



# 2016 CHARLES C. SHEPARD SCIENCE AWARDS

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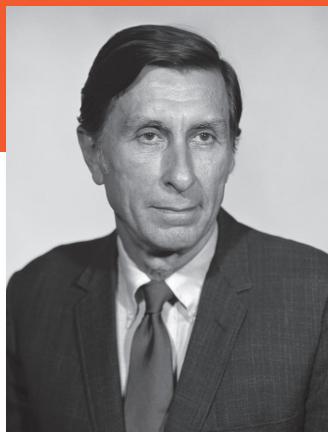
GLOBAL CHILD SURVIVAL:  
CHALLENGES & OPPORTUNITIES



JUNE 8, 2016  
10:00 A.M.

**Keynote Speaker:**  
Zulfiqar A. Bhutta  
PhD, MBBS, FRCPCH, FAAP





# CHARLES C. SHEPARD

The preeminent science awards of CDC/ATSDR, inaugurated in 1986, are named in honor of Charles C. Shepard, MD, the internationally recognized microbiologist who was chief of the Leprosy and Rickettsia Branch at CDC for more than 30 years, until his death on February 18, 1985.

Charles Carter Shepard was born in Ord, Nebraska, on December 18, 1914. He attended Stanford University (1932–1935) and then transferred to Northwestern University, where he received BS, MS, and MD degrees. In 1941, he joined the Commissioned Corps of the Public Health Service. From 1942 through 1948, he worked at the National Institutes of Health (NIH) in Bethesda, Maryland.

While on sabbatical during 1948 through 1949, he worked in the laboratory of Arne Tiselius in Uppsala, Sweden, and learned the new physical separation techniques that would revolutionize immunology and biochemistry. He returned to Bethesda for a year before moving to the Rocky Mountain Laboratory, National Institute of Allergy and Infectious Diseases, NIH, in Hamilton, Montana, to study various pathogenic bacteria and their phages at the biochemical and ultrastructural levels. In 1953 he came to CDC, where he continued his outstanding work with rickettsiae and began his distinguished and definitive experiments with mycobacteria, culminating in the cultivation of the leprosy bacillus, *Mycobacterium leprae*, in mice. His landmark article, "The Experimental Disease that Follows the Injection of Human Leprosy Bacilli into Foot-Pads of Mice" (*Journal of Experimental Medicine* 1960;112:445–454), is still considered a classic in microbiology. His achievement made possible the large-scale evaluation of antibiotic efficacy and reduced testing time from several years to only months. It also paved the way for leprosy vaccine studies.

Dr. Shepard made significant early contributions to the diagnosis, natural history, and epidemiology of Rocky Mountain spotted fever; Q fever; and scrub, murine, and epidemic typhus. He was also codiscoverer (with Joseph McDade) of the Legionnaires' disease bacterium (*Legionella pneumophila*) after the now famous outbreak of virulent pneumonia in Philadelphia in 1976.

Dr. Shepard received numerous awards, among them the Gorgas Medal (1962), the Kimble Methodology Award (1962), the Philip R. Edwards Award (1964), the World Leprosy Day Award (1970), and the first CDC Medal of Excellence (1977). He also received the HEW Distinguished Service Medal (1978), the Raol Folleraux Award (1978), and the Richard and Hinda Rosenthal Award (1979). He was active in multiple professional organizations, including the Armed Forces Epidemiologic Board Commission on Rickettsial Diseases; the WHO Immunology of Leprosy Program; the WHO Advisory Panel on Leprosy; the Heiser Program for Research in Leprosy; and the Leprosy Research Council, which he chaired. He was also involved in many editorial activities, having served on the board of directors of the *International Journal of Leprosy* and as a frequent reviewer for numerous prestigious journals.

Although Dr. Shepard's contributions to science and public health were prodigious, perhaps his greatest legacy is the influence he has had on the CDC scientists who have followed in his footsteps and have continued to find inspiration in the scientific integrity and excellence he has come to represent.



# AWARDS PROGRAM

June 8, 2016, 10:00 a.m. to 11:30 a.m.

Tom Harkin Global Communications Center  
Building 19, Alexander D. Langmuir Auditorium  
CDC Roybal Campus  
1600 Clifton Road, Atlanta, Georgia

*Introductory Remarks*

Sam Posner, PhD

*Introduction of Keynote Speaker*

Thomas R. Frieden, MD, MPH

*"Global Child Survival: Challenges and Opportunities"*

Zulfiqar A. Bhutta, PhD, MBBS, FRCPCH, FAAP

*Presentation of the 2016 Charles C. Shepard Science Awards*

Ron Otten, PhD

*Assessment*

*Data Methods and Study Design*

*Laboratory Science*

*Prevention and Control*

*Lifetime Scientific Achievement*

*Closing*

Ron Otten, PhD

*All guests and CDC and ATSDR staff are invited to the  
reception honoring the award nominees.*



# KEYNOTE SPEAKER'S BIOGRAPHY

**Zulfiqar A. Bhutta, PhD**, is the Robert Harding Inaugural Chair in global child health at the Hospital for Sick Children, Toronto; co-director of the SickKids Center for Global Child Health; and the founding director of the Center of Excellence

in Women and Child Health at the Aga Khan University. He also holds adjunct professorships at several leading universities, including the schools of public health at Johns Hopkins University, Tufts University, University of Alberta, and the London School of Hygiene & Tropical Medicine. He is a designated distinguished national professor of the government of Pakistan and was the founding chair of the National Research Ethics Committee of the government of Pakistan during 2003–2014. Dr. Bhutta was a member of the independent expert review group appointed by the UN secretary general for monitoring global progress in maternal and child health millennium development goals (2011–2015). He represented the global academic and research organizations on the Global Alliance for Vaccines and Immunizations board, was the co-chair of the Global Countdown for 2015 steering group (2006–2016), and is the co-chair of the Maternal and Child Health Oversight Committee of World Health Organization Eastern Mediterranean Region. Dr. Bhutta also is the chairman of the Coalition of Centers in Global Child Health, based at the Hospital for Sick Children, Toronto.

Dr. Bhutta was educated at the University of Peshawar (MBBS) and obtained his PhD from the Karolinska Institute, Sweden. He is a fellow of the Royal College of Physicians (Edinburgh and London), the Royal College of Paediatrics and Child Health (London), American Academy of Pediatrics, and the Pakistan Academy of Sciences. He heads a large research team in Pakistan working on maternal, newborn, and child survival and global and regional nutrition. He has served as a member of the Global Advisory Committee for Health Research for the World Health Organization, the Board of Child and Health and Nutrition Initiative of the Global Forum for Health Research, and the steering committees



of the International Zinc and Vitamin A Nutrition consultative groups. He was a founding board member of the Global Partnership for Maternal, Newborn and Child Health. He is a board member of the International Center for Diarrheal Diseases Research. He was a member of the WHO Strategic Advisory Committee for Vaccines (2010–2015), the Advisory Committee for Health Research of the WHO Eastern Mediterranean Region, and a co-chair of its Regional Committee for Maternal and Child Health. He is a former president of the Commonwealth Association of Paediatric Gastroenterology and Nutrition and the Federation of Asia-Oceania Perinatal Societies. Now, as the president-elect of the International Pediatric Association (2016–2019), he is a leading voice for health professionals supporting integrated maternal, newborn, and child health globally.

Dr. Bhutta is on several international editorial advisory boards including *The Lancet*, *The BMJ*, *PLoS Medicine*, *PLoS ONE*, *BMC Public Health*, and the Cochrane ARI group. He has published 8 books, 75 book chapters, and more than 600 indexed publications to date, including 110 in *The Lancet*, alone. He was a leading member of major *Lancet* series on child survival (2003), newborn survival (2005), undernutrition (2008), primary care (2008), stillbirths (2011), Pakistan (2013), childhood diarrhea and pneumonia (2013), maternal and child undernutrition (2013), every newborn (2014), and stillbirths (2016). He has won several awards, including the *Tamgha-i-Imtiaz* (Medal of Excellence) by the president of Pakistan for contributions toward education and research (2000), the president of Pakistan Gold Medal for contributions to child health in Pakistan (2004), and the Outstanding Pediatrician of Asia Award by the Asia Pacific Pediatric Association (2006). He is the first dual recipient of the Aga Khan University Distinguished Faculty Award for Research (2005) and Award of Distinction (2012). Dr Bhutta was awarded the inaugural Programme for Global Pediatric Research Award for outstanding contributions to global child health (2009) and the Kenneth Warren Prize for the best systematic review of community-based interventions by the Cochrane collaboration in 2011. Dr Bhutta was awarded the Global Advocacy Prize by the Royal College of Paediatrics & Child Health in 2012,

the American Academy of Pediatrics' Sam Fomon Award for lifetime contributions to nutrition research (2014), the WHO Dogramaci Family Health Award (2014), and the inaugural TUBA Academy of Sciences Award for global contributions to health and life sciences (2015).

