



THE STATE OF
BREAST CANCER



PRESENTED BY SUSAN G. KOMEN FOR THE CURE

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Dear Friends,

“What can I do?”

That was the question that haunted me after my sister — Susan G. Komen, in the last days of her battle against breast cancer — asked me to do everything in my power to spare other women and families the pain of this devastating disease.

Perhaps you’re asking yourself the same question right now. The answer is in your hands, literally.

This first-ever State of Breast Cancer report is guided by the simple truth that has inspired Susan G. Komen for the Cure for the past 25 years: Every one of us has the opportunity — in fact, the responsibility — to help save lives today and, ultimately, end this disease forever.

The pages that follow are both inspiring and shocking. You’ll be inspired by the great strides in diagnosis, treatment and research that have turned millions of breast cancer *patients* into breast cancer *survivors*. At the same time, you’ll be shocked that so many people — especially racial and ethnic minorities and those with little or no health insurance — continue to die needlessly from this disease simply because they cannot afford or access quality care.

In this sense, you’re not holding just another report — you’re holding a road map, a detailed plan for action. Read it. Mark it up. Carry it with you. Show it to family and friends. Let it be your guide. Whether you’re a patient or medical professional, a survivor or a scientist, an advocate or elected official, you’ll find at the end of each chapter a section called “What Can I Do?” listing the specific actions you can take *right now* to save lives and bring us closer to the cures.

We don’t have a minute to lose. While you’ve read this page, three more women have been diagnosed with breast cancer. Another woman — a sister, mother, daughter or friend — has died.

The question isn’t “What can I do?”

The question, my friends, is “What can I do, *today*?”



Sincerely,

A handwritten signature in black ink that reads "Nancy Brinker".

Nancy G. Brinker

Founder, Susan G. Komen for the Cure



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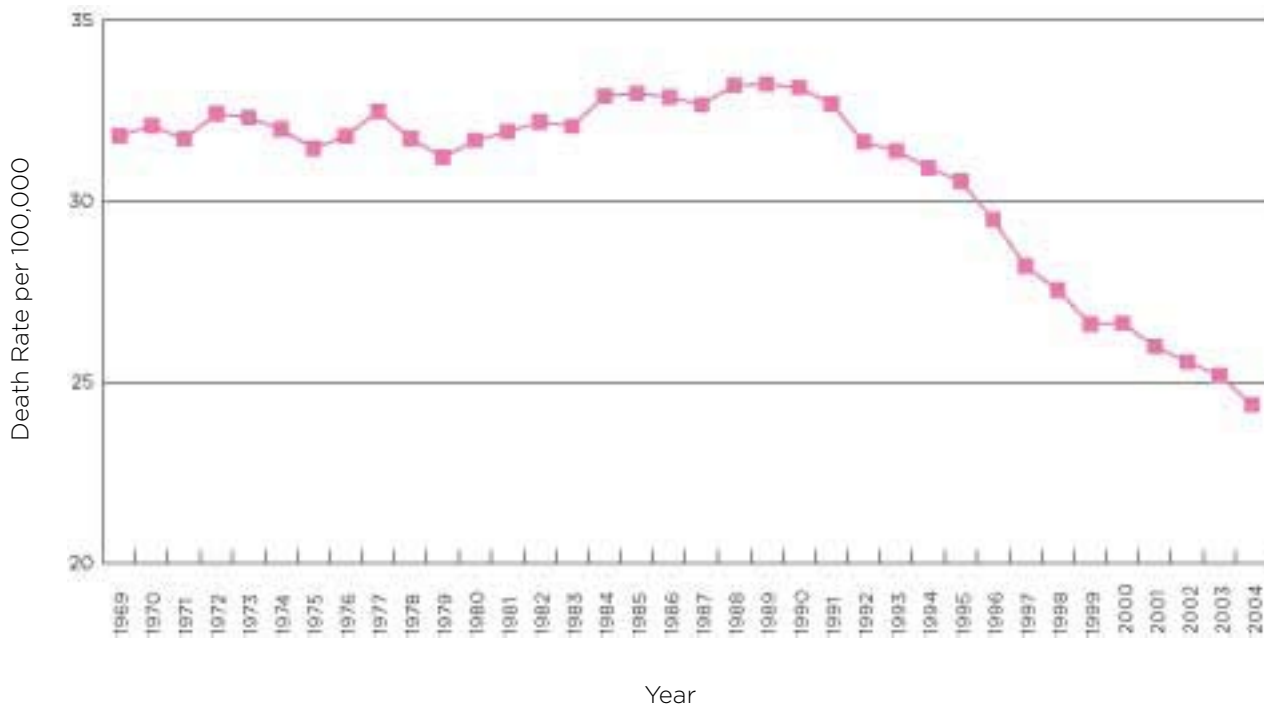
1: BREAST CANCER IN 2007 — VICTORIES AND THE FIGHT AHEAD

We've Made Progress in the Fight Against Breast Cancer...

*More than 2 million breast cancer survivors are living in the United States today.*¹ Nothing speaks more clearly to the progress we've made against breast cancer than this number. Before the birth of the breast cancer movement 25 years ago, being diagnosed with this disease was considered by many to be a death sentence. Today, a person who has been diagnosed with breast cancer in the earliest stages has a 98 percent chance of living at least five more years, on average, compared to only 77 percent in 1982.² The overall breast cancer death rate has decreased by about 2 percent each year since 1990 (Figure 1).²

"If we had known 12 years ago what we know today about breast cancer, my oldest sister might still be here with us." Susan Rosiles, Co-Survivor

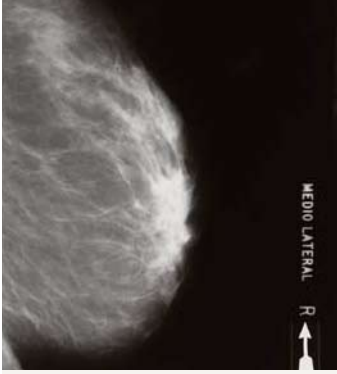
Figure 1²



Many advances have helped make breast cancer survivors the single largest group of cancer survivors in the U.S.³ and international efforts are helping to educate, screen and treat women around the world.

- Research has shown that breast cancer is not one but many diseases, and that the different types of breast cancer should be treated in different ways.
- Many new drugs have been developed to help tailor treatment to the needs of individual patients. The use of so-called “targeted therapies” has significantly improved the chance of long-term survival for people with some types of breast cancer.⁴⁻⁸
- Screening (mammography) has led to earlier diagnosis and a greater chance for effective treatment for many women.⁹
- Education has helped to raise awareness of breast cancer, the importance of screening and early detection, and the need for more research.
- Advocacy has resulted in significant increases in funding for breast cancer research.

Milestones in the War on Breast Cancer



1966

Mammography — the primary tool for the early detection of breast tumors — is invented¹⁰



1971

Nixon administration declares “War on Cancer,” designating the first centers for cancer research¹⁰



1974

U.S. First Lady Betty Ford speaks openly about her mastectomy, bringing breast cancer into the public spotlight¹⁰



1976

Use of chemotherapy after complete removal of breast tumors is found to significantly extend survival¹¹



1990

U.S. Congress passes the Breast and Cervical Cancer Mortality Prevention Act, which provides grants for programs that help detect breast cancer early¹⁰

Mutations in BRCA1 gene identified as an inherited risk for breast cancer¹⁰



1992

The Mammography Quality Standards Act (MQSA) is passed, setting safety and quality standards for mammography facilities in the U.S.¹⁰

The U.S. Department of Defense creates the Breast Cancer Research Program¹⁰



1998

Trastuzumab (Herceptin) — a targeted therapy shown to improve survival in advanced HER2-positive breast cancer — is approved by the U.S. Food and Drug Administration⁸

Landmark study shows tamoxifen reduces risk of breast cancer in high-risk women¹⁴



2000

The Breast and Cervical Cancer Prevention and Treatment Act is passed in the U.S., providing cancer screening and treatment for low-income women



1977

Tamoxifen, an anti-hormone drug, is approved for the treatment of advanced breast cancer¹⁰



1983

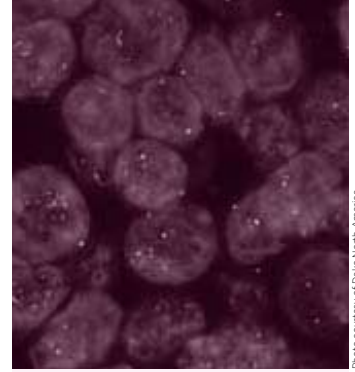
Inaugural Susan G. Komen Race for the Cure® helps launch global breast cancer movement

Treatment with tamoxifen after surgery is shown to reduce the risk of breast cancer returning¹²



1985

Breast-conserving surgery (lumpectomy) is shown to be a good alternative to mastectomy, giving many women a greater choice of treatments¹⁰



1987

The her2 gene is found to be overproduced in 25 percent of women with breast cancer, suggesting a genetic trigger — and a potential target for treatment¹³

U.S. begins tracking use of mammography

Photo courtesy of Doko North America



2002

Women's Health Initiative study suggests hormone replacement therapy increases risk of breast cancer⁵



2006

Herceptin is shown to reduce the risk of recurrence by more than 50 percent when used early in HER2-positive breast cancer⁵



2007

2.3 million people in the U.S. are living with or have survived breast cancer¹



2008 and Beyond

Work continues to be done to address the cultural, social, financial and educational barriers that prevent people from surviving breast cancer

...But We Can't Declare Victory Yet

Despite these advances, we have a long way to go before we can declare victory against breast cancer. Consider these sobering predictions:

Globally:

- More than *1.1 million women* will be diagnosed with breast cancer and more than *410,000 women* will die from the disease this year.¹⁶

In the U.S.:

- Nearly *240,000 women* will be diagnosed with breast cancer — and nearly 180,000 will be diagnosed with the most deadly type (invasive) — in 2007.
- More than *40,000 women* will die from the disease this year.¹⁷

Why should so many people — equal to the population of a medium-size city (Figure 2) — continue to die from breast cancer every year in the U.S. alone in spite of the advances that have been made?

