

Cancer: Who gets it? Risk groups reported

More than 675,000 persons in the United States will be told this year that they have cancer. More than 370,000 will die from it. Cancer, says the American Cancer Society, is the number two disease killer. But who gets it, and why?

With these questions in mind, cancer researchers and physicians held a conference at the end of 1974 to pool their collective knowledge. The proceedings of that conference have just been released in book form by Academic Press. *Persons at High Risk of Cancer*, edited by Joseph F. Fraumeni Jr. of the National Cancer Institute, represents, Fraumeni says, the first such compilation of data on high-risk groups. And it may, he believes, give epidemiology new stature in the study of cancer causes and control.

The book divides risk factors into two groups: Those inherent in the host, such as genetic diseases, acquired diseases and deficient immunity; and those present in the person's environment, such as tobacco, alcohol, radiation, drugs, occupational exposures, diet and viruses. Emphasis is given to environmental factors, since they are believed to account for about 80 percent of all cancers.

The book contains hundreds of pages of detailed epidemiological information on cancer sites and patient demographics and cannot, needless to say, be summarized here. Certain high-risk groups, however, do stand out: Smokers are the least debatable, best-documented high-risk group. Heavy drinkers, too, are susceptible to cancers of the mouth, esophagus, stomach and liver. When tobacco and liquor are both consumed, the risks increase disproportionately. Other clear-cut groups are workers in many types of manufacture, exposed to a long list of organic and inorganic chemicals, and some of those exposed to large amounts of certain dietary factors such as fungal toxins, nitrosamines, aromatic hydrocarbons, food additives and contaminants as well as overfeeding in general.

The book is aimed at physicians, experimenters, educators and administrators—what one English researcher calls the "informed nuclei" of a community. The book should give physicians a source of information, Fraumeni says, for answering patients' questions, advising them and for screening those at high risks.

In a larger context, the book demonstrates the value of an epidemiological approach to oncology (the study of cancer). "Most everything known about the causes of cancer," Fraumeni says, "comes from clinicians and epidemiologists through observation of disease patterns, not from laboratory studies." One physician proposes in the book, a new specialty, "preventative oncology," based on epidemiological studies. Specialists would gather information on high-

risk groups, design effective screening programs, educate the medical community and public and work to remove risk factors.

The book will also, Fraumeni hopes, lead to more collaboration with epidemiologists. Experimenters in the laboratory can follow up on the risk factors pointed out by disease, demographic and geographic surveys. □



Fraumeni: The first compilation of data on who gets cancer and why.

Wheat as a factor in schizophrenia

Schizoid, paranoid, rigid and stereotyped, repetitious in behavior, turned inward, difficult in temperament, negativistic—these are among the terms used to describe not a mental but a nutritional disturbance known as celiac disease. The condition is caused by improper absorption of fats, and it leads to malnutrition, diarrhea and a distended abdomen (celiac is from the Greek word for abdomen). The psychiatric characteristics of the disease not only distinguish it from other malabsorption and malnutrition disorders, they seem to link it to schizophrenia. Researchers now suggest another link between the two.

Wheat, or more specifically wheat gluten, is known to be especially toxic to celiacs. Gluten is the sticky plant protein found in cereal grains. When it is removed from the diets of celiacs, their psychotic behavior diminishes. Man Mohan Singh and Stanley R. Kay of the Bronx Psychiatric Center removed all cereal grain from the diets of patients diagnosed as schizophrenic and found similar beneficial changes in their behavior. The work is reported in the Jan. 30 *SCIENCE*.

Fourteen patients, all diagnosed as schizophrenic, took part in the experiment on a ward where strict dietary controls were maintained. All cereal grain (including wheat, rye, oats, barley, rice and corn) was removed from the patients' diet for the 14 weeks of the study. Milk was also removed because some celiacs do not improve unless cereal and milk are both removed from the diet.

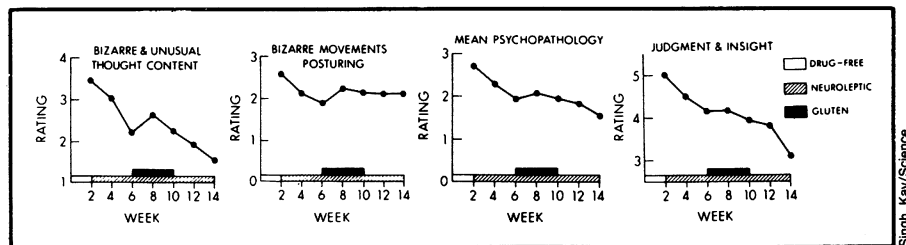
Patients were observed drug-free for two weeks and then for 12 weeks while they were receiving individually prescribed neuroleptic medication. Close behavioral observation was maintained throughout the study and each patient was independently rated during a 90-minute

psychiatric interview every other week.

During weeks 7 to 10 of the study, the patients were given a "special drink" every day. It contained Kool-Aid powder, acacia, dextrose, water and wheat gluten (30 to 45 grams a day). For four weeks prior to and four weeks following the special drink, patients were given a placebo drink that contained soy flour instead of wheat gluten. (Soy protein differs from wheat gluten in having relatively smaller percentages of proline and glutamic acid—the amino acids that are thought to be particularly toxic to celiacs.) Neither patients nor their raters knew the nature of the special drink. In order to rule out behavioral contagion and coincidental elements, patients entered the study on a staggered schedule and did not receive the same drink at the same time.

Data from all observations, report the researchers, "showed that wheat gluten had the effect of exacerbating the schizophrenic process and diminishing response to treatment." All therapeutic progress (the result of the neuroleptic medication) either stopped or appreciably reversed during the gluten period and resumed its course after gluten was removed. The researchers conclude that "wheat gluten is pathogenic in schizophrenia."

This conclusion, however, does not mean that wheat causes schizophrenia. For the most part, the causes of schizophrenia remain unknown. What is known is that genetic factors probably work in conjunction with environmental factors to produce the condition. Singh and Kay's research suggests that wheat gluten may be one of the environmental factors that can produce schizoid changes in a genetically predisposed person. Exactly how wheat gluten may contribute to the schizophrenic process is still a matter of speculation. □



Most measures of psychopathology show that gluten interrupted the treatment course.