Dr Bhutta's research interests include newborn and child survival, maternal and child undernutrition, and micronutrient deficiencies. He leads large research groups based in Toronto, Karachi, and Nairobi, with a special interest in research synthesis, scaling up evidence-based interventions in community settings, and implementation research in health systems research. In particular, his work with community health workers and outreach services has influenced integrated maternal and newborn outreach programs for marginalized populations around the world. His group's work with WHO and the Partnership for Maternal, Newborn & Child Health in developing consensus-based essential interventions for women, children, and adolescents is the dominant set of agreed-upon interventions guiding global health policy.





# PUBLICATION AWARD NOMINEES

Nominated by the Centers for Disease Control and Prevention and the Agency for Toxic Substances and Disease Registry (CDC/ATSDR) for the 2016 Charles C. Shepard Science Awards

The nominated articles were judged on scientific merit and the significance of their effect on the mission of CDC/ATSDR. Following is a complete citation and brief description of each article, listed by category and in alphabetical order by the first author's last name.

## Assessment

Rachel L. Bailey, Jean M. Cox-Ganser, Matthew G. Duling, Ryan F. LeBouf, Stephen B. Martin, Jr., Toni A. Bledsoe, Brett J. Green, and Kathleen Kreiss

### **Respiratory Morbidity in a Coffee Processing Workplace with Sentinel Obliterative Bronchiolitis Cases**

*American Journal of Industrial Medicine* 2015;58(12):1235–1245

Unroasted (green) coffee is one of the most traded agricultural commodities in the world, and there are an estimated 1,200 coffee roasters in the United States alone. The authors found that respiratory health risks related to the roasting of unflavored coffee has broad public health implications. They suggest that many other coffee roasting workers, even those who do not add flavoring chemicals to coffee, are at risk for occupational lung disease.

Stephen J. Blumberg, Benjamin Zablotsky, Rosa M. Avila,  
Lisa J. Colpe, Beverly A. Pringle, and Michael D. Kogan

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**Diagnosis Lost: Differences Between Children Who Had and Who Currently Have an Autism Spectrum Disorder Diagnosis**

*Autism: The International Journal of Research and Practice* 2015; doi:  
10.1177/1362361315607724

CDC's strategic plans include enhancing surveillance and research for autism and other developmental disabilities to monitor changes in prevalence and contributing risk factors, and better informing prevention policy and programs. This paper suggests autism spectrum disorder (ASD) diagnoses sometimes change due to misdiagnosis, maturation, or treatment. The authors showed that misdiagnosis of ASD was more common than expected and that diagnoses are not necessarily accurate or permanent.

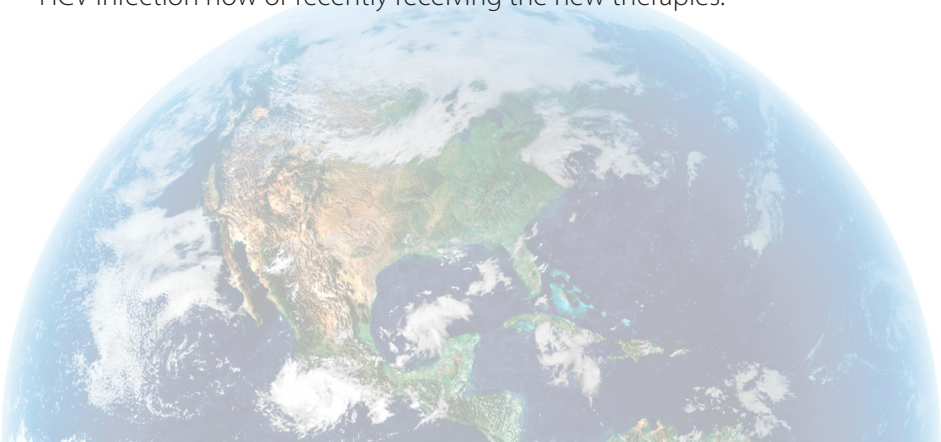
Lauren A. Canary, R. Monina Klevens, and Scott D. Holmberg

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**Limited Access to New Hepatitis C Virus Treatment Under State Medicaid Programs**

*Annals of Internal Medicine* 2015;163(3):226–228

This paper encouraged the Center for Medicare and Medicaid Services to issue a letter to recipient state Medicaid offices about the need to eliminate barriers to treatment for hepatitis C (HCV) infection. Because of this letter and the falling cost of therapy, many state Medicaid offices have reduced or eliminated restrictions to receiving HCV-related care and treatment. This has resulted in many thousands of Medicaid patients with HCV infection now or recently receiving the new therapies.



J. Peter Cegielski, Ekaterina Kurbatova, Martie van der Walt, Jeannette Brand, Julia Ershova, Thelma Tupasi, Janice Campos Caoili, Tracy Dalton, Carmen Contreras, Martin Yagui, Jaime Bayona, Charlotte Kvasnovsky, Vaira Leimane, Liga Kuksa, Michael P. Chen, Laura E. Via, Soo Hee Hwang, Melanie Wolfgang, Grigory V. Volchenkov, Tatiana Somova, Sarah E. Smith, Somsak Akksilp, Wanpen Wattanaamornkiet, Hee Jin Kim, Chang-ki Kim, Boris Y. Kazenny, Tatiana Khorosheva, Kai Kliiman, Piret Viiklepp, Ruwen Jou, Angela Song-En Huang, Irina A. Vasilyeva, and Olga V. Demikhova, on behalf of the Global PETTS Investigators

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### **Multidrug-Resistant Tuberculosis Treatment Outcomes in Relation to Treatment and Initial Versus Acquired Second-Line Drug Resistance**

*Clinical Infectious Diseases* 2016;62(4):418–430

This study showed the extent of drug resistance and effective chemotherapy with treatment outcomes of patients with multidrug-resistant (MDR) tuberculosis (TB). The results quantified many aspects of prevailing thinking about MDR TB that had not been well quantified to date. The sample size was large enough to determine the effects of individual drugs and drug resistance patterns.

Luenda E. Charles, Cecil M. Burchfiel, Khachatur Sarkisian, Shengqiao Li, Diane B. Miller, Ja K. Gu, Desta Fekedulegn, John M. Violanti, and Michael E. Andrew

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### **Leptin, Adiponectin, and Heart Rate Variability Among Police Officers**

*American Journal of Human Biology* 2015;27(2):184–191

This study investigated the relationship between the levels of the hormone leptin and the protein adiponectin with heart rate variability (HRV) among police officers. The authors found that high leptin levels are associated with low HRV, a biomarker of dysfunction of the autonomic nervous system. The inverse association between leptin and HRV was stronger among officers with higher levels of obesity.

Mary J. Choi, Montserrat Torremorell, Jeff B. Bender, Kirk Smith, David Boxrud, Jon R. Ertl, My Yang, Kamol Suwannakarn, Duachi Her, Jennifer Nguyen, Timothy M. Uyeki, Min Levine, Stephen Lindstrom, Jacqueline M. Katz, Michael Jhung, Sara Vetter, Karen K. Wong, Srinand Sreevatsan, and Ruth Lynfield

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**Live Animal Markets in Minnesota: A Potential Source for Emergence of Novel Influenza A Viruses and Interspecies Transmission**

*Clinical Infectious Diseases* 2015;61(9):1355–1362

Using active surveillance of people, swine, and the environment (air and surfaces) over 12 weeks, this paper characterized influenza A viruses (IAVs) in live animal markets in the United States. The study found that IAVs of swine origin were highly prevalent among swine and were readily isolated from environmental samples, especially air, providing evidence that air might be an important IAV transmission route among swine and from swine to people.

Jennifer R. Cope, Raoult C. Ratard, Vincent R. Hill, Theresa Sokol, Jonathan Jake Causey, Jonathan S. Yoder, Gayatri Mirani, Bonnie Mull, Kimberly A. Mukerjee, Jothikumar Narayanan, Meggie Doucet, Yvonne Qvarnstrom, Charla N. Poole, Olugbenga A. Akingbola, Jana M. Ritter, Zhenggong Xiong, Alexandre J. da Silva, Dawn Roellig, Russell B. Van Dyke, Harlan Stern, Lihua Xiao, and Michael J. Beach

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**The First Association of a Primary Amebic Meningoencephalitis Death with Culturable *Naegleria fowleri* in Tap Water from a U.S. Treated Public Drinking Water System**

*Clinical Infectious Diseases* 2015;60(8):e36–42

This paper describes the first association of a primary amebic meningoencephalitis (PAM) death with a treated public drinking water system in the United States. *Naegleria fowleri*, the cause of PAM, is a climate-sensitive, free-living amoeba found in fresh water. In this investigation, *Naegleria* was found in the treated Louisiana public drinking water that supplied the case-patient's home. Its presence in public drinking water has emerged as an indicator of climate change.

