Assessing Causality from a Multidisciplinary Evidence Base for National Ambient Air Quality Standards

Committee

Armistead G. Russell

Co-Chair

Armistead G. Russell, Ph.D., is the Howard T. Tellepsen Chair and Regents' Professor of Civil and Environmental Engineering at Georgia Institute of Technology, where his research is aimed at better understanding the dynamics of air pollutants at urban and regional scales and assessing their impacts on health and the environment to develop approaches to design strategies to effectively improve air quality. Dr. Russell was a member of EPA's Clean Air Scientific Advisory Committee (CASAC) and a member of the National Research Council's Board on Environmental Studies and Toxicology, and he has served on multiple National Academies committees. He chaired the CASAC NOx-SOx, Secondary NAAQS review panel, the Ambient Air Monitoring Methods Subcommittee, and the Council on Clean Air Compliance Analysis' Air Quality Modeling Subcommittee, and was on the Health Effects Institute's Report Review Committee. He was an Associate Editor of the journal Environmental Science and Technology. He co-directed the Southeastern Center for Air Pollution and Epidemiology and co-directs the NSF Sustainability Research Network "Environmentally Sustainable, Healthy and Livable Cities" project. He earned a B.S. degree from Washington State University (1979), and M.S. (1980) and Ph.D. (1985) degrees from the California Institute of Technology, all in mechanical engineering.

Elizabeth A. Stuart

Co-Chair

Elizabeth A. Stuart, Ph.D., is Associate Dean for Education and Bloomberg Professor of American Health in the Department of Mental Health at the Johns Hopkins Bloomberg School of Public Health, with joint appointments in the Department of Biostatistics and the Department of Health Policy and Management. She received her Ph.D. in statistics in 2004 from Harvard University and is a fellow of the American Statistical Association (ASA). Dr. Stuart has extensive experience in methods for estimating causal effects and is particularly interested in the trade-offs in different study designs, particularly as applied to mental health, public policy, and education. Her primary research interests include designs for estimating causal effects in non-experimental settings (such as propensity scores), and methods to assess and enhance the generalizability of randomized trials to target populations. She has received research funding for her work from the National Science Foundation, the Institute of Education Sciences, the National Institutes of Health, and the WT Grant Foundation and has served on advisory panels for the National Academy of Sciences, the US Department of Education, and the Patient Centered Outcomes Research Institute. She serves on the board of the Society for Research on Educational Effectiveness. She has received the Gertrude Cox Award for applied statistics, Harvard University's Myrto Lefkopoulou Award for excellence in Biostatistics, and the inaugural Marshall Joffe epidemiologic methods award from the Society for Epidemiologic Research.

Jill S. Baron

Member

Jill S. Baron, Ph.D., is a Senior Scientist with the U.S. Geological Survey, specializing in ecosystem ecology. Her interests include applying ecosystem concepts to management of human-dominated regions, and understanding the biogeochemical and ecological effects of climate change and atmospheric deposition to mountain ecosystems. She is also a senior research ecologist at the Natural Resource Ecology Laboratory at Colorado State University. Since 2017, she has served on the project management board of the International Nitrogen Management System, a program implemented by UN Environment to gather and synthesize evidence that can support international policy development to improve global nitrogen management. Baron is founder and Co-Director of the John Wesley Powell Center for Earth System Science Analysis and Synthesis. She is also founder and Principal Investigator of the Loch Vale Watershed long-term monitoring and research program in Rocky Mountain National Park, which began in 1983 to understand the ecological and biogeochemical implications of atmospheric deposition and climate change. Baron was President of the Ecological Society of America in 2014 and is a Certified Senior Ecologist. She is a Fellow of the Ecological Society of America and the American Association for the Advancement of Sciences. Dr. Baron received her Ph.D. from Colorado State University in 1991, and has undergraduate and master's degrees from Cornell University and the University of Wisconsin.

