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### **AREAS OF QUALIFICATION**

- Environmental health risk assessment
- Environmental health risk management and public policy
- Risk communication
- Toxicology

Dr. Gail Charnley is an internationally recognized scientist specializing in environmental health risk assessment and risk management science and policy. She has 30 years of experience in the biological, chemical, and social policy aspects of environmental and public health protection, writing and speaking extensively on issues related to the roles of science and risk analysis in environmental and public health risk management decision-making. Dr. Charnley focuses on strategic analysis and risk communication of complex scientific and regulatory issues to both nontechnical and scientific audiences. She works primarily on the safety of chemicals in food, environmental media, work environments, and consumer products. She has testified frequently on Capitol Hill and to many state and foreign legislative and administrative bodies. She has been the scientific spokesperson for a variety of organizations to print and television media. She serves on the National Academy of Sciences Board on Environmental Studies and Toxicology and has an appointment as a Lecturer at the Yale School of Public Health. She has served on numerous peer review panels convened by the Environmental Protection Agency, the Food and Drug Administration, and Health and Welfare Canada. From 1994-1997 she was executive director of the Presidential/Congressional Commission on Risk Assessment and Risk Management, mandated by Congress to evaluate the roles that risk assessment and risk management play in federal regulatory programs. Before her appointment to the Commission, she served as director of the Toxicology and Risk Assessment Program at the National Academy of Sciences/National Research Council. She is a lifetime fellow and a past president of the international Society for Risk Analysis, for which she has also served as the first Sigma Xi distinguished lecturer. She holds an AB in biochemistry from Wellesley College and a PhD in toxicology from MIT.

### **EDUCATION**

Massachusetts Institute of Technology	1984	Toxicology	Ph.D.
Wellesley College	1977	Molecular Biology	A.B. (with honors)

**PROFESSIONAL ORGANIZATIONS AND AFFILIATIONS**

Lecturer, Yale School of Public Health (2011-present)  
Member, National Academy of Sciences Board on Environmental Studies and Toxicology (2009-present)  
Member, California Green Chemistry Initiative's Science Advisory Panel (2008)  
Member, National Academy of Sciences Committee on Toxicity Testing and Assessment of Environmental Agents (2003-2007)  
Member, National Academy of Sciences Committee on Improving the Regulation and Management of Low-Activity Radioactive Wastes (2003-2007)  
Member, National Toxicology Program Report on Carcinogens Committee (2002-2005)  
Board of Directors, Environmental Law Institute (2003-2009)  
Adjunct Faculty, Harvard Center for Risk Analysis (2002-2005)  
Adjunct Faculty, George Mason University Law School (2004)  
Guest lecturer, Yale Law School and Yale School of Public Health  
Society for Risk Analysis  
Fellow  
Distinguished Service Award recipient (2004)  
Sigma Xi Lecturer (2001-2003)  
President (1998-1999)  
President-elect (1997-1998)  
Councilor (1994-1997)  
Chair, Public Policy Committee (1995-1997)  
Chair, Annual Meeting Program Committee (2004-2005)  
Board of Trustees, Toxicology Excellence for Risk Assessment (2002-present)  
Member, Society of Toxicology  
Technical Advisory Board, Dow Chemical Company (2000-2004)

**EMPLOYMENT**

- Principal, HealthRisk Strategies, Washington, DC; 1998-present
- Director for Risk Management, The Weinberg Group Inc., Washington, DC; 1997-1998
- Executive Director, Presidential/Congressional Commission on Risk Assessment and Risk Management, Washington, DC; 1994-1997
- Acting Director, Toxicology and Risk Assessment Program, Board on Environmental Studies and Toxicology, National Research Council/National Academy of Sciences, Washington, DC; 1994
- Senior Science Advisor and Project Director, Board on Environmental Studies and Toxicology, National Research Council/National Academy of Sciences, Washington, DC; 1992-1997
- Consultant in Toxicology and Human Health Risk Assessment, Arlington, VA; 1990-1994
- Vice President, Environmental Health and Toxicology, Meta Systems, Inc., Washington, DC; 1989-1990
- Manager, Toxicology, RCG/Hagler, Bailly, Inc., Washington, DC; 1988-1990
- Project Manager, ICF/Clement Associates, Fairfax, VA; 1986-1988
- Staff Officer, Board on Toxicology and Environmental Health Hazards, National Research Council/National

