



THE SISTER STUDY

BREAST CANCER RESEARCH

WOMAN BY WOMAN, SISTER BY SISTER, WE CAN MAKE A DIFFERENCE!

Dear Sisters —

How time flies! It is hard to believe that the Sister Study has reached its 20th anniversary. We could not have reached this milestone without you!

Over 50,000 Sister Study participants have dedicated their time and shared extremely valuable information with us to help learn how our environment, lifestyle, and genetics affect risk of breast cancer and other diseases that affect women. The Sister Study at 20 years has learned many important things about factors that affect breast cancer and other important women's health conditions such as air pollution, early life exposures, personal care products, genetic factors, reproductive history and hormones, and diet, exercise, and sleep. We share some examples in this newsletter.



This research was made possible by the long-term participation of each and every dedicated sister in the study. The entire team is extremely grateful for your participation in the Sister Study. We have more to learn and plan to continue the study for many years to come. We hope that you will stay engaged and continue to respond to our requests for information.

We wish you good health and happiness in the coming years.

Dale Sandler, Ph.D., lead researcher for the Sister Study



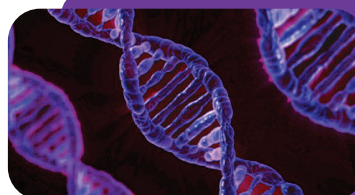
Air Pollution
and other
Environmental
Exposures



Early Life
Experiences



Household
and Personal
Care Products



Genetic
Factors



Reproductive
History and
Hormones



Diet, Exercise,
and Sleep

ANNIVERSARY BIOSPECIMEN COLLECTION



As we commemorate the 20th anniversary of our work together, the Sister Study is launching a new biospecimen collection effort. We will reach out to you to request another set of biological samples including blood, urine, and stool. The samples you provided when you joined the study have provided valuable insights related to breast cancer and other health outcomes. But they only provide a snapshot of a single point in time, and we know that much has changed for each of you over the past 20 years. With these new samples, we can better understand how changes in exposures and biological processes over time affect disease risk, quality of life, and for those who have been diagnosed, health and survival after a breast cancer diagnosis. A recent example of what we can learn by having samples at two time points is a Sister Study paper using samples collected in the Sisters Changing Lives effort that showed that not only was a biomarker of aging called DNA methylation age associated with the chances of developing breast cancer, but women diagnosed and treated for breast cancer between the two blood draws showed greater biological aging after treatment. It is important we have women from all walks of life participating in this special effort. We hope you will say yes when we call on you to participate in the 20th Anniversary Biospecimen Collection!

OUR RECENT FINDINGS

Study Finds Association Between Genital Talc Use and Increased Risk of Ovarian Cancer

Sister Study Staff Scientist, Dr. Katie O'Brien and her team examined the association between the use of intimate care products, such as talcum powder applied to the genital area and douching, and the risk of hormone-related cancers such as ovarian, breast, and uterine cancers. "Despite challenges in collecting data on past use of intimate care products, our findings consistently show an association between genital talc use and ovarian cancer," said Dr. O'Brien. "This study leverages detailed lifetime exposure histories and the unique design of the Sister Study to provide more reliable evidence that supports a potential association between long-term and frequent genital talc use and ovarian cancer." The association of genital talc use and ovarian cancer was particularly strong among women who used talc during periods of significant hormonal changes or reproductive activity (ages 20-39). A positive association between douching and ovarian cancer was also observed. These findings contribute significant insights into the ongoing debate about the safety of intimate care products and underscore the need for further research and potential reevaluation of the safety of these products.



Personal Care Products and Hormone-Sensitive Cancers

A recent Sister Study paper explored how everyday beauty, hygiene, and skincare products may be linked to breast, ovarian, and uterine cancers. **The study found that certain combinations of products, particularly in the hygiene and beauty categories, were associated with increased risk for ovarian or breast cancers.** This research provides new insights into a possible impact of our daily personal care product choices on our health and suggests the need for more research on the health effects of these everyday products.





Sister Study Co-Investigator, Alexandra White, has started new research to better understand how the levels of environmental chemicals in our bodies are related to future breast cancer development. Using blood samples provided at enrollment by a subset of Sister Study participants, we will be measuring exposure to thousands of chemicals, including the “forever chemicals” - per and polyfluoroalkyl substances (PFAS) - and exploring how these chemicals are related, individually and when considering exposure to multiple chemicals together, to breast cancer risk. As part of this effort, Dr. White’s group is using samples that were provided by some women at two timepoints to see how exposure to these chemicals has changed over time. This research takes advantage of new technology that allows us to detect exposures to chemicals that have not been previously identified, which may provide the opportunity to identify new risk factors for breast cancer.

