

Metastatic Breast Cancer Rates Show Disparities Between Black and White Patients in Cook County, Illinois

An examination of claims data for patients in Cook County offers insights into areas where intervention strategies can be enhanced to reduce disparities in breast cancer.

KEY FINDINGS:

- Black patients in Cook County, IL were 23% more likely than White patients to have metastatic breast cancer at diagnosis.
- Patients in Cook County, IL previously treated for breast disease, patients who had received BRCA screening, or patients who had received a breast biopsy had a decreased likelihood of metastatic breast cancer at diagnosis. This decrease in risk was present for both Black and White patients.
- Regardless of race, patients in Cook County, IL ages 18-39 were most likely to have metastatic breast cancer at diagnosis.

EXECUTIVE SUMMARY:

There's a popular notion that cancer is the great equalizer, but researchers have known for years that race is a factor in cancer survival. Black women are less likely than White women to get breast cancer but are more likely than White women to die from breast cancer.

That disparity is on stark display in Illinois, where the breast cancer mortality rate for non-Hispanic Black women is the fourth highest in the U.S. and 58% higher than non-Hispanic White women in the state (31.4 AG per 100,000 vs 20.0 AG per 100,000).¹

This disparity is confounding; it does not correspond to differences in reported screening rates or breast cancer incidence rates. Self-reported screening rates for Black women in Illinois are higher than rates for White women in the state (80.76% and 72.88%, respectively). And, both Black and White women in Illinois are diagnosed at similar rates (136.6 and 139.2 per 100,000, respectively).²

Aggregate screening and incidence data, such as those available at [State Cancer Profiles](#), the [Chicago Health Atlas](#), or [County Health Rankings](#), do not clarify the possible differences between Black women and White women observable prior to diagnoses. Identifying the nuances of patient experiences prior to their diagnoses could be key for informing policy, systems, and environmental changes to help reduce the proportion of late-stage breast cancer diagnoses.

A number of environmental factors are known to increase a woman's risk of a metastatic diagnosis,³ including access to primary healthcare, access to high-quality mammography, good navigation and support for younger at-risk women, and various social determinants of health. However, biological differences also influence outcomes.

Some breast cancers can be more aggressive in Black women and more likely to show up before menopause than breast tumors in women of other races/ethnicities.⁴ Some of these cancers are also less responsive to treatment in black women. This may be due to the underrepresentation of Black women in clinical trials resulting in treatments that have been disproportionately under-evaluated for Black patients. Even after controlling for a host of variables (e.g., body weight, education, and the type of cancer treatment), differences persist. When Black and White women receive the same treatment in clinical trials, for example, Black women’s chances of developing fatal metastasis have been shown to be greater.⁴

This analysis examines insurance claims data to identify if there are other, discernible differences or commonalities in the journeys of women in Cook County, IL prior to a metastatic diagnosis that might help inform more focused interventions to detect breast cancers earlier and reduce the proportions of late-stage and metastatic breast cancer diagnoses and related mortalities.

METHODOLOGY:

Using Komodo’s Healthcare Map of payer-complete sources which tracks individual encounters with the healthcare system for over 330 million patients the analysis identified over 8,000 insured women in Cook County who were diagnosed with metastatic breast cancer between June 2018 and May 2021 and self-reported their race as White or Black. Patients were categorized as metastatic at diagnosis if they had a diagnosis for a secondary neoplasm within 30 days after their breast cancer diagnosis. Patients under age 18, self-reporting as male, or with incomplete records were removed from the analysis.

Risk factors for metastatic breast cancer were identified through clinical expertise and existing literature. The analysis identified any presence of these risk factors noted and coded by a provider within the three years before a patient’s diagnosis of breast cancer. Although there are myriad factors that could influence or increase the risk of a cancer patient’s progression, we examined the potential impact of the risk factors preceding diagnosis on the risk of breast cancer metastasis in both White and Black patients.

To construct a model for predicting metastatic status, stepwise logistic regression using backward selection was used. The model examined all possible explanatory variables and selected the final variables to be regressed. Any p- values < 0.05 were considered significant. Regressions were performed with and without interaction variables between race and the explanatory variables.

RESULTS:

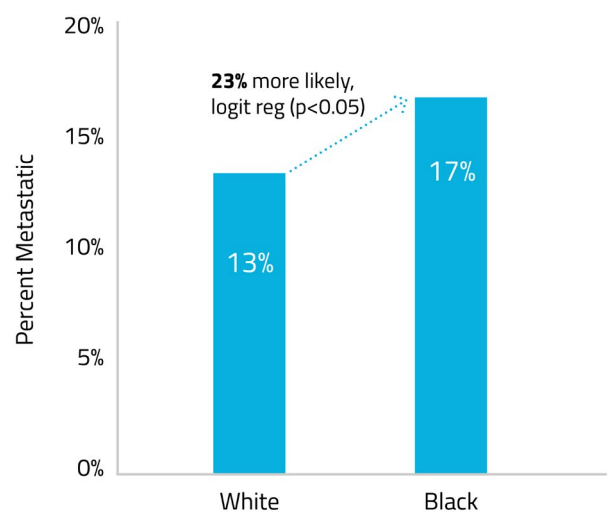
1) Black women were 23% more likely to have metastatic breast cancer at the time of diagnosis than White women.

