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Increasing mastectomy rates for early-stage breast cancer? Population-based trends from California

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To the Editor

Katipamula et al. reported an increase in mastectomy rates for the treatment of early-stage (stages 0, I, and II) breast cancer for the period 2004-2006 at the Mayo Clinic in Rochester, Minnesota [1]. This is the first US report of such a trend since the 1990 NIH Consensus Conference recommending breast conserving surgery (BCS) as a viable alternative to mastectomy [2]. BCS is generally the preferred treatment for most early-stage breast cancer, given the equivalent survival after BCS and mastectomy and greater morbidity associated with mastectomy. Thus, these and other clinical reports of an increasing trend in contralateral prophylactic mastectomy [3-8] raise the question of a recent "swing of the pendulum" [1] toward use of mastectomy. While mastectomies were more common among Mayo Clinic patients who had received pre-operative magnetic resonance imaging (MRI) (used to detect mammographically occult breast lesions), increased MRI use did not explain the rise in mastectomy rates in this clinic [1].

We and others have shown previously that disadvantaged and minority women with early-stage breast cancer, especially Asians, are more likely than non-Hispanic whites to have mastectomy [9-12]. The reasons for this remain unclear, but appear to relate in some part to biological/clinical factors such as smaller breasts and large tumor-to-breast ratios, as well as to sociocultural factors including poor patient-provider communications, language barriers, cultural factors, and possibly transportation difficulties [13-19]. However, the paper by Katipamula et al. suggests that we may now be seeing a preference for mastectomy in a distinctly different, predominantly non-Hispanic white, population. If the mastectomy trend observed at the Mayo Clinic is reflective of a similar trend in the general population, then further studies may be warranted to reveal whether this pattern is due to such factors as insufficient provider knowledge or communication about BCS, patient anxiety about

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radiotherapy or breast cancer recurrence, or the higher financial cost of BCS. Therefore, we examined time trends in mastectomy rates for early-stage breast cancer in population-based data for the state of California, whose registries are supported by both the NCI's Surveillance, Epidemiology, End Results (SEER) Program and the California Cancer Registry (CCR). We examined the proportions of women receiving mastectomy by time and also by patient race/ethnicity, stage of disease, age, and a neighborhood measure of socioeconomic status (SES) based on block-group level Census 2000 data, as described elsewhere [20]. We focused our assessment on cancers for which BCS is a treatment option, namely first primary breast cancers diagnosed at stages 0 (ductal carcinoma *in situ* (DCIS)), I, or II between the years 1990-2007. Mastectomy was defined based on the first course of surgery treatment including subcutaneous mastectomy, total (simple) mastectomy, modified radical mastectomy, radical mastectomy, extended radical mastectomy, and mastectomy (not otherwise specified), regardless of reconstruction, or removal of the uninvolved contralateral breast.

Across all racial/ethnic groups and stages of disease, the proportion of women receiving mastectomy declined rapidly from 1990-2000 at a rate of 2-4% per year, amounting to a nearly two-fold decrease over this 11-year period. After 2000, the proportion receiving mastectomy either stayed the same or increased about 1-2% per year. Among non-Hispanic whites (Figure 1), we observed an increase in the mastectomy rate that was most pronounced for DCIS, such that the mastectomy proportion for DCIS in 2007 was similar to that for stage I invasive disease. For stages I and II, by contrast, the proportion of patients receiving mastectomy remained constant from 2000 onward, with no evidence of an increase. Figure 2 shows clearly that the recent increase in mastectomy in on-Hispanic whites occurred only among women younger than 50 years at diagnosis. Figure 3 shows that the recent increase also was most prominent in women living in the highest 20% of neighborhoods ranked by SES, with an overall pattern of decreasing variation in mastectomy across SES groups after 2004. In the period 1988-2001, the mastectomy proportion ranged from 25% in the highest-SES quintile to 40% in the lowest-SES quintile, whereas in 2006-2007, this proportion varied by only 5% across the SES groups. Like others, we found racial/ethnic differences in the proportions of patients receiving mastectomy, varying by about 10% among groups, with the highest rates seen for Asians/Pacific Islanders and similar rates for non-Hispanic whites, Blacks, and Hispanics; this pattern was most striking for stage I cancer and remained consistent over time (data not shown).

