

disease (Surveillance Epidemiology and End Results [SEER] data at <http://seer.cancer.gov/>). It is both ironic and tragic that a neoplasm arising in an exposed organ, readily accessible to self-examination and clinical surveillance, continues to exact such a heavy toll.

Almost all breast malignancies are adenocarcinomas and based on the expression of estrogen receptor and HER2 can be divided into three major biologic subgroups: *estrogen receptor (ER)-positive, HER2-negative* (50% to 65% of tumors); *HER2-positive* (10% to 20% of tumors, which may either be ER-positive or ER-negative); and *ER-negative, HER2-negative* (10% to 20% of tumors). These groups (described in detail later) show striking differences with regard to patient characteristics, pathologic features, treatment response, and outcome.

Incidence and Epidemiology

Breast cancer is rare in women younger than age 25, but the incidence increases rapidly after age 30 (Fig. 23-13). ER-positive cancers continue to increase with age whereas the incidence of ER-negative cancers and HER2-positive cancers remains relatively constant. The number of ER-positive cancers detected in older women has risen as a result of mammographic screening (which preferentially detects ER-positive cancers) and menopausal hormone therapy (which is associated with an increase in these cancers). As a result, ER-negative and HER2-positive cancers comprise almost half of cancers in young women but fewer than 20% of cancers in older women.

Ductal carcinoma in situ (DCIS) is rarely palpable and is almost always detected by mammography. The increased diagnosis of invasive carcinoma and DCIS after 1980 is related to the introduction of mammographic screening and is confined to older women (Fig. 23-14). Rates of screening levelled off recently at 65% to 75% of eligible women, and the number of new breast cancer diagnoses has also plateaued. In the age of screening, the number of stage I cancers (small node-negative carcinomas) has

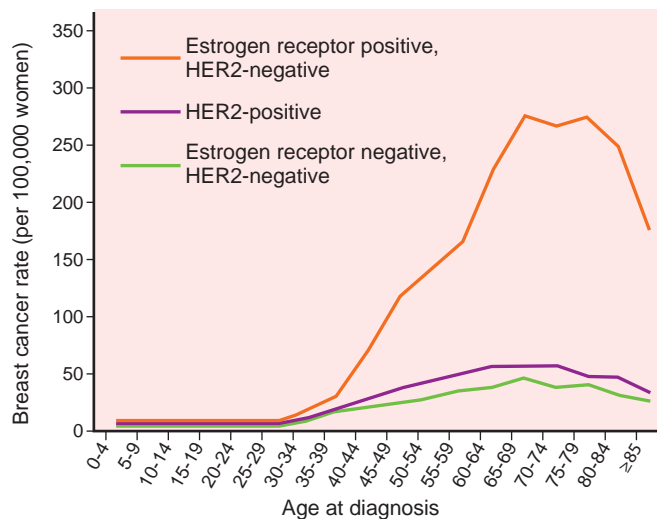


Figure 23-13 Incidence of ER-positive, ER-negative, and HER2-positive breast cancers according to age. Rates are per 100,000 women. ER-negative and HER2-positive cancers have a relatively constant incidence after age 40 years. In contrast, ER-positive cancers show a marked increase in incidence starting at around age 40 that peaks between the ages of 70 and 80.

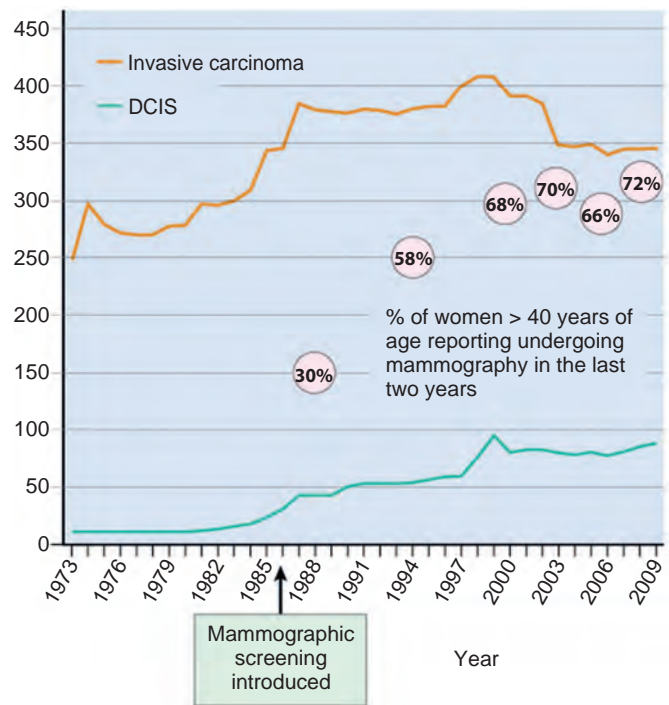


Figure 23-14 Changing incidences of ductal carcinoma in situ (DCIS) and invasive carcinoma during the years 1973 to 2009 in women older than 50 years of age. Rates are per 100,000 women and are age-adjusted to the 2000 US standard million population. (Data from SEER Cancer Statistics Review; <http://seer.cancer.gov/>.) Following introduction of mammographic screening in the 1980s, the number of cases of DCIS and invasive carcinoma increased in older women. The number of women screened has recently plateaued, as has the incidence of breast cancer.

increased in frequency, while the number of large node-positive or advanced-stage breast carcinomas (stages II to IV) has fallen.

Invasive cancer is less common overall in non-white women, especially in older women (Fig. 23-15). The average age at diagnosis is 61 years for white women, 56 for

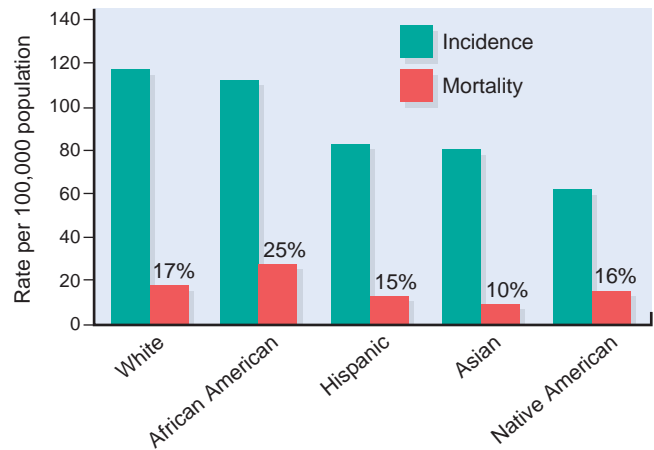


Figure 23-15 Breast cancer incidence and mortality in different ethnic groups (Data from North American Association of Central Cancer Registries). White women have the highest incidence of breast cancer, while African American women have the highest mortality rate. Likely contributors to these differences include socioeconomic factors (better access to care in white women) and biologic factors, particularly the higher incidence of aggressive, high grade, ER-negative tumors in younger African American women.