

# ISES Awards

## Constance L. Mehlman Award 2015 Winner: James L. Repace



**James Repace measuring PM<sup>2.5</sup>, PAH, and CO<sup>2</sup> with concealed monitors in a Canadian pub**

For over 35 years, **James L. Repace** has conducted original research measuring, and modeling human exposure to, and risk from, secondhand smoke (SHS) in a wide variety of locations where people live and work. His research, lectures, and testimony before the legislatures of many countries in North and South America, Europe, Asia, and the Pacific Rim has been a prime contributor to a worldwide effort to reduce the exposure of millions of people to SHS. His early research, published in 1980 in the journal *Science*, showed that PM<sup>2.5</sup> concentrations averaged six times higher in buildings where smoking was permitted than in nonsmoking buildings or outdoors, and this pioneering work had a major impact on the scientific community. In 1985, he published the first health risk assessment of passive smoking and lung cancer in the journal *Environment International*, estimating 500 to 5000 US lung cancer deaths annually, and developed an exposure-response relationship demonstrating that ventilation could not control SHS exposures to within an acceptable level of risk. His research became the subject of numerous radio, television, and newspaper interviews and commentaries around the world. In 2004, he published an air monitoring study in *JOEM* comparing particle levels before and after a statewide smoking ban in six bars, a casino, and a pool hall in Delaware. It showed that 90 to 95% of PM<sup>2.5</sup> and particulate polycyclic aromatic hydrocarbon (PAH) levels were caused by SHS, and generated 650 million media impressions internationally, helping to persuade several countries to enact smoke-free workplace laws. This societal change cleaned the air in indoor spaces where people spent a significant portion of their time.

James Repace has explored a remarkably diverse set of projects on SHS and human exposure to SHS, ranging from exposure and doses of flight attendants in the smoky skies, of workers and patrons in smoky restaurants, bars, offices, factories, casinos and multi-unit housing, to levels of smoke in outdoor cafes, on cruise ships at sea, and on college campuses. He was one of the first investigators to use portable monitors to measure air pollutants indoors, and his field studies have included measurements of particulate matter, PAHs, nicotine, carbon monoxide, and air exchange rates. He has shown that it would take tornado-like levels of ventilation or air cleaning to control tobacco smoke pollution to de minimis levels of lung cancer and heart disease mortality risk in hospitality locations. He has demonstrated a set of physical and pharmacokinetic equations for SHS correlating the SHS atmospheric markers nicotine, respirable particles, and carbon monoxide, to each other and with the SHS biomarkers cotinine in serum, saliva, and urine as well as hair nicotine. In collaboration with others, he has used this methodology to estimate levels of fine particle air pollution in bars from the urine cotinine of bartenders and patrons and compared them to the federal air quality index for outdoor air pollution alerts. These efforts have resulted in 48 peer-reviewed papers on secondhand smoke, in scientific, medical, engineering journals, earning over 3400 citations.

James Repace is presently a secondhand smoke consultant. He previously served as a research physicist at the Naval Research Laboratory and as a senior air policy analyst at the US EPA. He has earned several national awards, including The Surgeon General's Medallion, A Lifetime Achievement Award from the American Public Health Association, the Flight Attendant Medical Research Institute's Distinguished Professor Award, and the Robert Wood Johnson's Innovators Combating Substance Abuse Award. He has served as a Visiting Asst. Clinical Professor at the Tufts University School of Medicine, and as a Consultant to the Stanford University Department of Civil and Environmental Engineering.

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### About the Constance L. Mehlman Award

Myron Mehlman, the Society's first President and former managing editor of the Journal of Exposure Science and Environmental Epidemiology, endowed a new ISES award in 1999 in honor of his late wife, Constance Mehlman, an environmental attorney.

***In recognition of outstanding contributions in exposure analysis research that helped shape a national or state policy or that provided new approaches for reduction or prevention of exposures.***

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