Our analysis of population-based cancer registry data supports either a recent decline in the rate of mastectomy, or, among some groups, a shift from 2000 onward in surgical treatment toward mastectomy for early-stage breast cancer. However, among non-Hispanic white women, this shift was most evident among those who were younger, diagnosed with DCIS, or living in the highest-SES neighborhoods. Across all racial/ethnic, SES, and stage groups, the proportion of women receiving mastectomy has either declined or stayed constant since 2000. To the extent that MRI at breast cancer diagnosis is not covered by many health insurance plans, our finding of increasing mastectomy proportions primarily among women of high SES would support a possible role of MRI.

A number of factors influence the decision to pursue BCS. Factors that may contribute to a recommendation against BCS include increased risk for loco-regional recurrence among younger patients [21,22], recent recommendations for larger margins in the surgical treatment of DCIS [23], greater likelihood of poor cosmetic outcome in small-breasted women, and MRI-detection of more extensive disease. Locoregional management decisions, particularly in younger women, may also be influenced by recent data from the 2005 Early Breast Cancer Trialists' Collaborative Group demonstrating that overall survival at 15 years is improved when a local recurrence is avoided in the first five years [24]. Patient attitudes towards radiotherapy and reconstruction, in addition to individually perceived risks, also factor prominently into the decision about BCS; for patients with DCIS, an additional factor is the recommended use of tamoxifen therapy for five years after BCS, but not mastectomy [25]. Non-Hispanic white patients who have greater involvement in the decision-making process have been shown previously to be more likely to choose mastectomy, often in contrast to their surgeon's recommendations, citing fear of recurrence and effects of radiation in their decision [26]. The reasons for mastectomy in this patient sociodemographic group are likely quite different from those responsible for the traditionally high mastectomy rates among Asians and patients of low SES. A better characterization of the specific population groups, the decision-making processes underlying both the traditionally high mastectomy group (i.e., Asian, low SES) and the more recently adopting group (i.e., younger age, DCIS, higher SES), and the long- and short-term symptoms and quality of life associated with each type of treatment would ultimately help ensure that all women are given the opportunity to make fully-informed decisions about their treatment. Decision-making guides should be developed with information on the local recurrence risks, impact of local recurrence on overall survival, and short- and long-term side effects, including quality of life, of each type of treatment.

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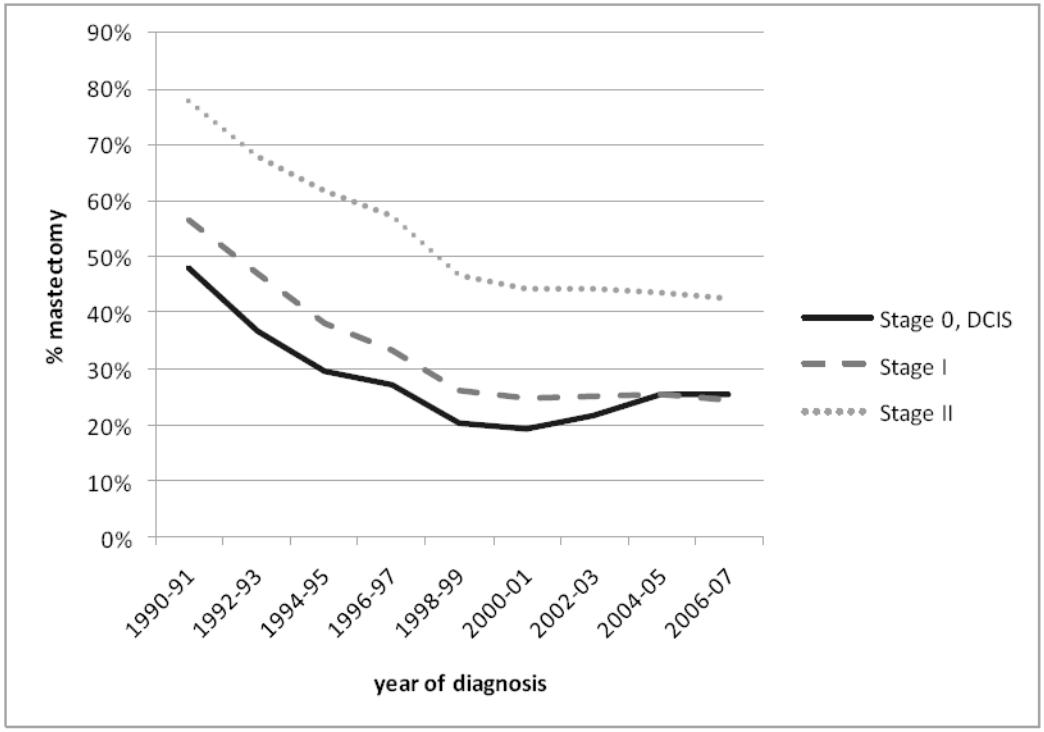

