

LETTER

Regarding “Increase in Breast Cancer Incidence in Middle-aged Women during the 1990s”

Dear Editors:

Recent controversy about the high breast cancer incidence rates in Marin County, California (1) illustrates some of the difficulties in interpreting cancer trends in small geographic areas. Breast cancer incidence reportedly increased by 8.0% per year in the 1991 to 1997 period among non-Hispanic white women aged 45 to 64 years in Marin County, California, with no significant increase among other age groups in Marin county or other counties within the San Francisco Bay area (SFBA) (2). Clark et al. reported similar findings for the 1990 to 1999 time period (3).

As was first noted by Edwards (1), a limitation of the two published analyses is that the denominators (number of women at risk) used to calculate the incidence rates after 1990 were projected from the 1990 census. This approach potentially under- or over-estimates the population in small geographic areas during periods of rapid migration (4). We therefore recalculated the rates using population estimates based on interpolation between the 1990 and 2000 census (5). The latter indicate that the number of non-Hispanic white women aged 45 to 64 years in Marin County increased by 29% from 1992 to 1999 (5), not by 10% as was projected from the 1990 census (6).

We also calculated the estimated annual percent change in incidence rates from 1992 to 1999 among non-Hispanic white women residing in Marin County and in the other four counties in the San Francisco bay area (SFBA) in the 1992 to 1999 period, using rates based on projected populations from the 1990 census (6), and in the 1992 to 2000 period, using interpolated population estimates from the 1990 and 2000 census (5). The joinpoint regression analysis assumed one linear trend during this time period (7).

Data in Fig. 1 and Table 1, based on the projected population at risk, show breast cancer incidence rates among

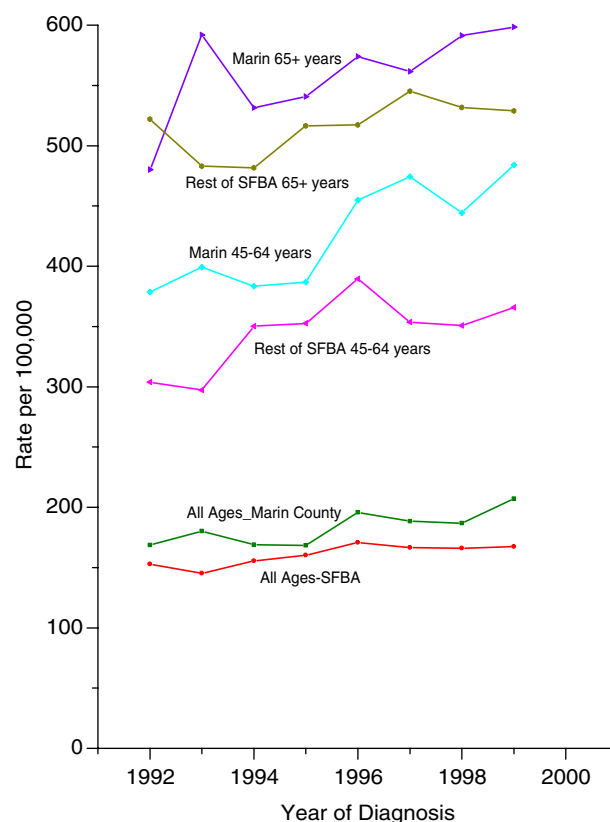


FIGURE 1. Female breast cancer Incidence rates among non-Hispanic whites in Marin County and in the rest of the San Francisco Bay Area (SFBA), 1992–1999, based on projected population estimates, ages 45–64, 65+ and all ages.

non-Hispanic white women aged 45 to 64 years in Marin County increasing significantly, at an average rate of 3.7% per year, in the 1992 to 1999 period, with no significant

TABLE 1. Estimated annual percent change (EAPC) in breast cancer incidence rates, non-Hispanic white women in Marin County, California and the San Francisco Bay area (SFBA), calculated using projected population estimates 1992–1999 and interpolated population estimates 1992–2000

Age	Projected populations 1992–1999				Interpolated populations 1992–2000			
	Marin County		SFBA		Marin County		SFBA	
	EAPC	95% CI	EAPC	95%CI	EAPC	95%CI	EAPC	95%CI
≥ 65	2.0	−0.2–4.2	1.1	−0.3–2.5	1.3	−0.4–3.0	1.1	−0.3–2.5
45–64	3.7	1.7–5.8	2.5	−0.1–5.2	0.3	−1.6–2.2	1.4	−0.5–3.4
All	2.6	0.7–4.5	1.8	0.6–3.1	0.4	−1.6–2.4	1.3	0.1–2.4

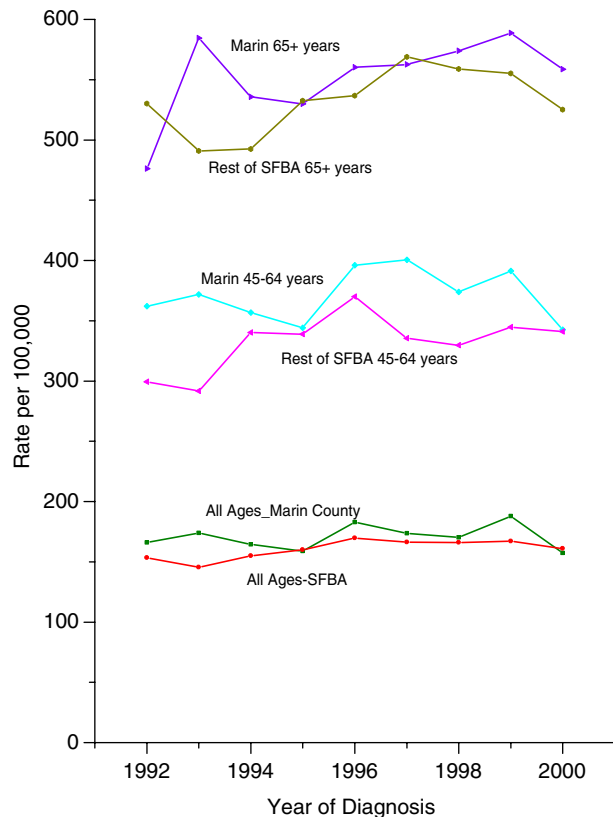


FIGURE 2. Female breast cancer Incidence rates among non-Hispanic whites in Marin County and in the rest of the San Francisco Bay Area (SFBA), 1992–2000, based on interpolated population estimates, ages 45–64, 65+ and all ages.

increase in other age groups or other SFBA counties. Data in Fig. 2 and Table 1, based on the interpolated population at risk, shows that the breast cancer incidence rate among 45- to 64-year-olds was stable in Marin County from 1992 to 2000 (average annual change of 0.3%, with a 95% confidence interval of -1.6 to 2.2). The appearance of a rapid increase in Marin County (Fig. 1) was an artifact due

to underestimation of the growth in the population of non-Hispanic white females aged 45 to 64 years in Marin County.

It should be noted that average incidence rates for breast cancer among women in Marin County are 7% higher than those for women in the rest of the SFBA, and 18% higher than rates in all SEER areas combined in the 1992 to 2000 period. Our analysis does not minimize the importance of developing new and more effective ways to prevent breast cancer. However, it does illustrate the pitfalls of interpreting temporal trends in small geographic areas and the importance of developing better methods to identify demographic shifts in evaluating local cancer rates.

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