NATIONAL ACADEMIES Sciences Engineering Medicine

Workshops to Support EPA's Development of Human Health Assessments: Triangulation of Evidence in Environmental Epidemiology

May 9th and 11th, 2022

Participant Biosketches

Session I. Triangulation: Background, Methodologies, and Applications

Deborah A. Lawlor is a Professor of Epidemiology and Deputy Director of the UK Medical Research Council Integrative Epidemiology Unit (IEU) at the University of Bristol. She has a background in clinical and public health medicine and her research is concerned with the causes and consequences of adverse reproductive, perinatal and cardiometabolic health. With colleagues in the IEU and external collaborators she has been proposing criteria and developing methods for triangulation of evidence to improve causal inference in epidemiology.

Neil Pearce, Professor of Epidemiology and Biostatistics, London School of Hygiene and Tropical Medicine

I joined the LSHTM at the beginning of 2011, after working in New Zealand for the last 30 years. I originally trained in biostatistics, before moving over to do a PhD in epidemiological methods. Since the completion of my PhD in epidemiology in 1985 I have been engaged in a wide range of public health research activities. My current research interests focus on epidemiological and biostatistical methods, and their application to studies of non-communicable diseases (NCDs), including occupational and environmental health, asthma, kidney disease and neurological disease. I have a particular interest in global epidemiological studies. I am a Fellow of the Royal Society of New Zealand (FRSNZ) and the Academy of Medical Sciences (FMedSCi) and Past-President of the International Epidemiological Association (IEA).

Kyle Steenland, Professor, Emory University Rollins School of Public Health

I am an environmental occupational epidemiologist who worked at NIOSH/CDC from 1982-2002, and have since by at the Rollins School of Public Health at Emory University. At Emory I have worked on diverse projects, including PFOA, occupational lead, and household air pollution. I recently worked with a group of colleagues on a

review of risk of bias tools published in EHP in 2020, and have been part of a group working on a new risk of bias tool called ROBINS-E which is in development.

Eric J Tchetgen Tchetgen is the Luddy Family President's Distinguished Professor and Professor of Statistics and Data Science at the Wharton School of the University of Pennsylvania. Professor Tchetgen Tchetgen research focuses on causal inference, missing data and semiparametric theory with applications in HIV and other Infectious Disease, Genetic, Social and Environmental Epidemiology.

Session II. Health Authority Perspectives on Synthesis of Epidemiologic Evidence

Joseph Haney has served as a regulatory toxicologist and risk assessor at the Texas Commission on Environmental Quality, or TCEQ, for over 24 years. He has interest in multiple areas, including the hazard identification, dose-response assessment, mode of action, inhalation dosimetry, toxicokinetic/toxicodynamic differences, and low-dose extrapolation issues. Joseph has conducted dose-response analyses for numerous chemicals (e.g., benzene, methylene chloride, formaldehyde, 1,4-dichlorobenzene, trimethylbenzenes, hexavalent chromium, cadmium, cobalt, nickel) and derived associated toxicity factors (e.g., unit risk factors, reference concentrations and doses). He has published several chemical dose-response assessments and related papers. Regarding exposure to drinking water contaminants and associated health hazard, Joseph has also published a paper on historical drinking water contamination at Camp Lejeune, NC. Mr. Haney was born on Camp Lejeune and raised in Houston, TX, where he received his B.S. in Biology (summa cum laude) from the University of Houston and his M.S. in Environmental Science with Emphasis in Toxicology from the University of Texas School of Public Health. He is a member of SOT and SOT's Risk Assessment Specialty Section, as well as the Society for Risk Analysis (SRA).

Ruth Lunn has been the head of the Report on Carcinogens (RoC) Group since 2008. The RoC is a U.S. congressionally mandated, science-based public health document that identifies and discusses cancer hazards. During her 20-plus-year tenure at the National Institute of Environmental Health Sciences (NIEHS), Lunn has led or contributed to numerous publications, including over 50 cancer hazard evaluations, developed systematic review methods (RoC handbook) and tools, and modified the RoC review process. She has served on national or international groups/panels that evaluated programs, advised priorities, developed systematic review methods, conducted cancer hazard evaluations (such as the International Agency for Cancer Research), and organized webinars or meeting symposiums. Lunn's research interests include advancing cancer hazard evaluation approaches to meet contemporary problems and increasing the public health impact of the RoC. She is also interested in

raising the visibility of environmental health disparities and environmental justice issues at NIEHS. Lunn has a DrPH in environmental health sciences from Columbia University and a MS from Drexel University.

