



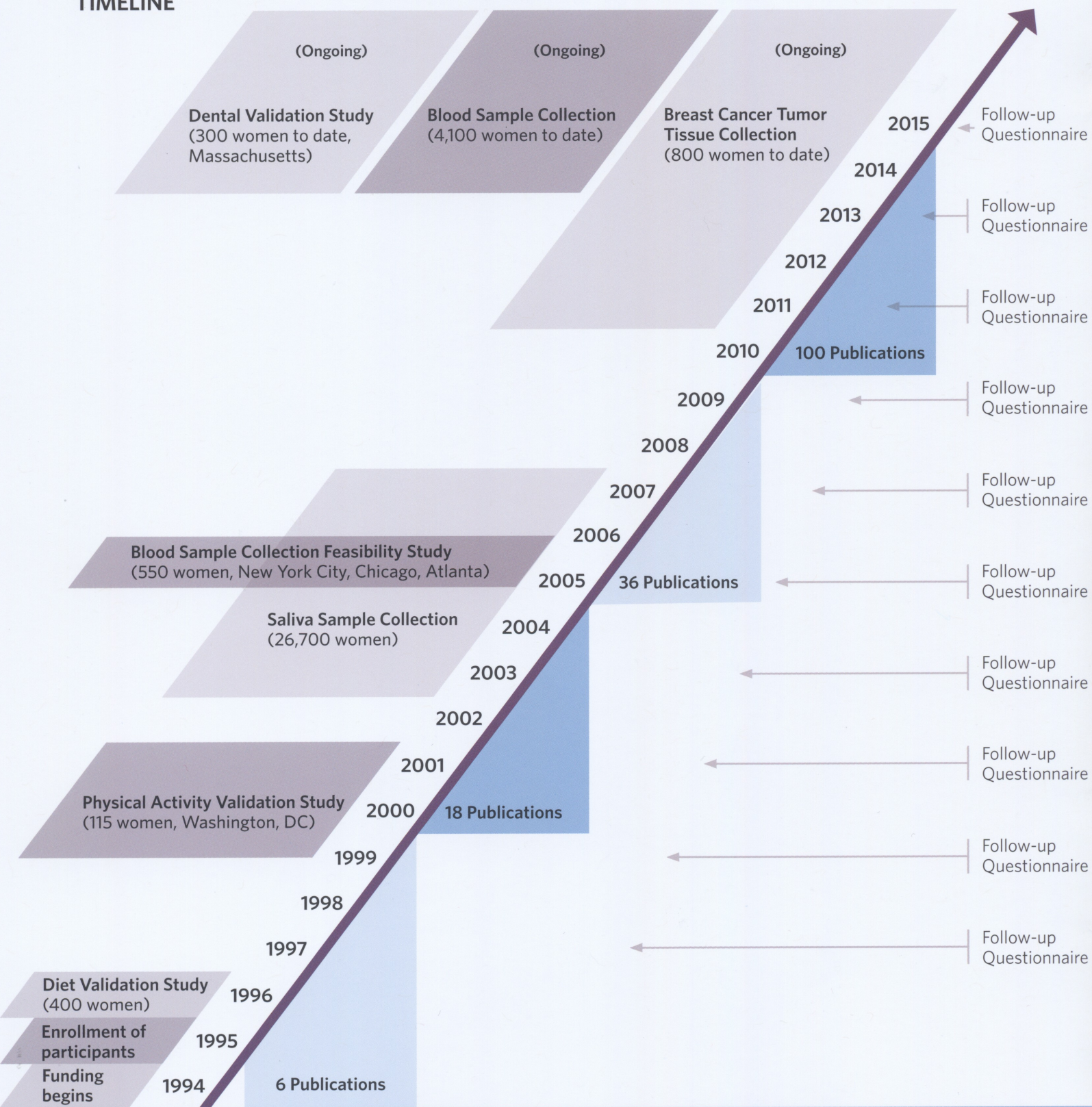
BLACK WOMEN'S HEALTH STUDY

20 YEARS OF
RESEARCH

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BLACK WOMEN'S HEALTH STUDY

TIMELINE



20 YEARS OF RESEARCH

RATIONALE FOR RESEARCH FOCUSED ON BLACK WOMEN

“Supposing is good, but finding out is better.” —Mark Twain

Why are Black women in the United States more likely than White women to develop aggressive breast cancer subtypes, like estrogen receptor negative breast cancer? Why are Black women also more likely to develop uterine fibroids, diabetes, colon cancer, or sarcoidosis? The Black Women’s Health Study (BWHS), the largest follow-up study of Black women’s health, was launched to answer these and other important questions. The participants, a dedicated group of 59,000 Black women from across the United States, filled out health questionnaires in 1995 and have done so every two years since. They provide information on the occurrence of disease and dietary intake, exercise, weight, smoking, medical history, stress, and several other factors. Many have contributed DNA samples for analyses of how particular genes contribute to disease occurrence.

