



Study reveals higher prevalence of smoking outside of the United States

Smoking is widely recognized as the most significant modifiable risk factor for numerous adverse health outcomes, including respiratory cancers, heart disease and stroke.

Educational campaigns, taxation on the sale of cigarettes, and restrictions on smoking in the workplace and in public buildings have resulted in a decrease in the number of smokers in the United States. However, a study authored by Stephen A. McCurdy, M.D., et al., titled "Smoking and Occupation from the European Community Respiratory Health Survey" revealed a significantly higher prevalence of smoking in the European Union and associated countries than in the United States.

For the study, researchers examined more than 17,000 individuals in Belgium, Germany, Spain, Ireland, Italy, the Netherlands, the United Kingdom, Iceland, Norway, Sweden, Switzerland, New Zealand, the United States and Australia to assess smoking prevalence among agricultural workers and other occupational groups. Of the 14 countries examined for smoking prevalence, the report revealed the highest percentage of current smokers in Spain.

Last summer McCurdy, who serves as deputy director for research in the Western Center for



A comprehensive study of smoking prevalence in 14 countries revealed that fewer than 20 percent of California adults smoke, whereas in Spain more than half of men and more than 40 percent of women are smokers.

Agricultural Health & Safety, undertook a brief sabbatical at the Institut Municipal d'Investigació Mèdica in Barcelona, Spain.

He observed, "One of the first things Californians notice in Europe is how common smoking is. Fewer than 20 percent of California adults smoke, whereas in Spain more than half of men and more than 40 percent of women are smokers."

McCurdy attributes an increase in smoking over the past decades to a general improvement in economic conditions for individuals, providing them with more disposable income. But, he

(see **Smoking** on page 4)

GRADUATE STUDENT FUNDING

Western Center provides funds for four pilot projects

Recently four graduate students received funding from the Western Center for Agricultural Health and Safety to help supplement 12-month pilot research projects involving the health and safety of California's agricultural workforce.

The names of award recipients and a brief description of their research projects follow.

ENGINEERING ERGONOMIC SYSTEMS FOR JOBS IN AGRICULTURE

Andrew J. Holtz is working toward a doctoral degree in engineering at UC Davis. His areas of interest lie in agricultural ergonomics in machinery systems that can improve working conditions of agricultural jobs.

Working with Center invest-
(see **New Projects** on page 2)

(New Projects *from page 1)*

tigator John Miles, Holtz will examine the problems associated with stoop labor-induced mus-



Andrew Holtz

culoskeletal injuries. He will determine ergonomic hazards and redesign tools and workstations found in agricultural jobs to help reduce repetitive motion injuries. The intervention designs will take into consideration the likelihood of acceptance of the new designs by workers, based on economic, social and cultural issues. Holtz will then determine the feasibility of the interventions through trials in industrial settings, and evaluate how well injury risk and exposure could be reduced.

RISK FACTORS FOR ADVERSE BIRTH OUTCOMES AMONG WOMEN IN THE AGRICULTURAL WORKFORCE

Olivia Kasirye, M.D., received her medical degree at Makerere University Medical School in Kampala, Uganda, in 1988. She is currently working toward a master of science degree in epidemiology at UC Davis.

Women employed on the farm are exposed to various occupa-



Olivia Kasirye

tional hazards, including biological, physical, chemical and mechanical dangers, as well as work-related physical and emotional stress. In addition, most of these women are foreign-born and face formidable barriers in accessing health care in the United States due to

language barriers, low literacy rate, low income and a lack of health insurance coverage. Little is known about the reproductive health status of farm working women. Utilizing data from the SHARE study (Study of Hispanic Acculturation Reproduction and the Environment), Dr. Kasirye will examine the incidence of pre-term and low birth weight delivery among agricultural workers, and the risk factors that affect these outcomes.

HEALTH PROFILE OF MIGRANT FARM WORKERS AND THE INTERFACE OF WORKERS WITH HEALTH CARE IN IMPERIAL COUNTY, CALIFORNIA: SIMPLIFIED SURVEILLANCE AND QUALITATIVE ANALYSIS

Heather M. Kun is a doctoral candidate of infectious disease epidemiology at Harvard School of Public Health. She received her master's degree in environmental science and management from UC Santa Barbara in 1999.

For this study, Heather Kun will examine the most common negative health outcomes that occur in migrant farm workers in Imperial County, California.

These include chronic illnesses, infectious diseases, and environmental and occupational hazards. She also will identify specific risk factors migrant farm workers face, such as background health, access to health care, worker attitude toward health care, and acculturation. Additionally, Kun will compare health outcomes of workers who commute each day from Mexico with those who reside in Imperial County, by means of



Heather Kun

surveys of health care providers as well as farm workers. She plans to secure a mobile health clinic to collect basic biometric data and possibly HIV and tuberculosis information. Kun, who lives in Southern California, hopes the information collected will be used to design better interventions and health infrastructure for the migrant farm workers employed in Imperial County.

