In the mid 1980s household biomass fuel use was identified by the United Nations Environment Programme as the most important global occupational health issue. In 1992 the World Bank named it one of the four most important environmental hazards in the world. Today, despite continuing evidence of damaging effects on health and climate change, three billion people — almost half of the world’s population — rely on solid fuels for cooking and heating.

“More people are using solid fuels for cooking than at any other time in history,” says Kirk Smith, professor of Global Environmental Health at UC Berkeley. “It’s a smaller fraction, but the absolute burden is going up by 20 million more people a year. Put another way, the shift to cleaner fuel is slower than population growth.”

Global efforts to reduce the use of inefficient biomass cookstoves gained momentum with a visit on July 20, 2011, by Secretary of State Hillary Rodham Clinton to Chennai, India. Speaking at the Working Women’s Forum, Clinton drew...
Letter from the Director

Exposure to smoke from combustion of solid fuels such as wood, dung, crop waste and coal leads to low birth weight and pneumonia in infants and cataracts, chronic obstructive lung disease, cardiovascular disease and lung cancer in adults – mainly women who cook using open fires. With approximately half of the world’s population, primarily in developing countries, exposed to smoke from solid fuel combustion, household air pollution from this source is a major contributor to the global burden of disease. Despite the large impact of household air pollution on health, relatively little attention has been paid to the problem.

COEH member Kirk Smith has strived for over three decades to increase the awareness of household air pollution as a critical driver of ill health. He was the first to measure levels of exposure to various components of smoke using personal monitoring of a woman cooking with biomass fuel, including particulate matter and carbon monoxide. Along with demonstrating that high levels of exposure to smoke occur around the world from cooking with biomass fuel, Dr. Smith sought to establish that improved cook stoves were an intervention that would reduce ill health due to biomass smoke emissions. Though it took many years before he could find the appropriate site and obtain the funding to conduct such an intervention study, I am happy to report the paper describing the results of the world’s first randomized controlled trial of a chimney stove in rural Guatemala is in press at the Lancet.

Why is this randomized controlled trial so important? One reason for the relative inattention to household air pollution has been the lack of data documenting the effectiveness of interventions to reduce exposure for the prevention of health outcomes. A health ministry in a developing country with limited resources is more likely to employ a pneumococcal vaccination program to prevent pneumonia in young children rather than mass distribute cleaner cook stoves. Quantitative evidence proving efficacy is needed to support expending limited resources on stoves. Dr. Smith has been for years encouraging policy makers in developing countries and funders in developed countries to take concrete actions to ameliorate the problem of household air pollution. While he has received numerous awards for his pioneering work, his efforts to stimulate government actions were of mixed success until recently.

Over the last two years, however, there has been a remarkable sea change in attitudes about this problem. As many of you may know, Hilary Clinton has long been interested in the health of women and children. After being named U.S. Secretary of State, she became aware of the huge public health impacts of household air pollution in developing countries and demanded action. As a result, a Global Alliance for Clean Cookstoves (GACC) was established that includes the governments of 16 countries, companies and nongovernmental organizations. The goal of the GACC is to distribute 100 million clean stoves to households in need around the world by 2020. Multiple U.S. governmental agencies have been mobilized to work on this ambitious goal, including USAID, CDC, NIH, and EPA.

As recently as two years ago, a review of a grant application to NIH Dr. Smith and I submitted indicated that since biomass smoke exposure was not a problem in the United States, our proposed research project was not of interest. But in May of this year, the NIH hosted an international conference to highlight knowledge gaps regarding health effects of household air pollution and methods to reduce exposures. As the feature article in this issue reports, Dr. Smith will be conducting a pilot study in India that is planned to lead into the launching of a major clean stove intervention study in that country.

As I’ve noted, the effects of exposure to harmful cooking smoke have historically received limited funding and research attention in comparison to other risk factors (e.g., lack of clean water, sanitation, and hygiene) or diseases (e.g., malaria) that lead to similar health outcomes. In addition to a lack of research into the impacts of biomass smoke exposure and the potential benefits of cleaner stoves, there also has been a lack of affordable, advanced solutions that yield clear benefits and achieve user acceptance.