Jonathan Samet, a pulmonary physician and epidemiologist, is Dean of the Colorado School of Public Health. Previously, he has held leadership positions at the University of New Mexico School of Medicine, the Johns Hopkins Bloomberg School of Public Health, and the University of Southern California Keck School of Medicine. His research has focused on the health risks of inhaled pollutants in outdoor air and also indoor pollutants including secondhand smoke and radon. He has also investigated the occurrence and causes of cancer and respiratory diseases, emphasizing the risks of active and passive smoking. He has served on and chaired numerous committees of the National Research Council and National Academy of Medicine, including chairing the Board on Environmental Studies and Toxicology. For several decades, he has been involved in global health, focusing on tobacco control, air pollution, and chronic disease prevention. He has been the chair of the Clean Air Scientific Advisory Committee of the EPA and the FDA's Tobacco Products Scientific Advisory Committee. Dr. Samet has served as Editor and Author for Reports of the Surgeon General on Smoking and Health since 1984, receiving the Surgeon General's Medallion in 1990 and 2006 for these contributions. Dr. Samet received the 2004 Prince Mahidol Award for Global Health awarded by the King of Thailand, the Edward Livingston Trudeau Medal from the American Thoracic Society/American Lung Association, the Luther Terry Award for Distinguished Career from the American Cancer Society, and the Fries Prize for Health. He received the Alumni Award of Merit from the Harvard School of Public Health in 2001 and was named Distinguished Alumnus of the Year by the University of Rochester School of Medicine and Dentistry in 2006. He was elected to the National Academy of Medicine in 1997 and received the David Rall Medal in 2015.

Mary Schubauer-Berigan, PhD, MS, is Deputy Branch Head of the Evidence Synthesis and Classification Branch of the International Agency for Research on Cancer (IARC), where she heads the Monographs programme. She joined IARC in 2018 as the senior epidemiologist for the Monographs. She currently manages a scientific and technical staff of 16 in leading evaluations of the epidemiologic, experimental, and mechanistic evidence bases to identify the preventable causes of human cancer. At IARC, Mary has co-led the update of the guiding principles (Preamble) for the Monographs, bringing increased transparency and scientific advances to this programme, which is essential for cancer prevention worldwide. She has been Responsible Officer for monographs on night shift work, opium consumption, and occupational exposure as a firefighter. Before joining IARC, Mary worked for nearly 20 years as an epidemiologist at the National Institute for Occupational Safety and Health. There, she led multidisciplinary teams conducting epidemiology studies of the health effects of occupational exposures to beryllium, carbon nanotubes, nuclear

work, radon, cosmic radiation, and circadian disruption. Mary has co-authored over 125 publications on the above topics. She received a PhD in epidemiology from the Medical University of South Carolina and a MS in biology from the University of Minnesota.

Rebecca Nachman, PhD, MPH, is an epidemiologist in the Center for Public Health and Environmental Assessment (CPHEA) at the U.S. Environmental Protection Agency (EPA) where she reviews evidence regarding the human health effects of chemical exposures for EPA's Integrated Risk Information System (IRIS) Program. She received her PhD from the Johns Hopkins Bloomberg School of Public Health where she investigated the early life toxicokinetics of bisphenol A. Prior to joining EPA, she conducted research as a postdoctoral fellow on the effects of early life exposure to air pollution in the Boston Birth Cohort. More recently she has published on adapting systematic review methods to evaluate environmental epidemiology and exposure sciences literature.

Session III. Poster Presentations

Thomas Bateson is a senior epidemiologist with the U.S. EPA's Office of Research and Development in the Center for Public Health and Environmental Assessment in Washington, DC. He earned his Master of Public Health degree in epidemiology and biostatistics from the University of California at Berkeley and his Doctor of Science in epidemiologic methods from the Harvard School of Public Health.

