

Program

10:00 am	Welcome	Sam Hawgood, Chancellor, UCSF
10:05 am	Symposium objectives	Jaime Sepulveda, UCSF
10:15 am	Summary of NAS Feb 16 workshop	Mary Wilson, UCSF
10:25 am	Epidemiology and prevention	
	Epidemiology	George Rutherford, UCSF
	Flavivirus infections	Desiree LaBeaud, Stanford University
	Blood transfusion	Michael Busch, UCSF
	Q & A	
11:10 am	Basic science	
	Virology	Bonnie Maldonado, Stanford University
	Placenta	Susan Fisher, UCSF
	Mathematical modeling	John Marshall, UC Berkeley
	Zika virus and microcephaly	Alex Pollen, UCSF
	Q & A	
Noon	Lunch break	
1:00 pm	Clinical management	
	Vector biology and control	Christopher Barker, UC Davis
	Maternal-fetal medicine	Kirsten Salmeen, UCSF
	Pediatrics	Margaret Feeney, UCSF
	Guillain-Barré Syndrome	Michael Wilson, UCSF
	Immunocompromised hosts and transplant recipients	Peter Chin-Hong, UCSF
	Clinical diagnostics	Charles Chiu, UCSF
	Q & A	
2:20 pm	Policy	
	Reproductive health policy implications	Claire Brindis, UCSF
	Clinical systems	Adrienne Green, UCSF
	Ethics	Barbara Koenig, UCSF
	Economics	Stefano Bertozzi, UC Berkeley
	California Department of Public Health assessment of risk to the public health related to Zika	James Watt, California Department of Public Health
	Q & A	
3:25 pm	Concluding remarks	Richard Feachem, UCSF



Dr. Chris Barker is an epidemiologist in the Department of Pathology, Microbiology, and Immunology at the UC Davis School of Veterinary Medicine. He studies the epidemiology and ecology of mosquito-borne viruses, with an interest in the factors that affect the dynamics of disease, including those caused by West Nile, dengue, and recently chikungunya and Zika viruses.

Dr. Barker co-directs the surveillance laboratory at UC Davis that tests mosquitoes for viruses from across California. His research aims to improve our understanding of the mechanisms that drive virus transmission and to translate observable data into epidemiologically relevant risk estimates for human health.

Presently, Dr. Barker has a NASA-funded research project on the Zika virus vectors, *Aedes aegypti* and *Aedes albopictus*, and the threat that they pose in California and elsewhere in the US and Europe. He is particularly interested in research to inform public health policy, and he works closely with public health and mosquito control partners at local, state, and national levels.



Dr. Stefano M. Bertozzi is dean and professor of health policy and management at the UC Berkeley School of Public Health. Previously, he directed the HIV and tuberculosis programs at the Bill & Melinda Gates Foundation. He serves on the scientific advisory boards for the President's Emergency Plan for AIDS Relief, the National Institute of Health's Office of AIDS Research, and the World Health Organization's HIV Program.

Bertozzi worked at the Mexican National Institute of Public Health as director of its Center for Evaluation Research and Surveys and has also held positions with UNAIDS and the World Bank. He holds a bachelor's degree in biology and a PhD in health policy and management from the Massachusetts Institute of Technology. He earned his medical degree at UC San Diego, and trained in internal medicine at UCSF.



Colin F. Boyle, MBA, MPP, master of ceremonies, works with global health programs and other organizations to design effective strategies, develop investment cases, and improve operational performance. His work often addresses the interface of health care and private sector organizations, and seeks to find ways to leverage differences across organizations to improve the performance of markets and systems. Currently deputy director of UCSF Global Health Sciences, Mr. Boyle was previously a partner and managing director for The Boston Consulting Group, a leading global management consulting firm. In that role, he has advised a number of leading foundations, international organizations, corporations and non-profits. At UCSF, Mr. Boyle oversees new program development and administration for Global Health Sciences. He also is a member of the professional faculty at the Haas School of Business, where he teaches a graduate level course on the management of social ventures.



Dr. Claire D. Brindis is professor of pediatrics and health policy in the Departments of Pediatrics and Obstetrics, Gynecology and Reproductive Health Sciences at UCSF. She is the director of the Philip R. Lee Institute for Health Policy Studies, a director of the Bixby Center for Global Reproductive Health, and co-director of the Adolescent and Young Adult National Health Information Center.

