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ISIAQ NEWSLETTER

March 2013

Changes in the Editorial Team for *Indoor Air*

Throughout its 20+ years of operation, *Indoor Air* has used a small range of editorial models. I am the third editor-in-chief (EIC) of the journal, following David Grimsrud (1991-2000) and Jan Sundell (2001-2010). During some periods, the EIC has been assisted by as many as four Associate Editors (AE). Although this model has served well, we have decided on some changes. Starting in January 2013, *Indoor Air* now has ten Associate Editors, each of whom has agreed to serve for a three-year term (with possibility of renewal). Two clear advantages accrue from this change. First, by dividing the AE responsibilities across a larger team, the pool is expanded of top scholars from our domain for whom this is a manageable service commitment. Second, for a broadly multidisciplinary field such as that covered by *Indoor Air*, having a larger team allows for consistently better alignment of each reviewed article with the managing editor's expertise. The net effect should be to strengthen the journal's overall peer review process and in doing so enhance its value to our authors, to our readers and to the broader scientific and professional community. I am hopeful of a third benefit, which is to increase the attractiveness of *Indoor Air* as a premier outlet for submitting first-rate scientific articles addressing the multidisciplinary domain of indoor environmental quality and health.

I'm thrilled that ten outstanding scholars have agreed to serve our community as Associate Editors of *Indoor Air*.

Look to the April 2013 issue of *Indoor Air* for more details.

- Bert Brunekreef
- Richard L. Corsi
- Yuguo Li
- Tiina Reponen
- Huey-Jen (Jenny) Su
- Geo Clausen
- William J. Fisk
- Glenn Morrison
- Tunga Salthammer
- Junfeng (Jim) Zhang

It is worthwhile to review key aspects of the journal's editorial practices and policies. After preliminary screening by an editorial assistant, each article passes to the EIC for the first substantial decision: should the article be reviewed or not. The articles to be reviewed are then assigned to one of the AEs or to the EIC for review management.

The managing editor selects and invites peer reviewers, seeking to secure 3 ± 1 reviews within a several week period. Once reviews are returned, the managing editor evaluates the article in light of reviewer input and recommends one of four outcomes to the EIC: accept, minor revision, major revision, or reject. Articles that are ultimately published most commonly go through one or two iterations of review and revision. The standard for acceptance is favorable recommendation by at least two reviewers plus support from a managing editor and concurrence by the EIC.

Indoor Air benefits from the services of many dedicated peer reviewers. The peer review process is essential for maintaining a strong journal.

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Not only do peer reviews play key roles in deciding which papers to publish, the constructive criticism elevates the quality of those papers. Even when a paper is declined publication, peer review can help authors recognize the limitations of their work as input for future improvements.

William W Nazaroff
Editor-in-Chief

EPA Tribal Research Funding Opportunities

U.S. Environmental Protection Agency
Office of Research and Development
National Center for Environmental Research
Science to Achieve Results (STAR) Program

Solicitation Opening Date: February 25, 2013

Solicitation Closing Date: June 25, 2013, 11:59:59 pm Eastern Time

Science for Sustainable and Healthy Tribes

Research funding announcement: We want to improve the understanding of climate change and indoor air pollution exposure's health impacts on traditional Tribal ways of life. We're seeking applications proposing research to develop sustainable solutions to environmental problems that affect tribes.

To apply and more details:
http://www.epa.gov/ncer/rfa/2013/2013_star_tribal.html

Eligibility Contact: Ron Josephson
(josephson.ron@epa.gov); phone: 703-308-0442

Electronic Submissions: Todd Peterson
(peterston.todd@epa.gov); phone: 703-308-7224

Technical Contact: Cynthia McOliver
(mcoliver.cynthia@epa.gov); phone: 703-347-0311

Funding Opportunity Number:

EPA-G2013-STAR-X1: Science for Sustainable and Healthy Tribes : Climate Change Impacts
EPA-G2013-STAR-X2: Early Career Projects: Science for Sustainable and Healthy Tribes : Climate Change Impacts
EPA-G2013-STAR-Y1: Science for Sustainable and Healthy Tribes : Indoor Air Impacts
EPA-G2013-STAR-Y2: Early Career Projects: Science for Sustainable and Healthy Tribes : Indoor Air Impacts

Environmental Health Basel 2013 Registration Now Open

More than 1900 abstracts were received, and this promises to be an outstanding conference. It is scheduled for the 19-23 August 2013, in Basel, Switzerland.

