Non-persistent Pesticides Found in U.S. Mothers’ Breast Milk

UC Berkeley scientists published the first pilot study of a U.S. population that found newborns and young children may be exposed to non-persistent pesticides through breast milk. Persistent pesticides and polychlorinated biphenyls, or PCBs, were also detected. Some of these non-persistent pesticides are emerging chemicals of concern because they have been associated with neurodevelopmental effects in children.

The study examined women’s breast milk samples from the urban Bay Area and rural Salinas Valley in California.
As most Bridges readers know, the federal budget crisis greatly threatens funding for training of occupational safety and health professionals. President Obama’s proposed budget for the current fiscal year had totally eliminated National Institute for Occupational Safety and Health (NIOSH) funding for the 17 Education and Research Centers (ERCs) and the Agricultural, Forestry, and Fishing (AgFF) Program that supports the eight Agricultural Occupational Health and Safety Centers. Our COEH includes both the Northern California ERC of which I am the Principal Investigator (PI) and the Western Center for Agricultural Health and Safety at UC Davis where Marc Schenker is the PI.

The Office of Management and Budget’s (OMB) justification for the elimination of funding for the ERCs and the AgFF Program was unconvincing. The main points were that (a) the original mandate for federal support of these programs was to provide seed money to get the ERCs and the AgFF Program launched, but not to sustain them; (b) sufficient numbers of occupational safety and health professionals have been trained by the ERCs so that they are no longer needed; (c) the Centers are required to have institutional support beyond that which NIOSH provides so they would continue to function without federal funding; and (d) the Centers were duplicative of Occupational Safety and Health Administration (OSHA) training activities. In addition, the AgFF Program was considered outside the CDC’s mission and to have insufficient impact on the nation’s health to merit continued funding.

The number of occupational injuries and illnesses in 2007 was estimated to be 8,564,600 and 480,000, respectively, at costs of $192 billion and $58 billion (see the story on page 4).1 For injuries and diseases combined, medical cost estimates were $67 billion (27% of the total), and indirect costs were almost $183 billion (73%). Agriculture, including forestry and fishing, remains an industrial sector with one of the highest rates of injury and illness. Given this tremendous and ongoing burden of occupational injury and illness, well trained occupational safety and health professionals continue to provide high value to both employers and workers. Despite OMB assertions that there are sufficient numbers of such professionals to serve the needs of the country, a recent needs assessment conducted under NIOSH auspices documented shortages of occupational medicine physicians, occupational health nurses, industrial hygienists, and ergonomists. Elimination of NIOSH funding of the ERCs and AgFF Program would effectively destroy the infrastructure for training of occupational safety and health professionals in the United States. While it is true that the academic institutions at which these Centers are based are required to provide some intramural support to qualify for NIOSH funding, virtually all of the support for students comes from NIOSH. It’s hard to have training programs without students. The idea that the Centers are duplicative of OSHA is so ludicrous that it barely merits discussion. OSHA provides some training to workers and employers, but not for occupational safety and health professionals.

After hearing from multiple stakeholders, including many of you, Congress overruled the President and provided funding for the ERCs and AgFF Program for the current fiscal year. Unfortunately, President Obama’s proposed budget for the next fiscal year again proposes elimination of both programs. The nation’s occupational safety and health training infrastructure is once again threatened with extinction. To allow this to occur would be a tragedy because, as you all know, the workplace remains a critical factor in human health. Conditions in U.S. workplaces have improved over the three-plus decades of NIOSH support of occupational safety and health professional training, but the trend may not continue if this support is eliminated. In addition to reducing exposure to known hazards, the nation needs a well-trained occupational safety and health workforce to be ready to deal

continues to page 11
Protecting Firefighters from Hearing Loss

More than one million U.S. firefighters are at risk of noise-induced hearing loss. Frequent exposure to high-intensity truck sirens, power tools, and water pumps gradually damages their sensory hair cells located in the inner ear. Hearing protection devices (HPDs) have been shown to prevent injury, but few studies have pinpointed critical factors shaping their use.

A study led by OiSaeng Hong from UCSF has revealed that interpersonal influences – the behaviors modeled by supervisors and peers - are by far the strongest predictor of whether firefighters will wear hearing protection on the job.

The study enrolled over 400 firefighters from 35 fire departments in California, Illinois, and Indiana to identify significant factors related to the firefighters’ use of HPDs. Noise exposure at work, interpersonal influences, and organizational support were the most strongly related, study authors found.

“Peer influence is remarkably important,” says Hong, director of the Occupational and Environmental Health Nursing Program at UCSF. Cognitive-perceptual factors, including perceived susceptibility to hearing loss, were also significant predictors of HPD use.

Approximately 40% of firefighters in the study showed hearing loss at noise-sensitive frequencies. Still, study participants reporting using HPDs only one-third of the time they are needed. In fact, one fire department located in the Midwest had provided no HPDs for its members. Hong noted that hearing loss was significantly higher in this department compared to others in the study.