Kiros T. Berhane

Member

Kiros T. Berhane, Ph.D. is the Cynthia and Robert Citron-Roslyn and Leslie Goldstein Professor and Chairman of the Department of Biostatistics at the Mailman School of Public Health, Columbia University. He received his BSc in Statistics from Addis Ababa University (Ethiopia, 1986), MS in Statistics from University of Guelph (Canada, 1991), PhD in Biostatistics from University of Toronto (Canada, 1994), and completed postdoctoral fellowship at Johns Hopkins University (USA). He is a widely published international expert on development of statistical methods for complex and correlated data structures, and their application into a wide range of public health topics with focus on environmental health. Prior to joining Columbia in January 2020, Dr. Berhane was Professor and Director of Graduate Programs in Biostatistics and Epidemiology at the University of Southern California. He served on several national and international advisory and review panels, including Committee to Review Health Effects in Vietnam Veterans of exposure to herbicides (fourth and fifth biennial updates) of the Institute of Medicine (US National Academies) , the US-EPA Science Advisory Board, and science advisory panel of the Western Interprovincial Scientific Studies Association (WISSA - Calgary, Canada). He currently serves as a member of the Review Committee and the Global Health Oversight Committees of the Health Effects Institute (HEI) and as a Standing Member, Biostatistical Methods and Research Design (BMRD) study section for the National Institutes of Health. He was a Fulbright Scholar in 2016-2017 and he is an elected fellow of the American Statistical Association.

Edmund A. Crouch

Member

Edmund A. C. Crouch, Ph.D., is Senior Scientist and Vice President of Green Toxicology LLC, and a part-time Senior Risk Assessor at ARM Group Inc. He received his B.A. in Natural Sciences in 1972, and Ph.D. in High Energy Physics in 1975, both from the University of Cambridge, England. He specializes in all aspects of exposure assessment and risk assessment, but particularly the analysis of experimental and observational data and the application of such analyses to those fields. His original research, publications, and consultant work includes quantitative evaluation of uncertainties in rodent cancer bioassays and in interspecies extrapolations of carcinogenicity; meta-analysis of cancer bioassay results, epidemiological observations, experimental bacterial growth rate data, human dose-response data on sulfur dioxide, and observable effects of ethanol in humans; and construction and application of Monte Carlo analyses in exposure and risk assessments. He received the Outstanding Practitioner award of the Society for Risk Analysis in 2013, has served on twelve NAS committees, and was designated a National Associate of the National Research Council in 2008.

Ivan Diaz

Member

Iván Díaz is an Associate Professor of Biostatistics at NYU Langone Health. He obtained his Ph.D. in Biostatistics from UC Berkeley and was a postdoctoral fellow at Department of Biostatistics in The Johns Hopkins Bloomberg School of Public Health, and previously held a faculty position at Weill Cornell Medicine. Dr. Díaz has extensive expertise in research focusing on causal inference from observational and randomized studies, ranging from definitions of causal effects to the study of optimal statistical methods. He works at the intersection of causal inference, machine learning, and mathematical statistics to develop methods that provide relevant answers to substantive questions using state-of-the-art data analysis techniques. He serves as Associate Editor for the Journal of Causal Inference.

Francesca Dominici

Member

Francesca Dominici, Ph.D., is the Director of the Harvard Data Science Initiative, at the Harvard University and the Clarence James Gamble Professor of Biostatistics, Population and Data Science at the Harvard T.H. Chan School of Public Health. She leads an interdisciplinary groups of scientists with the ultimate goal of addressing important questions in environmental health science, climate change, and health policy. Dr. Dominici has provided the scientific community and policy makers with robust evidence on the adverse health effects of air pollution, noise pollution, and climate change. Her studies have directly and routinely impacted air quality policy. She has published more than 220 peer-reviewed publications and was recognized in Thomson Reuter’s 2019 list of the most highly cited researchers–ranking in the top 1% of cited scientists in her field. Her work has been covered by the New York Times, Los Angeles Times, BBC, the Guardian, CNN, and NPR. In April 2020 she has been awarded the Karl E. Peace Award for Outstanding Statistical Contributions for the Betterment of Society by the American Statistical Association. Dr. Dominici is an advocate for the career advancement of women faculty. Her work on the Johns Hopkins University Committee on the Status of Women earned her the campus Diversity Recognition Award in 2009. At the T.H. Chan School of Public Health, she has led the Committee for the Advancement of Women Faculty. She is an elected member of the National Academy of Medicine and of the International Society of Mathematical Statistics.

