

Probing the Link Between Ethnic Origin and Disease

When Harold Freeman first started practicing surgery at New York's Harlem Hospital, he was frustrated by his inability to use new surgical techniques for curing various cancers. These treatments were dependent on early diagnosis of a malignancy. He couldn't use them effectively for most of the predominantly poor, African-American patients who came to see him because the patients were suffering from advanced forms of cancer.

This scenario prompted Freeman to ponder why his patient population, in contrast to an average group of cancer patients, had such severe forms of the disorder. Was it because African-Americans are more susceptible to advanced cancers? Or was it because poor people, black and white, don't have the information and resources that foster early diagnosis and consequently more effective treatment? Several years of research on the topic led Freeman to conclude that the latter

hypothesis — lack of access to information and early diagnosis — was the answer.

He presented his conclusions and the route that led him to that realization at an Institute of Medicine symposium last December that explored the differences in disease risks and outcomes among minority populations. Sponsored by the Institute's Food and Nutrition Board, the symposium "Nutrition and Minority Health: The Interplay of Food, Culture, Genetics, and Environment" brought together researchers who reported on studies of such disorders as cancer, diabetes, and heart disease among African-Americans, native Americans, Asians, Hispanics, and other ethnic groups.

By the middle of the next century, no single ethnic group will predominate in the United States, Board chair M.R.C. Greenwood, told the audience. As the population becomes more ethnically and racially mixed, many people in the health field are scrambling to catch up. There's a lack of information on the types of diseases most likely to afflict different ethnic



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groups, Greenwood pointed out. Where differences in health have been observed among various ethnic groups, researchers are just beginning to gain insight into the causes. Such understanding is key to devising effective disease prevention strategies.

Ethnic Mix in Hawaii

Hawaii is a hot spot for research on minority health because it is home to an ethnically diverse population including Japanese, Chinese, native Hawaiians, Filipinos, and Caucasians. These groups have marked differences in their susceptibility to various cancers. The incidence of breast cancer,

for example, is two times lower in Filipino women than in Caucasian or native Hawaiian women. Colon cancer is much higher in Japanese men than in native Hawaiian men, and the lung cancer rate varies tremendously for different ethnic groups.

Although it is tempting to attribute these differences in cancer rates to genetic variations, studies of immigrants to Hawaii downplay the role of genes. For example, breast cancer rates in Japanese women who reside in Japan are lower than for first-generation Japanese immigrants to Hawaii. These women, in turn, have lower rates of breast cancer than do their children born in Hawaii. For stomach cancer, the situation is reversed.

These findings "argue powerfully for the important role of the environment" in fostering these types of cancers, said epidemiologist Laurence Kolonel of the University of Hawaii.

Diet is one aspect of the environment that can influence cancer risk. Kolonel's studies indicate that variations in diet, such as the amount of calories, fat, or vegetables consumed, among Hawaii's different ethnic groups partially explain why some are more susceptible to cancer than others.

Despite strong evidence of dietary influences, genetics cannot be discounted. Kolonel found proof of this when he explored why Japanese in

Hawaii, who smoke more than any other ethnic group in the state, have the lowest rate of lung cancer. Smoking is a definite cause of lung cancer. But Japanese in Hawaii apparently are genetically less susceptible to the cancer-promoting effects of smoking. At every level of cigarette consumption, his studies suggested, the Japanese are less likely than other ethnic groups to develop lung cancer. Even a diet high in beta carotene and other vitamins thought to stem one's cancer risk can

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not completely explain why Hawaii's Japanese are protected to some degree from developing lung cancer, Kolonel said.

Genes, Diet, and Diabetes

The interplay of genetics and diet appears to explain why Mexican-Americans are almost twice as likely as Caucasians to develop noninsulin-dependent diabetes. The incidence of diabetes rises when Latinos migrate to industrialized nations, according to Julie Marshall of the department of preventive medicine and biometrics at the University of Colorado. This suggests environmental influences. But genetics also has a hand in making Mexican-Americans more prone to

diabetes in the first place, Marshall discovered.