Robert D. Daniels, Stephen Bertke, Matthew M. Dahm, James H. Yiin, Travis L. Kubale, Thomas R. Hales, Dalsu Baris, Shelia H. Zahm, James J. Beaumont, Kathleen M. Waters, and Lynne E. Pinkerton

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**Exposure-response Relationships for Select Cancer and Non-cancer Health Outcomes in a Cohort of U.S. Firefighters from San Francisco, Chicago, and Philadelphia (1950–2009)**

*Occupational and Environmental Medicine* 2015;72(10):699–706

Firefighting is a high-risk profession. But little is known about latent chronic illnesses related to firefighting. Firefighters are potentially exposed to a number of human carcinogens, but the risk for cancer in the fire service remains poorly understood. This study examined cancer among career firefighters. The authors hope to clarify the relationship between occupational exposures and cancer risk, which would benefit future cancer prevention methods and ultimately reduce cancer among firefighters.

Kenneth W. Fent, Douglas E. Evans, Donald Booher, Joachim D. Pleil, Matthew A. Stiegel, Gavin P. Horn, and James Dalton

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**Volatile Organic Compounds Off-gassing from Firefighters' Personal Protective Equipment Ensembles after Use**

*Journal of Occupational and Environmental Hygiene* 2015;12(6):404–414

This study measured the extent to which a variety of volatile organic compounds will give off harmful gases from firefighters' protective suits after they fight a fire. The authors found that firefighters may inhale these gases under a variety of circumstances. Given the potential of repeated exposure during a work shift, firefighters should minimize their exposures to these chemicals.

David S. Freedman, Hannah G. Lawman, Asheley C. Skinner,  
Lisa C. McGuire, David B. Allison, and Cynthia L. Ogden

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**Validity of the WHO Cutoffs for Biologically Implausible Values of Weight, Height, and BMI in Children and Adolescents in NHANES from 1999 through 2012**

*The American Journal of Clinical Nutrition* 2015;102(5):1000–1006

For more than 10 years, the computer programs developed by CDC have used cut-points suggested by WHO to identify implausible values of weight, height, and body-mass index. These extreme values are frequently excluded from analyses. Based on maximum values observed in the National Health and Nutrition Examination Survey, the authors were able to propose new, more accurate cut-points that are relevant for research, surveillance, and program evaluation.

T. W. Hennessy, Dana Bruden, Louisa Castrodale, Ken Komatsu,  
Laura M. Erhart, D. Thompson, K. Bradley, Daniel R. O’Leary,  
J. McLaughlin, Michael Landen, and the Investigative Team

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**A Case-control Study of Risk Factors for Death from 2009 Pandemic Influenza A(H1N1): Is American Indian Racial Status an Independent Risk Factor?**

*Epidemiology and Infection* 2016;144(2):315–324

Health disparities among American Indians and Alaska Natives (AI/AN) are well documented. The 2009 influenza A pandemic saw a four-fold increase in deaths among those populations but did not explain why. The authors collaborated with state, federal, and tribal partners to investigate the risk factors for the increased mortality. They found that AI/AN racial status was not an independent risk factor for influenza death and that their risk factors were similar to those of the overall population.





Julia S. Holmes, Anne K. Driscoll, and Melonie Heron

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**Mortality Among U.S.-born and Immigrant Hispanics in the U.S.: Effects of Nativity, Duration of Residence, and Age at Immigration**

*International Journal of Public Health* 2015;60(5):609–617

The authors compare death statistics of Hispanic immigrants to U.S.-born Hispanics (who are more likely to exhibit poorer health and mortality than foreign-born Hispanics). The study found that Hispanics who immigrated during adulthood are more likely to retain the customs, language, and behaviors of their culture of origin. As such, age at immigration, rather than duration of residence, drives differences in mortality between Hispanic immigrants and the U.S.-born Hispanic population.

Maho Imanishi, Janell A. Routh, Marigny Klaber, Weidong Gu, Michelle S. Vanselow, Kelly A. Jackson, Loretta Sullivan-Chang, Gretchen Heinrichs, Neena Jain, Bernadette Albanese, William M. Callaghan, Barbara E. Mahon, and Benjamin J. Silk

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**Estimating the Attack Rate of Pregnancy-Associated Listeriosis During a Large Outbreak**

*Infectious Diseases in Obstetrics and Gynecology* 2015; doi: 10.1155/2015/201479

About 1 in 7 *Listeria monocytogenes* (*Lm*) infections affects a pregnant woman or newborn, often leading to miscarriage or severe neonatal disease. A multistate outbreak of listeriosis in Colorado raised concerns that pregnant women might have been exposed to *Lm*. The American College of Obstetricians and Gynecologists recommended no testing or treatment for pregnant women who showed no symptoms during a *Listeria* outbreak. The study supports this opinion and provides guidelines on managing *Lm* exposure.

Seema Jain, Wesley H. Self, Richard G. Wunderink, Sherene Fakhran, Robert Balk, Anna M. Bramley, Carrie Reed, Carlos G. Grijalva, Evan J. Anderson, D. Mark Courtney, James D. Chappell, Chao Qi, Eric M. Hart, Frank Carroll, Christopher Trabue, Helen K. Donnelly, Derek J. Williams, Yuwei Zhu, Sandra R. Arnold, Krow Ampofo, Grant W. Waterer, Min Levine, Stephen Lindstrom, Jonas M. Winchell, Jacqueline M. Katz, Dean Erdman, Eileen Schneider, Lauri A. Hicks, Jonathan A. McCullers, Andrew T. Pavia, Kathryn M. Edwards, and Lyn Finelli, for the CDC EPIC Study Team

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### **Community-acquired Pneumonia Requiring Hospitalization Among U.S. Adults**

*The New England Journal of Medicine* 2015;373(5):415–427

Pneumonia is a leading cause of hospitalization and death among adults in the United States. During the past two decades, vaccination has led to dramatic reductions in pneumonia through herd immunity. This study describes the causes and incidence of adult pneumonia and illustrates the importance and burden of viral pneumonia, especially among the elderly. The authors' data suggest that expanding the coverage of influenza and pneumococcal vaccines could reduce the burden of pneumonia among adults.

Sarah Kidd, Akbar Zaidi, Lenore Asbel, Tamara Baldwin, Beau Gratzler, Sarah Guerry, Roxanne P. Kerani, Preeti Pathela, Kevin Pettus, Olusegun O. Soge, Ali Stirland, and Hillard S. Weinstock

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### **Comparison of Antimicrobial Susceptibilities of Pharyngeal, Rectal, and Urethral *Neisseria gonorrhoeae* Isolates Among Men Who Have Sex with Men**

*Antimicrobial Agents and Chemotherapy* 2015;59(5):2588–2595

CDC has identified antimicrobial-resistant gonorrhea as one of the top three urgent public health threats. Surveillance of emerging resistance is critical to prevention and control efforts. This paper provides information on the epidemiology of resistant gonorrhea and informs national treatment recommendations. The authors describe the antimicrobial susceptibilities of urethral, rectal, and pharyngeal types of the disease obtained from men who have sex with men and determine whether antimicrobial susceptibilities differ according to anatomic site.

Ola Landgren, Youn K. Shim, Joel Michalek, Rene Costello, Debra Burton, Norma Ketchum, Katherine R. Calvo, Neil Caporaso, Elizabeth Raveche, Dan Middleton, Gerald Marti, and Robert F. Vogt, Jr.

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**Agent Orange Exposure and Monoclonal Gammopathy of Undetermined Significance: An Operation Ranch Hand Veteran Cohort Study**

*JAMA Oncology* 2015;1(8):1061–1068

This paper compared the presence and characteristics of an abnormal protein in the blood of Vietnam War veterans exposed to the herbicide Agent Orange with the blood of unexposed veterans. Findings from other case-control studies linking environmental chemicals with certain cancers found in white blood cells have been limited by inadequate exposure assessments, small sample sizes, and short follow-up periods. The authors found the abnormal protein was much more common among veterans exposed to Agent Orange.

