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COEH
CENTER FOR OCCUPATIONAL & ENVIRONMENTAL HEALTH

Bridges

WINTER 2012

THE INSIDE TAKE ON CLIMATE CHANGE

Health officials encourage people to stay inside during ozone-advisory days or periods of extreme heat. Their warnings suggest our home or office building may offer protection from the harmful consequences of climate change. Yet a groundbreaking report from the Institute of Medicine (IOM) concludes that, surprisingly, our indoor environment — where we spend over 90 percent of our time — is precisely where we'll experience most of the adverse health effects of global warming.

The report's findings suggest that alterations in indoor environmental quality induced by climate change are an important public-health problem, and the authors recommend that the U.S. Environmental Protection Agency spearhead efforts to make indoor environment and health issues an integral part of federal climate change research and action plans.[1]

Recently, a study published in *Indoor Air* by IOM report co-author **William Nazaroff** at UC Berkeley illustrated one of the ways that our indoor environment is influenced by the environment outside.[2] Nazaroff and his research team measured ultrafine particles in six northern California classrooms. Outdoor concentrations were also measured at each school site. They found that average indoor particle

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FEATURES

Letter from the Director

John R. Balmes

As was true for our state, nation, and the world, 2011 was a year of challenges for COEH. A big challenge came with **Marion Gillen's** retirement as Deputy Director last summer. Marion first joined COEH in 1989 as head of the Continuing Education Program at the Labor Occupational Health Program. She then went back to graduate school in the Occupational Health Nursing Program at UCSF where she earned a PhD and eventually became head of the program. While at UCSF, Marion did outstanding research in the area of occupational injury, investigating determinants of risk for injury and disability in the health care and construction industries, and always working to reduce risk by improving the safety culture. Marion was a superb mentor to many nursing students at UCSF, and she continued to work with students after joining me at COEH. She was justly proud of the Short Term Educational Experiences for Research in Environmental Health (STEER) program that she ran at UC Berkeley for several years before her retirement. Marion was the glue that kept COEH together for the past five years and I miss her greatly, for she has not only been an excellent colleague, but a dear friend.

Fortunately, with challenge comes opportunity, and I have been able to recruit two very talented people to help me run both COEH and the NIOSH Education and Research Center grant. My long-time co-worker in the UCSF Occupational and Environmental Medicine Program, **Patty Quinlan**, has become the Deputy Director of COEH and the NIOSH ERC, and she is now responsible for much of the administrative work that Marion did. **Robin Baker**, the former Director of the LOHP, has become the Director of Research to Practice for COEH. Since Marion's departure, Robin has been leading the communications and outreach activities for the Center, including our efforts for continued federal support of occupational health and safety training and the production of *Bridges*. It is a testament to the depth of our bench in the COEH family of programs that I could find two such wonderful colleagues to work with in pursuit of a new vision for COEH.

Of course, the biggest challenge that COEH faces is whether federal support for the Education and Research Centers (ERC) will continue. We at the Northern California ERC have joined with the 16 other ERCs and the eight Agricultural Safety and Health Centers to try to convince the Obama administration and Congress that continuing to support these Centers is vital to maintaining the national infrastructure for training of occupational health and safety professionals. The good news is that funding for the current year appears to have survived the budget axe, but long-term support remains in jeopardy.

Because we cannot count on continued NIOSH support for our Center, we have begun some hard thinking about what a future without such support might look like for our programs. The Occupational Health Nursing Program is as strong as ever and could clearly continue. The Occupational and Environmental Medicine Program currently has a Health Research Services Administration grant that could potentially be renewed and is in discussion with another possible source of training support. The Ergonomics Program is another strong program that will attract graduate students without NIOSH support. The Industrial Hygiene Program is considering the development of a new focus in green chemistry to take advantage of a new strength of COEH. In the coming months, we will be asking our colleagues within and friends outside the Center to help us envision our role in the training of occupational and environmental health professionals in the future, with or without NIOSH support.

Wage Theft and Unsafe Working Conditions Revealed in San Francisco's Chinatown

Almost 40 percent of San Francisco's 15.9 million annual tourists visit Chinatown, a neighborhood in the hub of the downtown district. Many are attracted by its plentiful restaurants — dining out ranks among the top three reasons tourists visit San Francisco.[1] But despite the dollars spent by Chinatown's visitors, a UC Berkeley study reported that half of its restaurant workers are paid less than the minimum wage of $9.92 an hour. And, although over 40 percent work more than 40 hours a week, 75 percent fail to receive overtime wages and the majority never receive paid vacation.[2]

Half of restaurant workers in San Francisco's Chinatown earn less than minimum wage.

Minimum wage violations are costing Chinatown restaurant workers an estimated $8 million every year in lost wages, according to the Chinese Progressive Association.[3]

The study was led by principal investigator **Meredith Minkler**, professor of health and social behavior at UC Berkeley School of Public Health, along with partners at the Labor Occupational Health Program (LOHP), UCSF, the Chinese Progressive Association (CPA), the San Francisco Department of Public Health (SFDPH) plus dozens of restaurant workers and Chinatown residents. Project coordinator **Pam Tau Lee**, formerly of LOHP and a founder of the CPA, was "a lynch pin" according to Minkler, "in bringing together the community and the academic and health department partners."