“Our findings show that organizational-level intervention is critical to HPD use,” said Hong. “The chief or commander has a tremendous influence. Their support is essential to changing health promotion behaviors.”

Assessing Firefighters’ Cardio Fitness for Strenuous Duty

For firefighters, sudden cardiac death is the number one cause of occupational fatality. Accurately assessing their cardiopulmonary function is critical to occupational health and safety. Over-estimations may place firefighters at risk during rescue missions if they are unprepared for the physical demands of the assignment.

A new study published by Dana Drew-Nord from UCSF investigates the “gold standard” protocol used in the United States for assessing firefighters’ cardiopulmonary capacity, as proposed by the Fire Service Joint Labor Management Wellness-Fitness Initiative (WFI).

Drew-Nord and her research team assessed the aerobic function continues to page 4
of 83 firefighters from all ranks of a Northern California department. Study subjects performed maximal exercise treadmill tests and peak VO2 assessments, a measure of maximal aerobic capacity.

They found the revised 2008 WFI sub-maximal treadmill accurately estimates peak VO2 but the traditional maximal heart rate estimate proposed by WFI prior to the 2008 revision was significantly higher than measured maximal heart rate, and estimated peak VO2 was also significantly higher than directly measured VO2.

Performing peak VO2 and treadmill tests can be a challenge for fire departments with limited financial and human resources; however, Drew-Nord’s study underscores the importance of their role in assessing a firefighters’ preparedness for emergency fire and rescue duty.

Her research was made possible with support from the National Institute for Occupational Safety and Health and the UCSF School of Nursing Century Club.

of 83 firefighters from all ranks of a Northern California department. Study subjects performed maximal exercise treadmill tests and peak VO2 assessments, a measure of maximal aerobic capacity.

They found the revised 2008 WFI sub-maximal treadmill accurately estimates peak VO2 but the traditional maximal heart rate estimate proposed by WFI prior to the 2008 revision was significantly higher than measured maximal heart rate, and estimated peak VO2 was also significantly higher than directly measured VO2.

Performing peak VO2 and treadmill tests can be a challenge for fire departments with limited financial and human resources; however, Drew-Nord’s study underscores the importance of their role in assessing a firefighters’ preparedness for emergency fire and rescue duty.

Her research was made possible with support from the National Institute for Occupational Safety and Health and the UCSF School of Nursing Century Club.

David Rempel, professor of Medicine in the UCSF Division of Occupational and Environmental Medicine and director of the joint Berkeley and UCSF Ergonomics Program, will advise Cal/OSHA on the new Hospital Patient and Health Care Worker Injury Protection Act, AB 1136, that became effective January 1, 2012.

In addition to assisting with the development of the regulation and policies for compliance, Ergonomics staff will train Cal/OSHA officers responsible for confirming that patient handling programs meet state legislative requirements.

To comply with AB 1136, hospitals must ensure their Injury and Illness Prevention Program addresses all patient handling situations, develops strategies for identifying the mobility needs of each patient, provides powered lift devices and supplies where needed, and offers training for all personnel involved in patient handling.

Musculoskeletal injury is common among nurses as a result of lifting and handling patients. “We know that comprehensive safe patient handling programs prevent injuries among hospital staff and reduce patient injuries,” Rempel reports. Safe patient handling legislation has now passed in eight states, he added, while a growing number of additional states are considering similar legislation.

Annual Price Tag for Occupational Injuries and Illnesses Reaches $250 Billion

The annual cost for occupational injuries and illnesses in the United States has reached an estimated $250 billion per year, according to a paper from UC Davis. The total is $31 billion more than the direct and indirect costs of all cancers, $76 billion more than diabetes, and $187 billion more than strokes.

Comparatively, cardiovascular disease (including stroke), cancer, and diabetes account for approximately two thirds of all deaths in the United States, reports the American Heart Association. Yet occupational injuries and illnesses do not receive the same research, medical, or public attention.
as these other diseases.\textsuperscript{1}

Fatal and nonfatal occupational injuries in 2007 were estimated to be more than 5,600 and 8.5 million, respectively, at a cost of $6 billion and $186 billion. The number of fatal and nonfatal occupational illnesses was estimated at more than 53,000 and nearly 427,000, respectively, with cost estimates of $46 billion and $12 billion.\textsuperscript{2}

Workers’ compensation covers less than 25 percent of these costs, so all members of society share the burden, concludes author J. Paul Leigh, professor of public health sciences at UC Davis. As a result, much of the costs are absorbed by employer-provided medical insurance and by Medicare and Medicaid.\textsuperscript{3}

The analysis used 2007 data from the U.S. Bureau of Labor Statistics, the Centers for Disease Control and Prevention, the National Council on Compensation Insurance, and the Healthcare Cost and Utilization Project. Other data sources included the National Academy of Social Insurance, literature estimates of Attributable Fractions of diseases with occupational components, and national estimates for all health care costs.