ISIAQ will hold its Annual General Meeting during the conference. We will announce details later.

Please visit the conference web site for more information:
<http://www.ehbase13.org/english/registration.php>

Send Us Your News!

We are looking for your news to include in the ISIAQ Newsletter.

Send us stories about your research, internships, project awards, new national, state, and local government initiatives related to indoor air quality, new products and services for the research and professional indoor air communities, and news about our members.

If you have a prospective news item, send the Secretariat an email at info@isiaq.org

Indoor Air, Volume 23, Number 2 (April 2013)**Abstracts****William W Nazaroff - Changes in the Editorial Team for *Indoor Air***

Throughout its 20+ years of operation, *Indoor Air* has used a small range of editorial models. I am the third Editor-in-Chief (EIC) of the journal, following David Grimsrud (1991–2000) and Jan Sundell (2001–2010). During some periods, the EIC has been assisted by as many as four Associate Editors (AE). The longest-serving AEs are Yuguo Li and Huey-Jen (Jenny) Su, who have been stalwart contributors to the editing team since 2007 (Wolfgang Bischof, Hal Levin, and Charles Weschler were Associate Editors for the period 2001–2006).

J. Repace, B. Zhang, S. J. Bondy, N. Benowitz and R. Ferrence - Air quality, mortality, and economic benefits of a smoke – free workplace law for non-smoking Ontario bar workers

Abstract We estimated the impact of a smoke-free workplace bylaw on non-smoking bar workers' health in Ontario, Canada. We measured bar workers' urine cotinine before ($n = 99$) and after ($n = 91$) a 2004 smoke-free workplace bylaw. Using pharmacokinetic and epidemiological models, we estimated workers' fine-particle ($PM_{2.5}$) air pollution exposure and mortality risks from workplace secondhand smoke (SHS). workers' pre-law geometric mean cotinine was 10.3 ng/ml; post-law dose declined 70% to 3.10 ng/ml and reported work hours of exposure by 90%. Pre-law, 97% of workers' doses exceeded the 90th percentile for Canadians of working age. Pre-law-estimated 8-h average workplace $PM_{2.5}$ exposure from SHS was $419 \mu\text{g}/\text{m}^3$ or 'Very Poor' air quality, while outdoor $PM_{2.5}$ levels averaged $7 \mu\text{g}/\text{m}^3$, 'Very Good' air quality by Canadian Air Quality Standards. We estimated that the bar workers' annual mortality rate from workplace SHS exposure was 102 deaths per 100,000 persons. This was 2.4 times the occupational disease fatality rate for all Ontario workers. We estimated that half to two-thirds of the 10,620 Ontario bar workers were non-smokers. Accordingly, Ontario's smoke-free law saved an estimated 5–7 non-smoking bar workers' lives annually, valued at CA \$50 million to \$68 million (US \$49 million to \$66 million).

Practical Implication Worker's cotinine measurements can be compared with population databases to assess an occupational group's dose of secondhand smoke relative to the general population. Cotinine can be used to estimate secondhand smoke air pollution exposures and risks for workers and evaluate the efficacy of smoke-free workplace laws in terms of lives and social costs saved. Although Canadian bars are now smoke-free, substantial exposure persists on bar patios, and in many other countries, indoor air in bars remains polluted with secondhand smoke.

M. L. Clark, A. M. Bachand, J. M. Heiderscheidt, S. A. Yoder, B. Luna, J. Volckens, K. A. Koehler, S. Conway, S. J. Reynolds and J. L. Peel - Impact of a cleaner-burning cookstove intervention on blood pressure in Nicaraguan women

Abstract Few studies have evaluated the cardiovascular-related effects of indoor biomass burning or the role of characteristics such as age and obesity status, in this relationship. We examined the impact of a cleaner-burning cookstove intervention on blood pressure among Nicaraguan women using an open fire at baseline; we also evaluated heterogeneity of the impact by subgroups of the population. We evaluated changes in systolic and diastolic blood pressure from baseline to post-intervention (range: 273–383 days) among 74 female cooks. We measured indoor fine particulate matter ($PM_{2.5}$; $N = 25$), indoor carbon monoxide (CO; $N = 32$), and personal CO ($N = 30$) concentrations. Large mean reductions in pollutant concentrations were observed for all pollutants; for example, indoor $PM_{2.5}$ was reduced 77% following the intervention. However, pollution distributions (baseline and post-intervention) were wide and overlapping. Although substantial reductions in blood pressure were not observed among the entire population, a 5.9 mmHg reduction [95% confidence interval (CI): -11.3, -0.4] in systolic blood pressure was observed among women aged 40 or more years and a 4.6 mmHg reduction (95% CI: -10.0, 0.8) was observed among obese women. Results from this study provide an indication that certain subgroups may be more likely to experience improvements in blood pressure following a cookstove intervention.

