The National Academies of SCIENCES ENGINEERING MEDICINE

EMERGING SCIENCE FOR ENVIRONMENTAL HEALTH DECISIONS

Pivotal Interfaces of Environmental Health and Infectious Disease Research to Inform Responses to Outbreaks, Epidemics, and Pandemics

PARTICIPANT BIOGRAPHIES

(Listed In Alphabetical Order)

DAVID BLAZES* is Deputy Director in the Global Health Program at the Bill and Melinda Gates Foundation and an adjunct professor in tropical medicine at the Uniformed Services University of the Health Sciences. Dr. Blazes joined Bill and Melinda Gates Foundation after serving as a physician epidemiologist in the Navy. Throughout his twenty-one year career with the Navy, he served as Director of Infectious Diseases Research at Bethesda Naval Hospital, a Department Head on the USNS COMFORT, and Director of the Emerging Infections Department at the Naval Medical Research Unit Six in Peru. Upon his return to Washington, DC, he directed the Department of Defense's global disease surveillance efforts and served as the chief advisor to the Navy Surgeon General on Infectious Diseases. At the foundation, Dr. Blazes is the relationship manager for the Institute for Health Metrics and Evaluation (IHME), and manages a portfolio of grants around burden of disease modeling, geospatial mapping, and next generation genetic sequencing of pathogens with epidemic potential. He graduated from the U.S. Naval Academy and received his medical degree from the Johns Hopkins University. Dr. Blazes is currently serving as a member on the Board for Health Sciences Policy within the Health and Medicine Division at the National Academies.

CRISTINA CASSETTI is the Deputy Director of the Division of Microbiology and Infectious Diseases (DMID) at the National Institutes of Allergy and Infectious Diseases (NIAID), a component of the US National Institutes of Health (NIH). Dr. Cassetti has a Ph.D. in virology from the University of Rome, Italy. She conducted research on poxviruses replication at the NIH, influenza virus biology at Rutgers University and HPV vaccine development at the Vaccine Discovery Department at Wyeth (now Pfizer). In 2003 she became a Program Officer at NIAID where she was responsible for the management and direction of extramural research programs on several emerging viral diseases of global health importance including influenza and dengue. In 2016, she was appointed to coordinate the Zika research response in extramural NIAID and to manage translational research in the Virology Branch. In 2017 she was appointed as Chief of the Virology Branch in DMID. In 2019 she become the Deputy Director of DMID where she shares responsibilities with the director for the overall scientific direction, administration and management of the largest extramural Division at NIAID.

GWEN COLLMAN serves as Acting Deputy Director of National Institute of Environmental Health Sciences. For the past 11 years, Collman has been an active member of the NIEHS executive leadership team in her role as director of the NIEHS Division of Extramural Research and Training (DERT). Collman led the implementation of many exciting scientific programs with partners from other NIH ICs and Federal agencies. These includes the CHEAR/HHEAR exposure resource, Time Sensitive Research Awards, the Gulf Oil, PRIME mixtures, Nanotechnology, and TARGET Consortia, and Telomeres Network to name a few. During this time, DERT has developed many new areas of research support tied to the NIEHS Strategic plan. Collman has directed scientific activities across the field of environmental health sciences including basic sciences organ-specific toxicology, public health related programs and training and career development. She also oversees the implementation of the Superfund Research Program and the Worker Education and Training Program. She is credited with building the NIEHS grant portfolio in environmental and molecular epidemiology, and she developed several complex multidisciplinary research programs. These included the NIEHS Breast Cancer and the Environment Research Centers Program, the NIEHS/EPA Centers for Children's Environmental Health and Disease Prevention, and the Genes, Environment and Health Initiative. In recognition of her achievements, Collman has received many NIEHS Merit Awards, three NIH Director's Awards, and the HHS Secretary's Award for Distinguished Service. Collman received a Ph.D. in Environmental Epidemiology from the University of North Carolina School of Public Health.

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JOSEPH EISENBERG is the John G. Searle Endowed Chair and Professor of Epidemiology in the School of Public Health at the University of Michigan. Dr. Eisenberg received his PhD in Bioengineering in the joint University of California, Berkeley/University of California, San Francisco program, and an MPH from the School of Public Health at the University of California, Berkeley. Dr. Eisenberg studies infectious disease epidemiology with a focus on waterborne and vectorborne diseases. His broad research interests, global and domestic, integrate disease transmission models with field studies to study environmental determinants of infectious diseases. He has established a research platform in Ecuador, and over the past 20 years has examined how changes in the social and natural environments, mediated by road construction, affect the epidemiology of infectious diseases.

