



## Cornell University Program on Breast Cancer and Environmental Risk Factors in New York State (BCERF)

# Breast Cancer in Women from Different Racial/Ethnic Groups

*Women of different racial/ethnic backgrounds have different rates of breast cancer occurrence and survival from the disease. In general, women from lower socioeconomic groups, regardless of their race/ethnicity, have lower rates of occurrence of breast cancer but have higher death rates from breast cancer. However, there are exceptions depending on age, race/ethnicity, and place of residence. The differences in breast cancer occurrence and survival appear to be the result of cultural and environmental effects rather than genetic differences between ethnic groups. Women from different ethnic groups may be given different medical treatment for breast cancer.*

### **Are there differences in the occurrence of breast cancer among women from different racial/ethnic groups in the United States?**

In the United States the risk of *ever* getting breast cancer differs substantially among women from different racial/ethnic groups. It is highest for White women followed by African-American or Black women, Asian and Pacific Island women, Hispanic women and finally American Indian and Alaskan native women. Occurrence or incidence of breast cancer is expressed as the number of *new* cases diagnosed per year for each 100,000 women. This rate covers a specific time period (the most recent information is for the period from 1992 to 1999) and is adjusted for the ages of the women within the group. Age-adjustment accounts for the higher occurrence of breast cancer among older women and allows comparison of groups made up of different percentages of older and younger women. The US breast cancer occurrence rates (per 100,000 women) were: 139 for White women, 121 for Black women, 98 for Asian and Pacific island women, 82 for Hispanic women and 42 for American Indian and Alaska native women.

Earlier studies (1988-1992) examined Asian and Pacific Island women in the United States in more detail. During this period the occurrence rates were highest in Hawaiian women followed by Japanese, Filipino, Chinese, Vietnamese, and Korean women. The occurrence rates discussed above come from the SEER Cancer Registry (see 'What are Cancer Registries?' below).

### **Are there differences in the occurrence of breast cancer in women from different countries?**

Internationally there are large differences in breast cancer occurrence. The lowest rates are found in most of Asia and Africa where the occurrence is less than 25 cases a year for every 100,000 women. The highest rates are seen in North America, Western Europe, Australia, New Zealand and in the southern part of South America. In these countries the occurrence rates are more than 75 cases a year for every 100,000 women. The US and the Netherlands are the countries with the highest breast cancer occurrence, with rates as much as 5 to 8 times those reported for countries in parts of Asia and Africa. But, these numbers may not be directly comparable because of large differences in both the tools for diagnosis and tumor reporting between different countries.

### **Why does the occurrence of breast cancer vary among women from different racial/ethnic groups?**

It is not understood why breast cancer occurrence varies for women with different racial/ethnic backgrounds. Most studies of breast cancer occurrence (and survival) in racial/ethnic groups, in the United States, have examined differences between Black and White women. Potential explanations for the racial/ethnic occurrence differences are dissimilarities in: a) "established" breast cancer risk factors, b) diet, c) exposure to cancer causing agents and



d) socioeconomic position. Each of these topics is examined separately in questions below.

### **How are women from different racial/ethnic groups affected by the “established” breast cancer risk factors?**

The risk from each of the established breast cancer risk factors (such as young age of menarche, older age of menopause, and older age of first child’s birth) is the same for individual women of all ethnicities; no biological difference in the size of the risk exists. For example, the risk arising from young age of menarche is the same for Black women and non-black women. In other words, the *potential* of the risk factors to affect breast cancer occurrence is not different for Black and White women.

But, the racial/ethnic groups vary in the proportion of their members who are included in either the low or high risk categories for some of the established risk factors. That is to say the *prevalence* of some risk factors is different. For example, a large percentage of White women delay childbirth, and they are older when they have their first child, a factor for increased breast cancer risk. Accordingly, the occurrence of breast cancer in White women is affected to a greater extent by age at first birth than in other groups where earlier childbirth is more common.