An obese person is more likely to develop noninsulin-dependent diabetes than someone of average weight, she said, and Mexican-Americans are more likely than Caucasians to be obese. This observation led Marshall to suspect that a high fat content in the diets of Mexican-Americans in this country added to the tendency toward obesity, which, in turn, increased their risk of developing diabetes. When she compared the diets of different ethnic groups in a rural Colorado town, she found that Mexican-Americans consumed about the same amount of fat as others. Genetics must also be involved, she reasoned.

Other studies have shown, however, that Mexican-Americans report lower calorie intakes than Caucasians, despite the fact that more of them tend to be overweight. This suggested to Marshall that Mexican-Americans are more likely to have what is called the "thrifty genotype." People with this genetic makeup tend to burn fewer calories with exertion or to store calories more efficiently.

A thrifty genotype individual is thought to have an advantage in communities subject to frequent shortages of food. The type tends to be at a disadvantage in this country, where food is plentiful and often high in fat. Mexican-Americans with a thrifty genotype

who adopt the high-fat American diet, consequently, are more likely to be obese from an early age and also more likely to develop diabetes, Marshall concluded. These findings show how “genetics can affect the potency of environmental effects,” she pointed out.

One’s genetic makeup can be both an ally or a foe when it comes to influencing susceptibility to various diseases. The thrifty genotype seems to increase the risk of developing diabetes. In contrast, the genetic makeup of African-Americans apparently shields them to some degree from developing the disorder when they are overweight, pointed out epidemiologist Richard Cooper of Loyola University. Obese African-American women are nearly two times less likely than obese white women to develop diabetes.

Social Setting

One cannot use genetics to predict who will get or die from cancer, said Harlem Hospital’s Freeman. Noting that African-Americans have one of the highest incidence rates of cancer and one of the lowest five-year survival rates following diagnosis, he described a study he undertook to explore the relationship of race, poverty, and cancer. His research showed that African-Americans are more likely to develop and die from cancer, in part, because they are more likely

to be poor. And poverty limits access to adequate health care.

Nearly half of the women in Harlem with breast cancer have no health insurance, Freeman pointed out. Without insurance to cover their medical bills, many poor people avoid seeing a doctor. One of the main reasons that poor people have a 15 percent lower cancer survival rate than more affluent individuals is that their diseases often are diagnosed later.

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In his research Freeman found that only one out of every 20 Harlem women with breast cancer are diagnosed when the tumor is contained within the breast — a stage when treatment is more effective. In contrast, half of American white women and about 40 percent of all African-American women with breast cancer are diagnosed when the cancer is at an early stage.

“You must look beyond race to get information on why people die from various diseases,” he told his audience. In order to understand diseases, a researcher needs to understand the social settings in which they occur.

Cooper, who had conducted research in Nigeria, agreed. Better educated Nigerians are more likely to

have high blood pressure, whereas the reverse is true for African-Americans living in Chicago. Furthermore, Nigerians are much less predisposed to develop high blood pressure than blacks in Chicago.

“When we look within what we call racial groups, we see enormous heterogeneity in our disease measures,” Cooper said.

Class or educational distinctions aside, he pointed out, Africans and African-Americans are still diverse groups by virtue of differences in their genes. Molecular and genetic studies reveal that there is more variability within racial groups than between groups, according to Cooper. This suggests, he said, that “we should discard simple black and white categories” and pay more attention to cultural rather than biological distinctions between racial groups, when assessing health risks.

In concluding remarks, Cutberto Garza of Cornell University’s Division of Nutritional Sciences and a member of the Food and Nutrition Board, observed that whatever guideposts researchers use to assess differences in health between minorities, “the diverse population in the United States offers a great opportunity.”

— Margie Patlak

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