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Engineering & Scientific Consulting

## Richard Reiss, Sc.D.

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### Professional Profile

Dr. Reiss is an environmental health scientist with expertise in risk assessment, exposure assessment, environmental chemistry and fate, mathematical modeling, and applied statistics. He provides consulting services related to scientific issues associated with numerous environmental statutes, and has expertise in both air quality and chemical risk assessment. He has conducted risk assessments, data analyses, probabilistic exposure modeling, and environmental exposure modeling for environmental agents, such as pesticides, industrial chemicals, and consumer product chemicals. He has conducted risk assessments for new and existing products.

Dr. Reiss is very active in the application and development of quantitative methods in risk assessment. He is the developer of the Probabilistic Exposure and Risk assessment model for FUMigants (PERFUM), which is an air dispersion model designed to evaluate bystander inhalation exposure following fumigant applications. PERFUM is widely used by Environmental Protection Agency (EPA) and other public agencies for evaluating bystander risks for pesticide volatilization. Generally, he has used a variety of mathematical models in conducting occupational and ecological risk assessments for pesticides and industrial chemicals; and performed statistical analyses, including dose-response modeling to evaluate chemical toxicity. He has published in the areas of human and ecological risk assessment, exposure assessment, dose-response, nutrition, and epidemiology.

Dr. Reiss is actively involved in several scientific societies and he is the Past-President of the Society for Risk Analysis, the leading scientific society devoted to the field of risk assessment. Dr. Reiss was the Managing Editor of *Risk Analysis: An International Journal*, the leading scholarly journal for risk analysis, from 2001 through mid-2008. He was the winner of the 2001 Chauncey Starr award from the Society for Risk Analysis. This award recognizes a risk analyst less than 40 years of age that has made major contributions to the field of risk analysis. Dr. Reiss was also a councilor in the Society for Risk Analysis (term 2005-2008). In 2010, he was elected a Fellow of the Society for Risk Analysis.

### Academic Credentials & Professional Honors

Sc.D., Environmental Health, Harvard University, 1994

M.S., Environmental Engineering, Northwestern University, 1991

B.S., Chemical Engineering, University of California, Santa Barbara, 1989

Chauncey Starr Award from the Society for Risk Analysis, 2001, recognizing a scientist under 40 years of age who has made significant contributions to risk analysis

Outstanding Service Award, Society for Risk Analysis, 2009

Leslie Silverman Scholarship, Harvard University, 1991

Walter P. Murphy University Fellowship, Northwestern University, 1989-1990

## Prior Experience

Vice President, Sciences International, 2000-2006

Senior Scientist, Quantitative Risk Assessment Expert, Jellinek, Schwartz & Connolly, Inc., 1998-2000

Senior Air Quality Analyst, Sonoma Technology, Inc., 1994-1998

Engineer, Environmental Solutions, Inc., 1990-1991

## Publications

DeSesso JM, Williams AL, Reiss R. Conflicting views on the potential carcinogenicity of glyphosate: How did we get here and what should we do? *J Pub Health Emerg* 2017; 1:78. doi: 10.21037/jphe.2017.09.03.

Aslun MW, Breton RL, Padilla L, Winchell M, Wooding KL, Moore DR, Teed RS, Reiss R, Whatlong P. Ecological risk assessment for Pacific salmon exposed to dimethoate in California. *Environ Toxicol Chem* 2017; 36:532-543.

Reiss R, Chang ET, Richardson RJ, Goodman M. A review of epidemiologic studies of low-level exposures to organophosphorus insecticides in non-occupational populations. *Crit Rev Toxicol* 2015 Aug; 45(7):531-641. doi: 10.3109/10408444.2015.1043976.

Murphy M, Stettler N, Smith KM, Reiss R. Associations of consumption of fruits and vegetables during pregnancy with infant birth weight or small for gestational age (SGA) births: A systematic review of the literature. *Int J Womens Health* 2014; 6:899-912.

Reiss R, Johnston J, Tucker K, DeSesso JM, Keen CL. Estimation of cancer risks and benefits associated with a potential increased consumption of fruits and vegetables. *Food Chem Toxicol* 2012; 50:4421-4427.

Reiss R, Neal B, Lamb JC, Juberg DR. Acetylcholinesterase dose-response modeling for chlorpyrifos and chlorpyrifos-oxon. *Regul Toxicol Pharm* 2012; 63:124-131.