Academy of Sciences, Washington, DC; 1985

- Postdoctoral Fellow, Department of Applied Biological Sciences, Massachusetts Institute of Technology, Cambridge, MA; 1984-1985
- Scientist, Energy Resources Company, Cambridge, MA; 1977-1979

### **SUMMARY OF EXPERIENCE**

#### **Risk Management, Public Policy, and Risk Communication**

- Providing testimony to the US House of Representatives Science Committee on EPA's Integrated Risk Information System (IRIS).
- Providing testimony to the US Senate Environment and Public Works Committee on the public health impact of regulating perchlorate as a drinking water contaminant.
- Providing comments to federal and state regulatory agencies on proposed contaminant regulations.
- Acting as a spokesperson on behalf of a trade association when the safety of its members' products was challenged in the media and by advocacy organizations.
- Developing science policy and risk communication strategies to help companies and trade associations respond to or preempt regulatory, advocacy, and media challenges.
- Providing testimony to state legislatures and advisory committees on the impact of power plant mercury emissions on public health in support of EPA rulemaking.
- Providing testimony to EPA's Science Advisory Board on the children's health aspects of EPA's proposed cancer risk assessment guidelines.
- Helping a large apparel manufacturer anticipate and prepare for proposed state, federal, and international product safety regulatory initiatives.
- Helping a large personal care product manufacturer develop a risk communication strategy for its products' preservatives and fragrances.
- Providing testimony to EPA's science advisory board on the revised draft risk assessment of dioxins on behalf of a trade association.
- Providing testimony on EPA's advance notice of proposed rulemaking for formaldehyde on behalf of a trade association.
- Providing comments on the US Food & Drug Administration's Draft Report of Quantitative Risk and Benefit Assessment of Commercial Fish Consumption on behalf of a trade association.
- Providing testimony to EPA's Science Advisory Board on the complementary roles of science and public involvement in science policy decision-making.
- Advising EPA's Children's Health Protection Advisory Committee on the use of human data for research and regulation.

- Conducting a meta analysis of studies on the effects of age on chemically induced carcinogenesis in rodents and evaluating its implications for regulatory strategies directed towards protecting children's health.
- Providing comments to EPA on its proposed Clean Air Act implementation policies on behalf of a trade association.
- Providing testimony to EPA's Office of Research and Development on its proposed revised cancer risk assessment guidelines, on behalf of a trade association.
- Providing testimony to the National Toxicology Program on its chemical listing process, on behalf of a trade association.
- Developing recommendations advocating the role of credible science in stakeholder-based risk management decision-making processes, on behalf of the American Industrial Health Council and the American Chemistry Council.
- Responding to environmental justice concerns on behalf of a client seeking a large corporate merger impacting several urban communities.
- Helping a consortium of agrochemical manufacturers held responsible for a Superfund site cleanup modify EPA's toxicity standard for the substance on which the site risk was based, leading to a far less expensive remedial alternative than originally proposed by regulators.
- Developing the basis for an environmental health risk management decision-making framework that has been recommended as the first systematic, comprehensive strategy for addressing the nation's environmental health risks.
- Providing testimony on behalf of the Risk Commission to Congress on the environmental statutes under debate, making recommendations that were incorporated into regulatory reform legislation, the Safe Drinking Water Act, the proposed amendments to the Comprehensive Environmental Response, Compensation, and Liability Act (Superfund), and the Food Quality Protection Act.
- Identifying and collaborating with a diverse spectrum of stakeholders involved in addressing environmental health risk management issues to develop the findings and recommendations of the Risk Commission.

