Differences in Screening Mammography Outcomes Among White, Chinese, and Filipino Women

Karla Kerlikowske, MD; Jennifer Creasman, MSPH; Jessica W. T. Leung, MD; Rebecca Smith-Bindman, MD; Virginia L. Ernster, PhD

Background: The accuracy of screening mammography among Asian women in the United States has received little attention. We determined whether the accuracy of screening mammography for Chinese and Filipino women differs from that of white women.

Methods: We examined a cohort of white, Chinese, and Filipino women 40 years and older who underwent 200,402, 72,604, and 19,087 screening examinations, respectively, between January 1986 and December 2001 in San Francisco County, California, of whom 2,177 were diagnosed with breast cancer within 12 months of a screening examination. By linking screening examinations to the regional Surveillance, Epidemiology and End Results program and the California Cancer Registry, we identified the occurrence of any invasive cancer or ductal carcinoma in situ and then calculated the rate of cancer per 1000 screenings and the sensitivity of mammography.

Results: The rate of invasive breast cancer per 1000 screenings was 45% lower for Chinese than for white women aged 50 to 69 years (3.8 vs 6.9; P<.001) and 29% lower for Filipino than for white women (4.9 vs 6.9; P=.03). Rates of ductal carcinoma in situ were similar across all ethnic groups (1.6-1.7 per 1000 screenings; P=.60). The sensitivity of mammography was similar for white, Chinese, and Filipino women (81.6%-84.3%; P>.30).

Conclusions: Screening mammography has similar accuracy among white, Chinese, and Filipino women, although the absolute benefit of screening, in terms of breast cancer deaths averted, is likely to be less among Asian women because the rates of invasive cancer are lower compared with white women of similar age. Overdiagnosis of ductal carcinoma in situ with screening mammography among Asian women is likely to be comparable to that of white women because the rate of ductal carcinoma in situ was similar in all the examined ethnic groups.

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Asian women have a lower breast cancer incidence and mortality compared with white women.1 In the United States, the overall age-adjusted incidence of invasive breast cancer per 100,000 is 51 to 54 for Chinese women and 71 to 98 for Filipino women2,3 compared with 142 per 100,000 for white women.1 Differences in breast cancer incidence may be due to differences in breast cancer risk factors, genetic predisposition for breast cancer, and mammography use.4

Knowing whether Asian race/ethnicity influences the performance of mammography may be important in understanding differences in breast cancer incidence and developing more tailored screening strategies. We determined the rate of invasive cancer and ductal carcinoma in situ (DCIS) and the accuracy of mammography by race/ethnicity (white, Chinese, and Filipino) in a population-based sample of women undergoing screening mammography in San Francisco, Calif.

Methods

Subjects

The San Francisco Mammography Registry is a population-based mammography registry that includes 18 radiology facilities in San Francisco and Marin counties, California. The present analysis included women 40 years and older who were asymptomatic and underwent a bilateral mammography examination that was directly recorded by the radiologist as having been performed for screening in San Francisco County between January 1986 and December 2001. Analyses were performed per mammography examination, with 67% of women having had more than 1 examination. Screening examinations that occurred after December 2001 were excluded to ensure that there...
were at least 12 months for reporting cancer to a tumor registry after an examination and a 95% or higher completeness of cancer reporting to the Northern California Surveillance, Epidemiology, and End Results (SEER) program and the California Cancer Registry. We excluded women who had a prior breast cancer diagnosis, breast augmentation, reduction or reconstruction, or history of mastectomy. Annual approval has been obtained from the University of California, San Francisco institutional review board to collect registry information.

MEASUREMENTS AND DEFINITIONS

At the time of each screening examination, women completed a self-administered survey (available at: http://mammography.ucsf.edu/SMFR/links.htm) that included demographic information and breast health history questions in a standardized format established by the National Cancer Institute Breast Cancer Surveillance Consortium (BCSC). The survey included the following race/ethnicity categories: (1) African American/black, (2) white, (3) Hispanic/Latina, (4) American Indian, (5) Chinese, (6) Japanese, (7) Filipino, (8) Vietnamese, (9) other Asian, and (10) other non-Asian. Women were considered to be currently receiving hormone therapy if they reported using female hormones for menopause. Women were considered to be postmenopausal if they reported that both ovaries had been removed, their periods had stopped permanently, they were using hormone therapy, or they were 55 years and older. Prior breast biopsies performed included excisional biopsy, core biopsy, and fine-needle aspiration. In addition, the survey included questions about prior mammography use, family history of breast cancer in a first-degree relative (mother, sister, or daughter), age at first live birth, and height and weight. We used survey information to estimate each woman’s 5-year Gail risk score.