Bogen R, Reiss R. Generalized Haber's law with exponential decline, with application to riparian-aquatic pesticide ecotoxicity. *Risk Anal* 2012; 32:250-258.

Reiss R. Atmospheric modeling of fumigants. Workshop on methyl bromide alternatives, Kansas State University, Manhattan, KS, May, 2010.

Cantor R, Lyman M, Reiss R. Asbestos claims and litigation. *The John Liner Review* 2009; 23:28-38.

Reiss R, Lewis G, Griffin J. An ecological risk assessment for triclosan in the terrestrial environment. *Environ Toxicol Chem* 2009, 21:2483-2492.

Levy J, Reiss R. The importance of modeling in exposure and risk assessments. *Environmental Manager* 2008; 14-17, June.

Reiss R, Anderson EL, Cross CE, Hidy G, Hoel D, McClellan R, Moolgavkar S. Evidence of health

impacts of sulfate and nitrate containing particles in ambient air. *Inhalat Toxicol* 2007; 19:419-449.

Reiss R. Temporal trends and weekend-weekday differences for benzene and 1,3-butadiene in Houston, Texas. *Atmos Environ* 2006; 40:4711-4724.

Reiss R, Griffin J. A probabilistic model for acute bystander exposure and risk assessment for soil fumigants. *Atmos Environ* 2006; 40:3548-3560.

Reiss R, Schoenig GP, Wright, GA. Development of factors for estimating swimmer exposures to chemicals in swimming pools. *Hum Ecol Risk Assess* 2006; 12:139-156.

Reiss R, Gaylor D. Use of benchmark dose and meta-analysis to determine the most sensitive endpoint for risk assessment for dimethoate. *Regul Toxicol Pharmacol* 2005; 43:55-56.

Reiss R, Anderson EL, Lape J. A framework and case study for exposure assessment in the Voluntary Children's Chemical Evaluation Program. *Risk Anal* 2003; 23:1069-1084.

Reiss R, MacKay N, Habig C, Griffin, J. An ecological risk assessment for triclosan in lotic systems following discharge from wastewater treatment plants in the U.S. *Environ Toxicol Chem* 2002; 21:2483-2492.

Wilkinson CF, Christoph GR, Julien E, Kelley JM, Kronenberg J, McCarthy J, Reiss R. Assessing the risks of exposures to multiple chemicals with a common mechanism of toxicity: How to cumulate? *Regul Toxicol Pharmacol* 2000; 31:30-43.

Allen G, Sioutas C, Koutrakis P, Reiss R, Lurmann FW, Roberts PT, Burton R.M. Evaluation of the TEOM method for measurement of ambient particulate mass in urban areas. *J Air Waste Manage Assoc* 1997; 47:682-689.

Reiss R, Ryan PB, Koutrakis P, Tibbetts S. Ozone reactive chemistry on interior latex paint. *Environ Sci Technol* 1995; 29:1906-1912.

Reiss R, Ryan PB, Tibbetts S, Koutrakis P. Measurement of organic acids, aldehydes, and ketones in residential environments and their relation to ozone. *J Air Waste Manage Assoc* 1995; 45:811-822.

Reiss R, Ryan PB, Koutrakis P. Modeling ozone deposition onto indoor residential surfaces, *Environ Sci Technol* 1994; 28:504-513.

### **Selected Presentations and Conference Proceedings**

Reiss R, Driver J, Ross J, Young B. Aggregate and cumulative exposure contribution for pyrethroids: consideration of modeling and biological monitoring. International Society of Exposure Analysis and Epidemiology. Research Triangle Park, North Carolina, September 2017.

Reiss R. Title: Recent History of Fumigant and Semi-Volatile Bystander Risk Assessment and Use of PERFUM. American Chemical Society. Washington, DC. August 2017.

Aslund M, Breton R, Padilla L, Reiss R, Whatling P, Winchell M, Wooding K, Moore M, Ecological risk assessment for Pacific salmon exposed to dimethoate in California. American Chemical Society, Boston, MA, August 2016.

Ma Q, Reiss R., Schocken M. Influence of EPA's newer groundwater model (PRZM-GW) on drinking water exposure assessment. American Chemical Society, Philadelphia, PA. August 2016.