#### Project Management

- At the National Research Council/National Academy of Sciences, managing a program that included coordinating the activities of staff and a number of academy committees investigating risk-related policy issues.
- For three science consulting firms, being responsible for marketing and managing environmental health and strategic risk assessment consulting programs and projects.
- As a member of the U.S. Army's science advisory board, chairing numerous committees and being responsible for managing the conduct of critical evaluations of the Army's environmental and toxicological practices.

#### International

- Addressing the French Parliament on the subject of a risk-based regulatory framework as part of that

government's effort to establish a new environmental protection agency in France.

- Organizing and participating in symposia aimed at strengthening risk-based regulatory agendas in Europe and South America.
- Developed recommendations on risk-based decision-making and the role of the precautionary principle for the European Commission, on behalf of the American Chamber of Commerce.
- Assessing the primary risks to human health from environmental and occupational exposures to hazardous substances in Romania, including evaluating the institutional and regulatory issues related to characterizing and remediating hazardous exposures and developed a national environmental health strategy.
- Assessing risks to health and the environment associated with emissions from an antiquated copper smelter in Transylvania.
- Introducing Moldova to health risk assessment and modern epidemiology, serving as the impetus for the risk-based environmental health management programs now underway there.

#### Risk Assessment

- Peer-reviewing EPA's proposed Framework for Cumulative Risk Assessment.
- Reviewing and commenting on EPA's proposed methods for assessing the contribution of childhood carcinogen exposures to lifetime excess cancer risk.
- Chairing the peer review of EPA's proposed risk assessment methodology for complex mixtures.
- Provided comments to EPA during the development of a cumulative risk assessment of organophosphate pesticides.
- Co-authored a paper on risks from organophosphate pesticides as estimated from biomarkers or from different risk models.
- Working with the US Congress to promote science- and weight of evidence-based risk assessment in federal regulatory programs.
- Participating on an expert committee evaluating the public health impact of styrene.
- Developing threshold-based regulatory standards for a group of tumor promoters using EPA's new proposed cancer risk assessment guidelines, which will serve as the basis for updating the agency's standards as reported on the Integrated Risk Information System.
- Developing cancer dose-response models to estimate human risks from environmental contaminants, with particular emphasis on biologic mechanisms of action.
- Providing qualitative and quantitative assessments of the potential human health hazards associated with exposure to a wide variety environmental contaminants and developing medium- and contaminant-specific regulatory criteria.
- Performing and evaluating site-specific risk assessments for a number of industrial and Superfund sites.

Toxicology

- Providing scientific and technical support for cases of liability and toxic tort.
- Authoring numerous toxicity profiles of environmental contaminants.
- Conducting laboratory research, publishing, lecturing, and consulting in areas related to the experimental and applied aspects of environmental toxicology.

National Research Council/National Academy of Sciences

- Managing and participating in the activities of a number of NRC committees, contributing to the following publications:

*Report of the Committee on Toxicity Testing and Assessment of Environmental Agents (in progress)*

*Report of the Committee on Low-Activity Radioactive Waste Disposal (in progress)*

*Carcinogens and Anticarcinogens in the Human Diet* (1996)

*Nitrate and Nitrite in Drinking Water* (1995)

*Science and Judgment in Risk Assessment* (1994)

*Veterans and Agent Orange, Health Effects of Herbicides Used in Vietnam* (1994)

*Pesticides in the Diets of Infants and Children* (1993)

*Issues in Risk Assessment* (1993)

*Complex Mixtures* (1988)

*Drinking Water and Health Volume 6* (1987)

- Served on two committees (2003-2007)

*Toxicity Testing of Environmental Agents*

*Improving Practices for Regulating and Managing Low-Activity Radioactive Waste*

PUBLICATIONS

Charnley, G. and Archer, M.C. (1977) "Deuterium Isotope Effect in the Activation of Nitrosomorpholine into a Bacterial Mutagen." Mutat. Res. 46:265-268.

Kraft, P.L., Skipper, P.L., Charnley, G. and Tannenbaum, S.R. (1981) "Urinary Excretion of Dimethylnitrosamine: a Quantitative Relationship Between Dose and Urinary Excretion." Carcinogenesis 2:609-612.