PASCALE FUNG is a Professor at the Department of Electronic & Computer Engineering and Department of Computer Science & Engineering at The Hong Kong University of Science & Technology (HKUST), and a visiting professor at the Central Academy of Fine Arts in Beijing. She is an elected Fellow of the Association for Computational Linguistics (ACL) for her "significant contributions towards statistical NLP, comparable corpora, and building intelligent systems that can understand and empathize with humans". She is an Fellow of the Institute of Electrical and Electronic Engineers (IEEE) for her "contributions to human-machine interactions", and an elected Fellow of the International Speech Communication Association for "fundamental contributions to the interdisciplinary area of spoken language human-machine interactions". She is the Director of HKUST Centre for AI Research (CAiRE), an interdisciplinary research center on top of all four schools at HKUST. She co-founded the Human Language Technology Center (HLTC). She is an affiliated faculty with the Robotics Institute and the Big Data Institute at HKUST. She is the founding chair of the Women Faculty Association at HKUST. She is an expert on the Global Future Council, a think tank for the World Economic Forum. She represents HKUST on Partnership on AI to Benefit People and Society. She is on the Board of Governors of the IEEE Signal Processing Society. She is a member of the IEEE Working Group to develop an IEEE standard - Recommended Practice for Organizational Governance of Artificial Intelligence. Her research team has won several best and outstanding paper awards at ACL, ACL and NeurIPS workshops.

GARY GINSBERG[*†] is Director of the Center for Environmental Health for the New York State Department of Health and a lecturer at the Yale School of Public Health. Prior to this, he was a toxicologist for the Connecticut Department of Public Health. He serves or has served on a number of national committees, including U.S. Environmental Protection Agency's (EPA) Science Advisory Board (2008-present) and the National Academies' Biomonitoring committee (2004-2006), EPA's Risk Methods committee, which produced Science and Decisions (2006-2008), and Inorganic Arsenic Risk Assessment committee (2012-2015). He also served on EPA's Children's Health Protection Advisory Committee (2004-2009) and has been an external reviewer on a number of EPA Integrated Risk Information System documents. Dr. Ginsberg has been called on by other federal agencies to provide reviews, including Occupational Safety and Health Administration (silica workplace standard), U.S. Consumer Product Safety Commission (cadmium in children's jewelry) and U.S. Food and Drug Administration (dental amalgam). His risk assessments on fish contaminants, synthetic turf fields, acrylamide, cadmium, and assessments pertaining to risks in children and those with genetic polymorphisms have been published in peer reviewed journals. Dr. Ginsberg co-authored a book for the lay public called "What's Toxic, What's Not" (Berkeley Books, 2006). He received his Ph.D. in Toxicology from the University of Connecticut in 1986.

CHRISTINE KREUDER JOHNSON[*] is Professor of Epidemiology and Ecosystem Health and Director of the EpiCenter for Disease Dynamics at the One Health Institute, University of California, Davis. She has a PhD in Epidemiology from the University of California, Davis (2003) and VMD degree in Veterinary Medicine from the University of Pennsylvania (1994). Her work is committed to transdisciplinary research to characterize impacts of environmental change on animal and human health, inform preparedness for emerging threats, and guide public policy at the intersection of emerging disease and environmental health. Professor Johnson's research has pioneered new approaches to characterization of emerging threats and disease dynamics at the animal-human interface in rapidly changing landscapes that constitute "fault lines" for disease emergence, disease spillover and subsequent spread. Her activities also serve pressing research needs at the boundaries of science and policy, such as investigations into early indicators of unusual morbidity and mortality in wildlife, impacts of land use and climate change on disease in populations, and conservation and public

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health implications of harmful algal blooms and land-to-sea movement of pathogens in coastal systems. She leads the "EpiCenter for Emerging Infectious Disease Intelligence", one of NIAID's Centers for Emerging Infectious Disease (CREID) to investigate the environment and climate-related drivers for spillover and spread of emerging ebolaviruses, coronaviruses, and arboviruses. Previous work for the National Academies of Medicine were at request of the Vital Directions Steering Committee to coauthor a paper "Infectious Disease Threats: A Rebound to Resilience" for the National Academies Vital Directions policy initiative.