The study's findings paint a startling picture of wage violations, unsafe work practices and poor living conditions. Researchers reported that almost half of the workers have been burned, and four out of 10 reported cuts at work in the past year. In addition to occupational hazards like intense heat and slippery floors, critical safety equipment like floor mats and first-aid were found lacking. Not surprisingly, 64 percent of workers failed to receive any job training.[4]

Though restaurant workers have among the highest rates of work-related illness and injury in the United States,[5,6] few studies have been conducted on restaurant working conditions, and, until now, none have focused on San Francisco's Chinatown.[7]

Scientists used a community-based participatory research approach, which includes and empowers those most affected by the study in all stages of research and action. "The CBPR process allowed community, university, and health department partners to stay in close connection to understand the challenges in the community and improve the research process," said **Charlotte Chang**, a post-doctoral fellow from UC Berkeley who worked on the project as part of her doctoral work. "With the decline of the manufacturing sector, restaurants have been an important employer for immigrants who don't speak English, and whose education and skills don't easily translate from their country of origin. They feel vulnerable and don't want to raise a fuss."

Twenty-three restaurant workers were trained to interview over 400 of their peers at 71 Chinatown restaurants. Workers also helped shape the survey's content. For example, they added a question about a two-week, unpaid probationary period that some restaurant owners informally instituted in Chinatown," reported Chang. "It's a type of wage-theft we only learned about through their participation."

Among other findings, researchers discovered 95 percent of Chinatown's restaurant workers earn below a living wage. More than a third of these working-poor reside in a single-room occupancy hotel with an average of 80 square feet of living space, frequently with additional family members.[8]

The study empowered CPA and workers to set in motion a new coalition, the San Francisco Progressive Workers Alliance, to stop wage-theft violations across the city. With Board Supervisors **Eric Mar** and **David Campos**, they drafted the Wage-Theft Prevention Ordinance passed into law by Mayor Ed Lee on September 16, 2011. Key provisions of the ordinance include investigator access to worksites and records, the ability to cite employers immediately for violations and the doubling of penalties for employers who retaliate against workers.[9]

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COEH Student Researchers Go Global

Qianyi Li in China's Sichuan Province.

Over the summer, COEH students travelled from the slums of Nairobi to the Yi communities of Chengdu conducting hands-on field research. While navigating foreign territory, the students collaborated with international study teams, built relationships with locals and practiced scientific methods essential to their discipline. Universally, they returned home with a deeper understanding of public health issues at a global level.

Food Scarcity in the Slums of Africa

With funding from the Global Public Health's Summer Fellowship Program, **Jennifer Wang** travelled to Nairobi, Kenya, home to some of the largest slums in East Africa. Her research is centered in Mathare, a collection of slum villages housing up to 500,000 residents located five kilometers from Nairobi's city center.

"The reality of food insecurity and the deplorable living environment in Nairobi's slums were a shock to me, as were the resourcefulness and resilience of the slum communities in the face of so many ongoing and acute hardships." Jennifer Wang

With guidance from her academic advisor, **Jason Corburn**, an associate professor of Community Health and Human Development and City and Regional Planning at UC Berkeley, Wang collected quantitative and qualitative data on food security and health in the Mathare settlement as part of a community-based slum planning and upgrading process led by Corburn and local partners. Her goal is to characterize the experience of food insecurity and the potential impacts of climate change on this highly vulnerable population.

Collaborators on the project include the University of Nairobi and Muungano Support Trust, a local non-governmental organization. Wang also received funding from the UC Berkeley Chapter of Sigma Xi's Grants-in-Aid-for-Research.

Eradicating Schistosomiasis in China

MPH student **Mai Fung** took an important step toward her goal of helping China and other countries eliminate schistosomiasis, a parasitic disease that infects about 207 million in the developing world. Contracted through water containing schistosome cercaria, the disease can lead to stunted mental and physical development in children and damage to the bladder, kidneys and liver if left untreated.

Fung spent her summer in Chengdu collaborating with researchers at the Sichuan Institute for Parasitic Diseases. Earlier, she had designed a protocol for S. japonicum fecal PCR (polymerase chain reaction) diagnosis. With funding from the Center for Global Public Health's Summer Fellowship Program, she field tested the protocol in Chengdu and assessed the feasibility of low-cost molecular diagnostics like PCR for schistosomiasis screening.

"What I valued most about my experience was that I was able to collaborate with researchers from another country and gain a better understanding of a disease that is not endemic in the United States," says Fung.

"It was personally rewarding because my family is originally from Chengdu, but I had never been to China," adds Fung. "I was able to explore my roots and integrate myself into the culture in a way that would never have been possible with a quick visit."

Cultural Factors Linked to Schistosomiasis

Qianyi Li's research examines the spread of schistosomiasis from a different lens. An MS student in Global Health and Environment, Li travelled to China's Sichuan Province to explore the social and cultural factors that modify the transmission of the disease in Yi communities. Her research was supported by her academic supervisor, professor emeritus and previous

COEH Students (continued)

COEH Director **Robert Spear** from Environmental Health Sciences, and alumni **Song Liang**, assistant professor of EHS at Ohio State University.