Figure 2

40,000 breast cancer deaths in 2007 =
The entire population of Charlottesville, Virginia.



FACING THE FACTS ABOUT BREAST CANCER

- One in eight women in the U.S. will develop breast cancer in her lifetime¹⁷
- Breast cancer is the most common cancer among women¹⁷
- Breast cancer is the second leading cause of cancer death among women (after lung cancer) and the leading cause of cancer death among young women^{1,18}
- Being a woman and getting older are the most important risk factors for breast cancer¹
- The causes of breast cancer are unknown¹



There are several answers:

- *We still don't know what causes breast cancer.* Only 5 to 10 percent of breast cancers can be linked to a strong family history. Most women with breast cancer have no known risk factors.¹⁷
- *There is no "magic bullet" for breast cancer.* Breast cancer is a complicated disease. In fact, it is *many* diseases. Even when breast cancer is caught early, there is no guarantee the disease will not come back. For those with breast cancer that has spread to other parts of the body (metastasized), the chances of long-term survival remain limited.²
- *There is no way to prevent breast cancer.* Although diet, exercise and other lifestyle choices, as well as some forms of treatment, may help reduce the risk of breast cancer, there is no way to prevent it.¹
- *Many people don't benefit from the advances we've made so far.* For every person with breast cancer who has benefited from early detection and the best available care, there are many others who have not, and will not, benefit from the advances we've made over the past 25 years. For some types of breast cancer, treatment choices have not improved. Also, barriers — from beliefs, to poverty, to geography, to the way medicine is practiced — prevent many women from getting the best screening or care. Outside the U.S., these barriers are even greater.

The rest of this report takes a closer look at these barriers and inequalities — or disparities — in breast cancer, and what we all can do to help address the problems. Until something is done to remove roadblocks and close gaps, many women and men will continue to suffer and die from breast cancer unnecessarily.

Globally, a case of breast cancer is diagnosed every 29 seconds.

A woman dies from breast cancer every 75 seconds worldwide.



2: THE CRISIS OF DISPARITIES IN BREAST CANCER

Winning the fight against breast cancer is about much more than just curing a medical condition. It's about overcoming the cultural, social, educational and financial barriers that prevent people from getting screened and receiving life-saving treatment — *right now*. These barriers may partly explain why breast cancer death rates are so much higher in some groups of women, including some minorities (Figure 3); women living in poverty; and women in less-developed countries, where even the most basic healthcare is difficult or impossible to come by.

But these barriers, or *disparities*, in breast healthcare and treatment are not limited to women of color or the poor; they impact younger women and elderly women, women in rural and inner-city communities, lesbians, women with disabilities and even men. You most likely fall into at least one group that is facing a breast cancer disparity.^{2, 16, 19}

Breast cancer is the leading cause of cancer deaths for Latinas.¹

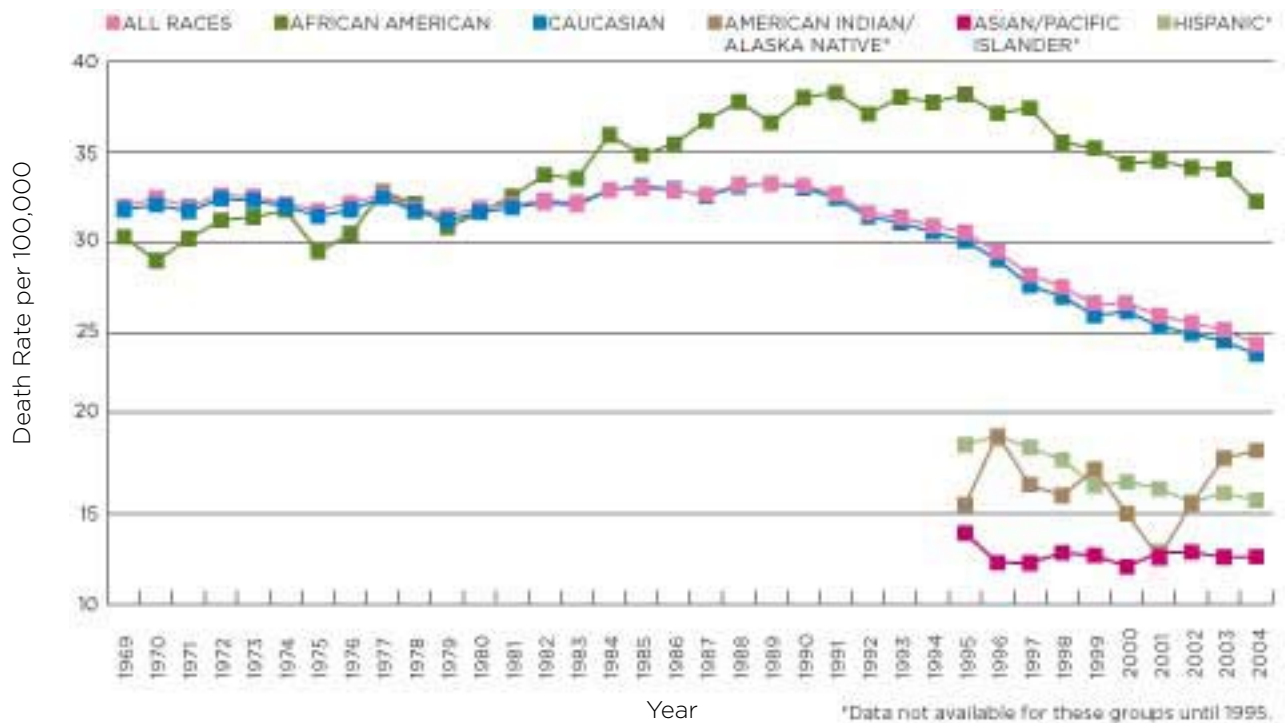


"[Everyone deserves] the same opportunity to become cancer survivors and to have an assurance that their future healthcare needs are properly managed."

*Lovell A. Jones, Ph.D.
Founder of the Intercultural Cancer Council*

African American women have a 35 percent higher breast cancer death rate than Caucasian women, even though they are less likely to get breast cancer.²⁰

Figure 3²





If you are an African American woman...

...you are less likely to develop breast cancer but more likely to die from the disease than women in other groups.¹



If you are a Hispanic or Latina woman...

...you are more likely to be diagnosed with breast cancer at a more advanced — and deadlier — stage. Only 38 percent of Hispanic women age 40 and older have regular mammograms.²¹⁻²³



If you are an Asian immigrant...

...language barriers may make it difficult for you to get screened or treated.²⁴



If you are a Native American or Alaska native...

...you are less likely than women of any other ethnic group in the U.S. to be alive five years or longer after a breast cancer diagnosis. Only 37 percent of Native American women age 40 and older get regular mammograms.^{25, 26}



If you live in a rural community...

...you may have to travel long distances to find a screening facility or a clinic for treatment.¹⁹



If you are uninsured...

...you are less likely to be screened for breast cancer, and your risk of dying from the disease increases by 30 to 50 percent.²⁶



If you are a lesbian or bisexual woman...

...negative experiences with the healthcare system may discourage you from seeking routine medical care, reducing your chances of finding breast cancer in its early, more treatable stages.²⁷



If you are under age 40...

...and are at high risk for breast cancer, you are less likely to benefit from screening technology compared to older women because your breast tissue may be denser, making mammography less effective.²⁸



If you are over age 70...

...you are less likely to receive the best available treatment.²⁹



If you are a man...

...you are less likely to think it's breast cancer if you find a lump in your breast, and you may be diagnosed late.³⁰



If you are disabled...

...you are less likely to be offered breast-conserving surgery instead of a mastectomy. You also may have mammograms less often than you should because screening facilities may not accommodate your disability.³¹

Until every woman and man has access to the best care possible — regardless of skin color, neighborhood or bank account — we must work to close these gaps. As you read this report, you'll learn about disparities related to breast cancer, from screening and diagnosis, to treatment, to the scientific research that brings us closer to the cures. You'll also find ways that you — as a family member, co-survivor, neighbor, doctor, politician, scientist — can help to make sure everyone has a chance of becoming a survivor and living a life with quality after breast cancer.

No matter where you live, you may have a hard time finding qualified breast care specialists.