The study introduces numerous methodological advances to an earlier investigation by Leigh based on data from 1992. Research funding came from the National Institute for Occupational Safety and Health.\textsuperscript{1,2}


UC Davis press release

Morello-Frosch Receives Chancellor’s Award

Rachel Morello-Frosch, co-director of the Doctor of Public Health program at UC Berkeley and associate professor jointly appointed in the College of Natural Resources and School of Public Health, was honored with the 2012 Chancellor’s Award for Public Service. The award is one of the four highest honors bestowed by the campus.

At the awards ceremony on April 30, 2012, the Chancellor and Mary Catherine Birgeneau recognized students, staff, faculty and community partnerships that embody UC Berkeley’s tradition of public service and commitment to improving the local and global community.

Morello-Frosch’s work focuses on environmental health and environmental justice. She investigates the double jeopardy of environmental and social stressors faced by communities of color and the poor. Individuals in these communities experience high exposures to environmental hazards. At the same time, they are more vulnerable to the toxic effects of pollution due to poverty, malnutrition, discrimination, and underlying health conditions. She also evaluates the influence of community participation on environmental health research, science, regulation and policy-making.

“I’m humbled to receive this award,”

continues to page 6
Non-Persistent Pesticides Found in US Mother’s Breast Milk

continuing from the front page

All of the samples revealed measurable pesticide concentrations. For 13 of the 24 chemicals tested, including the non-persistent insecticides chlorpyrifos and cis- and trans-permethrin, the frequency of detection exceeded 90%. For most chemicals, the detection limit averaged 0.02 to 5 ng g⁻¹ (parts per billion).¹

“Non-persistent pesticides break down quickly in the environment. Since they are rapidly metabolized and excreted in the body, it was thought previously that they wouldn’t be found in breast milk,” explains lead author Rosana Hernandez Weldon, a post-doctoral fellow at UC Berkeley’s Center for Environmental Research and Children’s Health.

Non-persistent pesticides were widely adopted after persistent organochlorine pesticides were banned from manufacture and use in the United States in the 1970s, but how exposure to non-persistent pesticides affects most people is still largely unknown, according to the Centers for Disease Control and Prevention.

“One of the motivations for conducting this investigation was to understand the exposures of neonates so that we could develop better informed epidemiological studies of the health effects,” says Weldon. Recently, her co-authors from the CHAMACOS study have found associations between organophosphate pesticides and neurodevelopment.² Others have shown that persistent pesticides and PCBs are potential endocrine disruptors.

The authors do not speculate on the source of exposure for non-persistent pesticides, but Weldon believes the findings point to nutrition. “It was interesting that the median concentrations of non-persistent pesticides were similar for urban and rural populations,” says Weldon. “The urban population doesn’t have any direct exposure from their environment for the most part, so we suspected it was diet. Persistent pesticides also tend to accumulate higher in the food chain, such as fatty foods.”

Recognizing that many people cannot afford organic produce, Weldon recommends washing fruits and vegetables to remove any excess pesticide residue. Study authors also stress that breast feeding remains the optimal source of nutrition for infants.³ “The benefits of breast feeding outweigh the risks of pesticide exposure, such as mother child bonding and the health benefits to the mother and child post-partum,” says Weldon.

The pilot, funded through a fellowship from the Environmental Protection Agency (EPA), was designed to inform an in depth study of pesticide exposure and lactation. Currently, researchers are measuring non-persistent and persistent pesticides in subset of approximately sixty mothers from the CHAMACOS study. Participants provided milk samples near the time of birth and again six months postpartum. Weldon notes, “Ultimately, we would like to see our research determine sources of exposure so effective policies can be developed to protect mothers of child-bearing age and their breast feeding infants.”

The EPA has shown interest in the multiresidue laboratory method developed to measure non-persistent pesticides, according to Weldon. She suggests the findings on non-persistent pesticides, such as chlorpyrifos, will likely be considered in the current (EPA) review.

UC Berkeley co-authors of the paper, published in the Journal of Environmental Monitoring, include CERCH investigators Celina Trujillo, Asa Bradman, Nina Holland, and Brenda Eskenazi.

Nuclear weapons testing at the Nevada Test Site (NTS) ended in 1992. Yet two decades later Raymond Meister, associate clinical professor in UCSF’s Division of Occupational Medicine, is part of a team of doctors who continue to offer health screening for former workers. In total, the team has conducted over five thousand exams since the program’s inception in 1998.1

With the emphasis on the development and testing of nuclear weapons, there was a reduced focus on health and safety when testing began at the NTS in the early 1950s. Radiation, silica, beryllium, and other exposures at the site are now known to have had lasting effects.

“Many of the health hazards that these workers are at risk for have long latency periods. Silicosis and beryllium diseases are two examples. It is important to provide ongoing screening as it can literally take decades for these illnesses to become apparent to the point of being diagnosed,” says Meister.

With funding from the Department of Energy, principal investigator Lew Pepper, an occupational health physician from Queens College-City University of New York, leads collaborators of the NTS former worker screening program. Robert Harrison, clinical professor in UCSF’s Division of Occupational and Environmental Medicine, and John Balmes, director of the Center for Occupational and Environmental Health, are also part of the team, along with doctors from the department of Family Medicine at the University of Nevada in Las Vegas.

