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Dr. Joseph F. Fraumeni Jr. in 2018. "He belongs on the Mount Rushmore of epidemiology," a colleague said. LFS Association

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By Trip Gabriel

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Dr. Joseph F. Fraumeni Jr., who helped discover one of the first examples of a cancer linked to a human gene, paving the way for a field that has so far seen the discovery of more than 120 genes that predispose people to cancer, died on June 22 in McLean, Va. He was 93.

His death, at a skilled nursing facility, was confirmed by Holly Fraumeni, his niece.

Besides his pioneering research on hereditary links to cancer, Dr. Fraumeni did groundbreaking work in identifying environmental and lifestyle risks for cancer. For decades, he led the world's top cancer epidemiology program, at the National Cancer Institute in Bethesda, Md.

“He belongs on the Mount Rushmore of epidemiology,” Dr. Norman E. Sharpless, a past director of the institute, told The Cancer Letter, a news site, after Dr. Fraumeni’s death.

Epidemiology is the study of patterns of disease within populations. In his office, Dr. Fraumeni hung an old New Yorker cover depicting birds on a rooftop, all but one facing forward. The backward-looking bird, he would say, is like an epidemiologist, who focuses on how past behavior and exposures influence current health.

Dr. Fraumeni recognized that the technology capable of exploring biology at the molecular level, developed starting in the 1970s and ’80s, could be used to hunt for causes of cancer in population- and family-based studies. As a leader at the cancer institute, he directed grants to do so, and is recognized as the founder of molecular epidemiology.



Dr. Fraumeni in 1995. He was a commissioned officer in the U.S. Public Health Service, rising to the rank of rear admiral and assistant surgeon general. via Fraumeni family

“That was part of his brilliance: He could see that this would completely be transformational, and he made sure that it was,” Dr. Judy E. Garber of the Dana-Farber Cancer Institute in Boston said in an interview.

Those molecular-level tools were unavailable in the 1960s, when Dr. Fraumeni began his best-known research, a study of four families with a history of multiple types of cancer that appeared in childhood or early adulthood.

“It was devastating,” he told The New York Times in 2015 for an obituary of his principal co-researcher, Dr. Frederick P. Li. At the time, he added, “we knew almost nothing about the cause of cancer.”

Cigarette smoking had been linked to lung cancer in the 1950s, but otherwise cancer epidemiology was at a loss. Many scientists were deeply skeptical of the idea that malignant tumors had a genetic origin, and most cancer research focused on external factors like air pollution and exposure to job-site chemicals.

The detailed medical histories that Dr. Fraumeni and Dr. Li compiled suggested that an inherited gene predisposed members of the families in their study to cancer. They reported their results in 1969, and the hereditary disorder, which significantly increases a person’s risk of developing multiple types of cancer at a young age, was later called Li-Fraumeni syndrome.



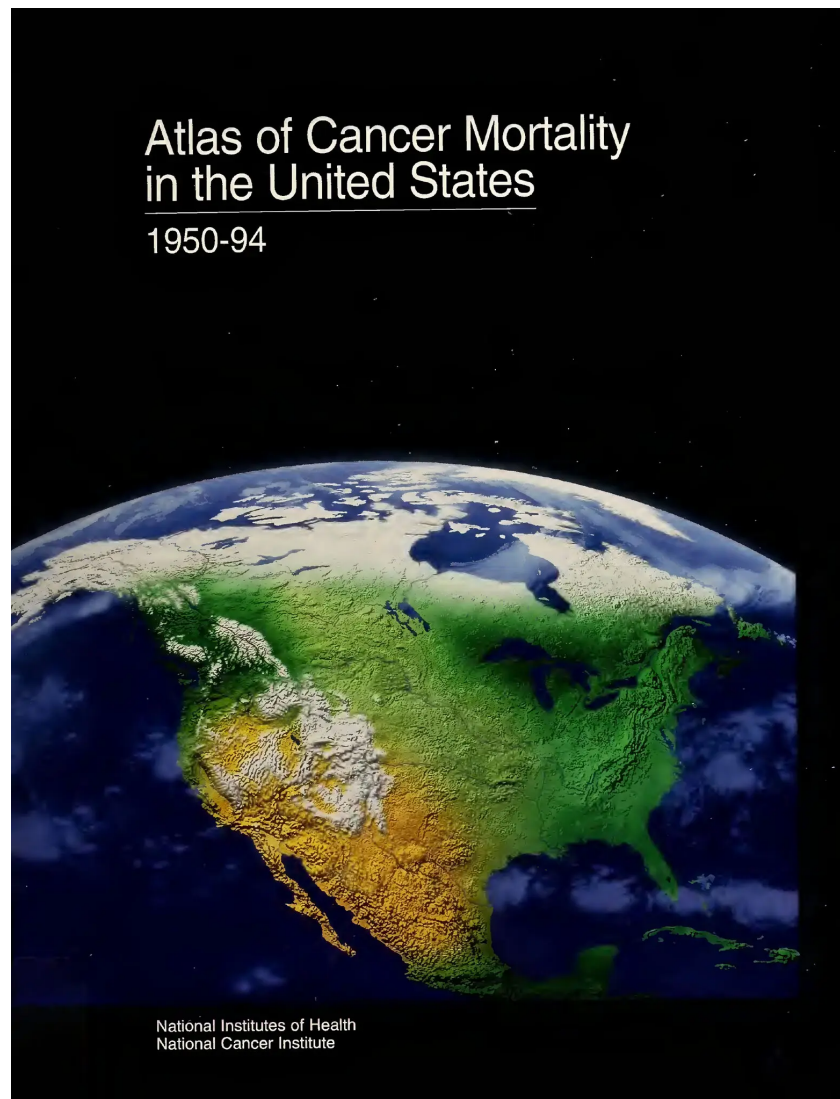
Dr. Fraumeni in 1991, right, with his principal collaborator, Dr. Frederick P. Li. In a study published in 1969, they compiled detailed medical histories of four families, suggesting that an inherited gene had predisposed the family members to cancer. National Cancer Institute, via Fraumeni family