A CLOSER LOOK AT DISPARITIES IN AMERICA: THE BREAST CANCER MORTALITY REPORT



Dr. Harold Freeman, President and Founder of the Ralph Lauren Center for Cancer Care and Prevention

Last year, Susan G. Komen for the Cure worked with Dr. Harold Freeman, president and founder of the Ralph Lauren Center for Cancer Care and Prevention in New York, to get “up close and personal” with eight communities plagued with high death rates from breast cancer — a sample of six counties, one city neighborhood and the nation’s capital (Table 1). The goal of the study was to find the common issues that lead to disparities in breast cancer death rates in these areas.

Under Dr. Freeman’s direction, a team of researchers dug beneath the surface to study the specific problems of each community, seen through the eyes of local care providers and community health workers who work daily with women receiving breast cancer screening and treatment services.

As shown in the map (Figure 4), the findings were surprising. Three main factors contributed to the findings: poverty, severe racial disparities and limitations of breast cancer legislation that enable states to deny treatment to women who need it, simply based on where they were initially screened.¹⁹

These are large and difficult challenges. However, addressing them will have a long-reaching, life-saving impact on women across the U.S. To read the full report, go to www.komen.org/mortality.

Table 1

Breast Cancer Death Rates in Locations Studied in the Breast Cancer Mortality Report¹⁰

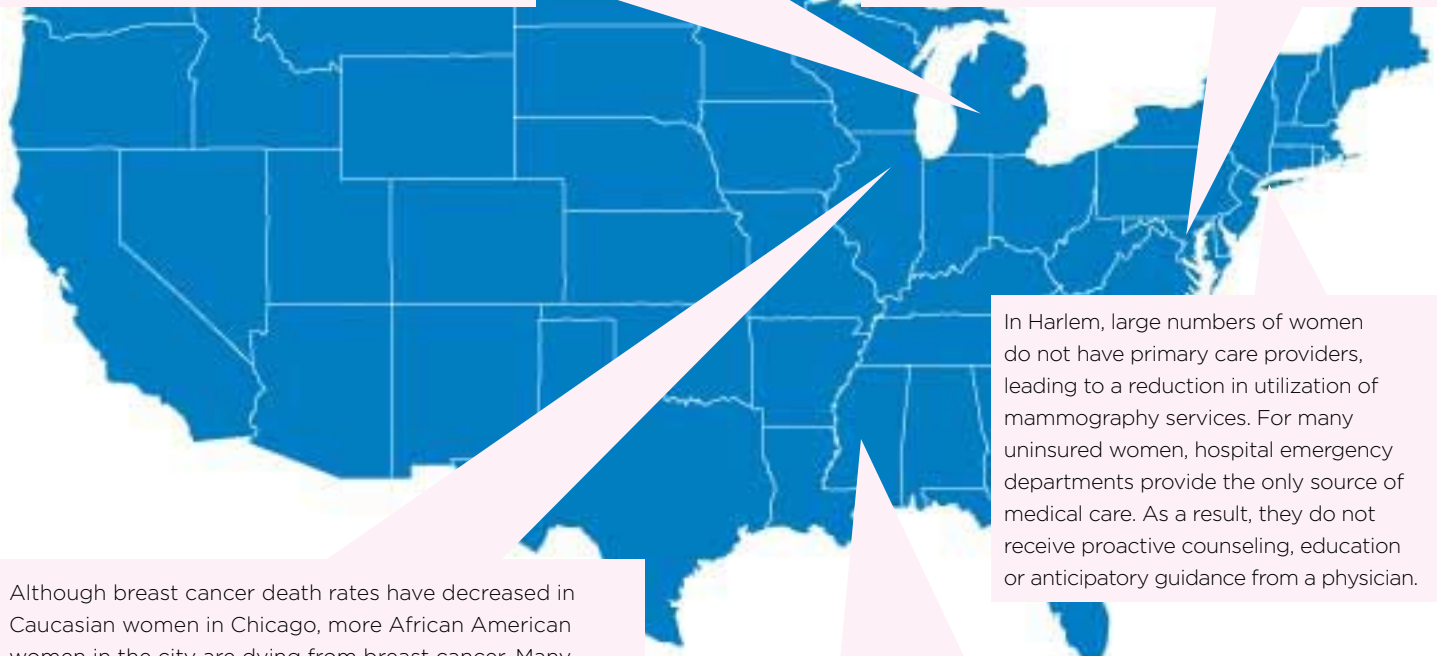
LOCATION	BREAST CANCER DEATH RATES (PER 100,000)
United States	26.0
Madison County, Mississippi	56.7
Moultrie County, Illinois	38.0
McDowell County, West Virginia	53.8
Chicago, Illinois	40.0 (African American); 24.0 (Caucasian)
Edgecombe County, North Carolina	34.8
Harlem, New York	27.8 (Central Harlem); 23.4 (East Harlem)
Washington, D.C.	32.1
Wayne County, Michigan	29.7

Figure 4

Examples of Findings from the Breast Cancer Mortality Report¹⁰

Recently, Michigan's Breast and Cervical Cancer Control Program has filled available screening slots very quickly in some areas of the state. The needs of low-income and uninsured women in Michigan used up available funds, leaving some clinics with waiting lists for screenings. Additionally, the state has faced repeated budget shortfalls that continue to threaten cancer control programs in the state overall.

When compared to all U.S. states, Washington, D.C., has the highest breast cancer death rate in the country, although several counties have higher rates than the District. Many women in our nation's capital, especially African Americans in low-income areas, face great difficulty using the healthcare system and lengthy waits for screening and follow-up care.



Although breast cancer death rates have decreased in Caucasian women in Chicago, more African American women in the city are dying from breast cancer. Many low-income women in Chicago had gone to a single public hospital for screening and treatment because it provided free care and was easily accessible by public transportation. However, waits of up to six months for mammography and diagnostic services were common.

In Harlem, large numbers of women do not have primary care providers, leading to a reduction in utilization of mammography services. For many uninsured women, hospital emergency departments provide the only source of medical care. As a result, they do not receive proactive counseling, education or anticipatory guidance from a physician.

Madison County, Mississippi, has one of the highest breast cancer death rates of any county in the nation, due in part to a hospice located in the area. It is important to note that African American women have higher mortality rates than Caucasian women living in the county.

3: DISPARITIES IN SCREENING AND DIAGNOSIS

Early Detection Can Help Save Lives...

Over the past 25 years, the widespread use of regular screening with mammography has had a major impact on breast cancer. Mammograms (breast X-rays) can detect breast cancers years before a woman has any symptoms, and often before the cancer spreads. If breast cancer is caught and treated in its earliest stages, women have a 98 percent chance of surviving five years, on average.²

SUSAN G. KOMEN FOR THE CURE SCREENING RECOMMENDATIONS

- Annual mammograms starting at age 40
- Women at high risk for breast cancer should talk to their doctors about when they should start having mammograms
- Clinical breast exams at least every 3 years starting at age 20 and annually from age 40 on

Tireless advocacy, increased public awareness and the wider availability and relative affordability of mammography have led to improvements in the screening and diagnosis of breast cancer:

- Around 70 percent of women 40 and older now report having regular mammograms — up from only 30 percent in 1987.³²
- Nearly two-thirds of women are diagnosed with breast cancer in its early stages — compared to less than half 30 years ago.²

Although mammography is not a perfect tool, government-enforced standards have improved the quality of screening facilities (Box 1). The benefits of broad use and better standards are clear: Studies have suggested that screening and early detection account for 28 to 65 percent of the reduction in breast cancer deaths seen in the U.S. between 1975 and 2000.⁹

As screening and diagnostic technology continue to improve, we will have an even better chance of catching — and treating — breast cancer before it becomes deadly.



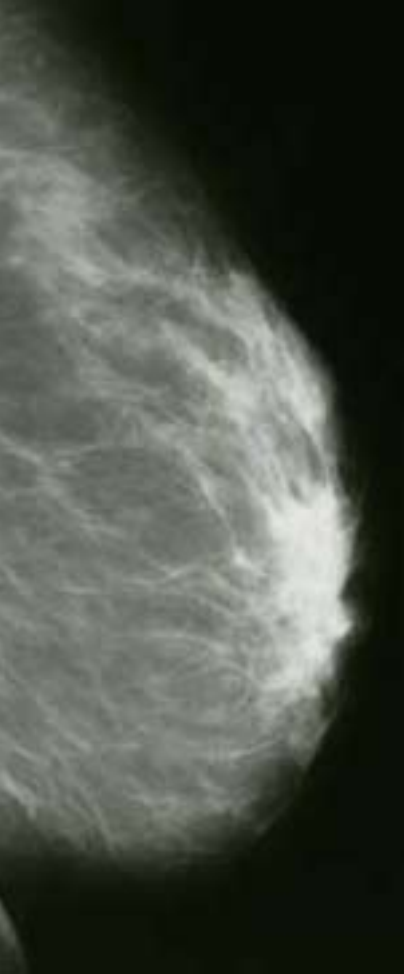


Table 2

Recent Advances in Screening and Diagnosis Technology

Digital mammography	<i>X-ray images of the breast are captured and enhanced using a computer. Studies show digital mammography may be somewhat more effective in detecting breast cancer in younger women, who often have denser breast tissue. Tumors in dense breast tissue are difficult to detect using standard mammography.^{28, 33, 34}</i>
Magnetic resonance imaging (MRI) in high-risk women	<i>MRI uses a large magnet and radio waves to make precise images of the breast, and may improve the chances of finding breast cancer early in women who are at the highest risk of developing breast cancer.^{33, 35}</i>
Tomosynthesis	<i>Tomosynthesis is a type of digital mammography that produces three-dimensional images, allowing a better view of the breast and abnormalities in the breast.³⁶</i>

