Today the Framingham project is devoted to stroke and aging, together with follow-up studies of children of the original participants.[11]

Epidemiology versus Animal Experiments

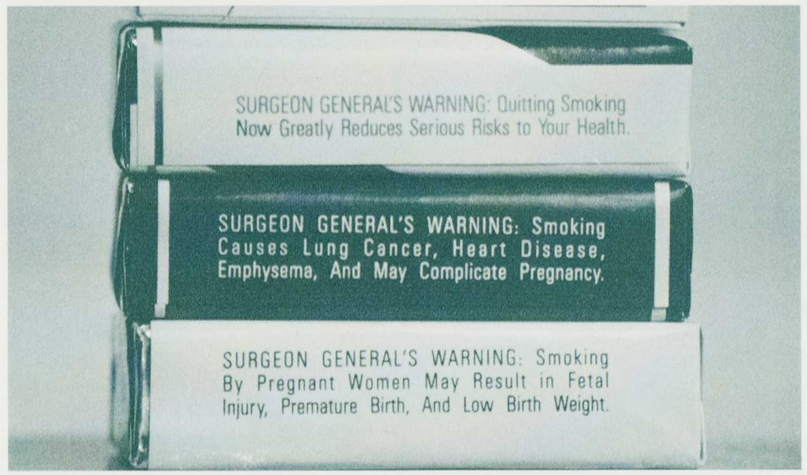
The revival of interest in epidemiology has been especially important for cancer research. Doctors now know much more about the causes and 80-90% of cases are considered potentially preventable.[1] Population studies have proved so valuable that an editorial in the medical journal *Clinical Oncology* described the epidemiologist as the most important member of the cancer research team.[48] Epidemiology has shown that differences in cancer between communities and between people are associated with differences in the local environment or the behavior or genetic constitution of individuals. According to Richard Doll,[19]

"The knowledge gained in this way has led, directly or indirectly, to nearly all the steps that have been taken to reduce the incidence of cancer in practice."

The great majority of cancer-causing agents were first discovered from their effects on people following widespread use rather than by experiments on animals.[19] It is also revealing that the 1980 United States Congress Office of Technology Assessment Report into the causes of cancer, relied far more on epidemiology than laboratory tests because, its authors argued,[23] these "cannot provide reliable risk assessments." Nevertheless, animal experiments have consistently been allowed to undermine epidemiological findings, often with disastrous results.

The failure to induce lung cancer in animals by forcing them to breathe tobacco smoke, cast doubt on the results of human studies, delaying health warnings for years and costing thousands of lives. Summing up nearly two years of experiments, the British Empire Cancer Campaign reported that mice, rabbits and other animals who were exposed to tobacco derivatives by direct inhalation, feeding, injection into the lungs and skin painting developed no signs of cancer.[24] And a year later, in 1957, American pathologist Eric Northrup concluded in his book *Science Looks at Smoking* that "(the) inability to induce experimental cancers, except in a handful of cases, during 50 years of trying, casts serious doubt on the validity of the cigarette-lung cancer theory."

Northrup described how "it is reassuring ... that public health agencies have rejected the demand for a mass lay educational program against the alleged dangers of smoking. Not one of the leading insurance companies, who consider health hazards in terms of monetary risk, has raised the life insurance rates for heavy smokers." To this day it has proved virtually impossible to induce lung cancer in animals by the inhalation method.[30]



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▲ ***Smoking:*** *Health warnings, although woefully inadequate, were delayed for years because of contradictory animal research.*

Another case is asbestos-induced lung cancer.[31] The first reports of an association between asbestos and lung cancer came from America, England and Germany during the 1930s following examination of people who had died with the lung disease asbestosis. By 1938 there were six reported cases and five years later the German government declared asbestos-induced lung cancer an occupational disease. But in some countries, notably the United States, the carcinogenic action of asbestos was doubted until the 1960s because it proved impossible to induce the disease in animals. By 1955, six separate animal studies had been carried out but only one appeared to show that asbestos might cause cancer and even this was discredited by scientists. Researchers were also concerned that the early autopsy findings might not be representative of all asbestos workers. The issue should have been resolved in 1949 when more cancer cases were found among workers seeking compensation for asbestosis than for silicosis, and again in 1955 when Doll