Despite inroads to eradicate schistosomiasis in China, studies in Puge and Zhaojue counties have found that human infections and re-infections in Yi communities to be much higher than others in the same region. Investigating the root causes of the disparity, Li designed questionnaires based on previous findings and information she collected using in-person interviews and focus groups. She then hired and trained six local college students to conduct the survey over the summer months.

"My experience has enhanced my interest in the social factors that influence people's well-being," says Li. She says her trip to China drove home the importance of social context to global health professionals. Li's research skills were also put to the test. "Be willing to make adjustments in the field," Li advises. "And check your results as soon as you get them — even when you are still at the study site — to make sure you get data of quality."

Obesity and the Built Environment in China

In July, **Jenna Hua** went to Kunming, the capital of Yunnan province in southwest China, to conduct field work investigating the influence of the environment on childhood obesity and metabolic risk. She developed a tool beforehand to assess China's changing food environment in collaboration with Edmund Seto from the School of Public Health at UC Berkeley and May Wang from Community Health Sciences at UCLA. The trip allowed her to field-test the instrument with the help of four public health students from Kunming Medical University.

"Given the rapid development of obesity rates in China, it is a natural laboratory for studying how development and the built environment influence health," says Hua, who was funded by a grant from the California Center for Population Research at UCLA.

In Kunming, she became acquainted with government and public agencies and developed data contacts. Her experience also taught her the logistics of collecting quality and timely field data. "I learned what instruments are essential and in what setting, and how to approach study subjects," says Hua. "These lessons will go into the protocols I will be developing for the next round of data collection."

Investigating E. coli Water Contamination

In August 2011, PhD candidate **Charlotte Smith** travelled to La Molina, Peru, to present her research findings at an international conference on water resources and the environment held at Universidad Nacional Agraria. Each year, thousands of children die of diarrheal related disease after consuming E. coli-contaminated water. "There are six pathotypes of diarrheagenic E. coli. Except for the Enterohemmorhagic E. coli 0157:H7, very little is known about the microbial ecology of the diarrheagenic E. coli serotypes," explains Smith.

Charlotte Smith, 3rd from left, in Perus

Her study, using Confocal Scanning Laser Microscopy in combination with viability assays, showed that survival within the protozoa Tetrahymena is not unique to enterohemorrhagic E. coli, but that all E. coli strains can survive digestion by protozoa that are common in aquatic environments. "The conference enhanced my understanding of water supply and treatment issues on a global level," notes Smith.

Designing Mobile Phone Applications to Promote Public Health in the Developing World

David Holstius went to Haiti to deploy a new mobile phone application he developed to monitor the safety of drinking water in a country overwhelmed by a catastrophic earthquake in January 2010.

Led by NGO Deep Springs International, the program distributes a sodium hypochlorite water disinfectant in communities reliant on contaminated well water in an effort to combat cholera and other diseases. Following the quake, Haiti experienced a massive cholera outbreak with 473,649 cases as of October 2011.

Holstius, a PhD candidate, spent time in Léogâne, Haiti, near the epicenter of the quake, before flying to Cap-Haïtien along the country's north coast. He conducted focus groups with technicians using the phone application and gathered intelligence for the next round of software development.

"Conditions in Haiti are a powerful motivator for anyone working in global health." David Holstius

Household Air Pollution May Lower Children's Cognitive Skills

Chronic prenatal exposure to woodsmoke may reduce children's neurobehavioral performance, a study by UC Berkeley researchers has found.

In 2010, scientists enrolled a sample of 39 mothers and their children ages 6 and 7 years who previously participated in RESPIRE, a randomized, longitudinal study that examined the incidence of acute lower respiratory infections and lung development in a cohort of over 500 children living in rural highland Guatemala. A portion of households in RESPIRE were given planchas — stoves designed to reduce air pollution from biomass fuel — as a health intervention. The other households continued to use traditional, unventilated stoves until the study child's 18th month of life, by which time, all households received planchas.

Lead study author **Linda Dix-Cooper** found an association between higher personal carbon monoxide concentrations, a marker for chronic woodsmoke exposure, assessed among mothers during their third trimester of pregnancy and lower neurobehavioral scores on four tests on their children 7 years later. More specifically, children tended to score worse on visio-spatial integration, both short and long-term memory recall, and fine motor performance with higher prenatal exposure to woodsmoke, according to scientists.[1]

Although studies of adults and children have reported that CO is a neurotoxicant at high exposure levels, this article from COEH researchers is the first to examine its effects from prenatal exposure to woodsmoke on childhood cognitive performance. Study authors suggest future studies with larger sample sizes are needed to replicate their results.

Dix-Cooper was an MS student in the Global Health and Environment Program in the Environmental Health Sciences department at UC Berkeley. Her research was supported by a COEH Llewellyn Student Award, National Institutes of Environmental Health Sciences and the Center for Environmental Research and Children's Health at UC Berkeley.

Tumbing E chart vision test

COEH co-authors include **Kirk Smith**, professor of global environmental health and director of the Global Health and Environment MS program, and **Brenda Eskenazi**, professor of epidemiology, both from UC Berkeley School of Public Health. John Balmes, director of COEH and professor of medicine in UCSF's Division of Occupational and Environmental Medicine, is also a co-author.