It is a very rare condition, but Dr. Fraumeni and Dr. Li were eager to find the specific genetic cause, in the hope of eventually identifying the genetic origins of cancers that were more common.

In 1990, a breakthrough was reported on the front page of The Times: Collaborators of Dr. Fraumeni and Dr. Li had traced Li-Fraumeni syndrome to a mutation in a gene known as TP53. It was one of the first times an inherited gene that predisposes an individual to cancer was identified.

Today, about 5 to 10 percent of cancers are considered hereditary. Among the 120 or so genes that are involved are those linked to breast and colon cancers.

Dr. Fraumeni understood that cancer was not a question of nature versus nurture; the environmental and genetic factors were interwoven. In the 1970s, he led the development of the first maps of cancer deaths in the United States, which became the U.S. Atlas of Cancer Mortality.



In the 1970s, Dr. Fraumeni led the development of the first maps of cancer deaths in the United

States, which resulted in further studies of specific cancers in certain areas. National Institutes of Health/National Cancer Institute

The color-coded maps, which have darker hues identifying counties with a higher frequency of certain cancers, led to further studies that pinpointed malignancies caused by arsenic emitted from copper smelters and by asbestos used in shipyards. A correlation was found between oral cancers and the tobacco snuff that women in the rural South used.

The research, groundbreaking at the time, led to policy changes that prevented “countless malignancies and premature deaths,” according to The Cancer Letter.

Joseph Francis Fraumeni Jr. was born on April 1, 1933, in Everett, Mass., just north of Boston, the elder of two sons of Joseph F. Fraumeni, an optometrist, and Pauline (Malta) Fraumeni, an antiques collector and dealer. The family soon moved to North Reading, Mass., where Joe, as he was known, grew up.

President



Joseph F. Fraumeni

Joe . . . synonym for activity . . . in fact, his activities read like a Red Book . . . Senior Class President, Junior Vice-President, Headmaster's Cabinet, traffic squad, Junior Executive Board, basketball, senior play committee. . . . The crystal ball predicts . . . success at Harvard. . .

After graduating from high school in 1950, Joe enrolled at Harvard, where he earned a bachelor's degree. He went on to get a medical degree at Duke in 1958 and a master's degree at the Harvard School of Public Health in 1965. via Fraumeni family

His father encouraged him to study medicine, as did a physician who was a friend of the family. “Whenever he saw me, he would call me ‘Doctor,’ even when I was a little kid,” Dr. Fraumeni recalled in 2014 in an interview with the Duke Medical Alumni Association.

After graduating from Harvard with a bachelor’s degree in 1954, he attended the Duke University School of Medicine, earning his M.D. in 1958. In 1965, he received a master’s degree from the Harvard School of Public Health.

Dr. Fraumeni was a commissioned officer in the U.S. Public Health Service, rising to the rank of rear admiral and assistant surgeon general. In 1962, he joined the National Cancer Institute as a researcher, and in 1995, he became the founding director of its division of cancer epidemiology and genetics.



Dr. Fraumeni with his wife, Patricia, in an undated photo. via Fraumeni family

He married Patricia D'Arcy in 1977. She died in February. The couple did not have children. Besides his niece, he is survived by a brother, Arthur, and two nephews, Richard and Joseph.

Dr. Fraumeni officially retired from full-time work in 2014, when he was named a scientist emeritus at the cancer institute. But he continued to go to the office regularly until the Covid-19 pandemic began.

“Out of habit from his earlier work ethic,” Ms. Fraumeni said, “he stayed at the office until as late as 7 p.m. on Fridays well into his 80s.”

Trip Gabriel is a Times reporter on the Obituaries desk.