Screening examinations were considered “first examinations” if a woman self-reported no prior mammography or if the time between mammography examinations was 5 years or more and “subsequent examinations” if the time between screening examinations was less than 5 years.

Mammograms were interpreted using assessment and breast density categories established by the American College of Radiology and reported in the Breast Imaging Reporting and Data System (BI-RADS) and classified as abnormal or normal using standard definitions developed by the BCSC. Examinations classified as abnormal were those with the following initial assessments: need additional imaging evaluation (category 0); suspicious (category 4); highly suggestive of malignancy (category 5); or probably benign finding with a recommendation for additional imaging or biopsy (category 3). Examinations classified as normal were those with the following initial assessments: normal (category 1); benign finding (category 2); or probably benign finding (category 3) with a recommendation for short interval or routine follow-up. Breast density was categorized as almost entirely fat, scattered fibroglandular densities, heterogeneously dense, or extremely dense.

Women were considered to have breast cancer if they had any report of invasive carcinoma or DCIS through December 2002 in the records of the Northern California SEER program or California Cancer Registry. Women with lobular carcinoma in situ only were not considered to have cancer. All breast cancers were classified according to the American Joint Committee on Cancer staging system. Invasive cancers were categorized by tumor size, grade, nodal status, and estrogen receptor status.

A screening examination was considered to be a false-negative examination if breast cancer was diagnosed within 12 months of an examination with a normal result and a true-positive examination if breast cancer was diagnosed within 12 months of an examination with an abnormal result.

DATA ANALYSIS

We stratified the data into the following 3 groups based on self-reported race/ethnicity: (1) non-Hispanic white (hereafter referred to as white), (2) Chinese, and (3) Filipino. Frequency distributions of breast cancer risk factors, breast density, BI-RADS assessment, and Gail risk scores greater than or equal to 1.67% in the next 5 years were determined for the 3 groups. The 5-year Gail risk scores were estimated using a compiled FORTRAN program, which is available on the National Cancer Institute Web site (http://bcra.nci.nih.gov/brc/start.htm).

Using published methods, we estimated breast cancer rates and the sensitivity, specificity, and positive predictive value of mammography using multivariate regression models. Poisson regression was used to estimate rate of cancer and true-positive and false-negative results per 1000 screenings. Logistic regression models were used to estimate the probability of an abnormal result among those who were diagnosed as having breast cancer (sensitivity), the probability of a normal result among those without breast cancer (specificity), and the probability of being diagnosed as having cancer among those with abnormal results (positive predictive value). All models were adjusted for factors potentially related to breast cancer risk or mammography accuracy or to vary proportionately across the 3 groups including age, previous mammography (first vs subsequent screening), family history of breast cancer, age at first live birth, and body mass index. We initially adjusted rates and probabilities for current postmenopausal hormone therapy use and prior breast biopsy. Because the reported rates and probabilities were similar to those with such adjustment, and to minimize the number of women excluded from analyses owing to missing values, we did not adjust for postmenopausal hormone therapy use or prior breast biopsy in the final models.

We standardized results for each race/ethnicity by taking a weighted average of rates or probabilities estimated from regression models for each covariate configuration, weighted by the proportion of women in the study with that covariate configuration. This results in an adjustment based on the same population for all ethnic groups. We used simulation to estimate the 95% confidence intervals, sampling 100 000 values of the regression coefficients from their joint multivariate normal distribution and calculating the rates or probabilities for each sample. We estimated upper and lower limits by the simulated 2.5 and 97.5 percentiles. We also calculated performance measures stratified by breast density with nondense breasts (defined as those with BI-RADS categories of almost entirely fat or scattered fibroglandular densities) and dense breasts (defined as those with BI-RADS categories of heterogeneously dense or extremely dense). To minimize the number of women excluded from analyses owing to missing values for each density category, we only adjusted for age and previous mammography. To compare the distribution of tumor characteristics of Chinese and Filipino women with white women, we used direct standardization to adjust for age and previous mammography, factors known to influence tumor distribution.

All statistical calculations were performed using SAS (version 8.2; SAS Institute, Cary, NC). P <.05 was considered statistically significant.

