

## Hazardous Substances

### Special Interest Articles:

- [Phthalate](#)
- [Gender Bias](#)
- [Wildlife](#)
- [Traffic Lights](#)
- [Body of Knowledge](#)

DOEHRS Super Star

## ASSE Salary Survey Reveals Strong Income Potential for EHS Professionals

The American Society of Safety Engineers' (ASSE) Salary Survey results are in, and according to the survey, occupational safety and health professionals earn an average, annual base salary of \$98,000. In addition, having some type of professional certification increases that salary by more than \$14,000.

The ASSE survey results are part of an expansive collaboration with the American Board of Industrial Hygiene (ABIH), Alliance of Hazardous Materials Professionals (AHMP), American Industrial Hygiene Association (AIHA), Board of Certified Safety Professionals (BCSP) and Institute of Hazardous Materials Management (IHMM). The complete results from the 2015 survey in addition to an interactive calculator are available online at [www.asse.org/salariesurvey](http://www.asse.org/salariesurvey).

Read more:

<http://ehstoday.com/safety/asse-salary-survey-reveals-strong-income-potential-ehs-professionals>



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## Traditional and Environmentally Preferable Cleaning Product Exposure and Health Symptoms in Custodians



**Background:** We investigated the associations between traditional and environmentally preferable cleaning product exposure and dermal, respiratory, and musculoskeletal symptoms in a population of custodians. **Methods:** We analyzed associations between symptoms and exposure to traditional and environmentally preferable cleaning product exposure among 329 custodians. **Results:** We observed increased odds of dermal ( $P < 0.01$ ), upper ( $P = 0.01$ ) and lower respiratory ( $P = 0.01$ ), and upper extremity ( $P < 0.01$ ), back ( $P < 0.01$ ), and lower extremity ( $P = 0.01$ ) musculoskeletal symptoms associated with increased typical

traditional cleaning product exposure. We observed significant trends for increased odds of dermal ( $P = 0.03$ ) and back ( $P = 0.04$ ) and lower ( $P = 0.02$ ) extremity musculoskeletal symptoms associated with increased typical environmentally preferable cleaning product exposure. **Conclusions:** Fewer positive associations and reduced odds of health symptoms associated with environmentally preferable cleaning product exposure suggest that these products may represent a safer alternative to traditional cleaning products.

*Read more:*

<http://www2a.cdc.gov/nioshtic-2/BuildQyr.asp?s1=20046313&f1=%2A&Startyear=&Adv=0&terms=1&EndYear=&Limit=10000&sort=&D1=10&PageNo=1&RecNo=1&View=f&>



### Work Schedule and Physical Factors in Relation to Fecundity in Nurses

**Objectives:** To evaluate the association of work schedule and physical factors with fecundity. **Methods:** Women currently employed outside the home and trying to get pregnant (n=1739) in the Nurses' Health Study 3 cohort (2010-2014) were included in this analysis. Work schedule and physical labour were self-reported on the baseline questionnaire, and every 6 months thereafter the women reported the duration of their ongoing pregnancy attempt. Multivariable accelerated failure time models were used to estimate time ratios (TR) and 95% CIs. **Results:** Among the 1739 women (median age=33 years, 93% Caucasian) the estimated proportions of women not pregnant after 12 and 24 months were 16% and 5%, respectively. None of the various shift work patterns were associated with duration of pregnancy attempt (as a surrogate for fecundity). However, women working >40 h/week had a 20% (95% CI 7 to 35%) longer median duration of pregnancy attempt compared to women working 21-40 h/week (p-trend=0.005). Women whose work entailed heavy lifting or moving (ie, 25+ pounds) >15 times/day also had a longer median duration of pregnancy attempt (adjusted TR=1.49; 95% CI 1.20 to 1.85) compared to women who never lifted or moved heavy



loads (p-trend=0.002). The association between heavy moving and lifting and duration of pregnancy attempt was more pronounced among overweight or obese women (body mass index, BMI<25: TR=1.17; 95% CI 0.88 to 1.56; BMI >=25: TR=2.03, 95% CI 1.48 to 2.79; p-interaction=0.007). **Conclusions:** Working greater than 40 h per week and greater frequency of lifting or moving a heavy load were associated with reduced fecundity in a cohort of nurses planning pregnancy.

*Read more:* <http://www2a.cdc.gov/nioshtic-2/BuildQyr.asp?s1=20046565&f1=%2A&Staryear=&Adv=0&terms=1&EndYear=&Limit=10000&sort=&D1=10&PageNo=1&RecNo=1&View=f&>

## **Manganese Speciation of Laboratory-Generated Welding Fumes**

The objective of this laboratory study was to identify and measure manganese (Mn) fractions in chamber-generated welding fumes (WF) and to evaluate and compare the results from a sequential extraction procedure for Mn fractions with that of an acid digestion procedure for measurement of total, elemental Mn. To prepare Mn-containing particulate matter from representative welding processes, a welding system was operated in short circuit gas metal arc welding (GMAW) mode using both stainless steel (SS) and mild carbon steel (MCS) and also with flux cored arc welding (FCAW) and shielded metal arc welding (SMAW) using MCS. Generated WF samples were collected onto polycarbonate filters before homogenization, weighing and storage in scintillation vials. The extraction procedure consisted of four sequential steps to measure various Mn fractions based upon selective solubility: (1) soluble Mn dissolved in 0.01 M ammonium acetate; (2) Mn(0,II) dissolved in 25% (v/v) acetic acid; (3) Mn(III,IV) dissolved in 0.5% (w/v) hydroxylamine hydrochloride in 25% (v/v) acetic acid; and (4) insoluble Mn extracted with concentrated hydrochloric and nitric acids. After sample treatment, the four fractions were analyzed for Mn by

inductively coupled plasma-atomic emission spectroscopy (ICP-AES). WF from GMAW and FCAW showed similar distributions of Mn species, with the largest concentrations of Mn detected in the Mn(0,II) and insoluble Mn fractions. On the other hand, the majority of the Mn content of SMAW fume was detected as Mn(III,IV). Although the concentration of Mn measured from summation of the four sequential steps was statistically significantly different from that measured from the hot block dissolution method for total Mn, the difference is small enough to be of no practical importance for industrial hygiene air samples, and either method may be used for Mn measurement. The sequential extraction method provides valuable information about the oxidation state of Mn in samples and allows for comparison to results from previous work and from total Mn dissolution methods.