CHARACTERIZATION OF AGRICULTURAL DUST EXPOSURE

Jodi L. Smith, who recently received a scholarship from the Air and Waste Management Association for the 2001/2002 school year, is working toward a master's degree in atmospheric science at UC Davis. She is a research assistant for Center investigator Kiyoung Lee, D. Sc., CIH.

Many agricultural workers are exposed to mixed dust in



Jodi Smith

occupational and environmental conditions. Increased incidence and prevalence of respiratory symptoms and disease in agricultural populations have been observed in several epidemiological studies. Among various risk factors, mixed dust appears to be a significant

Continued on page 3

News is published quarterly by the Western Center for Agricultural Health and Safety, University of California, Davis CA 95616-8575; phone (530) 752-4050; FAX 752-5047; e-mail: agcenter@ucdavis.edu URL: <http://agcenter.ucdavis.edu>

Director Marc Schenker
 Outreach Coordinator Pat O'Connor-Marer
 Research Coordinator Stephen McCurdy
 Center Manager Gwen Oliver
 Center Asst. Manager Kathy Ponce

(New Projects *from page 2)*

etiologic factor. However, the implications of such studies are limited by the relative lack of dust exposure measurements in agriculture. Better characterization of exposure to these agricultural dusts will help researchers determine the risk factors for respiratory disease in agricultural workers, and help them understand the nature and effects of exposure to similar ambient dusts. In her study, Jodi Smith will determine task-based exposures of agricultural mixed

dust in vineyards and will develop a proxy indicator of exposure using foliar dust. Her results will provide important information about the health effects of agricultural dust for future epidemiological studies and for the control of exposure to protect the respiratory health of people working in agriculture.

For more information about these projects, please contact the Western Center by e-mail at agcenter@ucdavis.edu, or call (530) 752-4050.



New public health master's program offered

The schools of Medicine and Veterinary Medicine at UC Davis will offer a new master's degree program in public health to help address the changing health needs of California communities. The program will capitalize on the strengths of the two schools, which include strong programs in medicine, epidemiology, preventive veterinary medicine, agricultural health, zoonoses and nutrition.

"Recent terrorist events have certainly raised awareness of the need for a strong public-health system," said Marc Schenker, professor and chair of Epidemiology and Preventive Medicine, which is administering the program. "It became painfully apparent in the past months that critical shortages in qualified people are limiting the public health system's ability to track, manage and prevent the spread of diseases and other infectious agents.

Initially, the program will take participants a year to complete and will culminate in a capstone field experience, such as working with an agency or organization on program evaluations, case studies, research, policy analyses, or descriptive studies.

In about five years, UC Davis will launch a two-year degree for others without medical or veterinary backgrounds but interested in pursuing a career in public health.

More information about the program is available from program coordinator Jane Emens, who can be reached at (530) 752-3627 or jmemens@ucdavis.edu.



NIOSH adds Spanish-language Web section with job health, safety information

DC's National Institute for Occupational Safety and Health (NIOSH) has added a new Spanish-language section to its Web site to serve the Nation's growing Spanish-speaking population.

The new section includes Spanish-language versions of several NIOSH workplace safety and health documents relevant to industries and occupations in which large numbers of Spanish-speaking workers are employed. The section is located at <http://www.cdc.gov/spanish/niosh/> and it also can be accessed from the NIOSH site at www.cdc.gov/niosh/ by clicking the link "NIOSH En Español." The section also describes in Spanish how workers and employers can contact NIOSH and access basic services, such as health hazard evaluations. In addition, it provides links to other Spanish-language resources, such as the CDC En Español Web page. The contents of the NIOSH Español section will be

expanded and updated on a regular basis.

The number of Hispanic workers in the U.S. work force is expected to increase by more than one-third over the next decade. Last year, fatal work injuries among Hispanic workers rose sharply while declining for non-Hispanic workers. This increase was led by a 24 percent jump in fatal injuries in construction among Hispanics, according to data from the U.S. Bureau of Labor Statistics.

NIOSH will work with Hispanic organizations, industry and labor groups, safety and health professionals, and other government agencies to help workers and employers become aware of the site. The Web site is one of several NIOSH initiatives for better identifying and addressing risks for job-related injuries and illnesses among Spanish-speaking workers.



(Smoking *from page 1)*

says, “Sadly, countries with high smoking rates will have to deal with an epidemic of lung cancer and heart disease in the coming years.”

Although the overall smoking prevalence was higher in European countries than in the United States, the study showed that smoking varied greatly among various occupational groups. In particular, farmers and farm workers had a lower smoking prevalence than the population at large.

