

The Pathways Study

Pathways Study Forum, February 6, 2023

Supported by the National Cancer Institute
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Nutrition and Physical Activity Guidelines for Cancer Survivors

CA Cancer J Clin 2012;62:242-274.

After receiving a diagnosis of cancer, survivors soon find there are few clear answers to even the simplest questions, such as: *Should I change what I eat? Should I exercise more? Should I gain or lose weight? Should I take dietary supplements?* Cancer survivors receive a wide range of advice from many sources about foods they should eat, foods they should avoid, how they should exercise, and what types of supplements they should take, if any. Unfortunately, this advice is often inconsistent and not supported by data.

The Pathways Study

- To be the premier prospective cohort study on the breast cancer experience, to develop knowledge to improve outcomes for women diagnosed with this disease
- Create a breast cancer research project and resource to examine factors at multiple levels on a comprehensive, integrative platform
- Incorporate the perspectives of women with breast cancer, breast cancer advocates, caregivers, and clinicians

The Pathways Study has become the premier prospective cohort study of women with breast cancer by ...

Study population

- Enrolling a large (n=4,505) and diverse cohort of study participants from women diagnosed with breast cancer in KP Northern California between 2006 and 2013

Collecting information on multi-level factors through:

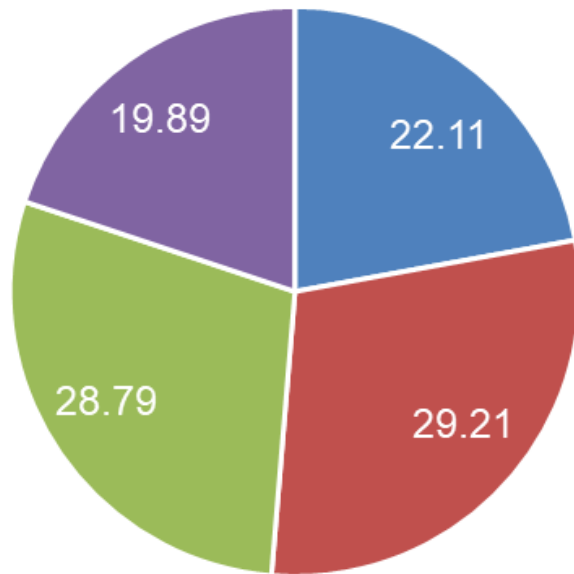
- Interviews and surveys on lifestyle and behavioral factors including diet, physical activity, and complementary and alternative therapies, and on quality of life, social support, processes of care, and related factors
- Blood and saliva samples provided by study participants to enable investigation of genetic and metabolic factors
- KP electronic databases and medical records on cancer diagnosis, treatment, toxicities, comorbid conditions
- Linkage to area-level databases and new data collection for information on neighborhood factors
- **Continuing to follow the study population through follow-up surveys and data linkages**

People were invited to join the Pathways Study if they were ...

- Women diagnosed with invasive breast cancer
- Age 21 y or older at diagnosis
- Diagnosed in KPNC
- No personal history of cancer other than non-melanoma skin cancer
- Live within 65 miles of a field interviewer

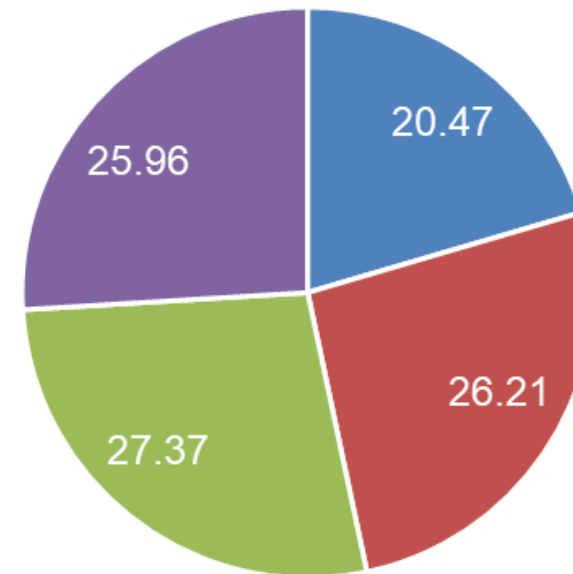
Age at breast cancer diagnosis of Pathways Study participants, compared to those eligible for but not enrolled in the study