[1] Dix-Cooper L, Eskenazi B, Romero C, Balmes J, Smith KR. Neurodevelopmental performance among school age children in rural Guatemala is associated with prenatal and postnatal exposure to carbon monoxide, a marker for exposure to woodsmoke. Neurotoxicology. 2011 Sep 24 ahead of print.

Chinatown (continued)

Study co-investigators included **Robin Baker**, director of Research to Practice (r2p) at UC Berkeley School of Public Health; **Niklas Krause**, professor and administrator, Environmental Health Sciences, UCLA; **Rajv Bhatia**, director of Occupational and Environmental Health for SFDPH and an assistant clinical professor of medicine at UCSF; and **Pam Tau Lee**, the former coordinator of public programs at LOHP who played a pivotal role in bringing together the community and university.

Others central to the project were Shaw San Liu, Alex Tom and Feiyi Chen from CPA; worker partners Hu Li Nong, Gan Lin, Li Li Shuang, Rong Wen Lan, Michelle Xiong and Zhu Bing Shu; Megan Gaydos, SPH '06, and Alvaro Morales from SFDPH; and Alicia Salvatore, SPH '09.

The study received funding from the National Institute of Occupational Safety and Health, The California Endowment and the Occupational Health Internship Program.

[1]http://www.sanfrancisco.travel/media/San-Francisco-Fact-Sheet.html
[2,3,4,7,8]http://www.datacenter.org/wp-content/uploads/Check-Please-CPA-Full-ENG-report.pdf
[5,7]Minkler M, Lee PT, Tom A, Chang C, Morales A, Liu SS, Salvatore A, Baker R, Chen F, Bhatia R, Krause N. Using community-based participatory research to design and initiate a study on immigrant worker health and safety in San Francisco's Chinatown restaurants. Am J Ind Med. 2010 Apr;53(4):361-71.
[6]http://www.bls.gov/opub/cwc/archive/summer2001art4.pdf
[9]http://nelp.3cdn.net/02aaa16a48d83c5714_ptm6b5owq.pdf

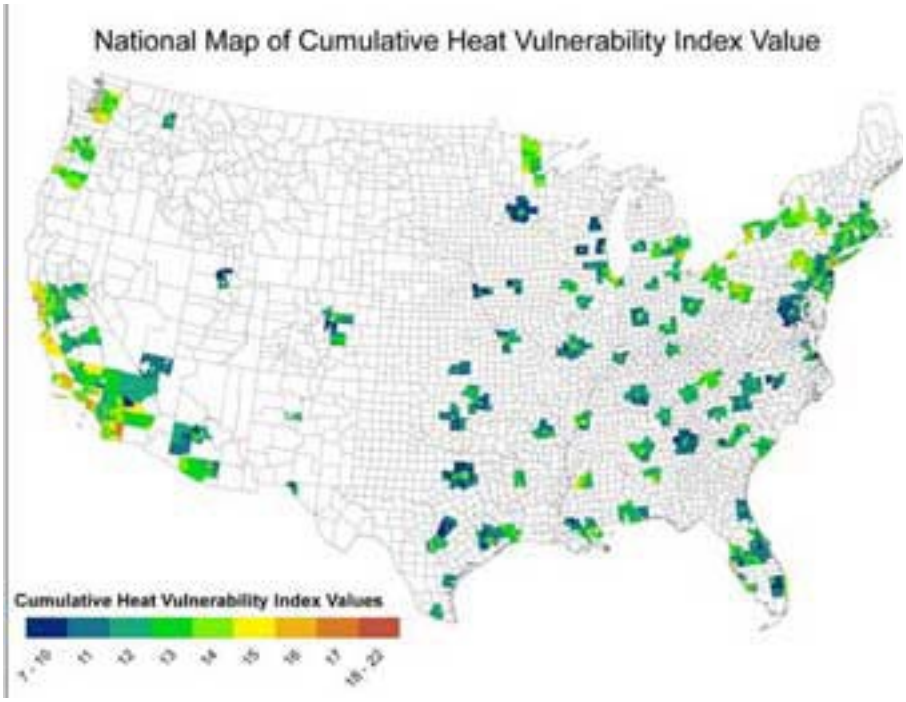
Mapping Climate Change Vulnerability

PhD candidate **Colleen Reid** and researchers at the University of Michigan and Harvard University had previously developed a Heat Vulnerability Index (HVI) to identify communities in the United States that are most susceptible to global warming. Recently, Reid teamed up with scientists at UC Berkeley and public health professionals who are part of the CDC's Environmental Public Health Tracking Network to evaluate the HVI.

The study team focused on five states with health and population data from the Network. In all five states they found higher hospitalization and mortality rates on extremely hot days.[1] Areas with higher vulnerability, as identified by the HVI, also showed higher rates of acute renal failure, electrolyte imbalance and nephritis in California, heat-related illness in Washington, all-cause mortality in New Mexico and respiratory hospitalizations in Massachusetts on extremely hot days.