Maribeth C. Lovegrove, Nina J. Weidle, and Daniel S. Budnitz

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**Trends in Emergency Department Visits for Unsupervised Pediatric Medication Exposures, 2004–2013**

*Pediatrics* 2015;136(4):e821–829

Despite the requirement for child-resistant packaging on nearly all medicines in the United States, in 2010 more than 75,000 children under age 6 were taken to emergency rooms after they swallowed medicines. This study demonstrates that related emergency room visits can be reduced and identifies targets for continued prevention efforts. The authors also found that using flow-restrictors on just four over-the-counter medicines greatly reduces accidental overdoses among young children.

Karin A. Mack, Kun Zhang, Leonard Paulozzi, and Christopher Jones

**Prescription Practices Involving Opioid Analgesics Among Americans with Medicaid, 2010**

*Journal of Health Care for the Poor and Underserved* 2015;26(1):182–198

Drug overdose is the leading cause of injury death in the United States. This study used complex measures to examine potentially risky prescribing in 2.2 million opioid prescriptions among Medicaid enrollees. The authors compiled an index of measures to describe potential misuse or inappropriate prescribing. They found that a quarter of patients had an indicator of potential misuse of opioids, and 16% had two or more indicators of potential inappropriate use.

Robert G. McMurray, Nancy F. Butte, Scott E. Crouter, Stewart G. Trost, Karin A. Pfeiffer, David R. Bassett, Maurice R. Puyau, David Berrigan, Kathleen B. Watson, and Janet E. Fulton, for the CDC/NCI/NCCOR Research Group on Energy Expenditure in Children

**Exploring Metrics to Express Energy Expenditure of Physical Activity in Youth**

*PloS One* 2015;10(6):e0130869

Measures of physical activity are not standardized. Resources needed to measure oxygen use during physical activity are not feasible for measuring energy expenditure in large groups of people. This study pooled data from independent sites to compare approaches across a range of activities of varying intensities. The data may be useful for describing physical activity patterns of the population and developing tailored programs to increase activity or achieve energy balance.



Claire M. Midgley, John T. Watson, W. Allan Nix, Aaron T. Curns, Shannon L. Rogers, Betty A. Brown, Craig Conover, Samuel R. Dominguez, Daniel R. Feikin, Samantha Gray, Ferdaus Hassan, Stacey Hoferka, Mary Anne Jackson, Daniel Johnson, Eyal Leshem, Lisa Miller, Janell Bezdek Nichols, Ann-Christine Nyquist, Emily Obringer, Ajanta Patel, Megan Patel, Brian Rha, Eileen Schneider, Jennifer E. Schuster, Rangaraj Selvarangan, Jane F. Seward, George Turabelidze, M. Steven Oberste, Mark A. Pallansch, and Susan I. Gerber, for the EV-D68 Working Group

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**Severe Respiratory Illness Associated with a Nationwide Outbreak of Enterovirus D68 in the USA (2014): A Descriptive Epidemiological Investigation**

*The Lancet Respiratory Medicine* 2015;3(11):879–887

Before the 2014 outbreak in the United States, Enterovirus D68 had been rarely investigated. Characterizations were limited to case studies or small clusters. The 2014 outbreak was unprecedented in geographical spread, affecting children in 49 states. It provided an excellent opportunity for a detailed virus characterization. The authors were able to show that severe respiratory illness was associated with a history of asthma or reactive airway disease.

Alexandra M. Oster, Joel O. Wertheim, Angela L. Hernandez, Marie Cheryl Bañez Ocfemia, Neeraja Saduvala, and H. Irene Hall

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**Using Molecular HIV Surveillance Data to Understand Transmission Between Subpopulations in the United States**

*Journal of Acquired Immune Deficiency Syndromes* 2015;70(4):444–451

The authors analyzed HIV genetic sequence data collected through routine HIV surveillance to characterize a national HIV transmission network. The study explored HIV transmission between demographic and risk groups and analyzed HIV genetic sequence data to guide prevention strategies. It also laid the groundwork for identifying pockets of active transmission for public health action and advancing understanding of HIV transmission in the United States.

Lijing Ouyang, Julie Bolen, Rodolfo Valdez, David Joseph, Michelle A. Baum, and Judy Thibadeau

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**Characteristics and Survival of Patients with End Stage Renal Disease and Spina Bifida in the United States Renal Data System**

*The Journal of Urology* 2015;193(2):558–564

This study used the United States Renal Data System to describe the demographic and clinical characteristics, treatments, and probability of survival of patients with spina bifida whose health status was complicated by the development of end-stage renal disease. The authors found that the prospects of undergoing a kidney transplant are significantly lower for patients with spina bifida than for their peers without the disease, even though the survival rates of both groups were comparable.

Ana Penman-Aguilar, Makram Talih, David Huang, Ramal Moonesinghe, Karen Bouye, and Gloria Beckles

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**Measurement of Health Disparities, Health Inequities, and Social Determinants of Health to Support the Advancement of Health Equity**

*Journal of Public Health Management and Practice* 2016;22 Suppl 1:S33–S42

Reduction of health disparities and advancement of health equity in the United States require high-quality data that shine a light on the nation's health equity, as well as proper analytic tools to facilitate accurate interpretation of these data. The authors provide an overview of health equity and social determinants of health and recommend improvements for measuring health disparities, health inequities, and social determinants of health at the national level to support the advancement of health equity.





Thomas A. Peterman, John Su, Kyle T. Bernstein, and Hillard Weinstock

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### **Syphilis in the United States: On the Rise?**

*Expert Review of Anti-Infective Therapy* 2015;13(2):161–168

This paper examines reported primary and secondary syphilis data from 50 years in the United States to characterize the changing epidemiology of syphilis from the 1960s to the increases in disease associated with crack cocaine in the 1980s, declines during the AIDS epidemic of the 1990s, and resurgence of syphilis among men who have sex with men in the early 2000s. The authors discuss the interventions tried, those that worked better, and how prevention is informed by past lessons.

Mateusz M. Plucinski, Timothée Guilavogui, Sidibe Sidikiba, Nouman Diakit , Souleymane Diakit , Mohamed Dioubat , Ibrahima Bah, Ian Hennessee, Jessica K. Butts, Eric S. Halsey, Peter D. McElroy, S. Patrick Kachur, Jamila Aboulhab, Richard James, and Moussa Keita

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### **Effect of the Ebola-virus-disease Epidemic on Malaria Case Management in Guinea, 2014: A Cross-sectional Survey of Health Facilities**

*The Lancet Infectious Diseases* 2015;15(9):1017–1023

This study found that indirect effects of the Ebola epidemic have outweighed direct, Ebola-specific sickness and death and sparked debate about secondary, long-lasting effects of the epidemic on health systems in affected countries. By illustrating how extensively the Ebola epidemic had disrupted malaria care delivery, Guinea’s health ministry was able to advocate for resources to maintain or reestablish critical non-Ebola activities and prioritize resource allocation during the epidemic.

Mona Saraiya, Elizabeth R. Unger, Trevor D. Thompson, Charles F. Lynch, Brenda Y. Hernandez, Christopher W. Lyu, Martin Steinau, Meg Watson, Edward J. Wilkinson, Claudia Hopenhayn, Glenn Copeland, Wendy Cozen, Edward S. Peters, Youjie Huang, Maria Sibug Saber, Sean Altekruise, Marc T. Goodman, and the HPV Typing of Cancers Workgroup

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**U.S. Assessment of HPV Types in Cancers: Implications for Current and 9-valent HPV Vaccines**

*Journal of the National Cancer Institute* 2015;107(6):djv086

This study shows the feasibility of using cancer registries to assess the potential impact of human papillomavirus (HPV) vaccines on cancers in the United States, where a nationwide health registry does not exist. The authors used data from seven cancer registries to obtain archival tissue for cancers diagnosed from 1993 to 2005. HPV testing was performed on 2,670 representative patients. Findings will be used to estimate the number of cancers preventable through HPV vaccination.

Karen R. Siegel, Kai McKeever Bullard, Mohammed K. Ali, Aryeh D. Stein, Henry S. Kahn, Neil K. Mehta, Amy Webb Girard, K. M. Venkat Narayan, and Giuseppina Imperatore

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**The Contribution of Subsidized Food Commodities to Total Energy Intake Among U.S. Adults**

*Public Health Nutrition* 2016;19(8):1348–1357

Using information from three federal databases, the authors estimated the proportion of individual energy intake from foods receiving the largest subsidies from 1995 to 2010 (corn, soy beans, wheat, rice, sorghum, dairy, and livestock). Going beyond the investigation of calorie pathways, this method can be used to demonstrate connections between agricultural policies and various indices of health risk. The authors examined the association between the Subsidy Score with obesity, belly fat, and high cholesterol.

