UNIVERSITY OF HAWAI'I CANCER CENTER
USC University of Southern California

A Newsletter for the Participants of the Multiethnic Cohort Study

Multiethnic BULLETIN

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Multiethnic Cohort Update

The Multiethnic Cohort Study (MEC) is an example of world class research being conducted at the University of Hawai'i Cancer Center and University of Southern California Norris Cancer Center. Research studies such as the MEC provide new information on the causes of cancer and other chronic diseases and, how they can be prevented. The success of this study is a direct result of your long-term commitment to completing our surveys over the many years.

MEC HIGHLIGHTS

- The MEC is unique in that it is one of the largest and the most ethnically diverse studies in the world that investigates the roles of diet, lifestyle, and genetics in the causation of cancer and other chronic diseases. In 1993-1998, MEC recruited over 215,000 participants who answered our first or "baseline" questionnaire. There is remarkable representation in MEC of five major ethnic groups living in Hawai'i and Los Angeles. By studying the different lifestyles of these groups with different risks for cancer, MEC researchers can better determine which behaviors are associated with a higher risk for certain cancers.
- MEC has gained national and international recognition among biomedical scientists. Investigators at more than a hundred other institutions around the world have used the MEC resource for ancillary studies and to extend scientific knowledge on a specific cancer or other chronic disease.
- MEC study data has resulted in over 850 scientific articles published in 169 different medical journals on topics including smoking, obesity, diet, alcohol and coffee consumption, meat cooking methods, physical activity levels, hormones, reproductive factors, genetic disposition, inflammation, sleep, air pollution, environmental contaminants, gut microbes, diabetes, and more, all of which are based on the answers you provided in the surveys you sent back to us.
- The MEC Biorepository, a collection of stored biological samples such as urine, blood and stool that were collected from MEC participants over the years, allow laboratory researchers to investigate how diet, hormones, metabolism and genetics affect one's risk of developing cancer, as well as some of the biological mechanisms involved in cancer and related diseases, when combined with survey data. The MEC Biorepository contains more than 2.5 million specimens from over 75,000 MEC participants.
- The MEC website available to participants to peruse is routinely updated to provide current and important information about the study. Participants are able to view MEC-related news, links to scientific publications, past issues of the Multiethnic Bulletin and much more. Participants can update their contact information via the website for future mailings. We encourage you to visit the website by scanning the QR code below or using the address **uhcancercenter.org/mec**.
- Findings from MEC data have resulted in knowledge that will save lives and improve early detection and prevention strategies of cancer and other chronic diseases.

Thank you for being an integral part of the Multiethnic Cohort Study!

Multiethnic Cohort Study

If you have recently moved or have a new phone number, please call us at 1-800-786-3538 (Toll free in California) • (808) 586-2996 (Oahu) • 1-877-415-8323 (Toll free in Hawai'i) or visit our website at *www.uhcancercenter.org/mec*

Risk Factors for Type 2 Diabetes in the MEC

Type 2 diabetes incidence and prevalence show strong disparities across ethnic groups with higher risk in groups with ancestries other than European. Factors such as excess weight, smoking, poor diet, and physical inactivity play a significant role in the development of type 2 diabetes. To understand these ethnic differences, researchers in Hawai'i and Los Angeles recently studied how different risk factors affect the five ethnic groups in the MEC.

During the 23 years of study follow-up between 1993 and 2016, 46,500 MEC participants were diagnosed with type 2 diabetes, which accounted for about 27% of the members not reporting diabetes at baseline. Several ethnic groups had a higher risk to develop type 2 diabetes. By the end of the follow-up period, the percentages with diabetes were 31% for Native Hawaiians, 31% for Latino Americans, 28% for Japanese Americans, 28% for African Americans, and 20% for Whites.