Cities in North America will experience more extreme heat due to climate change, according to the fourth Intergovernmental Panel on Climate Change report. Its authors predict heat waves will increase in frequency and severity, leading to more illness and death, particularly among the young and elderly. In addition, respiratory disorders may worsen with changes in air quality.[2]

"The Heat Vulnerable Index shows a spatial pattern of health disparities," says Reid, a doctoral candidate in Environmental Health Sciences at UC Berkeley. "Using the index, you could zoom in on areas in the United States that have higher expected vulnerability for adverse health effects from heat," she notes. "There have been a couple of studies attempting to map heat vulnerability at the local level, but none of national scale."



In a previous study published in *Environmental Health Perspectives*, Reid conducted a comprehensive literature review to identify 10 demographic and social variables that largely explain climate change vulnerability in the United States. She combined these ten factors into four statistically independent factors that represented different facets of heat vulnerability: socioeconomic and environmental vulnerability, social isolation, air conditioning prevalence and the portion of the population that is elderly or has diabetes.[3] Next, she calculated the four values and combined them for each U.S. census tract, then mapped her results to show how heat vulnerability varies nationally.

"When our paper came out, lots of people contacted us wanting to use the index, but we were hesitant until we could validate our study," said Reid. "We decided to validate the HVI with data from the Tracking Network and teamed up with states that had the information we needed."

Reid's COEH co-investigators include Director **John Balmes**, who was also the Principal Investigator of the Environmental Public Health Tracking (EPHT) grant from the CDC that funded the study. "When I first read Colleen's HVI paper, I thought that validation of the tool for planning public health responses to heat waves could be done through the EPHT network," said Balmes.

"The Heat Vulnerable Index shows a spatial pattern of health disparities," says Reid.

Research scientist **Jennifer Mann** and MPH student **Kathleen Navarro** participated from the UC Berkeley School of Public Health. Other co-investigators include **Helene Margolis** from the School of Medicine at UC Davis and **Paul English** from the California Environmental Health Tracking Program at the California Department of Public Health.

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The Inside Take on Climate Change (continued)

concentrations when students were present in the classroom were within a comparable range of those outdoors. After deciphering patterns in their measurements, the study's authors were able to conclude that most of the classroom particle exposure could be attributed to outdoor particles that had penetrated inside.

"Poor indoor environmental quality creates health problems and impairs the ability of occupants to work and learn," IOM report authors say.[3]

Ventilation, therefore, plays a significant role in improving indoor environments. Higher ventilation rates are associated with fewer adverse health effects and with superior work and school performance, according to scientists at the Lawrence Berkeley Laboratory. In addition, evidence suggests that occupants of buildings with higher ventilation rates have lower rates of absence from work or school.[4]

"The issues of climate change bring to the forefront the need to be more efficient in the way that we use energy," says Nazaroff. "There will likely be changes in buildings to reduce energy use. Those changes don't automatically mean that they will make indoor environmental quality problems worse, but they could. For example, if we reduce ventilation rates with a goal of saving energy then pollution emitted indoors will rise to higher levels."

Nazaroff points out that, "We see a higher incidence of a phenomenon called sick building syndrome in mechanically ventilated buildings compared to those that are naturally ventilated with operable windows. But until now, we haven't paid enough attention to the hygiene of the ducting system – the fans and filters – in buildings that are mechanically ventilated."

"Poor indoor environmental quality creates health problems and impairs the ability of occupants to work and learn," IOM report authors say.

If we did a better job of managing the hygiene of ventilation systems, Nazaroff believes we could probably operate safely with less ventilation than we do today. And, in outdoor environments that are heavily polluted, "we can do a better job of filtering the pollution from the ventilation air, along with working to ensure we don't have excessive indoor emission sources. If we can put all those elements together," says Nazaroff, "we can reduce the carbon footprint and have healthful buildings."

In a separate article, Nazaroff notes that approximately one-third of global, energy-related greenhouse gas emissions occur in buildings, according to an estimate based on year 2002 measurements.[5] In developed countries, improvements with the largest potential include increasing the thermal performance of building envelopes with better insulation and windows and improving space-heating systems.[6]

In addition to indoor air pollution, the IOM report draws attention to shifts in pesticide exposure as occupants and building owners respond to infestations of pests like termites whose geographic ranges have changed due to climate change.

Problems of flooding pose additional risks to the indoor environment. Increased frequency and intensity of heavy downpours have already been observed in the United States, the report states.[7]

"As buildings become wet more often, we end up with mold and mildew problems that have indoor environmental consequences," says Nazaroff. "In the case of Hurricane Katrina, there was additional fallout. Trailers used for emergency housing were later found to be emitting unsafe levels of formaldehyde. I can't say that's a consequence of climate change, but it is a consequence of an extreme weather event that is likely to become more frequent."

Poor environmental conditions and indoor contaminants cost the U.S. economy tens of billions of dollars a year by worsening illnesses and allergic symptoms that affect productivity.[8]

The IOM report suggests that, if we consider the consequences of climate change adaptation and mitigation actions before they play out, it will yield benefits in health and avoid costs of medical care, remediation and lost production.[9]

COEH member William Nazaroff is the Daniel Tellep Distinguished Professor and Vice-Chair for Academic Affairs for the Department of Civil and Environmental Engineering at UC Berkeley.