“A bit more than one quarter of farmers and farm workers in the study said they smoked,” noted McCurdy. “Although this is

higher than smoking prevalence we see in the United States, the lower smoking prevalence in agricultural populations compared to other groups is consistent with the pattern in the United States.”

Occupations associated with high smoking rates included metal-making (for men) and cleaning occupations (for women). “The major value of this study is that it identifies occupations with high smoking rates, allowing targeting of anti-tobacco efforts. Also, it provides baseline data for future comparisons,” says McCurdy.

For this study, McCurdy collaborated with several

researchers at the Institut—Drs. Jordi Sunyer, Josep-Maria Antó, Manolis Kogevinas and Jan-Paul Zock. “I was very lucky to work with a welcoming group of colleagues at the Institut who are top-notch in their fields,” says McCurdy.

What about the other advantages of spending a summer in Barcelona? McCurdy replies, “Barcelona is a wonderful city in a beautiful country. It’s situated on the Mediterranean coast near the French border, with excellent beaches and natural scenery. People were very friendly and patient. In addition to the research and writing, the visit markedly improved my Spanish.”



Food-borne illnesses threaten ‘at-risk’ populations

Food-borne illnesses that cause only mild symptoms in healthy adults can be deadly for certain “at-risk” populations, which include young children, pregnant women, the elderly and immunocompromised individuals. Some simple precautions may be taken to reduce the risk of contamination by many food-borne pathogens, but more widespread education is needed to prevent infection of individuals.

Young children are typically more susceptible to serious food-borne illnesses in their first year of development because of lower body weight, an underdeveloped immune system, and an immature population of natural protective bacteria in their intestinal tracts. Although pregnant women are not more susceptible to illness, exposure to certain types of pathogens may affect them or their fetus. Nearly 25 percent of all people are immunocompromised, with a weakened

immune system due to cancer therapy, organ transplant, HIV infection, AIDS or some other condition.

Linda Harris, Ph.D., a microbiologist and associate specialist in Cooperative Extension in the UC Davis Department of Food Science and Technology, was guest speaker at the Center’s noon seminar on Feb. 1. Her talk focused on “at-risk” populations, food-borne pathogens that pose a serious risk to these populations, and strategies for reducing exposure to pathogens.

Harris explained, “These four groups tend to be more susceptible to food-borne illnesses because they become ill with lower infectious doses of a pathogen than a healthy adult would. In addition, people in these categories become more severely ill, whereas a healthy adult may suffer from mild discomfort—diarrhea, vomiting.”

Due to the aging baby boomer

population, by the year 2040 a three-fold increase in individuals over the age of 85 is expected to occur in the United States. Because of the age-related decrease in immunity, and a decrease in gastric acidity—which kills organisms before they reach the intestines—the elderly are at high risk for developing food-borne illnesses.

Some of the factors that affect susceptibility to illness in elderly individuals include:

- ▶ taking drugs or over-the-counter antacids that raise the stomach pH;
- ▶ increased use of antibiotics, which reduce the natural protective bacterial population in the intestinal tract;
- ▶ decreased intestinal ability (constipation), which causes organisms to remain in the intestinal tract longer, allowing them to establish more toxins;
- ▶ malnutrition.

Continued on page 5

(Food-borne from page 4)

Deaths due to food-borne illness in nursing homes are significantly higher than pathogen-related deaths in the general population. For example, death from *campylobacter jejuni* is 2.1 per 1,000 cases in the general population, while nursing home deaths from this organism total 11 deaths per 1,000. Death due to infection of *E. coli* O157:H7 is 21-26 per 1,000 in the general population, but death from *E. coli* O157:H7 in the nursing home population is 217 per 1,000.

THE PATHOGENS

Listeriosis, the disease caused by *Listeria monocytogenes*, manifests itself in a number of ways. It can be transmitted through cuts or abrasions, but most often is contracted through foods. Generally a healthy individual infected by the pathogen will show no symptoms, or have only mild bouts of gastroenteritis, diarrhea or vomiting. "In pregnant women infected with *Listeria monocytogenes*, typically the response is similar to a healthy adult. But the effect is to the fetus and most commonly when infected during the third trimester. The effect on the unborn fetus is severe—spontaneous abortion, stillbirth. If the child is born, it can contract the illness from the womb or the birth canal. Newborn infants can end up with meningitis, an inflammation of brain tissue that can result in death.

For adults with weakened immune systems, the illness can progress to septicemia, then nervous system infection, which can result in meningitis. Approximately 2,500 cases of Listeriosis occur in the United States each year. But many of the

cases are considered sporadic illnesses rather than an outbreak, so tracing the origin of the pathogen is difficult to impossible.

