

Most Cancer Is Made, Not Born

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LIKE A RIFLE SHOT in the middle of the night, a new study from Scandinavia provides shocking evidence of what growing numbers of cancer doctors have long suspected. Most cancer is made, not born.

In the largest study ever conducted among twins, published in the *New England Journal of Medicine* last month, researchers found that for all cancers combined, identical twins ... sharing 100 percent of their genes ... developed the same disease about 10 percent of the time. For breast, colon and prostate cancer, both twins had the disease between 14-30 percent of the time.

For most people, cancer comes not from preprogrammed genes, but from conditions and exposures that are encountered throughout their lives. When it comes to hormonal cancers, a series of studies show the critical role of the early environment.

One study, from the London School of Hygiene and Tropical Medicine in 1998, found that fraternal twins ... sharing only 50 percent of their genes ... developed even more hormonal cancers than did identical twins. Other new studies find that girls who are heavier at birth also have a greater risk of developing breast cancer. Fraternal twins and higher birth weight babies are known to experience higher in utero hormone levels, which can fuel later abnormal cell growth.

The ability of a number of persistent organic chemicals to stoke this same growth is a matter of grave concern, according to several recent national assessments in the United States and Europe.

Researchers in the Scandinavian study assumed that any common cancer in twins was solely due to shared genetic defects. Cancer certainly runs in families, but not just because of shared genes. A study in 1988 found that adopted children whose adoptive parents died of cancer had five times the chance of getting the same disease, reflecting some common life settings independent of inherited genes.

Smoking is the single-most important avoidable cause of cancer and is directly responsible for 30 percent of all cases. What do this Scandinavian study and other new reports tell us about the causes of the other 70 percent?

In the United States, deaths from all cancers are declining, driven by sharp reductions in smoking. However, new cases of cancer not known to be linked to cigarettes are growing ... among Generation X in the United States, young men are developing four times more cancer and young women are developing 50 percent more cancer than did their grandparents. National Cancer Institute researchers have shown that rates of non-Hodgkin's lymphoma, kidney, brain, thyroid, bone marrow, liver and testes cancer have more than doubled in the general population since the last half of the past century. Why? These changes surely have nothing to do with sudden shifts in inherited genetic defects.

Studies of farmers provide some clues. Although they are generally healthier than the rest of us, farmers develop some types of cancer more often. These same tumors that are common among farmers are becoming increasingly common all over the world, according to reports from several different national cancer institutes. Besides being one of the most dangerous professions, farming includes regular contact with diesel and other engine exhausts, pesticides, solvents and paints, animal viruses and sunlight. Could growing general population exposures to these same materials lie behind the rising incidence of these diseases globally?

As to diet, evidence is compelling that animal fat plays a role in colon and prostate cancer, but mixed for breast cancer. Fat, especially animal or dairy fat, has been called the body's own hazardous waste site, as it tends to attract many toxic products. As to breast cancer, contaminants in fat could be playing an important role.

Several studies from Canada and Denmark have found that women with the disease have much more elevated levels of some toxic residues in their bodies in the years before diagnosis than those without the disease. Those with the highest exposures also have the poorest prognoses. Dr. Tony Zheng and colleagues at Yale University recently reported that women who ate the greatest amounts of well-cooked red meat during the three years before diagnosis had three to four times more breast cancer than those who consumed much less meat.

In addition to heterocyclic amines, known to damage genes, could this meat also contain toxic compounds such as fat-seeking organochlorines, or plastic contaminants migrating from food-packaging that can cause abnormal cell growth? One clue comes from a Columbia University study which last month reported much higher levels of cancer-causing compounds--called polycyclic aromatic hydrocarbons--directly bound up in the DNA of those with breast cancer.

Many of the proven causes of cancer today are hard to control, including viruses, sunlight, medical procedures and drugs, and the addictive bad habits of cigarette smoking, overeating, drinking alcohol and inherited genetic defects. What we eat, we breathe, our good and bad habits ... all these affect the chances we will develop any disease. The International Agency for Research on Cancer of the World Health Organization(WHO) has identified more than 100 compounds that are regularly used today by painters, welders, electrician, plumbers and others that increase the risk of cancer.

Even for one of the best-studied causes of cancer that we know of, radiation, genetics and gender make big differences in the chance the disease will occur. A new study published in the government's journal, Environmental Health Perspectives, and reported in the Washington Post on July 18, found that early childhood X-rays increased the risk of bone cancer about 1.6 times in all children. But, the risk that early X-rays would cause bone cancer was six times higher in girls with a certain genetic mutations, and much less in boys.

Some \$33 billion and three decades into the War on Cancer, the costs of treatment and worker loss each year runs more than \$100 billion. The United States spends about five times more per patient on chemotherapy than the United Kingdom, but survival for most common cancers does not differ.

Investments in controlling and studying avoidable environmental contributions to cancer remain scandalously low. The budget for the Occupational Safety and Health Administration ... the agency charged with protecting workers ... remains stalled, despite an expanded mandate and growing evidence of worker hazards many of which are shared in the general population.

Fueled by a sophisticated disinformation campaign of the tobacco industry--just confirmed by the WHO--we wasted 50 years debating the importance of cigarettes. We cannot afford to make the same mistake again.

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