Outdoor Air Pollution Exposure and Uterine Cancer Incidence in the Sister Study

Sister Study investigators have recently examined the associations between two measures of air pollution exposure and uterine cancer. Participants’ exposure to particulate matter less than 2.5 μm in diameter ($\text{PM}_{2.5}$) and nitrogen dioxide (NO_2) were estimated for home addresses using monitoring and other data. Results indicated that an increase of 5 parts per billion of NO_2 was associated with a 23% increase in the rate of uterine cancer, with even stronger associations seen among participants living in urban areas (53% increase). $\text{PM}_{2.5}$ was not associated with uterine cancer. These findings add further evidence that **NO_2 , a marker of vehicular traffic exposure which has also been related to a higher risk of breast cancer, has important long-term health consequences.**



Women Treated for Breast Cancer May Age Faster Than Cancer-free Women

Sister Study investigators looked at how “biological age” changed over time using blood samples collected at two time points from 417 women. Biological age reflects a person’s cell and tissue health, and it differs from chronological age. This study showed that women diagnosed with breast cancer experience faster biological aging than those without cancer. This effect was most significant in women who underwent radiation therapy, whereas surgery had no impact on biological aging. Dale Sandler, Ph.D., chief of the NIEHS Epidemiology Branch and a co-author on the paper notes that “Radiation is a valuable treatment option for breast cancer. We don’t yet know why radiation treatment was most strongly associated with biological age. This finding supports efforts to minimize radiation exposures when possible and to find ways to mitigate adverse health effects among the approximately 4 million breast cancer survivors living in the United States.” This research provides insights into how cancer and its treatment affect long-term health and highlights the importance of being able to assess changes in biological measures over time.



**A Big Thanks to
Our Generous
Sister Study Sisters!**

Since we began analyzing the data provided by our generous Sisters, **our researchers have published over 300 scientific papers!** These findings contribute to improvements in our understanding of the environmental and genetic causes of breast cancer and other important issues in women’s health. We are proud of what we have accomplished together with our study sisters! Thank you for sticking with us!

Early-life Exposures and Age at Thelarche in the Sister Study Cohort

Thelarche is a term for the start of breast development during puberty. Thelarche often begins up to 2 years before the onset of menses. A previous Sister Study report showed that earlier age at thelarche is associated with increased breast cancer risk, but little is known about factors that influence the timing of thelarche. In a recent analysis, Sister Study investigators identified early-life factors associated with early

To view our study findings, please visit our Sister Study website:
tinyurl.com/SISDiscoveries

thelarche, which they defined as age 10 or younger. They found that multiple prenatal factors were associated with early thelarche, including maternal gestational hypertensive disorder, diethylstilbestrol (DES) use, smoking during pregnancy, being firstborn, and being born to a teenage mother. This work helps us better understand how the early-life environment influences the timing of puberty and may also affect adult breast cancer risk.

HAVE YOU SEEN THE SISTER STUDY IN THE NEWS?

Hair Straightening Chemicals Associated with Higher Uterine Cancer Risk

In a recent publication, Sister Study investigators found that women who used chemical hair straightening products were at higher risk for uterine cancer compared to women who did not report using these products. While the association between chemical use and uterine cancer was the same regardless of race, hair straightener use is far more common among Black women who start using these products at an early age. Given the higher rates of uterine cancer among Black women and this higher product use, chemical hair straighteners may be an important contributor to racial health disparities.

“To our knowledge this is the first epidemiologic study that examined the relationship between straightener use and uterine cancer,” said Dr. Alexandra White, the lead researcher on the paper. “More research is needed to confirm these findings in different populations and to identify the specific chemicals that may be increasing the risk of cancers in women.”



MEET EVA - THE SISTER STUDY PROGRAM MANAGER

Greetings Sisters,

I am thrilled to introduce myself as the Sister Study Program Manager! I joined the Sister Study team just over 3 years ago. I started out supporting day to day study operations. Next I oversaw participant communication and Study retention activities. In my current role, I oversee all study operations where I work with our talented team to make sure study activities happen smoothly. Each of these roles has given me a deep appreciation for your commitment to this study. The groundbreaking findings our study has produced over the last two decades has had a significant impact on women's health research. Each and every day, I am inspired by the study leadership and researcher's deep commitment to our participants and public health research. I feel incredibly lucky to work with such a passionate team of investigators, staff and collaborators, and I truly enjoy when I have the opportunity to speak with you, our dedicated participants.



My interest in breast cancer research started at a young age as I witnessed loved ones navigate difficult cancer diagnoses. I have spent most of my career working in cancer research programs, including coordinating clinical trials to evaluate innovative lung and breast cancer treatments. Outside of work, I enjoy traveling to national parks and historical sites, and spending time with my family, friends and three dogs. In my free time, I love to cook and bake, enjoy home renovation projects, and am always happy to try out new local restaurants.

Thank you for your continued dedication to advancing scientific knowledge through your participation in the Sister Study. I look forward to continuing our work together.

With gratitude,

Eva Bauer, Sister Study Program Manager

As always, please contact us at the Sister Study helpdesk toll-free at 877-4SISTER (877-474-7837) or email us at update@sisterstudy.org if you have updates or questions.



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