

Fact Sheet: An Urgent Public Health Priority



General Facts

- Breast cancer is the second leading cause of cancer deaths in American women today¹ and the leading cause of cancer death for U.S. women between the ages of 20 and 59.²
- It is estimated that 39,510 women will die of cancer of the breast in 2012.³
- A woman's lifetime risk of being diagnosed with breast cancer is 12.38%. That can also be expressed as 1 in 8 women born today will be diagnosed with cancer of the breast during their lifetime.³
 - Race and ethnicity play a part in breast cancer risk. While 127.3 per 100,000 White women were diagnosed with breast cancer per year from 2005-2009, the rate for Black women was 121.2, for Hispanics was 92.7, for Asian/Pacific Islanders 94.5, and for American Indians or Alaska Natives was 80.6.³
- From 2005-2009, the median age at diagnosis for cancer of the breast was 61 years of age.³ This means that 50% of women who developed breast cancer were 61 years of age or younger at the time of diagnosis.
 - Breast cancer does not affect only older women. Approximately 21.3%, or 8,250 of the women who died from cancer of the breast each year between 2005-2009 were age 54 or younger.³
 - Breast cancers that develop earlier in life are often more aggressive and more difficult to treat. Breast cancer survival is consistently lower for adolescent and young adult women than for other age groups.⁴
- Breast cancer also affects men, although at much lower rates. 1.2 per 100,000 men in the United States were diagnosed with breast cancer per year from 2005-2009.⁵

Breast Cancer and the Environment

- Accumulating evidence suggests that interactions between genetic and environmental factors may play a part in who gets breast cancer and who does not.⁶
 - For the purposes of this fact sheet, "environmental factors" include the air we breathe, the food we eat, the water we drink, and things we touch and put on our skin.

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- According to the National Institutes of Health, only 5 to 10% of all breast cancers are hereditary, and less than half of breast cancer cases can be attributed to well-established risk factors.⁷
 - One study shows that the breast cancer rates of descendants of Japanese women who migrated to the United States become similar to the higher breast cancer rates of Western women within one or two generations,⁸ demonstrating the significant role played by environmental factors in breast cancer risk.
- Scientists believe that there are periods of vulnerability in the development of the breast when exposures to environmental agents may impact the breast in ways that can influence breast cancer risk in adulthood.⁹
 - These periods are known as “windows of susceptibility” and include, but are not limited to, before birth, during puberty, during pregnancy, during lactation, and during menopause.¹⁰

The Breast Cancer and the Environment Research Program

- Scientists in the Breast Cancer and the Environment Research Program (BCERP), a joint effort co-funded by the National Institute of Environmental Health Sciences (NIEHS) and the National Cancer Institute (NCI), are exploring whether environmental exposures, such as certain chemicals and foods, may affect the way a girl's body develops as she grows, making her more vulnerable to developing breast cancer as an adult.
- The BCERP supports a multidisciplinary network of scientists, clinicians, and community partners to examine the effects of environmental exposures that may predispose a woman to breast cancer throughout her life.
 - The network engages both laboratory and population-based research to study puberty and other “windows of susceptibility” or specific time periods when the developing breast may be more vulnerable to environmental exposures.
 - Researchers are monitoring 1,200 girls, keeping track of their exposure to a variety of environmental factors and the age they enter puberty, both of which may affect their risk of breast cancer later in life.
 - Researchers in the BCERP studies are collaborating with breast cancer advocates and community members to inform the public and policy makers about the studies' findings regarding environmental exposures and their potential relationship to breast cancer risk.

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Endocrine Disrupting Chemicals

- A major area of study for the BCERP is the role of chemicals in the environment, with a primary focus on hormonally active agents known as “endocrine disruptors.”¹¹
 - Endocrine disruptors are substances that may mimic or interfere with the function of hormones in the body.
 - Endocrine disruptors may turn on, shut off, or modify signals that hormones carry, which may affect the normal functions of tissues and organs.
 - Many of these substances have been linked with developmental, reproductive, neural, and immunological problems in wildlife and laboratory animals.
 - Research suggests that these substances adversely affect human health in similar ways, resulting in reduced fertility and increased occurrence or faster development of some diseases, including obesity, diabetes, endometriosis, and some cancers.
- BCERP researchers are studying two types of endocrine disruptors more closely: phthalates¹² and bisphenol A.¹³
 - Phthalates (*THAL-ates*) are chemicals in some detergents; personal care products, like fragrances, nail polish, deodorant, hair care products, and body lotions; food and beverage containers; and plastic or vinyl toys. They may enter a girl's body through the skin, the air she breathes, the food she eats, and the water she drinks.
 - Bisphenol A (*bis-FEE-nawl A*) (BPA) is a chemical in some plastic bottles, food and beverage containers, the lining of some cans, and in some cash register receipts. It can leak into food and drinks in small amounts.
- Children and pregnant or breastfeeding women are especially vulnerable to environmental exposures.
 - Childhood is a time of rapid cellular growth of breast tissues in girls and therefore represents a “window of susceptibility” to the possible harmful effects of chemicals in the environment.
 - Chemicals present in a pregnant or breastfeeding woman's body may enter a baby's bloodstream before birth or through breast milk.
- There is evidence that exposure to endocrine disruptors such as phthalates or BPA may affect when a girl develops breasts or gets her first period.¹⁴
- Girls who enter puberty early may be at a greater risk for developing breast cancer later in life.⁹