Practical Implications Nearly half the world's population is regularly exposed to extremely high household air pollution concentrations from the use of traditional, inefficient and poorly vented indoor cookstoves. Cleaner-burning stove designs have the potential to substantially reduce pollutant emissions and indoor air pollution exposures; however, few studies

Clark et al (continued from previous page)

have been conducted to evaluate cardiovascular health improvements following a cookstove intervention. In this longitudinal intervention study using a cookstove that reduced average indoor particulate matter concentrations by 77%, we observed greater systolic blood pressure improvements among certain subgroups of the population (e.g. older and obese participants). These results demonstrating greater differences in mean blood pressure improvements in subgroups with poorer baseline health (i.e. higher baseline blood pressure) provide evidence supporting the hypothesis that susceptible populations will benefit most from interventions that reduce air pollution exposures.

M. Braubach, A. Algoet, M. Beaton, S. Lauriou, M.-E. Héroux and M. Krzyzanowski - Mortality associated with exposure to carbon monoxide in WHO European Member States

Abstract In closed environments, the concentration of carbon monoxide (CO) can easily rise to health-threatening levels. CO-related incidents are often caused by poor condition or inappropriate use of indoor combustion devices as well as structure fires but are also due to suicides. To evaluate the incidence of CO poisoning in Europe, national data on CO-related mortality and morbidity were compiled from Member States of the WHO European Region using a standardized data collection form. National data on CO poisoning were provided by 28 Member States. Within the maximum reporting period (1980–2008), a total of 140 490 CO-related deaths were reported (annual death rate of 2.2/100 000). The number of hospital admissions available from six countries was 31 473. Unintentional CO deaths accounted for 54.7% of the CO-related deaths (35.9%: unintentional inhalation; 18.8%: related to structure fires). The intentional deaths related to CO exposure account for 38.6% of all CO-related deaths (38.1%: suicides; 0.5%: homicides). CO exposure is preventable but causes a substantial amount of deaths in many European countries. More efficient measures and policies to prevent CO poisoning and better reporting of CO mortality are necessary.

Practical Implications Carbon monoxide is known to be a highly dangerous indoor pollutant leading to severe health outcomes. However, CO-related mortality data are not available through standard reporting schemes, and therefore, the magnitude of CO-related mortality has always been subject to estimation. The compilation of CO mortality data presented in this study provides, for the first time, an indication of the magnitude of CO-related health risk and documents that CO poisoning is associated with substantial mortality across Europe. The study identifies the problems that exist with the current reporting schemes and suggests actions for better monitoring. Furthermore, it provides recommendations related to the prevention and diagnosis of CO-related mortality.

B. Gevao, A. N. Al-Ghadban, M. Bahloul, S. Uddin and J. Zafar - Phthalates in indoor dust in Kuwait: implications for non-dietary human exposure

Abstract Phthalates are semivolatile organic compounds with a ubiquitous environmental distribution. Their presence in indoor environments is linked to their use in a variety of consumer products such as children's toys, cosmetics, food packaging, flexible PVC flooring among others. The goal of this study was to investigate the occurrence and concentration of phthalates in dust from homes in Kuwait and to assess non-dietary human exposure to these phthalates. Dust samples were randomly collected from 21 homes and analyzed for eight phthalates. The concentrations of total phthalates were log normally distributed and ranged from 470 to 7800 µg/g. Five phthalates [Di(2-ethylhexyl) phthalate (DEHP), Di-n-octyl phthalate (DnOP), Di-n-butyl phthalate (DBP), Benzyl butyl phthalate (BzBP), and Dicyclohexyl phthalate (DcHP)] were routinely detected. The major phthalate compound was DEHP at a geometric mean concentration of 1704 µg/g (median, 2256 µg/g) accounting for 92% of the total phthalates measured. Using the measured concentrations and estimates of dust ingestion rates for children and adults, estimated human non-dietary exposure based on median phthalate concentrations ranged from 938 ng/kg-bd/day for adults to 13362 ng/kg-bd/day for toddlers. The difference in exposure estimates between children and adults in this study supports previous reports that children are at greater risk from pollutants that accumulate indoors.

