



UNIVERSITY OF HAWAII  
CANCER CENTER



# Multiethnic Bulletin

A NEWSLETTER FOR THE PARTICIPANTS IN THE MULTIETHNIC COHORT STUDY

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## Multiethnic Cohort Update

Many of you may be wondering why we ask certain questions in the *Follow-Up Health Surveys* we send you periodically for the *Multiethnic Cohort Study* (MEC). A few questions have been selected from the most recent survey, so we can provide you with some of the reasons why we ask them. Why we ask:

### If you ever smoked, how soon after waking up did you smoke your first cigarette?

Our researchers study the ways people smoke, in order to better understand how smoking relates to cancer, heart disease and other respiratory ailments. The time when people have their first cigarette of the day is one indication of how dependent they are on cigarettes. Information like this may help us to improve the effectiveness of smoking cessation programs.

### On average during the last year, how many hours at night did you sleep?

Research has found that sleep is related to overall health. Sleep patterns change with aging and with the use of some medications. Information on duration of sleep will allow our researchers to evaluate sleep patterns among MEC participants, and to see how this affects their risk of diseases such as cancer.

### On average during the last year, how many hours per day did you spend in the following sitting activities: 1) Sitting in a car, bus, truck or train; 2) Sitting at work; 3) Watching TV; 4) Sitting at meals; and 5) Other sitting activities (such as reading, playing cards, sewing, using a personal computer)?

Being physically active is well-known to be important to health. However, recent research suggests that the amount of time a person spends in sedentary activities (particularly sitting) may contribute to poor health even if the person is

physically active at other times. Answers to this question will allow our researchers to study the effects of different types of sitting activities on the risk of cancer and other diseases.

Have you had any of the following tests: 1) Gastroscopy of the stomach; 2) Colonoscopy or sigmoidoscopy of the colon; 3) PSA blood test for prostate (*men only*); 4) Mammogram (*women only*); and 5) Pap smear (*women only*)?

Screening tests like these help to detect diseases or conditions in their early stages when treatment is more likely to produce a cure. The screening tests listed here are specific for certain cancers that can be identified before symptoms appear and when early treatment can be initiated. By

comparing cancer incidence rates and survival between persons who routinely get screened and those who do not, our researchers can assess the effectiveness of having these tests.

Note: All of our study members should have received this most recent follow-up questionnaire in the mail by now. If you have not yet mailed in your completed survey, it is not too late! Your answers are valuable and allow our researchers to get a better understanding of the causes of cancer and other chronic diseases, and how they can be prevented. Your continued support over the many years of this project is greatly appreciated! ❖

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For more information on the MEC, please visit our website at [www.crch.org/multiethniccohort](http://www.crch.org/multiethniccohort).

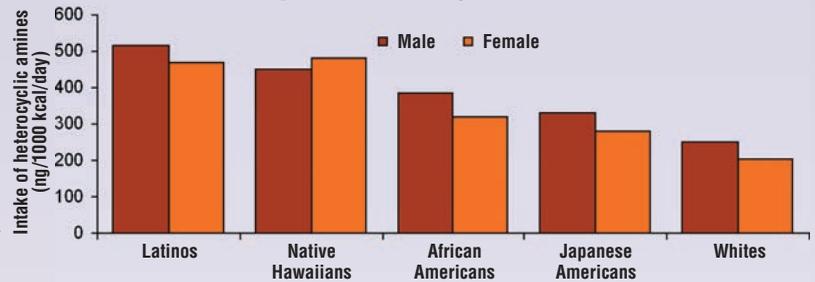
# The Multiethnic Cohort Study

## Intake of Cooked Meats and Heterocyclic Amines in the Multiethnic Cohort

In a short questionnaire that we sent you about 10 years ago, we asked questions about how often you cooked your meats (beef, pork, chicken, fish) by pan-frying, oven-broiling, and grilling or barbecuing. We also asked about the outside doneness of the meat (light, medium, or dark brown). This information enabled MEC researchers to estimate dietary exposure to heterocyclic amines (HCA), chemicals formed when meat is cooked at high temperatures. HCA formation is influenced by the cooking method and temperature used, cooking duration, and type of meat cooked. Previous research has shown HCA exposure to be carcinogenic (cancer-causing) in laboratory animals, but whether HCAs have the same effect in humans is not known. Just because a chemical can cause cancer in animals does not necessarily mean it can do so in humans. That is why, in order to learn how to prevent cancer in people, we need studies done in humans.