Charnley, G. and Tannenbaum, S.R. (1982) "Gastric Cancer: An Etiologic Model." In P.N. Magee, ed. "Nitrosamines and Human Cancer." Banbury Report 12. Cold Spring Harbor Laboratory, Cold Spring Harbor, New York.

Charnley, G. and Tannenbaum, S.R. (1984) "A Flow Cytometric Analysis of the Enhancing Effect of Sodium Chloride on MNNG-Induced Gastric Cancer in the Rat." Proc. Am. Cancer Res. 25:81.

Charnley, G., Adams, K., Roth, D., and Newberne, P.M. (1985) "Risk Factors in Gastric Cancer: Early Markers." Presented at the Annual Meeting of the Society of Toxicology. The Toxicologist 5:40.

Busby, W.F., Shuker, D.E.G., Charnley, G., Newberne, P.M., Tannenbaum, S.R., and Wogan, G.N. (1985) "Carcinogenicity of the Nitrosated Bile Acid Conjugates, N-nitrosoglycocholic Acid and N-nitrosotaurocholic Acid." Cancer Res. 45:5608-5616.

Newberne, P.M., Charnley, G., Adams, K., Cantor, M., Roth, D., and Supharkarn, V. (1986) "Gastric and Oesophageal Carcinogenesis: Models for the Identification of Risk and Protective Factors." Food Chem. Toxicol. 24:1111-1119.

Thorslund, T.W. and Charnley, G. (1986) "Development of a Dose-Response Model for the Joint Carcinogenic Effect of Exposure to Multiple Polycyclic Aromatic Hydrocarbons." In: Proceedings of the 1986 Washington Conference on Risk Assessment. Sponsored by CEEM and Inside EPA Weekly Report, Arlington, Virginia.

Thorslund, T.W., Brown, C.C., and Charnley, G. (1987) "Biologically Motivated Cancer Risk Models." Risk Analysis 7:109-119.

Charnley, G. And Thorslund, T.W. (1988) "Biologically-Motivated Models to Predict Cancer Risk." In: Travis, C. ed. Carcinogen Risk Assessment. Plenum Press, New York.

Newberne, P.M., Charnley, G., Adams, K., Cantor, M., Suphakarn, V., Roth, D., and Schragar, T.F. (1987) "Gastric Carcinogenesis: A Model for the Identification of Risk Factors." Cancer Lett. 38:149-63.

Thorslund, T.W. and Charnley, G. (1988) "Quantitative Dose-Response Models for Tumor Promoting Agents." In: Carcinogen Risk Assessment: New Directions in the Qualitative and Quantitative Aspects. Banbury Report 31. Cold Spring Harbor Laboratory.

Charnley, G. And Wilson, J.D. (1991) "Evaluation of the Form of the Cell Growth Rate Function of the Two-Stage Model for Carcinogenesis." In: B.E. Butterworth, T.J. Slaga, W. Farland, and M. McClain, eds. Chemically Induced Cell Proliferation. Implications for Risk Assessment. Prog. Clin. Biol. Res. Vol. 369. John Wiley & Sons, Inc.: New York.

Charnley, G. (1993) "Cancer Dose-Response Modeling and Methylene Chloride," In: C. Zervos, ed. Oncogene and Transgenics Correlates of Cancer Risk Assessments. Plenum Press, New York.

Charnley, G. (1993) Glossary of Human Health Risk Assessment Terminology. Prepared for the Office of Health and Environmental Assessment, U.S. Environmental Protection Agency. Washington, D.C.

Charnley, G. (1993) Issues in Environmental and Occupational Health in Romania. Prepared for the U. S. Agency for International Development Mission in Bucharest, Romania.

Charnley, G. (1993) Copper Smelting in Zlatna, Romania: Human Health Risk Assessment. Prepared for the Environment Division of the Europe Bureau, U.S. Agency for International Development. Washington, D.C.

Charnley, G. (1994) Human Health Risks Associated with Energy Production-Related Activities and Innovative Technology Implementation in USAID-Assisted Countries. Prepared for the Office of Energy and Infrastructure, U.S. Agency for International Development. Washington, D.C.

