposure areas were defined in several different ways, taking into account whether a particular area had contained any chromium waste sites at all, whether a waste site had high levels of chromium waste, and how much of the residential area was within 300 feet of a waste site. Different combinations of these definitions allowed historic rates of lung cancer to be compared in areas in which exposure to chromium waste was more likely to have been high to the rates in areas where exposure was more likely to have been low.

What did the investigation find?

The NJDHSS and NJDEP found that the rate of lung cancer incidence was higher in areas closest to historic chromium sites. Within Jersey City, males in the high exposure group had a lung cancer incidence rate ranging from 7% to 17% higher than the lowest exposure group, depending on the particular approach that was taken to estimate who was exposed in the past. Similarly, females in the high exposure group had a lung cancer incidence rate ranging up to 10% higher than the lowest exposure group.

What does this investigation conclude about the historical incidence of lung cancer near chromium sites?

The agencies conclude that there were increased rates of lung cancer associated with having lived close to chromium waste sites. However, the investigation cannot conclude that the increased incidence of cancer was definitely due to historical environmental exposure to chromium from the waste sites, since there are other risk factors for lung cancer (such as smoking and occupational exposures to chromate production plants) that could not be accounted for in this analysis. Alternatively, the increased historical incidence of lung cancer in Jersey City could be due to chance alone. Establishing a causal link is beyond the scope of this study.

Are people being exposed to chromium today?

All of the chromium waste sites have had some interim remedial actions taken to prevent direct exposure to hexavalent chromium. Therefore, people are not being exposed to chromium now as they might have been in the past. However, the agencies recommend that efforts to remediate chromium sites to limit any human exposure to hexavalent chromium should continue.

What else do the agencies recommend?

The NJDHSS and NJDEP recommend evaluating other cancer types in relation to chromium sites due to recent studies suggesting other exposure pathways and cancers. A new study by the federal National Toxicology Program indicates that chromium exposure by mouth can increase the risks of oral and small intestine cancers in laboratory animals. Also, a new study of a Chinese population exposed to hexavalent chromium in drinking water showed an increased risk of stomach cancer.

Where can I get additional information?

The NJDHSS and NJDEP have written a report called a Health Consultation that describes the investigation in detail. Copies of this document are available from NJDHSS at (609) 584-5367, or the NJDHSS website at www.state.nj.us/health.

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