Reiss R. An evaluation of epidemiologic studies of low-level exposures to organophosphorus insecticides

and implications for risk assessment . Society for Risk Analysis, Arlington, VA, December 2015.

Reiss R, Tucker K, Weidling R. Validation of pesticide dietary exposure model using biomonitoring data — Case study for chlorpyrifos. Society for Risk Analysis, Denver, CO, December 2014.

Beyer D, Hays S, Hentz K, Lamb J, Reiss R, Hentges S. EFSA's WoE analysis of bisphenol A (BPA) is sound, but improved BMDL and HEDF calculations support reconfirming the 50 &micro;g/kg-bw/day TDI. Eurotox, Edinburgh, Scotland, 2014.

Reiss R, Tucker K, Johnston J. Fruits and vegetables are good for you: Cancer risks and benefits as a case study. American Chemical Society/IUPAC Joint Meeting, San Francisco, CA, 2014.

Poletika N, Mosquin P, Aldworth J, Reiss R, Williams M. Interpretation of peak concentration estimates for a typical NAWQA/NASQAN surface water monitoring dataset using a weight-of-evidence approach. American Chemical Society/IUPAC Joint Meeting, San Francisco, CA, 2014.

Ma Q, Reiss R, Whatling P. Non-equilibrium sorption of flutriafol on predicted environmental concentrations. Presentation to the 245th American Chemical Society (ACS) National Meeting & Exposition, New Orleans, LA, April 7-11, 2013.

Reiss. R. Assessing risks from pesticide post-application volatilization. Presentation to the 246th American Chemical Society (ACS) National Meeting, Indianapolis, IN, September 8-12, 2013.

Ma Q, Reiss R, Whatling P. Influence of time-dependent sorption of flutriafol on predicted environmental concentrations. Presentation to the 246th American Chemical Society (ACS) National Meeting, Indianapolis, IN, September 8-12, 2013.

Reiss R. What can we learn and apply from journal peer review. Society for Risk Analysis, Baltimore, MD, 2013.

Reiss R. Assessing risks of pesticide post-application exposure. American Chemical Society, Indianapolis, IN, 2013.

Reiss R. Estimation of cancer risks and benefits associated with a potential increased consumption of fruits and vegetables. Invited presentation at the U.S. Department of Agriculture, Washington, DC, 2012.

Reiss R. Measuring risk exposure when using global supplier. Society for Risk Analysis World Congress, Sydney, Australia, 2012.

Reiss R, Johnston J, DeSesso J, Tucker K. Pesticide residues on food: A mountain or a molehill. Society for Risk Analysis, Charleston, SC, 2011.

Reiss R, Bogen K. Modeling risk to aquatic species subject to realistic, dynamic exposures using a generalized form of Haber's law. American Chemical Society, Denver, CO, 2011.

Ma Q, Reiss R, Habig C. Applying the joint probability distribution analysis for Pacific Northwest salmonid risk assessment. American Chemical Society, Denver, CO, 2011.

Li A, Reiss R, Lowe K, McIntosh L, Mink P. Framework for integration of human and animal data for risk assessment. Society of Toxicology, Washington, DC, 2011.

Reiss R. Atmospheric modeling of fumigants. Workshop on methyl bromide alternatives, Kansas State University, Manhattan, KS, May, 2010.

Reiss R. Health risk assessment for fumigants. Keynote address to the annual meeting of the Australia-

New Zealand Chapter of the Society for Risk Analysis, Sydney, Australia, September 2010.

Reiss R. Evaluation of water contamination from consumer product uses. Invited presentation to the National Capitol Area Chapter of the Society for Toxicology, Washington, DC, April, 2010.

Reiss R. The evolution of health risk assessment in the United States. Keynote address to the first annual Society for Risk Analysis meeting of the Taiwan SRA chapter, Taichung, Taiwan, January, 2010.

Reiss R. Risk analysis: The evolution of a science. Invited presentation to the Joint IRAC-SRA-CBER-JIFSAN Symposium on New Tools, Methods and Approaches for Risk Assessment, Baltimore, MD, December, 2009.

Reiss R. Exposure analysis: Pathways to refining regulatory risk assessments. Midwest States Risk Assessment Symposium, Indianapolis, IN, November 2009.