Hopefully, with this latest push to distribute clean cook stoves by the GACC, appropriate research and evaluation of various stove interventions will be conducted to ensure the efforts achieve success. 🌍
Contaminated drinking water is a major public health threat in Haiti, a problem worsened by chronic poverty and malnutrition. It contributes to Haiti’s staggering childhood mortality rate — one in eight die before they reach the age of five.¹ Not only did last year’s earthquake in Haiti kill an estimated 230,000 people, but it led to a cholera outbreak resulting in over 300,000 cases and 5,986 deaths, according to the World Health Organization.²

David Holstius, a PhD candidate in the School of Public Health at UC Berkeley, travelled to Haiti in October 2011. In the town of Léogâne, near the epicenter of the quake, Holstius is piloting the deployment of mobile phone software he developed to help the non-profit Deep Springs International (DSI) monitor their safe water program, which encourages Haitians to disinfect drinking water with chlorine.

Half the population in Haiti lives in rural areas where only 3% of households are connected to public water systems. This means villagers, mostly women and children, travel back and forth to contaminated wells and streams to manually fill household water containers. DSI distributes a low-cost 0.7% sodium hypochlorite solution called Gadyen Dlo that disinfects drinking water.³ The cornerstone of the DSI initiative is their household follow-up program, which helps reinforce the health benefits of water sanitation.⁴

“Monitoring at the household level takes a lot of resources, from transportation to personnel,” says Holstius. “Before the cholera epidemic, DSI workers visited households once a month. Unfortunately, when relief organizations distribute chlorine for free on a short-term basis, it can undercut programs that focus on long-term sustainability and job creation, like DSI. Since the earthquake, they’ve had to reduce base salaries for staff, and now they visit once every two months.”

Holstius loaded forty phones with a survey questionnaire for community health workers to track whether a household’s water tested positive for residual chlorine, the identification tag of the water bucket and the amount of chlorine on hand with a rating of 1 to 5. “The prompts on the phone are in Creole,” says Holstius, which is one of the country’s two official languages. A DSI technician who became vested in the project has written a training manual in Creole for other staff.

The phone survey makes the safe water program more sustainable by automating household data collection. “It’s doable to manage up to 1,000 households using an ad hoc Excel spreadsheet,” says Holstius, “but as you scale up to 40,000 households it becomes more difficult to manage.”

Digicel, a cell phone service provider in Haiti, underwrote the costs of text messaging. Nokia supplied the phones, a laptop for DSI and an initial gift of $12,000 U.S. to fund the pilot. A second gift from Nokia of $28,000 will enable the team to deploy another 100 mobile phones to fieldworkers.

Holstius wants to further explore the potential of using open software platforms for the monitoring, measuring and modeling of community exposures. “What happens when you open up platforms for two-way communications?” questions Holstius. “Not only are you tracking data, but you can begin to push information to health workers and individual households, changing the relationship between epidemiologists, health practitioners and the communities with which they collaborate.”

¹ http://www.state.gov/r/pa/ei/bgn/1982.htm  
² http://www.who.int/hac/crises/hti/en/  
³ http://www.iwawaterwiki.org/  
⁴ http://deepspringsinternational.org
Kirk Smith Brings Global Attention to the Effects of Solid Fuel Use on Health and Climate Change (continued from cover)

attention to the work of UC Berkeley School of Public Health collaborator Kalpana Balakrishnan of Sri Ramachandra University, calling the professor “one of the world’s experts on how to make cooking safer for women and children.”

Indoor air pollution from cooking and heating with solid fuels accounts for nearly 2 million deaths annually, which is more than the deaths from malaria or tuberculosis. Women and children in developing countries are most at risk. Cooking over open fires or with makeshift stoves, they inhale smoke that contains particulate matter up to 20 times higher than the maximum recommended levels by the World Health Organization (20 milligrams per cubic meter). Multiple epidemiological studies have linked this exposure to higher rates of acute lower respiratory infection, low birth weight, cancer, blindness and chronic obstructive pulmonary disease.

In addition to its health damaging effects, solid fuel use has been found to play a role in climate change. “In India, up to 50% of outdoor air pollution may be coming from indoor sources, and 30% in China,” reports Smith. Solid fuel smoke contains black carbon, CO2 and methane, pollutants that are active in climate warming, as well as contributing to regional outdoor air pollution. Black carbon is also implicated in accelerating the melting of mountain glaciers.