Box 1

The MQSA: Ensuring High-Quality Screening

In 1992, the U.S. government enacted the Mammography Quality Standards Act (MQSA) to ensure that mammograms are performed using high-quality equipment and that the results are read by certified professionals.³⁷

...But Many Women Still Don't Get Screened Regularly

A recent report from the Centers for Disease Control and Prevention (CDC) and the National Cancer Institute (NCI) showed that almost a million fewer women in the U.S. had mammograms in 2005 than in 2000.³⁸ What's more, women who have traditionally used mammography at high rates, including women with higher incomes, more education and private or public health insurance coverage, are getting screened less often. This trend has raised concerns that breast cancer deaths could increase in the U.S. for the first time in many years.³⁹

Why are we losing ground? And why do more than one in four women 40 and older in the U.S. still not receive regular mammograms in spite of the proven benefits?³⁸ There are many possible answers:

- **Poverty.** Many low-income women can't afford mammograms due to lack of insurance or not enough insurance.²⁶
- **Not enough funding for screening programs.** In 1991, the U.S. government created a program to increase access to screening for women with no insurance or not enough insurance (Box 2). However, funding for the program covers less than one in five eligible women.⁴⁰
- **Cultural issues and beliefs.** Different beliefs and customs may discourage screening in some ethnic groups.⁴¹
- **Practical barriers.** Some women may be unable to get screened because of work, lack of childcare, lack of transportation and other factors.¹⁹
- **Geography.** In rural areas, women may have to drive an hour or more to get to a screening facility. Even in big cities, long distances from affordable facilities or from public transportation may discourage low-income women from getting screened.¹⁹
- **Misperceptions and lack of awareness.** Some women may believe they are not at risk for breast cancer, or may be unaware of the importance of early detection.⁴¹
- **False sense of security.** Recent declines in cancer-related deaths may lead some people to believe that breast cancer is not a major concern, especially for higher-income, more-educated women.

AM I AT RISK?

Being a woman and getting older are the most important risk factors for breast cancer. Several other factors are known to increase risk:^{1,42}

- Testing positive for BRCA1 and BRCA2, the gene mutations commonly associated with breast cancer
- Having a previous biopsy showing overactive cell growth (hyperplasia) or cancer contained within the breast (carcinoma in situ)
- Having a mother, daughter or sister who has had breast cancer
- Having dense breast tissue
- Having a personal history of breast or ovarian cancer
- Starting menopause after age 55
- Never having children or having your first child after age 30
- Being overweight after menopause or gaining weight as an adult
- Having more than two alcoholic drinks per day
- Using hormone replacement therapy (HRT)
- Being under age 12 at the time of your first period
- Recent birth control use
- Being of Ashkenazi Jewish descent

For more information about risk factors, go to:
www.komen.org/risk.





Other barriers to early detection include:

- **A shortage of qualified medical personnel and screening facilities.** Breast care specialists are often scarce in rural areas and in low-income neighborhoods in major cities.¹⁹ Screening centers may be forced to close in some communities due to shortages of qualified specialists.⁴³⁻⁴⁶ With fewer facilities, women may have to wait longer for screenings.
- **Differences among screening facilities.** In spite of government legislation, the quality of screening facilities may still vary. And, even though mammography has been widely used for more than 20 years, some medical centers, especially in poor communities, may not offer it.¹⁹
- **Limitations and costs of screening technologies.** Standard mammography may not work as well in women with dense breasts.²⁸ Although digital mammography can help find tumors in these women, this more expensive test is often not covered by insurance.^{19,35} Magnetic resonance imaging (MRI), which can help in both screening and diagnosis, is even more expensive.⁴⁷

Screening and detection are the first steps in the fight against breast cancer. When mammograms show something abnormal, doctors usually examine a sample (biopsy) to make a diagnosis. Lack of experience interpreting breast cancer biopsies may be a problem in some rural and poor communities.¹⁹ For more information about the quality and practice of breast pathology, please visit www.komen.org/pathology.

Box 2

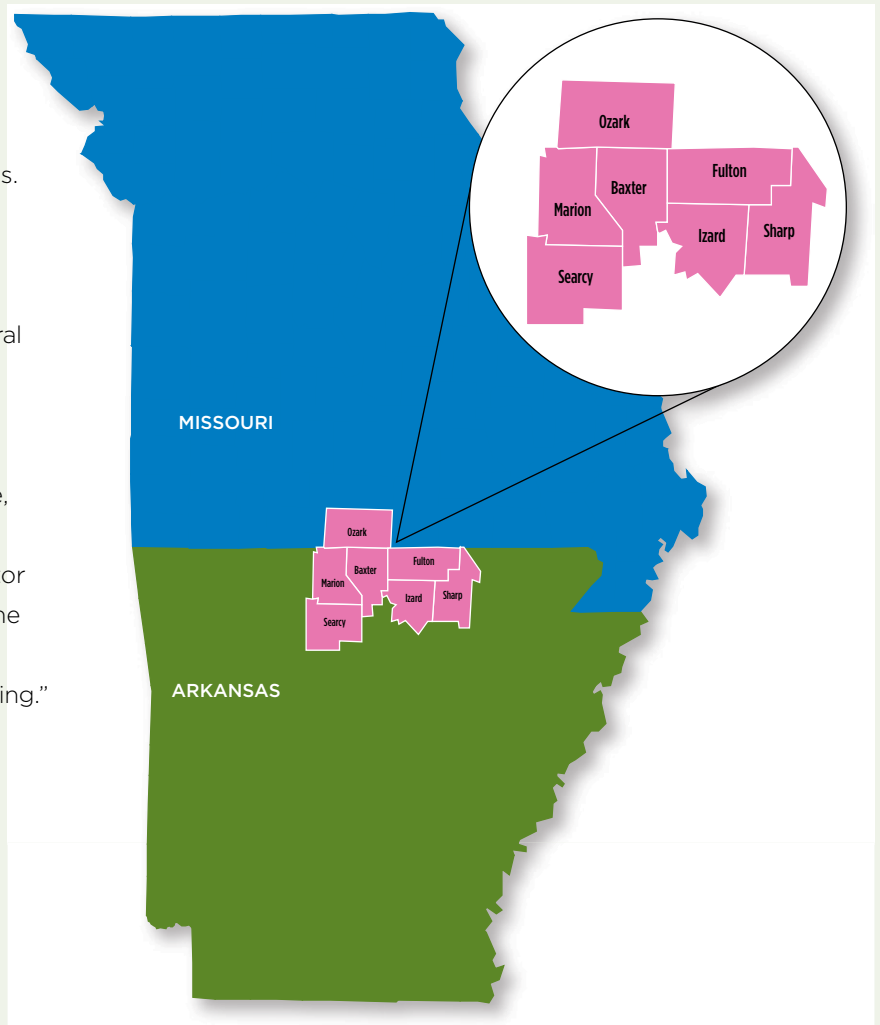
The National Breast and Cervical Cancer Early Detection Program (NBCCEDP)

- The NBCCEDP is a government program created in 1991 to provide free breast cancer screening and case-management services for women with little or no health insurance.⁴⁰
- If you are uninsured or underinsured, at or below 250 percent of the federal poverty level and between the ages of 40 and 64, you may be eligible for free breast screenings through NBCCEDP.⁴⁰
- State programs put their own strategies in place to reach women in underserved communities and set priorities for screening.⁴⁰

For more information on the NBCCEDP, go to:
<http://www.cdc.gov/cancer/nbccedp>.

ON THE FRONTLINES

Traveling five hours in one day is not uncommon for the Mobile Mammography Unit (MMU) of the Baxter Regional Medical Center in Mountain Home, Arkansas. In fact, in 2006 the MMU was on the road for nearly 50 weeks and provided 2,769 mammograms to women who might not have gotten them otherwise. The MMU travels through seven counties in north central Arkansas — three of which have no mammography facilities — and visits towns that are remote and rural. Many of the MMU visitors are women who are uninsured or too young to qualify for state insurance, but the MMU provides free mammograms to all. “Detection is imperative,” says Bonnie Fischer, Director of Baxter Regional Medical Center’s MMU. “Having the ability through this program to make mammograms convenient, painless and cost-effective is very rewarding.”





▶ WHAT CAN I DO?

- Give a neighbor a ride to her screening.
- Promote breast cancer education in your place of worship or through community events.
- Talk to your friends about getting screened.
- Become a family history buff to help assess your personal risk, and encourage family members to get screened.
- If you speak a foreign language, help a non-English speaker understand the importance of screening.
- If you own a business, allow your employees flexible time to get regular screenings.
- If you are a physician, implement a mammogram reminder program for your patients, stay up-to-date on practice guidelines and talk to patients about the importance of early detection.

