About the Physical Activity Research Resources of the Risk Factor Monitoring and Methods Branch
Applied Research Program

Introduction

The Risk Factor Monitoring and Methods Branch (RFMMB) is one of three branches in the National Cancer Institute's Applied Research Program. RFMMB contributes to reducing cancer in the U.S. by serving as a critical link between etiologic research on cancer risk factors, such as tobacco, diet, physical activity, sun exposure, and genetics and family history, and the translation of such research into targeted and effective interventions for prevention.

Current evidence convincingly indicates that physical activity reduces the risk of colon cancer and breast cancer and improves quality of life in cancer survivors. Physical activity also may reduce the risk of endometrial cancer and lung cancer.

To better understand the relationships between physical activity and cancer, levels and types of activity must be accurately assessed. This poses a challenge because assessment methods can be crude and imprecise.

The RFMMB supports the collection of physical activity data in existing and planned surveys. The goal of these efforts is to develop more complete assessments of individuals' physical activity using information derived from multiple contexts, including transportation, occupation, and recreation. RFMMB also conducts and supports methodological research to evaluate and improve physical activity assessment.

Activity Monitors

Activity monitors can be used to collect objective physical activity data in large surveys, such as the National Health and Nutrition Examination Survey (NHANES).

These monitors, which record motion activity as people wear them over several days, circumvent the cognitive and cultural challenges inherent in collecting physical activity data by questionnaire.

Several SAS programs are available to investigators who wish to analyze accelerometer (Actigraph 7164) Physical Activity Monitor (PAM) data from the 2003-2006 NHANES. These programs are used to import and analyze NHANES accelerometer data that can be downloaded from the Centers for Disease Control and Prevention's National Center for Health Statistics (NCHS) NHANES website (http://www.cdc.gov/nchs/nhanes.htm).

These programs also can be used with data downloaded directly from Actigraph 7164 accelerometers used in other studies. To do this, the user must first convert the data into the appropriate format and merge the records from multiple accelerometers. A program for this conversion is provided on the RFMMB website.

For more information: http://riskfactor.cancer.gov/tools/nhanes_pam

Metabolic Equivalent (MET) Values for Activities in the American Time Use Survey (ATUS)

The ATUS, conducted by the U.S. Department of Labor, Bureau of Labor Statistics, collects information on how Americans spend their time in work, household chores, child care, recreation, and other activities. The activities reported in the 2003 ATUS have been linked to estimates of physical activity intensity from the Compendium of Physical Activities.

The RFMMB website contains a searchable database of MET values for these activities. SAS code also is provided for researchers who wish to use the codes in data analyses.

For more information:
http://riskfactor.cancer.gov/tools/atus-met/

Cognitive Research

We are conducting cognitive research to better understand the information respondents provide when asked about their physical activity. We are exploring cultural differences in how concepts such as "leisure time," "vigorous activity," and "moderate activity" are interpreted.

Standardized Questionnaires of Walking & Bicycling Database

This database contains questionnaire items and a list of validation studies for standardized items on walking and biking from multiple national and international physical activity questionnaires (PAQs). The database provides easy access to numerous items assessing duration and frequency of walking and bicycling in the non-disabled adult population, plus references describing validation studies that use the items.

For more information:
http://appliedresearch.cancer.gov/tools/paq

National Health Interview Survey (NHIS) and California Health Interview Survey (CHIS)

We have supported inclusion of a variety of questions related to physical activity and sedentary behavior in the National Health Interview Survey Cancer Control Supplement ((NHIS CCS) and the California Health Interview Survey (CHIS). These added questions complement the NHIS/CHIS core physical activity questions concerning leisure and transportation walking. The data from these surveys are publicly available and provide a rich resource for exploring the demographic and health-related correlates of physical activity in multiple domains.

For more information:
http://appliedresearch.cancer.gov/surveys/nhis
http://appliedresearch.cancer.gov/surveys/chis

Genes, Environment, and Health Initiative (GEI)

NCI and other NIH partners are supporting the research and development of innovative wearable sensors to accurately measure physical activity. This project is part of the NIH-wide GEI. GEI investigators are using cell phone technology to capture/transmit data, combining accelerometers with physiologic sensors (e.g., heart rate) to improve estimates of energy expenditure, and pairing video/audio components with automated processing technology (e.g., image detection, voice recognition).

For more information:
http://www.gei.nih.gov

NHANES Physical Activity and Cardiovascular Fitness Data Tutorial

Web-based tutorials aimed at promoting broader, more proficient use of NHANES data have been developed. The tutorials, including one specifically for physical activity and cardiovascular fitness data, are composed of modules that provide background information to help users understand key concepts; they also take users step-by-step through typical analytic procedures. NHANES data information, explanations for SAS or SUDAAN programs, and downloadable sample program code are provided to facilitate the learning process. The tutorials are designed for a wide range of NHANES users including those in government, research, education, public health, and medical practice.

For more information:
http://riskfactor.cancer.gov/tools/nhanes_tutorial.html