Figure 1. Time trends in the percentage of non-Hispanic White women diagnosed with breast cancer undergoing mastectomy, by stage, California, 1990-2007

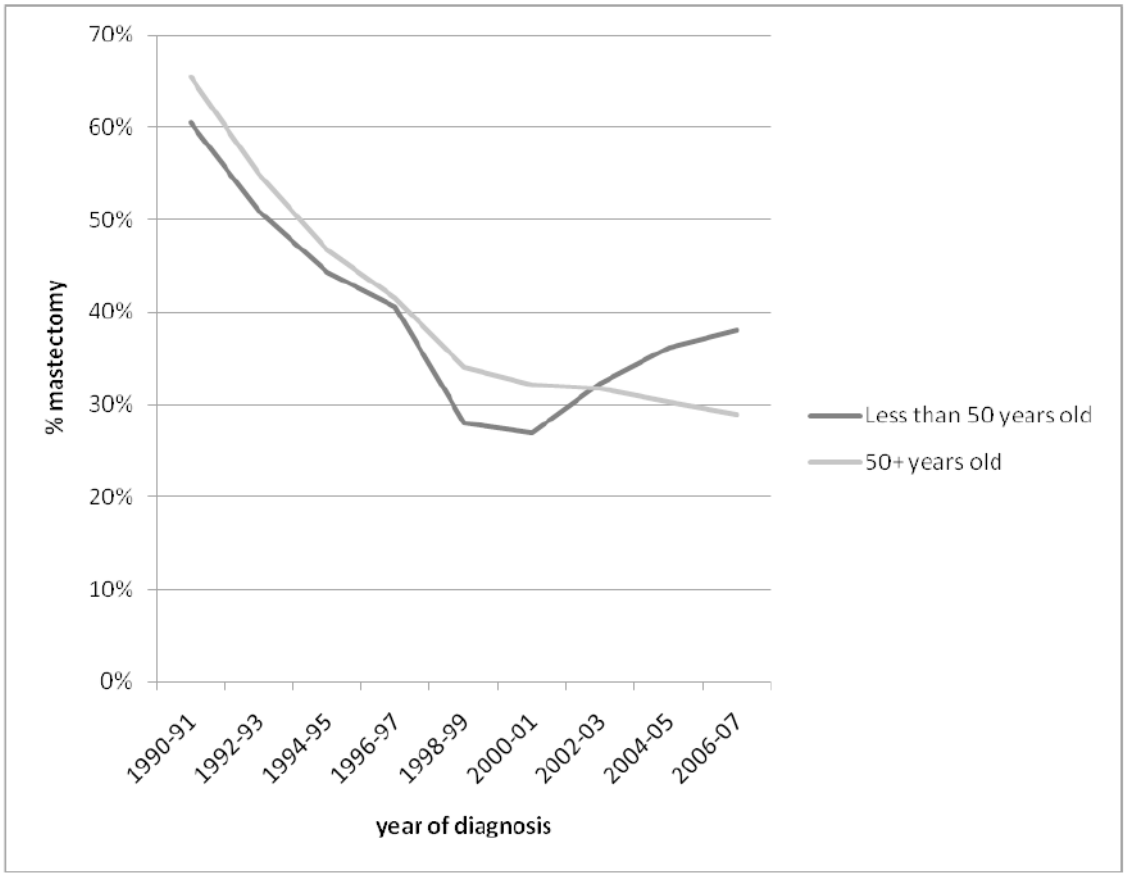

Figure 2. Time trends in the percentage of non-Hispanic White women diagnosed with breast cancer undergoing mastectomy, by age at diagnosis, California, 1990-2007

