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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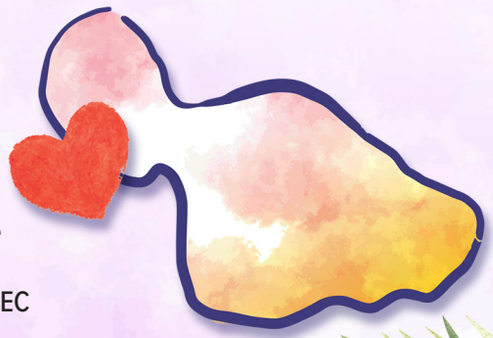
Multiethnic Cohort Update

We are happy to report that we are making great strides toward fulfilling our mission. Thanks to your participation in the Multiethnic Cohort Study (MEC), we have been able to study the behavioral and genetic causes of cancer and other chronic diseases for over three decades! Your dedication and commitment to this research have allowed us to develop a resource of data and biospecimens that is truly unique in the world. Using this resource to understand differences in the risk of cancer across racial and ethnic groups has remained our main focus, with the goal of preventing cancer in all populations. This work has led to changes in local and national policies, and in cancer prevention practices. In addition to applying the expertise and talents available at our institutions, we have teamed up with researchers around the world to answer broader questions and promote rapid advancement in science.

MEC researchers continue to be remarkably successful in obtaining federal grants to meet their research objectives, especially considering the significant decrease in research funding nationally. Looking to the future, we are resolved to leverage the cohort to answer critical questions about cancer occurrence in each population represented in the MEC (Native Hawaiians, African Americans, Latinos, Japanese Americans, Filipino Americans, Okinawan Americans, Whites) and for emerging risk factors, such as new environmental man-made pollutants, climate change, and social determinants of health.

It has also been tremendously rewarding to use the MEC for training the next generation of researchers who are now expanding our work with an equal passion and dedication. We are immensely grateful for your support and participation as we continue to pursue a future without cancer.

Maui
ISLAND WILDFIRES



We express our sincere condolences to those impacted by the devastating August 2023 Maui wildfires. We sadly share that several MEC participants lost their lives and many others were directly affected by this tragedy. Many on Maui have lost loved ones, homes, and their community. Our thoughts are with them.

For more updates on the MEC, visit our website: *https://www.uhcancercenter.org/mec*. You'll find news, FAQs, previous newsletters, poster presentations, list of scientific articles, map of collaborators, and more.

Changes in Diet Quality Among MEC Participants in Relation to Mortality

Diet quality was assessed using the Healthy Eating Index-2015 (HEI-2015), which measures how well individuals meet the 2015-2020 Dietary Guidelines for Americans (https://www.dietaryguidelines.gov/). Diets that meet the guidelines receive a higher HEI-2015 score. Between cohort entry (1993-1996) and the 10-year follow-up (2003-2006), overall diet quality improved slightly among MEC participants who completed both surveys. The HEI-2015 score increased by an average of 3 points, from 68 to 71 points out of a possible 100. The HEI-2015 score is made up of scores for 13 dietary components (see Figure 1). The average scores for all components of the HEI-2015 over the 10-year follow-up either remained the same or showed slight improvement, except for saturated fat. The slight decrease in score for this component indicates an increase in saturated fat consumption over time. Despite the overall improvement in diet quality, scores for whole grain, dairy, and sodium remained low. Whole grain and dairy intakes were lower than recommended, while sodium intake was high in comparison to the dietary guidelines.

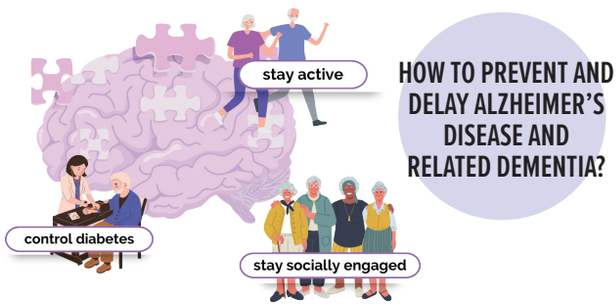
The 10-year change in diet quality was examined for association with subsequent mortality among both cancer survivors and participants without cancer. Compared to those with a stable HEI-2015 score over the 10 years, cancer survivors whose scores improved - meaning a better diet quality - had up to a 13% lower mortality. Conversely, those whose scores declined - meaning a worsening diet quality - had about a 25% higher mortality. Similar associations between diet quality changes and mortality were observed among MEC participants without cancer. The findings suggest that improving diet quality and maintaining a healthy eating pattern over time is beneficial for older adults, regardless of whether they have been diagnosed with cancer or not.

Figure 1: Score of how well MEC participants met the Dietary Guidelines for Americans at cohort entry and 10 years later for each component of the HEI-2015 diet quality index. The outer edge of the graph represents the optimal score (100%), while the center represents the least desirable score (0%).

