

Trend of Breast Cancer Incidence in the U.S. Prior to Screening Mammography (1940-1970)

Second National Cancer Survey, 1947-1948: Ten cities with some of their counties?

Source: David E. Lilienfeld, MD, *Harold Fred Dorn and the First National Cancer Survey (1937-1939): The Founding of Modern Cancer Epidemiology*. Am J Public Health. 2008 December; 98(12): 2150-8.

For the survey, the United States was divided into three regions: north, south, and west.³⁶ The proportion of the population in cities with 100 000 persons or more relative to that for the entire region was approximately the same for each of the three regions. Since medical students were employed as medical record abstractors, each area had to have a medical school, limiting the survey to metropolitan areas.³⁷ The 10 registries selected, including the counties that each comprised, are shown in Table 1.¹ Two registries, New Orleans and Philadelphia, did not include any suburban counties. San Francisco included both the city of San Francisco and Alameda County (including the city of Oakland), but no suburban counties.

Third National Cancer Survey, 1969-1971: Nine geographic areas: Detroit, SF-Oakland, Iowa, Atlanta, Colorado, Birmingham, DFW, Pittsburgh, Minneapolis-St.Paul {note: Connecticut not included}

Source: Cutler SJ, Scotto J, Devesa SS, Connelly RR. *Third National Cancer Survey—An Overview of Available Information*. JNCI J Natl Cancer Inst (1974) 53 (6): 1565-1575. For this report, data were collected in the Third National Cancer Survey, which covered nine geographic areas with a combined population of 21 million people. During the 3-year period 1969-1971, a total of 181,027 new cancers were diagnosed, excluding in situ carcinomas and non-melanoma skin cancer.

Debra Monticciollo and Barbara Monsees in their letter to the editor (*Effect of Screening Mammography on Breast Cancer Incidence Correspondence*, N Engl J Med February 14, 2013; 368:677-679) refer to a 1% per year incidence increase prior to 1980, citing **Garfinkel L, Boring CC, Heath CW Jr** (American Cancer Society). *Changing trends. An overview of breast cancer incidence and mortality*. Cancer. 1994 Jul 1;74(1 Suppl):222-227. The only information in the Garfinkel report on incidence trend is: “*The Connecticut Tumor Registry has been in operation for more than 50 years. Between 1940 and 1980, breast cancer incidence in this registry rose an average of 1% per year.*” No data are provided substantiate this statement. The only chart in the report (right) displayed SEER9 data after 1973.² The **1%/year is an over-estimate** for several reasons: 1) it was based on a single geographic registry (Connecticut) that in 1950 was 1.3% of the population of the U.S.; 2) it was rounded to the nearest whole number; 3) it is not a compounding value but a linear average for the 40 years; and 4) most importantly, it included the distinct increase in breast cancer incidence during the 1970s that was due to the first years of screening mammography and the increase caused by the public announcement of breast cancer diagnoses in First Lady Betty Ford and Happy Rockefeller in 1974.

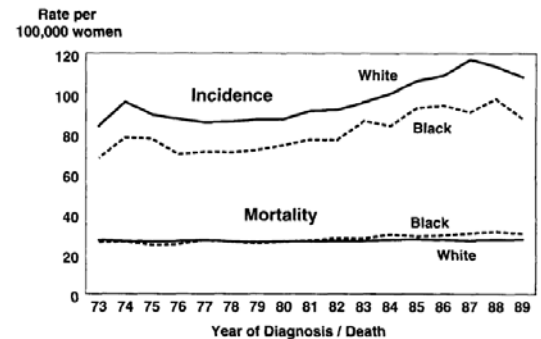
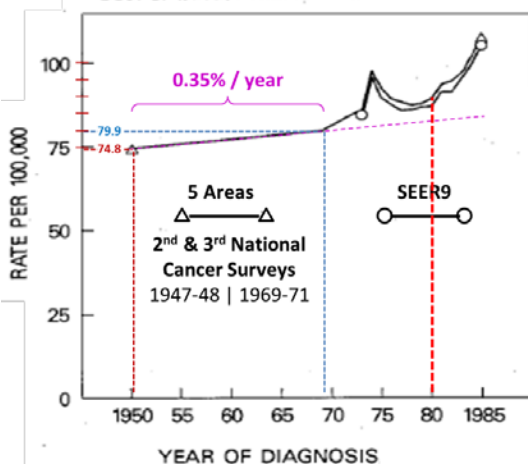


FIG. 1. Breast cancer: white females.



The Garfinkel report cites a report by National Cancer Institute investigators to have data on the incidence trend prior to 1980: **Kessler LG, Feuer EJ, Brown ML**. Prev Med. 20:170-182, 1991. The report states: *The age-adjusted rate of malignant breast cancer was 56.3³ in 1940 and increased to 71.6 by 1960, and to 91.1 in 1980: an average annual increase of 0.85.*⁴ As shown in the report's figure (left, with all elements in black the original figure) however, this estimate includes the increase after 1970 (between the blue and red vertical dashed lines) mentioned above. From the figure, the values of 74.8 and 79.9 per 100,000 white females for 1950 and 1970 respectively demonstrate an increase of 0.35%/year prior to 1970. Moreover, the data in the chart are for five geographical areas (the triangle and associated curve) that the NCI surveyed in the 2nd and 3rd National Cancer Surveys of 1947-1948 and 1969-1971, respectively. The sites were selected from the north, south and west of the U.S. as described above. These data are therefore more representative of the national trend before 1980 than the Connecticut data cited above. White women dominated the data for 1940-1980 (which is why only white females were shown by Kessler et al) and hence the slope of the curve reflects all women.

The **0.35% per year from 1950 to 1970** is between the assumptions of 0.25% and 0.5% per year Bleyer and Welch used for the *Best Guess* and *Extreme Assumption* estimates, respectively in their NEJM report and closer to *Best Guess* than the *Extreme Assumption*. Also, why would a trend in 40-60 years agobe expected to have continued during the past three decades. Would not a more relevant basis be contemporary trends in a non-screened (age <40) population such as used by Bleyer and Welch?

¹ Table not provided with online article

² The figure also shows no reduction in breast cancer mortality despite the increase in incidence due to screening

³ All rates expressed per 100,000

⁴ The 1980 estimate includes the beginning of the upsweep due to screening mammography as well as the Ford-Rockerfeller effect.