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Reply to L.A. Newman

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We thank Newman¹ for her comments on the potential for descriptive analyses such as those in Park et al² to shed light on racial disparities in breast cancer outcomes. Overall, US age-standardized breast cancer mortality rates have been higher for blacks than whites (non-Hispanic white women), but rates have been decreasing in both blacks and whites since about 2000.³ The mortality rates are influenced by factors that act both before and after diagnosis.⁴ Breast cancer incidence has increased more in black than white women since 1990,³ and black women have less favorable stage and molecular features at diagnosis.³ The less favorable stage distribution may reflect differences in rates of screening mammography and/or tumor biology. After diagnosis, access to treatment and responsiveness to treatment can affect breast cancer mortality. More data are needed on the comparative effectiveness of treatment of black and white women, but the best data from clinical trials suggest that black and white patients with similar stage, cancer subtypes, and treatments have similar breast cancer-free survival after treatment.⁵ However, the fact that treatments are effective in black women in clinical trials does not guarantee that similar women will receive adequate treatment in the general population. Menashe et al⁴ concluded that factors affecting breast cancer mortality after diagnosis, such as treatment access, explained more of the disparity in US breast cancer mortality rates than estrogen receptor status at diagnosis. Thus, numerous factors, including incidence rates, tumor characteristics, socioeconomic status, health care delivery, and response to treatment, affect US breast cancer mortality rates and warrant the type of investigation recommended by Newman.¹

AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST

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Park et al² focused on breast cancer mortality after diagnosis in the National Cancer Institute's Surveillance, Epidemiology, and End Results Program. Here, we extend those analyses to compare black and white patients. In Table 1, we present the cumulative pure risk of dying of breast cancer within 5 years of diagnosis in 1973 to 1979 and in 2005 to 2010, separately for black and white patients. This 5-year risk is calculated as 1 minus the Kaplan-Meier estimate of not dying of breast cancer within 5 years, treating competing risks as independent censoring. Both in 1973 to 1979 and in 2005 to 2010, black patients had a higher risk of breast cancer death than white patients within each age group and stage.

There have been large decreases in the risk of breast cancer death for both black and white patients, but the percentage decreases were larger in white patients. If, as suggested by Dignam,⁵ treatments are equally effective for blacks and whites with comparable disease and treatment in randomized clinical trials, these data suggest either that black patients have had less access to proper treatment or that black patients at a given age and stage have breast cancers that are more difficult to treat than white patients in the same age and stage group in the general population. More detailed analyses taking into account tumor size within stage, estrogen receptor status, and human epidermal growth factor receptor 2 (HER2)/neu status are needed to investigate the latter possibility, but the results in Menashe et al⁴ on estrogen receptor status suggest a key role for access to proper treatment. As expected from treatment patterns, the percent decreases in breast cancer mortality were greater in women younger than 70 years of age with local or regional disease, regardless of race (Table 1).

To evaluate concerns raised by Newman,¹ we used methods of Park et al² to calculate the proportion of the decrease in ratios of breast cancer mortality hazard rate within 5 years (comparing 2005 to 2010 with 1973 to 1979) that could be explained by stratification on tumor size within stage and age group (Fig 1). Underlying this approach is the tacit assumption that the percentage explained by stratification on tumor size is related to interventions that occur before diagnosis, such as screening, rather than to factors that occur after diagnosis, such as treatment. For black and white women younger than the age of 70 years, only a small proportion of the improvement can be explained by changes in tumor size, but changes in tumor size distribution explain more of the improvement in women 70 years of age or older at diagnosis. This suggests a larger contribution from treatment improvements in women younger than the age of 70. In addition, stratification on tumor size explained more of the improvements in black women than in white women within each age and stage group. This suggests that treatment contributed relatively more to improvements in white patients than in black patients.

Thus, many lines of evidence need to be investigated to understand and reduce disparities in breast cancer outcomes, but our analyses suggest that access to proper treatment is a leading contender.

References

1. Newman LA. Parsing the etiology of breast cancer disparities. *J Clin Oncol*. 2016; 34:1013–1014. [PubMed: 26786919]

2. Park JH, Anderson WF, Gail MH. Improvements in US breast cancer survival and proportion explained by tumor size and estrogen-receptor status. *J Clin Oncol*. 2015; 33:2870–2876. [PubMed: 26195709]
3. DeSantis CE, Fedewa SA, Goding Sauer A, et al. Breast cancer statistics, 2015: Convergence of incidence rates between black and white women. *CA Cancer J Clin*. [epub ahead of print on October 29, 2015].
4. Menashe I, Anderson WF, Jatoi I, et al. Underlying causes of the black-white racial disparity in breast cancer mortality: A population-based analysis. *J Natl Cancer Inst*. 2009; 101:993–1000. [PubMed: 19584327]
5. Dignam JJ. Efficacy of systemic adjuvant therapy for breast cancer in African-American and Caucasian women. *J Natl Cancer Inst Monogr*. 2001; 2001:36–43.

Fig 1.

Percentage of improvement in breast cancer-specific mortality hazard ratios explained by stratification on tumor size. Data are shown for each combination of age group and stage at diagnosis among black and white women. Hazard ratios compare 2005 to 2010 with 1973 to 1979 for the first 5 years after diagnosis.

Cumulative Pure 5-Year Risk of Breast Cancer Mortality After Diagnosis for Black and White Women, in Strata Defined by Age and Surveillance, Epidemiology, and End Results Stage at Diagnosis

Table 1

Age (y) and Stage	Black Women, %			Non-Hispanic White Women, %		
	1973–1979	2005–2010	Decrease	1973–1979	2005–2010	Decrease
< 50, local	15.1	5.1	66	10.7	1.9	82
< 50, regional	42.3	17.7	58	29.6	6.6	78
< 50, distant	78.0	64.6	17	74.9	45.8	39
50–69, local	11.6	4.5	61	9.2	2.0	78
50–69, regional	38.7	18.9	51	30.1	7.8	74
50–69, distant	82.3	67.7	18	78.5	55.4	29
70+, local	10.9	7.5	31	10.7	4.2	61
70+, regional	36.4	23.4	36	29.3	18.5	37
70+, distant	83.4	82.2	1.4	75.2	68.3	9.2

NOTE. Cumulative risk is calculated as 1 minus the Kaplan-Meier estimate of not dying of breast cancer within 5 years, with competing mortality treated as censoring.