“We take a detailed medical and work exposure history, and offer a physical exam and medical tests, depending on their work exposures. We’ve added a blood test for beryllium exposure and more general health tests such as cholesterol, HDL (high-density lipoprotein) and glucose levels,” reports Meister.

NTS contained miles of underground tunnels where employees conducted nuclear testing once above ground testing was banned in 1962. “The rock where workers dug the tunnels had silica in it. That’s why there is higher percentage of silicosis,” explains Meister. “The mining equipment was extremely loud, contributing to hearing loss. Beryllium was used in nuclear device parts, which explains why we found workers who have been sensitized to beryllium. They can go on to develop chronic beryllium disease; therefore, having the blood test to learn if someone is sensitized to beryllium allows us to keep a closer eye on these patients.”

The same group from Queens College and UCSF now also run a similar screening program in Northern California. This project aids former workers employed by Lawrence Livermore National Laboratory, Sandia National Laboratories, also in Livermore, and Lawrence Berkeley National Laboratory.

1 http://coeh.berkeley.edu/docs/bridges/2001MarchBridges.pdf
A call for experts to work collaboratively on the public health response to disaster — one of COEH’s strengths — was at the heart of a keynote presentation by John Howard at the Lela Morris Symposium held on March 2 in Oakland, California.

Howard, the director for the National Institute for Occupational Safety and Health, confirmed the United States set a new record for the number of disaster events in 2010. “We are either getting better at counting disasters, or they are actually increasing,” he noted. “That suggests that we, as public health professionals, need to establish a knowledge base from the research, intervention, and training perspectives to put disaster response into the public health profile.”

Howard’s keynote address offered first-hand accounts of the most significant U.S. disasters over the last decade, from the World Trade Center collapse to the Gulf Coast oil spill. “Each one of these disasters has its own signature,” he acknowledged.

From a public health perspective, the aftermath of the World Trade Center collapse was a disaster in its own right, with major mental and respiratory health impacts, according to Howard. An estimated half a million people were directly affected including approximately 90,000 responders in Lower Manhattan. Only a small portion of the air pollution particles generated by the twin towers’ collapse were respirable. “But there were so many of them, they overwhelmed peoples’ defense systems,” he explained. “Even large particles reached the lower airways and, hence, caused problems for our responders ever since.”

Summarizing key lessons from 9/11, Howard emphasized the need for a cadre of toxicologists, epidemiologists, and industrial hygienists who can identify real-time exposures during disasters to improve the public health response.

“Every public health school in the United States needs to have a presence in emergency preparedness and response,” says NIOSH Director John Howard.

Learning from 9/11
Robyn R.M. Gershon, a professor in UCSF’s School of Medicine, revealed findings of her 9/11 disaster management study. Fire codes in New York at the time were among the best in the nation, Gershon highlighted. The tragedy, therefore, was shaped by poor safety behaviors and insufficient communication rather than engineering failures.

Fifty percent of the survivors she surveyed said they did not know how to evacuate their building, other than the way they normally came in or out. Many of the floor wardens, who could have helped with the evacuations, had not reached their desks when the first plane hit at 8:46 a.m., Gershon noted. And although 81% of those surveyed...
had participated in fire drills, most had never practiced exited the building as part of the exercise.

Worse, emergency preparedness for persons with disabilities scored 0.32 on a 4 point scale. “Basically, nobody knew anything about preparedness for people with disabilities or medical conditions,” reported Gershon. Their evacuation time averaged three times slower than non-disabled workers, a significant factor in light of the aging U.S. population.

Gershon also reviewed victims’ calls to 911 operators. “People were told repeatedly to stay in place. Help will be on its way. And that led to the deaths of many people who may have been safely evacuated.”

Still, Gershon emphasized that her message is one of hope. “Change may come in increments, but we do learn.” Last year, she began teaching a course in public health emergency preparedness. Half her students were subsequently hired by government and non-profits. “I can’t believe the transformations I’ve seen in this field,” said Gershon. “It has become a specialty science within public health.”

**Paths of Pandemic Infectious Disease**

**Tomás J. Aragón** presented the role of statistical models in risk management communication, using the recent norovirus outbreak in a San Francisco high school to underscore the potential of infectious disease threats. The incident began on a busy basketball court. From one player, roughly 100 others became ill in 24 hours. In a matter of days, 900 out of 1,400 students were also affected. Aragón, director of Cal PREPARE Research Center, used the case as well as the SARS crisis in 2003 to demonstrate “just how impressive an infectious disease can be.”

**Lessons from Katrina**

Reviewing the results of her environmental assessment investigations post-Katrina, Gina Solomon described problems of soil contamination and indoor and outdoor mold concentrations and their health effects on the community. The next ‘New Orleans’ may be in California, Solomon warned, citing the Sacramento-San Joaquin Delta for its risk of flooding Sacramento with up to 17 feet of water.