Steven A. Sumner, Louis H. Marcelin, Toni Cela, James A. Mercy, Veronica Lea, Howard Kress, and Susan D. Hillis

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**Sentinel Events Predicting Later Unwanted Sex Among Girls:  
A National Survey in Haiti, 2012**

*Child Abuse & Neglect* 2015;50:49–55

Preventing sexual violence depends on identifying those at risk for abuse. This study investigates sentinel events in a child's life—episodes of unwanted sexual touching or attempted sex—and their ability to predict later unwanted penetrative sex. Characteristics, timing, and help-seeking behavior surrounding sentinel events were examined to guide efforts to prevent and respond to violence in Haiti. The paper also discusses gaps in understanding sexual violence prevention in other international settings.

Suzanne R. Todd, F. Scott Dahlgren, Marc S. Traeger, Eugenio D. Beltr'an-Aguilar, Donald W. Marianos, Charlene Hamilton, Jennifer H. McQuiston, and Joanna J. Regan

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**No Visible Dental Staining in Children Treated with Doxycycline  
for Suspected Rocky Mountain Spotted Fever**

*The Journal of Pediatrics* 2015;166(5):1246–1251

Rocky Mountain spotted fever (RMSF) is a severe tickborne illness that is fatal in up to 30% of untreated cases. Early treatment with tetracycline antibiotics prevents death, but other antibiotics are not effective. This paper evaluated whether dental staining occurred among children who had received doxycycline for treatment of RMSF. The assessment showed no evidence of tooth discoloration and has both national and global implications for improving the treatment of children with life-threatening rickettsial infections.

Adam S. Vaughan, Harrison Quick, Elizabeth B. Pathak, Michael R. Kramer, and Michele Casper

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**Disparities in Temporal and Geographic Patterns of Declining Heart Disease Mortality by Race and Sex in the United States, 1973–2010**

*Journal of the American Heart Association* 2015;4(12):e002567

Heart disease death rates have declined substantially in the United States during the past 50 years. This study examined county-level patterns in the timing of declines in heart disease deaths by race and sex. Using complex statistical methods, the authors document racial and geographic disparities in the magnitude and timing of declining county-level heart disease deaths from 1973 through 2010.

Susanna N. Visser, Rebecca H. Bitsko, Melissa L. Danielson, Reem M. Ghandour, Stephen J. Blumberg, Laura A. Schieve, Joseph R. Holbrook, Mark L. Wolraich, and Steven P. Cuffe

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**Treatment of Attention Deficit/Hyperactivity Disorder Among Children with Special Health Care Needs**

*The Journal of Pediatrics* 2015;166(6):1423–1430

This study described the parent-reported frequency of treatments for attention deficit/hyperactivity disorder (ADHD) in a national sample of children with special needs, and compares ADHD treatment with American Academy of Pediatrics guidelines. The authors examined ADHD data and associated health service use and key demographic characteristics and extended the agency's commitment to characterize the changing epidemiology of ADHD and its treatment in the United States.



Xiaohui Zhuo, Ping Zhang, Henry S. Kahn, Barbara H. Bardenheier, Rui Li, and Edward W. Gregg

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### **Change in Medical Spending Attributable to Diabetes: National Data from 1987 to 2011**

*Diabetes Care* 2015;38(4):581–587

While the number of diabetes patients has doubled in the past 2 decades, the complexity of diabetes care has also increased, but the effects of treatment changes on national spending on diabetes remain unclear. This study examined the use of different methods of diabetes care and their effect on national expenditures in the United States. Findings suggest a doubling in per-person medical spending attributable to diabetes, supporting the need for better prevention efforts.

## **Data Methods and Study Design**

James Baggs, Kimberly Yousey-Hindes, Elizabeth Dodds Ashley, James Meek, Ghinwa Dumyati, Jessica Cohen, Matthew E. Wise, L. Clifford McDonald, and Fernanda C. Lessa

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### **Identification of Population at Risk for Future *Clostridium difficile* Infection Following Hospital Discharge to Be Targeted for Vaccine Trials**

*Vaccine* 2015;33(46):6241–6249

The authors developed a unique data set drawing from several complex sources suitable for creating and validating an infection-prediction tool, and then developed an analytic approach that used these data to develop a risk-prediction tool that could provide greater efficiency when testing a vaccine against *Clostridium difficile* infection. Vaccine manufacturers can use this method to find a higher-risk population where effectiveness can be tested, decreasing the number of patients needed in trials.

Thu-Ha Dinh, Kevin P. Delaney, Ameena Goga, Debra Jackson, Carl Lombard, Selamawit Woldesenbet, Mary Mogashoa, Yogan Pillay, and Nathan Shaffer

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### **Impact of Maternal HIV Seroconversion During Pregnancy on Early Mother-to-Child Transmission of (MTCT) HIV Measured at 4–8 Weeks Postpartum in South Africa 2011–2012: A National Population-Based Evaluation**

*PloS One* 2015;10(5):e0125525

This study measured HIV acquisition during pregnancy and its effect on mother-to-child transmission. Using a mobile phone-based data collection system, a representative sample of mother-infant pairs was compiled that measured maternal HIV antibody in infant blood that can be used to identify and distinguish undiagnosed and incident HIV infection in mothers. The study also determined the distribution and timing of maternal infection and the implications of this timing for guidelines for retesting women for HIV late in pregnancy.

Jacquelyn Mason, William Wheeler, and Mary Jean Brown

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### **The Economic Burden of Exposure to Secondhand Smoke for Child and Adult Never Smokers Residing in U.S. Public Housing**

*Public Health Reports* 2015;130(3):230–244

This paper uses nationally-representative and large-scale data to estimate the impact of secondhand smoke exposures in vulnerable populations who have never engaged in smoking. Results suggest that smoke-free policies in U.S. public housing can reduce secondhand-smoke-related sickness and death among residents who have never smoked, resulting in societal savings of between \$183 million and \$267 million annually.



Roque Miramontes, Andrew N. Hill, Rachel S. Yelk Woodruff, Lauren A. Lambert, Thomas R. Navin, Kenneth G. Castro, and Philip A. LoBue

**Tuberculosis Infection in the United States: Prevalence Estimates from the National Health and Nutrition Examination Survey, 2011–2012**

*PLoS One* 2015;10(11):e0140881

Tuberculosis is nationally notifiable, but latent TB infections are not reported to CDC. NHANES results confirm the need to test for latent TB infection in high-risk populations. Because an estimated 86% of newly developed TB cases occur as a result of reactivation among persons with latent TB infection rather than transmission from an infectious case, this study's findings highlight the importance of national prevalence surveys and targeted testing and treatment of latent TB infection in high-risk populations.

Latetia V. Moore, Kevin W. Dodd, Frances E. Thompson, Kirsten A. Grimm, Sonia A. Kim, and Kelley S. Scanlon

**Using Behavioral Risk Factor Surveillance System Data to Estimate the Percentage of the Population Meeting U.S. Department of Agriculture Food Patterns Fruit and Vegetable Intake Recommendations**

*American Journal of Epidemiology* 2015;181(12):979–988

This paper reports on the development of a new way to estimate percentages of each state's population who eat the recommended amounts of fruits and vegetables and applies that method to the Behavioral Risk Factor Surveillance System to help states better interpret and use their fruit and vegetable dietary surveillance data. The method highlighted that nationwide fruit and vegetable consumption is low compared to what people should be eating.

Carrie Reed, Sandra S. Chaves, Pam Daily Kirley, Ruth Emerson, Deborah Aragon, Emily B. Hancock, Lisa Butler, Joan Baumbach, Gary Hollick, Nancy M. Bennett, Matthew R. Laidler, Ann Thomas, Martin I. Meltzer, and Lyn Finelli

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### **Estimating Influenza Disease Burden from Population-Based Surveillance Data in the United States**

*PloS One* 2015;10(3):e0118369

The underdetection of influenza hospitalizations and deaths has been recognized for decades. Surveillance for influenza does not count every case, which would be prohibitive with millions of influenza cases each year. This paper describes new methods to characterize the underdetection in influenza surveillance data and adjusts to produce estimates of influenza disease costs that are calculated during and shortly after an influenza season to keep public health decision makers and the public informed about the costs of influenza.

Jennita Reefhuis, Owen Devine, Jan M. Friedman, Carol Louik, and Margaret A. Honein

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### **Specific SSRIs and Birth Defects: Bayesian Analysis to Interpret New Data in the Context of Previous Reports**

*The BMJ* 2015;351:h3190

The association between selective serotonin reuptake inhibitor (SSRI) use during early pregnancy and birth defects has long been debated. This paper combined summaries in a meta-analysis with new data from the largest case-control study of birth defects in the United States. Potential bias in the analysis results due to missing information was evaluated using new Bayesian methods. Incorporation of prior knowledge and adjustment for missing data provides a more robust estimate of the association between specific SSRIs and birth defects.