Making Early Detection and Diagnosis a Reality for All

How can we make early detection and diagnosis a reality for all women and men? The problems are complicated, so there is no simple solution. However, many things can be done to improve outcomes. For example:

- Special screening programs can make early detection accessible to some underinsured and uninsured women.
- Mobile mammography can bring convenient screening to women in rural or poor urban communities.
- Healthcare providers can incorporate culturally sensitive educational materials and support services to women of ethnic and racial minorities, as well as other underserved groups such as the elderly, lesbians, immigrants, men and the disabled.
- Places of worship and community-based organizations can help raise awareness of the importance of regular screening among people of ethnic and racial minorities, and address negative beliefs and attitudes about mammography and breast cancer treatment.
- Physicians should discuss family histories with women and men to determine if a patient may have a higher risk of breast cancer.

4: DISPARITIES IN TREATMENT



We Have Better Weapons than Ever Before...

Although there are no cures for breast cancer yet, the past two decades have given us many new weapons in our battle against this disease. In some cases, cancer specialists have refined how they use standard treatments. For example, using chemotherapy, radiation and/or hormonal therapy after surgery can significantly reduce the chance that the cancer will return.⁴⁸ Researchers have also found new ways to attack cancer specifically, and to tailor treatment to a person's particular disease (Table 3). Along with widespread screening and early detection, advances in treatment have helped to reduce the rate of breast cancer death over the past two decades.

Table 3

Advances in Testing: Choosing the Best Treatment

Sentinel lymph node biopsy	<i>To check for the possible spread of breast cancer, surgeons used to remove many of the lymph nodes under the arm near the affected breast. This sometimes led to a swelling of the arm called lymphedema, or numbness and pain in the arm. Now, surgeons can often remove one to three key nodes — known as the sentinel lymph nodes — to check for the spread of cancer.⁴⁹</i>
HER2/neu	<i>HER2/neu is a protein that appears on the outside of some breast cancer cells and may help aggressive tumors grow. About one in four women with breast cancer have “HER2-positive” breast cancer. These women could benefit from targeted treatments such as Herceptin.^{4,8}</i>
Hormone receptor status	<i>Some breast cancers are “fed” by certain hormones. Tests that determine if tumor cells have receptors for these hormones help to guide treatment. Women who test positive for hormone receptors may be treated with drugs that block the receptors or stop the hormones from being made.⁵⁰</i>



...And We've Made Them Available to More People

In addition to new therapies and approaches to treatment (Figure 5), we've also made some progress in improving access to quality care for breast cancer. In 2000, the U.S. Congress enacted the Breast and Cervical Cancer Prevention and Treatment Act (BCCPTA), which allows states to provide assistance through Medicaid to low-income women with breast cancer. Under this program, states provide free treatment to women under age 65 who have no healthcare coverage and who are screened through their state's breast and cervical cancer detection program.⁵¹

Figure 5
Advances in Treatment

Breast-Conserving Surgery

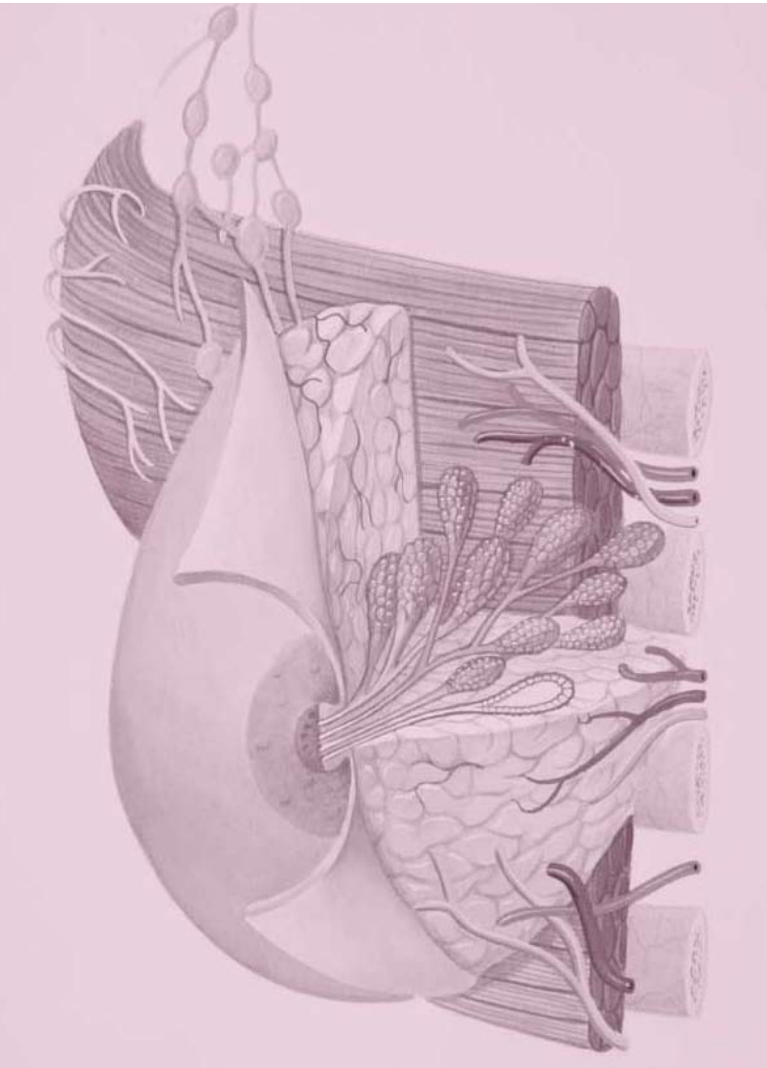
Women no longer have to lose an entire breast or breasts to breast cancer. Studies show that for some women, treatment with a lumpectomy, which removes only the tumor, and radiation has similar outcomes to a mastectomy (removing the entire breast).⁵²

Brachytherapy

Radioactive pellets, or "seeds," are placed inside the body, close to the tumor. This could potentially eliminate the need to treat the entire breast with radiation and also decrease the length of treatment time from weeks to days.^{53,54}

Targeted Therapies

Targeted therapies are designed to specifically attack cancer cells while leaving most normal cells alone.



Fertility-Conserving Treatment

Studies are being done on drugs that may allow women to have children after treatment.⁵⁵

Preventive Surgery

Surgically removing the breasts before cancer is detected (prophylactic bilateral mastectomy) has been found to greatly reduce the risk of developing the disease for high-risk women, particularly those who have tested positive for the BRCA genes. This is an option for women at higher risk.¹⁷

Preventive Chemotherapy

High-risk women may be able to reduce their risk of developing breast cancer by taking certain medicines such as tamoxifen or raloxifene, an approach known as chemoprevention.⁵⁶

FRONTIERS IN TREATMENT RESEARCH

Hundreds of studies are exploring new ways to treat breast cancer — some closer on the horizon than others. Areas of focus include:

- **Anti-angiogenesis drugs.** Anti-angiogenesis drugs work by preventing tumors from developing new blood vessels. Without blood vessels, tumors can't keep growing.⁵⁷
- **Gene therapy.** In gene therapy, a specific gene can be transferred into a patient's cancer cells to make them more responsive to treatment. A gene can also be transferred into a patient's immune system cells to make them better able to fight the cancer.⁵⁸
- **Nanotechnology.** Tiny particles can be coated with a special material. When introduced into the body, these particles may be able to target and kill cancer cells from the inside out.⁵⁹
- **RNA interference.** A technology with the potential to turn off the genes that make cancer grow.⁶⁰
- **Adult stem cell research.** Some researchers believe that stem cells (cells that give rise to all cells in the body) are the source of at least some, and perhaps all, cancers. Breakthroughs in adult stem cell research may allow us to develop more effective treatments.⁶¹
- **Targeted therapies.** An ever-expanding list of targeted therapies is making breast cancer treatment more specific and possibly less toxic.

...But the Battle Is Far from Over

Despite advances in therapy and improvements in access, many women with breast cancer are still not getting the treatment they need. For many people who lack insurance, the enormous cost of treatment can be devastating. Low-income and minority women are less likely to be offered the latest tests or treatments. They are therefore more likely to suffer side effects from conventional, less specific treatments and are more likely to die of breast cancer.²⁶

Under the Breast and Cervical Cancer Prevention and Treatment Act (BCCPTA), U.S. states that opt into the program must provide Medicaid-funded breast cancer treatment to any low-income, uninsured woman screened through her state's breast and cervical cancer screening program.⁴⁰ However, according to a recent survey, more than half of states can deny treatment if a woman was screened through a different provider (Figure 6). Thousands of women may be denied treatment because of this. In addition, because of limited funding for the screening program, many women must be screened by other providers and therefore would not qualify for Medicaid-covered treatment. Undocumented immigrants are not covered by the Treatment Act at all.⁴⁰



ON THE FRONTLINES

A college graduate with two kids, Lucy Spears of Charleston, South Carolina, found a cancerous lump in her breast before she was 40 years old. After having health insurance for over 20 years from the small business she and her husband owned, an error at the post office caused her insurance company to drop her coverage without notice. Stuck with a diagnosis of breast cancer and no way to pay for treatment, Lucy went in search of help, but she found her income was a little too much for her to be eligible for most aid. “We weren’t on welfare...so [people] didn’t know where to send us.” Lucy managed to find treatment because of doctors who wanted to help with payment plans, but she is still unable to find insurance coverage. Now Lucy says, “I may never be able to repay my financial debts, but I will do everything I can to help other women get through this with their dignity.”

