NURSES' HEALTH STUDY NEWSLETTER | VOLUME 23, 2016

NHS NEWS

Celebrating Forty Years!

This year, we are delighted to celebrate the 40th anniversary of the Nurses' Health Study, and to honor all the nurses who have given their time and enthusiasm to this extraordinary project.

A Brief History of the NHS

The Nurses' Health Study (NHS) has been a pioneer in the study of women's health. The data collected over the last 40 years have been exceptionally rich, combining long-term lifestyle and health-related information while also creating and maintaining an extensive repository of biological specimens. Thanks to the dedication of our participants, the NHS maintains a response rate approaching 90% for each questionnaire cycle.

The study's origins go back to the early 1970s, following reports that phlebitis and pulmonary emboli in healthy young women might be associated with the newly widespread use of oral contraceptives. To investigate the topic appropriately, researchers needed long-term follow-up data on sufficiently large cohorts of women.

Back row: *Walter Willett, Heather Eliassen, Meir Stampfer* ***Front row:*** *Fran Grodstein, Frank Speizer, Sue Hankinson,*

In 1976, Dr. Frank Speizer turned to 121,700 nurses to create the NHS. The nurses' medical sophistication and dedication have made the NHS arguably the world's most valuable study of women's health.

We continue to follow the nurses through biennial questionnaires, making the NHS the first cohort of its size with repeated data collection. We have expanded the NHS's research scope, founded a biorepository of blood and tissue samples, and established four related studies: the Nurses' Health Studies II and III, the Growing Up Today Study, and a study in men, the Health Professionals Follow-Up Study. The NHS is also instrumental in training new generations of researchers; the study data have been used by hundreds of trainees, many of whom have gone on to leadership positions in epidemiological research around the world. NHS

Contributions to Science

The contributions to science that have relied on NHS data are vast and varied. Well over 1,000 scientific papers have been published from NHS data. NHS research has enabled many practical and widely applicable recommendations to improve public health.

To highlight the importance of the Nurses' Health Study's achievements The American Journal of Public Health will publish a special edition, all about the NHS, in the fall. To give you a preview of this AJPH special issue, some of our key findings over the last four decades are summarized below.

Cardiovascular Disease

Cardiovascular disease (CVD) remains the leading cause of death in women and men. The NHS provided the necessary evidence to support the growing consensus that diets low in trans fats, saturated fats, refined carbohydrates, and sugar-sweetened beverages, and diets rich in fruits and vegetables, whole grains, and sources of unsaturated fats are associated with reduced risk of CVD. Other healthy lifestyle choices include not smoking, regular physical activity, maintaining a weight in the normal body mass index (BMI) range, and moderate alcohol consumption. The NHS was the leader in studying many of those preventive factors, and led the largely successful battle to rid the American diet of trans fats from partially hydrogenated oils. We found that by following these simple guidelines, the vast majority of CVD can be prevented. For more information, see "Diet, Lifestyle, and Biomarkers and Risk of Cardiovascular Disease in the Nurses' Health Studies," by Yu et al. in the forthcoming *AJPH* issue.

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Breast Cancer

For four decades, NHS researchers have investigated a wide range of lifestyle factors, medications, biomarkers, as well as intermediate endpoints and breast cancer tumor characteristics. The NHS has examined exogenous hormones (oral contraceptives and postmenopausal hormones), endogenous hormones, weight and weight change, and lifestyle factors including diet, physical activity, aspirin consumption, and shift work. The NHS has also led the way in studies of intermediate markers of breast cancer risk, including benign breast disease and mammographic density, and genetic factors. This research has identified ways in which women may reduce their risk of breast cancer, including limiting adult weight gain, reducing the duration of hormone therapy involving estrogen plus progestin, limiting alcohol consumption, and increasing consumption of vegetables. For more information, see "Breast Cancer Research in the

MORE IN-DEPTH DETAILS

We have arranged for free digital access to the *American Journal of Public Health's* special Nurses' Health Study edition when it is published in the Fall of 2016.

For more information, see **nurseshealthstudy.org/AJPH**

Nurses' Health Studies: Exposures Across the Lifecourse," by Rice et al. in the forthcoming *AJPH* issue.

