For most of the 20th century, there was conclusive epidemiologic evidence concerning occupational pneumoconiosis (asbestosis) and cancer (lung, mesothelioma, and others) from workplace exposures to asbestos. There was considerable scientific evidence of community environmental cancer and other public health risks of asbestos exposures in the air (building demolition, brake linings, deterioration of building insulation) and drinking water (from asbestos-cement drinking water pipe and from naturally occurring contamination of the water supply). Yet asbestos products continued to be sold and used, and workers were exposed throughout most of the century due to a lack of decisive preventive medicine action. The human toll from working with asbestos was estimated at 10 million lives lost prematurely worldwide and 131,200 cancer deaths in 1985-2009 in the United States alone.

More specifically, various studies showed that occupational exposure to asbestos resulted in elevated worker rates of lung cancer, mesothelioma, gastrointestinal cancers, larynx cancer, and others. Mesothelioma (diffuse neoplasia of the pleura or peritoneum) was shown to result from low asbestos exposures and to have long latent periods (up to 50 years) in studies of children who had been born in South African mining towns and then diagnosed with mesothelioma in London many years later. In addition, the synergism between cigarette smoking and occupational exposure to asbestos in Selikoff’s studies in lung cancer causation was indicative of other possible synergisms in environmental cancer.

The industry response of ignoring the occupational hazard of working with asbestos has been characterized as “outrageous misconduct” and has more recently been well documented in Doubt Is Their Product: How Industry’s Assault on Science Threatens Your Health. Documentation of the premature deaths in workers had been done early in the 20th century in both England and the United States, but was largely ignored by the companies and regulatory agencies. Workers died from diseases, and the industry did not take responsibility.

The Manville Corporation filed for bankruptcy protection under Chapter 11 with assets of over $2 billion (the most financially healthy company ever to do so) to halt some 17,000 product liability lawsuits brought against the company by the families of victims of asbestos-related disease and death. The asbestos industry funded a large number of university researchers to conduct studies that clouded the issue. The goal of the research was to determine that Canadian serpentine type chrysotile asbestos was less toxic than other types of asbestos (the amphiboles: crocidolite, amosite, tremolite). This would allow the continuation of mining, milling, and selling products containing chrysotile asbestos around the world. The so-called “amphibole hypothesis”—that only amphiboles caused mesothelioma and chrysotile is free of mesothelioma risk—had no scientific validity. Years of delay in preventive medicine intervention by creating deliberate scientific doubt is not confined to the asbestos controversy, but has been successfully carried by with other environmentally hazardous substances, such as tobacco and lead.

My involvement began by assessing asbestos in drinking water and cancer in the San Francisco Bay area. That census-tract ecological environmental epidemiology study combined electron microscope analyses of water samples as surrogates for past exposure with census-tract cancer incidence reporting data made into cancer incidence rates, and found correlations between asbestos in the drinking water and adjusted cancer rates in the Bay Area.

I was then involved in the 1973 Reserve Mining case, in which Taconite iron ore was stripmined in Minnesota by the Reserve Mining Corporation and then sent by private railroad to Silver Bay, Minn, where the iron ore was separated from the rock and the tailings. The rock and tailings, which contained...
low grade asbestos, were dumped in Lake Superior, and asbestos ultimately ended up being detected in the Duluth, Minn drinking water supply by an EPA electron microscopist. The resulting epidemiology study led to new use of asbestos-cement pipe being banned in the United States.

By studying previous failures of preventive medicine we hope to avoid repeating them. There are encouraging signs as certain industries are being more careful in managing their waste and more vigilant in monitoring and responding to potential harms produced by their products. Regulatory agencies are more advanced and watchful, and more transparency is being demanded of the source of research funds and conflict of interest for scientists.

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