WHY I WANTED MY TUMOR BACK

By Diane Balma, vice president of public policy for Susan G. Komen for the Cure



I was a well-educated, sophisticated, professional, 30-year-old woman about to undergo surgery to remove a tumor from my breast. I was medically naïve, uninformed and anxious. I did not ask before signing the surgical informed consent form what would happen to my tumor once it was removed. Rather, I was preoccupied with whether I would lose my breast or, more profoundly, whether I would live to be 31.

When I was diagnosed in 1995 with an aggressive form of breast cancer, testing for HER2, an important factor in assessing odds of survival, was not always accurate. My initial pathology report was negative for HER2. Several years after my diagnosis and treatment, my oncologist asked to have a sample of the removed tumor re-tested because new technologies had been developed that could better tell just how serious my breast cancer was.

Fortunately, a sample of my tumor was still “on file.” When it was re-tested, the result was quite different. Not only did I have HER2-positive breast cancer but, in the words of my doctor, the tumor was “off-the-charts positive.” Worse, I learned that the type of chemotherapy I had received was not very effective with my type of breast cancer. But I also learned that my type of cancer was responsive to a new, targeted drug, and that I would be a candidate for the drug if my breast cancer returned.

Three or four years later, I read about how breast tumor samples are often discarded and that there are no uniform standards regulating how long the samples are kept or preserved. I was overcome by a powerful uncertainty: Did my tumor specimen still exist? If it was no longer

preserved and accessible, it could never again be tested to determine whether I could benefit from new breast cancer therapies, or even a cure. I was panic-stricken. Had my tumor tissue been thrown out? If not, where was it, and how could I find it?

I had waived any rights I might have had to my tumor specimen when I signed the surgical informed consent form. Nevertheless, I decided to track down my tumor. I called the community hospital where I had undergone the lumpectomy. No tumor. I then called the comprehensive cancer center in San Francisco where my mastectomy was performed. No tumor. In an act of desperation, I called the community hospital back, told them that I was a lawyer and I was not crazy, but that I wanted my tumor back.

The FedEx package arrived at my office two days later. In it was a box that held my tumor. My tumor continues to reside in its box, in my closet, next to my shoes.

I want something better for cancer survivors. This is an issue that has major implications for hundreds of thousands of patients yet to be and those already diagnosed with breast and other cancers. Susan G. Komen for the Cure proposes to achieve the right balance between ensuring that patients have ready access to information from their specimens for clinical use, and the academic community has access to tissue for research. Tissue banking that doesn't occur in a responsible manner is another obstacle standing in the way of *the cures*.

Reprinted with permission from *CURE: Cancer Updates, Research, & Education*.

“At minimum, our society should assure that anyone that has cancer should be treated...It’s not morally acceptable that you can diagnose cancer and not provide treatment.” Harold P. Freeman, M.D.

Providing Quality Treatment for Everyone

In a country with so many resources, why do so many women and men with breast cancer still lack access to quality treatment? How can we close the gaps?

- Increase access to treatment services for all women and men with breast cancer, regardless of where they were diagnosed (see page 20 for more information on the Treatment Act).
- Ensure that breast cancer treatment is recognized as charity care.
- Establish scholarships or stipends for cancer specialists who commit to practicing in areas with limited resources.
- Increase recruitment of minority women in clinical studies.
- Increase funding for research on difficult-to-treat forms of breast cancer.
- Increase programming and funding for programs to help patients navigate through the healthcare system to get timely and quality cancer care. Patient navigation services are critical to address barriers to quality cancer care, particularly for minority and underserved patients who often do not speak the native language, have lower literacy skills, are uninsured and live long distances from treatment centers (see On the Frontlines, below right).
- Set up programs to help medical professionals recognize how all types of disabilities — both physical and mental — affect care, and to help disabled patients gain better access to breast care.
- Increase education about breast cancer in medical schools and through continuing medical education.

ON THE FRONTLINES

“I enrolled in a clinical trial [because it provided] me hope. Every three weeks I took the drug, and to everyone’s surprise, my treatments lasted for six years. That is way beyond normal clinical trial expectations, so it was thrilling. The clinical trial might not have been a cure, but it bought me time so that I could wait for the next drug that may offer a cure for me.”

Darlene Pettis, clinical trial participant, Crowley, Texas

▶ WHAT CAN I DO?

- Urge your legislators to increase federal and state funding that makes treatment available to more women. Go to www.ActNowEndBreastCancer.org.
- Ask your doctor for the latest information on breast cancer treatment to empower yourself. Visit www.WebMD.com or www.medscape.com.
- If you are a hospital administrator, start a navigator program at your institution.

ON THE FRONTLINES

Gloria Lopez, a former nurse who was disabled and dealing with depression, was 57 years old when she was diagnosed with breast cancer. She did not have much of a support network. She lived in Seattle — far from her family in the Caribbean — and she didn’t speak much English. She needed help. The cross-cultural mediator program at Harborview Medical Center paired Gloria with a patient navigator named Christina Garces, who helped her to not only find treatment but also a way to pay for it. Christina also served as a translator for Gloria’s many doctor visits. She helped Gloria find a psychiatrist and language-specific counselor, and helped her apply for government housing. Christina even accompanied Gloria as she went to find a bra and prosthesis after her mastectomy. Gloria’s situation is similar to many women in the cross-cultural mediator program. She was alone, scared and unprepared to handle her disease. Through the program Gloria got the help that she desperately needed, and that she likely would not have received otherwise.



5: DISPARITIES IN RESEARCH

The major questions in breast cancer research are: “What causes breast cancer?”, “How do we prevent it?” and “How can we cure it?”

Over the past 25 years, the U.S. federal government has spent billions of dollars pursuing these questions.⁶⁵ Although researchers haven’t found the answers yet, they have made progress on nearly every front, from our basic understanding of breast cancer, to early detection, to more “personalized” treatment, to risk-reducing therapies. Breast cancer has become a manageable disease for many women, including those with advanced forms of the disease. But research completed to date has not benefited all people equally.

Many People Are Left Out of Research

Ethnic and racial minorities make up less than 10 percent of participants in cancer clinical trials (Figure 7). In addition, people 65 or older make up less than one-third of clinical trial enrollees, even though nearly two-thirds of cancer patients are in this age group.⁶⁵

Without greater participation of all groups in clinical trials and other types of studies, researchers can’t answer basic questions like:

- Why are some forms of breast cancer more common in some ethnic and racial groups than in the general population?
- Why do African American women tend to have more aggressive forms of breast cancer and die more often from the disease than Caucasian women?⁶² Many experts believe that African American women may not have access to the same screening and quality of care as Caucasian women. Others believe that there are biological differences that explain the disparities.¹⁹

“Until we’ve done studies...with regards to the role of biology, social issues or other factors, then really no one can stand on solid ground and say, ‘All we need to do is address the access issue.’ You really don’t know until you do the study.”
Lovell A. Jones, Ph.D.

- Do African American and other ethnic minorities respond to breast cancer therapies in the same way Caucasian women do?
- Do patients 65 and older respond to breast cancer therapies as well as younger patients do?

THE COST OF CURES

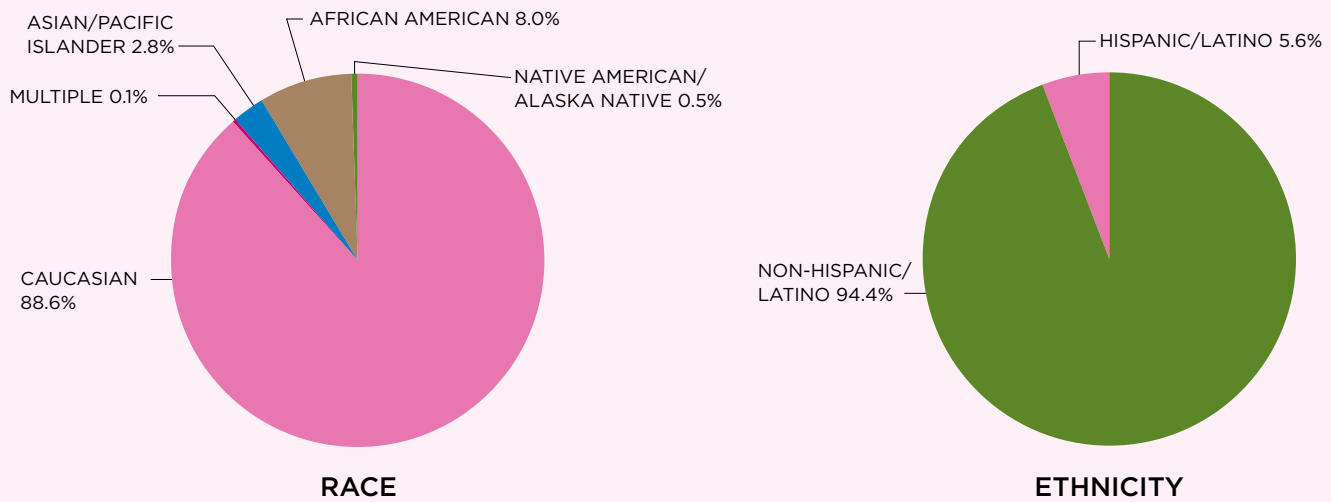
- The National Cancer Institute spends roughly \$5 billion on cancer research each year, yet cancer costs us over \$200 billion in healthcare costs and lost productivity.⁶⁵
- Funding for the National Institutes of Health (NIH), though at a record high, has remained flat, when adjusted for inflation, over the last several years.⁶⁶
- NIH funding for breast cancer research reached a high of \$718 million in 2006, but is expected to drop steadily through 2010.^{67, 68}