Based on your responses to the questionnaire, we found that pan-fried chicken was the most commonly consumed meat item (45% of men and 43% of women reported eating it at least once a week). The least often eaten item was grilled sausage, and oven-broiled hamburger ranked low as well. Of

Median Intake of Total Dietary Heterocyclic Amines according to Sex and Ethnicity in the Multiethnic Cohort



course, there were differences among ethnic groups in these eating patterns. We took the quantified information from the questionnaire and applied it to a database from the National Cancer Institute, which enabled us to calculate the intake of total HCAs, as well as three specific HCAs (commonly referred to as PhIP, MeIQx, and DiMeIQx). As shown in the figure above, the median intakes differed among men and women of the five ethnic groups in the MEC. Except for Native Hawaiians, men had higher HCA intakes than women, and across ethnicities, higher HCA intakes were found for Latinos [continued on page 4]



### Carol Boushey, PhD, MPH, RD

major responsibilities is to help other investigators assess dietary exposures reported by the MEC participants on their questionnaires. All of the dietary information provided by the participants is managed under Dr. Boushey's direction in a unique food composition database containing the nutrient content of ethnic foods and recipes that are not found in similar databases elsewhere.

Dr. Boushey's ties to Hawai'i extend back to the 1970s, when she earned her Master's degree in Public Health at the University of Hawai'i, and then worked in public health nutrition in Hawai'i for several years. This experience led her to pursue a doctoral degree at the University of Washington in Nutritional Sciences and Epidemiology. Prior to assuming her current position, she was a professor in the Department of Nutrition Science at Purdue University.

Recently, Dr. Boushey and a multidisciplinary research team from Purdue University were recognized for their work in developing a powerful Smart Phone application designed to obtain caloric and nutritional information (for example, amount of fat) from food images taken with a smart phone. Before-and-after pictures are analyzed for food identity and portion size as a means of conducting nutrient analyses that can help improve researchers' ability to accurately measure diet and determine which aspects of people's daily diets play a role in the risk of cancer. This ambitious research project holds great promise to harness new technologies in the advancement of dietary assessment. It is an outstanding example of the many contributions that Dr. Boushey has made to the field of public health research. ❖

IN THE SPOTLIGHT

Carol Jo Boushey is an Associate Professor in the Cancer Epidemiology Program at the University of Hawai'i Cancer Center. She also serves as the Director of the Nutrition Support Shared Resource at the Cancer Center. Dr. Boushey has been working on the Multiethnic Cohort (MEC) Study since joining the Cancer Center in May 2011, and serves as an advisor on data analysis related to diet and nutrition. One of her

# The Multiethnic Cohort Study

## Studying Obesity Rates in the Multiethnic Cohort

On the very first questionnaire that we sent you in 1993-1996, we asked for your height and weight. On three subsequent questionnaires over the next 15-years, we also asked you to update us with your current weight. With these data, we have been able to examine changes in body weight across time among study participants. Additionally, using measures of both height and weight, we calculated Body Mass Index (BMI) values, which are often used to determine whether persons are overweight or obese (see table below). As you are no doubt aware, having a BMI above normal may lead to chronic health problems.

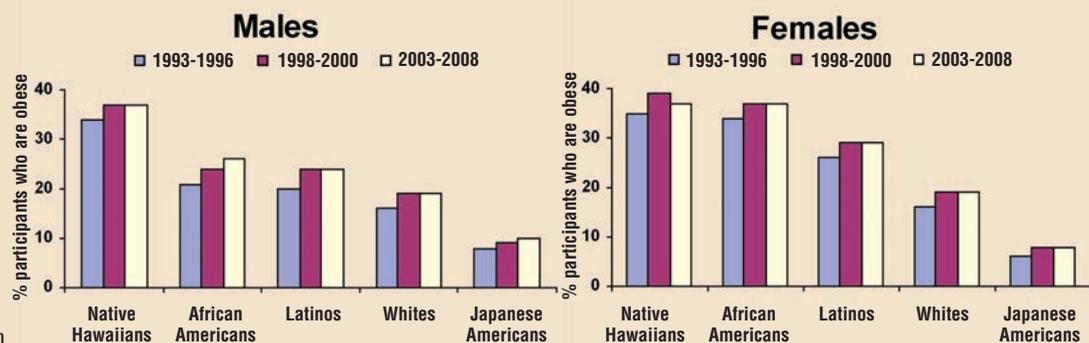
### Official BMI Categories and Ranges

Category	BMI Range
Underweight	18.5 and below
Normal	18.5 - 24.9
Overweight	25.0 - 29.9
Obese	30.0 and above

According to the U.S. National Center for Health Statistics (NCHS), approximately 32% of American men and 35% of American women aged 60 and over were obese in 2005-2006. In the MEC, however, only 19% of MEC men and 21% of MEC women were obese.