*Read more:* <http://www2a.cdc.gov/nioshtic-2/BuildQyr.asp?s1=20046429&f1=%2A&Startyear=&Adv=0&terms=1&EndYear=&Limit=10000&sort=&D1=10&PageNo=1&RecNo=1&View=f&>

## **Characterization of Urinary Phthalate Metabolites among Custodians**

Phthalates, a ubiquitous class of chemicals found in consumer, personal care, and cleaning products, have been linked to adverse health effects. Our goal was to

characterize urinary phthalate metabolite concentrations and to identify work and nonwork sources among custodians using

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traditional cleaning chemicals and 'green' or environmentally preferable products (EPP).

Sixty-eight custodians provided

four urine samples on a workday (first void, before shift, end of shift, and before bedtime) and trained observers recorded cleaning tasks and types of products used (traditional, EPP, or disinfectant) hourly over the work shifts. Questionnaires were used to assess personal care product use. Four different phthalate metabolites [monoethyl phthalate (MEP), monomethyl phthalate (MMP), mono (2-ethylhexyl) phthalate (MEHP), and monobenzyl phthalate (MBzP)] were quantified using liquid chromatography mass spectrometry. Geometric means (GM) and 95% confidence intervals (95% CI) were calculated for creatinine-adjusted urinary phthalate concentrations. Mixed effects univariate and multivariate modeling, using a random intercept for each individual, was performed to identify predictors of phthalate metabolites including demographics, workplace factors, and

personal care product use. Creatinine-adjusted urinary concentrations [GM (95% CI)] of MEP, MMP, MEHP, and MBzP were 107 (91.0-126), 2.69 (2.18-3.30), 6.93 (6.00-7.99), 8.79 (7.84-9.86) microg g<sup>-1</sup>, respectively. An increasing trend in phthalate concentrations from before to after shift was not observed. Creatinine-adjusted urinary MEP was significantly associated with frequency of traditional cleaning chemical intensity in the multivariate model after adjusting for potential confounding by demographics, workplace factors, and personal care product use. While numerous demographics, workplace factors, and personal care products were statistically significant univariate predictors of MMP, MEHP, and MBzP, few associations persisted in multivariate models. In summary, among this population of custodians, we identified both occupational and nonoccupational predictors of phthalate exposures. Identification of phthalates as ingredients in cleaning chemicals and consumer products would allow workers and consumers to avoid phthalate exposure.

*Read more:*

<http://www2a.cdc.gov/nioshtic-2/BuildQyr.asp?s1=20046541&f1=%2A&Startyear=&Adv=0&terms=1&EndYear=&Limit=10000&sort=&D1=10&PageNo=1&RecNo=1&View=f&>

**EPA Proposes Stronger Standards for People Applying the Pesticides  
with the Greatest Risk/ Improved training and minimum age  
Requirements for Certified Applicators Will Help Protect People and  
the Environment**



available for purchase by the general public, require special handling, and may only be applied by a certified applicator or someone working under his or her direct supervision.

*Read more:*

<http://yosemite.epa.gov/opa/admpress.nsf/21b8983ffa5d0e4685257dd4006b85e2/9d60709bdfdbfa0e85257e98006e9a2a!OpenDocument>

EPA is proposing stronger standards for pesticide applicators who apply “restricted-use” pesticides. These pesticides are not

**Report: Cause for 'Alarm' on Possible Work-Related Causes of Breast  
Cancer**

A new review of the science concludes workers exposed to solvents and other toxic substances may be at increased risk of the disease

A new summary of the science makes a strong case for occupational links to breast cancer and calls on Congress, regulators and researchers to pay more attention to chemical exposures and other risk factors.

“Working Women and Breast Cancer: The State of the Evidence,” is the product of more than two years of work overseen by



the San Francisco-based Breast Cancer Fund. A panel of experts reviewed scientific studies, most published in the past 25

## Army Industrial Hygiene News and Regulatory Summary

years, and found ties between the disease and exposures to solvents; pesticides; tobacco smoke; ionizing radiation and other toxic materials. There also was an association with night shift work.

*Read more:*

<http://www.publicintegrity.org/2015/08/06/17788/report-cause-alarm-possible-work-related-causes-breast-cancer>

### Radiation

#### How Sellafield's Radiation-Proof Robots Do Our Dirty Work

It was the birthplace of Britain's nuclear industry, and the site of its worst nuclear accident.

For decades, the Sellafield plant in Cumbria could lay claim to being one of the most controversial industrial complexes in Britain.

Now, however, it is playing a new role - as a giant test bed for specialised technology and techniques used in nuclear decommissioning.

Flying drones, remote controlled submarines and industrial robots have all been brought in to carry out tasks which are simply too dangerous, or even impossible, for humans to do.

*Read more:*

<http://www.bbc.com/news/business-33849026>

### Ventilation

#### Here's Why Your Office May Be Too Hot or Cold: Gender Bias



Many couples fight about it at home. No, it's not money, sex, or parenting but the lowly thermostat. Heated arguments often ensue about how warm or cool to keep a room. New research suggests why women may lose out—at least at the office.

Gender bias may affect the heating and cooling in office buildings, and it's no Mars vs. Venus misunderstanding. Temperatures

are often based on a decades-old standard that considers the metabolic rate of men, according to a study Monday in *Nature Climate Change*.

This bias isn't just about equity or comfort. It has real-world climate implications, because it could waste a lot of energy that emits heat-trapping greenhouse gases.

After all, buildings account for nearly a third of carbon emissions, and their energy use is largely determined by occupant behavior.

*Read more:*

<http://news.nationalgeographic.com/energy/2015/08/150803-gender-bias-affects-office-heating-cooling-temperatures/>

### PPE

## Development of a Cobinamide-Based End-of-Service-Life Indicator for Detection of Hydrogen Cyanide Gas

### End-of-Service-Life Indicator (ESLI)

A system that warns the user of the approach of the end of adequate respiratory protection; e.g., the sorbent is approaching saturation or is no longer effective.