The BWHS is celebrating its 20th year of follow up. The research focus to date has been on the most common cancer in women, breast cancer, and common non-cancer conditions like diabetes and uterine fibroids. After further follow up, it will be possible to carry out studies of less common cancers and other illnesses. Some of the potential lifestyle risk factors assessed are modifiable, with a healthy change resulting in a reduced chance of developing the disease associated with that risk factor. This report highlights findings of particular interest from these first 20 years of the BWHS, especially findings concerning modifiable factors. BWHS publications with details of the findings discussed here are listed at the end of this review, and every BWHS publication with a brief description of results (160 to date) is listed on the BWHS website (www.bu.edu/bwhs).

THANK YOU TO BWHS PARTICIPANTS

The dedication and generosity of BWHS participants have been remarkable. The 59,000 women who joined the BWHS in 1995 completed health questionnaires at that time; every two years since, they have been asked to complete questionnaires to update information about their health. Many participants have provided saliva/cheek cell samples and blood samples for use in the research, and many women who developed cancer have allowed tumor tissue that was removed at the time of cancer surgery and stored at hospitals in paraffin blocks to be used for research as well. In addition, many women have taken part in validation studies conducted to confirm the high quality of information provided by participants on dietary intake, physical activity, body size, and dental health. The findings described here were possible because of the willingness of BWHS participants to share information about their health. With their continued dedication, the BWHS will make even greater contributions in the future to improving the health of Black women.

Occurrences of medical conditions in the BWHS, 1995–2015

NON-CANCER		CANCER	
High Blood Pressure	16,177	Stroke	1,201
Obesity	15,679	Heart Attack	956
Uterine Fibroids	8,690	Glaucoma	809
Diabetes	7,582	Sarcoidosis	540
Asthma	1,805	Lupus	540
Preterm births	1,300	End stage renal disease	346
Colon adenomas	1,222	Multiple sclerosis	326
		Breast	2,334
		Lung	500
		Colorectal	490
		Endometrium	289
		Ovary	129
		Pancreas	111
		Multiple myeloma	111
		Kidney	94

BREAST CANCER

BACKGROUND: Breast cancer is the most commonly occurring cancer among American women. While Black women are less likely to develop breast cancer than White women, they are more likely to develop aggressive subtypes, like estrogen receptor negative breast cancer, and they are more likely to die of breast cancer than White women.

RESULTS: ^{publications 1-41} Higher parity (having had more children) was associated with a higher risk of estrogen receptor negative breast cancer in the BWHS, but breastfeeding appeared to reduce that risk, counteracting the effect of higher parity. The risk of estrogen receptor negative breast cancer was reduced among women with high intakes of fruits and vegetables. The incidence of breast cancer was lower among women who exercised vigorously or walked briskly. Long-duration use of oral contraceptives, long-duration use of menopausal female hormone supplements that contained both estrogen and progestin, and long-term heavy cigarette smoking were associated with increased breast cancer risk. Several genetic variants were also associated with higher risk and one was a variant that is present only in people of African ancestry. Breast cancer prediction models that have been used to estimate a woman's risk of developing breast cancer (for example, to decide if she is eligible to participate in a breast cancer prevention trial) were found to be poor predictors of breast cancer risk in the BWHS. The BWHS developed a prediction model that was an improvement on the previous model and would result in more Black women being eligible to participate in cancer prevention trials, but further improvement is still needed.

RECOMMENDATIONS: Research findings suggest several ways to reduce the risk of developing breast cancer. The fact that Black women on average have higher parity than White women and are less likely to breastfeed may contribute to the higher incidence of estrogen receptor negative breast cancer in Black women. Increased breastfeeding by Black women might reduce this racial disparity. Other ways to reduce breast cancer risk include substituting fruits and vegetables for meats, fried foods, and sweets, increasing participation in physical activity, limiting the duration of the use of oral contraceptives, particularly at older ages, limiting supplemental female hormone use in the postmenopausal years, and quitting smoking.