For most cancers, Black people are more likely than White people to be diagnosed with an advanced (regional or distant) stage when treatment is more likely to be more aggressive and less likely to successfully suppress cancer.⁵ This finding holds for breast cancer and is echoed in this analysis, which shows that Black patients were 23% more likely to have metastatic breast cancer at the time of diagnosis than White patients.

The CDC-defined risk factors for breast cancer were evaluated for their association with having metastatic cancer at diagnosis.⁶ The analysis found that a recent history of Hodgkin’s lymphoma and non-Hodgkin’s lymphoma, myocardial infarction, obesity, and type 2 diabetes had no significant impact on the risk of being metastatic at diagnosis for either Black or White women.

Previously published literature suggests a correlation between even minimal alcohol intake and breast cancer.⁷ In this more narrowly focused analysis, a record of alcohol use, abuse, and dependence in the three years prior to diagnosis was not found

METASTATIC RATE BY RACE



to be a significant predictor of metastatic cancer diagnosis for either Black or White patients. However, a record of drug use disorders⁸ was associated with a greater risk of metastatic cancer at the time of diagnosis, increasing the likelihood by 50% for both Black and White women. The rate of drug abuse is higher among Black patients compared to White patients (20% vs 12%). However, the extent to which this factor contributes to disparities in metastatic diagnoses among Black patients is likely due to broader social and environmental factors not evaluated in this analysis. Women with drug use disorders are less likely to receive primary care or be reached by screening programs,⁹ which can increase their risk of delayed diagnoses and treatment. While known risk factors should continue to receive close attention from cancer control practitioners (i.e., policy, practice, and systems improvement to enhance access to primary healthcare), this finding suggests that developing outreach and educational interventions tailored to women receiving care for drug use disorders may be beneficial.¹⁰

2) Patients previously treated for breast disease, patients who had received BRCA screening, or patients who had received a breast biopsy had a decreased likelihood of metastatic breast cancer at diagnosis.

In the three years prior to their breast cancer diagnosis, patients who had breast biopsies were 44% less likely to have metastatic cancer at diagnosis. Patients who had a breast cyst were 17% less likely, and patients who had fibrocystic breast disease or fibroadenoma were 32% less likely to have metastatic cancer at diagnosis.

Significant Risk Factor	Likelihood of Metastatic Disease at Diagnosis
Breast biopsy	-44%
Breast cyst	-17%
Fibrocystic breast disease or fibroadenoma	-32%

Women who have a hereditary mutation, such as a mutation in the BRCA1 and BRCA2 genes, have a much higher risk of developing cancer by age 80 (70% compared to 10% for women at average risk).¹¹ Testing for these high-risk breast cancer mutations was associated with a 35% decrease in the likelihood of having metastatic cancer at diagnosis. This decrease in risk was present for both Black and White patients.

This analysis suggests that previous testing and treatment for breast disease activates an awareness and sense of urgency that leads both Black and White women to maintain recommended screening schedules and to seek out high-quality screening, both of which contribute to a greater likelihood that breast cancer will be detected and diagnosed earlier.

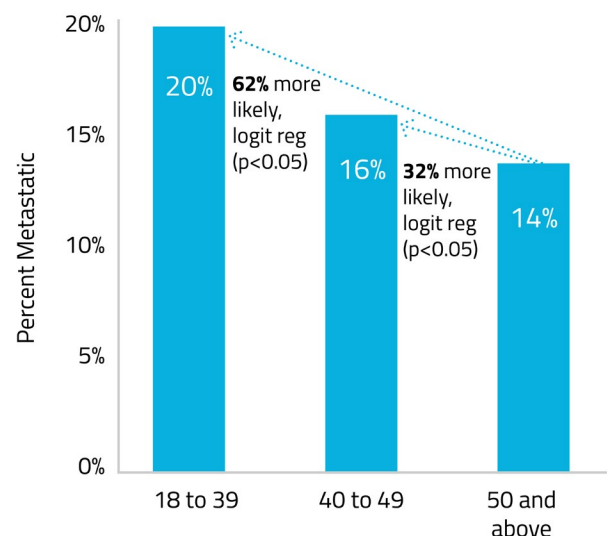
3) Regardless of race, patients ages 18 to 39 were the most likely to have metastatic breast cancer at diagnosis.

Regardless of race, patients 50 years and older were the least likely to have metastatic breast cancer at diagnosis. This is unsurprising, given that the American Cancer Society recommends women begin screening at age 40 and begin yearly routine mammograms at age 45 through age 54, when they can then choose to have biennial screenings.