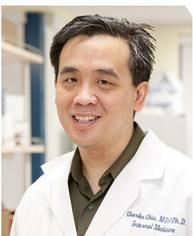
Incorporating a variety of quantitative and qualitative methodologies, Dr. Brindis' research focuses on the evaluation of reproductive health services, adolescent pregnancy prevention programs, and assessing care integration in the California safety net within the context of the Affordable Care Act. In the interface between research and public policy, Dr. Brindis is often called upon to help a variety of community groups; local, state, and the federal government; and international entities to translate research findings for purposes of policy planning and development of new program interventions.



Dr. Michael P. Busch is co-director of the Blood Systems Research Institute (BSRI) and senior vice president, Research and Scientific Affairs, of Blood Systems, Inc., a national network of over 30 blood centers across the United States. He is a professor of laboratory medicine at UCSF. Dr. Busch earned his MD and PhD at the University of Southern California in Los Angeles, and is board-certified in clinical pathology and blood banking/transfusion medicine. Dr. Busch's major research interests over the past 25 years have focused on transfusion medicine, including 1) the epidemiology, natural history, pathogenesis, and laboratory evaluation of transfusion-associated viral and parasitic infections, and 2) immunological consequences of allogeneic transfusion including graft-vs. host-disease, donor leukocyte clearance vs. proliferation, alloimmunization, and development of microchimerism and tolerance.



Dr. Peter Chin-Hong earned his undergraduate and medical degrees from Brown University, before completing an internal medicine residency and infectious diseases fellowship at UCSF, where he is professor of medicine. He directs the Pathways to Discovery Program in Clinical and Translational Research and the CTSI TL-1 training grant. He holds the Academy Endowed Chair for Innovation in Teaching. Clinically, Dr. Chin-Hong specializes in infectious diseases in immunocompromised hosts and directs the transplant and immunocompromised host infectious diseases service. He is the infectious diseases consultant for the regional organ procurement organization, Donor Network West, and a former member of the UNOS Donor Transmission Advisory Committee.



Dr. Charles Chiu is associate professor of medicine and laboratory medicine in the Division of Infectious Diseases at UCSF, director of the UCSF-Abbott Viral Diagnostics and Discovery Center (VDDC), and associate director of the UCSF Clinical Microbiology Laboratory. Dr. Chiu received an MD and a PhD in biophysics from UCLA, and trained at UCSF as a resident and clinical fellow in infectious diseases. He currently heads a translational research laboratory focused on clinical diagnostic next-generation sequencing assay development for infectious diseases and investigation of emerging pathogens, including *Borrelia burgdorferi*, Ebola virus, enterovirus D68,



and Zika virus. Dr. Chiu holds over 15 patents and patent applications, and serves on the scientific advisory board for Karius Diagnostics and Rubicon Genomics.

Sir Richard Feachem is director of the Global Health Group at UCSF Global Health Sciences and professor of global health at UCSF and UC Berkeley. He is also a visiting professor at London University and an honorary professor at the University of Queensland.

From 2002 to 2007, Sir Richard served as founding executive director of the Global Fund to Fight AIDS, Tuberculosis and Malaria and Under Secretary General of the United Nations. From 1995 until 1999, Dr. Feachem was director for Health, Nutrition and Population at the World Bank. Previously (1989–1995), he was dean of the London School of Hygiene and Tropical Medicine.

Dr. Feachem served on the Commission on Macroeconomics and Health, the Commission on HIV and Governance in Africa, the Commission on Investing in Health, and numerous other boards and committees. He has published extensively on epidemiology, public health, and health policy. In 2002 he was elected to membership in the US National Academy of Medicine.



Dr. Margaret Feeney is chief of the Division of Pediatric Infectious Diseases and Global Health at UCSF Benioff Children's Hospital. Dr. Feeney is a physician-scientist whose research interests center on the immunopathogenesis of HIV and malaria in childhood. Her laboratory is engaged in field-based translational research based on collaborations in Africa and the Caribbean, aimed at understanding how immunity to pathogens such as HIV and malaria develops during childhood and how vaccines and immunomodulatory therapies can best be designed to protect infants against these pathogens.



