

*Editorials***ABORTION, BREAST CANCER,
AND EPIDEMIOLOGY**

IN this issue of the *Journal*,¹ Melbye et al. present substantial epidemiologic evidence that induced abortions do not affect a woman's risk of having breast cancer. In a linkage study, they compared the abortion histories of women with and without breast cancer in Denmark. The use of data on abortion obtained from population registries rather than from interviews, the large size of the study, the inclusion of one country's entire population of women, and the adjustment for other aspects of reproductive history all strengthen the credibility of the findings. The study thus provides important new evidence to resolve a controversy that previous investigations have been unable to settle.

By relying on uniformly collected data on abortion in Danish registries, Melbye et al. avoided the major problem that has plagued case-control interview studies: differential reporting of abortions. For many issues, interviews of women with breast cancer (as case patients) and women from the same population (as controls) provide valid information, but they founder if the patients with breast cancer are either more or less likely than other women to recall or report their history accurately.

Induced abortion, even when legal, is an emotional and private matter and is often not reported in interviews.² Women whose recent diagnosis of breast cancer moves them to cooperate with researchers are more likely to report their abortions.³ Thus, when several case-control studies based on interviews⁴⁻⁶ reported a slightly elevated risk overall or in a subgroup of women, the interpretation was clouded by the unknown extent of the bias. For instance, in a case-control study involving personal interviews that was conducted in Seattle,⁴ the investigators estimated an overall increase in risk of 50 percent. They judged that false reports of not having had an abortion could have inflated the estimate by 16 percent at most, but their estimate of the bias was arguably too low, since half of all abortions were denied in earlier U.S. surveys. In a later study, the investigators reported no overall difference in risk but noted a slightly higher risk among nulliparous women.⁵

In a study using telephone interviews,⁶ the authors concluded that much if not all of an apparent 23 percent increase in risk could be attributed to inaccurate reports of the history of abortion. In a recent Dutch study, only 1 of 230 women in the control group from the heavily Roman Catholic region of the country reported having had an abortion, and the re-

sulting apparent risk was very large.⁷ The investigators doubted the validity of the association, however, since none appeared in the other region and since a comparison of prescriptions for oral contraceptives and interviews showed that control-group women in the Roman Catholic region were especially prone to understate their use of oral contraceptives.

With low estimated risks and a potentially large bias, it is ultimately impossible to tell how far off the mark these case-control interview studies could be. Meta-analysis of multiple case-control interview studies offers no insights into this critical issue, only adding apparent precision to an estimate that is systematically erroneous by an unknown amount. In short, record-based studies like the one by Melbye et al. are necessary.

The Danish study included data on the key reproductive factors that affect the risk of breast cancer and that may differ between women who have had abortions and other women. In this way, the potential effects of abortion could be distinguished from related reproductive characteristics, such as older age at the time of the first full-term pregnancy. One drawback of the study was that it lacked data on non-reproductive risk factors for breast cancer that could differ according to abortion history. Could such confounding have obscured a real overall association? If the women who had abortions had substantially fewer family members with breast cancer, were much older at menarche, or had other unmeasured characteristics that lowered their expected risk of breast cancer, some degree of risk associated with abortion could have been missed. Such a characterization could apply to small subgroups, but it seems unlikely that it would apply to all 18 percent of the women in the Danish cohort who had had an abortion.

The large size of the new study is also an advantage. It yields a very stable estimate of overall risk, and it provides information on specific risks according to when in the woman's life the abortion occurred. In this cohort of 1.5 million women, 1338 cases of breast cancer were diagnosed in women who had terminated pregnancies. By comparison, large case-control studies in the United States each have included 200 to 300 cases of breast cancer in women who had abortions. Among the women who had abortions, those who later had full-term pregnancies and those who never gave birth had the same risks as women in the corresponding groups who had not had abortions. Similarly, having had more than one abortion did not appear to alter the risk.

Even though the risk of breast cancer was unrelated to abortion overall, the length of gestation when the abortion was performed differed between the women with breast cancer and the controls. The overwhelming majority of the abortions in the Danish study took place at 7 to 14 weeks of gestation, as in the United States today, but the study included

a small number of women who had terminated their pregnancies in the fifth month or later and a small number who had abortions very early, at less than 7 weeks. Among the women with late terminations, there were 14 cancers — almost twice as many as expected. Slightly fewer cancers than expected were diagnosed in women whose abortions took place before seven weeks of gestation.

With such small numbers, a chance association is possible, but one also may wonder what else distinguishes women who have very late or very early abortions. Their diet, alcohol consumption, or social class may be different from that of other women. The overall trend toward a slightly decreased risk in association with very early abortion and an increased risk in association with late abortion could be the result of cause, chance, or confounding (that is, correlation with an unmeasured risk factor). Only epidemiologic studies that include both large numbers of women who have had these unusual abortions and detailed information about nonreproductive risk factors are likely to reveal which explanation is correct.

In short, a woman need not worry about the risk of breast cancer when facing the difficult decision of whether to terminate a pregnancy. For the scientist trying to elucidate how pregnancy sometimes impedes and sometimes enhances one or more steps in breast carcinogenesis, puzzles remain, and this large study highlights some of them. The possibility of an increased risk with very late abortion, a decreased risk with very early abortion, or both must be seen as one of those puzzles. Neither the clear central finding that there is no overall risk nor the unresolved peripheral issues ought to influence the continuing public debate about abortion itself — a debate that is ethical and political in its essence.

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