We describe an inexpensive paper-based sensor for rapid detection of low concentrations (ppm) of hydrogen cyanide gas. A piece of filter paper pre-spotted with a dilute monocyanocobinamide [CN(H<sub>2</sub>O)Cbi] solution was placed on the end of a bifurcated optical fiber and the reflectance spectrum of the CN(H<sub>2</sub>O)Cbi was monitored during exposure to 1.0-10.0 ppm hydrogen cyanide gas. Formation of

dicyanocobinamide yielded a peak at 583 nm with a simultaneous decrease in reflectance from 450-500 nm. Spectral changes were monitored as a function of time at several relative humidity values: 25, 50, and 85% relative humidity. With either cellulose or glass fiber papers, spectral changes occurred within 10 s of exposure to 5.0 ppm hydrogen cyanide gas (NIOSH recommended short-term exposure limit). We conclude that this sensor could provide a real-time end-of-service-life alert to a respirator user.

*Read more:* <http://www2a.cdc.gov/nioshtic-2/BuildQyr.asp?s1=20046505&f1=%2A&StartYear=&Adv=0&terms=1&EndYear=&Limit=10000&sort=&D1=10&PageNo=1&RecNo=1&View=f&>

## Noise

### In Quest for More Stillness, Researchers Make Lots of Noise

How important is natural quiet? In southwestern Idaho, biologists are purposefully making a racket to find out.

An invisible road - heard but not seen, thanks to a half-kilometer long string of outdoor speakers - created the sonic illusion of cars racing through the Boise National Forest. The two year experiment demonstrated that road noise alone causes migratory birds to flee and fail to gain weight, according to Boise State University Professor Jesse Barber.

Now, in a continuing effort to discover how wildlife and humans respond to noise pollution, his research team has set up a phantom natural gas field.



*Read more:*

<http://www.voanews.com/content/in-quest-for-more-stillness-researchers-make-lots-of-noise/2913160.html>

## Preventive Medicine

### Study: Web-Based Hand Washing Tool May Lower Respiratory Illness



Doctors and medical students in India An Internet-based hand washing intervention system may reduce

rates of flulike illness and other respiratory tract infections (RTIs), according to a study yesterday in *The Lancet*.

UK researchers enrolled 20,066 volunteers across three winters from Jan 17, 2011, through Mar 31, 2013. About half received the Web-based intervention and half did not. The automated intervention system is designed to maximize intent to wash hands,

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monitor hand washing practice, provide feedback, reinforce positive behavior, and address negative beliefs.

The authors were able to follow up with 16,908 participants (84%).

*Read more:*

<http://www.cidrap.umn.edu/news-perspective/2015/08/news-scan-aug-07-2015> (Scroll down to 2nd article)

### Plumbing Pathogens: A Fixture in Hospitals and Homes

Practicing good hygiene is supposed to make you healthier, not sicker. However, a growing body of research shows that certain bacteria can thrive in household and hospital plumbing systems and may cause life-threatening infections among susceptible individuals after inhalation or ingestion. In this issue of EHP, Joseph Falkinham of Virginia Polytechnic Institute and State University in Blacksburg and colleagues review the epidemiology and ecology of what are known as opportunistic premise plumbing pathogens (OPPPs).



*Read more:* <http://ehp.niehs.nih.gov/123-A217/>

### Arsenic and Blood Pressure: A Long-Term Relationship



Overexposure to naturally occurring arsenic in groundwater and soil can cause a variety of cancers and has been associated with developmental effects, neurotoxicity, diabetes, and cardiovascular disease.<sup>1</sup> In this issue of EHP, researchers provide new evidence of arsenic's ability to elevate blood pressure, potentially leading to hypertension and more serious clinical outcomes.<sup>2</sup>

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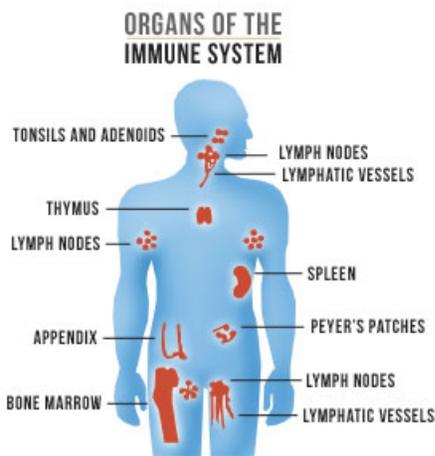
Globally, 200 million people are estimated to drink water exposing them to arsenic at concentrations above the World Health Organization's recommended limit of 10 µg/L.<sup>3</sup> An estimated 35–77 million of these people reside in Bangladesh alone,<sup>4,5</sup> where

nearly all rural households rely on groundwater for drinking water.<sup>6</sup>

*Read more:*

<http://ehp.niehs.nih.gov/123-A218/>

## Associations between Selected Xenobiotics and Antinuclear Antibodies in the National Health and Nutrition Examination Survey, 1999-2004



**Background:** Potential associations between background environmental chemical exposures and autoimmunity are understudied.

**Objectives:** Our exploratory study investigated exposure to individual environmental chemicals and selected mixtures in relation to the presence of antinuclear antibodies (ANA), a widely used biomarker of autoimmunity, in a representative sample of the U.S. population.

**Methods:** This cross-sectional analysis used data on 4340 participants from the National Health and Nutrition Examination Survey (1999-2004), of whom 14% were ANA positive, to explore associations between ANA and concentrations of dioxins, dibenzofurans, polychlorinated biphenyls, organochlorines, organophosphates, phenols, metals, and other environmental exposures and metabolites measured in participants' serum, whole blood, or urine. For dioxin-like compounds with toxic equivalency factors, we developed and applied a new statistical approach to study selected mixtures. Lognormal models and censored-data methods produced estimates of chemical associations with ANA in males, nulliparous females, and parous females that were adjusted for confounders and accommodated concentrations below detectable levels.

**Results:** Several associations between chemical concentration and ANA positivity were observed, but only the association in males exposed to triclosan remained statistically significant after correcting for multiple comparisons (mean concentration

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ratio = 2.8; 95% confidence interval = 1.8,4.5;  $p < 10^{-5}$ ).

Conclusions: These data suggest that background levels of most xenobiotic exposures typical in the U.S. population are not strongly associated with ANA. Future studies should ideally reduce exposure

misclassification by including prospective measurement of the chemicals of concern, and track changes in ANA and other autoantibodies over time

Read more:

<http://ehp.niehs.nih.gov/1409345/>

## In The Fight against Tsetse Flies, Blue Is the New Black

Walk along one of the many streams and rivers in the West Nile region of Uganda, and you'll notice something funny. All along the riverbanks, you'll see small pieces of blue cloth, attached to wooden stakes in the ground. There's one every 50 yards or so.