RESULTS

Between January 1986 and December 2001, 65 628 white, 29 239 Chinese, and 8392 Filipino women underwent...
A total of 2177 cases of breast cancer (1684 invasive and 493 DCIS) were diagnosed, 1684 among white women, 357 among Chinese women, and 136 among Filipino women within 12 months of a screening examination. Compared with Filipino and white women, Chinese women were thinner, less likely to be nulliparous, and less likely to have 5-year Gail risk scores of 1.67% or higher, a family history of breast cancer, or a previous breast biopsy (Table 1). A similar proportion of white and Chinese women were classified as having heterogeneously dense or extremely dense breasts (45% vs 44%; P = .36), but a slightly higher proportion of Filipino women had dense breasts compared with white women (47% vs 45%; P < .001) (Table 1).

The rate of invasive cancer per 1000 screenings was 44% lower for Chinese than for white women (P = .002) and 18% lower for Filipino than for white women (P = .14) (Table 2). Among women aged 50 to 69 years (the group in which mammography is most efficacious), the rate of invasive cancer per 1000 screenings was 45% lower for Chinese than for white women (3.8 vs 6.9; P < .001) and 29% lower for Filipino than for white women (4.9 vs 6.9; P = .03). The rate of DCIS per 1000 screenings was similar in all ethnic groups (P = .60) (Table 2), as it was for women aged 50 to 69 years (Chinese vs white, 1.7 vs 1.8 [P = .47]; and Filipino vs white, 1.7 vs 1.8 [P = .84]).

The sensitivity of screening mammography for Chinese (P = .36) and Filipino (P = .69) women was similar to that for white women (Table 3), as it was for women aged 50 to 69 years (Chinese vs white, 84.8% vs 81.8% [P = .40]; and Filipino vs white, 82.4% vs 81.8% [P = .84]). The rates of true-positive and false-negative examina-
tions per 1000 screenings were significantly lower for Chinese than for white women ($P<.001$ for both) (Table 3). The rates of true-positive and false-negative examinations per 1000 screenings did not differ in Filipino compared with white women ($P = .13$ and $P = .39$, respectively) (Table 3).

The specificity of mammography was higher for Chinese than for white women ($P<.001$) (Table 3). The positive predictive value of screening mammography was lower in Chinese and Filipino women compared with white women ($P = .04$ and $P = .12$, respectively) (Table 2) because these women have a lower incidence of breast cancer. The proportion of examinations that are abnormal and biopsy results per 1000 screenings was lower for Chinese women than for Filipino and white women (Table 3). The proportion of biopsy results that were for cancer was similar in all 3 groups (Table 3).

The rate of cancer per 1000 screenings was higher among white women with dense breasts compared with women with nondense breasts (Table 4). Breast density did not significantly influence cancer rates among Chinese and Filipino women. The sensitivity of mammography was similar for white women with dense and nondense breasts but was slightly lower among Asian women with dense breasts; however, this finding was not statistically significant, possibly because of small sample sizes across breast density categories (Table 4). The specificity of mammography decreased among women with dense breasts, and this trend was significant in all 3 groups (Table 4).

Chinese women had a greater proportion of breast cancers that were DCIS compared with white women (30% vs 21%; $P<.001$) and had a slightly higher proportion of invasive cancers that were estrogen receptor negative (Table 5), with no differences in tumor stage, size, grade, or nodal status among invasive cancers between the 2 groups. Filipino women had a greater proportion of invasive tumors that were larger than 20 mm in diameter and of a higher grade (Table 5), but they had a similar proportion of early-stage tumors (Table 5) and proportion of breast cancers that were DCIS compared with white women (24% vs 21%; $P = .35$).

### Table 2. Breast Cancer Rates by Age and Cancer Type Among White, Chinese, and Filipino Women

<table>
<thead>
<tr>
<th>Measure</th>
<th>White</th>
<th>Chinese</th>
<th>Filipino</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total No. of examinations</td>
<td>200 402</td>
<td>72 604</td>
<td>19 087</td>
</tr>
<tr>
<td>Total No. of cancer cases</td>
<td>1684</td>
<td>357</td>
<td>136</td>
</tr>
<tr>
<td>Cancer cases per 1000 examinations†</td>
<td>7.8 (7.4-8.3)</td>
<td>5.1 (4.4-5.9)</td>
<td>6.7 (5.6-8.3)</td>
</tr>
<tr>
<td>Invasive cancer cases per 1000 examinations†</td>
<td>6.2 (5.9-6.6)</td>
<td>3.5 (2.9-4.2)</td>
<td>5.1 (4.1-6.5)</td>
</tr>
<tr>
<td>Invasive cancer cases per 1000 examinations by age group‡</td>
<td>7.8 (7.4-8.3)</td>
<td>5.1 (4.4-5.9)</td>
<td>6.7 (5.6-8.3)</td>
</tr>
</tbody>
</table>

Abbreviation: DCIS, ductal carcinoma in situ.