Smith has pioneered the study of household air pollution from solid fuel use since the 1980s. “As a doctoral student working with founding COEH director Robert Spear and others, I trained myself to follow the risk. As a physicist, I was working on nuclear energy problems. Soon after graduating, I realized you could have a Chernobyl accident per month and it wouldn’t come anything close to [the health effects of] air pollution. We have a million people dying of coal combustion and two million people dying of indoor air pollution that goes on day in, day out. If you want to help real peoples lives, you have to follow the risk.”

Smith notes that, “Even with strong evidence, it takes a long time for things to happen.” He’s seen three big pushes for change in the past: one around 1980, a second in the late 1980s, and now. “The first wave resulted in huge national stove programs in India and several other countries: China introduced 180 million stoves and India introduced approximately 40 million. We now understand only the Chinese program accomplished anything. The others were mixed successes.”

“You can call a stove ‘improved’ because you’ve improved fuel use, but still you may have worsened pollution. Advocacy may still be ahead of implementation science.”

Kirk Smith

When the second round of interest emerged in the late 1980s, stove technology lagged behind the biomedical science. “In retrospect, it was premature then to push a solution nobody had any experience would work,” says Smith.

Recently, Secretary Clinton was instrumental to the launch of the Global Alliance for Clean Cookstoves Initiative led by the United Nations Foundation. Actor Julia Roberts joined the Initiative in May as a Global Ambassador to help raise awareness of the organizations mandate to install clean burning stoves in 100 million homes by 2020. “Current evidence suggests that you need to achieve very clean combustion to obtain significant improvements -- and that doesn’t come about by magic modifications of an existing mud stove,” says Smith. “It comes with advanced engineering and materials. You can call a stove ‘improved’ because you’ve improved fuel use, but still you may have worsened pollution. Advocacy may still be ahead of implementation science.”

Smith, a member of the National Academy of Sciences, leads numerous international efforts to slow climate change and reduce air pollution. He is contributor to the Global Energy Assessment conducted by the International Institute for Applied Systems Analysis (IIASA) in Austria. After years of effort involving a cast of hundreds, the Assessment will report on the future of the world’s energy systems and all its ramifications including climate, health, energy security and the economy.

Another project in which Smith is involved is the Global Burden of Disease and Comparative Risk Assessment organized by a consortium that includes the World Health Organization (WHO). “It calculates the burden of disease from approximately 40 different risk factors globally including household and outdoor air pollution, lead, high cholesterol, unsafe sex, smoking and malnutrition,” says Smith.

In addition, Smith is helping to draft the 2012 WHO air quality guidelines and is a lead author for health of the new Intergovernmental Panel on Climate Change (IPCC) effort, Assessment Report 5, to be published in 2014. “One of the biggest single co-benefits between climate and health is household fuels,” says Smith.

In September 2011, a team led by Smith is launching a feasibility study in India to deploy clean stoves to 200 women receiving government-run antenatal
In the Line of Duty – A Remembrance of Timothy Quinlan

Editor’s note: This is the first in an occasional history series looking back at occupational health issues in a historical context. Please let us know if you have a story to share.

On the morning of February 27, 1904, railroad switchman Timothy Quinlan set out as a young man with an enviable job and a bright future. By days end, he would perform an extraordinary act of heroism that would save hundreds of lives at the cost of his own — all in the line of duty.

From his post at the railroad switch, Quinlan heard the whistle sound for the Lake Shore Limited calling ahead to clear the track. The train barreled full steam along the rails, hurrying passengers to their destinations. At the same time from the other end of the yard, another engine pulled toward Quinlan on a track running parallel to the one carrying the Limited. The switch for the Limited was open, however, and there was now a train of freight cars in its path.

Passengers were headed toward catastrophe. With only moments to make up his mind, Quinlan seized the switch and threw it, diverting the passenger train to the main line. The wheels safely latched onto new track, but the force of the lever threw him directly ahead of the oncoming train, ending his life.

Stories like Timothy Quinlan’s help to put a human face on workplace fatalities. In 1912, more than 18,000 workers died from work-related injuries.¹ This number has dropped significantly over the last hundred years. Still, in 2009 there were 4,551 U.S. fatal work injuries,² the vast majority preventable.³ Ninety-three percent of the fatalities were men, and transportation-related accidents accounted for thirty-one percent of the total.⁴

Timothy Quinlan was the great uncle of COEH member and UC Berkeley alumna Patricia Quinlan, MPH, CIH. Quinlan, the new deputy director of

1. CDC website: http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4822a1.htm

COEH, also divides her time between research, practice and teaching in the Occupational and Environmental Health Nursing and the Occupational and Environmental Medicine programs at UCSF, and the Industrial Hygiene program at Berkeley.