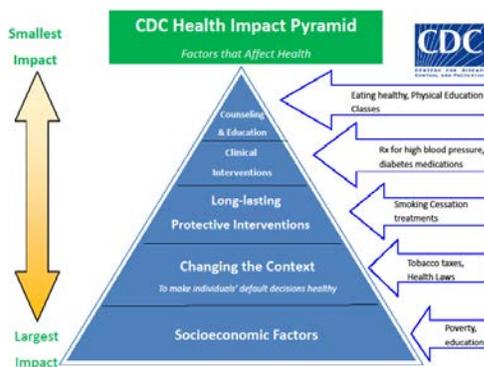
No, this isn't some half-baked public art project. These dinky contraptions are actually flytraps, designed to lure and kill tsetse flies, whose bites transmit a parasitic disease called sleeping sickness, which, like rabies, drives victims mad before it kills them.



Read more:

<http://www.npr.org/sections/goatsandsoda/2015/08/04/427181595/in-the-fight-against-tsetse-flies-blue-is-the-new-black>

## American Heart Association Calls for Focus on Social Factors



The American Heart Association said today that more attention needs to be paid to the social factors that influence heart health, such as race, education, and address.

Those factors may be partly responsible for the increase in rates of cardiovascular disease expected over the coming decades, according to a statement in the journal *Circulation*.

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Read more:  
<http://www.reuters.com/article/2015/08/0>

<3/us-health-heart-social-aha-idUSKCN0Q82DE20150803>

## Environmental Health

### The Clean Power Plan: What Stakeholders Are Saying About It

The Clean Power Plan sets achievable standards to reduce carbon dioxide emissions by 32 percent from 2005 levels by 2030. By setting these goals and enabling states to create tailored plans to meet them, the Plan will:

Protect the health of American families. In 2030, it will:

- Prevent up to 3,600 premature deaths
- Prevent 1,700 non-fatal heart attacks
- Prevent 90,000 asthma attacks in children
- Prevent 300,000 missed workdays and schooldays

Boost our economy by:

- Leading to 30 percent more renewable energy generation in 2030
- Creating tens of thousands of jobs
- Continuing to lower the costs of renewable energy

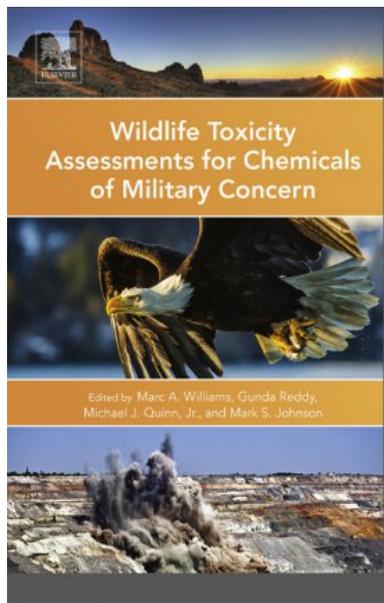
Save the average American family:

- Nearly \$85 a year on their energy bills in 2030
- Save enough energy to power 30 million homes



Read more:  
<https://www.whitehouse.gov/climate-change>

## AIPH Toxicology Portfolio Publishes Book on Wildlife Toxicity Assessments



The Toxicology Portfolio of the Army Institute of Public Health (AIPH) recently authored a new book: **Wildlife Toxicity Assessments for Chemicals of Military Concern.**

Back in 2000, individuals from the Health Risk Management Portfolio and the Toxicology Portfolio developed a method to search, document and categorize toxicology information for substances of military concern to assist with making decisions at contaminated military sites. The Army Environmental Command through the Installation Restoration Program supported these efforts.

*Read more:*

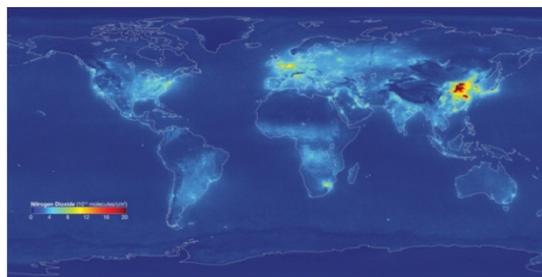
[http://www.army.mil/article/152674/AIPH\\_Toxicology\\_Portfolio\\_publishes\\_book\\_on\\_wildlife\\_toxicity\\_assessments/](http://www.army.mil/article/152674/AIPH_Toxicology_Portfolio_publishes_book_on_wildlife_toxicity_assessments/)

## Long-Term Trends Worldwide in Ambient NO<sub>2</sub> Concentrations Inferred from Satellite Observations

**Background:** Air pollution is associated with morbidity and premature mortality. Satellite remote sensing provides globally consistent decadal-scale observations of ambient NO<sub>2</sub> pollution.

**Objective:** We determined global population-weighted annual mean NO<sub>2</sub> concentrations from 1996 through 2012.

**Methods:** We used observations of NO<sub>2</sub> tropospheric column densities from three satellite instruments in combination with chemical transport modeling to produce a global 17-year record of ground-level NO<sub>2</sub>



at 0.1° x 0.1° resolution. We calculated linear trends in population-weighted annual mean NO<sub>2</sub> (PWMNO<sub>2</sub>) concentrations in different regions around the world as defined by the Global Burden of Disease Study.

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Results: We found that PWMNO<sub>2</sub> in High-Income North America (Canada and the U.S.) decreased more steeply than in any other region, having declined by -4.7% yr<sup>-1</sup> (95% confidence interval (CI): -5.3, -4.1). PWMNO<sub>2</sub> decreased in Western Europe at a rate of -2.5% yr<sup>-1</sup> (95% CI: -3.0, -2.1). The highest PWMNO<sub>2</sub> occurred in High-Income Asia Pacific (predominantly Japan and South Korea) in 1996, with a subsequent decrease of -2.1% yr<sup>-1</sup> (95% CI: -2.7, -1.5). In contrast, PWMNO<sub>2</sub> almost tripled in East Asia (China, North Korea, and Taiwan), at a rate of 6.7% yr<sup>-1</sup> (95% CI: 6.0, 7.3). The satellite-derived estimates of trends in ground-level NO<sub>2</sub> were consistent with regional trends inferred with ground-station monitoring networks in North America (within 0.7% yr<sup>-1</sup>) and Europe (within 0.3% yr<sup>-1</sup>). Our

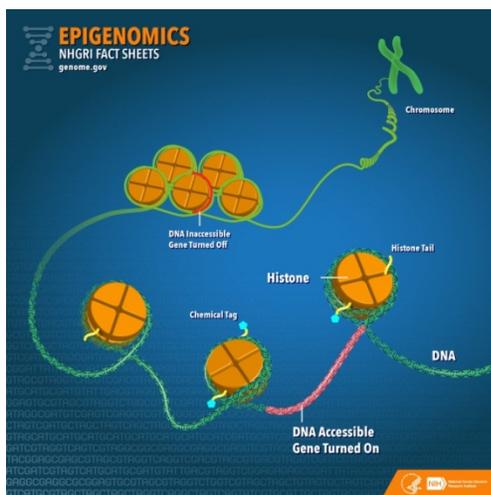
rankings of regional average NO<sub>2</sub> and long-term trends differed from the satellite-derived estimates of fine particulate matter reported elsewhere, demonstrating the utility of both indicators to describe changing pollutant mixtures.