COLORECTAL ADENOMA

BACKGROUND: Colorectal adenomas, a type of polyp that develops in the colon or rectum, are precursors to colorectal cancer, which occurs more commonly in Black than White Americans.

RESULTS: ^{pubs. 38, 42-46} Women who exercised vigorously or walked had a lower risk of developing colorectal polyps. Diets high in vegetables and fruits were associated with lower risk, and diets characterized by a high intake of red and processed meats and fried foods were associated with higher risk. Obese women (body mass index of 30kg/m² or greater) also had a higher risk of colorectal polyps.

RECOMMENDATIONS: The chance of developing colorectal adenomas may be reduced by a diet high in fruits and vegetables, exercising, and losing weight. A lower risk of adenomas in turn would be expected to lower the risk of developing colorectal cancer.

LUNG CANCER

BACKGROUND: The overwhelming cause of lung cancer is cigarette smoking, but other factors may also affect risk.

RESULTS: ^{pubs. 38, 47, 48} In a collaborative study that included the BWHS, mortality from lung cancer in non-smokers was higher in Blacks than Whites. In BWHS data, risk of lung cancer was greatly increased in smokers and lower in obese smokers than in thinner smokers.



UTERINE CANCER

BACKGROUND: It is established that endometrial cancer occurs more often among women who are obese and less often among women who have had several children or used oral contraceptives. Use of menopausal estrogen supplements without a progestin increases the risk.

RESULTS: ^{pubs. 49} In a collaborative analysis that included the BWHS, risk factors for a rare form of uterine cancer that has been little studied, uterine sarcoma, were similar to those of the most common form of the disease.

PANCREATIC CANCER

BACKGROUND: Pancreatic cancer occurs more commonly among African Americans and has a high mortality rate. There is little evidence on whether obesity affects the risk in African Americans.

RESULTS: ^{pubs. 50} In a collaborative analysis that included the BWHS, obesity was a risk factor for pancreatic cancer mortality.

WEIGHT GAIN AND OBESITY

BACKGROUND: Approximately 60 percent of Black women are obese. Obesity increases the risk of adverse health outcomes, including diabetes, cardiovascular disease, stroke, and premature death. Most adult weight gain among Black women occurs before the age of 45 years; weight gain then tapers off in later years.

RESULTS: ^{pubs. 51-65} Many factors were associated with weight gain, overweight, or obesity in the BWHS. What women ate was important. Women with high intakes of hamburgers from fast food and other restaurants and of sugar-sweetened drinks gained more weight. The risk of becoming obese was lower in women who had high intake of fruits and vegetables and low intake of red meat, processed meats, fried foods, and sweets. Women who participated in vigorous exercise or brisk walking gained less weight than inactive women. Women living in urban neighborhoods where the street layout made walking more feasible gained less weight and were less likely to become obese than women living in neighborhoods that were less conducive to walking. Childbearing was associated with more weight gain, with the greatest gain occurring after the birth of the first child. Over and above the effects of individual factors, residential neighborhood mattered: women who lived in the most deprived neighborhoods as characterized by data from the US Census Bureau had significantly greater weight gain and were more likely to be obese than women who lived in wealthier neighborhoods, regardless of their educational status and income. Obesity was a strong risk factor for premature death.

RECOMMENDATIONS: These findings suggest that women can take several measures to control weight gain and reduce obesity. Better diet quality will help, such as substituting fruits and vegetables for meats, fried foods, and sweets. Increased physical activity will also help. Thus, access to healthy foods and safe places to exercise are imperative for all women, including those who live in disadvantaged neighborhoods. Since women tend to gain more weight after the birth of their first child than after later children, extra effort to control weight gain after the first child is important.

DIABETES

BACKGROUND: Overweight and obesity are important causes of type 2 diabetes (formerly known as adult-onset diabetes), which African Americans are twice as likely to develop as White Americans. Many health complications are associated with diabetes, including cardiovascular disease, end-stage renal disease, and amputation.

RESULTS: ^{pubs. 66-78} As expected, the incidence of diabetes was much higher among the heaviest women than among women of healthy weight. The incidence of diabetes was also higher among women who had high intakes of sugar-sweetened drinks (including sugar-sweetened fruit drinks), women who had frequent restaurant meals of hamburgers or fried

chicken, and women who were inactive and spent long hours sitting and watching TV. Women who were born prematurely or had a low birth weight were also at higher risk of developing diabetes as adults. Healthier diets, including those with fewer processed foods, were associated with lower risk, and caffeinated coffee was also associated with lower risk. Women who exercised vigorously on a regular basis had a much lower risk of diabetes than those who were inactive, and brisk walking was also associated with lower risk. Women who had worked night shifts for many years had a higher risk of diabetes. We are conducting further research to understand why.