[1,3,7,9]IOM (Institute of Medicine). 2011. Climate Change, the Indoor Environment, and Health. Washington, DC: The National Academies Press.
[2]Mullen NA, Bhangar S, Hering SV, Kreisberg NM, Nazaroff W. Ultrafine particle concentrations and exposures in six elementary school classrooms in northern California.Indoor Air. 2011 Feb;21(1):77-87.
[4]http://eetd.lbl.gov/ied/sfrb/vent-summary.html
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[8]Fisk WJ, Rosenfield AH. Estimates of improved productivity and health from better indoor environments. Indoor Air. 1997;7(3):158-72.

Mapping Climate Change Vulnerability (continued)

The studies were funded by the Centers for Disease Control and Prevention through the Berkeley Center for Environmental Public Health Tracking and the U.S. Environmental Protection Agency.

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[2]http://www.ipcc.ch/publications_and_data/ar4/wg2/en/ch14s14-1-1.html

[3]Reid CE,O'Neill MS, Gronlund CJ, Brines SJ, Brown DG, Diez-Roux AV, Schwartz J. Mapping Community Determinants of Heat Vulnerability. Environ Health Perspect. 2009 Nov.;117(11):1730-36.

Thompson Receives Award to Investigate Prenatal Exposure to Household Air Pollution

Lisa Thompson

Lisa Thompson, assistant professor of Family Health Care Nursing at UCSF, received a multidisciplinary clinical research award from the UCSF Clinical and Translational Science Institute Career Development Program (CTSI KL2). The award will support her research investigating the neurodevelopment and anthropometric growth of infants exposed to household air pollution in Guatemala, a country with one of the highest childhood mortality rates in the Americas, according to the World Health Organization.

Thompson's pilot study will measure personal exposures to household air pollutants from solid fuels in a cohort of thirty pregnant women and their infants. The results of the pilot will support an R01 application to conduct a randomized control trial comparing the effects of in utero and infant exposures to household air pollutants on infant development in households with open fires compared to a randomized clean-stove intervention.

Thompson will use the Bayley Scales of Infant Development to identify infants at risk for neurodevelopmental impairment, opening the door for early interventions to reduce childhood disabilities and morbidity.

The project builds on a feasibility study funded by UCSF's Burke Family Global Health faculty award, which provided Thompson salary support and travel funds to visit her study site in the San Marcos region of in rural highland.

COEH Grads Play Key Roles in Cal/OSHA

Quite a number of alumni from COEH programs hold influential positions at Cal/OSHA in the Bay Area and beyond. In June 2011, for example, Governor Jerry Brown appointed COEH grad **Deborah Gold**, SPH '93, Deputy Chief for Health with the Division of Occupational Safety and Health (Cal/OHSA).

Gold started with Cal/OSHA in 1993 as a compliance industrial hygienist and has been a senior safety engineer in the Research & Standards unit since 2000. Earlier, she was a staff research associate at UC Berkeley's Labor Occupational Health Program.

Garrett Brown, SPH '91, has been named as Special Assistant to new Chief **Ellen Widess**, appointed by Governor Brown in April 2011. Brown, a Cal/OSHA compliance industrial hygienist for 17 years in Oakland before his new role, is a member of COEH's Advisory Committee.

"We look forward to deepening our ties with COEH students and faculty in joint efforts to research and solve the key occupational health and safety problems of our day." Chief Ellen Widess

"We are delighted to have so many COEH graduates working at Cal/OSHA, and playing such important roles in the organization," says Chief Widess. "Their expertise and dedication to the mission of protecting our state's workers is testimony to the high quality of COEH's programs and its faculty. We are just now starting to hire again after a long drought — so we encourage more COEH grads to join us in the essential work of protecting all workers' right to come home at the end of the day safe and sound. We look forward to deepening our ties with COEH students and faculty in joint efforts to research and solve the key occupational health and safety problems of our day."

Additional Alumni Making a Difference at Cal/OSHA

- Janice Prudhomme, MD, SPH '96, Manager of the Cal/OSHA Medical Unit, Oakland
- Robert Nakamura, SPH '74, Senior Safety Engineer, Research and Standards Health Unit, Oakland
- Scott McAllister, SPH '76, Senior Safety Engineer, Research and Standards Health Unit, Oakland
- Amalia Neidhardt, SPH '96, Senior Safety Engineer, Region VI in Sacramento
- Eric Berg, SPH '96, Senior Safety Engineer, Region VI in Concord
- Chris Kirkham, SPH '98, Senior Safety Engineer, Region I in Oakland
- Luis Ramon Mireles, SPH '92, Senior Safety Engineer, Region VI in San Diego
- Patrick Corcoran, SPH '00, Compliance Safety and Health Officer, Sacramento District Office
- Susan Eckhardt, SPH '85, Compliance Safety and Health Officer, Fremont District Office
- Clement Hsieh, SPH '03, Compliance Safety and Health Officer, High Hazard Unit - North, Oakland
- Shohreh Kheradpir, SPH '01, Compliance Safety and Health Officer, High Hazard Unit - North, Oakland
- David Hornung, SPH '07, Compliance Safety and Health Officer, Oakland District Office

Other COEH grads have made important contributions to Cal/OSHA, including **Len Welsh**, SPH '84 and **Robert Harrison**, MD, SPH '83. Welsh was Chief of the agency from 2002 to 2011. Harrison, clinical professor of Medicine in the Division of Occupational and Environmental Medicine at UCSF, was a member of the Standards Board.