Conclusions: Long-term trends in satellite-derived ambient NO<sub>2</sub> provide new information about changing global exposure to ambient air pollution. Our estimates are publicly available at [http://fizz.phys.dal.ca/~atmos/martin/?page\\_id=232](http://fizz.phys.dal.ca/~atmos/martin/?page_id=232)

*Read more*

<http://ehp.niehs.nih.gov/1409567/>

### Beyond the Mean: Quantile Regression to Explore the Association of Air Pollution with Gene-Specific Methylation in the Normative Aging Study



Background: Air pollution has been related to mean changes in outcomes, including

DNA methylation. However, mean regression analyses may not capture associations that occur primarily in the tails of the outcome distribution.

Objectives: In this study, we examined whether the association between particulate air pollution and DNA methylation differs across quantiles of the methylation distribution. We focused on methylation of candidate genes related to coagulation and inflammation: coagulation factor III (F3), intercellular adhesion molecule 1 (ICAM-1), interferon gamma (IFN- $\gamma$ ), interleukin-6 (IL-6), and toll-like receptor 2 (TRL-2).

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**Methods:** We measured gene-specific blood DNA methylation repeatedly in 777 elderly men participating in the Normative Aging Study (1999–2010). We fit quantile regressions for longitudinal data to investigate whether the associations of particle number, PM2.5 (diameter  $\leq 2.5 \mu\text{m}$ ) black carbon, and PM2.5 mass concentrations (4-week moving average) with DNA methylation [expressed as the percentage of methylated cytosines over the sum of methylated and unmethylated cytosines at position 5 (%5mC)] varied across deciles of the methylation distribution. We reported the quantile regression coefficients that corresponded to absolute differences in DNA methylation (expressed in %5mC) associated with an interquartile range increase in air pollution concentration.

**Results:** Interquartile range increases in particle number, PM2.5 black carbon, and PM2.5 mass concentrations were associated with significantly lower methylation in the lower tails of the IFN- $\gamma$  and ICAM-1 methylation distributions. For instance, a 3.4- $\mu\text{g}/\text{m}^3$  increase in PM2.5 mass concentration was associated with a 0.18%5mC (95% CI:  $-0.30, -0.06$ ) decrease on the 20th percentile of ICAM-1 methylation, but was not significantly related to the 80th percentile (estimate: 0.07%5mC, 95% CI:  $-0.09, 0.24$ ).

**Conclusions:** In our study population of older men, air pollution exposures were associated with a left shift in the lower tails of the IFN- $\gamma$  and ICAM-1 methylation distributions.

*Read more:*

<http://ehp.niehs.nih.gov/1307824/>

### EPA Workers Spill 1M Gallons of Colorado Mine Waste

The EPA has confirmed that its workers caused the spill of one million gallons of wastewater from an abandoned mine in the mountains of Colorado.

The EPA workers were using heavy machinery to investigate pollutants at the Gold King Mine, north of Silverton, when they breached a strip of raised land, and the toxic water flowed into the Animas River. The spill turned the river a mustardy-orange color, and officials warned Thursday that contaminants threaten water quality downstream.



The EPA said that at 10:30 am, an EPA and State Division of Reclamation, Mining and Safety team working to investigate and address contamination at the Gold King

Mine in San Juan County, “unexpectedly triggered a large release of mine waste water into the upper portions of Cement Creek.”

Read more: <http://ens-newswire.com/2015/08/08/epa-workers-spill-1m-gallons-of-colorado-mine-waste/>

### Ergonomics

#### Contrasting Patterns of Care for Musculoskeletal Disorders and Injuries of the Upper Extremity and Knee through Workers' Compensation and Private Health Care Insurance



Background: Musculoskeletal symptoms and disorders (MSDs) are common reasons for visits to medical providers in the general population and they are common work-related complaints. Prior reports raise concerns as to whether declines in workers' compensation (WC) rates represent true improvement in occupational health and safety or shifting of care to other payment systems. Methods: By linking administrative records, we compared patterns of WC claims and private health care utilization for disorders of the upper extremity (UE) and

knee among a large cohort of union carpenters over a 20-year period. Results: As WC claim rates declined, private health care utilization increased. The increase was muted somewhat but sustained when adjusting for other patterns of health care utilization. Conclusions: Findings suggest the decline of WC claim rates do not solely represent improved occupational safety in this population, but also a considerable shifting of care to their private insurance coverage over time.

Read more: <http://www2a.cdc.gov/nioshtic-2/BuildQyr.asp?s1=20046148&f1=%2A&Startyear=&Adv=0&terms=1&EndYear=&Limit=10000&sort=&D1=10&PageNo=1&RecNo=1&View=f&>

## An Examination of an Adapter Method for Measuring the Vibration Transmitted to the Human Arms



The objective of this study is to evaluate an adapter method for measuring the vibration on the human arms. Four instrumented adapters with different weights were used to measure the vibration transmitted to the wrist, forearm, and upper arm of each subject. Each adapter was attached at each location on the subjects using an elastic cloth wrap. Two laser vibrometers were also used to measure the transmitted vibration at each location to evaluate the validity of the adapter method. The apparent mass at the palm of the hand

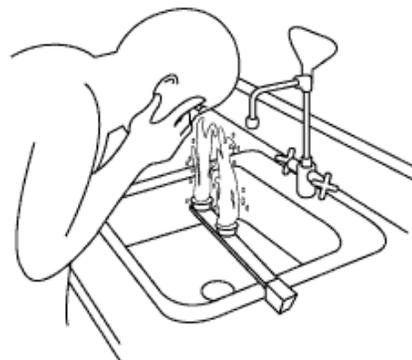
along the forearm direction was also measured to enhance the evaluation. This study found that the adapter and laser-measured transmissibility spectra were comparable with some systematic differences. While increasing the adapter mass reduced the resonant frequency at the measurement location, increasing the tightness of the adapter attachment increased the resonant frequency.