*Data are given as rates (95% confidence interval) unless otherwise specified.
†Adjusted for age, previous mammography, family history of breast cancer, age at first live birth, and body mass index.
‡Adjusted for previous mammography, family history of breast cancer, age at first live birth, and body mass index.

In the greater San Francisco Bay area, among women aged 50 to 69 years, the incidence of invasive breast cancer per 100 000 women is 139 for Chinese women, 210 for Filipino women, and 355 for white women. Consistent with these population-based incidence data, we found the rate of invasive breast cancer among Chinese and Filipino women aged 50 to 69 years who underwent screening mammography to be notably lower than that of white women of similar age. Differences in population-based breast cancer incidence rates across racial groups may be due to differences in mammography use and/or in absolute risk of breast cancer. The lower proportion of Asian, compared with white, women with high Gail risk scores reported herein suggests that the lower incidence of breast cancer among Asian women is probably because they are at lower risk of disease.

Randomized controlled trials of screening mammography that have demonstrated a reduction in breast cancer mortality among screened women aged 50 to 69 years have reported the underlying incidence of breast cancer in the population to be approximately 187 per 100 000 among women aged 50 to 59 years and 250 per 100 000 among women aged 60 to 69 years. Assuming that the efficacy of screening mammography in Asian women is similar to that reported in the meta-analyses based largely on white women, the lower rate of invasive cancer among screened Chinese and Filipino women compared with white women would result in a lower absolute benefit of screening Chinese and Filipino women aged 50 to 69 years compared with white women of similar age. Only at ages 70 years and older did Chinese and Filipino women have invasive cancer rates similar to those of white women aged 50 to 59 years.

It has been proposed that DCIS is a precursor lesion for some invasive cancers and that the increased detection of DCIS among women undergoing screening mammography was significantly lower for Chinese than for white women ($P<.001$). The positive predictive value of screening mammography was lower in Chinese and Filipino women compared with white women ($P = .04$ and $P = .12$, respectively) (Table 2) because these women have a lower incidence of breast cancer. The proportion of examinations that are abnormal and biopsy results per 1000 screenings was lower for Chinese women than for Filipino and white women (Table 3). The proportion of biopsy results that were for cancer was similar in all 3 groups (Table 3).

The rate of cancer per 1000 screenings was higher among white women with dense breasts compared with women with nondense breasts (Table 4). Breast density did not significantly influence cancer rates among Chinese and Filipino women. The sensitivity of mammography was similar for white women with dense and nondense breasts but was slightly lower among Asian women with dense breasts; however, this finding was not statistically significant, possibly because of small sample sizes across breast density categories (Table 4). The specificity of mammography decreased among women with dense breasts, and this trend was significant in all 3 groups (Table 4).

Chinese women had a greater proportion of breast cancers that were DCIS compared with white women (30% vs 21%; $P<.001$) and had a slightly higher proportion of invasive cancers that were estrogen receptor negative (Table 5), with no differences in tumor stage, size, grade, or nodal status among invasive cancers between the 2 groups. Filipino women had a greater proportion of invasive tumors that were larger than 20 mm in diameter and of a higher grade (Table 5), but they had a similar proportion of early-stage tumors (Table 5) and proportion of breast cancers that were DCIS compared with white women (24% vs 21%; $P = .35$).