Dr. Susan Fisher is professor in the Departments of Obstetrics, Gynecology and Reproductive Sciences, and of Anatomy at the UCSF School of Medicine. She belongs to the Center for Reproductive Sciences and the Eli & Edythe Broad Center of Regeneration Medicine and Stem Cell Research. She directs the Human Embryonic Stem Cell Program and the Sandler-Moore Mass Spectrometry Core Facility. She received her PhD from the University of Kentucky, where she also completed a postdoctoral fellowship.

Dr. Fisher and her group have developed approaches for studying the human placenta that have advanced understanding of how this transient organ carries out its many remarkable functions during normal pregnancy. This work has enabled elucidation of the placental defects that are associated with common pregnancy complications, including preeclampsia and CMV infection. Her group also studies the earliest stages of human development. Their contributions include the discovery of a key step in implantation and new methods for deriving human embryonic stem cells. In parallel, they use mass spectrometry approaches to decipher elements of carbohydrate structures that bacteria use as receptors, and to compile proteomes in pursuit of disease biomarkers, including cancer and environmental exposures.

Dr. Fisher is an AAAS Fellow. Recent honors include the Pioneer Award in Reproductive Sciences and the Fundación IVI (Spain) Award for Research in Reproductive Medicine.



Dr. Adrienne Green is a clinical professor of medicine, chief medical officer for UCSF Medical Center, and vice president for Patient Safety and Accreditation for UCSF Health. She has been a hospitalist at UCSF since completing her residency and chief residency at Stanford in 1998, and assumed the role of Associate CMO in 2007, and Chief Medical Officer in January 2016.

Dr. Green provides physician oversight and leadership for patient safety, throughput, and many other operational and quality programs for the adult hospital and health system. She is the physician lead for UCSF's Transitions of Care and Post-Acute Strategies programs—leading a collaborative for the entire UC system that demonstrated a 3 percent reduction in readmissions in 2015, and developing five partnerships with Bay Area post-acute facilities to ensure high quality care across the continuum for UCSF patients.

In 2014 and 2015, Dr. Green led UCSF Health's response to the Ebola epidemic, including opening a Highly Infectious Care Unit that is a CDC designated facility. She is a board member of the Hospice by the Bay.



Dr. Sam Hawgood is chancellor of UCSF and holds the Arthur and Toni Rembe Rock Distinguished Professor appointment. Dr. Hawgood graduated from the University of Queensland in Australia in 1975. After graduation, he trained in pediatrics with a sub-specialty interest in neonatology in Australia. Dr. Hawgood moved to the Cardiovascular Research Institute at UCSF in 1982 to work with Drs. Tooley and Clements, pioneers in the discovery and therapeutic uses of pulmonary surfactant in premature babies. Dr. Hawgood served as division chief of Neonatology from 1994 to 2006, associate director of the CVRI since 1997, chair of Pediatrics and Physician-in-Chief of the UCSF Children's Hospital from 2003 to 2009, and Dean of the School of Medicine from 2009 to 2014. He was the president of the Society for Pediatric Research in 1999 and currently is a trustee of the International Pediatric Research Foundation.



Dr. Barbara A. Koenig is professor of Bioethics and Medical Anthropology based at the Institute for Health & Aging at UCSF. Currently, she co-directs an NHGRI "Center of Excellence in ELSI Research" that focuses on translational genomics, co-leads an NCI ROI on return of results in genomic biobanks, and directs the ELSI component of an NICHD award focused on newborn screening in an era of whole genome analysis. Dr. Koenig pioneered the use of empirical methods in the study of ethical questions in science, medicine, and health. Previously she was the founding executive director of the Center for Biomedical Ethics at Stanford University; she created and led the Biomedical Ethics Research Program at the Mayo Clinic in Rochester, Minnesota.



Dr. Desiree LaBeaud is an associate professor in the Division of Pediatric Infectious Diseases at Stanford University. Her research interests include infectious disease epidemiology, domestic and international arbovirology, and emerging infections. Since the early 2000s, she has devoted her efforts to better understanding the risk factors and long-term health consequences of arboviral infections, including Rift Valley fever, chikungunya, dengue, and Zika viruses. Currently, she has two large field projects ongoing in Kenya. As a physician-scientist, she splits her time between research and clinical pediatric infectious disease inpatient practice.