Figure 7

Enrollment by Race and Ethnicity in National Cancer Institute (NCI) Publicly Funded Clinical Trials⁶³

(Phase I-III Treatment Studies)

January 1, 2003-June 30, 2005



Tissue Banking

Another barrier to including everyone equally in breast cancer research is the lack of uniform national standards for collecting, storing and providing access to breast tumor samples, which was mentioned in the treatment section. Research institutions (or hospitals) routinely retain patient tissue samples for both clinical use and research purposes. However, in general, community hospitals are far less likely to retain specimens for research. Many, if not most, community hospitals keep only what they need for a patient's treatment — sometimes for as little as two years — and discard the rest. This means that there is a limited number of high-quality tissue samples from women treated at these hospitals — often low-income women and minority women. If made available, tissue that is routinely discarded by community hospitals could be an invaluable resource with which to study aggressive breast cancers that disproportionately impact some minority patients.⁶⁴

**LACK OF DATA SHARING:
AN EQUAL-OPPORTUNITY PROBLEM**

Researchers need to be able to build on one another's research so they don't have to "reinvent the wheel" with each study. Thus, the free exchange of results (data sharing) is an important part of speeding up the pace of breast cancer research and discovery for everyone.

The realities of scientific research often stand in the way of data sharing. For example, negative studies are less likely to be published than positive studies. In addition, some research sponsored by pharmaceutical companies may be kept under wraps.

To get new treatments from the lab bench to the bedside more quickly, we need to improve data sharing and make breast cancer research more of a team effort.

"If we're going to reduce health disparities, it's not just about doing research. It's about getting information out through extensive communication channels."

Elena Rios, M.D., MSPH, President of the National Hispanic Medical Association

There Are Many Reasons Why People with Breast Cancer May Be Discouraged from Joining a Clinical Trial:

"I don't have insurance to cover the cost of the trial."

"I prefer treatment from a traditional healer."

"The trial excludes me because I have heart disease."



"I don't trust medical research."

"The trial center is a two-hour drive from my town."

"You have to speak English to join the trial. I don't speak English."

"I've never been asked to join a clinical trial or told it was an option."

The Path Forward

Understanding, curing and preventing breast cancer remain research priorities. However, we also need to continue to fund research that leads to improved treatment options for people diagnosed with the disease *today*.

- We must invest more in research that studies how breast cancer affects ethnic and racial minorities so these groups will be more likely to receive quality cancer care and be less likely to die from breast cancer.
- We must work toward recruiting more minority researchers and advocates.
- We must continue taking steps to bridge the cultural gaps between patients, doctors and researchers, so that more people from medically underserved groups join clinical trials.
- We must work toward making sure tumor samples are preserved for research.
- We must promote data sharing — the free exchange of scientific results among researchers — to allow them to build on one another’s research. One way to do this is to foster “team science” based on collaboration.

▶ WHAT CAN I DO?

- If you have breast cancer, ask your physician about clinical trials. Go to www.clinicaltrials.gov.
- Educate yourself about your rights as a patient.
- Talk to community leaders about clinical trials.
- If you are a doctor, stay up-to-date on the latest clinical trials and inform your patients accordingly.
- If you are a clinical researcher, actively recruit women and men from ethnic and racial minorities and provide candid information that addresses their needs and concerns.

ON THE FRONTLINES



A recent study by Dr. Lisa Newman and colleagues at the University of Michigan identified a racial gap in breast cancer mortality suggesting that minorities, in general, are less likely to receive the best breast cancer treatment. Her findings suggest biologic, genetic, cultural and societal factors may cause higher mortality rates in African American women with breast cancer. For example, breast cancer death rates are similar in African American women and sub-Saharan western African women. This finding suggests that women of western African descent may be more prone to aggressive types of breast cancer.⁶⁹

ENCOURAGING MINORITY PARTICIPATION IN CLINICAL TRIALS

This year, the U.S. Department of Health and Human Services introduced two programs — Culturally and Linguistically Appropriate Standards and Clinical Trials (CLAS-ACT) and Backpack — that are among the first to develop national standards for culturally and language-appropriate resources to the clinical trials process. Through CLAS-ACT and Backpack, resources and guidelines will be developed to help scientists and health professionals recruit minority patients into new clinical trials and address attitudes related to mistrust of the healthcare system.

MAKING A DIFFERENCE: THE TRANSLATIONAL BREAST CANCER RESEARCH CONSORTIUM

The Translational Breast Cancer Research Consortium (TBCRC) was created by scientists from major academic research centers in 2005, and is funded by the Breast Cancer Research Foundation, Susan G. Komen for the Cure and Avon. It includes clinical trial specialists, scientists and patient advocates from 14 academic medical centers. The mission of the Consortium is to reduce the burden of breast cancer by improving the understanding of breast cancer biology and testing new ways to treat breast cancer. For more information, go to http://www.bcrfcure.org/rese_news_tbcrc.html.

6: GLOBAL DISPARITIES

Breast cancer is a global health crisis. Although the incidence of breast cancer is much lower in many countries compared to the U.S., the rate of breast cancer death is similar or even higher (Figure 8). Each year more than 1.1 million people worldwide are diagnosed with breast cancer and 410,000 die of the disease. Over the next 25 years, 10 million people around the world could lose their lives to breast cancer.¹⁶

Many of the barriers and disparities discussed so far are even more pronounced outside of the U.S., especially in less developed countries.

- **Lack of healthcare resources.** In many low-resource countries, cancer is not a main health concern and there are not enough resources to set up breast healthcare programs. For example, Kenya's public health system consists of two medical oncologists and one radiology center supporting a population of more than 32 million.⁷⁰
- **Lack of data.** Many countries do not collect good data on breast cancer within their borders. A lack of accurate data on the number of people with breast cancer makes it difficult to convince government, healthcare professionals and the public as a whole that a problem exists.
- **Lack of awareness and education.** Without funding for breast cancer education, people in many countries do not know that early detection increases their chances of survival, and are unaware of available treatments. Even industrialized nations don't always provide enough information. A recent study of eight European nations (Austria, France, Germany, Hungary, Spain, Sweden, Switzerland and the United Kingdom) found that less than half of post-menopausal women with early-stage breast cancer were made aware of their treatment options.⁷¹
- **Cultural barriers.** In many countries, health screening is not a part of the culture. People in some cultures do not "look for" disease; they wait until they get symptoms before they seek care. In addition, certain societies view discussion of breast cancer as a cultural taboo or a reflection on a woman's morality or behavior.⁴¹

ON THE FRONTLINES

Africa has the highest death rate from breast cancer in the world. In Kenya, 95 percent of women have never had a clinical breast exam.⁷⁰ After her own battle with breast cancer, Julia Mulaha formed Kenya's first breast cancer group to promote awareness and screening: the Kenya Breast Health Programme. This program has funded the training of dozens of doctors and nurses and free clinics that screened thousands of women — most for the first time in their lives.