A recent study co-authored by Solomon in the February 2012 issue of *Environmental Health Perspectives* reviews the health effects of seafood contamination resulting from the BP
Broader themes of the public health response to disaster planning emerged during the Symposium’s panel discussion. Local, state and federal government experts relayed facts of search and rescue deployment during 9/11 in addition to smaller scale public health investigations, including cases of occupational and environmental contamination from chemical hazards. “As we heard today, there is a hair’s breadth between surviving and not surviving a disaster,” Solomon said at the conclusion of the symposium, as she called attention to COEH’s opportunity to develop the public health response to natural and human disasters.

The 2012 Lela Morris Symposium was made possible by course directors Gina Solomon, co-director of the UCSF Occupational and Environmental Medicine Residency Program, associate clinical professor of medicine and associate director of the UCSF Pediatric Environmental Health Specialty Unit and senior scientist at the Natural Resources Defense Council, and Patty Quinlan, deputy director of COEH. Other committee members included Michael Wilson, director of LOHP, and John Balmes, director of COEH and division chief of Occupational and Environmental Medicine at San Francisco General Hospital.

**Revelations from Japan’s Nuclear Disaster**

Thomas McKone reflected on lessons from the Fukushima nuclear disaster in Japan one year after the tragedy on March 11, 2011. Ignoring historical earthquake and tsunami data, Tokyo Electric Power Company, owners of the nuclear power plant, failed to construct containment walls high enough to prevent flooding from the forty foot wall of water that followed the 9.0 earthquake off the coast, he concluded.

Emergency diesel tanks located perilously on the waterfront, back-up batteries falling short of their design specifications, and lax regulatory oversight were some of obstacles described by McKone, a professor from the UC Berkeley School of Public Health.

Placing the effects of the disaster in perspective, he predicted, “The health risks, though they vary with distance from the plant, will be much lower than what people now fear.”

**Expert Panel Shares Stories of Emergency Preparedness**

COEH renamed its annual symposium in 2011 to honor the late Lela Morris, who became the Center’s first director of Continuing Education (C.E.) in 1982. “Lela Morris touched everyone she met,” said John Balmes, director of COEH. “I’m sure she is smiling down on us today as this is the type of event she would have liked to organize.” Barbara Plog, the current C.E. director noted, “She started the COEH Summer Institute, which has continued for 25 years.”

Morris’ family members were on hand to kick-off the inaugural symposium honoring her legacy. Dr. Walter Morris personally thanked attendees for dedicating their lives to public health, as his wife had.

“Good health is a right,” said Dr. Morris. “And you are on the fighting edge of making this a reality.”
Veteran COEH Professor Kirk Smith, whose groundbreaking work has documented the dangers of household air pollution, has been named one of two winners of the 2012 Tyler Prize for Environmental Achievement. The Tyler Prize is given to those who “confer great benefit upon humankind through environmental restoration and achievement,” and is regarded as the premiere award for environmental science, environmental health, and energy.

A professor of global environmental health at the UC Berkeley School of Public Health, Smith is recognized for his work identifying that household air pollution in developing nations is responsible for nearly two million premature deaths per year, disproportionately among women and children.

“We now understand the deadly effects of these fuels that are used by nearly half the world,” said Smith. “The impact of household air pollution is on scale with any other major health risk in developing countries, including exposure to HIV, mosquitoes, or dirty water.”

In addition to recognizing the impact of this cooking and heating practice on health, Smith’s work has also led to the recognition of the role it plays in climate change. He realized the potential major co-benefits for both health and climate from improvements in household energy technologies in poor countries. This has led to increased support to get improved stoves out to developing countries.

Throughout his career, Smith has advised major international organizations, such as the World Health Organization, and his research, including the first measurements of the global warming impacts of stoves, is routinely cited by other scientists. His research on the health and climate effects from indoor cooking with solid fuels contributed to the Intergovernmental Panel on Climate Change reports that helped earn the organization a 2007 Nobel Peace Prize, shared with former Vice President Al Gore. In 2009 he received the Heinz Award for Environmental Achievement. He is also a member of the National Academy of Sciences.

The only previous Tyler laureate from UC Berkeley was Bruce Ames in 1985, originator of the Ames Test. A professor of Biochemistry and Molecular Biology and a Senior Scientist at Children’s Hospital Oakland Research Institute, he is famous for inventing a laboratory assay to test for potential carcinogens. The Tyler Prize, established in 1973 and administered by the University of Southern California, is named for the prize’s founders, John and Alice Tyler.

with new hazards as they emerge. Our recent symposium on the occupational and environmental health problems attendant to natural and human made disasters (the story begins on page 8) highlighted the critical need for workplace preparedness, a need the ERCs are well positioned to meet. Reducing investment in professional training of occupational safety and health professionals, even at a time of economic strain, would be penny-wise and pound foolish.