Williams P, Reiss R. Modeling the variability in consumer product use patterns. International Society for Exposure Analysis annual meeting, Minneapolis, MN, November 2009.

Cramer S, Poletika N, Everich R, Schocken M, Habig C, Reiss R. Framework for estimating exposure to ESA-listed salmon to pesticides. American Chemical Society semiannual meeting, Washington, DC, August 2009.

Reiss R, Edwards M. Analysis of cholinesterase variability in animals and implications for risk assessment. Society for Risk Analysis Annual Meeting, Boston, MA, December 2008.

Reiss R, Lewis G, Griffin J, Inauen J, Navarro L. Terrestrial risk assessment for triclosan. Poster presentation, Pacific Northwest Organic Residuals Symposium, Davis, CA, October 2008.

Reiss R, Chan R. Estimation of emission rates for building fumigations. Methyl Bromide Alternative Outreach conference, San Diego, CA, October 2007.

Reiss R, Chan R. Impact of estimation methods and tarping methods on flux rates. Methyl Bromide Alternative Outreach conference, San Diego, CA, October 2007.

Reiss R, Anderson E, Turnham P. Exposure and risk assessment for residents and contractors associated with vermiculite attic insulation. International Society for Exposure Analysis. Durham, North Carolina, October 2007.

Reiss R. A critical evaluation of the National Ambient Air Toxics Assessment (NATA) program for benzene. Society for Risk Analysis Annual Meeting, Baltimore, MD, December 2006.

Reiss R, Inauen J, Hoffman-Kamensky M, Capdevielle M. Terrestrial risk assessment for triclosan. Society of Environmental Toxicology and Chemistry Meeting, Montreal, Canada, November 2006.

Reiss R. Near-field air quality impacts from fumigant applications. American Chemical Society Meeting, San Francisco, CA, September 2006.

Reiss R. A probabilistic model for estimating bystander inhalation risks following fumigant applications. American Chemical Society Meeting, San Francisco, CA, September 2006.

Reiss R, Gaylor D. Statistical evaluation to determine the most appropriate endpoint for dimethoate risk assessment. Society for Risk Analysis Annual Meeting, Orlando, FL, December 2005.

Reiss R. Bystander risk assessment for fumigant: an evaluation of current regulatory activity. Society for Risk Analysis Annual Meeting, Orlando, FL, December 2005.

Gibb HJ, Kozlov K, Centeno J, Kolker A, Conko K, Reiss R. Potential health risks from long term mercury exposure in Gorlovka, Ukraine. Society for Risk Analysis Annual Meeting, Orlando, FL, December 2005.

Reiss R. Development of risk-based buffer zones for a fumigant application. Society for Risk Analysis Annual Meeting, Palm Springs, CA, December 2004.

Reiss R. Estimating fumigant buffer zones by air dispersion modeling. Methyl Bromide Alternatives Outreach Conference, Orlando, FL, October 2004.

Reiss R. Air exposure following a fumigant application. International Society of Exposure Analysis Meeting, Philadelphia, PA, October 2004.

Reiss R. Analysis of benzene and 1,3-butadiene emissions in the Houston Ship Channel. Presented at API/EPA Conference on Emissions Uncertainties, Houston, TX, 2003.

Reiss R, Anderson EL. A framework and case study for the Voluntary Children's Chemical Evaluation Program. Presented at the Society for Risk Analysis Annual Meeting, New Orleans, December 2002.

Reiss R. Emerging issues in environmental health for children. Invited lecture given at the Air and Waste Management Association meeting in Baltimore, MD, June 2002.

Reiss R, Griffin, J. A critical review of the National Emissions Inventory for Air Toxics. Presented at the Coordinating Research Council conference on Air Toxics Modeling, Houston, TX, February 2002.

Reiss R, MacKay N, Habig C, Griffin J. A probabilistic ecological risk assessment for Triclosan in lotic systems following discharge from wastewater treatment systems. Presented at the Society of Environmental Toxicology and Chemistry meeting, Baltimore, MD, November 2001.

Reiss R. A review of the National Air Toxics Assessment. Presented at the Mid-Atlantic Section Meeting of the Air and Waste Management Association, Baltimore, MD, December 11, 2000.

Reiss R, Wilkinson CW. Exposure to chemicals with same mechanism of action: How to add the risk? Presented at the Annual Meeting of the American College of Toxicology, McLean, VA, November 9, 1999.