RECOMMENDATIONS: These findings indicate that better weight control, increasing vigorous exercise or brisk walking, reducing hours spent sitting, and substituting fruits and vegetables for red meats, processed foods, and sweets will lower the risk of type 2 diabetes. Because fruit drinks often contain added sugar, these drinks are not a healthy alternative to sugar-sweetened sodas.

UTERINE FIBROIDS

BACKGROUND: Approximately one-third of American women are diagnosed with uterine fibroids (fibroids in the womb), which Black women are 2-3 times as likely to develop as White women. The Black-White difference in incidence has not been satisfactorily explained. Uterine fibroids are associated with higher likelihood of hysterectomy, pelvic pain, bleeding, and difficulty becoming pregnant. Female hormones are thought to play a role in causing fibroids.

RESULTS: ^{pubs. 79-91} In the BWHS, higher weight was associated with higher risk of uterine fibroids, while late age at start of menstruation, having had children, and late age at first birth were associated with lower risk. Higher levels of dairy intake were associated with lower risk. Intake of foods with a higher glycemic index was associated with higher risk, while intake of fruits and vegetables was associated with a lower risk. Women who had a higher percent of African ancestry had a higher incidence of fibroids than women who had a lower percent, suggesting that genetic factors are involved.

RECOMMENDATIONS: The BWHS has thoroughly, and in a larger sample than in any previous study, explored a wide range of environmental risk factors for uterine fibroids in Black women. Some reproductive and hormone-related factors are associated with risk of fibroids but the associations are insufficient to explain the much higher incidence of this condition in Black women than in White women. As is the case for many other conditions, weight reduction and a diet high in fruit might lower the risk of fibroids. The association of higher dairy intake with lower risk of fibroids is a new finding. If confirmed, the fact that dairy intake is lower among Black women than White women might be contributing to the higher risk of fibroids in Black women.

SARCOIDOSIS

BACKGROUND: Black women are two to three times more likely than White women to be diagnosed with sarcoidosis, an autoimmune disease that most often affects the lungs but can also affect skin, heart, eyes and other organs.

RESULTS: ^{pubs. 92-97} In the BWHS, approximately 2 percent of participants have been diagnosed with sarcoidosis, with the lungs being the most commonly affected organ. Reproductive factors did not predict risk. Several genetic variants were associated with risk, but they do not explain the excess of sarcoidosis in Black women. Weight gain and obesity were associated with higher risk.

RECOMMENDATIONS: The BWHS finding that weight gain and obesity increase risk of sarcoidosis, if confirmed, is yet another good reason for maintaining a healthy weight.

SYSTEMIC LUPUS ERYTHEMATOSUS (LUPUS)

BACKGROUND: Lupus is an autoimmune disease that affects Black women more than other population groups.

RESULTS: ^{pubs. 98-100} Smoking was associated with a higher incidence of lupus. Several genetic variants in the MHC region were also predictors of lupus risk. Risk factors for lupus are still poorly understood and additional research is needed.



ASTHMA

BACKGROUND: Adult-onset asthma occurs more commonly among Black women than White women.

RESULTS: ^{pubs. 101-104} Adult-onset asthma occurred more frequently among heavier women. The BWHS has not studied environmental risk factors, such as dust mites or mold, because such an assessment requires a different study design. More frequent experiences of racism, depression, and abuse during childhood were all associated with increased asthma incidence.

BIRTH OUTCOMES

BACKGROUND: The babies of Black women are more likely to be born preterm (more than three weeks before the due date) than those of other women, putting these babies at a higher risk for adverse health outcomes.

FINDINGS AND CONCLUSIONS: ^{pubs. 105-111} Underweight women were at a higher risk for preterm birth, both spontaneous and medically induced, while obese women were at a higher risk of medically induced preterm birth. Women who were overweight when they became pregnant or had excess weight gain during pregnancy were more likely to have a baby with a birth weight of 8.8 pounds or more (macrosomia); these babies have a higher risk of death during the pregnancy, of birth injury, and of childhood obesity. Women who were obese took longer to become pregnant than women who had healthy weights.