Her formal education includes a bachelor's degree in Biology (UC San Diego), medical degree (Medical College of Wisconsin), pediatric residency-International Health track (Rainbow Babies & Children's Hospital, CWRU), fellowship in pediatric infectious diseases (Rainbow Babies & Children's Hospital, CWRU), and master's degree in Clinical Research with a focus in epidemiology (CWRU).



Dr. Yvonne (Bonnie) A. Maldonado is professor, director of Global Child Health, chief, Division of Infectious Diseases, Department of Pediatrics, and senior associate dean for Faculty Development and Diversity at Stanford University School of Medicine. Dr. Maldonado attended Stanford University School of Medicine and completed a pediatric residency program and pediatric infectious diseases fellowship in the Department of Pediatrics at Johns Hopkins University. She was an epidemic intelligence service officer at the Centers for Disease Control and Prevention prior to joining the faculty at Stanford University. She has led several NIH, CDC, WHO, and Gates funded domestic and international pediatric vaccine studies, and studies in prevention and treatment of perinatal HIV infection in the US, Mexico, and Africa. She is currently the vice-chair of the American Academy of Pediatrics Committee on Infectious Diseases and a member of the National Vaccine Advisory Committee.

She is co-editor of the textbook *Infectious Diseases of the Fetus and Newborn Infant* and the American Academy of Pediatrics *Red Book*.



Dr. John Marshall is an assistant professor in the Divisions of Biostatistics and Epidemiology at the School of Public Health at UC Berkeley. His research focuses on mathematical modeling in epidemiology, with a particular interest in malaria elimination strategies and novel mosquito control strategies, including the use of genetically modified (GM) mosquitoes. He teaches courses on mathematical modeling of infectious diseases.

He was formerly a member of the malaria modeling group at Imperial College London where he conducted research on the impact of human movement on malaria transmission, and of the Hay lab at Caltech where he conducted research on gene drive systems for mosquitoes. Prior to that, he conducted surveys of public attitudes to GM mosquitoes for malaria control in Mali, and has contributed to

dialogue regarding their international regulatory issues. He received a PhD in biomathematics from UCLA in 2008.



Dr. Alex Pollen is a Damon Runyon Postdoctoral Fellow in Arnold Kriegstein's lab at UCSF studying the development and evolution of the human cerebral cortex. Pollen's recent work has highlighted molecular distinctions between human neural stem cell populations, suggesting a mechanism for primate brain expansion. Previously, he collaborated with Tom Nowakowski and scientists at Fluidigm to develop approaches for single cell genomics. As a graduate student in David Kingsley's lab at Stanford, Pollen identified key mutations that contribute to the expansion of the human brain and the evolution of other human traits.



Dr. George Rutherford is the Salvatore Pablo Lucia Professor of Epidemiology, Preventive Medicine, Pediatrics and History; head of the Division of Infectious Disease Epidemiology, and vice chair of the Department of Epidemiology and Biostatistics at UCSF. Educated at Stanford University and Duke University School of Medicine, he is board certified in pediatrics and general preventive medicine and public health. He has worked primarily in public health, with an emphasis on the epidemiology and control of communicable diseases, both domestically and internationally. His academic interests focus on the epidemiology and control of infectious diseases of public health importance, and more specifically on HIV infection in low- and middle-income countries. He is principal investigator of a group of cooperative agreements with CDC to support its Center for Global Health and works on projects in Brazil, Croatia, the Dominican Republic, the Eastern Caribbean, Ghana, Haiti, Iran, Kenya, Mozambique, Namibia, Rwanda, South Africa, Tanzania, Uganda, Ukraine, Vietnam, and Zambia.

Dr. Rutherford serves as an advisor to the World Health Organization, UNAIDS, and the Global Fund; is the past chair of the American Academy of Pediatrics Section on Epidemiology; and was the first chair of the Department of Veterans Affairs Research Advisory Council. He has served on the Institute of Medicine's Board on the Health of Select Populations and has chaired Institute of Medicine committees on traumatic brain injury in Iraq and the readjustment needs of military personnel and reservists returning from Iraq and Afghanistan and their families.



Dr. Kirsten Salmeen is a clinical assistant professor in the Department of Obstetrics, Gynecology & Reproductive Sciences, Division of Maternal-Fetal Medicine at UCSF. She is a clinical perinatologist and the medical director of Outpatient Obstetrical Services. Her clinical practice includes work in the UCSF Obstetrics & Perinatal Medicine Specialty Clinics, Prenatal Diagnostic Center, Fetal Treatment Center, and Labor & Delivery. Her clinical areas of interest include shared decision-making, patient counseling, and management of medically complex pregnancies. She completed her medical education and Obstetrics & Gynecology residency at the University of Michigan and her Maternal-Fetal Medicine fellowship at UCSF.