A tribute to Timothy Quinlan’s heroism by Knights of Columbus leader T. V. Powderly was published in the Journal of the Switchman’s Union in February 1905 and in “The Life Work of Edward A. Moseley” by author James Morgan published in 1913.

2. Household Cookstoves, Environment, Health & Climate Change: A New Look at an Old Problem, published online by The World Bank at cleancookstoves.org

A switchman riding a car in the Atchison, Topeka, and Santa Fe Railroad yard. (Frank Delano/Library of Congress)

Care. Eighty percent of poor pregnant women in India participate in the antenatal program, and 96% use solid fuels. Technicians will provide training on how to operate the new stoves and will track its use. They’ll also measure air pollution changes and birth outcomes. Smith plans to expand the project into a 10,000 person trial that can form the basis of a national intervention.

“Studies show a 90-gram difference in birth weight between households who use clean fuel compared to those who don’t,” says Smith. “If we can show half that gain -- a 45-gram difference in weight -- then the health sector will pay. They are already giving these women benefits in some Indian states worth hundreds of dollars: folic acid and iron pills, nutrition supplements and hygiene education. Women visit clinics a minimum of three times during their pregnancy. Another $50 for an improved stove is not out of hand if we can show the benefit.”

Smiths collaborators on the India study include colleagues from the School of Public Health at Columbia University, his long-term Indian colleagues at Sri Ramachandra University, plus a new group of colleagues from the International Clinical Epidemiology Network, (INCLEN).
Ergonomic Drill Solution Piloted at Memorial Stadium

A research team from UC Berkeley led by David Rempel, building on the success of an overhead drill press design, piloted a new solution for drilling into concrete during the seismic upgrade of Memorial Stadium at UC Berkeley. Workers taking part in the pilot reported a significant reduction in fatigue and back pain.

The new tool, called the Highway Drill Jig, aids construction workers who handle rock drills and rotary hammer drills that weigh anywhere from fifteen to forty-five pounds. These drills are employed on large scale projects such as highway bridges and large buildings, where workers will puncture up to 20,000 holes one to two feet deep into concrete.

“The rock drills used are pneumatic drills, similar to jack hammers,” says Rempel, a professor of Medicine in the UCSF Division of Occupational and Environmental Medicine and director of the joint Berkeley and UCSF Ergonomics Program. “It’s like holding a jack hammer at your waist and then forcing it into a concrete wall.”

Existing drill methods are noisy and heavy, and they create large amounts of silica dust. The ergonomic design of the Highway Drill Jig solves some of these health risks. “We’ve been conducting laboratory studies measuring noise and dust at the Laborers Training Center in Pleasanton, California, and we’ve found that our method of dust containment reduces silica dust exposure to lower than NIOSH limits,” says Rempel. “We’re trying to decrease respiratory exposure, vibration exposure and the forces to the shoulder and back.” An article publishing their results is in peer review.

The prototype device, developed in six months, was first tested on the new sound barriers installed along the San Raphael freeway in Marin County. “Laborers who used the device said they didn’t want to go back to the previous method,” said Rempel. “With the old method, workers were completely exhausted after a half day of work. Using the new device, they were able to work almost all day long without that same exhaustion.”

The seismic renovation of Memorial Stadium represents the second test of the Highway Drill Jig. Rempel and colleagues will be recruiting 30 workers to compare the tool side-by-side their current methods. Outcomes measured are force, vibration, dust exposure and subjective feedback on pain. “This method is the way to go,” said one worker surveyed. “No back pain.” Another said, “I prefer the drill support. My hands and arms do not hurt at the end of the day.”

Looking forward, Rempel says there are plans to use the Highway Drill Jig on an upcoming seismic upgrade of a Bay Area Rapid Transit station and on a bridge upgrade on Highway 13 in Oakland.

Collaborators on the Highway Drill Jig from the Ergonomics program include Research Assistant Maggie Robbins and Senior Development Engineer Alan Barr. Research partners are Webcor Builders, RM Harris Company and the Laborers International Union. Both research projects are funded by the Center for Construction Research and Training (CPWR) and The National Institute for Occupational Safety and Health.

“With the old method, workers were completely exhausted after a half day of work. Using the new device, they were able to work almost all day long without that same exhaustion.”