Before joining the EPA in 2006, Dr. Bateson studied the causes of birth defects, children's health and development, the health of military personnel, and the effect of air pollution on the elderly using the case-crossover study design. At the EPA, he works together with statisticians and toxicologists from multiple disciplines to identify hazards and to quantify the associated risks. Dr. Bateson has contributed to the EPA Integrated Risk Information System (IRIS) assessments of environmental agents such as asbestos, formaldehyde, hexavalent chromium, manganese and PFAS (PFDA, PFHxS, PFNA). He has also contributed to the Office of Chemical Safety and Pollution Protection's Toxic Substances Control Act (TSCA) risk evaluations of chrysotile asbestos and carbon tetrachloride, as well as the Office of Water's evaluations of PFOS and PFOA.

My name is **Mireya Diaz**. I received my doctorate degree in Biostatistics from Case Western Reserve University. I am a Professor and Chief of Epidemiology and Biostatistics at Homer Stryker M.D. School of Medicine, Western Michigan University. I offer 19.5 years of statistical consulting and research experience. My research interests include the development, application, and evaluation of statistical methods

for correlated data and effectiveness research with large observational data. Among my contributions to health technology assessment and these methods are evaluating:

(1) The comparative effectiveness of robotic prostatectomy from the Vattikuti Urology Institute, one of the largest and pioneering centers of the technique;

(2) Through meta-analyses the evidence used in the guidelines developed by the American Urological Association related to the management of vesicoureteral reflux in children, cryptorchidism, and follow-up of the renal mass;

(3) The evidence about infiltrates incidence with extended wear lenses, later used by Vistakon for the FDA approval of their corresponding product;

(4) The bivariate random effects model for diagnostic accuracy; and

(5) The methodological state of the art regarding indirect treatment comparisons and network meta-analysis through the pertinent ISPOR Task Force.

Jamie Donatuto is a Community Environmental Health Analyst for the Swinomish Indian Tribal Community, located in the Pacific Northwest of the United States. A Swinomish staff member for the past 22 years, Dr. Donatuto specializes in working with Indigenous communities across North America in the development and implementation of projects that uphold the community's values and address the community's priorities, as well as distilling and communicating results for multiple audiences using mixed methods and structured decision-making analyses. In her research, she uses social science methods to improve natural resource management decision-making, such as: modifying human health risk assessments to reflect Indigenous values; analyzing toxics in local traditional foods and subsequent Indigenous health impacts; evaluating climate related impacts to Indigenous health and wellbeing; and, developing adaptive management strategies founded on Indigenous ways of knowing. Dr. Donatuto completed her doctoral studies at the University of British Columbia, Vancouver, Canada, in the interdisciplinary program with a focus on Indigenous community health and environmental studies.

My name is **Pengfei Guo**. I am a PhD candidate at Department of Environmental Health Sciences, Yale School of Public Health, working with Dr. Zeyan Liew. My research interests include environmental exposure and maternal and child health, chemical mixture, and causal inference. I want to work in the field of environmental and perinatal epidemiology. I am also a Chinese Podcaster for American Journal of Public Health.

Warren Kindzierski split time as an Associate Professor in the University of Alberta Faculty of Engineering and School of Public Health (1996–2018) and was formerly a science manager (Head, Chemical Risk Assessment) for Alberta Department

of Health (1993–1996). He has published/co-published over 65 papers and 44 reports and made over 70 presentations at national and international technical conferences in North America over the past 25 years. He supervised 58 graduate students, post doctorates and research associates during this time. He was formerly a member of the American Conference of Governmental Industrial Hygienists and American Industrial Hygiene Association and is a lifetime honorary member of the Canadian Institute of Public Health Inspectors. He has served or acted as an academic expert and/or advisor for public and private organizations across Canada on human health risk and environmental pollution issues.

Daniel Lauer is a Senior Associate Health Scientist I with Cardno ChemRisk. He earned his MPH in Environmental Health from the University of Minnesota School of Public Health. Mr. Lauer's primary areas of training include epidemiology, environmental health, biostatistics, and risk assessment. During his graduate studies, Mr. Lauer focused on infectious and chronic disease epidemiology. Mr. Lauer also received a BS in Biological Sciences, with minors in Chemistry and Psychology, from the University of Denver. Since joining the firm, Mr. Lauer has applied his epidemiologic training to rigorously investigate the association between biologic, chemical, and physical agents and health outcomes. Specific areas of interest include improving methods in occupational epidemiology, the epidemiology and non-clinical safety of Electronic Nicotine Delivery Systems (ENDS), and microbial risk assessments of food and consumer products.