Read more: <http://www2a.cdc.gov/nioshtic-2/BuildQyr.asp?s1=20046431&f1=%2A&Startyear=&Adv=0&terms=1&EndYear=&Limit=10000&sort=&D1=10&PageNo=1&RecNo=1&View=f&>

## Safety

### Health Effects from Contaminated Water in Eyewash Stations

OSHA has updated a resource to help employers understand how important it is to flush emergency eyewashes to prevent organisms from growing in the stagnant water. Eyewash stations are critical emergency safety equipment intended to lessen the severity of eye injuries from workplace exposure to irritants or biological agents. The Health Effects from Contaminated Water in Eyewash Stations Infosheet\* provides information about the



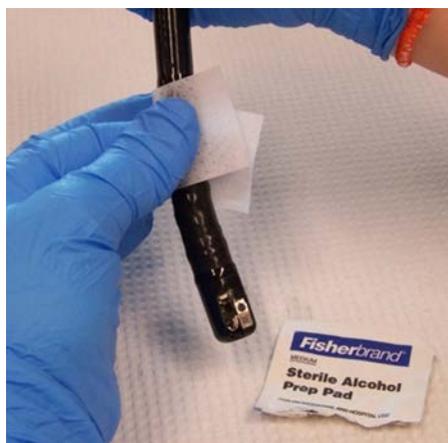
## Army Industrial Hygiene News and Regulatory Summary

organisms that can grow in stagnant water, how to prevent them from growing, and how to recognize infection signs and symptoms.

*Read more:*

<https://www.osha.gov/as/opa/quicktakes/qt080315.html> (Scroll down to the 10<sup>th</sup> article)

### Tests Find Residual Contamination after Endoscope Cleaning



Endoscopes commonly used in digestive tract exams can harbor bacteria, even when technicians carefully follow guidance for cleaning the devices, according to a study published in the Aug 1 issue of the American Journal of Infection Control.

Researchers from St Paul and from the Mayo Clinic in Rochester, Minn., tested samples obtained after 60 encounters with 15 colonoscopes and gastroscopes at each cleaning step. They also observed all cleaning steps using a checklist to ensure that protocols were followed according to published guidelines. Cleaning steps included bedside cleaning, automated reprocessing with high-level disinfectant, and storing cleaned devices vertically after drying with isopropyl alcohol and forced air.

*Read more:*

<http://www.cidrap.umn.edu/news-perspective/2015/08/news-scan-aug-06-2015> (Scroll down to 2<sup>nd</sup> Article)

### NIOSH Ladder Safety App Will Expand to Cover Stepladders

Since its release in 2013, the National Institute for Occupational Safety and Health's Ladder Safety app has helped thousands of users set up and use extension ladders more safely to prevent falls. NIOSH recently announced that the app will now include stepladders.

The new stepladder module will be available at the end of this year to help workers use the most common four-legged



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portable ladders more safely. The new module will be based on the existing ladder safety standards and regulations and will provide easy-to-use, graphic-oriented safety tools, checklists, and guidelines.

*Read more:*

<https://www.osha.gov/as/opa/quicktakes/qt080315.html> (Scroll down to the 11<sup>th</sup> article)

### Perspectives on Communication and Participation in Research Notification Focus Groups



Researchers are slowly acknowledging an ethical obligation to inform research participants about study findings. Research notification may help participants become aware of and manage potential health risks. Scholars and practitioners have acknowledged the need for better understanding of this process. This study investigates transcripts of focus groups conducted to gauge audience reactions to notification materials that communicate scientific research findings about occupational exposures. Focus groups are a

useful way to tailor notification materials to audiences, but we caution that transmission models of communication used in risk research may obscure the full value of focus groups. The emphasis on translating scientific communication into "lay" language may overlook how scientists and lay audiences can work together to bridge differences in language, experiences, goals, and orientations toward health. This study demonstrates limitations in scientific risk communication that minimize participation in communicating science. The conclusion provides instructive insights for strengthening the process of communicating science.

*Read more:* <http://www2a.cdc.gov/nioshtic-2/BuildQyr.asp?s1=20045667&f1=%2A&Startyear=&Adv=0&terms=1&EndYear=&Limit=10000&sort=&D1=10&PageNo=1&RecNo=1&View=f&>

## Length of Time Spent Working on a Commercial Construction Site and the Associations with Worker Characteristics

Background: Construction workers move frequently from jobsite to jobsite, yet little is documented about length of stay on-site and associations with worker characteristics. Method: Using cross-sectional data, we investigated associations between worker characteristics (including trade and musculoskeletal pain) and length of stay on-site (dichotomized as <1 month, n=554, and  $\geq$ 1 month, n=435). Results: Approximately, 56% of workers remained on the worksite for at least 1 month. Length of stay was significantly associated with workers' race/ethnicity, union status, title, trade, and musculoskeletal pain (P-values<0.05). Trades associated with longer length of stay included pipefitters and plumbers. Trades associated with shorter length of stay included operators and piledrivers. Workers with single-location pain had 2.21 times (95%CI: 1.52, 3.19) the odds of being short-term versus long-term, adjusting for trade, title, and race/ethnicity. Conclusion: The length of stay and



associated characteristics provide important insight into how workers come and go on construction sites and the methodological challenges associated with traditional intervention evaluations.

*Read more:*

<http://www2a.cdc.gov/nioshtic-2/BuildQyr.asp?s1=20046380&f1=%2A&Startyear=&Adv=0&terms=1&EndYear=&Limit=10000&sort=&D1=10&PageNo=1&RecNo=1&View=f&>

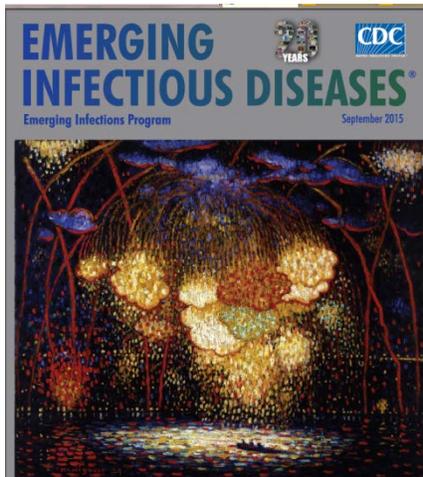
## Emergency Preparedness & Response

### CDC Funding Helps States Address Infectious Disease Threats

The CDC announced awards of nearly \$110 million to help states and communities strengthen their capacity to track and respond to infectious diseases. The awards represent an increase of about \$13 million

over fiscal year 2014 funding, with increases going to vaccine-preventable-disease surveillance, foodborne-disease prevention and advanced molecular detection, among other projects.

