

Understanding and Responding to Global Health Security Risks from Microbial Threats in the Arctic: A Workshop

Committee

Diana H. Wall

Chair

Diana Wall, Ph.D., (Co-Chair), is an elected member of the National Academy of Sciences and the American Academy of Arts and Sciences and is the 2013 Laureate of the Tyler Prize for Environmental Achievement. She is currently Science Chair, Global Soil Biodiversity Initiative. To understand the importance of soil biodiversity, she works at the physical limits to life in the Antarctic dry valleys where climate change effects are amplified and species diversity is much reduced compared to other soil ecosystems. Dr. Wall's more than 25 years of research in the Antarctic continues to clarify the critical links between climate change and soil biodiversity. Her interdisciplinary research has uncovered dramatic impacts to invertebrate communities in response to climate change, the key role nematode species play in soil carbon turnover, and how they survive such extreme environments. Dr. Wall has combined her polar research with global scale field studies demonstrating that soil animals increase decomposition rates more in temperate and moist tropical climates than in cold and dry conditions, indicating a latitudinal gradient in their roles in ecosystems. Dr. Wall served as President of the Ecological Society of America, the American Institute of Biological Sciences, and the Society of Nematologists. Dr. Wall received the 2017 Eminent Ecologist Award from the Ecological Society of America, the 2016 Honorary Member award from the British Ecological Society, the 2015 Ulysses Medal from University College Dublin, the 2012 SCAR President's Medal for Excellence in Antarctic Research and the 2013 Soil Science Society of America Presidential Award. Wall Valley, Antarctica was named in 2004 to recognize her research. She is a Fellow of the Ecological Society of America and the Society of Nematologists and holds an Honorary Doctorate from Utrecht University, The Netherlands. She is the Inaugural Director of the School of Global Environmental Sustainability at Colorado State University. She received a B.A. in biology and Ph.D. in plant pathology at the University of Kentucky, Lexington.

Volker ter Meulen

Vice Chair

Volker ter Meulen, M.D., (Vice Chair), qualified as an M.D. in 1960. He received his post-doctoral training in virology in the United States at the Children's Hospital of Philadelphia. On returning to Germany in 1966, he specialised in paediatrics and was subsequently Visiting Scientist at the Wistar Institute for Anatomy and Biology in Philadelphia and at the Viral and Rickettsial Disease Laboratory in Berkeley from 1969 to 1970. In 1975 he became a full professor and Chairman of the Institute of Virology and Immunobiology at the University of Würzburg. He retired in 2002, having twice been elected Dean of the Faculty of Medicine of Würzburg University. During his research career, Dr. ter Meulen worked on molecular and pathogenic aspects of viral infections in man and animals, in particular on infections of the central nervous system. Due to the recognition of his research achievements and his experience in heading a Medical Faculty, Dr. ter Meulen has on numerous occasions been invited to give policy advice on research matters to German research organizations and to state and federal ministries of science in Germany. Internationally, Dr. ter Meulen has served on a number of committees of organizations and scientific societies/unions in the area of virology and infectious diseases, covering a broad spectrum of important issues connected to human and animal pathogens. From 2003 to 2010, Dr. ter Meulen was President of the German Academy of Sciences Leopoldina. Under his leadership, the Leopoldina strengthened its international commitments in different inter-academic councils and was appointed to the National Academy of Sciences in 2008. From 2007 to 2010, he was President of the European Academies Science Advisory Council (EASAC), the association of the National Science Academies of the European Union, which is the Interacademy Panel (IAP) associated regional network for Europe. He was elected IAP Co-Chair in February 2013.