Neurodegenerative Diseases

NHS research has led to significant progress in the understanding of how lifestyle, diet, and genetic/biologic factors can affect the risk of cognitive decline, multiple sclerosis, Parkinson's disease, and ALS. Factors which support the maintenance of cognitive function include higher intakes of flavonoids (especially from berries), nuts, moderate alcohol, as well as physical activity whereas postmenopausal hormone use has been associated with more rapid decline. For multiple sclerosis, the NHS has also been integral in establishing Epstein-Barr virus infection, inadequate vitamin D nutrition, cigarette smoking, and obesity as risk factors. Inverse associations between cigarette smoking and caffeine with Parkinson's disease risk were also noted. In the case of ALS, smoking has been determined to be a risk factor, and obesity is associated with decreased risk for reasons that need to be further explored. For more information, see "Epidemiology of Major Neurodegenerative Diseases in Women: Contribution of the Nurses' Health Study," by Hagan et al. in the forthcoming *AJPH* issue.

Diabetes

Findings from the NHS cohorts indicate that approximately 90% of type 2 diabetes cases may be prevented by diet and lifestyle modifications. There is compelling evidence that high body fat is the single most important risk factor for type 2 diabetes; thus, maintaining a healthy body weight and avoidance of excess weight gain during adulthood is the cornerstone of diabetes prevention. At the same time, diet quality can contribute to diabetes prevention independent of body weight. Higher consumption of coffee, whole

Continued on page 5

NHS: Training the Next Generation

While conducting research is our primary goal, training the next generation of scientists has always been of great importance to us. Past and present Nurses' Health Study researchers now occupy the following prestigious academic roles, around the country and around the world.

17 DEPARTMENT CHAIRS

43 FULL PROFESSORS

19 ASSOCIATE PROFESSORS

26 ASSISTANT PROFESSORS

Focus on our Research Team

Frank Speizer

FOUNDING PRINCIPAL INVESTIGATOR NHS

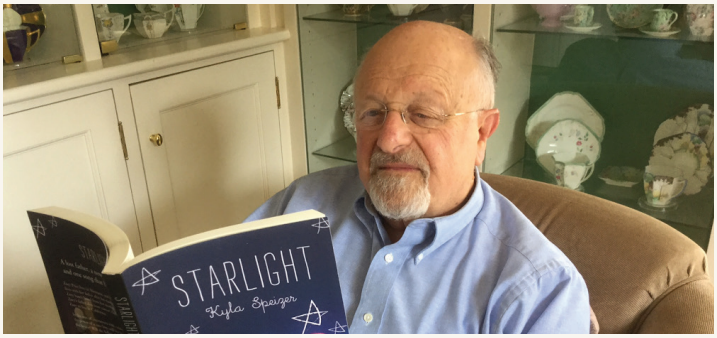
Dr. Frank Speizer has spent over 50 years associated with Harvard University. After completing his clinical training at Stanford Medical School and time in England working with Sir Richard Doll, he joined the Channing Laboratory in 1968. He was co-director of the lab from 1988–2005.

He has played a major role in the establishment of large cohort studies related to environmental exposures including air pollutants and diesel exhaust. As the founding principal investigator of the Nurses' Health Study, he helped to develop new ways to examine how lifestyle factors can influence risk for chronic diseases among women.

With colleagues at the Harvard T.H. Chan School of Public Health, he started the Six Cities Study, the results of which have played a major role in the setting of modern National Ambient Air Quality Standards. In 2000, he was elected into the Institute of Medicine of the National Academy of Sciences.

Presently, in addition to continuing his involvement with the Nurses' Health Study, Frank works with colleagues at Harvard Medical School in establishing a cohort of retired National Football League Players to explore the long-term health consequences of participating in the sport.

He has the good fortune to have been married to his wife Jeanne for almost 60 years. He has four children and eight grandchildren. He is currently working part time, which gives him the opportunity to enjoy showing off his 13-year-old granddaughter's first novel, published earlier this year.



Fran Grodstein

DIRECTOR OF THE NHS

Dr. Fran Grodstein came to Harvard in 1988 to earn a doctorate in epidemiology at the Harvard School of Public Health. After completing her doctorate in 1992, she joined the Channing Laboratory as a postdoctoral fellow working with the Nurses' Health Study, and she has been part of the NHS ever since.

