Brain cancer is relatively rare, accounting for only 2% of all cancers, but it seems to be increasing rapidly in children and in people over 65 in the U.S. The latest figures from the National Cancer Institute indicate that brain cancer in the elderly (ages 75-84) is doubling every 9 years [1, pg. 1621; 2, pg. 635.]. In 1991 in the U.S., an estimated 16,700 new cases of brain cancer were diagnosed and an estimated 11,500 deaths occurred. [3, pgs. I.15-I.16] The causes of brain cancer are unknown.

Brain cancer is usually fatal; the average (median) time between diagnosis and death is about nine months. [1, pg. 1621.] The average survival rate after 5 years is 25%, but in people over 65 the 5-year survival rate is only 4%. [3, pg. I.16.]

This situation—a fatal cancer that is rapidly increasing, particularly in older Americans—clearly sets the "cancer establishment" apart from those younger medical professionals who are prevention-oriented. "Cancer establishment" is a label commonly given to the tightly-knit, international group of professionals that has controlled $2 billion per year of research funds for the past 20 years as the U.S. has waged its "war on cancer," searching unsuccessfully for a cure.

In 1988 when a group of prevention-oriented public health specialists began to sound the alarm about rising cancer rates in older people in many industrialized countries [2, 4], the cancer establishment attacked them openly. Richard Doll, the eminent British epidemiologist, called the new work "uninteresting," "quaintly uninformative," "boring," and "old junk." [5, pg. 901.] As SCIENCE magazine said, "If it were politicians doing this rather than scientists, you might say they were engaged in spin control."

Doll's position, which he staked out in a paper first delivered in September, 1989, is that deaths of older people that used to be attributed to senility or some other non-specific cause are now attributed correctly to cancers. [6, pg. 500.] Doll went on to make it clear that he doesn't think cancer among older people is terribly important anyway; he said "I conclude that we are, for the most part, winning the fight against cancer. This does not appear from examination of the trends in mortality [death] at all ages, but it does when we examine the cohorts [groups] on whom the future depends." [6, pg. 508.] In other words, Doll argues that the future does not depend on older people so their rising cancer rates can be dismissed and we can declare that we are winning the war on cancer.

A different view has emerged since the late 1980s among a group of younger researchers who emphasize the need to prevent cancer rather than cure it after it occurs. To them, rising cancer rates among older Americans are a public health problem that needs to be understood and prevented, not simply brushed aside. Two advocates of this position are Devra Lee Davis of Mt. Sinai Medical Center in NYC and Joel Schwartz of U.S. Environmental Protection Agency.

The latest information from the U.S. National Cancer Institute reveals that the brain cancer problem is not confined to older people. A "dramatic rise" in brain cancers has occurred during the past 15 years in Americans over 65 but also in children, and in adults aged 30-34 [1, pg. 1622.]

Between 1973 and 1985, the incidence (occurrence) of brain cancer increased 2.6% per year in the age-group 0-4, 5% per year in the age-group 30-34, 2.8% per year in the age-group 70-74, 7% per year in the age-group 75-79, 20.4% per year in the age-group 80-84, and 23.4% per year in those 85 and older. [1, pg. 1622.] Between 1973 and 1988, in white children under age 14 in the U.S. the incidence of brain cancer jumped from 2.3 per 100,000 to 3.4 per 100,000, a 47% increase in 15 years. [3, pg. H.32; 1, pg. 1622.]

Data for non-white children is not available.

In the age-group 75-84, brain cancer deaths increased 8% per year between 1968 and 1983. Overall, brain cancer in Americans over 75 tripled between 1968 and 1983. [2, pg. 634.] Thus in older Americans, brain cancer is doubling every 9 years, a very rapid increase. Even in the age-group 30-34, deaths from brain cancer are doubling every 14 years.

Davis and Schwartz suggest that exposure to chemicals in the workplace and in the general environment may explain the rise in brain cancer. People over age 64 have experienced longer exposure to chemicals than younger people, and in the past, they say, there were fewer environmental and occupational controls. In addition, the proportion of U.S. workers in blue collar jobs has declined steadily since the early 1960s. Furthermore, the production of synthetic [human created] organic chemicals increased rapidly throughout the 1960s and 1970s and a rise in cancers from exposure to these would be expected to be particularly evident among the elderly. After careful analysis of available data, Davis and Schwartz answer the Doll argument specifically: "There is no evidence that recent increases in cancer mortality among elderly whites in the U.S. chiefly reflect improved diagnoses in cases that would formerly have been misrepresented or miscoded as ill-defined causes, such as senility or non-specified cancers." [2, pg. 635.]

They point out that better diagnosis, aided by the CAT scan accounts for some of the increase, but they also note the general increase began before CAT scans grew common in the late 1970s.

The first suspicion of brain cancer risks in blue collar workers was recorded in 1949 and definite evidence appeared in 1968 but it was not until the 1980s that numerous studies revealed risks to rubber workers, oil refinery workers, chemical plant workers, polynuclear chloride workers, and machinists (often exposed to various oils and oil mists). Some white collar and professional occupations also have an elevated risk of brain cancer, including artists, laboratory professionals (pathologists and hematologists, for example), veterinarians, cosmetologists, farmers, and embalmers [7.]

Chemicals that have been implicated with brain cancer to one degree or another include lubricating oil, acrylonitrile, vinyl chloride and polynuclear chloride (PVC), polycyclic aromatic hydrocarbons [PAHs], and phenolic compounds [phenol, chlorophenols, cresol, resorcinol, hydroquinone, and quinone], hexamethylenetetramine, coal tar, carbon tetrachloride, methylene chloride, tetrachloroethylene, benzene, toluene, PCBs, acrylates, acrylonitrile, diesel exhaust, welding fumes, dyes, pigments, organochlorine pesticides, N-nitroso compounds, and formaldehyde. [7] Other possible explanations, derived from study of worker deaths include x-rays and electro-magnetic fields. [8, pg. 185; 7, pgs. 3.9.]

Workplace exposures cannot easily explain all brain cancers because children never exposed to a workplace get brain cancer. Something occurring during conception, during pregnancy, or shortly after birth must cause brain cancer in young children. Some researchers wonder whether it isn't chemicals affecting the father's sperm. Others wonder whether it isn't electromagnetic radiation—the kind emanating from large electric transformers at power substations, from the backs and sides of many computer screens and TV sets, and from intimate contact with electric blankets.

In addition to chemicals and electro-magnetic fields, exposure to atomic radiation also contributes to brain cancer. Viruses, spontaneous genetic aberrations, and perhaps other factors cause brain cancer as well.

Until the U.S. and other industrial nations, which also appear to be experiencing rising rates of brain cancer [9.], conduct more research aimed at finding the causes of brain cancer, rates of incidence and death seem likely to continue rising.

--Peter Montague

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Descriptor terms: brain cancer; cancer; us; industrialized countries; health; carcinogens; chlorinated chemicals; prevention; elderly; studies; workers; occupational safety and health; chemicals; childhood cancer;