Charnley, G. and Omenn, G.S. 1997. Introduction: With a summary of the findings and recommendations of the commission on risk assessment and risk management. Human and Ecological Risk Assessment (Special Issue) 3:701-711.

Charnley, G. 1998-2004 (annual updates). Health risk assessment. In Conrad J.W., Jr. (ed.). The Environmental Science Deskbook. New York: Shepards/McGraw Hill.

Charnley, G. and Goldstein, B.D. 1998. A public health context for residual risk assessment and risk management under the Clean Air Act. Environmental Health Perspectives 106:519-521.

- Elliott, E.D. and Charnley, G. 1998. Toward bigger bubbles: From Environmental Protection Agency to Environmental Accounting Agency; Why inter-pollutant and inter-risk trading are a good idea and how we get there from here. *The Forum for Applied Research and Public Policy*. Winter. Pp. 48-54
- Charnley, G. 1999. The evolution of environmental health risk management: A U.S. perspective. *Journal of Risk Research* 2:3-10
- Charnley, G. 1999. Risk tradeoffs and public health protection. *Proceedings of the First China-Japan Conference on Risk*. Beijing, China
- Charnley, G. and Elliott, E.D. 2000. Risk versus precaution: A false dichotomy. *Proceedings of the annual meeting of the European Section of the Society for Risk Analysis*. Edinburgh, Scotland. A.A. Balkema, publisher
- Charnley, G., Graham, J.D., Kennedy, R.F. Jr., and Shogren, J. 2000. Assessing and managing risks in a democratic society. *Risk Analysis* 20:301-315
- Charnley, G. 2000. Enhancing the role of science in stakeholder-based risk-management decision-making processes. Report prepared for the American Industrial Health Council and the American Chemistry Council.
- Charnley, G. and Putzrath, R.M. 2001. Children's health, susceptibility, and regulatory approaches to reducing risks from chemical carcinogens. *Environmental Health Perspectives* 109:187-192
- Charnley, G. 2001. *Protecting the Children: Risk Assessment, Risk Management, and Children's Environmental Health*. Policy study #283. Reason Public Policy Institute. Los Angeles, CA.
- Charnley, G. 2002. Contributor to Breslow, L., (ed.) Encyclopedia of Public Health. Macmillan Reference USA. New York, NY
- Scheuplein, R., Charnley, G., and Dourson, M. 2002. Differential sensitivity of children and adults to chemical toxicity. I. Biological basis. *Regulatory Toxicology and Pharmacology* 35:429-447
- Dourson, M., Charnley, G., and Scheuplein, R. 2002. Differential sensitivity of children and adults to chemical toxicity. II. Risk and Regulation. *Regulatory Toxicology and Pharmacology* 35:448-467
- Charnley, G. and Elliott, E.D. 2002. The Democratization of Risk Analysis. In Paustenbach, D.J. (ed.) Health Risk Assessment. John Wiley & Sons
- Charnley, G. and Elliott, E.D. 2002. Risk versus Precaution: Environmental Law and Public Health Protection. *Environmental Law Reporter* 32:10363-10366
- Charnley, G. Contributor to Oxford Dictionary of Environmental Science. Oxford University Press (in press)
- Cohen, J.T., Carlson, G., Charnley, G., et al. 2002. A comprehensive evaluation of the potential health risks associated with occupational and environmental exposure to styrene. *Journal of Toxicology and Environmental Health, Part B*, 5:1-263
- Charnley, G. and Patterson, J. 2003. Review of procedures for protecting human subjects in recent clinical studies of pesticides. *Regulatory Toxicology and Pharmacology* 38:210-223
- Charnley, G. and Patterson, J. 2003. Use of human subjects data for regulating chemical exposures. *Environmental Law Reporter* 33:10923-10929



Charnley, G. and Doull, J. 2005. Human exposure to dioxins from food, 1999-2002. *Food and Chemical Toxicology* 43:671-679

Charnley, G. 2005. Is mercury from power plants poisoning our children? *The Environmental Forum*. May/June. Environmental Law Institute. Washington, DC