Cancer Incidence Among Filipino Americans by Generational Status in the MEC

Filipinos make up a major migrant group in the US, with the highest concentrations of Filipino Americans in Hawai'i and California. The size of the Filipino population is estimated to be 200,000 in Hawai'i and 1.7 million in California. Research on cancer incidence among migrants has allowed us to understand how changes in lifestyle, behaviors and exposures play a role in cancer risk. We investigated the impact of migration, or generational status, on the risks of colorectal, breast and prostate cancers among the 10,495 MEC members who self-reported as being Filipino. Among Filipino males, we observed a 62% increased risk of colorectal cancer incidence among 2nd and 3rd generations compared to the 1st generation born in the Philippines. This increase in risk by generation in women was much weaker. Filipino women of the 3rd generation exhibited a 57% higher breast cancer incidence compared to the 1st generation. In contrast, the risk of prostate cancer was lower for the 2nd and 3rd generations, compared to the 1st. These differences in cancer risk by generational status may be due to acculturation and/or screening practices. Acculturation is the adoption by migrants to the lifestyle and health-related behaviors common in the host country, such as a Westernized diet and sedentary lifestyle that could lead to overweight and obesity.

Alzheimer's Disease in MEC: Ethnic/Racial Differences in Risk Factors



Alzheimer's and related dementia have been considerably less studied among racial and ethnic minorities compared to Whites. MEC researchers previously reported that risk of Alzheimer's disease and related dementia differs across ethnic and racial groups (see 2021 MEC Bulletin: https://www.uhcancercenter.org/mec-newsletters). In MEC, risk was highest among African Americans and Native Hawaiians, followed by Latinos and Whites, and lowest in Asian Americans. Recently, we estimated the percentages of Alzheimer's and related dementia cases that are accounted for by known risk factors, including the genetic risk factor *APOE* e4 and twelve non-genetic risk factors. The risk factors studied were: lower education level; residing in a neighborhood of lower socioeconomic status; being unmarried (a proxy for having less social support); having been diagnosed with hypertension, stroke, diabetes or heart disease; smoking; being less physically active; sleeping fewer hours or longer hours; being obese; or eating a poor quality diet.

We found that the genetic risk factor, *APOE* e4, accounted for 10-14% of cases in each sex and ethnic group. The non-genetic risk factors together accounted for 23% of the cases, but this proportion varied across racial and ethnic groups: 33% of cases in Latinos, 29% in Native Hawaiians, 28% in African Americans, 22% in Whites, and 14% in Japanese Americans. Lower socioeconomic status and education were important contributors to risk for all groups. The risk factor that accounted for the highest proportion of cases was diabetes for Latinos, being unmarried for African Americans, low physical activity for Native Hawaiians and Japanese Americans, and smoking for Whites. These findings have implications for preventing Alzheimer's and related dementia, conditions that are taking a growing toll on our aging society.

My Journey as a MEC Research Team Member

▶ By Janine Abe, Ph.D.

Cancer affects the lives of many, either through their own experience or through those of people around them. My journey with the MEC research team began in 2006 when I joined the MEC study as an interviewer at the University of Hawai'i Cancer Center. In the following thirteen years, I had the honor of contacting many of you to assist in completing the health surveys. Motivated by my passion for learning and inspired by the impact MEC has had, I decided to go back to school. In 2019, I enrolled in the Epidemiology PhD program at the University of Hawai'i and was fortunate to receive a graduate assistantship (GA) with the MEC team. Throughout my academic journey, I was privileged to receive guidance from many MEC researchers. For my PhD dissertation, I used the MEC data to study the association of lifestyle and reproductive factors with risk of thyroid cancer, and I graduated in 2022. Thyroid cancer is the most common endocrine cancer worldwide, and Filipinos like myself have high incidence rates compared to other racial and ethnic groups.

Most importantly, we found associations with risk factors that can be modified, such as obesity and diabetes, as well as reproductive factors, such as having a hysterectomy and surgical menopause. We also found that thyroid cancer patients who are males (compared to females) and Filipinos (compared to other racial and ethnic groups) had a higher mortality rate.

I am currently beginning my second year as a postdoctoral fellow with the MEC. One of the projects I am working on is looking at cancer occurrence among Filipino Americans by generational status. Starting as someone who collected data, then moving on to analyzing and interpreting these data has been very rewarding. I am continuously learning and am excited to be working toward becoming an independent researcher. I am truly grateful for your participation as it made it possible for me, and others like me, to do research that will have an impact on our communities and beyond!

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Airport-Related Air Pollution and Lung Cancer Risk

There is increasing evidence that airports are an important source of air pollution caused by "ultrafine particles" (UFPs). The exceptionally small size of these particles allows them to penetrate deeply into the lungs. A study conducted by MEC researchers, involving over 71,000 participants in California, explored the long-term health effects of exposure to UFPs from Los Angeles International Airport (LAX). The focus was particularly on lung cancer across a diverse residential population.

This research examined long-term UFP exposure over a 20-year period and found no significant link between UFP exposure and overall lung cancer risk in the entire cohort. However, a notable association was found between UFP exposure and an elevated risk of lung squamous cell carcinoma, a distinct and relatively common sub-type of lung cancer. This association was especially strong in specific subgroups, including males and smoking participants. This suggests that individual attributes such as smoking history may interact with environmental exposures like UFPs to influence cancer risk.

While these findings require confirmation in other studies, they highlight the potential link between airport-related air pollution and risk of lung squamous cell carcinoma. These results have implications for improved air quality monitoring and stricter air pollution control around major aviation hubs.