The breast cancer risk factors associated with childbearing do appear to play a role in the differences in breast cancer occurrence between racial/ethnic groups. Differences between Black and White women exist within four risk factors associated with breast cancer: age of menarche (first menstrual period), age at birth of first child, number of children, and age of menopause. These differences taken together are considered important and may contribute to the differences in the age at which Black and White women are diagnosed with breast cancer. But it is important to note, especially with the above examples, that there is a strong connection of these risk factors (especially age of childbirth and number of children) to the socioeconomic challenges faced by the women in question. For example, poorer women regardless of their race/ethnicity have children early in life and affluent women have children later or not at all.

### **Does diet play a role in the differences in breast cancer occurrence between racial/ethnic groups?**

A number of studies have examined dietary differences between racial/ethnic groups, but very few studies have examined diet and breast cancer risk in other than White women. Levels of alcohol consumption and obesity possibly play a part in the differences in breast cancer occurrence between racial/ethnic groups.

Alcohol consumption is associated with increased breast cancer risk and there are differences in the levels of alcohol consumption among racial/ethnic groups. White women consume alcoholic beverages more frequently than Black, Hispanic, or Asian women. Nonetheless, the true effect of this racial/ethnic difference will require direct study, and this has not been done. Obesity is associated with increased breast cancer risk after menopause. Racial/ethnic differences in obesity have been reported and they may contribute to racial/ethnic difference in breast cancer occurrence. The size of the contribution will also require more study.

Racial/ethnic differences in other aspects of diet, such as consumption of fruits, vegetables, fiber, and foods containing phytoestrogens, have been described. However, the degree to which they affect breast cancer risk has not been well established and their impact on racial/ethnic differences in breast cancer occurrence is unknown.

### **Are there differences in exposure to cancer-causing agents between women in different racial/ethnic groups?**

Numerous studies have documented that women from different racial/ethnic groups are potentially exposed to different levels of environmental health hazards. Socioeconomics play a large role as hazardous-waste facilities and treatment, storage and disposal facilities are often located in areas with lower per capita income. While they have been inconsistently associated with breast cancer risk, studies of residues from DDT and PCBs in women of different ethnicities provide good examples for potential differences in exposure between women of



different racial/ethnic groups. Generalizations could not be made from the limited number of studies that have been conducted but there was a trend in all the studies toward lower blood serum levels of DDT and PCB residues in White women and higher blood serum levels in Black women. A study that also examined Asian women found they had elevated levels similar to those of Black women. In another study, Hispanic women had intermediate levels for most of the residues evaluated. The results of examinations of the association of specific DDT and PCB residues and breast cancer risk within the racial/ethnic groups of women were conflicting, like examinations of risk and residue levels in women of all races/ethnicities. The extent to which exposure differences to these and potentially other cancer-causing agents contribute to the racial/ethnic differences in breast cancer occurrence is unknown.

#### **Does socioeconomic position play a role in the differences in occurrence of breast cancer between racial/ethnic groups?**

The relationship between breast cancer risk and socioeconomic position is poorly understood, but it has been found to be related to a complicated mixture of features including education, family income, related features of diet and living conditions, as well as, access to health care. The occurrence of breast cancer is higher in women from all racial/ethnic groups who have more education or family income. Socioeconomic position as measured by either level of education and family income is considered an established risk factor for breast cancer. Since socioeconomic information for individual women is not typically collected, most studies have relied on less direct characteristics such as income within a census tract. Nonetheless, the association between education/socioeconomic position and breast cancer risk appears to be unaffected by race. Black women with higher socioeconomic position and more education have breast cancer risk similar to White women within the same socioeconomic position.

#### **Is the age of occurrence of breast cancer similar for women from different racial/ethnic groups and nationalities?**

The age of occurrence of breast cancer is different among racial/ethnic groups and among women from

different countries. The best studied racial/ethnic groups are White and Black women. Before age 40, Black women have higher occurrence rates of breast cancer than White women. But after age 40, this relationship reverses and the occurrence rates becomes higher in White women. For both groups of women the occurrence rate of breast cancer increases as women get older.

Japanese women and women from less developed countries have historically displayed a different pattern. For these women, the occurrence rate of breast cancer reaches a maximum at about the age of menopause and remains near this value or decreases among older women. However, recent examinations suggest that the pattern for women from undeveloped countries may be changing and becoming more similar to that seen in more affluent countries. Younger women in those countries are developing breast cancer and breast cancer risk is increasing with age.