Charnley, G. 2006. Assessing and managing methylmercury risks associated with power plant mercury emissions in the US. *Medscape General Medicine* 8:64. <http://www.medscape.com/viewarticle/522270>

Charnley, G. and Kimbrough, R.D. 2006. Overview of exposure, toxicity, and risks to children from current levels of 2,3,7,8-tetrachlorodibenzo-p-dioxin and related compounds in the US. *Food and Chemical Toxicology* 44:601-615

Charnley G. 2006. Politics, perchlorate, and public health. *The Environmental Forum*, November/December. Environmental Law Institute. Washington, DC

Charnley G. 2008. Perchlorate: Overview of risks and regulation. *Food and Chemical Toxicology* 46:2307-2315

Aylward LL, Goodman JE, Charnley G, Rhomberg LR. 2008. A margin-of-exposure approach to assessment of noncancer risks of dioxins based on human exposure and response data. *Environmental Health Perspectives* 116:1344-1351

Elliott ED, Charnley G. 2009. Private Product Risk Assessment and the Role of Government. *John Liner Review* 23: 73-82

Charnley G, Rogers MD. 2011. Frameworks for Risk Assessment, Uncertainty, and Precaution. In: JB Wiener, MD Rogers, JK Hammitt, PH Sand, eds. The Reality of Precaution. Comparing Risk Regulation in the United States and Europe. RFF Press. Resources for the Future. Washington, DC

### **SELECTED PRESENTATIONS**

“Use of the Multistage Model to Predict the Carcinogenic Response Associated with Time-Dependent Exposure to Multiple Agents.” Presented at the ASA/EPA Conference on Current Assessment of Combined Toxicants, Washington, D.C. (1986)

“Use of the Two-Stage Case of the Multistage Model for Cancer Risk Assessment.” Presented at the Annual Meeting of the Society for Risk Analysis, Boston, MA. (1986)

“Innovative Use of Toxicological Data to Improve Cost-Effectiveness of Waste Cleanup.” Presented at Superfund ‘86: Management of Uncontrolled Hazardous Waste Sites, Washington, D.C. (1986)

“Application of a Biologically Motivated Model for Carcinogenesis: Comparative Potency Approach for Assessing the Cancer Risk of Complex Mixtures of Polycyclic Aromatic Hydrocarbons.” Presented at the EPA Workshop on the Use of Biomechanism-based Models of Carcinogenesis in Risk Assessment, Washington, D.C. (1986)

“Quantitative Model for the Tumor Promoting Activity of 2,3,7,8-TCDD.” Presented at the Seventh International Symposium on Chlorinated Dioxins and Related Compounds, Las Vegas, Nevada. (1987)

“Assessing Risks to Environmental Health.” Presented to the Parliament of Moldova. (1994)

“Generating Uncertain Risk Estimates.” Presented at the annual meeting of the Society for Toxicology. Honolulu,

HI. (1995)

“Improving Risk Assessment and Risk Management in Federal Regulatory Programs.” Presented at the annual meeting of the Society of Toxicology. Anaheim, CA. (1996)

“Building a Systematic, Comprehensive Framework for Environmental Risk Management.” Presented at the 124th annual meeting of the American Public Health Association. New York. (1996)

“Improving risk assessment and risk management in federal regulatory programs.” Presented at the Society of Toxicology annual meeting, Anaheim, CA. (1996)

“Comparative risk analysis in an environmental health risk management framework.” Presented at Risk in the Republic: Comparative Risk Analysis and Public Policy. Duke University, Durham, NC. (1996)

“Improving risk assessment and risk management.” Presented at the annual meeting of the European Society for Risk Analysis, Guildford, UK. (1996)

“Framework for risk management.” Presented at the annual meeting of the American Water Works Association, Boston, MA. (1996)

“Risk assessment, risk management, and public policy: A vision for the millennium.” Presented at the Society for Risk Analysis annual meeting, New Orleans, LA. (1996)

“Framework for risk management.” Presented at Regulatory Issues in Crop Production: Scientific Uncertainty and Regulation. Tufts University, Boston, MA. (1997)