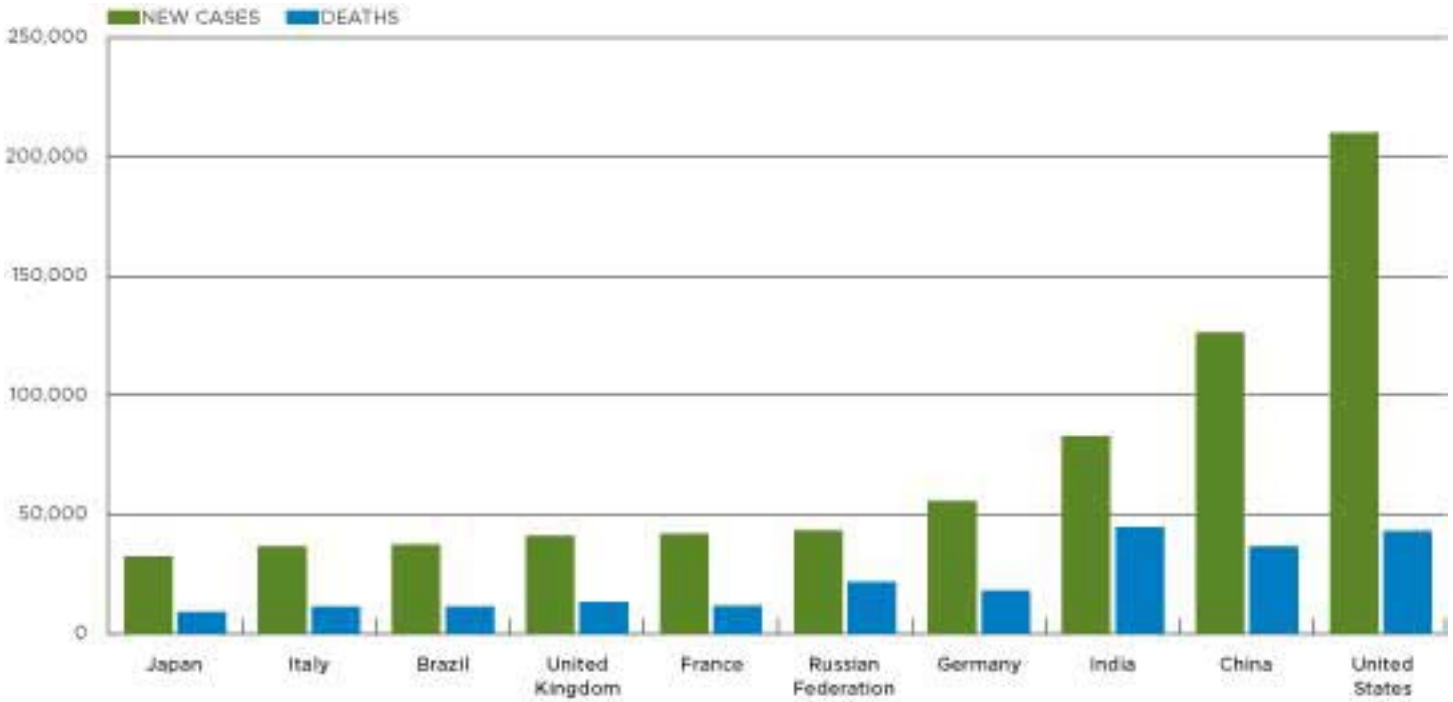


GLOBAL OUTREACH: SUSAN G. KOMEN FOR THE CURE EXPANDS

In September 2007, Susan G. Komen for the Cure launched an unprecedented global expansion to create sustainable breast cancer outreach and education programs in 10 countries around the globe. In these 10 countries — Brazil, Costa Rica, Ghana, India, Jordan, Mexico, Romania, Saudi Arabia, Ukraine and United Arab Emirates — the program will partner with various groups, including non-governmental organizations, government agencies and healthcare centers, to educate women and girls to increase breast cancer awareness through community-based projects, train primary healthcare workers and address policy issues.

Figure 8

Number of New Cases of Breast Cancer and Breast Cancer Deaths Each Year¹⁶



Possible Solutions

The barriers to adequate screening and care for breast cancer outside the U.S., especially in low-resource countries, are large and complex. However, various global efforts are helping to address the problems:

- The World Health Organization is implementing a Global Plan Against Cancer in its member states: “Prevent what’s preventable, cure what’s curable, reduce pain and improve quality of life, and measure and manage for success.” These strategies are designed to help countries implement breast cancer control programs that are appropriate for their resources and competing healthcare needs.
- Similarly, the Breast Health Global Initiative, founded by the Fred Hutchinson Cancer Research Center and Susan G. Komen for the Cure, is striving to develop and implement evidence-based, economically feasible strategies for underdeveloped nations to improve breast health outcomes.
- Grassroots programs, such as the Kenya Breast Health Programme, are striving to promote breast health advocacy and education in some low-resource nations.

▶ WHAT CAN I DO?

- Reach out to communities near you with large immigrant populations to help build connections that spread awareness to their families in their home countries.
- Support the Breast Health Global Initiative, an innovative alliance and network of health organizations, government agencies, non-governmental organizations and corporations that share a dedication to improving breast healthcare and cancer treatment for women in economically disadvantaged countries. Go to <http://www.fhcrc.org/science/phs/bhgi>.
- Susan G. Komen for the Cure funds breast cancer research in the U.S. and more than 50 countries around the world. Go to www.komen.org to donate; at least 80 cents of each dollar donated goes directly to breast cancer programs and services.
- Donate to organizations in specific countries.

7: TAKE ACTION!

Every Action Counts

Great strides are being made toward achieving our vision of a world without breast cancer. But for all the progress and promise, there are still gaps that prevent every woman and man from getting the best care possible — *right now*. Closing these gaps is a matter of life and death.

Everyone can make a difference. Everyone can help overcome the crisis of disparities in his or her own way, from joining an advocacy group, to writing a letter to a lawmaker, to simply reminding a loved one to schedule a screening.

If we have the urgency and the will, all things are possible. I hope this report has communicated the urgency, and that you have the will to join the fight. Every action counts.

Sincerely,



Nancy G. Brinker

Founder, Susan G. Komen for the Cure



RESOURCES

Advocacy Groups

American Cancer Society

www.cancer.org
1-800-ACS-2345

National Breast Cancer Coalition

www.natlbcc.org
1-800-622-2838

Redes En Acción

www.redesenaccion.org

Sisters Network

www.sistersnetworkinc.org

Susan G. Komen for the Cure

www.komen.org
1-877 GO KOMEN

Y-Me National Breast Cancer Organization

www.y-me.org
1-800-221-2141

Young Survival Coalition

www.youngsurvival.org
1-877-YSC-1011

Government Agencies

Centers for Disease Control and Prevention

www.cdc.gov

National Cancer Institute

www.cancer.gov
1-800-4-CANCER

National Institutes of Health

www.nih.gov

Additional Support and Information

American Association for Cancer Research

www.aacr.org

American Cancer Society Cancer Survivors Network

www.acscsn.org

American Society of Clinical Oncology

www.asco.org

Association of Cancer Online Resources

www.acor.org

Association of Community Cancer Centers

www.accc-cancer.org
301-984-9496

Be Bright Pink

www.bebrightpink.org

Breast Health Global Initiative

www.fhcrc.org/science/phs/bhg/

CancerCare

www.cancercare.org

Centerwatch Clinical Trials

www.centerwatch.com

Gilda's Club Worldwide

www.gildasclub.org

Lance Armstrong Foundation

www.livestrong.org

Living Beyond Breast Cancer

www.lbbc.org

Mautner Project for Lesbians with Cancer

www.mautnerproject.org
202-332-5536

Men Against Breast Cancer

www.menagainstbreastcancer.org
1-866-547-MABC

National Asian Women's Health Organization

www.nawho.org

National Cancer Institute Surveillance Epidemiology and End Results (SEER)

seer.cancer.gov

National Coalition for Cancer Survivorship

www.canceradvocacy.org

National Lymphedema Network

www.lymphnet.org
1-800-541-3259

National Women's Health Resource Center

www.healthywomen.org
1-877-986-9472

People Living with Cancer

www.plwc.org

Susan Love Research Foundation

www.susanlovemd.org

Well Spouse Foundation

www.wellspouse.org

World Health Organization

www.who.int

Glossary of Terms Used in This Report

For more information, go to the Susan G. Komen for the Cure website at www.komen.org or the National Cancer Institute website at www.cancer.gov.

Angiogenesis: Blood vessel formation. Tumor angiogenesis is the growth of blood vessels from the surrounding tissue to a solid tumor.

Biopsy: The removal of cells or tissues for examination by a pathologist.

BRCA1: A gene that is important in the development of breast cancer. A woman who inherits a mutated BRCA1 gene has a higher risk of getting the disease.

Brachytherapy: A procedure in which radioactive material sealed in needles, seeds or wires is placed directly into or near a tumor.

Chemotherapy: The treatment of cancer by chemicals that stop the growth of or kill cancer cells.

Gene therapy: Treatment that alters a gene. In studies of gene therapy for cancer, researchers are trying to improve the body's natural ability to fight the disease or to make the cancer cells more sensitive to other kinds of therapy.

HER2: A protein on the outside of some breast cancer cells that causes aggressive tumor growth.

Herceptin: A targeted therapy that is used to treat HER2-positive breast cancer.

Hormone replacement therapy (HRT): Hormones given to women to lessen the side effects of menopause.

Lumpectomy: Surgery to remove a breast tumor and a small amount of normal tissue around it.

Lymph node: A small clump of immune cells.

Lymphedema: A painful condition in which excess fluid collects in the arm, causing swelling, after the removal of lymph nodes.

Magnetic resonance imaging (MRI): A procedure in which radio waves and a powerful magnet linked to a computer are used to create detailed pictures of areas inside the body.

Mammography: The use of X-rays to create a picture of the breast.

Mastectomy: Surgery to remove the breast, or as much of the breast tissue as possible.

Nanotechnology: The field of research that deals with the engineering and creation of things from materials that are less than 100 nanometers (one-billionth of a meter) in size, especially single atoms or molecules. Nanotechnology is being studied in the detection, diagnosis and treatment of cancer.

Radiation therapy: The use of high-energy radiation such as X-rays to kill cancer cells.

Sentinel lymph node: The first lymph node to which cancer is likely to spread from the primary tumor.

Stem cell: A cell from which other types of cells develop. Blood cells develop from blood-forming stem cells.

Tamoxifen: A drug used to treat certain types of breast cancer. It is also used to prevent breast cancer in some women who are at high risk of developing the disease.

Targeted therapy: A type of treatment that is designed to specifically attack cancer while leaving normal cells alone.

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