Practical Implications Chemical additives in consumer products can migrate during normal use and contaminate the indoor environment. This study provides information on the levels of phthalate esters in dust collected from homes in Kuwait and assesses the potential for human non-dietary exposure to these compounds. The concentration of Di(2-ethylhexyl) phthalate is one of the highest reported so far in the literature and supports previous reports that the inadvertent ingestion of dust is a significant exposure pathway for some phthalate esters.

M. W. Murphy, J. F. Lando, S. M. Kieszak, M. E. Sutter, G. P. Noonan, J. M. Brunkard and M. A. McGeehin - Formaldehyde levels in FEMA-supplied travel trailers, park models, and mobile homes in Louisiana and Mississippi

Abstract In 2006, area physicians reported increases in upper respiratory symptoms in patients living in U.S. Federal Emergency Management Agency (FEMA)-supplied trailers following Hurricanes Katrina and Rita. One potential etiology to explain their symptoms included formaldehyde; however, formaldehyde levels in these occupied trailers were unknown. The objectives of our study were to identify formaldehyde levels in occupied trailers and to determine factors or characteristics of occupied trailers that could affect formaldehyde levels. A disproportionate random sample of 519 FEMA-supplied trailers was identified in Louisiana and Mississippi in November 2007. We collected and tested an air sample from each trailer for formaldehyde levels and administered a survey. Formaldehyde levels among all trailers in this study ranged from 3 parts per billion (ppb) to 590 ppb, with a geometric mean (GM) of 77 ppb [95% confidence interval (CI): 70–85; range: 3–590 ppb]. There were statistically significant differences in formaldehyde levels between trailer types ($P < 0.01$). The GM formaldehyde level was 81 ppb (95% CI: 72–92) among travel trailers ($N = 360$), 57 ppb (95% CI: 49–65) among mobile homes ($N = 57$), and 44 ppb (95% CI: 38–53) among park models ($N = 44$). Among travel trailers, formaldehyde levels varied significantly by brand. While formaldehyde levels varied by trailer type, all types tested had some levels ≥ 100 ppb.

Practical Implications Temporary housing units such as trailers are commonly used to provide shelter for displaced populations following disasters. The results of this study can inform public health, disaster response, and manufacturing decision-makers about potential formaldehyde exposure risks in temporary housing. This study data will contribute to gaps in the scientific literature and provide guidance for future studies, exploring trailer design and manufacturing techniques that could decrease formaldehyde levels in trailers.

A. Adhikari, T. Reponen and R. Rylander - Airborne fungal cell fragments in homes in relation to total fungal biomass

Abstract Fungal exposure may induce respiratory symptoms. The causative agents are compounds in the fungal cell wall. Fragments of microbes may be present in air samples but are not measurable using conventional spore counting or by the determination of viable organisms. This study assesses the proportion of fungal cell biomass and endotoxin in different particle size fractions in air samples from homes. Air samples were collected from 15 homes using a cyclone sampler, collecting particles in three aerodynamic size fractions: <1.0 , 1.0 – 1.8 , and >1.8 μm . N-Acetylhexosaminidase (NAHA) was determined as a marker of fungal cell biomass. Endotoxin was determined using the Limulus amoebocyte lysate method. NAHA and endotoxin in the size range <1.0 μm comprised up to 63% (mean 22.7%) and 96.3% (mean 22.6%) of the total concentrations, respectively. There were significant relationships between the amounts of NAHA and endotoxin in the total amount and in the size fraction >1.8 μm but not in the smaller fractions. The results demonstrate significant amounts of fungal cell biomass and endotoxin in particles <1.0 μm . Homes with reported mold damage had a lower concentration of NAHA in particles <1.0 μm than homes without mold damage. To assess airborne exposure for diagnostic and preventive purposes, measurement techniques that include this fraction should be considered.

Practical Implications Considerable amounts of biologically active microbial agents may be present in airborne fractions of microbial cells smaller than 1.0 μm . For optimal health risk assessment of indoor airborne microbes, sampling techniques that collect the small fraction should be employed.