“The future of risk assessment and risk management.” Presented at the annual meeting of the Risk Assessment and Policy Association, Alexandria, VA. (1997)

“The future of risk assessment and risk management.” Presented at symposium, The Role of Risk Assessment in Developing Reasonable Policy and Regulation. WM Symposia, Inc., Washington, DC. (1997)

“The future of risk assessment and risk management.” Presented at the Toxicology in Risk Assessment Symposium convened by the U.S. Army Chemical and Biological Defense Command. Bethesda, MD. (1997)

“Proposed standard processes for integrating risk assessment into risk management.” Presented at the National Governors’ Association conference on state and local risk-based decision-making. Omaha, NE. (1997)

“Integrating risk assessment and risk management.” Presented at the annual meeting of the European Society for Risk Analysis annual meeting. Stockholm, Sweden. (1997)

“The future of risk assessment and risk management.” Presented at the National Conference of State Legislatures’ Federation on State and Tribal Toxics Action meeting. Alexandria, VA. (1997)

“Risk commission’s recommendations and responses to tribal comments.” Presented at the National Congress of American Indians Nuclear Waste Program’s Tribal Risk Assessment Forum. Albuquerque, NM. (1997)

“Stakeholder involvement in the management of environmental health risks.” Presented at the E7 Seminar on Social Trust and Public Confidence, Paris, France. (1998)

“Implementation progress of the commission’s risk management framework.” Presented at the Second TRUSTNET Seminar on Facility Siting, Land Use, and Stakeholder Involvement, Paris, France. (1998)

“Risk assessment and risk management from a U.S. perspective.” Presented to the French Parliamentary Commission created to establish a new Agency for the Environment, Paris, France. Also presented to the U.K. Government Inter Departmental Liaison Group on Risk Assessment, London, United Kingdom. (1998)

“The anatomy of an industry at risk. Asbestos, tobacco...what’s next?” Presented at AIRMIC Conference on Innovation: Blueprint for the Future, The University of Nottingham, Nottinghamshire, United Kingdom. (1998)

“My risk is greater than your risk: The application of the concept of risk trade-offs in public health.” Presented at The European Policy Center Conference, London, United Kingdom. (1998)

“The role of science, politics, and policy in risk management.” Presented at the conference, The Application of Risk Assessment and Management in South America, Rio de Janeiro, Brazil. (1998)

“Risk tradeoffs and public health protection.” Presidential address to the annual meeting of the European Society for Risk Analysis, Paris, France. (1998)

“Managing Risks: Choices, Impacts, and Regulatory Decision-Making.” Presented at the Science and Policy in Risk Management Roundtable Conference organized by the EU Committee of the American Chamber of Commerce. (1999) Brussels, Belgium

“Implementing the Precautionary Principle: Chemical Risk Management.” Presented at the Harvard Center for Risk Analysis Precautionary Principle Workshop. Washington, D.C. (1999)

“Enhancing the role of science in stakeholder-based risk management decision-making.” Presented at the annual meeting of the European Section of the Society for Environmental Toxicology and Chemistry. Brighton, UK (2000)

“Assessing Risks to Children’s Health: Science and Precaution.” Presented at the World Chlorine Council Science and Research Forum. Porto, Portugal (2000)

“Risk Analysis: Past, Present, and Future.” Presented at the International Conference on Risk Analysis and Its Role in the European Union. Brussels, Belgium (2000)

“Children’s Health and Safety: Science *and* Precaution.” Presented at Women in Government’s Seventh Annual Midwestern Legislators Conference. Kohler, Wisconsin (2000)

“The Precautionary Principle in Europe: A Natural Science Perspective.” Presented at the Center for Technology Assessment. Stuttgart, Germany (2001)

“The Science and Policy of Children’s Environmental Health.” Presented at the Duke University Center for Environmental Solutions and at the annual meeting of the American Crop Protection Association (2001)

“Phthalates, Toys, and the Precautionary Principle.” Presented at the conference The US, the EU, and Precaution. Bruges, Belgium (2002)