Dr. Jaime Sepulveda, the Haile T. Debas Distinguished Professor of Global Health, is the executive director of Global Health Sciences, at UCSF. Before joining UCSF, Sepulveda was a member of the Foundation Leadership Team at the Bill & Melinda Gates Foundation. Sepulveda worked for more than 20 years in a variety of senior health posts in the Mexican government, as the vice-minister of Health, director of the National Institutes of Health and dean of the National School of Public Health. Sepulveda holds a medical degree from National Autonomous University of Mexico, and two master's degrees and a doctorate degree from Harvard University. He served on the Harvard Board of Overseers and is a member of the National Academy of Medicine and fellow of the Academy of Arts and Sciences.



Dr. Mary E. Wilson is visiting professor of Epidemiology and Biostatistics, School of Medicine, UCSF and adjunct professor of Global Health and Population, Harvard. Her academic interests include the ecology of infections and emergence of microbial threats, travel medicine, and vaccines. She has served on the Advisory Committee on Immunization Practices (ACIP) of the CDC, the Academic Advisory Committee for the National Institute of Public Health in Mexico, and on five committees for the Institute of Medicine (National Academy of Medicine). She serves on several editorial boards and is an associate editor for *NEJM Journal Watch Infectious Diseases*. She is the author of *A World Guide to Infections: Diseases, Distribution, Diagnosis* (Oxford University Press, New York); senior editor of *Disease in*



Evolution: Global Changes and Emergence of Infectious Diseases (New York Academy of Sciences); and editor of *New and Emerging Infectious Diseases* (Medical Clinics of North America).

Dr. Michael Wilson is an assistant professor in the Department of Neurology and the Division of Multiple Sclerosis and Neuroinflammation at UCSF. He completed medical school at UCSF and residency at the Harvard Neurology Residency Program at Massachusetts General Hospital and Brigham and Women's Hospital. He did a neurovirology post-doctoral fellowship at MGH and Boston University's National Emerging Infectious Diseases Laboratories from 2011 to 2013 before joining Dr. Joseph DeRisi's lab at UCSF. There he applies pathogen and antibody discovery techniques to samples from patients with undiagnosed causes of meningitis and encephalitis.



Dr. James Watt received his medical degree at UC San Diego and an MPH at UC Berkeley. He completed a pediatric residency at Oakland Children's Hospital and a preventive medicine residency with the California Department of Public Health. He also served as an epidemic intelligence service officer with the Centers for Disease Control and Prevention in Atlanta. Following his training he spent five years on the faculty of the Johns Hopkins Bloomberg School of Public Health where his research focus was on vaccine preventable diseases in developing country settings. For the past 10 years he has worked at the California Department of Public Health, where he is currently chief of the Division of Communicable Disease Control.

Preparedness for the Zika Virus: A Public Health Emergency is sponsored by UCSF Benioff Children's Hospitals and convened by UCSF Global Health Sciences.

UC San Francisco (UCSF) is a leading university dedicated to promoting health worldwide through advanced biomedical research, graduate-level education in the life sciences and health professions, and excellence in patient care. It includes top-ranked graduate schools of dentistry, medicine, nursing, and pharmacy; a graduate division with nationally renowned programs in basic, biomedical, translational, and population sciences; a preeminent biomedical research enterprise; and Global Health Sciences (GHS).

Through interdisciplinary education, service, and research programs, GHS harnesses UCSF's scientific strengths to train leaders in global health and develop solutions to today's most pressing health challenges. GHS faculty, staff, and students are on the cutting edge of research, treatment, public health practice, and policy development in more than 50 countries and partner with academic centers, international organizations, ministries of health, and private industries to improve the health of vulnerable populations around the world.

UCSF also includes UCSF Medical Center and UCSF Benioff Children's Hospitals and other partner and affiliated hospitals and healthcare providers throughout the Bay Area. UCSF Benioff Children's Hospitals create an environment where children and their families find compassionate care at the forefront of scientific discovery, with more than 150 experts in 50 medical specialties serving patients throughout Northern California and beyond.