In a large population of women undergoing screening mammography, we found the rate of invasive cancer among women aged 50 to 69 years to be 45% and 29% lower in Chinese and Filipino women, respectively, than in white women, whereas the rate of DCIS was similar in all 3 groups. Because invasive cancer rates are lower in Chinese women compared with white women and DCIS rates similar, Chinese women have a greater proportion of diagnosed breast cancer that are DCIS compared with white women. The ability to detect cancer was similar among white, Chinese, and Filipino women, although the absolute benefit of screening, in terms of breast cancer deaths averted, is likely to be less in Asian women because rates of invasive cancer are lower compared with white women.
mography may eventually lead to a decrease in the incidence of invasive cancer. Yet, incidence rates of DCIS and invasive cancer have both continued to increase for almost 20 years.\(^1,17,18\) If DCIS is a precursor lesion for most invasive cancers, then one might also expect that the incidence of DCIS would vary with the incidence of invasive cancer across race/ethnicity groups. Yet, population-based incidence rates of DCIS have been found to be similar among white, African American, and Asian/Pacific Islanders.\(^18\) Consistent with this observation, we found that the number of DCIS cases per 1000 screenings is similar among white, Chinese, and Filipino women, despite significantly lower invasive cancer rates among Chinese and Filipino women compared with white women. That the rate of DCIS is similar among screened women of different races/ethnicities with varying invasive cancer rates suggests that not all DCIS lesions progress to invasive cancer and that the detection and treatment of all DCIS lesions detected by mammography may not be beneficial.

Table 3. Performance Measures of Screening Mammography Among White, Chinese, and Filipino Women*

<table>
<thead>
<tr>
<th>Measure</th>
<th>White</th>
<th>Chinese</th>
<th>Filipino</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity, %</td>
<td>81.6 (79.2-83.5)</td>
<td>84.3 (78.5-88.5)</td>
<td>83.1 (74.6-89.0)</td>
</tr>
<tr>
<td>True-positive result per 1000 exams, No.</td>
<td>6.2 (5.8-6.6)</td>
<td>4.1 (3.5-4.9)</td>
<td>5.2 (4.2-6.5)</td>
</tr>
<tr>
<td>False-negative result per 1000 exams, No.</td>
<td>1.4 (1.3-1.6)</td>
<td>0.8 (0.6-1.1)</td>
<td>1.2 (0.8-1.7)</td>
</tr>
<tr>
<td>Specificity, %</td>
<td>93.8 (93.7-93.9)</td>
<td>94.9 (94.7-95.1)</td>
<td>93.2 (92.8-93.6)</td>
</tr>
<tr>
<td>Abnormal result, %†</td>
<td>6.3 (6.2-6.5)</td>
<td>5.2 (5.0-5.5)</td>
<td>6.7 (6.3-7.2)</td>
</tr>
<tr>
<td>Positive predictive value, %</td>
<td>9.1 (8.6-9.7)</td>
<td>7.7 (6.7-90)</td>
<td>7.7 (6.3-9.5)</td>
</tr>
<tr>
<td>Biopsies performed per 1000 exams, No.</td>
<td>15.8 (15.0-16.6)</td>
<td>11.7 (10.4-13.1)</td>
<td>16.9 (14.0-20.4)</td>
</tr>
<tr>
<td>Cancer yield per biopsy, %</td>
<td>23.8 (22.4-25.4)</td>
<td>23.4 (20.0-27.3)</td>
<td>20.0 (14.8-26.7)</td>
</tr>
</tbody>
</table>

*Data are given as value (95% confidence interval), adjusted for age, previous mammography, family history of breast cancer, age at first live birth, and body mass index.
†Defined as Breast Imaging Reporting and Data System assessment categories 3 (probably benign finding with recommendation for diagnostic workup), 0 (need additional imaging evaluation), 4 (suspicious), or 5 (highly suggestive of malignancy).

Table 4. Rate of Breast Cancer and Sensitivity and Specificity of Screening Mammography Among Chinese, Filipino, and White Women by Breast Density*

<table>
<thead>
<tr>
<th>Measure</th>
<th>BI-RADS Breast Density Category</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Almost Entirely</td>
</tr>
<tr>
<td>Cancer cases per 1000 examinations†</td>
<td>White (85.1) (75.9-85.5)</td>
</tr>
<tr>
<td></td>
<td>Chinese (94.6) (86.3-97.9)</td>
</tr>
<tr>
<td></td>
<td>Filipino (90.1) (73.8-96.7)</td>
</tr>
<tr>
<td>Sensitivity, %</td>
<td>White (85.1) (75.9-85.5)</td>
</tr>
<tr>
<td></td>
<td>Chinese (94.6) (86.3-97.9)</td>
</tr>
<tr>
<td></td>
<td>Filipino (90.1) (73.8-96.7)</td>
</tr>
<tr>
<td>Specificity, %</td>
<td>White (93.9) (93.6-94.1)</td>
</tr>
<tr>
<td></td>
<td>Chinese (95.0) (94.6-95.3)</td>
</tr>
<tr>
<td></td>
<td>Filipino (93.6) (92.9-94.3)</td>
</tr>
</tbody>
</table>

*Data are given as value (95% confidence interval), adjusted for age, previous mammography and age.
†Invasive cancer and ductal carcinoma in situ combined, adjusted for previous mammography and age.