A study by a multi-disciplinary team of COEH scientists concludes that reducing indoor air pollution from wood-burning stoves substantially decreases childhood pneumonia — the leading cause of death for children less than 5 years of age. These latest findings offer compelling evidence that wood smoke is a major risk factor for pneumonia in the households of the estimated three billion people who rely on solid fuel for indoor cooking and heating.

Although earlier studies have linked exposure to household smoke to respiratory infections, the study published by lead author Kirk Smith and co-investigators John Balmes and Lisa Thompson is the first randomized controlled trial on indoor particulate air pollution. Conducted in the San Marcos region of rural highland Guatemala, the study enrolled 534 households with a pregnant woman or young infant between October 2002, and December 2004. Approximately half of the households were randomly assigned a woodstove with a chimney. The remaining households formed the control group and continued to cook with traditional, unventilated stoves. On completion of the study, the research team gave all participants the chimney stove.

There were 149 cases of physician diagnosed pneumonia in intervention households and 180 cases in control households during the monitoring period. Nine out of 23 childhood deaths in the study were assigned to pneumonia — three occurred in the intervention group and six in the control group.

Air pollution measurements in a random sample of households showed carbon monoxide (CO) concentrations in the kitchen were about 90% lower in chimney stove households compared to control households. The chimney stove was associated with just a 50% reduction in actual exposure, however, based on multiple personal air pollution measurements on all children. Nevertheless, this reduction was associated with a reduced relative risk of 18% for physician-diagnosed pneumonia and 28% for physician-diagnosed severe pneumonia, defined as being accompanied by low oxygen saturation in the child’s blood.1

“Reducing household wood smoke exposure seems to offer as much benefit as vaccinations and nutrition supplements for reducing severe pneumonia. Substantial additional investment is now needed to find ways to do so effectively for large populations,” Smith said.

The study adds evidence to support the Global Alliance for Clean Cookstoves, an initiative of the United Nations Foundation backed by Secretary of State Hillary Clinton. It calls for 100 million households to adopt clean and efficient cookstoves and fuels by 2020.

Kirk Smith is a professor of global environmental health at UC Berkeley School of Public Health. John Balmes is director of COEH and division chief of Occupational and Environmental Medicine at San Francisco General Hospital. Lisa Thompson is an assistant professor in the School of
Nursing at UCSF. The study was funded by the U.S. National Institute of Environmental Health Sciences and the World Health Organization.


Announcement: U.S. EPA Appoints Solomon to Science Advisory Board

Lesliam Quirós-Alcalá, Ph.D. ’10, a postdoctoral fellow at UC Berkeley’s Center for Environmental Research and Children’s Health, has been awarded a year-long Science Communication Fellowship from Environmental Health Sciences.

In March 2012, ten fellows will begin working with editors and writers at Environmental Health Sciences to produce original research reviews and assist journalists seeking information for news stories. The goal of the fellowship program is to increase the public’s understanding of rapidly evolving research in environmental health sciences and green chemistry.

Quirós-Alcalá’s Ph.D. studies were supervised by COEH faculty Brenda Eskenazi and Mark Nicas. Currently, her work focuses on the effects of environmental contaminants on women’s and children’s health. Her research explores factors that predict exposures to environmental chemicals, evaluates methods to assess these exposures, and determines whether these exposures lead to adverse health effects in occupationally-exposed and low-income populations.

The U.S. Environmental Protection Agency (EPA) appointed COEH faculty Gina Solomon to its Chartered Science Advisory Board effective October 2011. EPA Administrator Lisa P. Jackson selected Solomon for her scientific and technical expertise in human health risk assessment and environmental medicine.

Solomon is co-director of the UCSF Occupational and Environmental Medicine Residency Program, clinical professor of medicine, and associate director of the UCSF Pediatric Environmental Health Specialty Unit. She also is a senior scientist at the Natural Resources Defense Council.

Established by Congress in 1978, the U.S. EPA Science Advisory Board advises the Agency on topics related to science, technology, and social and economic issues. It also reviews scientific information used as the basis for Agency regulations as well as guidelines governing regulatory decisions.

“The EPA is the “thin green line” protecting public health and the environment from pollution and toxic substances,” according to Solomon. “I’m proud to have a role in assuring that the Agency’s science is bulletproof, since it’s the foundation for their regulatory actions.”
Reducing Confined Space Fatalities in California

Two brothers, Armando and Eladio Ramirez, 16 and 22 years of age, died in October 2011 in a concrete drain pipe underneath a composting facility in Lamont, California. Armando was cleaning the inside of the pipe when he was overcome by hydrogen sulfide vapors. Eladio died after attempting to save his brother, as occurs in 10% of confined space fatalities, where would-be rescuers become victims themselves.¹

The death of the two young men “was the last straw for me,” said Ellen Widess, chief of the California Department of Industrial Relations’ Division of Occupational Safety and Health (Cal/OSHA), as she announced a new initiative aimed at reducing confined space fatalities in California. “We have the tools to prevent these needless tragedies.”