Robyn A. Barbato

Member

Robyn A. Barbato, M.Sc., Ph.D., has, since October, 2013, served as a Research Microbiologist at the Cold Regions Research and Engineering Laboratory (CRREL) in Hanover, New Hampshire, one of seven laboratories that comprise the U.S. Army Engineer Research and Development Center (ERDC). Dr. Barbato leads the Cold Regions Microbiology Team and conducts research on extremophiles in the environment. Dr. Barbato began her career with the Army in 2011 as a postdoctoral fellow with CRREL. After a year and a half of service, she became a federal employee at the laboratory. In 2016, Dr. Barbato was awarded the Department of the Army Achievement Medal for Civilian Service. She has completed the Leadership Development Program and in 2018 was competitively selected for the Emerging Leaders Group. As an extremophile microbiologist, Dr. Barbato leads a team of researchers to answer challenging questions relating to life in the cold regions of the planet. She has extensive experience leading field campaigns in the sub-Arctic and Arctic Alaska to study the permafrost microbiome and how it changes during thaw, as well as the efficacy of bioremediation treatment technologies in cold regions. She and her team write competitive grants to explore the intricate relationships among microorganisms and their surrounding environment, including their ecosystem impacts to address Department of Defense problems on range sustainability, forensics, and detection. Dr. Barbato takes a holistic systems-based approach by combining empirical laboratory and field measurements with stand-off sensing techniques like terrestrial laser scanning and modeling efforts. In doing so, she answers ecosystem-level research questions such as shifts in microbial communities and processes as a result of extreme weather. By generating high resolution microbial sequencing and metagenomics data, she and her collaborators attempt to statistically describe the natural environment and how it changes with perturbations, particularly in extreme environments such as the cold. Dr. Barbato graduated with a Bachelor of Science degree at Cook College, Rutgers University in New Brunswick, New Jersey in 2005. In 2008, Dr. Barbato earned her Master of Science degree at the Graduate School of New Brunswick at Rutgers University. Four years later, Dr. Barbato earned her Ph.D. at Rutgers University studying the response of the soil microbiome to wildfire.

Birgitta Evengård

Member

Birgitta Evengård, M.D., Ph.D., is a professor of infectious diseases in the Department of Clinical Microbiology at Umeå University, Sweden and is a senior consultant for Clinic Infectious diseases at Umeå University hospital. From 2008 to 2015, she was a member of the Arctic Human Health Expert group, and between 2011 and 2013 she was chair. Dr. Evengård was chair of ARCUM, the Arctic Research Center at Umeå University, between 2012 and 2016. Since 2016, she has been a member National Committee for Global Environmental Change at the Swedish Royal Swedish Academy of Sciences. She is Principal Investigator for the Nordic Center of Excellence funded by Nordforsk: 'Responsible Development in the North, 2016-2021. Dr. Evengård has over 135 publications in peer-reviewed journals, and she is the author and editor of 11 books. The focus of her research has been infectious diseases in diagnostics, epidemiology and clinical findings with a focus since 2007 on Arctic issues, including health in a changing climate in the North.

Robin Fears

Member

Robin Fears, Ph.D., D.Sc., has 29 years experience in the pharmaceutical industry in the UK in research and development (R&D). The first 20 years were focused on cardiovascular disease and neurosciences, from discovery through to marketed product. The final nine years of this industry experience was occupied in setting up and leading a policy group for R&D in Europe. While in industry, he served on committees advising UK and EU trade associations, UK government, Research Councils, university groups and the European Commission and he was Honorary Senior Fellow at the School of Public Policy at the University College London. Since leaving the UK pharmaceutical sector, he has worked as an advisor to various bodies including academies, universities, businesses and parliamentary groups on issues relating to biomedical science and innovation within the European policy environment. He has provided biosciences support to EASAC since 2002.

Charles N. Haas

Member

Charles N. Haas, M.S., Ph.D., is the L.D. Betz Professor of Environmental Engineering and head of the Department of Civil, Architectural and Environmental Engineering, at Drexel University, where he has been since 1991. He also has courtesy appointments in the Department of Emergency Medicine of the Drexel University College of Medicine and in the School of Public Health. He received his B.S. (Biology) and M.S. (Environmental Engineering) from the Illinois Institute of Technology and his Ph.D. in Environmental Engineering from the University of Illinois at Urbana-Champaign. He has served on the faculties of Rensselaer Polytechnic Institute and the Illinois Institute of Technology prior to joining Drexel. He co-directed the USEPA/DHS University Cooperative Center of Excellence – Center for Advancing Microbial Risk Assessment (CAMRA). He is a fellow of the International Water Association, American Academy for the Advancement of Science, the Society for Risk Analysis, the American Society of Civil Engineers the American Academy of Microbiology and the Association of Environmental Engineering and Science Professors. He is a Board Certified Environmental Engineering Member by eminence of the American Academy of Environmental Engineers. He has received the Dr. John Leal Award and the AP Black Award of the American Water Works Association and the Clarke Water Prize. Over his career, Dr. Haas has specialized in the assessment of risk from and control of human exposure to pathogenic microorganisms, and in particular the treatment of water and wastewater to minimize microbial risk to human health. Dr. Haas has served on numerous panels of the National Academies of Sciences, Engineering and Medicine. He is a past member of the Water Science and Technology Board of the National Academies, and the US EPA Board of Scientific Counselors.