#### **Are the differences in occurrence of breast cancer among racial/ethnic groups genetically determined?**

Genetics likely plays very little role in the difference in breast cancer occurrence among different racial/ethnic groups. This is supported by several lines of evidence. First, studies of human genetics have shown that there are *more* genetic differences between people within the same racial/ethnic group than there are between people from different racial/ethnic groups. There are in general very few, if any, medically significant genetic differences between racial/ethnic groups of people. Second and as discussed above, women of different racial/ethnic groups are subject to the same level of risk from each of the established breast cancer risk factors; these risk factors affect women equally regardless of their racial/ethnic background. Third, women who are migrants to areas of higher or lower breast cancer risk adopt the level of breast cancer risk reported for women already living in the new place of residence. This suggests that, rather than genetics, there is an important role for a woman's lifestyle and environment in breast cancer risk. Finally, genetics has not been found to play a large role in breast cancer in general.



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### **Are there differences in the risk of dying from breast cancer between racial/ethnic groups of women in the United States?**

There is a considerable difference in death from breast cancer between different racial/ethnic groups. Black women have the highest rate of death from breast cancer in the US. Over the period from 1995 to 1999 the yearly rate of death from breast cancer was 37 deaths in every group of 100,000 Black women. This is 32% higher than the rate in White women (28 deaths/100,000) and three times that of Asian and Pacific Island women (13 deaths/100,000 women), who had the lowest death rate. The rate for both American Indian/Alaska Native women (15 deaths/100,000 women) and Hispanic women (17 deaths/100,000 women) were also much lower than those of Black and White women.

Survival has also been examined for different Asian and Pacific Island racial/ethnic groups over the period of 1988 to 1994. Japanese women had the best survival (92% survived 5 years). Chinese women and Filipina women had a survival rate about the same as White women (86% survived 5 years).

### **Why do death rates from breast cancer differ between different racial/ethnic groups in the United States?**

The reasons for the differences in death rates from breast cancer between racial/ethnic groups are not fully understood. They are thought to involve complicated interactions between socioeconomic and medical factors such as stage or seriousness of the cancer at diagnosis, types of treatment received, tumor aggressiveness and access to and racial discrimination within medical service systems. (These topics are examined separately in the questions below).

### **Can socioeconomic factors play a role in differences in breast cancer death rates among racial/ethnic groups?**

Socioeconomic factors, such as education and income, play a role in the racial/ethnic differences in breast cancer deaths but the size of this role is uncertain.

Socioeconomic factors have been demonstrated to affect the stage of cancer at diagnosis which greatly influences survival. Most studies have found that adjusting for the level of breast cancer risk associated with socioeconomic position greatly decreased, and in some cases eliminated, the differences in death rates between Black and White women. Socioeconomic effects are very complicated and could affect women's survival in a number of ways including access to medical services, treatment received, care during and after treatment, general state of health, as well as, the stage of diagnosis mentioned above.

### **Does the stage or seriousness of breast cancer when it is diagnosed contribute to the differences in death rates from breast cancer of racial/ethnic groups?**

The stage of breast cancer when it is detected is the main factor involved in survival. A number of studies have found that Black women are more often diagnosed with late stage breast cancer. This difference in stage of diagnosis makes a large contribution to the differences in breast cancer death rates between White and Black women. Delay in seeking treatment is thought to play a major role in the differences in stage of diagnosis between Black and White women. Studies examining late-stage diagnosis have shown that a number of social and cultural factors contribute, including old age, low economic status, low education, unemployment, unequal treatment due to racial/ethnic biases, marital status, beliefs about health care, and health care providers and access to them. Access to health care may also be an important component in the delay in seeking treatment; examinations of White and Black women in the US military, where there is equal access to health care, have reported no difference in the stage of breast cancer diagnosis.

### **Does breast cancer treatment differ depending on a woman's racial/ethnic background?**

The National Academy of Sciences recently reported that racial and ethnic minorities receive lower quality healthcare, in general, than non-minorities. This treatment pattern also exists in the breast cancer treatment received by women of different racial/ethnic groups. A number of factors contribute to this treatment pattern including the type of treatment examined, the age of the women examined, and the location of the study. Most studies looked at only Black and White women. Breast cancer treatment was typically examined in



relation to the recommended therapy at the time of the study; the results varied between the studies. The largest studies reported treatment differences between racial/ethnic groups but not for all types of treatment. For example in some, but not all studies, breast-conserving surgery was more frequent for Black than White women. However, radiation therapy following breast conserving surgery was consistently reported to be less frequently given to Black than White women. About half of all the studies found a difference in treatment between Black and White women; in one quarter of all the studies the difference was statistically significant and unlikely to be due to chance alone.