Women enrolled in the Pathways Study (n=4,504)



■ <50 y ■ 50-59 y ■ 60-69 y ■ 70+ y

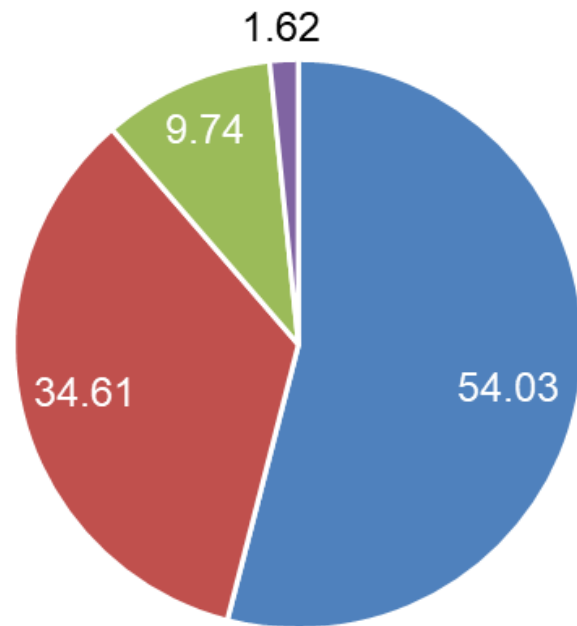
Women eligible but not enrolled in the Pathways Study (n=6,665)



■ <50 y ■ 50-59 y ■ 60-69 y ■ 70+ y

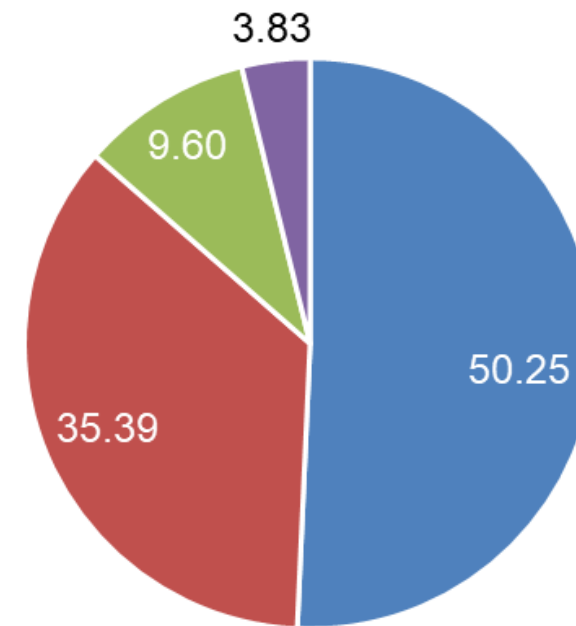
Stage at diagnosis of Pathways Study participants, compared to those eligible for but not enrolled in the study

Women enrolled in the Pathways Study (n=4,504)