David Rempel
Wilson Announced as New Director for LOHP

Michael Wilson has been appointed as the new Director of the Labor Occupational Health Program (LOHP), stepping into a role held by Robin Baker for some 30 years. LOHP is a public service program of the Center for Occupational and Environmental Health (COEH) within the UC Berkeley School of Public Health. Its mission is to protect the health and safety of workers and communities worldwide. The appointment was announced by John Balmes, Director of COEH, and is effective July 2011.

Wilson holds a PhD and MPH in Environmental Health Sciences from UC Berkeley, and a bachelors degree in Biology from UC Santa Cruz. He is also a graduate of the Trade Union Program at Harvard University, the Pre-Hospital Care Program at Stanford University and the Projecto Linguistico Francisco Marroquin in Antigua, Guatemala.


“LOHP is a community of people who embody the best of Berkeley,” says Wilson. “It applies the resources of the University to a meet a critical social need, here in California and internationally. The work environment in the U.S. produces nearly 50,000 disease deaths each year, on top of some two-and-half million emergency rooms visits; we need to solve that problem, both in the near term and at its root cause,” says Wilson. “Workers need training and tools to act effectively, and root causes are usually tied to political economic decisions and public policy; LOHP has a role in both areas.”

Under his direction, Wilson hopes to increase LOHP’s role internationally and in public policy debates. “As the global South continues to industrialize, I think we have an obligation at Berkeley to advocate on behalf of these workers and communities, which are often one in the same.”

In addition to his role at LOHP, Wilson will continue to serve as an Associate Director of the Berkeley Center for Green Chemistry (BCGC), organizing interdisciplinary green chemistry research, education and public engagement. “I expect the relationship between LOHP and the BCGC to grow over time,” notes Wilson, who sees the BCGC, with its explicit public interest focus, as a natural way for LOHP to strengthen its ties on campus.

“LOHP provides enormous benefit to California,” says Wilson. “I’d like decision-makers in Sacramento to know that, on behalf of the University of California, there is an extraordinary group of people working with little support but with great benefit to the people who live and work here.”

David Michaels, Assistant Secretary of Labor for Occupational Safety and Health, was the first person to congratulate Wilson on his appointment. “LOHP is widely recognized as an organization that delivers,” points out Wilson. “That’s a testament to the staff and to former Director Robin Baker’s good work over many years.”

Wilson’s own relationship with LOHP goes back more than two decades. As a fire fighter-paramedic and union officer in the early 1990s, he caught the attention of former LOHP health educator Betty Szudy while testifying at a hearing on the federal Hazardous Waste Operations and Emergency Response regulations. “We need to talk,” was the opening line of a conversation that would convince Wilson he had a future at Berkeley. Now, the Center that first beckoned him to graduate school welcomes him in his new role as Director.

3 Iles A. Greening Chemistry: Emerging Epistemic Political Tensions in California and the United States. Public Understanding of Science. 13 July 2011
COEH faculty member Ellen Eisen, adjunct professor in the School of Public Health (SPH) at UC Berkeley, is the director of a new Occupational Epidemiology program funded by the National Institute for Occupational Safety and Health (NIOSH). The program will prepare MS, MPH and PhD students for leadership roles as occupational epidemiologists in governmental public health agencies, nongovernmental organizations, universities and private industry.

Core faculty for the program from UC Berkeley include COEH members Michael Bates, adjunct professor of epidemiology at SPH and Patricia Buffler, professor of epidemiology and dean emeritus, who was also recently elected president of the International Epidemiological Association.1 Joining Bates and Buffler is John Balmes, director of COEH and professor of Medicine in the Division of Occupational and Environmental Medicine at UCSF.

“Training in epidemiology enables scientists to look at clinical outcomes or causes of death and assess the risk of those health endpoints in relation to specific workplace exposure”

Ellen Eisen

Nine others from UC Berkeley, UCSF, UC Davis and UCLA* will contribute as teaching faculty who will serve on thesis and qualifying examination committees. Collaborators from Stanford University are Mark Cullen, chief of the Division of General Internal Medicine, and Peggy Reynolds, senior research scientist at the Cancer Prevention Institute of California.

The program faculty offer expertise in occupational and pulmonary medicine, exposure assessment, epidemiologic methods, ergonomics, cancer epidemiology, toxicology, social epidemiology and injury and respiratory epidemiology.