Charles T. Driscoll, Jr.

Member

Charles T. Driscoll, Ph.D., He is currently Distinguished and University Professor of Civil and Environmental Engineering at Syracuse University. Driscoll's scholarly work addresses the effects of disturbance on forest, freshwater and marine ecosystems, including air pollution (acid and mercury deposition), land-use, and climate change. Driscoll has served on a number of National Academy committees, including most recently the Committee on Independent Review of Everglades Restoration Progress. He received his B.S. in Civil Engineering from the University of Maine and M.S. and Ph.D. in Environmental Engineering from Cornell University. He is a member of the National Academy of Engineering.

Joel Kaufman

Member

Joel Kaufman, M.D., M.P.H., is a physician-epidemiologist, board-certified in internal medicine and occupational medicine. He has been a full-time faculty member at the UW since 1997, currently holding appointments in the Departments of Environmental & Occupational Health Sciences, and Medicine (General Internal Medicine), and Epidemiology. His current research activities are primarily focused on environmental factors in cardiovascular and respiratory disease. He is the principal investigator of a major epidemiological prospective cohort study of air pollution and cardiovascular disease (The Multi-Ethnic Study of Atherosclerosis and Air Pollution, or "MESA Air"). He served as the principal investigator of an NIH-funded Specialized Center for Research at the University of Washington on Cardiovascular Disease and Traffic-Related Air Pollution. He directs the UW Northlake Controlled Exposure Facility, a facility customized for experimental inhalation toxicology studies on health effects of combustion products including diesel exhaust. Dr. Kaufman's research integrates the disciplines of epidemiology, exposure sciences, toxicology, and clinical medicine. From 2016 to 2018 he was the interim dean of the University of Washington School of Public Health.

Jana B. Milford

Member

Jana B. Milford, Ph.D., is Professor in the Department of Mechanical Engineering and the Environmental Engineering Program at the University of Colorado at Boulder. Her research addresses technical, legal, and policy aspects of air pollution, including the role of scientific information in air quality management. Her technical expertise includes atmospheric chemistry and transport modeling, exposure assessment, and receptor modeling. She currently serves on the Colorado Air Quality Control Commission and the Research Review Committee for the Health Effects Institute. She has previously served on the Board on Environmental Studies and Toxicology of the National Academies of Sciences, Engineering and Medicine; National Academies Committees on Science for EPA's Future and Air Quality Management in the United States; National Academy of Engineering and Chinese Academies joint committees on Energy Futures and Urban Air Pollution, and Cooperation on Electricity from Renewable Resources; and the Science Advisory Board of the U.S. Environmental Protection Agency. She holds a B.S. in Engineering Science from Iowa State University, a M.S. in Civil Engineering from Carnegie Mellon University, a Ph.D. in Engineering and Public Policy from Carnegie Mellon University, and a J.D. from the University of Colorado School of Law.

