

all incidence declined between 1947 and 1970, it has increased between 5 and 10 percent since 1970. The ACS specifically cautions that the increase does not represent an epidemic. Lawrence Garfinkel, ACS vice president for epidemiological studies, says that despite potential flaws, the NCI evidence is the best around. "You have to be patient and give it time in order to decide if this is a real trend or an artifact," he says.

Just how reliable are the NCI data? Epidemiologists would probably agree that the ideal study of trends in cancer incidence would consist of annual national surveys, which would also be prohibitively expensive, or—barring this—annual surveys of perfectly comparable populations that are representative of the United States. The surveys on which the

of the Shell Oil Company, says that the authors' comparisons of the total populations are flawed, leading to an inadvertent doubling of the estimated cancer rate increase. Morgan, who prepared his critique at the request of the American Industrial Health Council, an organization of chemical firms, says that these and other flaws "produce a trend estimate that must be considered unreliable and possibly deceptive." Schneiderman characterizes Rothman's comments as "thoughtful," but insists that the populations are indeed comparable from year to year. Clearly, NCI's case would be stronger if the regions (and the demographic characteristics of each region) had remained constant.

Even if one accepts the data as valid, there are several factors other than ex-

If the statistics cannot relate cause and effect, they can certainly add to the rhetoric.

Pollack and Horm data depend, and which NCI funds at the rate of \$10 million a year, are a far cry from this ideal.

There is only indirect evidence that the populations surveyed are representative of the total U.S. population. Each survey encompassed 10 percent of the total population, but underrepresented rural dwellers and overrepresented Chinese and Japanese Americans, Indians, and Polynesians. An industry critic complains that it overrepresents shipbuilders, who are vulnerable to asbestosis; Harris of CEQ, on the other hand, complains that it underrepresents the industrial Northeast.

Perhaps more important in the statistical sense is that the survey groups varied considerably from year to year on a non-random basis, as cities and regions decided to drop out or were persuaded to join. The survey population in 1976 had only four geographical regions (out of 11) in common with the survey population in 1969. § NCI made efforts to ensure continuing regional participation beginning in 1973, but it could not resist the temptation to add new groups until 1976.

Authors Pollack and Horm attempt to prove that the total populations are comparable from year to year. But their methodology has been attacked by other epidemiologists including Kenneth Rothman at Harvard, and Robert Morgan at SRI International in Palo Alto. Rothman, who prepared his critique at the request

§Atlanta, Detroit, Iowa, and San Francisco.

posure to chemicals that might account for the cancer rate increase. Several critics of the NCI data raise the possibility that methods of detecting cancer improved enough from 1969 to 1976 to account for a portion of the increase in reported cases. "Case finding is improving, especially among the old and the black, and this biases such trends upwards," says Richard Peto, a statistician at Oxford University. Peto favors mortality as an indicator of cancer trends, and only among middle-aged white populations—to compensate for changes in cancer reporting and therapy. In this group, he suggests, mortality rates are not significantly increasing.

Horm and Schneiderman counter that disease reporting among all age groups has been good in the United States for some time, and that incidence rates are therefore a reliable indicator of trends. Possible exceptions are cancer of the pancreas and of the breast; increased detection of the latter was sparked in the early 1970's by the publicity surrounding the surgery of Betty Ford and Happy Rockefeller, and incidence rates went up shortly thereafter. Cancer incidence among blacks was deliberately excluded from the NCI data because of detection improvements.

Abe Lilienfeld, an epidemiologist at Johns Hopkins University, suggests another potential explanation for the cancer rate increase. During the 1970's, he

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French Doctors Claim Shah Had Wrong Treatment

The French doctors who had long been treating the late Shah of Iran for cancer believe that their patient did not receive the correct treatment when he was brought from Mexico to the United States last year.

The French doctors, Paul Milliez and Jean Bernard, visited the Shah in Mexico in October 1979 and advised that his spleen, which was considerably enlarged, should be removed, and that he should have an operation for his gallstones. Everything was ready for both operations at a Mexican hospital, according to a report in *Le Monde* (29 July), when the Shah was taken to New York. Here he was treated for gallstones. "Despite the specific and urgent recommendations of the French doctors, the removal of the spleen was not undertaken at that time, and the chemotherapy modified by the Americans, was in no way suitable to his condition," says *Le Monde*.

The Shah left New York for Panama, then Cairo, where his spleen was finally removed, by DeBaakey of Houston, on 28 March 1980. But it was too late. The Shah's condition continued to deteriorate. His immune system, weakened by the chemotherapy, was unable to fight off infections, and on 27 June he died.

Aquarian Candidate Quizzed by Laureates

A group of Nobel laureates has a question for Ronald Reagan: Do you really believe in astrology?

The five Nobelists confess themselves to be "gravely disturbed" at a recent newspaper report which states that Reagan follows the daily zodiacal advice for his sign—Aquarius—in the horoscope column of Carroll Righter, and that he pays attention to the predictions of clairvoyant Jeane Dixon.

In a 12 August letter to the Republican candidate, the Federation of American Scientists on behalf of the five worried laureates asks for a clarification of Reagan's views.

"As scientists we know of no basis for the belief in astrology . . . that you