Confined spaces hazards are present in many industries. Sewer pipes, tunnels, crawl spaces, and underground vaults are examples where poor ventilation, minimal clearances, and reduced access for emergency rescue compound work hazards for employees. Last year, seven workers died as a result of confined space incidents across the state.

A mock rescue operation at the kick-off of Cal/OSHA’s Confined Space Emphasis Program, held in collaboration with the City of Oakland’s Fire Department, echoed the findings of a UC Berkeley study of 530 U.S. worker deaths in confined spaces from 1992-2005, published in February in the Journal of Occupational and Environmental Hygiene. The study found that fire department crews can usually arrive on the scene of an emergency within five to seven minutes from the time of dispatch. But the time required to effect a confined space rescue, from extricating the victim to administering advanced life support, ranged from 48 to 173 minutes.

In the event of a life threatening emergency in a confined space, the study concluded that fire departments will usually not be able to complete a rescue in time to save the entrant. The study found, however, that less than 20% of 21 large companies surveyed maintained their own on-site rescue team for confined space work, and more than half reported they simply relied on the fire department for confined space rescue service.

“If employers are relying on fire departments to pull a worker out of a confined space, the outcome is very likely going to be a body recovery, not a rescue,” says lead author Michael Wilson, director of the Labor Occupational Health Program at UC Berkeley’s School of Public Health.

“There are well-recognized hazards associated with entering confined spaces, but many employers seem to be unaware of them,” adds Wilson. “And when something goes wrong, they’re caught off-guard, without a plan aside from calling the fire department. Maybe they are unaware that a fire department rescue could take between one and three hours from the time a call is placed to 911. Employers are going to have to raise the bar on this. There is no excuse for another confined space fatality in California.”

The results of Wilson’s study add weight to Cal/OSHA’s confined spaces initiative, which requires employers to have an on-site plan with employee training and proper safeguards in place, including an effective rescue plan.

Wilson believes nearly every one of the 530 U.S. fatalities his study evaluated was preventable. Calling the Cal/
Skin Lightening Cream Contains Hidden Risks

A new case study co-authored by COEH members Mark Miller and Gina Solomon, published in Morbidity and Mortality Weekly Report, has linked a skin-lightening cream manufactured in Mexico to mercury contamination cases affecting five households in California and Virginia. In total, fifteen out of twenty-two household members showed evidence of mercury poisoning, including six with no history of using the cream.

Miller, the director of UCSF’s Pediatric Environmental Health Specialty Unit Program (PEHSU), launched the investigation in March 2010 after he was notified that a mother and her three children showed elevated levels of urine mercury while participating in a health study.

“We knew the mercury was inorganic. That told us a lot right off the bat,” said Miller. “And because there were multiple family members affected, it pointed to something around the household. It was clear the next step was to get the Environmental Protection Agency (EPA) on-site to identify the source.”

Miller began collaborating with the local health department and the California Department of Public Health (CDPH) and in less than 48 hours had an emergency response team from EPA Region 9 conducting real-time air mercury monitoring at the family’s home. “They identified a drawer in the parent’s room and a drawer in the bathroom as contaminated, though the cream wasn’t in the drawers at the time,” said Miller.

CDPH interviewed family members using a questionnaire to identify potential mercury exposures such as thermometers, fluorescent light bulbs, pharmaceuticals, and occupational exposures. They quickly identified the unlabeled skin cream as the source. The bottles were found to contain a mercury content of 2% to 5.7% by weight, an extremely high level, Miller confirmed.

The team discovered two additional households in Virginia were also using the illegally imported cream and brought the Virginia Department of Health (VDH) into the investigation. In all, six of the cream users reported symptoms consistent with mercury poisoning including numbness, tingling, dizziness, forgetfulness, headaches, and depression.

“Mercury has a half-life of two or three months. You rid of it fairly quickly when you’re no longer exposed to it,” said Miller. In July 2010, VDH retested eight household members and found their urinary mercury concentrations, although still elevated, had dropped by 45%.

Investigators are now urging clinicians to consider skin cream exposure for all cases of mercury poisoning. Their recommendation is based on strong evidence that mercury vapors from stored cream are potentially dangerous to all household members near the product. In addition, children are highly vulnerable through their contact with adult cream users’ skin, contaminated clothing, and non-dietary hand to mouth ingestion.

PEHSU worked with CDPH on a Spanish language education campaign, including radio novellas targeted at Latino listeners. Currently, Miller is collaborating with the Environmental Health Investigations branch of CDPH. By collecting then testing up to 100 samples of imported cream, they will begin to characterize the prevalence of mercury products in communities at risk.

OSHA program on confined spaces an important first step, Wilson noted that it will take effective enforcement in conjunction with outreach to employers, workers, and unions, and the availability of safer chemicals for certain applications to prevent future fatalities.

Heather Madison conducted research for the study as a Berkeley graduate student in environmental health sciences. Stephen Healy is a Battalion Chief with the Moraga-Orinda Fire District and an expert in technical rescue operations.

UC Berkeley featured the confined space study in California Department of Public Health, Miller, the director of UCSF’s Fire District and an expert in technical rescue.