The bar graphs above shows how obesity rates have changed over the years in each ethnic group in the MEC, based on participants who gave us data in all three previous questionnaires (sent in 1993-1996, 1998-2000, and 2003-2008). For both men and women, the proportion of obese individuals increased between the first and second questionnaires in all ethnic groups. However, for nearly all groups, the

### CHANGES IN OBESITY RATES IN THE MEC

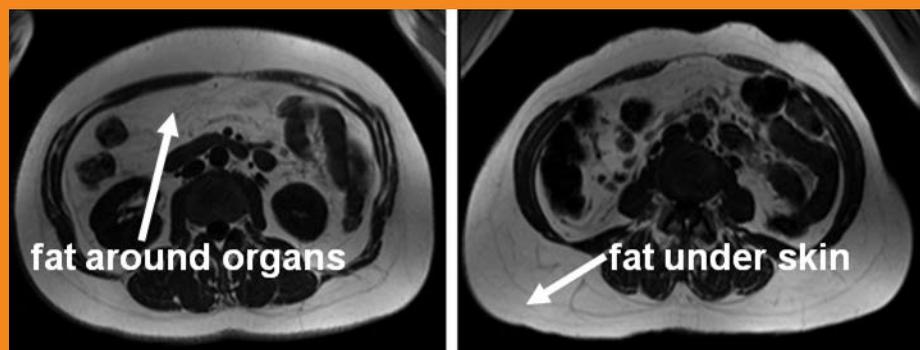


obesity rate stabilized after that. In fact, the rate of obesity decreased somewhat in the Native Hawaiian women in the last of the three time periods. Overall, Native Hawaiians and African Americans have the highest rates of obesity, and Japanese Americans have the lowest.

### NEW MEC STUDY

Because we found that the risk of getting diabetes or certain cancers was associated with BMI, but varied considerably depending on ethnicity, we have begun a new study to understand how fat

distribution in the body affects health. We are particularly interested in fat that is stored in the abdomen. Using MRI scans, for example, we found in some preliminary results that people differed greatly in where they store their abdominal fat, i.e., whether around the internal organs (visceral fat) or whether under the skin (subcutaneous fat) (see the MRI figure below). This very exciting new study will include 2,000 volunteer MEC participants, and has been funded by the U.S. National Cancer Institute for a period of 5 years. ❖



MRI cross-sectional view in the lumbar region of the abdomen, showing fat around organs (visceral fat) and fat underneath the skin (subcutaneous fat).



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## Multiethnic Cohort Study

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### Intake of Cooked Meats and Heterocyclic Amines in the Multiethnic Cohort

[continued from page 2]

and Native Hawaiians than for the other three groups.

Because cancers occurring in the colon and rectum would be the ones most likely to be influenced by exposure to HCAs, we then investigated whether higher dietary HCA intakes led to a greater risk of colorectal cancer in the MEC participants. However, our results did not show any increase in colorectal cancer associated with the intake of HCAs. These findings were reported in an article that was published in the scientific journal *Cancer Epidemiology Biomarkers and Prevention* in 2009. The full scientific citation is provided below.

Nöthlings U, Yamamoto JF, Wilkens LR, Murphy SP, Park SY, Henderson BE, Kolonel LN, Le Marchand L. Meat and heterocyclic amine intake, smoking, NAT1 and NAT2 polymorphisms, and colorectal cancer risk in the Multiethnic Cohort Study. *Cancer Epidemiol Biomarkers Prev.* 2009 Jul;18(7):2098-106

### Determining Your Own Body Mass (Obesity) Index

You can easily determine your own Body Mass Index (BMI) using this chart. Find the weight closest to your own across the top of the chart and draw a vertical line down from there. Then, find the height closest to your own on the left side of the chart and draw a horizontal line across the chart from there. Where the vertical and horizontal lines meet, you will find the number in the chart that corresponds to your BMI. You can then see whether you are underweight, healthy weight, overweight or obese.



Note: This chart is for adults (aged 20 years and older). Chart adapted from the Surgeon General's Report.  
<http://www.surgeongeneral.gov/library/calls/obesity/factsheet04>



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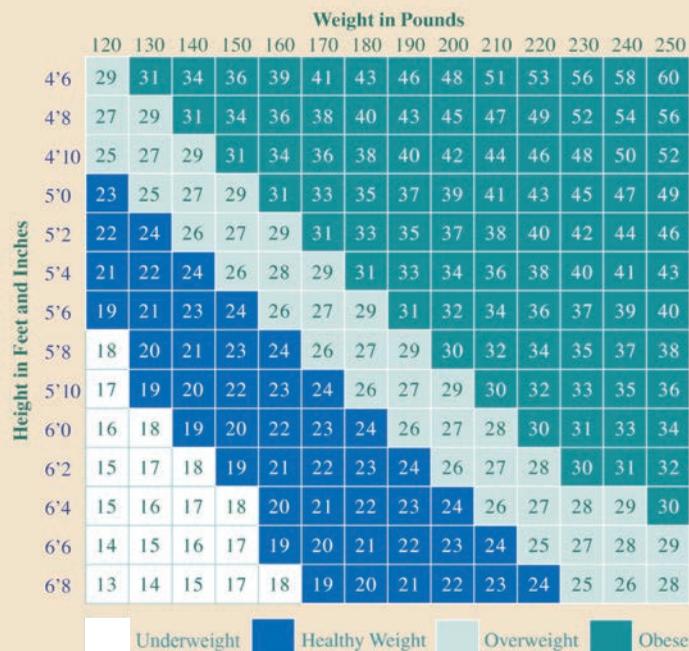
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