The most important factor related to type 2 diabetes in all ethnic groups was the presence of overweight or obesity at cohort entry, but excessive body weight was not equally important for all ethnic groups as shown in the Figure below. Overweight and obesity increased risk of diabetes incidence by 2-fold and 3-fold, respectively. This was true for each ethnic group except African Americans, where the risk of diabetes was lower. It is also noteworthy that Japanese American and White individuals who were underweight experienced a 30% lower incidence of diabetes. Physical activity as reported by cohort members in the first questionnaire was also associated with the presence of diabetes. On average, individuals who were more active had a 20% reduced risk for diabetes.

Another risk factor investigated was daily red meat consumption. Compared with those who ate less red meat per day, individuals who consumed moderate to high amounts both showed a 6-15% elevated risk in developing diabetes. Conversely, participants who reported a high quality diet displayed a lower risk for the disease. In addition, moderate consumption of coffee and alcohol was found to be protective against diabetes in all ethnic groups. Smoking was a significant risk factor for type 2 diabetes.

These results confirm the importance of known risk factors for type 2 diabetes and show how vital it is to take care of one's overall lifestyle to prevent type 2 diabetes. Maintaining a healthy weight and diet, as well as reducing adverse behaviors, such as smoking, may protect against this serious condition and its complications such as heart disease, kidney failure, damage of the retina, and loss of limbs.

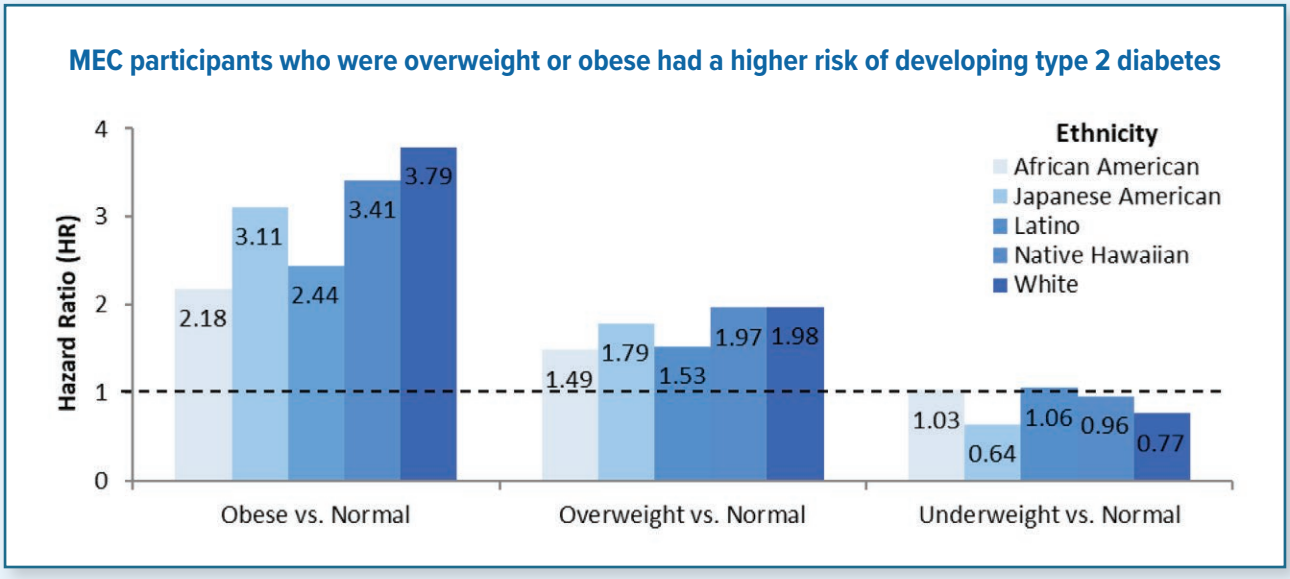

Figure: Risk of type 2 diabetes associated with body mass index (BMI) and physical activity by ethnicity. Values above 1 indicate an increased risk for diabetes, while values below 1 show a protective effect against developing the disease.