### **Is breast cancer more aggressive and difficult to treat in some racial/ethnic groups of women?**

It is unclear if different racial/ethnic groups have breast cancer which is more aggressive and difficult to treat. This issue has been examined in several ways and most studies have examined only Black and White women.

One approach has been to examine tumor characteristics which affect treatment difficulty, such as lack of estrogen receptors. Early studies of this type suggested that Black women more often have tumors that are advanced and difficult to treat. But, most of these studies were not designed to directly evaluate this question and in many cases did not compensate for the effect of age on their evaluations. This is an important limitation since breast cancer in younger women is generally more difficult to treat successfully. Recent studies examining these characteristics have controlled for age and support a higher occurrence of difficult to treat breast cancer in Black women. But, this difference is not firmly established and further study is needed.

Other studies have approached this question in epidemiological studies that compared the survival of Black and White women after attempting to eliminate the contribution of non-biological factors, such as socioeconomic position. As mentioned above, the effect of these non-biological factors on breast cancer risk is complicated and is not represented by a single factor such as socioeconomic position. Accordingly the elimination of their contribution to the observed risk is difficult. In addition almost all of these studies have used less direct information on these factors such as

census tracts rather than information reported by the individual women themselves. The results have been contradictory. Some studies have found no difference in breast cancer deaths between Blacks and Whites after adjustment for socioeconomic factors. Others have reported an excess risk for Black women. Additional studies of this design have attributed differences in breast cancer death to other factors related to racial/ethnic biases, such as cultural attitudes leading to delays in seeking treatment.

Another approach to this question has been to compare the response of Black and White women to cancer treatment in clinical trials. These studies have demonstrated that the response of Black women to treatment is the same as White women with the same stage of breast cancer. Further support of there being no difference in Black/White tumor biology is also provided by examining the difference in Black/White breast cancer survival over time. Only since 1982 has there been a difference in survival between these racial/ethnic groups; before this time the survival rate was about the same. A change, over time, in the biological behavior of the tumors of an entire racial/ethnic group is unlikely and further argues against biological differences.

### **What are the Cancer Registries?**

Cancer registries play a critical role in the understanding and prevention of cancer. They are organizations that collect and organize information on the different types of cancer. This information includes patient information, tumor occurrence, tumor body location, severity of cancer when diagnosed, treatment received, treatment outcome and survival time. Every state in the United States now has a Cancer Registry. The National Cancer Institute operates an extensive cancer registry known as SEER (Surveillance, Epidemiology, and End Results Program, <http://seer.cancer.gov/>). This registry is composed of a number of states, cities and counties such that it covers about one quarter of the United States' population and is representative of the entire country with regard to income, education and percentage of urban and farm areas. In addition the SEER program includes registries to allow the collection of information on racial/ethnic minorities. But, at the time many of the cited studies were conducted, there were a much smaller number of registries and the



data was less representative of the country as a whole. It should also be noted that racial/ethnicity inaccuracies have been documented in the data contained within registries. These inconsistencies arise from misclassifications and are most prevalent among races/ethnicities other than White and Black.

An Extensive bibliography on “Ethnicity and Breast Cancer Risk” is available on the BCERF web site: <http://envirocancer.cornell.edu>

*Prepared by*

*Barbour S Warren, Ph.D.,  
Research Associate, BCERF*

*and*

*Carol Devine, Ph.D.  
Division of Nutritional Sciences, College of Human Ecology*

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***Program on Breast Cancer and  
Environmental Risk Factors (BCERF)***

College of Veterinary Medicine  
Cornell University  
Box 31  
Ithaca, NY 14853-5601

Phone: (607) 254-2893  
Fax: (607) 254-4730  
email: [breastcancer@cornell.edu](mailto:breastcancer@cornell.edu)  
WWW: <http://envirocancer.cornell.edu>