Jarad M. Schiffer, Ligong Chen, Shannon Dalton, Nancy A. Niemuth, Carol L. Sabourin, and Conrad P. Quinn

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**Bridging Non-Human Primate Correlates of Protection to Reassess the Anthrax Vaccine Adsorbed Booster Schedule in Humans**

*Vaccine* 2015;33(31):3709–3716

This study identifies evidence of immunity in animals and applies predictive models to humans for anthrax vaccine that have been used to demonstrate the effectiveness of reduced booster schedules. Findings suggest reduced booster schedules are highly protective and could reduce the cost of vaccination on recipients and improve mass vaccination programs. The authors establish a basis for instituting improvements in the use of anthrax vaccine in the United States.

Jacek Skarbinski, Eli Rosenberg, Gabriela Paz-Bailey, H. Irene Hall, Charles E. Rose, Abigail H. Viall, Jennifer L. Fagan, Amy Lansky, and Jonathan H. Mermin

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**Human Immunodeficiency Virus Transmission at Each Step of the Care Continuum in the United States**

*JAMA Internal Medicine* 2015;175(4):588–596

Preventing HIV transmission is the key to stopping the HIV epidemic, but understanding and quantifying HIV transmission to help guide prevention programs has been challenging. In this paper, the authors integrated data from three national HIV surveillance systems within a modeling framework and estimated transmissions at different stages in the HIV care continuum. The framework created for this initial analysis serves to answer questions about HIV prevention in the United States.

Adam S. Vaughan, Michael R. Kramer, Lance A. Waller, Linda J. Schieb, Sophia Greer, and Michele Casper

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**Comparing Methods of Measuring Geographic Patterns in Temporal Trends: An Application to County-Level Heart Disease Mortality in the United States, 1973 to 2010**

*Annals of Epidemiology* 2015;25(5):329–335

Analytical and computing advances have increased the numbers of methods and tools available to quantify disease trends. This paper quantified county-level heart disease death rate trends from 1973 to 2010 using four regression-based models. These models estimate summaries of changing rates using software and methods accessible to many in public health. The authors describe features of these four methods and compare the resulting estimates of county-level percentage change in heart disease death rates.

Chia-Yih Wang, Alicia L. Carriquiry, Te-Ching Chen, Catherine M. Loria, Christine M. Pfeiffer, Kiang Liu, Christopher T. Sempos, Cria G. Perrine, and Mary E. Cogswell

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**Estimating the Population Distribution of Usual 24-hour Sodium Excretion from Timed Urine Void Specimens Using a Statistical Approach Accounting for Correlated Measurement Errors**

*The Journal of Nutrition* 2015;145(5):1017–1024

Federal and private-sector efforts to reduce sodium consumption require a feasible and accurate way to monitor intake across the population. This study developed a way to more accurately estimate sodium consumption from two urine samples taken over 24 hours. The new method also yields population percentile estimates and adjusts more for measurement error. The method may provide a low-cost alternative to monitoring population sodium intake and distribution and have significant public health impact.



Matthew W. Wheeler, Kan Shao, and A. John Bailer

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### **Quantile Benchmark Dose Estimation for Continuous Endpoints**

*Environmetrics* 2015;26(5):363–372

Benchmark dose analysis characterizes dose-response relationships using mathematical models. But, continuous measures, such as changes in body weight, lung function, and blood chemistry values are difficult to quantify using benchmark dose models. This paper offers an approach to risk assessment for continuous health effects data using quantile regression, expanding the range of health endpoints that can be modeled for risk assessment. It will allow scientists to more accurately quantify the risk of chemical and other workplace and environmental hazards.

Hong Zhou, Howard Burkom, Carla Winston, Achintya Dey,  
and Umed Ajani

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### **Practical Comparison of Aberration Detection Algorithms for Biosurveillance Systems**

*Journal of Biomedical Informatics* 2015;doi: 10.1016/j.jbi.2015.08.023

One of the challenges of public health syndromic surveillance systems is to identify events of interest from “background noise” in surveillance data routinely collected from electronic health records or other data sources. Such systems require anomaly detection methods to identify disease outbreaks and health effects of hazardous conditions and other public health threats. This study examined the performance of a range of statistical methods for anomaly detection in national rather than regional data.

## Laboratory Science

B. Boylan, A. S. Rice, A. L. Dunn, M. D. Tarantino, D. B. Brettler, J. C. Barrett, and C. H. Miller, for the Hemophilia Inhibitor Research Study Investigators

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### **Characterization of the Anti-Factor VIII Immunoglobulin Profile in Patients with Hemophilia A by use of a Fluorescence-Based Immunoassay**

*Journal of Thrombosis and Haemostasis* 2015;13(1):47–53

This paper describes a new way to detect antibodies against products used to treat or prevent bleeding in patients with hemophilia A. The study describes the composition of the antibody response in the largest group of hemophilia patients studied to date. The work demonstrates the clinical relevance of anti-FVIII antibody subtypes by evaluating the correlation between fluorescence immunoassay results and those obtained with the traditional clotting assay.

David S. Campo, Guo-Liang Xia, Zoya Dimitrova, Yulin Lin, Joseph C. Forbi, Lilia Ganova-Raeva, Lili Punkova, Sumathi Ramachandran, Hong Thai, Pavel Skums, Seth Sims, Inna Rytsareva, Gilberto Vaughan, Ha-Jung Roh, Michael A. Purdy, Amanda Sue, and Yury Khudyakov

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### **Accurate Genetic Detection of Hepatitis C Virus Transmissions in Outbreak Settings**

*The Journal of Infectious Diseases* 2016;213(6):957–965

This paper describes how the authors developed and validated a simple approach for molecular detection of hepatitis C transmissions in outbreak settings. The new approach compared Hamming distances among samples belonging to the same outbreak with those without links, to establish a minimal Hamming distance for which samples could be accurately linked. The approach improves public health agencies' ability to effectively control hepatitis C.



Samantha L. Isenberg, Melissa D. Carter, Leigh Ann Graham, Thomas P. Mathews, Darryl Johnson, Jerry D. Thomas, James L. Pirkle, and Rudolph C. Johnson

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### **Quantification of Metabolites for Assessing Human Exposure to Soapberry Toxins Hypoglycin A and Methylene cyclopropylglycine**

*Chemical Research in Toxicology* 2015;28(9):1753–1759

This paper identifies the cause of acute encephalitis syndrome (AES) outbreaks in Muzaffarpur, India, in 2013 and 2014. Initially, diseases or pesticides were believed to cause the outbreaks, but a hypothesis surfaced in 2014 that a toxin in litchi fruit called methylenecyclopropylglycine (MCPG) was the cause. The authors identified two urine biomarkers for exposure assessment to the toxins MCPG and hypoglycin A. This was the first time hypoglycin A was discovered as a cause of AES.

Elena R. Kisin, Naveena Yanamala, Mariana T. Farcas, Dmitriy W. Gutkin, Michael R. Shurin, Valerian E. Kagan, Aleksandar D. Bugarski, and Anna A. Shvedova

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### **Abnormalities in the Male Reproductive System After Exposure to Diesel and Biodiesel Blend**

*Environmental and Molecular Mutagenesis* 2015;56(2):265–276

Diesel-powered equipment is broadly used in mining, construction, railroad, and transportation industries. Although exposure to diesel exhaust has been reported to disrupt male reproductive function, whether biodiesel blends would help or worsen these responses was unknown. Using an animal model, the authors showed that exposure to the blend BD50 caused more harm to the male reproductive system than the regular diesel fuel D100.

Zsuzsanna Kuklenyik, Michael Gardner, Bryan Parks, David Schieltz, Jon Rees, Lisa McWilliams, Yulanda Williamson, James Pirkle, and John Barr

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**Multivariate DoE Optimization of Asymmetric Flow Field Flow Fractionation Coupled to Quantitative LC-MS/MS for Analysis of Lipoprotein Subclasses**

*Chromatography* 2015;2(1):96–117

This study presents a new way to measure the size of lipoprotein particles (e.g., size fractions of high- and low-density lipoproteins) that has a unique combination of very good size resolution, minimal chance of altering lipoprotein structure, and the most extensive characterization to date of lipids and apolipoproteins that are known or likely risk factors for cardiovascular disease.