Kenneth A. Mundt, a Senior Principal Health Scientist at Cardno ChemRisk now Stantec, is an epidemiologist with professional interest and experience in applying epidemiological concepts and methods to understand human health risks from environmental, occupational and consumer product exposures. He is a fellow of the American College of Epidemiology. He has designed, conducted and published numerous epidemiological studies, performed critical reviews and syntheses of the published literature, and is active in the development of methods for integrating evidence across lines of evidence including epidemiology, toxicology and exposure science. Dr. Mundt specializes in the practical application of scientific concepts, methods and evidence in evaluating disease causation, deriving health protective regulations, and for science-based evaluations for litigation and other decision-making purposes.

Martha Powers is an epidemiologist in the Center for Public Health and Environmental Assessment (CPHEA) at the US Environmental Protection Agency. Prior to joining the EPA, she was a postdoctoral fellow at Northeastern University. She has her PhD in Environmental Health Sciences from Johns Hopkins Bloomberg School of Public Health and she completed her Master of Public Health and Master of

Environmental Studies at the University of Pennsylvania.

Elizabeth Radke is an epidemiologist in the Integrated Risk Information (IRIS) program in the Office of Research and Development at the U.S. EPA. She is the lead epidemiologist for the IRIS assessments of several per and polyfluoroalkyl substances (PFAS) and has also contributed to IRIS work on phthalates, methyl mercury, hexavalent chromium, and vanadium, and EPA's Office of Water assessments of other PFAS (PFOA and PFOS). She is a co-chair of the IRIS systematic review workgroup, which developed the IRIS Handbook. Prior to joining EPA, Elizabeth received her PhD in Epidemiology from the University of Florida and her MPH from the University of Pittsburgh and worked as a communicable disease epidemiologist for the Florida Department of Health and the Arlington County health department.

Anthony Russell is a Senior Associate Health Scientist with Cardno Chemrisk. He earned a Master of Public Health (MPH) in Chronic Disease Epidemiology from Yale University and completed a Bachelor of Science in Chemical Engineering from the University of Cincinnati. His research and academic training focused on organic chemistry, engineering methods, risk assessment, exposure assessment, epidemiology, and statistical analysis. He served in the United States Peace Corps in Lesotho, Africa where he researched HIV mitigation and prevention as well as performed mathematics education. His thesis focused on food insecurity and its effect on chronic illnesses among refugees in Ghana. His research assisted local Non-Government Organizations identify culturally appropriate ways to deliver food baskets to refugee populations. He was contracted by the CDC Foundation to work with the Connecticut State Department of Public Health as a COVID-19 Contact Tracing Team Lead. Throughout his graduate coursework and professional career, he has developed skills in statistical methods and modeling as well as assessing the public health impact of infectious and chronic illnesses.

William (Bill) Thompson is a Senior Epidemiology Consultant at Cardno ChemRisk, now Stantec. He has a MS in Mathematics, a BS in Biology and over twenty years of experience in the application of epidemiological and statistical principles and methods to recognize, evaluate, and communicate health risks for legal and regulatory matters. Much of his experience has focused on general and specific causation of chronic diseases at varying exposure levels. Mr. Thompson has conducted and managed systematic reviews, provided analysis, written reports and delivered presentations for various projects as well as published scientific papers on various cancer outcomes.