Dr. Grodstein's first major project in the Nurses' Health Study was to establish a study in the mid-1990s of memory in participants age 70 years and older. She worked closely with neuropsychologists to develop a battery of memory assessments that could be administered by telephone to the nurses. This substudy eventually enrolled almost 20,000 of the nurses and helped examine how diet and lifestyle could affect memory with aging. Extensions of this work recently include a computerized memory battery which is being initiated in Nurses' Health Study II.

In 2011, Dr. Grodstein became the scientific director of the Nurses' Health Study. She oversees research operations, with the goal of supporting all investigators in their work, as well as trying to keep the infrastructure running smoothly and efficiently.

She has a beautiful family, with two energetic children who keep her young! Toby is nine years old and was adopted from Korea, and Kaya is seven and was adopted from Taiwan. NHS

"Contributions to Science" continued from page 3

grains, fruits, and nuts is associated with a lower type 2 diabetes risk, whereas regular consumption of refined grains, red and processed meats, and sugar-sweetened beverages is associated with a higher risk. Other risk factors for type 2 diabetes include physical inactivity, exposure to both passive and active smoking, and both long (≥9 hours/day) and short (≤5 hours/day) sleep durations. For more information, see "Risk Factors for Type 2 Diabetes: Diet, Lifestyle, Biomarkers, and Genetics," by Ley et al. in the forthcoming *AJPH* issue.

Colorectal Cancer

Colorectal cancer is one of the most common cancers worldwide, and NHS research has made huge contributions to our understanding of its origins and prevention; in fact, researchers have estimated that 43% of colon cancers in the NHS were potentially preventable with lifestyle modification, and even more when judicious use of colonoscopy is added. Risk factors for colorectal cancer identified by the NHS include consumption of red and processed meat, alcohol consumption, smoking, and obesity. Folate, calcium, vitamin D, aspirin, and physical activity, on the other hand, have been shown to protect against colorectal cancer. NHS data have also supported the previously controversial hypothesis that colorectal cancer risk can be reduced by quitting smoking later in life. NHS studies focusing on survival among those with colorectal cancer have also shown that physical exercise, a healthy diet, and moderate alcohol consumption can improve outcomes. For these studies, NHS data are particularly invaluable; where many studies of colorectal cancer rely on post-diagnostic data, NHS researchers were able to examine pre- and post-diagnostic exposures independently in relation to survival. For more information, see "Colorectal Cancer Epidemiology in the Nurses' Health Study," by Lee et al. in the forthcoming *AJPH* issue.

Ongoing Investigations

The study began in 1976 with the primary goal of examining the health effects of oral contraceptives, but rapidly expanded to study causes of a wide variety of diseases among women, with the aim of finding means for prevention. For example, how can diet choices help prevent heart disease and cancer among women? With the maturing of the cohort, we are in a unique position to examine determinants of all aspects of "healthy aging"; what are the factors that allow women to live healthy, engaged, vigorous lives into their 80s and beyond?

> ***"With continued support from the dedicated nurse participants, we can together remain a beacon to shed further light on women's health for many years to come."***

The NHS is still implementing diverse innovations to expand and refine its research scope. For example, cutting-edge research making use of NHS cohort data includes studies on Cesarean births and the risk of offspring obesity, dietary patterns and risk of incident diverticulitis, religious service attendance and mortality among women, mental health and social epidemiology, and many, many others. With continued support from the dedicated nurse participants, we can together remain a beacon to shed further light on women's health for many years to come. NHS

Study Updates

Growing Up Today Study

The Growing Up Today Study (GUTS) is celebrating twenty years of ground-breaking health research. GUTS began in 1996, enrolling children 9–14 years old, who were the offspring of women in NHS II. Today those "children" are now young adults—many of whom are starting families of their own. As the cohort ages, the focus of our research continues to expand in new directions.

Presently, GUTS researchers are investigating the health effects of various substance use behaviors and the different obstacles to accessing treatment when it is needed. In the coming years, researchers plan to launch additional analyses of a wide range of topics affecting young adult health, including sleep behaviors, hearing loss, cognitive function, and eating disorders.

Twenty years of consequential research of this kind would not be possible without the generous commitment of both GUTS and NHS II participants. Even if it's been a few years since your son or daughter last participated, we'd love to hear from them in 2016. For more information, visit **www.gutsweb.org.**

Nurses' Health Study 3

The Nurses' Health Study 3 continues to grow and YOU can help. Over 40,000 female and male RNs, LPNs and nursing students born on or after January 1, 1965 have enrolled. We are particularly interested in adding male nurses to the study. Most of the nurses who have joined the study during the last year learned about NHS 3 from current participants like you.