Lurmann FW, Reiss R. Analysis of the first three years of PM<sub>2.5</sub> data collected in the Southern California Children's Health Study. Presented at PM<sub>2.5</sub> A Fine Particle Standard, Long Beach, CA, sponsored by A&WMA, U.S. Environmental Protection Agency, and the U.S. Department of Energy, January 28-30, 1998.

Reiss R, Chinkin L. Ozone exceedance data analysis: representativeness of the 1995 summer ozone season in the Northeast. Paper presented at the 1st NARSTO Northeast Data Analysis Symposium and Workshop, Norfolk, VA, December 10-12, 1996.

Coe D, Chinkin L, Reiss R, DiSogra C, Hammerstrom K. An emission inventory of agricultural internal combustion engines for California's San Joaquin Valley. Paper presented at the Air & Waste Management Association Emission Inventory: Key to Planning, Permits, Compliance & Reporting Conference, New Orleans, LA, September 4-6, 1996.

Main HH, Roberts PT, Korc ME, Coe DS, Dye TS, Lindsey CG, Reiss R. Analysis of PAMS and NARSTO-Northeast data — Supporting evaluation and design of ozone control strategies: A workshop. Presented at U.S. Environmental Protection Agency, Research Triangle Park, NC by Sonoma Technology, Inc., Santa Rosa, CA, December 11-12, 1995.

Chinkin LR, Ryan PA, Reiss R. A critical evaluation of biogenic emission systems for photochemical grid

modeling in California. Paper presented at the Air & Waste Management Association and U.S. Environmental Protection Agency Emissions Inventory Conference, Research Triangle Park, NC, October 11-13, 1995.

Main HH, Roberts PT, Lurmann FW, Wright DB, Reiss R, Hering SV. Measurement of acid gases and PM<sub>2.5</sub> in 12 Southern California communities for use in an epidemiologic study. Paper presented at the Air & Waste Management Association and U.S. Environmental Protection Agency Conference on Measurement of Toxic and Related Air Pollutants, Research Triangle Park, NC, May 16-18, 1995.

Reiss R, Lurmann FW, Roberts PT, Schoell BM, Geyh AS, Koutrakis P. A pilot personal ozone study in Southern California for validation of a microenvironmental model. Paper presented at the Air & Waste Management Association and U.S. Environmental Protection Agency Conference on Measurement of Toxic and Related Air Pollutants, Research Triangle Park, NC, May 16-18, 1995.

Allen G, Koutrakis P, Reiss R, Lurmann F, Roberts PT, Burton R, Wilson W. Evaluation of the TEOM method for measurement of ambient particle mass in urban areas. In: Transactions of the Air & Waste Management Association Conference on Particle Matter: Health and Regulatory Issues, Pittsburgh, PA. Air & Waste Management Association, Pittsburgh, PA, April 4-6, 1995.

Reiss R, Ryan PB, Tibbetts S, Koutrakis P. Ozone reactive chemistry in residential environments. Presented at Air & Waste Management Association Conference, Measurement of Toxic and Related Air Pollutants, Durham, NC, May 1994.

Reiss R, Ryan PB, Koutrakis P, Bamford S. Modeling ozone deposition onto indoor surfaces. Presented at an Air & Waste Management Association Conference, Measurement of Toxic and Related Air Pollutants, Durham, NC, May 1993.

### **Book Chapters**

Ma Q, Reiss R, Habig C, Whatling P. Use of the joint probability distribution analysis for assessment of the potential risks of dimethoate to aquatic endangered species. Chapter 12, pp. 171-181. In: Pesticide Regulation and the Endangered Species Act. ACS Symposium Series, Vol. 1111, American Chemical Society, 2012.

Reiss R. Use of simple stream modeling methods to assess the potential risks of malathion to salmonids. Chapter 11, pp. 159-169. In: Pesticide Regulation and the Endangered Species Act. ACS Symposium Series, Vol. 1111, American Chemical Society, 2012.

Cantor R, Lyman M, Reiss R. Asbestos claims and litigation. In: Product Liability, 2011.

Reiss R. Ozone reactive chemistry on interior surfaces of buildings. In: Encyclopedia of Environmental Analysis and Remediation, 1998.