Jonathan Urban is a Managing Scientist and the Associate Director of the Health Sciences Practice with ToxStrategies, Inc., in Austin, TX. Dr. Urban is a board-certified toxicologist with more than fifteen years' experience studying and evaluating the potential health effects of a wide range of environmental and occupational chemicals of concern, consumer product ingredients, raw materials and impurities, and food-related compounds. He specializes in the use of evidence-based methods in support of hazard and risk assessment and is involved in the firm's integration of these methods in the safety assessment development process. He has played an integral role in the firm's efforts to develop and apply comprehensive systematic review methods for chemical risk assessment, with experience in all aspects of systematic review including the use of critical appraisal tools for evaluating studies for risk of bias and external validity, as well as evidence integration. Dr. Urban has been involved with the critical evaluation and application of study quality tools (e.g., NTP-OHAT risk of bias, ToxRTool,
SciRAP, EPA-OPPT's TSCA tool, etc.) used in systematic review being developed and adopted by regulatory agencies for improving the scientific vigor and transparency of human health risk assessment. As such, he is well acquainted with the contemporary critical appraisal methods available for evaluating human health, animal toxicology and *in vitro* experimental study data. Dr. Urban has published on the application of these methods and utilized this expertise in the development of critiques and recommendations regarding health-based toxicity criteria for both state and federal regulatory agencies, industry, and private-sector stakeholders. Dr. Urban is a Diplomate of the American Board of Toxicology, has published academic and professional studies in the peer-reviewed literature, and is a reviewer for various scientific journals. While earning his Ph.D. in toxicology at the University of North Carolina at Chapel Hill, Dr. Urban served as an enlisted communications specialist in the United States Marine Corps Reserves (Communications Company, Greensboro, NC).

S. Stanley Young graduated from North Carolina State University, BS, MES and a Ph.D. in Statistics and Genetics. He worked in the pharmaceutical industry on all phases of pre-clinical research, first at Eli Lilly and then at GlaxoSmithKline. He has authored or co-authored over 50 papers including six "best paper" awards, and a highly cited book, Resampling-Based Multiple Testing. He has two issued patents. He is interested in all aspects of applied statistics, with special interest in chemical and biological informatics. He conducts research in the area of data mining.

Dr. Young is a Fellow of the American Statistical Association and the American Association for the Advancement of Science. He is an adjunct professor of statistics at North Carolina State University, the University of Waterloo and the University of British Columbia where he co-directs thesis work.

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Session IV. Case Studies of Triangulation Across Epidemiology Studies for Hazard Identification and Risk Assessment

Amy Berrington de González, D.Phil., is the Branch Chief of the NCI's Radiation Epidemiology Branch and Senior Advisor for Strategic Activities in the Division of Cancer Epidemiology and Genetics. She is an internationally recognized cancer epidemiologist who has made important contributions to the understanding of cancer risks from medical radiation exposures. Dr. Berrington is the PI of the U.S. Pediatric Proton vs Photon Therapy Cohort, the Kaiser Breast Cancer Survivor Study and co-PI of the UK Pediatric CT scans cohort, which was the first epidemiological study to support a direct link between CT scans and subsequent cancer risk. Dr. Berrington has participated in numerous national and international radiation and cancer advisory committees including UNSCEAR, the National Academies, RERF and IARC. In 2019 she founded the International Society for Radiation Epidemiology and Dosimetry with a key goal of supporting capacity building and training of the next generation of radiation scientists, especially those from low and middle-income countries. She is an elected member of the American Epidemiological Society and served on the editorial board for the American Journal of Epidemiology. Before joining the NCI she held faculty positions at Oxford and Johns Hopkins University.

Hanna Boogaard has more than 20 years of experience in air pollution epidemiology. She is a Consultant Principal Scientist at the Health Effects Institute (HEI) in Boston, MA, an independent research organization with balanced funding from the US Environmental Protection Agency and motor vehicle industry. She received a PhD in 2012 in air pollution epidemiology from Utrecht University, Netherlands. She studied health effects of traffic-related air pollution, and the effectiveness of traffic policy measures. At HEI, she is involved in research oversight and review of studies investigating the health effects of air pollution and studies evaluating the effectiveness of interventions to improve air quality and public health. In addition, she is involved in developing and overseeing new research programs on non-tailpipe traffic emissions, studies assessing adverse health effects of long-term exposure to low levels of ambient air pollution, and studies on health effects of traffic-related air pollution. Furthermore, she is leading an expert HEI panel to systematically evaluate the evidence for the associations of long-term exposure to traffic-related air pollution with adverse human health outcomes. She holds a MSc in Epidemiology and Environmental Health Sciences (2005) from Maastricht University, Netherlands.

She has been advisor of National Institute of Environmental Health Sciences, World Health Organization, Health Canada, and other national and international bodies. She is associate editor for Environment International and on the Editorial Review Board for Environmental Health Perspectives. She is co-chair of the International Society for Environmental Epidemiology (ISEE) Europe Chapter, and member of the ISEE Policy Committee.