“Democratic Science: The Role of Science and Values in Risk Management.” Presented at the French Ministry of Health and World Health Organization symposium Risks, Public Health Safety, and Decision-Making Processes. Paris, France (2002)

“The Science and Policy of Children’s Environmental Health: Evaluating Differential Sensitivity and Regulating Chemical Risks.” Presented at the Yale Environment School. New Haven, Connecticut (2002)

“Communicating About Environmental Health Risks: Using Science to Shape Policy.” Presented at Argonne National Laboratory West. Idaho Falls, Idaho (2002)

“The Science and Policy of Children’s Environmental Health: Evaluating Differential Sensitivity and Regulating Chemical Risks.” Presented at the annual meeting of the Society of Toxicology. Salt Lake City, Utah (2003)

“Reducing Risks to Our Health and Environment: The Roles of Science and Precaution.” Presented to the Washington Philosophical Society. Washington, DC (2003)

“Enhancing the Role of Science in Stakeholder-Based Risk Management Decision-Making.” Presented at the 9<sup>th</sup> Annual FDA Science Forum. Washington, DC (2003)

“Children’s Health and Environmental Exposures in Europe: Implications for Risk Management Policy and Research.” Presented at the annual meeting of the Society for Risk Analysis (2004)

“Human Exposure to Dioxins from Food, 1999-2002.” Presented to the National Academy of Sciences’ Dioxin Committee. Washington, DC (2005)

“Mercury, Myths, and the Media.” Presented to the Western Environmental Trade Association. Butte, Montana (2005)

“Mercury, Power Plants, and Public Health in Montana.” Presented to the Montana Department of Environmental Quality. Helena, Montana (2005)

“Mercury, Power Plants, and Public Health.” Presented to the New England Chapter of the Society for Risk Analysis. Cambridge, MA (2006)

“The Toxicology-Legal Interface: Evolution of Risk-Based Regulation.” Presented at the Integrated Toxicology and Environmental Health Program symposium on The Toxicology-Legal Interface: Use of Toxicological Science in Regulation and Litigation. Duke University School of Law. Durham, NC (2008)

“The Future of Toxicity Testing and Risk Assessment.” Presented at Yale Law School. New Haven, CT (2008)

“Challenges in International Implementation of Risk Assessment and Testing Guidelines.” Presented at the symposium International Implications of the U.S. National Research Council Report on Toxicity Testing in the 21<sup>st</sup> Century: Challenges and Opportunities in Implementation. University of Ottawa, Ottawa, Canada (2009)

“New Science/New Paradigms: The Future of Chemical Risk Assessment.” Presented at the Environmental Law Institute’s 40th Anniversary Symposium: An Agenda for the New EPA. Washington, DC (2009)

“Assessing and Managing Risk: First Things First.” Presented at the symposium: New Ideas for Risk Regulation. Resources for the Future. Washington, DC (2009)

“Risk, Science, and Policy in Chemical Regulation.” Presented at Yale Law School. New Haven, CT (2010)

“Implementing the National Academy of Sciences Report Toxicity Testing in the 21<sup>st</sup> Century: Implications for Risk Assessment.” Presented to the Upstate New York Chapter of the Society for Risk Analysis. Syracuse, NY (2010)

“Legal Acceptance of Non-Apical Data.” Presented at RISK21: Realizing the Future of Risk Assessment Workshop. Washington, DC (2011)

“Toxicity Testing in the 21<sup>st</sup> Century: Implementing the National Academy of Sciences Report.” Presented to the

US Army Public Health Command, Directorate of Toxicology. Edgewood Arsenal, MD (2011)

“Risk versus Reality: Exposure Assessment in Policy Development.” Presented at the Yale University School of Public Health. New Haven, CT (2008, 2009, 2010, 2011, 2013)

“Regulating Chemicals in the Post-Industrial Environment.” Presented to the Yale University Women’s Organization. New Haven, CT (2013)

“Science, Outrage, and Risk Governance.” Presented at the International Council on Amino Acid Science General Assembly. New York, NY (2014)