■ Stage I ■ Stage II ■ Stage III ■ Stage IV

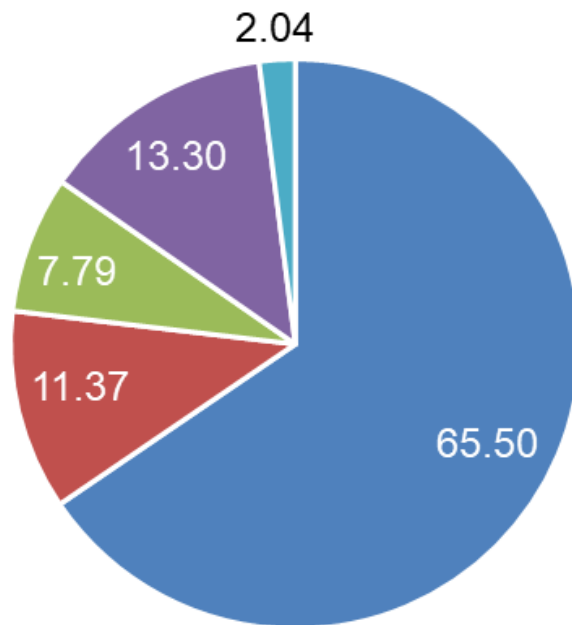
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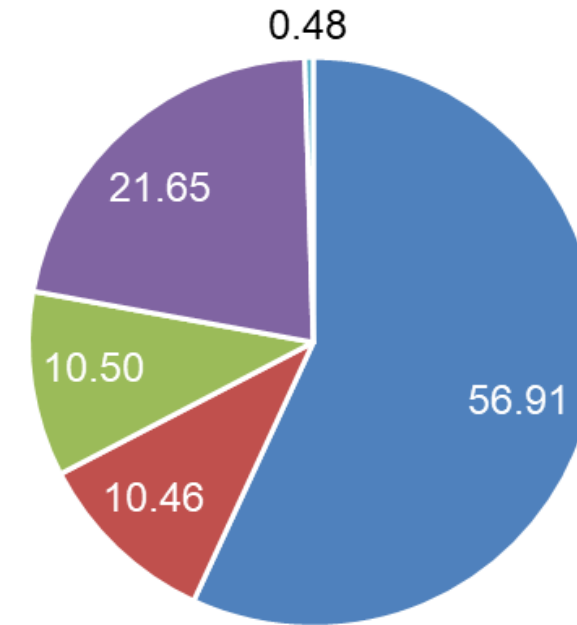
Race and ethnicity of Pathways Study participants, compared to those eligible for but not enrolled in the study

Women enrolled in the Pathways Study (n=4,504)



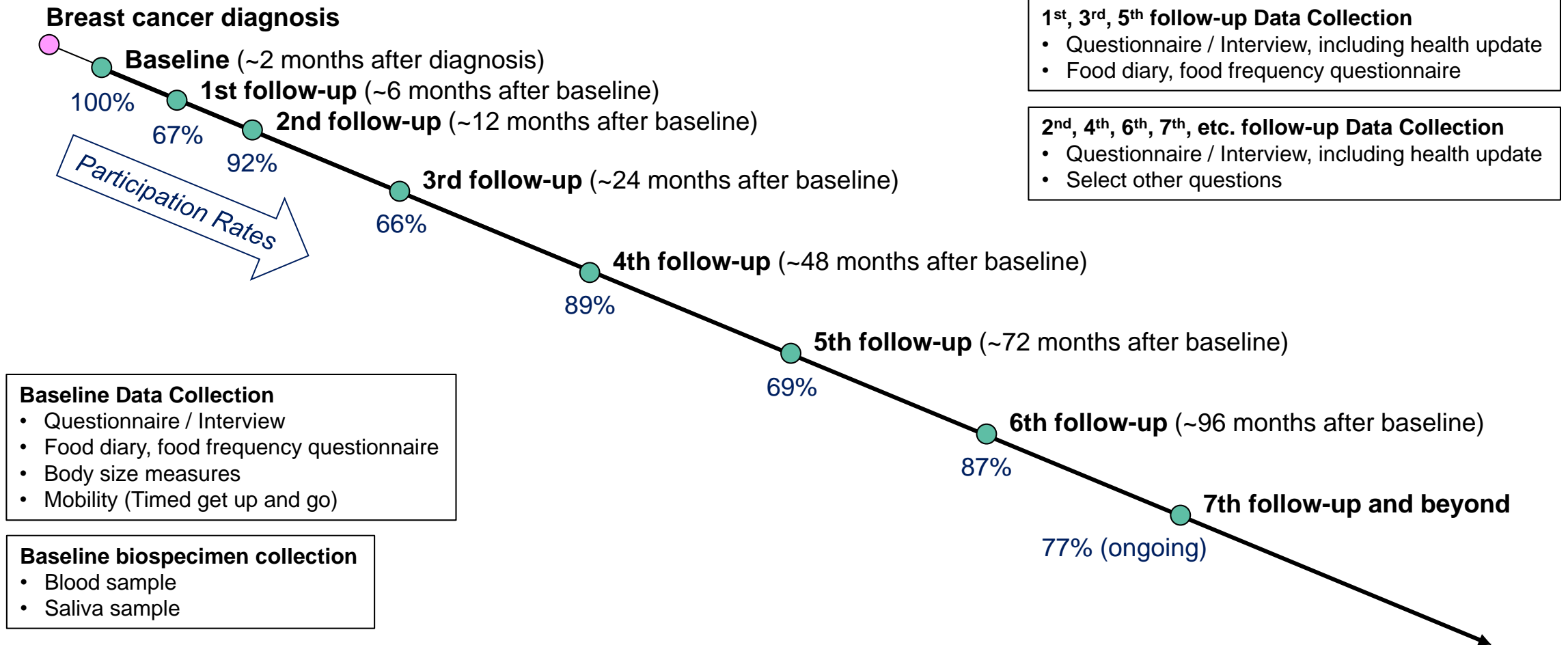
■ White ■ Hispanic ■ Black ■ Asian/PI ■ AI/AN