Brown Recognized for Social Responsibility by AIHA

The American Industrial Hygiene Association (AIHA) selected the Maquiladora Health and Safety Support Network, co-founded by **Garrett Brown**, SPH '91, for its 2011 Social Responsibility Award. Brown, a member of COEH's Advisory Committee, accepted the honor on behalf of the Network at AIHA's annual conference held in Portland, Oregon.

Sponsored by Bureau Veritas North America, the award honors individuals and organizations that have demonstrated ethical behavior in dealing with social, cultural, economic and environmental issues as part of AIHA's mission to protect worker health and safety.

Brown, recently appointed as a Special Assistant to new Cal/OSHA Chief **Ellen Widess**, was a compliance safety and health officer for the California Division of Occupational Safety and Health for 17 years, and he is a Fellow of the AIHA. He helped launch the volunteer Network of 400 occupational health and safety professionals in 1993 to improve conditions for maquiladora workers employed by primarily U.S.-owned transnational corporations along Mexico's northern border. Since its inception, the Network has expanded to include projects in Indonesia, China and Central America.

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

Garrett Brown

CHAMACOS Study Awarded Best Article

Karen Huen's paper "PON Genomics" was awarded best student or new investigator research publication of 2010 by Environmental and Molecular Mutagenesis. Huen, an assistant researcher at UC Berkeley's Center for Children's Environmental Health Research, received a cash award and complementary registration to the Environmental Mutagen Society's annual conference in September 2012 to be held in Bellevue, Washington.

In 2010, the article was also selected as the "Editor's Choice" by the Environmental Mutagen Society. It was featured on the cover of the March issue.

"Effects of PON Polymorphisms and Haplotypes on Molecular Phenotype in Mexican-American Mothers and Children" was co-authored by **Lisa Barcellos**, **Kenneth Beckman**, **Sherri Rose**, and COEH members **Brenda Eskenazi** and **Nina Holland** from the Center for Children's Environmental Health Research at UC Berkeley and the Children's Hospital Oakland Research Institute, Functional Genomics Core, in Oakland, California.

The study, led by principal investigator Holland, conducted a thorough analysis of PON genetic variation by sequencing the PON1 gene in 30 Mexican-American subjects. Researchers also assessed the significance of these genetic variants in over 700 Mexican-American mothers and children from the CHAMACOS birth cohort study in Salinas Valley, California.

More than 90 PON genetic variants were identified by scientists, including nine novel polymorphisms. The PON1 enzyme is considered protective to humans because it can detoxify some organophosphate pesticides;[1] therefore, these genetic variants may influence an individual's vulnerability to pesticide exposure.

Their research was funded by the U.S. Environmental Protection Agency and the National Institute of Environmental Health Sciences.

[1] Huen K, Barcellos L, Beckman K, Rose S, Eskenazi B, Holland N. Effects of PON polymorphisms and haplotypes on molecular phenotype in Mexican-American mothers and children. Environmental and Molecular Mutagenesis. 2010 Mar; 52(2):105-16.

OEM Fellows Reach Low-wage Workers in Underserved Communities

Funded by a three year training grant from Health Resources and Services Administration (HRSA), UCSF's Occupational and Environmental Medicine (OEM) program has partnered with three community clinics to offer outreach services to low-wage, immigrant workers.

The goal of the grant, spearheaded by COEH faculty **Gina Solomon**, is to familiarize UCSF Fellows with occupational and environmental health issues facing California's most vulnerable populations.

"The effective practice of occupational medicine requires not only an understanding of diagnosis and treatment, but also a grasp of the social, economic, legal and psychological stressors that affect individuals and groups in society," says Solomon.

Fellows will provide clinic staff and physicians with OEM training, on-call assistance and workplace wellness. They will also supply onsite consultation services to support the medical team for approximately a half-day per month.

Three clinics are participating: Asian Health Services in Oakland, which serves low-wage workers from nail salon, garment and restaurant industries; Planned Parenthood Mar Monte in Watsonville where, in addition to addressing reproductive health, they provide service to farmworkers; and Clinic Ole in Napa, which treats agriculture and service sector workers from the North Bay. Several UCSF clinical faculty have volunteered to precept the residents paired to each site.

Solomon is co-director of the UCSF OEM Residency and Fellowship Program. She is a clinical professor of medicine at UCSF, the associate director of the UCSF Pediatric Environmental Health Specialty Unit and a senior scientist for the Natural Resources Defense Council. She credits **Bob Harrison**, **Rachel Roisman** and **Jayshree Chander** from UCSF's OEM program for helping the project take off.

The UCSF OEM training program was created in 1977 as a component of the University of California Center for Occupational and Environmental Health.