John W. Jackson is an Assistant Professor in the Departments of Epidemiology, Biostatistics, and Mental Health at the Johns Hopkins Bloomberg School of Public Health, and core faculty in the Johns Hopkins Center for Health Equity and Center for Health Disparities Solutions. His research primarily focuses on developing methodological tools for translational health equity research. This includes methods to identify high leverage targets and strategies for interventions that address health disparities, as well as methods to evaluate interventions and translate them to new populations and contexts, with current applications in healthcare and clinical prognosis. His work has been funded by a K01 award from the National Heart, Lung, and Blood Institute as well as pilot funding from Johns Hopkins University. He serves on the editorial board at Epidemiology and also Sociological Methods & Research.

David A. Savitz is Professor of Epidemiology in the Brown University School of Public Health, with joint appointments in Obstetrics and Gynecology and Pediatrics in the Alpert Medical School. His epidemiological research has addressed environmental hazards in the workplace and community, reproductive health outcomes, and environmental influences on cancer. His research includes studies of miscarriage, preterm birth, and pregnancy complications, and he has addressed health effects of nonionizing radiation, pesticides, drinking water treatment by-products, and perfluorinated compounds. Dr. Savitz is an elected member of the National Academy of Medicine and was awarded the David Rall Medal for Distinguished Leadership as Chair of Study Committee.

Roel Vermeulen is a Professor of Environmental Epidemiology and Exposome Science at the Institute for Risk Assessment Sciences (IRAS), Utrecht University and at the Julius Center for Health Sciences and Primary Care, University Medical Center Utrecht, The Netherlands.

He is the co-chair of the Personalized Health and Medicine Program of Utrecht Life Sciences at Utrecht University and co-coordinates the preventive health program of the alliance between the Universities of Wageningen, Eindhoven and Utrecht and the academic Medical Center Utrecht. He previously held positions at the National Cancer Institute, USA.

His scientific research focuses on environmental risk factors for cancer, cardiometabolic and neurological diseases through inter and trans-disciplinary research. One of the current research areas is the exploration of new methods for quantifying the external and internal exposome.

He coordinates the Dutch research program on the exposome (Exposome-NL), leads an EU project (EXPANSE) as part of the European Human Exposome Network and coordinates the Dutch Hub of the European infrastructure on Exposome research

(EIRENE-NL). He is the PI of several large case-control and prospective (biobank) studies in occupational and the general population. Dr. Roel Vermeulen has served on many international committees including the WHO and the National Toxicology Program in the US. He is a member of the Dutch Health Council. He has published over 700 publications.

Session VI. Next Steps and Opportunities for Applying Triangulation

Lisa Bero is a leader in evidence synthesis, meta-research and studying commercial determinants of health, focusing on tobacco control, pharmaceutical policy, and public health. She was Co-Chair, Cochrane Governing Board from 2014-2018 and is currently Senior Editor, Research Integrity and Cochrane Public Health and Health Systems Network. She has conducted systematic reviews, scoping and rapid reviews of human across multiple public health areas, including environmental health, and has led methods development to advance methods of systematic review in public health. LB has chaired and served on committees related to conflicts of interest, evidence and decisions, and evidence synthesis for the US National Academies of Science, IARC and WHO.

Ellen T. Chang, Sc.D., is a Principal Scientist and epidemiologist in the Center for Health Sciences at Exponent, Inc., an international science and engineering consulting company in Menlo Park, California. She is also an Adjunct Associate Professor in the Department of Epidemiology & Biostatistics at the University of California, San Francisco, and a Visiting Professor at the Sun Yat-sen University Cancer Center in Guangzhou, China. Dr. Chang has conducted epidemiologic studies and systematic literature reviews of the risk of malignant lymphomas, nasopharyngeal carcinoma, hepatocellular carcinoma, and other cancers in association with a wide range of exposures, including infections, immunological biomarkers, occupational agents, industrial chemicals, medications and medical devices, reproductive factors, physical activity, alcohol and tobacco, diet and nutrition, and genetic variation. Dr. Chang earned her undergraduate degree at Harvard College in 1998 and her doctorate degree in epidemiology with a minor in biostatistics from the Harvard School of Public Health in 2003. She completed a postdoctoral fellowship in medical epidemiology and biostatistics at the Karolinska Institute in Stockholm, Sweden, and she worked at the Cancer Prevention Institute of California and the Asian Liver Center at Stanford University before joining Exponent in 2012.