DAVID LARSEN is an epidemiologist with expertise in global health and infectious disease. He received a master's degree in public health and doctorate degree from Tulane University School of Public Health and Tropical Medicine from the department of International Health and Development in 2013. Dr. Larsen is now an associate professor in the department of public health at Syracuse University. From 2015-2016 Dr. Larsen served as the director of public health for Akros, an international non-governmental organization based in Lusaka, Zambia that focuses on surveillance systems to improve health and precision delivery of public health interventions. Most of his career has focused on the surveillance, control, and elimination of malaria while also adapting and applying those principles to other infectious disease systems. Throughout the pandemic, Dr. Larsen has advised on coronavirus surveillance and control at Syracuse University and led initiatives to establish a wastewater surveillance platform for the state of New York. Dr. Larsen is the happy father of four young children and lives in Syracuse, New York with them and his wife Natalia.

AYESHA MAHMUD is an Assistant Professor of Demography at the University of California, Berkeley. She is a demographer, and is broadly interested in the interplay between human population changes, environmental factors, and infectious disease dynamics. Her research draws on theory and methods from demography and disease ecology, to answer questions such as - why do outbreaks occur at certain times of the year? How and why does the mortality burden of infectious diseases vary over time? How do population travel patterns drive the spatial dynamics of outbreaks? How will global environmental and demographic changes alter the landscape of infectious disease burden in the future? She uses statistical methods and biologically mechanistic models to answer these questions in the context of multiple diseases in countries in Asia, Africa, and Central America, using data from disease surveillance systems, hospital databases, climate models, human mobility data, and population surveys and censuses. Prior to coming to Berkeley, Ayesha was a Rockefeller Foundation Planetary Health Fellow at Harvard University. She received her Ph.D. in Demography from Princeton University in 2017.

KRISTEN MALECKI[*†] is an Associate Professor in the Department of Population Health Sciences. She has a Ph.D. in Environmental Epidemiology and Health Policy and M.P.H. from Johns Hopkins University Bloomberg School of Public Health. Dr. Malecki is the Director and Principal Investigator for the Survey of the Health of Wisconsin, overseeing survey implementation efforts and ancillary study development. Her current research is also focused on developing models to examine combined chemical (air pollution, water pollution), physical and social stressors and influence on adult chronic disease, childhood development and obesity. Dr. Malecki's current research aims to understand the biological consequences of social disadvantage and environmental exposure across the lifecourse and relationship with persistent health disparities. Her transdisciplinary work includes identification of biomarkers of expression and response using epigenetics and transcriptomics and investigations of the gut microbiome. Dr. Malecki's work is grounded in communities and uses community engaged approaches to population and environmental health sciences research.

JADE MITCHELL[*] is an Associate Professor in the Department of Biosystems and Agricultural Engineering at Michigan State University. Her research expertise is in human health risk analysis, understanding how chemical and microbial stressors from diverse environmental exposures lead to adverse human health outcomes. She uses quantitative analysis, statistical and mechanistic modeling to characterize risks to support risk management decision making, including engineering design and environmental policy. Since 2015, she has led a large interdisciplinary research education program related to quantifying infectious disease risks for pathogens in different microenvironments funded by the National Institutes of Health. The program was just funded for another 5 years. She received her B.S. in 1997 from the University of Pittsburgh in Civil and Environmental Engineering. After graduation she worked for engineering consultant firms. A strong desire to understand and direct the "best management practices" she used in her daily work prompted

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her to purse an M.S. in Civil Engineering, which she obtained in 2007 followed by her Ph.D. in Environmental Engineering in 2010 from Drexel University. Prior to joining Michigan State University, Dr. Mitchell completed post-doctoral research fellowships with the U.S. EPA National Exposure Research Laboratory and the USDA Food Safety Inspection Service where she focused on chemical exposures through multiple types of environmental media. She is both keenly interested in and uniquely well suited for research projects involving risk tradeoffs between chemical and microbial stressors; and addressing needs at the intersection of the two.

DONALD MILTON is a professor of Environmental Health at the University of Maryland School of Public Health, with a secondary appointment in the Department of Medicine, School of Medicine. He is board-certified in Internal and Occupational and Environmental Medicine and has 20 years of experience in environmental and occupational medicine referral practice. Dr. Milton is a pioneer of the modern science of airborne transmission of respiratory viruses. His work focuses on the interrelated areas of infectious bioaerosols, exhaled breath analysis and the development and application of innovative methods for respiratory epidemiology. Milton provide key elements of the scientific foundation for the two most effective non-pharmaceutical interventions being deployed to control the SARS-CoV-2 pandemic. In recognition of his contributions, he has been asked by his scientific colleagues to take a leading role in efforts to persuade the WHO and CDC to fully acknowledge the importance of aerosols and their control in protecting essential workers and the public. He is the Principal Investigator of the UMD StopCOVID study which aims to understand how people transmit COVID-19 and how to prevent its spread. Milton has served on the editorial boards of Applied Environmental Microbiology, Indoor Air, and BMC Public Health and on the NIOSH NORA Indoor Environment Team and chaired the ACGIH Bioaerosols Committee. He earned a BS in Chemistry from UMBC, MD from Johns Hopkins, and an MOH and a DrPH (Environmental Health) from Harvard.