"Working with underserved and vulnerable communities is essential for comprehending the cultural and social dimensions of the challenges we face in occupational medicine." Gina Solomon

OHIP Interns Gain Life Changing Experience

By Sara Jacobs | UCLA - Labor Occupational Safety & Health (LOSH) Program

Occupational Health Internship Program Participants

Since 2004, the national Occupational Health Internship Program (OHIP) has played a vital role in mentoring and inspiring a new generation of occupational health and safety (OHS) professionals. OHIP has grown substantially over the past eight years and has successfully responded to workforce changes by recruiting a more diverse group of students who have different academic and technical skills, and who speak the languages of the workers involved in their projects.

"OHIP students bring a lot of energy, focus and intelligence to their projects. It's great to watch them work well with stakeholders and become excited about what they are doing to help prevent a workplace injury or illness. For many it's a life changing experience," commented 2011 OHIP mentor and supervisor **David Harrington** from the California Department of Public Health (CDPH), Occupational Health Branch.

This year may have been OHIP's most successful summer, with 28 interns playing a crucial role in some of the most exciting worker health and safety movements across the country. Placed at seven OHIP training centers (San Francisco Bay Area, Los Angeles, San Diego, Seattle, Chicago, Boston and New York City), each 2011 OHIP student worked on one of 15 team projects during the nine-week summer internship. Students were paired with a particular union or worker organization to explore health and safety concerns among workers employed in underserved or high hazard jobs. They had the unique opportunity to talk with workers, visit worksites and develop something useful to "give back" to the workers.

Three notable 2011 OHIP projects were from the San Francisco Bay Area. The first investigated the impact of policies and procedures on violence-related injuries and illness, including stress experienced by mental health care workers at Napa State Hospital. The second evaluated the usage and barriers of silica dust control tools and methods among construction workers since the adoption of Cal/OSHA construction regulation on controlling silica dust. The third researched living and working conditions of Filipino caregivers in South San Francisco.

OHIP interns **Michelle Santizo** and **Cassandra Porchas** worked on the Silica Project with San Francisco Bay Area Bricklayers and Roofers Unions. "The moment you understand a construction worker's job is the moment you appreciate everything they do from pouring cement to standing in the sun for many hours," said Santizo. "Sometimes breathing in silica is their only way of making a living."

Santizo and Porchas, along with their apprentice programs and contractors, produced the video Don't Let Silica Dust You! Their OHIP "give back" video is intended to increase awareness of silica dust issues and controls.

"My expectations for the project were exceeded," remarked Porchas. "I am grateful I had the opportunity to gain access to so many worksites with the help of the participating unions and with the efforts of my site supervisor. There was never a dull moment."

Santizo and six other 2011 OHIP interns presented their summer projects at the American Public Health Association (APHA) 139th Annual Meeting in Washington DC on November 2 (http://apha.confex.com/apha/139am/webprogram/Session33016.html).

Details about all the 2011 projects and OHIP funders (NIOSH, the California Wellness Foundation, NIEHS, CDPH, Kazan Foundation, and other partners) will be posted on the new OHIP website.

For more information about OHIP visit www.aoec.org/ohip/ or contact National OHIP Program Coordinator, **Sarah Jacobs**, at sjacobs@irle.ucla.edu.

Federal Government Adopts California's Heat Campaign

The social marketing campaign developed by UC Berkeley's Labor Occupational Health Program (LOHP) to prevent heat illness and related fatalities went national in 2011. Last year, 30 workers died of heat related illness in the United States according to a statement by OSHA's Assistant Secretary of Labor, **David Michaels**. The campaign, developed and tested in California, promotes the benefits of heat prevention measures and emphasizes that these are simply part of the job: "Water. Rest. Shade. The work can't get done without them."

"The campaign developed in California was really impressive. Being able to adopt their materials made it possible for us to go national with the campaign quickly and effectively." David Michaels

Suzanne Teran, coordinator of public programs at LOHP, first explored the use of social marketing as a strategy with a heat awareness pilot in Mendota, California. She chose Mendota since approximately half of the predominantly Latino community works in agriculture – a population highly vulnerable to heat illness. During 2003-06, over 70% of the 28 deceased crop workers in the United States were from Mexico or Central and South America.[1]

LOHP drew on this experience to develop the 2010 California Heat Campaign in collaboration with California's Department of Industrial Relations (DIR), Cal/OSHA, Underground Advertising, UCLA-LOSH (Labor Occupational Safety and Health) and UC Davis's Western Center for Agricultural Health and Safety. The campaign included broad media visibility through outdoor advertising and radio, as well as outreach and education programs targeting workers in agriculture, construction and landscaping industries. Materials were produced in five languages – Spanish, Hmong, Punjabi, Mixteco and English – matching the diversity of California's underserved communities.

Heat stress campaign materials were developed in five languages -- Spanish, Mixteco, English, Punjabi and Hmong (Image courtesy of LOHP)

In 2011, federal OSHA recognized California's efforts by adopting the campaign and launching it on a national scale. Recently, OSHA received international recognition for the campaign by winning the platinum MarCom Award from the Association of Marketing and Communications Professionals. The award for outstanding excellence and creativity is the highest honor in the Publicity Campaign category.

The state of California also continued its efforts and LOHP collaborated on a targeted media campaign and worked with its UC partners on "train the trainer" programs and other outreach activities throughout the state.

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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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