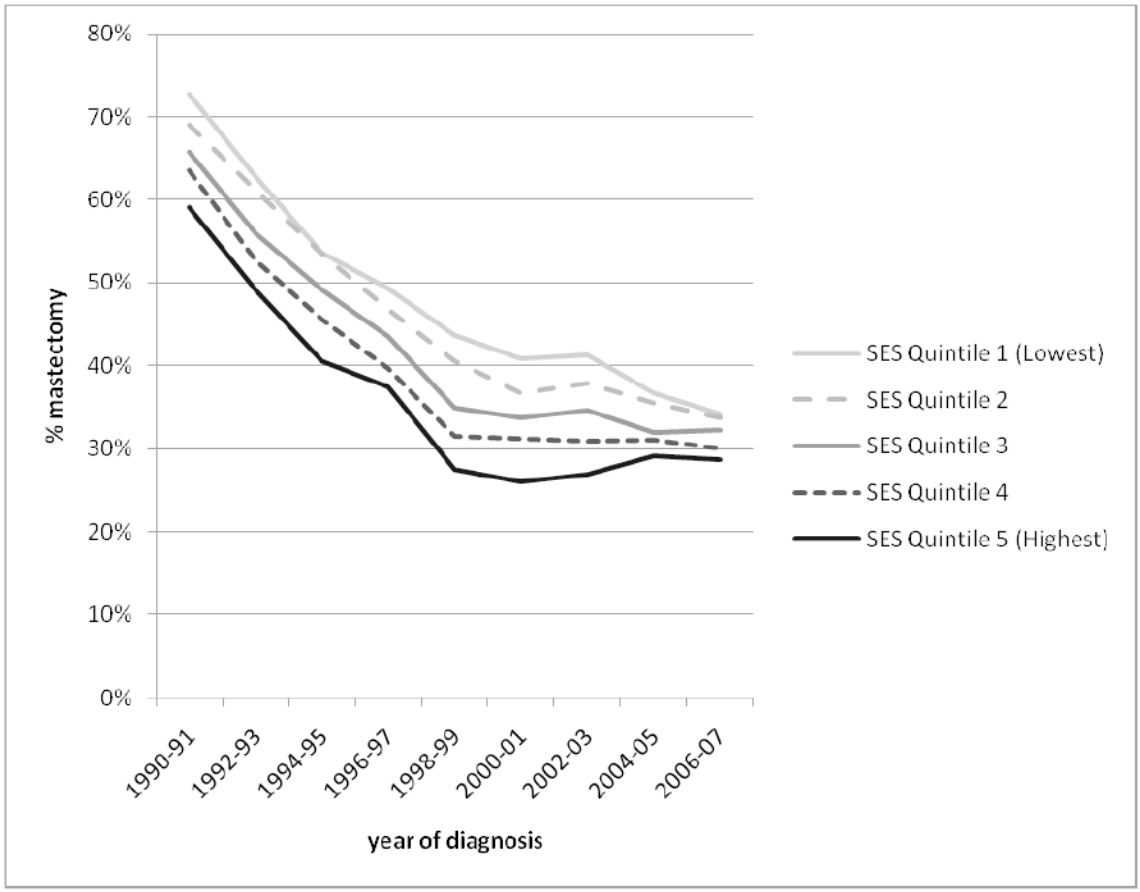

Figure 3. Time trends in the percentage of non-Hispanic White women diagnosed with breast cancer undergoing mastectomy, by neighborhood socioeconomic status (SES), California, 1990-2007