Richard L. Poirot

Member

Richard L. Poirot is an independent consultant who recently retired as the Air Quality Planning Chief with the Vermont Department of Environmental Conservation, where he worked since 1978. During his 37 years in VT state government, Mr. Poirot's responsibilities included developing and implementing State Implementation Plans to ensure attainment and maintenance of federal and state air quality standards for ozone, particulate matter, and regional haze. He developed interests and expertise in drawing inference on the nature of pollution sources from analysis of ambient air quality and meteorological measurement data. Mr. Poirot has been an active participant on the Acid Deposition Committee and the Ambient Monitoring and Assessment Committee for the Northeast States for Coordinated Air Use Management (NESCAUM); the U.S. Environmental Protection Agency (EPA) Acid Rain Advisory Committee; the Data Analysis Workgroup for the Ozone Transport Assessment Group (OTAG); the Science and Technical Support Workgroup for the Federal Advisory Committee on Ozone, Particulate Matter and Regional Haze (OPRHA); the Monitoring and Data Analysis Workgroup for the Mid Atlantic/Northeast Visibility Union (MANE-VU), the Steering Committees for the Interagency Monitoring of Protected Visual Environments (IMPROVE); the Subcommittee on Scientific Cooperation for the U.S./Canada Air Quality Agreement; the EPA Clean Air Scientific Advisory Committee (CASAC), the CASAC Ambient Air Monitoring and Methods Subcommittee, the CASAC Panels for Particulate Matter, Ozone, Lead, and Secondary SOx and NOx National Ambient Air Quality Standards Review; the NARSTO External Review Panel; the U.S. EPA Advisory Council on Clean Air Compliance Analysis; the EPA Science Advisory Board; and the Board on Environmental Studies and Toxicology (BEST) for the National Research Council.

Richard L. Smith

Member

Richard L. Smith, Ph.D., is the Mark L. Reed III Distinguished Professor of statistics, and holds a joint position as professor of biostatistics. He obtained his doctoral degree from Cornell University in 1979 and has previously held academic positions at Imperial College (London), the University of Surrey (Guildford, England) and Cambridge University. His principal areas of research are spatial statistics, time series analysis, extreme value theory and Bayesian statistics. Specific areas of expertise include spatial and time series modeling of environmental pollutants, the health effects of atmospheric pollution, the statistics of global climate change, and extreme values in insurance and finance. Dr. Smith is a fellow of the American Statistical Association and the Institute of Mathematical Statistics, an elected member of the International Statistical Institute, and has won the Guy Medal in Silver of the Royal Statistical Society and the Distinguished Achievement Medal of the Section on Statistics and the Environment, American Statistical Association. In 2004 he was the J. Stuart Hunter Lecturer of The International Environmetrics Society (TIES). He also is a chartered statistician of the Royal Statistical Society.

Justin G. Teeguarden

Member

Justin G. Teeguarden, Ph.D., is Director the Chemical Biology and Exposure Science Team and Chief Exposure Scientist for the Pacific Northwest National Laboratory. He holds a joint faculty position with the Oregon State University (OSU) Department of Environmental and Molecular Toxicology, where he served as the director of the OSU–PNNL–Superfund Center Research Translation Core. Dr. Teeguarden also leads the Decoding the Molecular Universe Directorate Objective for the Earth and Biological Sciences Directorate of PNNL in addition to leading Defense Health Programs. Recently, he helped build PNNL’s growing computational metabolomics program which has developed methods for identifying small organic molecules with computational derived libraries instead of libraries derived from authentic chemical standards. Dr. Teeguarden has more than 20 years of experience in computational and experimental exposure assessment in humans, animals, and cell culture systems. His particular focus has been the utilization of emerging technologies, novel experimental data, and computational methods for addressing public health challenges related to human exposure to chemicals. His experience includes developing pharmacokinetics models for volatile and non-volatile organics, trace metals, nanomaterials (particles) and receptor binding endocrine active compounds. These models were developed as tools for understanding the relationship between external exposure and internal exposures for purposes of comparing human exposure to those in toxicity test systems (such as, rodents and cell culture systems). Dr. Teeguarden served on the National Academies Committee on incorporating 21st Century Science in Risk-Based Evaluations; Committee on Human and Environmental Exposure Science in the 21st Century; and Committee for Review of the Federal Strategy to Address Environmental, Health, and Safety Research Needs for Engineered Nanoscale Materials. He currently serves on the U.S. EPA’s Board of Scientific Counselors. Dr. Teeguarden received a PhD in toxicology from the University of Wisconsin, Madison and is board certified in Toxicology.

Sammantha L. Magsino

Staff Officer