Women eligible but not enrolled in the Pathways Study (n=6,665)



■ White ■ Hispanic ■ Black ■ Asian/PI ■ AI/AN

Study participant follow-up in the Pathways Study



Obtaining information from KP health records greatly enhances the Pathways Study – and KP cancer research in general

- Details of cancer diagnosis
- Treatments for cancer such as chemotherapy, radiation therapy, and type of surgery
- Identifying various conditions such as:
 - Breast cancer recurrence
 - Cardiovascular diseases or diabetes
 - Bone health
- Prescription medications, laboratory test results
- Surgical specimens such as from cancer surgery



When we think about health, we usually think about health care and access to health care and the quality of care. But what research clearly shows is that **health is embedded in the larger conditions in which we live and work ...**

David Williams

“Unnatural Causes. Place Matters.” (PBS documentary, 2008)



When we think about health, we usually think about health care and access to health care and the quality of care. But what research clearly shows is that health is embedded in the larger conditions in which we live and work ...

Sometimes, we naively think of improving health by simply changing behaviors. But the **choices of individuals are often limited by the environments in which they live.**”

David Williams

“Unnatural Causes. Place Matters.” (PBS documentary, 2008)

Pathways Study data enhancements for the Social, Built, and Pollution Environment

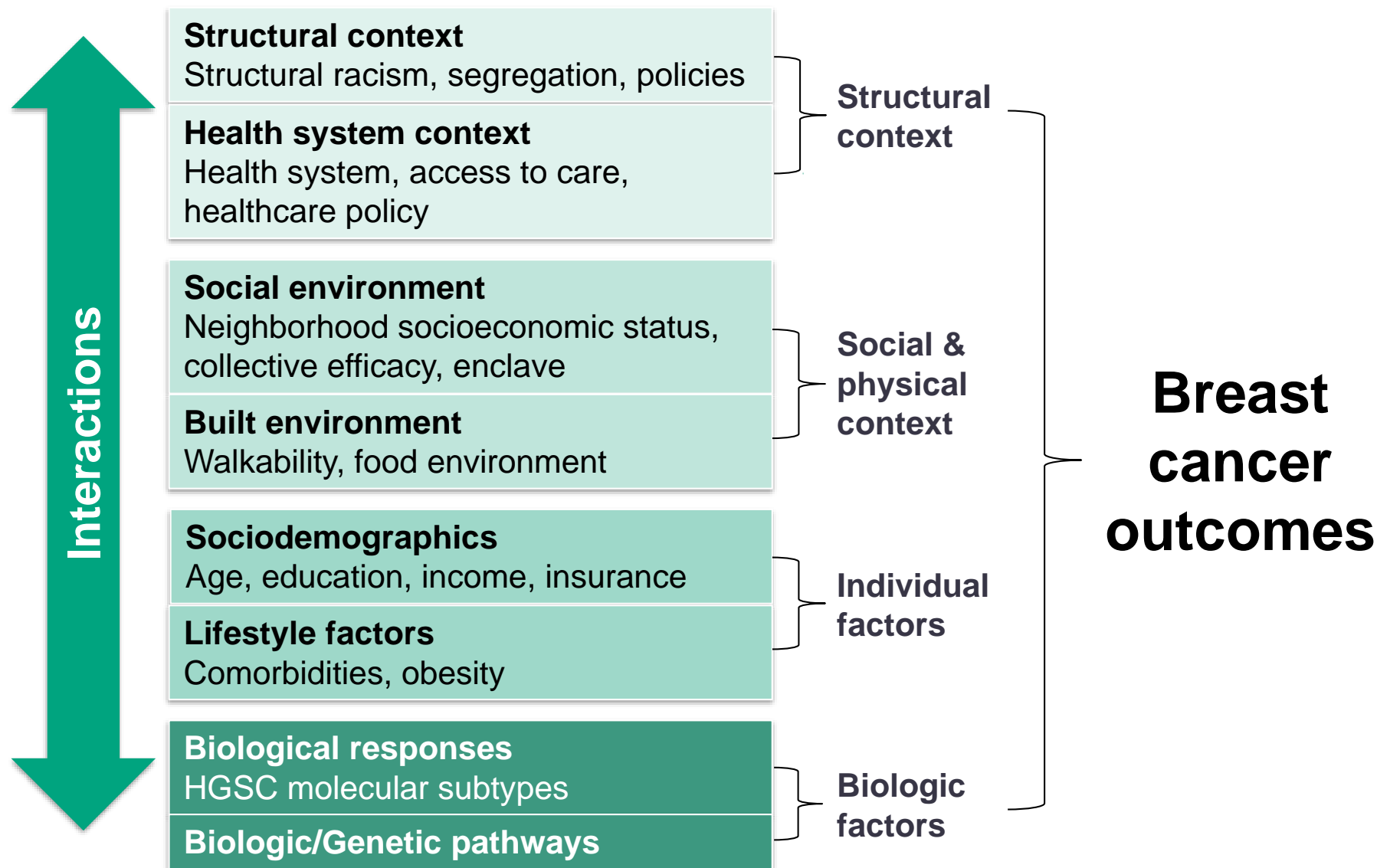
- Social and built environment attributes
- Virtual street audits
- Perceived neighborhood attributes (72-month)
- Residential histories
- Remote sensing/machine learning methods
- Pollution environment
 - Air pollutants: ozone, PM_{2.5}, diesel,
 - Ground pollutants: agricultural pesticides, toxic releases from facilities, toxic clean-ups, solid waste sites
 - Water pollutants: groundwater, hazardous waste facilities, impaired water bodies
- Cal EnviroScreen 3.0, California Communities Environmental Health Screening Tool