UC Berkeley featured the confined space study in California Department of Public Health, Miller, the director of UCSF’s Fire District and an expert in technical rescue.

Heather Madison conducted research for the study as a Berkeley graduate student in environmental health sciences. Stephen Healy is a Battalion Chief with the Moraga-Orinda Fire District and an expert in technical rescue operations.

Hidden Risks

Cream Contains

Methylene chloride is dangerous...there are safer alternatives: http://www.cdph.ca.gov/programs/herb-face/Documents/paintstripper.pdf

Methylene chloride is dangerous...there are safer alternatives: http://www.cdph.ca.gov/programs/herb-face/Documents/paintstripper.pdf

Mercury has a half-life of two or three months. You rid of it fairly quickly when you’re no longer exposed to it,” said Miller. In July 2010, VDH retested eight household members and found their urinary mercury concentrations, although still elevated, had dropped by 45%.

Investigators are now urging clinicians to consider skin cream exposure for all cases of mercury poisoning. Their recommendation is based on strong evidence that mercury vapors from stored cream are potentially dangerous to all household members near the product. In addition, children are highly vulnerable through their contact with adult cream users’ skin, contaminated clothing, and non-dietary hand to mouth ingestion.

PEHSU worked with CDPH on a Spanish language education campaign, including radio novellas targeted at Latino listeners. Currently, Miller is collaborating with the Environmental Health Investigations branch of CDPH. By collecting then testing up to 100 samples of imported cream, they will begin to characterize the prevalence of mercury products in communities at risk.

OSHA program on confined spaces an important first step, Wilson noted that it will take effective enforcement in conjunction with outreach to employers, workers, and unions, and the availability of safer chemicals for certain applications to prevent future fatalities.

Heather Madison conducted research for the study as a Berkeley graduate student in environmental health sciences. Stephen Healy is a Battalion Chief with the Moraga-Orinda Fire District and an expert in technical rescue operations.

UC Berkeley featured the confined space study in California Department of Public Health, Miller, the director of UCSF’s Fire District and an expert in technical rescue.

Heather Madison conducted research for the study as a Berkeley graduate student in environmental health sciences. Stephen Healy is a Battalion Chief with the Moraga-Orinda Fire District and an expert in technical rescue operations.

Hidden Risks

Cream Contains

Methylene chloride is dangerous...there are safer alternatives: http://www.cdph.ca.gov/programs/herb-face/Documents/paintstripper.pdf

Methylene chloride is dangerous...there are safer alternatives: http://www.cdph.ca.gov/programs/herb-face/Documents/paintstripper.pdf

Mercury has a half-life of two or three months. You rid of it fairly quickly when you’re no longer exposed to it,” said Miller. In July 2010, VDH retested eight household members and found their urinary mercury concentrations, although still elevated, had dropped by 45%.

Investigators are now urging clinicians to consider skin cream exposure for all cases of mercury poisoning. Their recommendation is based on strong evidence that mercury vapors from stored cream are potentially dangerous to all household members near the product. In addition, children are highly vulnerable through their contact with adult cream users’ skin, contaminated clothing, and non-dietary hand to mouth ingestion.

PEHSU worked with CDPH on a Spanish language education campaign, including radio novellas targeted at Latino listeners. Currently, Miller is collaborating with the Environmental Health Investigations branch of CDPH. By collecting then testing up to 100 samples of imported cream, they will begin to characterize the prevalence of mercury products in communities at risk.

OSHA program on confined spaces an important first step, Wilson noted that it will take effective enforcement in conjunction with outreach to employers, workers, and unions, and the availability of safer chemicals for certain applications to prevent future fatalities.

Heather Madison conducted research for the study as a Berkeley graduate student in environmental health sciences. Stephen Healy is a Battalion Chief with the Moraga-Orinda Fire District and an expert in technical rescue operations.

UC Berkeley featured the confined space study in California Department of Public Health, Miller, the director of UCSF’s Fire District and an expert in technical rescue.

Heather Madison conducted research for the study as a Berkeley graduate student in environmental health sciences. Stephen Healy is a Battalion Chief with the Moraga-Orinda Fire District and an expert in technical rescue operations.
The Northern California Center for Occupational and Environmental Health (COEH), a multidisciplinary program of the University of California at Berkeley, Davis, and San Francisco, promotes health and safety in workplaces and communities by:

- Educating health professionals in epidemiology, ergonomics, industrial hygiene, medicine, nursing, toxicology, and related fields to be leaders in occupational and environmental health.
- Developing new knowledge through an interdisciplinary research agenda focused on preventing illness and injury.
- Responding to the needs of people affected by hazards in their workplaces or communities, with special attention to vulnerable populations.

Through these activities COEH supports federal, state, and local agencies, health and safety professionals, industry, labor, and community-based organizations in their efforts to prevent occupational and environmental disease and injury.

COEH is an Education and Research Center (ERC) of the National Institute for Occupational Safety and Health (NIOSH).