RECOMMENDATIONS: Weight control is good not just for the health of the mother but for the health of the baby as well. Among the adverse effects of obesity are a higher risk of having a preterm birth due to medical problems, a higher risk of having a macrosomic baby, and greater difficulty in becoming pregnant.

PSYCHOSOCIAL STRESSORS

BACKGROUND: Many Black women report high levels of stress, such as from experiences of discrimination, heavy family responsibilities, or problems associated with living in neighborhoods that lack amenities, such as good schools, recreational areas, and healthy food outlets. A great deal of evidence indicates that psychosocial stressors can affect not just mental health but physical health as well.

FINDINGS AND CONCLUSIONS: ^{pubs. 52, 53, 57, 58, 63, 82, 87, 102-104, 112-114} Frequent experiences of racism were not associated with developing high blood pressure or with mortality, but they were associated with more weight gain and obesity. Physical and sexual abuse during childhood were also associated with greater risk of becoming obese in adulthood. Childhood abuse, frequent experiences of racism, and depressive symptoms were associated with higher incidence of adult-onset asthma, findings that strongly support an adverse effect of psychosocial stressors on the airways. Living in disadvantaged neighborhoods was associated with higher risk of developing high blood pressure and of becoming obese.

SUMMARY OF BWHS FINDINGS

DIETARY INTAKE AND EXERCISE: Healthier diets, such as those characterized by a high intake of fruits and vegetables and a low intake of red and processed meats, fried foods, and sweets, have been associated in the BWHS with a reduced risk of a wide range of illnesses and adverse health outcomes, including breast cancer, type 2 diabetes, colorectal adenomas, and obesity. Exercise has also been associated with a reduced risk of illness, including breast cancer, diabetes, and obesity. Learning these findings is a first step toward behavioral changes, but knowledge alone is insufficient. Individuals are affected by their environments and circumstances. For dietary intake to improve and for exercise to be undertaken, healthy foods and safe, convenient places to walk and to exercise must be readily available and affordable.

OVERWEIGHT AND OBESITY: Another common theme in BWHS results was that being overweight or obese are powerful risk factors for numerous adverse health outcomes, including diabetes, birth problems, and premature death. Healthy diet

and exercise were effective ways for BWHS participants to reduce weight gain and maintain a healthy weight. Some of the behavioral changes for reducing weight gain are relatively easy, such as substituting water for sugar-sweetened drinks and cutting down on meals from fast food restaurants.

PSYCHOSOCIAL STRESSORS: People are affected by circumstances over which they may have little control. Stressors such as experiences of racism and abuse were associated with a number of adverse health outcomes in the BWHS, including weight gain and the occurrence of asthma. Many participants in the BWHS have reported high levels of psychosocial stressors in their lives. Efforts to decrease the adverse health effects of these stressors must include efforts to reduce the occurrence of the stressors at the individual and societal level. The BWHS will continue to assess the effects of stressors on a range of health outcomes and will also assess what factors, such as social support or coping mechanisms, might lessen adverse effects.

GENETIC FACTORS: Some genes have a large effect on the risk of illness. For instance, the rare BRCA1 gene is associated with a very high risk of developing breast cancer. However, the effects of most genetic variants for most diseases have been found to be small. Most of the genetic variants identified in BWHS research do not explain the large Black/White differences in risk that are present for some illnesses. This work is continuing in collaboration with other large studies of Black women.

FUTURE WORK

As follow-up in the BWHS continues, the number of health outcomes and the amount of information available will increase, making more informative analyses possible. As participants grow older, some of the issues to be assessed will change, with more of a focus on factors that contribute to health at older ages and on risk factors for diseases of aging, such as heart failure and Alzheimer's disease. Numerous issues have not been studied in Black women: What are the factors that predict better memory? What factors are related to better dental health? How is poor dental health related to the occurrence of other health problems? What is the influence of religious and spiritual practices on health? How do sleep quality and shift work affect the occurrence of various diseases? All will be topics of further research in the BWHS.

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 Susan G. Komen for the Cure Foundation

Hood Foundation
 Association of Schools of Public Health/CDC
 Arthritis Foundation

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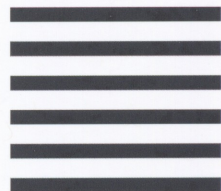
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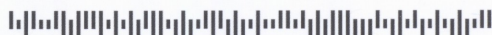
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