"Some of the foods that provide a perfect environment for growth of *Listeria monocytogenes* include soft cheeses and hot dogs, which are often vacuum packaged and very favorable to the growth of this pathogen. *Listeria monocytogenes* grows under refrigerated conditions, so products with long shelf-life can go from having undetectable levels of this organism to very high levels at the end of their shelf life. It's very hard to predict," says Harris.



Technician Carolyn Johnson uses monoclonal antibodies to confirm *E. coli* O157:H7 presence in cattle fecal samples. Photo by Keith Weller; courtesy USDA Agricultural Research Service.

Listeria monocytogenes is very widespread in the environment. It can be found in the soil and may be tracked into food processing facilities on shoes and clothing." It is killed by heat, so the food industry is looking at pasteurizing products once in the package to eliminate contamination that may have occurred after packaging," says Harris.

The organism *Taxoplasma gondi* is actually a parasite. Its definitive host is cats, which shed oocysts in their feces. Cows, pigs and other food animals may be infected by cats that use the feed

bins in barns as a liter box. These organisms migrate to different tissue in the animal, so the primary route for infection in humans is consumption of contaminated undercooked meat. In addition to infected meats, *Taxoplasma gondi* may be picked up through food that comes in contact with contaminated soil or water.

In a healthy adult, the illness may be very mild, but the organisms can migrate to the muscle tissue or brain and can remain dormant for a long period of time. But the fetus of pregnant women may be affected through the placenta.

"Thirty percent of the population is seropositive for *Taxoplasma gondi*, meaning they have been exposed and have antibodies to this organism. Most people have no symptoms," says Harris. "If a woman has never been exposed, then becomes exposed while she is pregnant, fetal infection occurs in 30-40 percent of exposures."

Approximately 3,000 cases of *Taxoplasma gondi* are diagnosed in the United States per year. It can lead to blindness or reduced vision, neurological problems and learning disabilities.

Approximately 10,000 to 20,000 cases of *E. coli* O157:H7 are diagnosed per year. Symptoms include diarrhea, which may lead to bloody diarrhea and kidney failure. In young children and the elderly it may cause fever and central nervous system disorder, which can also lead to death. Beef is the primary host for this organism, and transmission is through undercooked meat. Cross contamination of raw meat

Continued on page 6

(Food-borne *from page 5)*

to vegetables and fruits can occur in the kitchen.

Vibrio vulnificus is primarily transmitted through consumption of raw shellfish—Gulf Coast oysters and other raw shellfish. Each year in California one or two deaths occur from infection with *V. vulnificus*. The mortality rate for individuals infected is 50 percent. People who are susceptible include people with liver disease, leukemia, HIV, hepatitis, or high stomach pH.

RECOMMENDATIONS

Harris offered the following four steps to help reduce the occurrence of food-borne illnesses:

1. Clean hands, kitchen utensils and food preparation areas.
2. Separate raw meats from raw produce.
3. Chill foods properly and promptly.
4. Cook foods to the correct temperature.

Harris advises members of “at-risk” populations to avoid drinking or eating unpasteurized milk or milk products; raw meat or seafood; seed (e.g. alfalfa) sprouts; unpasteurized juices; soft cheeses; raw or undercooked eggs. She suggests cooking hot dogs to steaming hot; cooking luncheon meats, fermented and dry sausages; and paying close attention to expiration dates on all products.

In her quest to find solutions to food-borne illnesses, Harris asks, “Is education enough?” She recalled a conversation with an FDA inspector who had interviewed a man who had lost his leg from *V. vulnificus* he contracted through eating raw oysters. The man told the inspector that he refused to give up eating raw oysters. “Do we have to ban these products? Where do you draw the line between choice and protection of the population? At what level do we want to protect, and at what cost?”



**Western Center for Agricultural
Health and Safety
One Shields Avenue
Davis, CA 95616-8757
AG10**

CALENDAR

April 5, Noon

Foster Room, Meyer Hall

Ladder Injuries in Washington

Orchards: A Problem of Significant Gravity

Matthew C. Keifer, M.D., M.P.H.

Co-Director, Pacific Northwest Agricultural Safety & Health Center, University of Washington

May 3, Noon

Foster Room, Meyer Hall

Costs of Agricultural Injuries: An Update

J. Paul Leigh, Ph.D., Professor, Department of Epidemiology and Preventive Medicine, UC Davis

June 7, Noon

Foster Room, Meyer Hall

Single Particle Analysis of Airborne Matter

Anthony S. Wexler, Ph.D., Professor, Department of Land, Air & Water Resources, UC Davis

June 12, 8 a.m.–4:30 p.m.

Winters, Calif.

Trainers of Pesticide Handlers & Ag Field Workers Workshop

(530) 752-5273

www.ipm.ucdavis.edu/IPMPROJECT/workshops.html