Further, the United States Preventive Services Task Force recommends biennial mammography screening for women aged 50 to 74, which, under the Affordable Care Act, requires Medicare and group or individual health plans to cover preventive care without any cost-sharing requirements (e.g., copays or coinsurance).¹²

Patients aged 40-45 were 32% more likely to have metastatic breast cancer at diagnosis, and patients aged 18-39 were 62% more likely to have metastatic breast cancer at diagnosis relative to those age 50 and up. Screening guidelines are

METASTATIC RATE BY AGE GROUP



unquestionably important: early detection of breast cancer saves lives. Guidelines provide a balance between screening too early or too often, which could lead to unnecessary procedures and testing, and not screening often enough, which could delay diagnosis. However, when adherence to guidelines is followed strictly, those who fall outside the recommended age ranges for screening are often overlooked, even with presenting symptoms. For women under age 50, screening is limited, and often cost prohibitive, with mammograms costing over \$150 for those without insurance. Nuanced insights from real-world evidence may help support the argument for expanding screening ages for certain demographics of patients and specific cancer types.

DISCUSSION:

Black women are more likely than White women to receive a diagnosis of metastatic breast cancer, be younger at the time of diagnosis, and die from breast cancer. Early detection and treatment are critical to improving outcomes for all patients, but crucially, early detection and treatment are essential to increase the odds of survival for those patients who are facing an undue burden of disease due to myriad factors, both inside and outside the healthcare system. Breast cancer five-year survival rates drop precipitously with later -stage diagnoses, which provides some explanation for the mortality disparity between Black women and White women.

There are opportunities to close this gap, reducing the rate of metastatic diagnosis and the disparities between Black and White women. Improved provider education and increased awareness among at-risk populations about factors that contribute to metastatic diagnoses (e.g., delayed diagnosis, risks associated with hereditary/genetic mutations, and higher incidence of triple negative and inflammatory cancers) all could contribute to increased screening rates and, ultimately, survival.

Given the increased risk of breast cancer and later -stage diagnosis, providers should assess all women for a personal or family history of cancer, and all women with ancestries associated with a higher risk for BRCA1 and BRA 2 gene mutations, which includes Black women, and refer them for genetic counseling and testing if indicated. As our analysis indicates, there are women outside the established screening protocol who have metastatic breast cancer at the time of diagnosis. Site- and situation specific strategies can and should be created to reach at-risk women younger than 50 and their specialized healthcare providers.

Quality screening, early detection, and timely diagnosis and treatment are key to favorable outcomes. But the guidelines, protocols, and access needed to achieve those outcomes aren't always available to all patients at all times. Using insights generated from real-world evidence offers a greater understanding of where, how, when, and to whom the healthcare system can better provide the necessary interventions to improve outcomes for all.

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About Komodo Health

Komodo Health builds groundbreaking software solutions powered by our Healthcare Map™ — the industry's largest and most comprehensive database of real-world, patient-level data. With access to data from over 330 million patients, Komodo Health's next-generation analytics make it easy to unlock meaningful insights and create more cost-effective, value-driven solutions. We help stakeholders in Life Sciences, patient advocacy groups, and healthcare payers and providers answer healthcare's most complex questions in our mission to reduce the global burden of disease.

Notes:

- 1 American Cancer Society. Cancer Facts & Figures for African Americans 2019–2021. Atlanta: American Cancer Society, 2019.
- 2 Giaquinto AN, Sung H, Miller KD, et al. Breast Cancer Statistics, 2022 [published online ahead of print, 2022 Oct. 3]. *CA Cancer J Clin.* 2022;10.3322/caac.21754. doi:10.3322/caac.21754
- 3 Define metastatic and how ICD codes were used to identify women with metastatic diagnosis (Stage IV only or Stage III and IV)
- 4 Prakash O, Hossain F, Danos D, Lassak A, Scribner R, Miele L. Racial Disparities in Triple Negative Breast Cancer: A Review of the Role of Biologic and Non-biologic Factors. *Front Public Health.* 2020 Dec 22;8:576964. doi: 10.3389/fpubh.2020.576964. PMID: 33415093; PMCID: PMC7783321
- 5 American Cancer Society. Cancer Facts & Figures for African American/Black People 2022–2024. Atlanta: American Cancer Society, Inc. 2022.
- 6 Centers for Disease Control, What Are the Risk Factors for Breast Cancer? Accessed at https://www.cdc.gov/cancer/breast/basic_info/
- 7 American Cancer Society Guideline for Diet and Physical Activity for Cancer Prevention.
- 8 Drug use disorders include the use, abuse, or dependence on opioids; cannabis; sedatives, hypnotics, or anxiolytics; cocaine; hallucinogens; or other stimulants and drugs.
- 9 Dahlman, D., Magnusson, H., Li, X. et al. Drug use disorder and risk of incident and fatal breast cancer: a nationwide epidemiological study. *Breast Cancer Res Treat* 186, 199–207 (2021). <https://doi.org/10.1007/s10549-020-05998-4>
- 10 As defined by ICD-10 codes (note series)
- 11 American Cancer Society. Breast Cancer Facts & Figures 2022–2024. Atlanta: American Cancer Society, Inc. 2022.
- 12 The Patient Protection and Affordable Care Act, sections 4106 and 2713.