COEH has a comprehensive teaching program including three core and one affiliated NIOSH-funded disciplines.2 “Now, we are able to add to training with a targeted program in occupational epidemiology,” says Eisen. “Training in epidemiology enables scientists to look at clinical outcomes or causes of death and assess the risk of those health endpoints in relation to specific workplace exposure. The exposure of interest could be an airborne chemical, organic dust or a physical hazard; you need epidemiologic tools to establish the link.”

The program is funded for four years and it includes tuition and stipend support for three graduate students: two PhD candidates and one MPH student have been accepted. Trainees may enroll in different divisions in the SPH such as epidemiology, biostatistics or environmental health sciences, and they are required to take a set of core courses including risk assessment, exposure assessment, and occupational health.

Eisen earned an MS and ScD from the School of Public Health at Harvard University. Her research spans occupational and environmental health, biostatistics and epidemiology. She is currently involved in several large cohort studies of occupationally exposed populations and in applying causal methods to reduce bias due to healthy worker survivor effect. She is following a cohort of autoworkers exposed to metalworking fluids to investigate cancer incidence3 and cardiovascular mortality. Other ongoing projects include a study of incident heart disease in a cohort of aluminum manufacturing workers exposed to small particles and a prospective pooled study of carpal tunnel syndrome. In a cohort study of female textile workers in Shanghai, Eisen and colleagues from the University of Washington have found evidence that endotoxin exposure, occurring 20 years earlier, may provide an anti-carcinogenic effect against lung cancer.4

2 http://coeh.berkeley.edu/about/default.htm

*UC Berkeley faculty includes Katharine Hammond, Stephen Rappaport and Martin Smith. UC Davis faculty includes Stephen McCurdy and Marc Schenker. UCSF faculty includes Paul Blanc, Robert Harrison and David Rempel. Niklas Krause from UCLA will also participate.
Air Pollution Linked to Changes in Prenatal Immune System

Maternal exposure to air pollution during pregnancy may alter fetal immune development, according to a study from investigators at the University of California, Davis.

The study, published in Environmental Health by lead author Caroline Herr and COEH co-authors Irva Hertz-Picciotto and Kent Pinkerton, found significant associations between polycyclic aromatic hydrocarbons (PAHs), a component of particulate air pollution, and increases in T lymphocytes (CD3+ and CD4+), as well as decreases in B lymphocytes (CD19+) and natural killer (NK) cells in cord blood during early gestation. In contrast, PAH exposure during late gestation was significantly associated with decreases in CD3+ and CD4+, and increases in CD19+ and NK cells. The relationship between particulate matter less than 2.5 micrograms per cubic meter (PM2.5) and T lymphocytes displayed similar results, though findings were not consistently significant.1

“Overall, these two studies suggest that during fetal life, development of the immune system is not necessarily protected by the placental barrier from environmental insults such as air pollutants”

Rakesh Ghosh

T and B lymphocytes, which are part of the adaptive immune response system,2 begin to develop during the early weeks of fetal development.3 Exposure to high levels of air pollution during critical stages of gestation4 could possibly lead to a greater susceptibility to infection in early life, notes Pinkerton.

Researchers recruited 1,397 pregnant women from May 1994 to March 1999 residing in two districts of the Czech Republic: industrial Teplice in Northern Bohemia where air pollution levels are typically higher and Prachatice in Southern Bohemia, an area with light industry and better air quality.

“During the period these women were pregnant, ambient air was monitored in each of the two cities,” explains Pinkerton. These air measurements were then matched to time periods of gestation for each participant, specifically, to each month of pregnancy.

“We found the impact to the lymphocyte population type and abundance had a strong correlation with the type of air quality during each period of gestation,” said Pinkerton, suggesting it’s plausible the changes were environmentally induced.

In a separate study, the investigators found that concentrations of PAHs and PM2.5 were associated with prenatal changes in cord serum Immunoglobulin (IgE) levels, and that the changes were linked to gestational windows of exposure. 5

The study analyzed IgE levels following 459 births from the same cohort of pregnant women in the Czech Republic. Scientists matched the IgE measurements to PAH and PM2.5 samples from Teplice and Prachatice and assigned them to participants for each gestational month.

Regression models used to estimate prevalence ratios of elevated IgE took into account factors that may influence the results, such as the district of residence, year of birth, maternal IgE and gestational season.