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What Can Be Done Now

- Pregnant and breastfeeding women can try to limit their exposure to endocrine disrupting chemicals such as BPA and phthalates whenever possible, which may be passed on to a developing or breastfeeding baby.
- Parents and caregivers can reduce girls' exposure to endocrine disrupting chemicals such as BPA and phthalates.
 - Reduce the use of plastic food and drink containers, and plastic or vinyl toys, with the number 3 in the recycling triangle. They contain phthalates.
 - Reduce the use of plastic food and drink containers with the number 7 in the recycling triangle. They often contain BPA.
- Both healthy eating and being active can help people maintain a healthy weight and body fat level, and may help to reduce the risk of developing breast cancer later in life.
 - Healthy foods come in a variety of forms and a range of prices that likely fit just about anyone's budget.¹⁵



To learn more, visit www.niehs.nih.gov/BreastCancerandEnvironment.

¹ National Cancer Institute. (2011, August 18). *Breast Cancer Prevention (PDQ®) General Information About Breast Cancer*. Retrieved September 14, 2012, from the National Cancer Institute Web site: <http://www.cancer.gov/cancertopics/pdq/prevention/breast/Patient/page2>

² National Institute of Environmental Health Sciences. (2007). *Environmental Factors and Breast Cancer Risk*. Retrieved August 24, 2012, from the National Institute of Environmental Health Sciences Web site: http://www.niehs.nih.gov/health/assets/docs_a_e/environmental_factors_and_breast_cancer_risk_508.pdf

³ National Cancer Institute. (n.d.). *SEER Stat Fact Sheets: Breast*. Retrieved September 13, 2012, from the National Cancer Institute Web site: <http://seer.cancer.gov/statfacts/html/breast.html>

⁴ Bleyer A, O'Leary M, Barr R, Ries LAG (eds). *Cancer epidemiology in older adolescents and young adults 15 to 29 years of age, including SEER incidence and survival: 1975-2000 (p.117)*. National Cancer Institute, NIH Pub. No. 06-5767. Bethesda, MD 2006.

⁵ National Cancer Institute. (n.d.). *Fast Stats: Statistics Stratified by Cancer Site*. Retrieved September 15, 2012, from the National Cancer Institute Web site: <http://seer.cancer.gov/faststats/selections.php?series=cancer>

⁶ Claudio, L. (2004). Translation: Breast Cancer Takes Center Stage. *Environmental Health Perspectives*, 112 (2), A92-94.

⁷ Madigan, M. P., Ziegler, R. G., Benichou, J., Byrne, C., & Hoover, R. N. (1995). Proportion of breast cancer cases in the United States explained by well-established risk factors. *Journal of the National Cancer Institute*, 87 (22), 1681-1685. doi: 10.1093/jnci/87.22.1681.

⁸ Shimizu, H., Ross, R., Bernstein, L., Yatani, R., Henderson, B., & Mack, T. (1991). Cancers of the prostate and breast among Japanese and white immigrants in Los Angeles County. *British Journal of Cancer*, 63, 963-966.

⁹ Claudio, L. (2007). Centered on Breast Cancer. *Environmental Health Perspectives*, 115 (3), A132-133.

¹⁰ Bay Area Breast Cancer and the Environment Research Center. (2009, October). *Puberty, Breast Cancer, and the Environment*. Retrieved September 14, 2012, from the Bay Area Breast Cancer and the Environment Research Center Web site: bayarea.bcerc.org/COTC/BABCERC.Monograph.Oct09.pdf

¹¹ Breast Cancer and the Environment Research Centers. (2009). *Progress Report*. BCERP Coordinating Center, UCSF.

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- ¹² Barlow, J., Brown, K., Johnson, J. P., & Scofield, L. (2007, November 7). *Fact Sheet on Phthalates*. Retrieved June 27, 2012, from the Breast Cancer and the Environment Research Program Web site: <http://www.bcerp.org/cotcpubs.htm>
- ¹³ National Institute of Environmental Health Sciences. (2010, May). *Endocrine Disruptors*. Retrieved August 28, 2012, from the National Institute of Environmental Health Sciences Web site: <http://www.niehs.nih.gov/health/topics/agents/endocrine/index.cfm>
- ¹⁴ Biro, F. M., Greenspan, L. C., & Galvez, M. P. (2012). Puberty in girls of the 21st century. *Journal of Pediatric and Adolescent Gynecology*, 25 (5), 289–294. doi: 10.1016/j.jpag.2012.05.009
- ¹⁵ Lino, M. (2011, August 25). *USDA Blog: Nutrition Doesn't Have to be Expensive*. Retrieved September 21, 2012, from the United States Department of Agriculture Web site: <http://blogs.usda.gov/2011/08/25/nutrition-doesn%E2%80%99t-have-to-be-expensive/>

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