

Long Island Breast Cancer Study Project leads Gammon to more research



Dr. Marilie Gammon

PHOTO BY TOM FULDNER

It started more than a decade ago, when a group of women on Long Island became concerned about reports that the breast cancer rate in their region was above the national average.

In 1993, the advocates – many of them breast cancer survivors – pressed Congress to pass a law requiring a study of potential environmental factors that might be contributing to the increased breast cancer rate in suburban New York. The result was the Long Island Breast Cancer Study Project, a large population-based study of breast cancer.

Marilie D. Gammon, PhD, professor of epidemiology at the UNC Gillings School of Global Public Health, designed the study, which focuses on approximately 3,000 women. About half were newly diagnosed with breast cancer, and the rest were healthy women used as a control group.

Using blood samples, Gammon and her colleagues did not find links between breast cancer and the pesticide DDT or exposure to PCBs, a family of chemicals once used in electrical equipment. They did find a slightly elevated risk for breast cancer linked to exposure to PAH, a chemical carcinogen formed by the incomplete combustion of fossil fuels, which is driving further studies.

PAH exposure can come from sources ranging from air pollution to grilled meat. It's found in tobacco smoke, charred and smoked foods, and diesel and jet exhaust.

PAH is one of the few environmentally related factors linked to breast cancer risk. An example of an established environmental risk is radiation exposure.

“More studies have to be done,” Gammon says. “We don’t ever believe (just) one study.”

Now, Gammon and other researchers are trying to determine whether certain individuals might be more genetically susceptible to cancer from PAH exposure. Studying PAH exposure in cigarette smoke is complicated by the fact that smokers are more likely to have an early onset of menopause, a process that may *decrease* a woman’s risk for breast cancer, since it lessens lifetime exposure to estrogen, a known breast cancer risk factor.

The Long Island study also resulted in a new research tool, a geographic information system that allows researchers to explore new hypotheses on environmental factors for breast cancer. It uses 80 databases to map health, demographic and environmental data in New York’s Nassau and Suffolk counties, including the location of roads, land use and breast cancer incidence. The information includes air quality data from monitoring sites set up by the Environmental Protection Agency.

“We can look at what’s happening when people live near a busy road or a stop light,” where cars and trucks are producing more exhaust, Gammon says.

Gammon also uses these data to examine whether developing and surviving breast cancer is influenced by other factors – not just those that society can change (like pollution) – but factors that women can control, such as diet and exercise.

For example, Gammon’s work has shown that premenopausal women who gain more than 35 pounds after age 20 – prior to breast cancer diagnosis – are two times less likely to survive the disease. Postmenopausal women who gain more than 29 pounds after age 50 are nearly three times less likely to survive. Adult weight gain is associated with abdominal fat, and another study by Gammon provided evidence that excess abdominal fat can adversely affect breast cancer survival.

“These results demonstrate that obesity, particularly abdominal fat, decreases a woman’s chance of surviving breast cancer, even if she is premenopausal at the time of diagnosis,” Gammon says. “Our goal is to identify factors that will reduce risk of breast cancer and enhance survival once diagnosed. Maintaining a healthy weight throughout adult life is something women can do to reduce their risk of developing breast cancer, and if diagnosed, improve survival.” ■

– By Sylvia Adcock