Traffic-related Air Pollution and Survival Following Breast Cancer Diagnosis Among Californian Women in the MEC

There are over 3.8 million breast cancer survivors in the U.S. A public health priority is to identify factors that can improve the health of this large group of women. Air pollution is known to impact several health outcomes, including mortality. A study was conducted among 3,089 women in the MEC, who were diagnosed with breast cancer and who resided in California from 1993-2013. Among these women, there were 474 deaths from breast cancer and 272 deaths from cardiovascular disease during the study follow-up. Exposure to air pollution was estimated over this 21-year period based on the statewide air monitoring data available for California.

The association between air pollution and risk of death following a breast cancer diagnosis was examined. An increased risk of death from breast cancer and cardiovascular disease was found with higher exposure to the gaseous pollutants called nitric oxides that are markers of traffic-related air pollution.

These findings are important as they suggest that traffic-related air pollution influences survival after breast cancer diagnosis, supporting the need for public policies and regulation to maintain healthy air standards.

Addressing Overweight and Obesity in Hawai‘i

An estimated 42% of U.S. adults aged 20 and over are classified as obese and another 31% are overweight. Data from the Multiethnic Cohort volunteers participating in the “MEC Adiposity Phenotype Study”, from Hawai‘i and California, assisted with the discovery that substantial variation exists in the distribution of body fat, especially when comparing multiple ethnic groups. Among some individuals, excess body fat was identified as being primarily around the abdomen and/or limbs. In contrast, there were others with excess body fat being primarily around the internal abdominal organs. With regard to overall health, the body fat around the abdominal organs, referred to as “visceral adipose tissue” (VAT), puts one at greater risk for type 2 diabetes, chronic liver disease, and certain cancers.

IF YOU ARE A HAWAI‘I RESIDENT BETWEEN 35-69 YEARS OLD AND INTERESTED IN PARTICIPATING IN THE SIX-MONTH HDLS2, PLEASE CONTACT US AT 808-237-3901 OR BY EMAIL AT HDLS2@CC.HAWAII.EDU.

To address these risks, MEC investigators undertook a pilot study, the Healthy Diet and Lifestyle (HDLS) study, to evaluate how well different diets reduce VAT, and how well participants followed the study requirements. The pilot was restricted to sixty East Asian volunteers in Hawai‘i, ages 35-55 years. The volunteers were randomized to one of two diets for three months. One involved intermittent energy restriction with partial fasting two consecutive days each week combined with a Mediterranean diet (IER+MED) the remaining five days of the week. The other was the DASH diet with no energy restriction. The participants were able to successfully follow the diets. The study demonstrated that the IER+MED diet was acceptable and lowered VAT.

These results provided the backdrop to undertake a larger study to better evaluate which method of energy restriction works the best. The idea of IER+MED worked well in the pilot. What is unknown is whether the intermittent energy restriction performs differently from “daily energy restriction”. National Institutes of Health designated studying this question a priority. To explore this research question, we submitted a “HDLS2” proposal to the National Institutes of Health (NIH). The good news is that we received a grant to carry out this work.

HDLS was funded by the William and Ellen Melohn Endowed Research Fund and HDLS2 by the National Cancer Institute.

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The Role of Birthplace and Generation Status in Influencing Cancer Death Rates in Mexican-Latinos in the MEC

Latinos are the largest ethnic population in California, and more than 80% of Latinos in California are of Mexican origin. Little is known about how nativity and generation status influence cancer rates in Mexican-Latinos. MEC investigators examined whether birthplace and generation status influence cancer mortality among the 27,000 cohort participants of Mexican-Latino origin. We observed a higher risk of cancer death by 30% in US-born Mexican-Latinos whose parents were born in Mexico relative to the first-generation Mexico-born immigrants. When we looked by type of cancer, US birthplace was associated with increased risk of colorectal, liver and lung, and ovarian cancer death, whether or not known risk factors for these cancers were present. Interestingly, overall and site specific cancer mortality was similar for US-born Mexican-Latinos with both parents born in Mexico, with one parent born in Mexico and the other born in the US, and with both parents born in the US. These findings suggest that US birthplace is a risk factor for cancer death in Mexican Americans. Finding what factors contribute to increasing cancer mortality in US-born Mexican-Latinos is important to curtailing this pattern.