We hope you will act as our ambassador to encourage your colleagues to join this new study by visiting **www.nhs3.org**, where you can get more information and even download signs to help spread the word. With your help, we hope to make NHS 3 a big success for the next generation!

NHS Mail

"I am doing pretty darn good. I worked out at the club today (stationary bike and lifted a few free weights) and participated in a concert at an assisted living center with 20 other 'senior singers'. Such fun! On Saturday I plan to run 5 miles (I run 3 days a week). I have a busy life and still cook a lot, do scrapbooking, work on my computer skills and enjoy every day."

A.G. *(81 doesn't seem any older than 80)*

Quote used with permission.

Check out the new NHS website!

This spring, in honor of the 40th anniversary of the NHS, we launched a new website for the NHS and NHS II: **nurseshealthstudy.org**. The site features a modern design and layout as well as a new NHS logo. In addition, the site contains information that study participants, researchers, and members of the public will find helpful.

Here is a sample of the information you can find on the website.

- Recent news articles about NHS studies
- An overview of the history of the studies
- The former and current principal investigators
- Key contributions to scientific knowledge
- An archive of past questionnaires and newsletters
- Information on how to contact us

We hope that you will explore **nurseshealthstudy.org** and be proud to share the link with your nursing colleagues.

Valuable data from cancer registries

When a member of the Nurses' Health Study reports a new cancer diagnosis, we generally contact the nurse to request permission to review her medical records relating to this diagnosis. When this is not possible, we may request data from state cancer registries on diagnosis date and tumor characteristics such as site, type of tumor, stage of disease, and treatment. This detailed diagnostic information from the registry, combined with the extensive lifestyle, health and biologic data that the study has collected across decades, is vital to understanding the causes of cancer and allows us to learn more about improving survival for a variety of cancers. Most states have cancer registries. In order to accurately locate the correct information, we securely send the patient's name, date of birth, address and social security number to the state's cancer registry to look for a match. If you do not wish to have your data linked with the state cancer registry data, in the event you are diagnosed with cancer, please send an email to **nhsgwas@channing.harvard.edu** or write us at NHS Cancer Registry, 181 Longwood Ave, Boston, MA 02115. If you have any questions, please call Ayesha Mohammed at 617-525-1116 (M-F,9-5).

If you'd like to speak to someone not involved in this research about your rights as a research subject, or any concerns or complaints you may have about the research, contact the Partners Human Research Committee at 617-424-4100. NHS

HOT OFF THE PRESS:

Specific Dietary Fats in Relation to Total and Cause-Specific Mortality

Consuming higher amounts of unsaturated fats was associated with lower mortality, according to a study from researchers at Harvard T.H. Chan School of Public Health using NHS cohort data. The findings also showed that higher consumption of saturated and trans fats was linked with higher mortality and replacing saturated fats with unsaturated fats conferred substantial health benefits. This study provides further support for the 2015-2020 Dietary Guidelines for Americans that emphasize the types of fat rather than total amount of fat in the diet.

The study is the most detailed and powerful examination to date on how dietary fats impact health. It suggests that replacing saturated fats like butter and, lard, and fat in red meat with unsaturated fats from plant-based foods—like olive oil, canola oil, and soybean oil—can be beneficial to health and should continue to be a key message in dietary recommendations. Among the polyunsaturated fats, both omega-6, found in most plant oils, and omega-3 fatty acids, found in fish and soy and canola oils, were associated with lower risk of premature death. NHS

Friends of the Nurses' Health Study

Over the years, many participants and their families have asked how they might help support the NHS and NHS II, beyond the wonderful and generous donation that all participants make of their time and energy. We are deeply grateful for the expressions of support and for donations made to the Friends of the Nurses' Health Study Fund, especially in view of the constraints of federal support for research.

If you wish to make a donation, please contact us at the address below. Alternatively, please call us at 617-525-2258 or visit **www.nurseshealthstudy.org** and click the "Donations" link. Donations and bequests help sustain our ongoing research.

Nurses' Health Study

To report name or address changes, please visit **www.nurseshealthstudy.org.** Letters and feedback are welcome!

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