VINCENT MUNSTER* is the chief of the Virus Ecology Section at NIAID's Rocky Mountain Laboratories. He received his Ph.D. in virology from Erasmus University, Rotterdam, the Netherlands, in 2006. During his Ph.D. studies, Dr. Munster studied the ecology, evolution, and pathogenesis of avian influenza viruses. In 2013, Dr. Munster established the Virus Ecology Unit as an independent tenure-track investigator. His lab is working to elucidate the ecology of emerging viruses and drivers of zoonotic and cross-species transmission. Munster has been actively involved in the response to MERS-CoV, Ebola virus and COVID19 outbreaks. With the current COVID19 pandemic he is actively involved in the development of medical countermeasures and providing critical experimental data supporting direct public health decisions and interventions.

WILLIAM PAN is the Elizabeth Brooks Reid and Whitelaw Reid Associate Professor of Population Studies and Global Environmental Health at Duke University, with joint appointments at the Duke Global Health Institute and the Nicholas School of Environment. Dr. Pan's research interests focus on population, health, and environmental interactions, with a particular focus in Latin America. He currently leads projects on the development of malaria early warning systems in the Amazon and on risk assessment and mitigation of mercury exposure related to artisanal and small-scale gold mining. Dr. Pan received his doctoral training in Biostatistics from UNC-Chapel Hill with a focus on demography and spatial analysis. He also received a Master of Public Health from Rollins School of Public Health at Emory University.

MELISSA PERRY*† is Professor of Environmental and Occupational Health and Interim Associate Dean for Research in the Milken Institute School of Public Health at the George Washington University (GWU). Before joining GWU, she spent 13 years on the Harvard School of Public Health's Department of Environmental Health faculty. As an environmental and occupational epidemiologist, Dr. Perry's research focuses on the health impacts of environmental chemicals with particular focus on reproduction, and on the prevention of occupational injuries and disease. Her lab at GWU examines environmental impacts on sperm and male fertility. She is the Chair of the Board of Scientific Counselors for the National Center for Environmental Health/Agency for Toxic Substances and Disease Registry of the Centers for Disease Control and Prevention; co-chair of the National Academies' Committee on Emerging Science for Environmental Health Decisions; a Fellow of the Collegium Ramazzini; and a member of the Technical Advisory Board for the Center for Construction Research and Training. She has served as President of the American College of Epidemiology and as a standing member of the National Institute for Occupational Safety and Health study section. She is currently an

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associate editor of Environmental Health Perspectives and an editorial board member of Environmental Health. She received her B.A. from the University of Vermont, and her M.H.S. and Sc.D. from The Johns Hopkins University School of Hygiene and Public Health.

SVITLANA VOLKOVA* is a Chief Scientist in Decision Intelligence and Analytics at the National Security Directorate, Pacific Northwest National Laboratory. She is a recognized leader in the field of computational linguistics, applied machine learning and open-source data analytics. Her research focuses on modeling real-world events e.g., influenza dynamics and human social behavior by learning from public data. Data-driven approaches developed by Dr. Volkova's team advance understanding and effective reasoning about extreme volumes of dynamic, multilingual, diverse, heterogenous real-world data. Dr. Volkova's recent work on forecasting influenza dynamics using deep neural architectures and open-source data was featured by Biomed Central, Scientific American and BBC Ukraine. In response to COVID-19 crisis, her team developed an interactive decision intelligence tool https://watchowl.pnnl.gov/v1/#/covid/policy - to inform public health policy decision making in real-time by analyzing millions of social media messages discussing NPIs (e.g., containment measures, movement restrictions, social distancing, or communications) using natural language processing to infer audience reactions (in favor, against, or neither), perspectives (positive, negative or neutral), and psycho-demographics (gender, age, income and education level) over time across all 50 states in the US. She received her Ph.D. in Computer Science in 2015 from Johns Hopkins University where she was affiliated with the Center for Language and Speech Processing. Dr. Volkova has authored more than 50 peer-previewed top-tier publications, three patents, multiple book chapters and tutorials on data-driven analytics. She frequently serves as a senior program committee member, an area chair at top-tier AI conferences and journals, and as a panelist for National Science Foundation.

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