Lianne Sheppard, PhD is the Rohm & Haas Endowed Professor at the University of Washington School of Public Health with appointments in both Biostatistics, and Environmental and Occupational Health Sciences. Trained as a biostatistician, her

research focuses on understanding the health effects of environmental and occupational exposures. She is particularly interested in how aspects of exposure assessment affect our understanding of toxic exposures; her research ranges from the design of the exposure data collection to the modeling of exposure and subsequent epidemiologic inference. Her current research focuses on air pollution exposures and brain health. Dr. Sheppard has a strong personal commitment to research training at the interface between the environmental and quantitative sciences; research integrity; and diversity. She is the 2020 recipient of the International Society for Environmental Epidemiology Research Integrity Award, Chair of the EPA Clean Air Scientific Advisory Committee, and has served on various EPA special panels under CASAC, IRIS, FIFRA, and TSCA.

Martyn Smith is Professor of Toxicology and the Kaiser Endowed Chair of Cancer Epidemiology in the Division of Environmental Health Sciences in the School of Public Health at the University of California Berkeley. He received his Ph.D. in Biochemistry from St. Bartholomew's Hospital in London and did Post-Doctoral training in toxicology at the Karolinska Institute in Stockholm. Dr. Smith is a laboratory scientist with expertise in molecular epidemiology, toxicology and genomics, and his research is aimed at finding the causes of chronic diseases, including cancer and diabetes. He currently teaches Toxicology and Health Risk Assessment and mentors graduate students and postdoctoral scholars in the Molecular Toxicology, Epidemiology and Environmental Health Science programs. Dr. Smith is a Fellow of the American Association for the Advancement of Science. He received the 2010 Children's Environmental Health Network Award, became an Elected Fellow of the Collegium Ramazzini in 2012, and received the Alexander Hollaender Award from the Environmental Mutagenesis and Genomics Society in 2014. Since its inception in 1987, Smith has directed the Superfund Research Program (SRP) Center at the University of California, Berkeley (UC Berkeley). This program combines basic research, engineering, population studies, training, and community engagement to understand cumulative impacts from multiple environmental stressors. Smith is best known for his work on benzene toxicity, the exposome concept and the key characteristics framework, which helps risk assessors better identify, organize, and summarize the potential health risks of different chemicals. His most recent work uses machine learning, AI and molecular modeling to predict toxicity.

Kyla W. Taylor, Ph.D. is a health scientist in the Integrative Health Assessment Branch at the Division of the National Toxicology Program (DNTP) at the National Institute of Environmental Health Sciences. Dr. Taylor serves as a member of DNTP's Consumer Products and Therapeutics Program Management Team and her work includes conducting systematic reviews and meta-analyses, developing and promoting harmonization of systematic review methods, and understanding how personal care

product use is related to sociodemographic characteristics, early puberty, breast cancer and other health outcomes.

Dr. Taylor joined the DNTP in 2009. She received her B.A. from St. Olaf College, her M.S. in Population Health Sciences from the University of Wisconsin-Madison, and her Ph.D. in Epidemiology from the University of North Carolina-Chapel Hill.

Tracey Woodruff, PhD, MPH is the Director of and Alison S. Carlson Endowed Professor for PRHE and is a Professor in the UCSF Department of Obstetrics, Gynecology and Reproductive Sciences and the Philip R. Lee Institute for Health Policy Studies. She is also the Director of a newly awarded NIEHS Environmental Health Core Center grant, the Environmental Research and Translation for Health (EaRTH) Center at UCSF. She is a recognized expert on environmental pollution exposures and impacts on health, with a focus on pregnancy, infancy and childhood, and her innovations in translating and communicating scientific findings for clinical and policy audiences. She has authored numerous scientific publications and book chapters, and has been quoted widely in the press, including USA Today, the San Francisco Chronicle and The New York Times. Before joining UCSF, Dr. Woodruff was a senior scientist and policy advisor for the U.S. EPA's Office of Policy. She was appointed by the governor of California in 2012 to the Science Advisory Board of the Developmental and Reproductive Toxicant (DARTIC) Identification Committee.