Table 5. Invasive Breast Cancer Characteristics of Chinese and Filipino Women Compared With White Women*

<table>
<thead>
<tr>
<th>Characteristic†</th>
<th>White</th>
<th>Chinese</th>
<th>Filipino</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage</td>
<td>65</td>
<td>57</td>
<td>65</td>
</tr>
<tr>
<td>Tumor size, mm‡</td>
<td>10</td>
<td>16</td>
<td>20</td>
</tr>
<tr>
<td>Nodal status‡</td>
<td>Positive</td>
<td>28</td>
<td>26</td>
</tr>
<tr>
<td>Tumor grade‡</td>
<td>II</td>
<td>41</td>
<td>40</td>
</tr>
<tr>
<td>Estrogen receptor status‡</td>
<td>Positive</td>
<td>86</td>
<td>81</td>
</tr>
</tbody>
</table>

*Data are given as percentages (adjusted for age and previous mammography).
†Percentage unknown ranges from 16% to 21% across groups for “stage,” from 1% to 5% across groups for “tumor size,” from 11% to 17% across groups for “tumor grade,” and from 10% to 21% across groups for estrogen receptor status.
‡Invasive cancer only.
erent Asian ethnicities.19 Two studies have reported that white and black women in a screened population had similar cancer detection rates and mammography accuracy.19,20 Another study reported the sensitivity of mammography to be similar among Hispanic and white women.21 Consistent with other findings, our results suggest that a woman’s race/ethnicity does not appreciably influence the sensitivity of mammography. Our study showed that the rates of abnormal and false-positive examination findings among Chinese women were slightly lower compared with white women. Therefore, Chinese women undergoing screening mammography would likely have less additional imaging and fewer breast biopsies compared with white women of similar age. In contrast, Filipino women undergoing screening mammography would be expected to have additional tests and breast biopsies to the same extent as white women because the rate of abnormal examination findings is similar in both groups of women.

Mammographic breast density is associated with decreased cancer detection on mammography,8,22 probably because cancerous and fibroglandular tissue have similar x-ray attenuation. We found that women with dense breasts tended to have their breast cancers go undetected by mammography compared with women with nondense breasts. Also, increased mammographic breast density is strongly associated with increased breast cancer susceptibility.23-25 We hypothesized that Asian women would have a lower proportion of women with mammographically dense breasts given their lower absolute risk of invasive breast cancer compared with white women.26 However, we found that similar proportions of white and Chinese women had dense breasts, whereas a slightly higher proportion of Filipino women had dense breasts compared with white women. It may be that BI-RADS breast density categories overestimate the extent of breast density in Asian women, possibly because of small average breast size.27 Quantitative measures of breast density have shown that the absolute dense area within the breast is 15% smaller in Chinese women than in white women.27

The accuracy of our data depends on completeness of cancer reporting to the SEER program and California Cancer Registry, which is estimated to be more than 95% complete. We were missing values for some variables that may influence performance measures. Breast density, body mass index, and postmenopausal hormone therapy use are most often missing because some participating facilities do not consistently collect this information. We are not aware of any cancer reporting bias related to these risk factors.

Guidelines suggest that clinicians inform women of the age-specific potential benefits and harms of screening mammography.28-31 Potential harms include false-positive test results leading to unnecessary interventions with their own inherent risks; identification and treatment of breast tumors that never would have become clinically apparent in a woman’s lifetime; and worry and anxiety associated with testing and being labeled a cancer patient.32-38 Accordingly, health care providers discussing screening mammography with their patients should be aware that compared with white women, mammography is (1) as likely to find cancer if it is present and as likely to lead to a diagnosis of DCIS among Chinese and Filipino women; (2) as likely to lead to a false-positive examination result among Filipino women but slightly less likely among Chinese women; and (3) less likely in absolute terms to avert a death from breast cancer in both Chinese and Filipino women owing to their lower incidence of breast cancer. Policymakers developing guidelines for screening mammography should consider incidence of disease in subgroups of women when developing screening recommendations.

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