W. T. Leung, G. N. Sze-To, C. Y. H. Chao, S. C. T. Yu and J. K. C. Kwan - Study on the interzonal migration of airborne infectious particles in an isolation ward using benign bacteria

Abstract Negative pressure isolation wards are essential infection control facilities against airborne transmissible diseases. Airborne infectious particles are supposed to be contained in the isolation room. However, negative pressure may break down by door-opening action or by human movement. Understanding the interzonal transport of airborne infectious particles in the isolation wards can aid the design and operation strategy of isolation facilities. In this work, the interzonal migration of airborne infectious particles by human movement was studied experimentally in an isolation ward. Artificial saliva solution with benign *E. coli* bacteria was aerosolized to simulate bacterium-laden infectious particles. The interzonal migration of aerosolized bacteria was characterized by biological air sampling. Less than 1% of airborne

Leung et al (continued from previous page)

infectious particles were transported to the higher pressure zone when door was closed. With human movement, 2.7% of the particles were transported from the anteroom to the corridor. From high-to-low pressure zones, as much as 20.7% of airborne infectious particles were migrated. Only a minimal amount of particles was transported from the corridor to the positive pressure nurses' station. Infection risk of *tuberculosis* of the healthcare workers and other occupants in the isolation wards were also assessed based on the measured migration ratios.

Practical Implications Human movement is an important factor governing interzonal migration. It is the main cause of migration of airborne infectious particles to a relatively negative pressure zone. This study provides a set of experimentally obtained particle migration ratios by human movement. Other than serving as empirical data for further studies on the mechanics, these migration ratios can also be used to assess the infection risk for occupants in the isolation ward.

X. Li, J. Niu and N. Gao - Co-occupant's exposure to exhaled pollutants with two types of personalized ventilation strategies under mixing and displacement ventilation systems

Abstract Personalized ventilation (PV) system in conjunction with total ventilation system can provide cleaner inhaled air for the user. Concerns still exist about whether the normally protecting PV device, on the other hand, facilitates the dispersion of infectious agents generated by its user. In this article, two types of PV systems with upward supplied fresh air, namely a chair-based PV and one kind of desk-mounted PV systems, when combined with mixing ventilation (MV) and displacement ventilation (DV) systems, are investigated using simulation method with regard to their impacts on co-occupant's exposure to the exhaled droplet nuclei generated by the infected PV user. Simulation results of tracer gas and particles with aerodynamic diameter of 1, 5, and 10 μm from exhaled air show that, when only the infected person uses a PV, the different PV air supplying directions present very different impacts on the co-occupant's intake under DV, while no apparent differences can be observed under MV. The findings demonstrate that better inhaled air quality can always be achieved under DV when the adopted PV system can deliver conditioned fresh air in the same direction with the mainly upward airflow patterns of DV.

Practical Implications Research found that some PV devices used by the infected person would enhance the dispersion of pathogen-laden respiratory droplet nuclei and induce higher personal exposure for occupants. This study shows that the type of PV devices plays an important role on the distribution of respiratory pollutants, and an optimum PV terminal device can ensure a better inhaled air quality. It is important to preserve the advantages of DV in forwarding the contaminants to the higher space to reduce personal exposure, when using PV as one complementary ventilation method.

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THANK YOU IN ADVANCE

About ISIAQ

With more than 800 members from more than 45 countries, ISIAQ is an international, independent, multidisciplinary, scientific, non-profit organization whose purpose is to support the creation of healthy, comfortable and productive indoor environments. We strongly believe this is achievable by advancing the science and technology of indoor air quality and climate as it relates to indoor environmental design, construction, operation and maintenance, air quality measurement and health sciences.

As a Society, our major role is to facilitate international and interdisciplinary communication and information exchange by publishing and fostering publication on indoor air quality and climate. We organize, sponsor and support initiatives such as meetings, conferences, and seminars on indoor air quality and climate; and we develop, adapt and maintain guidelines for the improvement of indoor air quality and climate.

ISIAQ's journal, *Indoor Air*, published six times per year, is the most respected and widely-cited source of scientific information relevant to building scientists and professionals. Our two major international conferences -- the Indoor Air 'xx and the Healthy Buildings 'xx conference series -- set the standard for high quality scientific information and its application to making healthy buildings. We also cooperate with government and other agencies and societies with interests in the indoor environment and climate.

To find out more about us, visit our website: <http://isiaq.org>

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Corporate Memberships are available

If your organization is involved in indoor air science, policy, or practice, a corporate membership in ISIAQ will place you in the limelight with the international indoor air community.

- ISIAQ reaches more than 45 countries around the world.

- ISIAQ's conferences, considered the most important in the field, have been attended by more than 4,000 individuals.

- The official Society journal, *Indoor Air*, is respected by scientists and policy-makers as the most reliable way to keep up with the latest scientific findings in the field.

To learn more about the benefits of corporate membership in ISIAQ, visit the membership page on our web site and click on the [corporate membership link](#).

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