# Army Industrial Hygiene News and Regulatory Summary



The funding is allocated through the Epidemiology and Laboratory Capacity for Infectious Diseases Cooperative Agreement (ELC), with a goal of helping states fight infectious disease outbreaks more quickly and develop better interventions to protect

the public's health. Of the nearly \$110 million, \$51 million is provided through the Affordable Care Act's Prevention and Public Health Fund. That funding will support:

- Infectious disease surveillance and outbreak response
- Public health laboratories
- Health information systems
- Efforts to combat zoonotic, vector-borne and foodborne diseases; vaccine-preventable infections; influenza; and healthcare-associated infections

*Read more:*

<http://www.cdc.gov/media/releases/2015/p0803-cdc-funding.html>

## First Responders to Control Traffic Lights during Emergencies

Lenoir County's emergency crews are now equipped to halt traffic at certain intersections so they can safely pass through.

The Queen Street bridge replacement plan by the N.C. Department of Transportation started a conversation among city, county and state officials as to safety concerns about time that would be lost detouring around the construction area, Kinston Mayor B.J. Murphy said.

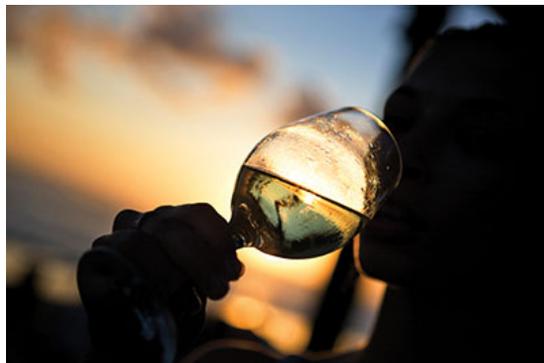


*Read more:*

<http://www.emergencymgmt.com/disaster/First-Responders-Control-Lights.html>

## Deployment Health

### Analysis of Post Deployment Health Assessment Forms Indicates Risks of Alcohol Abuse among Service Members Returning From Deployment



An analysis of responses to questionnaires administered to U.S. active component service members who had returned from deployment during a seven-year surveillance period found that 3.4 percent and 4.8 percent of them, respectively, indicated a severe risk for alcohol abuse.

Of the 1,073,840 Post Deployment Health Assessment (PDHA) forms completed with responses to the Alcohol Use Disorders Identification Test -- Consumption (AUDIT -- C) screens, 3.4 percent indicated severe risk for alcohol abuse -- as defined by a score of 8 or higher -- during the surveillance period between January 1, 2008, and December 31, 2014, according to a report published in the July issue of the Medical Surveillance Monthly Report (MSMR) by the Armed Forces Health Surveillance Center (AFHSC).

*Read more:*

<http://www.sciencedaily.com/releases/2015/07/150731104043.htm>

## Nanotechnology

### Bayesian Evaluation of a Physiologically-Based Pharmacokinetic (PBPK) Model of Long-Term Kinetics of Metal Nanoparticles in Rats

Biomathematical modeling quantitatively describes the disposition of metal nanoparticles in lungs and other organs of rats. In a preliminary model, adjustable parameters were calibrated to each of three data sets using a deterministic



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approach, with optimal values varying among the different data sets. In the current effort, Bayesian population analysis using Markov chain Monte Carlo (MCMC) simulation was used to recalibrate the model while improving assessments of parameter variability and uncertainty. The previously-developed model structure and some physiological parameter values were modified to improve physiological realism. The data from one of the three previously-identified studies and from two other studies were used for model calibration. The data from the one study that adequately characterized mass balance were used to generate parameter distributions. When data from a second study of the same nanomaterial (iridium) were added, the level of agreement was still

acceptable. Addition of another data set (for silver nanoparticles) led to substantially lower precision in parameter estimates and large discrepancies between the model predictions and experimental data for silver nanoparticles. Additional toxicokinetic data are needed to further evaluate the model structure and performance and to reduce uncertainty in the kinetic processes governing in vivo disposition of metal nanoparticles.

*Read more:* <http://www2a.cdc.gov/nioshtic-2/BuildQyr.asp?s1=20046499&f1=%2A&Staryear=&Adv=0&terms=1&EndYear=&Limit=10000&sort=&D1=10&PageNo=1&RecNo=1&View=f&>

### Potential Explosion Hazard of Carbonaceous Nanoparticles: Explosion Parameters of Selected Materials



Following a previous explosion screening study, we have conducted concentration and ignition energy scans on several carbonaceous nanopowders: fullerene, SWCNT, carbon black, MWCNT, graphene, CNF, and graphite. We have measured minimum explosive concentration (MEC), minimum ignition energy (MIE), and minimum ignition temperature (MITcloud) for these materials. The nanocarbons exhibit MEC 10<sup>1</sup>-10<sup>2</sup> g/m<sup>3</sup>, comparable to the MEC for coals and for fine particle carbon blacks and graphites. The nanocarbons are confirmed mainly to be in the St-1 explosion class, with fullerene, at KSt 200 bar-m/s, borderline St-1/St-2. We estimate MIE 10<sup>2</sup>-10<sup>3</sup> J, an order of

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magnitude higher than the MIE for coals but an order of magnitude lower than the MIE for fine particle graphites. While the explosion severity of the nanocarbons is comparable to that of the coals, their explosion susceptibility (ease of ignition) is significantly less (i.e., the nanocarbons have higher MIEs than do the coals); by contrast, the nanocarbons exhibit similar explosion severity to the graphites but enhanced explosion susceptibility (i.e.,

thenanocarbons have lower MIEs than do the graphites). MITcloud> 550.C, comparable to that of the coals and carbon blacks.