A Cells-to-Society Model for Breast Cancer Outcomes Research

A framework for multilevel research

Centers for Population Health and Health Disparities, NIH

Adapted from
Warnecke et al. AJPH 2008



Core institutions collaborating on the Pathways Study

- **Kaiser Permanente Northern California**, Oakland, CA – *since 2004*
 - Cohort recruitment and follow-up; self-reported and clinical characteristics
- **Roswell Park Comprehensive Cancer Center**, Buffalo, NY – *since 2004*
 - Genetic and molecular factors; Site PI (U01 mPI): Christine Ambrosone, PhD
- **University of California, Davis**, CA – *since 2021*
 - California Cancer Registry and Office of Statewide Health Planning & Development linkage; Site PI: Theresa Keegan, PhD
- **University of California, San Francisco**, CA – *since 2004*
 - Neighborhood social and contextual factors; Site PI: Scarlett Lin Gomez, PhD
[Complementary & alternative therapies; Site PI: Marion Lee, PhD]
- **Zero Breast Cancer**, San Rafael, CA – *since 2004*
 - Community perspectives; Site PI: Catherine Thomsen, MPH

Some other institutions with researchers who have worked with the Pathways Study

- Columbia University
- Emory University
- Georgetown University
- The Ohio State University
- Rutgers Cancer Institute of New Jersey
- University of Florida
- University of Washington
- University of Bristol (England)
- City of Hope Comprehensive Cancer Center
- Fred Hutchinson Cancer Research Center
- Memorial Sloan Kettering Cancer Center
- H. Lee Moffitt Cancer Center
- Weill Cornell Medical College

The Pathways Study would not be possible ...

- Without the many researchers and study staff who have believed in this study and have been dedicated their effort to ensuring the best study procedures and data quality possible
- The support of the KP research and health care community
- Funding support from the National Cancer Institute

And most of all, the **thousands of study participants who have generously contributed their time, experience, and information so that others may benefit from the knowledge that comes from their participation**