Higher PAHs and PM2.5 exposures during the first trimester, especially in the second month of gestation, resulted in a lower prevalence of elevated cord serum IgE. They also found exposures during mid-pregnancy were associated with a higher prevalence of elevated cord IgE. The associations were stronger among infants whose mothers had low IgE. 6

“This latter finding would appear to support the notion that those without a genetic predisposition to atopy may actually be more susceptible to influences from pollutants in ambient air,” noted Hertz-Picciotto.

“The primary risk of elevated IgE levels is susceptibility to allergies or to developing an asthmatic like condition,” says Pinkerton, who cautions its uncertain whether the changes they observed in the study could lead to these susceptibilities in childhood.7

Rakesh Ghosh, a postdoctoral fellow in Dr. Hertz-Picciotto’s laboratory commented: “Overall, these two studies suggest that during fetal life, development of the immune system is not necessarily protected by the placental barrier from environmental insults such as air pollutants.”

Hertz-Picciotto adds, “What remains to be elucidated is whether alterations in the maturation of lymphocytes might have long-lasting impact on the ability to appropriately regulate responses to infection.” 🌍

Keynote Address at AIHce Calls for Support of Chemicals Policy Reform

Michael Wilson’s keynote address to the 4,200 attendees of the American Industrial Hygiene Conference and Exhibition (AIHce) called on members to join in the effort to rewrite the U.S. Toxic Substances Control Act (TSCA) of 1976.

“TSCA reform is critical to protecting worker health, and it’s highly relevant to the science and practice of industrial hygiene,” said Wilson, director of the UC Berkeley Labor Occupational Health Program and Associate Director of the Berkeley Center for Green Chemistry.

He told members that, “TSCA reform has the potential to motivate companies to ‘design out’ many of the hazardous properties of chemicals,” and that “in doing so, the U.S. can retain a robust industrial chemical industry capable of responding to the growing global demand for safer chemicals and products.”

The Toxic Substances Control Act covers 82,000 chemicals in commerce and 74 billion pounds of chemicals produced or imported into the United States each day, according to Wilson. Only about 1,000 of these are regulated by U.S. statutes, leaving businesses, government and the public in the dark about the potential health and environmental effects of the great majority of chemicals in commercial use.1

Wilson told AIHce attendees that weaknesses in the TSCA are the primary reason industrial hygienists lack the hazard and exposure information needed to identify safer alternatives for workers and communities.

As part of his address, Wilson worked with the AIHA Stewardship and Sustainability Committee in drafting a policy statement, calling on the U.S. Congress to implement critical reforms of TSCA. That Statement is now under revision and, if successful, will join those of other key health organizations, including APHA, the American Medical Association, and the American Academy of Pediatrics. On the other hand, Wilson warned, if AIHA members decide to steer clear of the reform effort, “we are going to be back here in 10-15 years saying the same things were saying today.”

By engaging in changing what Wilson called a “root cause” of worker morbidity and mortality in the United States, “the effort to rewrite TSCA is an historical opportunity for public health as well as for the industrial hygiene profession to experience new energy and growth.”

Wilson is a graduate of the Industrial Hygiene Program at Berkeley’s School of Public Health.  

CDC Selects Pesticide Illness Study for Weekly Top Ten

The Center for Disease Control (CDC) highlighted COEH member Soo-Jeong Lee’s first-authored article in Environmental Health Perspectives as one of the top 10 significant public health articles of the week.1 The article was named in the June 13 issue of Science Clips, a digest from the CDC Public Health Library and Information Center.

Lee’s study estimates the incidence of acute illnesses from pesticide drift resulting from outdoor agriculture applications. It analyzes almost 3,000 pesticide drift cases identified in 11 states during 1998-2006. Agricultural workers and residents of agricultural regions were found to have the highest rate of pesticide poisoning from drift exposure. Soil fumigations were responsible for 45 percent of cases, while aerial applications accounted for 24 percent.2

Common factors contributing to drift cases included weather conditions, improper sealing of the fumigation site and applicator carelessness near non-target areas.

Lee joined the faculty at UCSF in August 2010 as an assistant professor with the Occupational and Environmental Health Nursing (OEHN) Program. Previously, Lee worked as a post-doctoral fellow for the CDC’s Epidemiologic Intelligence Service, a training program for public health and applied epidemiology.  