Jie Liu, Caroline Ochieng, Steve Wiersma, Ute Ströher, Jonathan S. Towner, Shannon Whitmer, Stuart T. Nichol, Christopher C. Moore, Gilbert J. Kersh, Cecilia Kato, Christopher Sexton, Jeannine Petersen, Robert Massung, Christine Hercik, John A. Crump, Gibson Kibiki, Athanasia Maro, Buliga Mujaga, Jean Gratz, Shevin T. Jacob, Patrick Banura, W. Michael Scheld, Bonventure Juma, Clayton O. Onyango, Joel M. Montgomery, Eric Houpt, and Barry Fields

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**Development of a TaqMan Array Card for Acute-Febrile-Illness Outbreak Investigation and Surveillance of Emerging Pathogens, Including Ebola Virus**

*Journal of Clinical Microbiology* 2016;54(1):49–58

This paper describes the development, validation, and deployment of a multiple pathogen assay capable of simultaneously detecting 26 pathogens associated with acute febrile illness in sub-Saharan Africa from up to eight patient specimens. Currently, diagnostics for these 26 pathogens are unrelated and require extensive resources. Also, the diagnostics require large numbers of patient specimens. This Taqman Array Card simplifies specimen processing and can provide results within 2.5 hours.

Henju Marjuki, Vasily P. Mishin, Anton P. Chesnokov, Joyce Jones, Juan A. De La Cruz, Katrina Sleeman, Daisuke Tamura, Ha T. Nguyen, Ho-Sheng Wu, Feng-Yee Chang, Ming-Tsan Liu, Alicia M. Fry, Nancy J. Cox, Julie M. Villanueva, Charles T. Davis, and Larisa V. Gubareva

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**Characterization of Drug-Resistant Influenza A(H7N9) Variants Isolated from an Oseltamivir-Treated Patient in Taiwan**

*The Journal of Infectious Diseases* 2015;211(2):249–257

This study of influenza A (H7N9) virus isolated from a drug-treated patient in Taiwan uncovered several novel virus variants that showed resistance to the neuraminidase inhibitor class of drugs. The study not only provided information on the genetic markers of drug resistance for this novel virus, but also characterized the variant viruses in an animal model that highlighted the potential risk posed by its drug-resistant variants.

Nikki B. Marshall, Ewa Lukomska, Carrie M. Long, Michael L. Kashon, Douglas D. Sharpnack, Ajay P. Nayak, Katie L. Anderson, B. Jean Meade, and Stacey E. Anderson

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**Triclosan Induces Thymic Stromal Lymphopoietin in Skin Promoting Th2 Allergic Responses**

*Toxicological Sciences* 2015;147(1):127–139

The antimicrobial chemical triclosan used in soaps, toothpastes, clothing, shoes, kitchen utensils, and medical supplies has been associated with asthma and rhinitis. Although triclosan itself is not allergenic, the authors found that repeated application of triclosan to the skin can increase immune responses in the respiratory tract during exposure to an allergen. This paper identified a mechanism for how exposure to an antimicrobial chemical like triclosan boosts allergic immune responses.

Susan E. Maslanka, Carolina Lúquez, Janet K. Dykes, William H. Tepp, Christina L. Pier, Sabine Pellett, Brian H. Raphael, Suzanne R. Kalb, John R. Barr, Agam Rao, and Eric A. Johnson

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**A Novel Botulinum Neurotoxin, Previously Reported as Serotype H, Has a Hybrid-Like Structure with Regions of Similarity to the Structures of Serotypes A and F and is Neutralized with Serotype A Antitoxin**

*The Journal of Infectious Diseases* 2016;213(3):379–385

The botulism neurotoxin has seven known serotypes (A through G). This paper describes the characterization of a novel botulinum neurotoxin previously reported in 2013 as the first new serotype (H) in more than 40 years. But results show the toxin is actually a hybrid of serotypes A and F, and its toxic effects can be treated with existing serotype A antibody, including the licensed heptavalent antibody product available in the Strategic National Stockpile.

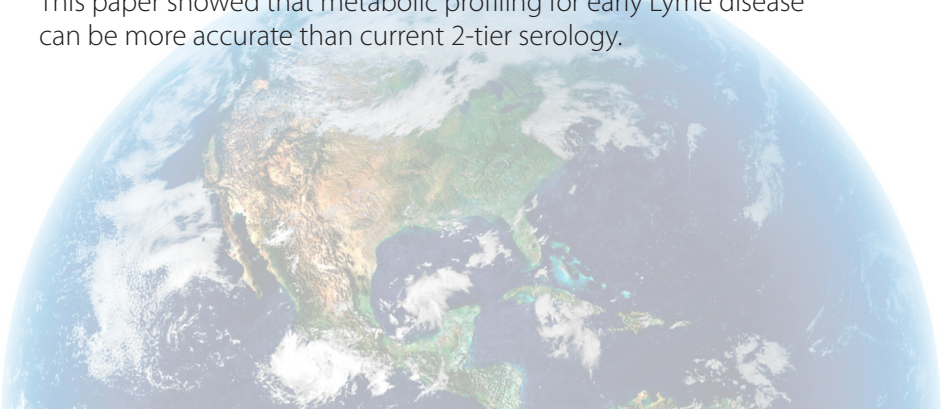
Claudia R. Molins, Laura V. Ashton, Gary P. Wormser, Ann M. Hess, Mark J. Delorey, Sebabrata Mahapatra, Martin E. Schriefer, and John T. Belisle

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**Development of a Metabolic Biosignature for Detection of Early Lyme Disease**

*Clinical Infectious Diseases* 2015;60(12):1767–1775

Early Lyme disease patients often visit a clinic before developing a detectable antibody response to *Borrelia burgdorferi*, the cause. The lack of an accurate laboratory test for early Lyme disease complicates treatment and underscores the need for new diagnostic approaches. This paper showed that metabolic profiling for early Lyme disease can be more accurate than current 2-tier serology.



Atis Muehlenbachs, Julu Bhatnagar, Carlos A. Agudelo, Alicia Hidron, Mark L. Eberhard, Blaine A. Mathison, Michael A. Frace, Akira Ito, Maureen G. Metcalfe, Dominique C. Rollin, Govinda S. Visvesvara, Cau D. Pham, Tara L. Jones, Patricia W. Greer, Alejandro Vélez Hoyos, Peter D. Olson, Lucy R. Diazgranados, and Sherif R. Zaki

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**Malignant Transformation of *Hymenolepis nana* in a Human Host**

*The New England Journal of Medicine* 2015;373(19):1845–1852

This paper reports on the first known case of a person becoming infected with cancer cells that arose in a parasite, the tapeworm *Hymenolepis nana*. The authors performed more than a dozen tests before detecting tapeworm DNA via polymerase chain reaction. The study suggests a path for research about how cells may depart from normal development and become cancerous.

Jessica Radzio, William Spreen, Yun Lan Yueh, James Mitchell, Leecresia Jenkins, J. Gerardo García-Lerma, and Walid Heneine

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**The Long-Acting Integrase Inhibitor GSK744 Protects Macaques from Repeated Intravaginal SHIV Challenge**

*Science Translational Medicine* 2015;7(270):270ra5

Pre-exposure prophylaxis (PrEP) is effective in preventing HIV infection in men and women, but many find a daily pill schedule challenging and do not fully benefit from PrEP. This study evaluated a form of PrEP that does not depend on daily dosing but uses an injectable long-acting antiretroviral drug that provides sustained drug delivery for weeks. The innovative long-acting drug formulation of GSK-744 and its effectiveness may pave the way for a new era of HIV prevention.

Neil M. Vora, Yu Li, Marika Geleishvili, Ginny L. Emerson, Ekaterine Khmaladze, Giorgi Maghlakelidze, Archil Navdarashvili, Khatuna Zakhshvili, Maka Kokhraidze, Marina Endeladze, Gela Mokverashvili, P. S. Satheshkumar, Nadia Gallardo-Romero, Cynthia S. Goldsmith, Maureen G. Metcalfe, Inger Damon, Edmond F. Maes, Mary G. Reynolds, Juliette Morgan, and Darin S. Carroll

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**Human Infection with a Zoonotic Orthopoxvirus in the Country of Georgia**

*The New England Journal of Medicine* 2015;372(13):1223–1230

Researchers detected anti-orthopoxvirus from blood samples from two index patients and confirmed the presence of orthopoxvirus, but later assays for cowpox and vaccinia viruses were negative. Researchers determined that this new virus is a close relative of the remaining Old World orthopoxviruses. The virus was cultured, examined via electron microscopy, and named the Akhmeta virus for the region where it was identified. Findings suggest this new virus might not be isolated in a particular region of Georgia.