Thomas V. Inglesby

Member

Thomas Inglesby, M.D., is the Director of the Center for Health Security of the Johns Hopkins Bloomberg School of Public Health. Dr. Inglesby is also a Professor in the Department of Environmental Health and Engineering in the Johns Hopkins Bloomberg School of Public Health, with a Joint Appointment in the Johns Hopkins School of Medicine. Dr. Inglesby's work is internationally recognized in the fields of public health preparedness, pandemic and emerging infectious disease, and prevention of and response to biological threats. He is Chair of the Board of Scientific Counselors, Office of Public Health Preparedness and Response, US Centers for Disease Control and Prevention (CDC). He previously served as Chair of the National Advisory Council of the Robert Wood Johnson Foundation's National Health Security Preparedness Index. He was a member of the CDC Director's External Laboratory Safety Workgroup, which examined biosafety practices of the CDC, the National Institutes of Health (NIH), and the Food and Drug Administration (FDA) following high-profile laboratory incidents in federal agencies. He was on the 2016 Working Group assessing US biosecurity on behalf of the President's Council of Advisors on Science and Technology (PCAST). He has served on committees of the Defense Science Board, the National Academies of Sciences, and the Institute of Medicine, and in an advisory capacity to NIH, BARDA, DHS, and DARPA. Dr. Inglesby has authored or co-authored more than 130 publications, including peer-reviewed research, reports, and commentaries on issues related to health security, preparedness for epidemics, biological threats, and disasters. He is Editor-in-Chief of the peer-reviewed journal *Health Security*, which he helped establish in 2003. He was a principal editor of the JAMA book *Bioterrorism: Guidelines for Medical and Public Health Management*. He has been invited to brief White House officials from the past four presidential administrations on national biosecurity challenges and priorities, and he has delivered Congressional testimony on a number of issues related to public health preparedness and biosecurity. He is regularly consulted by major news outlets for his expertise. He is a member of the Board of Directors of PurThread, a company dedicated to developing antimicrobial textiles. Dr. Inglesby completed his internal medicine and infectious diseases training at Johns Hopkins University School of Medicine, where he also served as Assistant Chief of Service in 1996-97. Dr. Inglesby received his M.D. from Columbia University College of Physicians and Surgeons and his B.A. from Georgetown University. He sees patients in a weekly infectious disease clinic.

Rebecca Katz

Member

Rebecca Katz, M.P.H., Ph.D., is a Professor and Director of the Center for Global Health Science and Security at Georgetown University. Prior to coming to Georgetown, she spent ten years at The George Washington University as faculty in the Milken Institute School of Public Health. Her research is focused on global health security, public health preparedness and health diplomacy. Since 2007, much of her work has been on the domestic and global implementation of the International Health Regulations. Since 2004, Dr. Katz has been a consultant to the Department of State, working on issues related to the Biological Weapons Convention, pandemic influenza and disease surveillance. Dr. Katz received her undergraduate degree from Swarthmore College, an M.P.H. from Yale University, and a Ph.D. from Princeton University.

Susan Kutz

Member

Susan Kutz, DVM, Ph.D., is a Professor in the Department of Ecosystem and Public Health at the University of Calgary Faculty of Veterinary Medicine, Calgary, Alberta. She completed her Doctor of Veterinary Medicine at the Western College of Veterinary Medicine, University of Saskatchewan in 1992. After working as a veterinarian in the Canadian Arctic for a few years she returned to do a Ph.D. in wildlife parasitology at the University of Saskatchewan. Following that she was a post-doctoral fellow at the University of Alaska, Fairbanks, where she studied host-parasite associations in Beringia. She was a founding member of the Faculty of Veterinary Medicine at the University of Calgary, is Co-Editor in Chief for the journal *International Journal of Parasitology - Parasites and Wildlife*, is on the Board of Directors for the Arctic Institute of North America, is past Director of the Alberta Centre of the Canadian Cooperative Wildlife Health Centre and past member of the Terrestrial Mammals Committee on COSEWIC (Committee on the Status of Endangered Wildlife in Canada). Dr. Kutz's research interests include understanding the impacts of climate and landscape change on host-parasite interactions in the Arctic. She has research programs investigating parasite biodiversity, invasion processes, and the impacts of parasites on host populations, food safety and food security and has published widely in this field (over 125 publications). She brings local, traditional and scientific knowledge together to generate a better understanding of wildlife health and ecology and for early detection and response to emerging health issues. She has extensive collaborations around the Arctic, led a major circumarctic caribou and reindeer health assessment program during International Polar Year, and sits on the Muskox Expert Network for CAFF. In the Arctic, Dr. Kutz works closely with aboriginal subsistence hunters to monitor wildlife health and has maintained a popular NSERC PromoScience funded outreach program in the Canadian North since 2004. Her research interests in parasitology extend beyond the Arctic, where she also collaborates on studies in behavioral ecology and parasitism in non-human primates, wild ungulates, and carnivores.