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Breast Cancer Risk Estimation: A Translational Statistic for Communication to the Public

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During the 1990s, the attention of the public and the media has been repeatedly focused on the threat of breast cancer. In addition, to educate the public about breast cancer and to increase access to prevention and early detection techniques and state-of-the-art treatment, breast cancer activists' groups are functioning in communities in nearly every state in the United States. Statistics describing an "epidemic" of breast cancer are quoted and misquoted in the press nearly every day. Clearly, breast cancer has shifted from a topic never discussed in public just a few years ago to a topic of extensive popular deliberation today (1).

Fear is a common reaction to reports of increasing incidence of breast cancer: Women at increasingly younger ages are frightened that they will develop breast cancer. In the March 15, 1993, issue of *U.S. News and World Report*, an article entitled "The Breast Cancer Scare" refers to breast cancer statistics, describing increasing numbers of cases as having created "math anxiety" (2). This article states: "To many younger women, it means that breast cancer has become real and frightening, an epidemic in their ranks." Some of the fear arises from the presentation of statistics that suggest an overwhelming epidemic and that are not accompanied by clear discussions or explanations. Eloquent women are at the forefront of educating women about breast cancer, and they need simple, easily understood statistics with which to communicate concepts of risk (3).

In this issue of the *Journal*, Feuer et al. (4) present a modified methodology for calculating women's risks of breast cancer at different ages, by race, and in keeping with patterns of breast cancer that are changing dramatically over short periods of time. The authors propose not just a single lifetime risk estimate, but rather, a method to evaluate risks

at different periods of a woman's life. The estimate that Feuer et al. (4) have developed is a "translational" statistic, i.e., a statistic that can move from the esoteric deliberations of biostatisticians and epidemiologists to daily communication with the general public. Indeed, over the past 2 years, the National Cancer Institute has given priority to translational cancer research, which includes investigations that take either laboratory results into the clinic or clinical results into the community.

How can this method of calculating the risk of developing breast cancer improve our ability to accurately communicate both the changing patterns of breast cancer incidence and mortality and the risks in groups of women of specific age and race? After all, we now have *the* lifetime risk that we see and hear in the media constantly—the risk of breast cancer is one in eight. That estimate is compared with a risk of one in 10 just a few years ago or one in 20 in the 1960s, with the end result often being a discussion of today's breast cancer "epidemic." As Feuer and colleagues (4) point out, the public often interprets this *lifetime* risk to mean that this estimate is a woman's risk *next year*. Developing modifications of previous methodology, Feuer et al. (4) reduce the potential for misinterpretation by explaining women's risk of breast cancer in three ways: 1) lifetime risk by 5-year age groups, 2) risk of developing breast cancer at age Z if one has reached age Y without developing breast cancer, and 3) risk of dying from breast cancer.

Before discussing the value of this estimation technique for communicating lifetime breast cancer risk, it is important to highlight the improvements in this methodology that enable us to develop more accurate and more relevant estimates of risk. Methods used in the past have been criticized primarily because they do not consider either prevalent (previously diagnosed) cancers or the presence of multiple cancers in the same individual (5). As Feuer et al. (4) describe in detail, their method has four specific advantages:

- 1) It uses age-specific incidence rates for the first primary breast cancer.
- 2) It allows risk estimates to be adjusted for prevalent cases.
- 3) It assumes that deaths from causes other than breast cancer occur according to a standard mortality distribution.
- 4) It enables researchers to calculate and modify lifetime

*See "Notes" section following "References."

risks on the basis of recent national incidence data, thus ensuring that these estimates remain current with changing patterns of breast cancer.

The methodology also produces estimates by race and age, which are essential, since neither today's risks nor the changing risks are identical or shifting at the same pace for Blacks and Whites.

How will this translational statistic help us meet the need to communicate breast cancer risk to women? First, women are interested in their breast cancer risk today or next year, as well as over an entire lifetime. A woman who is now 40 years old and has never had a diagnosis of breast cancer can be told that her risk of breast cancer by age 50 is one in 63 and that, by age 60, it will be one in 25. In contrast, a woman who is now 50 and is free of breast cancer will have a risk of one in 41 by age 60. Women who are 40, 50, or 60 years old and who have not had a diagnosis of breast cancer also can be shown to have different lifetime risks of breast cancer—one in eight, one in nine, and one in 10, respectively. This variation at least begins to enable us to communicate the diversity of risk.

Providing these risk estimates by race also is essential. For example, breast cancer incidence rates are higher for Black women in their 30s and 40s than for White women in the same age group. In the fifth and sixth decades of life, however, the incidence of breast cancer is lower among Black women. Thus, a 20-year-old Black woman can be told that through age 40, her risk of breast cancer is higher than that of a White woman of the same age. But, if she remains free of breast cancer until age 50, her risk will be lower than that of a White woman of the same age. Too often, statistics give the impression of homogeneity of risk in a population simply because we quote a single estimate to women, such as a breast cancer risk of one in eight. The underlying

incidence and mortality data are becoming more complete and accurate for diverse ethnic groups, and Feuer and colleagues (4) have provided an opportunity to translate these data into current risk estimates that at least encompass age differences and ethnic and secular diversity.

While the refined methodology reported by Feuer et al. (4) is an improvement over previous risk estimates, individuals communicating these statistics have a responsibility to transmit this information accurately and with appropriate explanations. Most important of all, these risk estimates provide a framework in which it can be demonstrated that current, age-specific screening guidelines for breast cancer are essential, since women must obtain clinical examinations and mammograms to attain the low risk of death due to breast cancer projected when these prevention techniques are practiced. The key is to utilize improved risk estimates in the context of well-delineated breast cancer education messages that are sensitive to age differences and cultural and regional heterogeneity.

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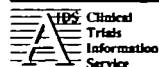
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