Hirsh Receives Awards from AIHA

The American Industrial Hygiene Association (AIHA) honored COEH Advisory Committee member and UC Berkeley alumnus Richard Hirsh, CIH, MPH, with the Fellow Award at its annual AIHce conference in May 2011 held in Portland, Oregon.

“You can be proud that your accomplishments are recognized by your peers as outstanding contributions to the Association and to the profession,” AIHA president Michael Brandt wrote in his announcement to Hirsh. Only five percent of AIHA’s 10,700 members qualify for the honor of Fellow.

In July 2011, Hirsh was honored a second time with the Dr. Christine Einert Award from the Northern California Section of the AIHA (AIHA-NCS) for his exceptional contributions to the Association. Hirsh is the founder and leader of the AIHA-NCS’s Developing World Outreach Initiative, which strives to increase occupational health and safety capacity in the developing world.

Founded in 1939, AIHA is a nonprofit organization serving the needs of occupational and environmental health and safety professionals practicing industrial hygiene in industry, government, labor, academic institutions, and independent organizations.

EHS Alumni Help Students Chart Futures in Environmental Health

Alumni from the division of Environmental Health Sciences (EHS) at the UC Berkeley School of Public Health met with current students to share first-hand information and experiences about their careers in Environmental Health. The professional networking event, the first of its kind for EHS, was conceived by recent graduates Nina Townsend and Michelle Stewart (MPH 11), Program Coordinator Norma Firestone and Professor Emeritus Robert Spear.

Ten alumni, six faculty and almost thirty graduate students attended the event held on campus at the International House in April 2011.

EHS faculty Michael Bates, Katharine Hammond, John Balmes, Nina Holland, Steve Rappaport and Spear helped to facilitate connections between students and alumni who shared wide-ranging academic and professional interests.

Alumni included Paurene Duramand, MPH, PhD 05, Miriam Rotkin-Ellman, MPH 06, Michael M. Fischman MD, MPH 82 (COEH Advisory Chair), Chris Kirkham, MPH 08, David Penkowski, PhD 03, Donna Seid, MS 79, Candace Vahlsing, MS, GHE 08, Michael Williams, MS 75, David Zalk, PhD, MPH 94 and Amod Pokhrel, PhD 10.

Duramand commented that, as a student, she always appreciated faculty and alumni who took the time to come speak about their careers. “Their informal guidance and encouragement helped me get a better sense of what I wanted to be ‘when I grew up.’ It is in this spirit that I happily return to my alma mater.”

She adds that there are many resources out there for students; it’s a matter of making connections and being able to tap into them at the right time.

“I really enjoyed the vitality and passion of the students who are committed to a better future — for themselves and for the environment around them,” noted Duramand. “Their energy is contagious.”
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).

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- John Balmes
- Marion Gillen
- Robert Spear
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**Managing Editor:** Marion Gillen
**Design:** John Minardi
**Writer:** Maureen Jerrett
**Contact Information:**
- Fax: (510) 642-5815
- coehnews@berkeley.edu
- http://coeh.berkeley.edu/bridges

The STEER Program (Short Term Experiences for Research in Environmental Health for Undergraduate Students) supports summer internships in public health research for undergraduate students. The Llewellyn Student award supports multi-disciplinary graduate student projects. Targeted Reserarch Training grants (TRT) provide NIOSH funded stipends for research in Occupational health.

**COEH Spring Get Together Showcases Student Research**

Students, faculty and affiliates came together in May at UC Berkeley for presentations from participants in COEH's various programs that support student research: Llewelyn Student Awardees, Targeted Research Training designees and former STEER interns.

The event began with Ergonomics student Peiyi Ko presenting her work on the effects of glare, presbyopia and font size on the posture of computer users. Llewelyn awardee Georgia Green followed with a profile on electronic waste workers in Abidjan, Cote d’Ivoire. Environmental Health Sciences Student Nina Townsend discussed industrial hygiene practices in a Dominican Republic-based textile mill. Former STEER Intern Veronica Davé gave a presentation on the effects of vitamin supplementation on paraoxonase activity. The program ended with an introduction to Michelle Stewart and Travor Bausman’s pilot study on formaldehyde exposure to salon workers who perform the "Brazilian Blowout" hair straightening technique.

Director John Balmes emphasized COEHs commitment to supporting student research, stressing the significance of the projects presented and the need for funding to continue this important work.

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Find out more about all of these programs at http://coeh.berkeley.edu

Peiyi Ko (Photo John Minardi)