Read more: <http://www2a.cdc.gov/nioshtic-2/BuildQyr.asp?s1=20046146&f1=%2A&Startyear=&Adv=0&terms=1&EndYear=&Limit=10000&sort=&D1=10&PageNo=1&RecNo=1&View=f&>

### Regulatory Research & Industrial Hygiene Professional News

#### AIHA

#### AIHA Provides Preventative Guidance in New Legionella Guideline



AIHA announces the release of its new guideline on Legionella titled Recognition, Evaluation, and Control of Legionella in

Building Water Systems. This technical document for industry professionals is an

expansion of information provided in AIHA's publication, Field Guide for the Determination of Biological Contaminants in Environmental Samples, 2nd edition.

Read more: <http://spadmin.aiha.org/about-aiha/Press/2015PressReleases/Pages/AIHA-Provides-Preventative-Guidance-in-New-Legionella-Guideline.aspx>

#### Three New AIHA® Bodies of Knowledge (BoK)

The Field Use of Direct-Reading Instruments for Detection of Gases and Vapors Body of Knowledge provides a comprehensive summary necessary for competent field use of DRIs in the detection and monitoring of gases and vapors. This resource was comprised of information recommended by

**BODY**  
*of Knowledge*

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representatives from the International Association of Fire Fighters, the Marine Chemist Association, NIOSH, industrial hygiene and environmental professions, and instrument manufacturers.

The Respiratory Protection Program Administration and Fit Testing Body of Knowledge Respiratory Protection Program Administrators (RPPAs) and respiratory fit testers a framework for developing training programs and skill assessments. This invaluable resource was developed by key AIHA experts, representatives from NIOSH, occupational hygienists, and respiratory protection equipment and instrument manufacturers this compendium of

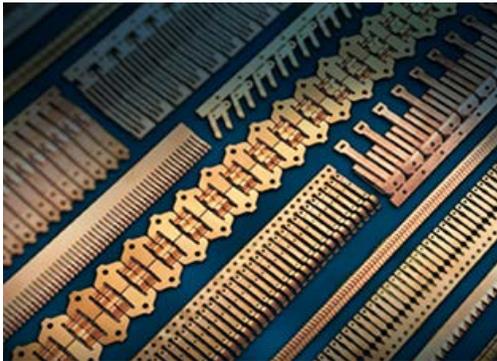
knowledge is invaluable for today's RPPAs and Fit Testers.

The IAQ/IEQ Practitioner Body of Knowledge is a first-of-its-kind resource that provides indoor air quality practitioners and employers with a compendium of knowledge and practicum as recommended by a joint panel of AIHA and IAQA experts. This BoK was created in conjunction with the Indoor Air Quality Association (IAQA).

*Read more:* AIHA Quick Takes September 2015 (Available with a membership)

### OSHA

## OSHA to Propose Lower PEL for Beryllium



OSHA has announced a forthcoming proposed rule that would lower the agency's permissible exposure limit (PEL) for beryllium in general industry from 2

$\mu\text{g}/\text{m}^3$  to  $0.2 \mu\text{g}/\text{m}^3$ . According to OSHA, the new rule would require employers to measure workers' exposures to beryllium, limit their access to areas where exposures exceed the PEL, implement controls for reducing exposures, and train workers about beryllium-related hazards.

*Read more:*

<https://www.aiha.org/publications-and-resources/TheSynergist/Industry%20News/Pages/OSHA-to-Propose-Lower-PEL-for-Beryllium.aspx>

# Army Industrial Hygiene News and Regulatory Summary

## Updated Comprehensive Guide to OSHA Training Requirements Now Available

OSHA has posted a fully updated version of its guide to all agency training requirements to help employers, safety and health professionals, training directors and others comply with the law and keep workers safe. Training Requirements in OSHA Standards\* organizes the training requirements into five categories: General Industry, Maritime, Construction, Agriculture and Federal Employee Programs.

Read more:

<https://www.osha.gov/as/opa/quicktakes/qt080315.html>



**NIOSH**

## New NIOSH Newsletter Available



NIOSH released the first edition of its new newsletter, Research Rounds, in July. Research Rounds is a monthly bulletin of selected research at NIOSH. View or subscribe at <http://www.cdc.gov/niosh/research-rounds/>

# Army Industrial Hygiene News and Regulatory Summary

**USAPHC**

## We're Now the ARMY PUBLIC HEALTH CENTER!



The former U.S. Army Public Health Command has been renamed the Army Public Health Center (Provisional) as part of an overall Army Medical Command reorganization. The intent of the reorganization is to support the requirements of the MEDCOM and better support our mission of promoting health and preventing disease and injury in our beneficiaries. The goal is to create a single point of accountability for health readiness at each Regional Health Command.

The Army Medical Command's realignment supports the Army's current operations and

global engagements. The reorganization will help support the Surgeon General's System for Health by making access to public health services locally accessible.

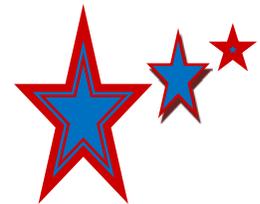
Our customers and clients can expect the same level and quality of services they are accustomed to receiving. The new Army Public Health Center has the same parent organization (Army Medical Command) as before and offers the same range of services in each region. The public health mission does not change; we remain committed to promoting health and preventing disease and injury in Soldiers, retirees, their families, Veterans, Army civilians and our government-owned animals.

*Read more:*

<http://phc.amedd.army.mil/Pages/About.aspx>

## How to become a DOEHS-IH Super Star

- ✓ Do you feel like you use DOEHS-IH more than other program offices?
- ✓ Do you feel unnoticed?
- ✓ Do you feel like you have done great IH things with DOEHS-IH?
- ✓ Do you wear a unitard and cape under your clothes? (Don't answer this question please)



Email the **Industrial Hygiene Training Coordinator** a brief synopsis about a new idea, a faster way, or a milestone you just met. Your Program Office just may be nominated as the monthly DOEHS-IH **Super Star**.

# Army Industrial Hygiene News and Regulatory Summary

## Training

This monthly summary is published by the Industrial Hygiene and Medical Safety Management Program (IHMSMP) for the U.S. Army Public Health Command.



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## Transitioning to a New Format!

Please be patient while we transition to a new training format. In the past, the AIPH Blackboard courses were dependent on Defense Connect Online recordings; however, DCO is no more, our existing material is being converted to a new format that automatically allows recordings to play within Blackboard. Continue to check the training website as we add course material daily. Some courses are already up and running. So visit <https://aiph-dohs.ellc.learn.army.mil> to check their availability.

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