Eric J. Zaccone, W. Travis Goldsmith, Michael J. Shimko, J. R. Wells, Diane Schwegler-Berry, Patsy A. Willard, Shannon L. Case, Janet A. Thompson, and Jeffrey S. Fedan

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**Diacetyl and 2,3-Pentanedione Exposure of Human Cultured Airway Epithelial Cells: Ion Transport Effects and Metabolism of Butter Flavoring Agents**

*Toxicology and Applied Pharmacology* 2015;289(3):542–549

This paper investigates the effects of popcorn butter flavorings on ion transport in human airway epithelial cells. Ion transport in the airways is critical for maintaining fluid balance on the surface of epithelial cells. The authors designed an apparatus to expose epithelial cells to butter flavorings. In the future, the apparatus will be useful for investigating the metabolism of inhaled chemicals and drugs by epithelium, as well as the effects of any gas, vapor, or particulate on epithelial ion transport.

## Prevention and Control

Abhijeet Anand, K. Zaman, Concepción F. Estivariz, Mohammad Yunus, Howard E. Gary, William C. Weldon, Tajul I. Bari, M. Steven Oberste, Steven G. Wassilak, Stephen P. Luby, James D. Heffelfinger, and Mark A. Pallansch

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### **Early Priming with Inactivated Poliovirus Vaccine (IPV) and Intradermal Fractional Dose IPV Administered by a Microneedle Device: A Randomized Controlled Trial**

*Vaccine* 2015;33(48):6816–6822

This trial investigated options for introducing type 2 inactivated polio vaccine (IPV) in the polio program globally, including early vaccination with IPV. Also, this trial investigated the effectiveness of reduced-dose injections compared with full-dose IPV. Findings showed the inferior ability of intradermal reduced-dose IPV to provoke an immune response, compared with full-dose IPV.

Andrew F. Auld, Harrison Kamiru, Charles Azih, Andrew L. Baughman, Harriet Nuwagaba-Biribonwoha, Peter Ehrenkranz, Simon Agolory, Ruben Sahabo, Tedd V. Ellerbrock, Velephi Okello, and George Bicego

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### **Implementation and Operational Research: Evaluation of Swaziland's Hub-and-Spoke Model for Decentralizing Access to Antiretroviral Therapy Services**

*Journal of Acquired Immune Deficiency Syndromes* 2015;69(1):e1–e12

In 2007, Swaziland initiated a hub-and-spoke model for decentralizing antiretroviral therapy (ART) access. Decentralization was achieved by redirecting patients from overburdened central facilities (hubs) to clinics (spokes) to start their therapy there. The study showed that decentralization of ART services, important for expanding capacity to enroll new patients on ART, can also reduce the loss of patients to attrition.



Edward Coffield, Allison J. Nihiser, Bettylou Sherry, and  
Christina D. Economos

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**Shape Up Somerville: Change in Parent Body Mass Indexes  
During a Child-Targeted, Community-Based Environmental  
Change Intervention**

*American Journal of Public Health* 2015;105(2):e83–e89

Because parental involvement in health promotion and disease prevention programs focused on children is crucial for success, effects may spill over to parent behaviors. The authors tested this idea in the Shape Up Somerville study, a community-based study focused on altering children's environments to prevent and reduce obesity. Findings suggest parents exposed to the intervention along with their children had decreased BMIs over the course of intervention compared with parents of children in the control communities.

Concepción F. Estivariz, Abhijeet Anand, Howard E. Gary, Jr.,  
Mahmudur Rahman, Jannatul Islam, Tajul I. Bari, Steven  
G. F. Wassilak, Susan Y. Chu, William C. Weldon, Mark A. Pallansch,  
James D. Heffelfinger, Stephen P. Luby, and Khalequ Zaman

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**Immunogenicity of Three Doses of Bivalent, Trivalent, or Type  
1 Monovalent Oral Poliovirus Vaccines with a 2-Week Interval  
Between Doses in Bangladesh: An Open-Label, Non-Inferiority,  
Randomised, Controlled Trial**

*The Lancet Infectious Diseases* 2015;15(8):898–904

This study showed that giving infants three doses of certain oral polio vaccines with an accelerated schedule induced the same immune response as giving three doses with the usual 4-week interval. The authors also found that administering oral vaccines at short intervals can be safe and effective. The study opens research options for short schedules to improve the efficiency of delivering several doses of other oral vaccines when short schedules may be important.

Hongwei Hsiao, Jennifer Whitestone, Michael Wilbur, J. Roger Lackore, and J. Gordon Routley

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**Seat and Seatbelt Accommodation in Fire Apparatus:  
Anthropometric Aspects**

*Applied Ergonomics* 2015;51:137–151

This study developed body dimension information of U.S. firefighters and specifications for improved seating and seatbelt fit for the firefighting workforce while encumbered with protective clothing and personal gear in riding fire apparatus. The results are critical for fire apparatus manufacturers and standards committees to improve firefighter seat designs and seatbelt usage compliance for firefighter and fire-truck safety.

Caroline C. King, Athena P. Kourtis, Deborah Persaud, Julie A. E. Nelson, Carrie Ziemniak, Michael G. Hudgens, Gerald Tegha, Charles S. Chasela, Denise J. Jamieson, and Charles M. van der Horst

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**Delayed HIV Detection Among Infants Exposed to Postnatal  
Antiretroviral Prophylaxis During Breastfeeding**

*AIDS* 2015;29(15):1953–1961

The authors detected extremely low HIV DNA concentrations in infants who became infected with HIV via breastfeeding while on maternal or infant antiretroviral prophylaxis up to 31 weeks before detection by conventional assays. Prophylaxis may suppress infection enough to escape detection, but not prevent infection, suggesting that additional or intensified approaches may be needed to prevent HIV transmissions to infants.

Yecai Liu, Drew L. Posey, Martin S. Cetron, and John A. Painter

**Effect of a Culture-Based Screening Algorithm on Tuberculosis Incidence in Immigrants and Refugees Bound for the United States: A Population-Based Cross-Sectional Study**

*Annals of Internal Medicine* 2015;162(6):420–428

This study was based on growing evidence that foreign-born persons account for the highest percentage of TB cases in the United States and other industrialized nations. The authors examined a new screening algorithm shown to reduce the number of new tuberculosis cases among foreign-born newcomers arriving in the United States. Findings justify expanding TB screening to other long-term visa applicants to the United States.

Tim McAfee, Kevin C. Davis, Paul Shafer, Deesha Patel, Robert Alexander, and Rebecca Bunnell

**Increasing the Dose of Television Advertising in a National Anti-smoking Media Campaign: Results from a Randomised Field Trial**

*Tobacco Control* 2015; doi:10.1136/tobaccocontrol-2015-052517

This study quantified the effectiveness of increased exposure to a national tobacco education campaign using field-based randomization at the media market level. Results suggested a higher proportion of quit attempts in markets that received higher doses of advertising. This effect was especially pronounced among African Americans and those with chronic conditions. Findings can help guide health organizations in planning media campaigns to reduce tobacco use and the negative health and economic outcomes.



Lucy A. McNamara, Alice M. Shumate, Peter Johnsen, Jessica R. MacNeil, Manisha Patel, Tina Bhavsar, Amanda C. Cohn, Jill Dinitz-Sklar, Jonathan Duffy, Janet Finnie, Denise Garon, Robert Hary, Fang Hu, Hajime Kamiya, Hye-Joo Kim, John Kolligian, Jr., Janet Neglia, Judith Oakley, Jacqueline Wagner, Kathy Wagner, Xin Wang, Yon Yu, Barbara Montana, Christina Tan, Robin Izzo, and Thomas A. Clark

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### **First Use of a Serogroup B Meningococcal Vaccine in the US in Response to a University Outbreak**

*Pediatrics* 2015;135(5):798–804

Meningococcal disease often kills, even with antibiotic treatment. This paper describes the use of a new vaccine to control a large outbreak of meningococcal disease at a university in the United States. The vaccine was not yet licensed and had to be used under an investigational new drug protocol, but this usage allowed the collection of safety data on the use of the vaccine important for the vaccine's licensure in 2015 and development of recommendations for its use.

Daniel C. Payne, Rangaraj Selvarangan, Parvin H. Azimi, Julie A. Boom, Janet A. Englund, Mary Allen Staat, Natasha B. Halasa, Geoffrey A. Weinberg, Peter G. Szilagyi, James Chappell, Monica McNeal, Eileen J. Klein, Leila C. Sahni, Samantha H. Johnston, Christopher J. Harrison, Carol J. Baker, David I. Bernstein, Mary E. Moffatt, Jacqueline E. Tate, Slavica Mijatovic-Rustempasic, Mathew D. Esona, Mary E. Wikswo, Aaron T. Curns, Iddrisu Sulemana, Michael D. Bowen, Jon R. Gentsch, and Umesh D. Parashar

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### **Long-Term Consistency in Rotavirus Vaccine Protection: RV5 and RV1 Vaccine Effectiveness in U.S. Children, 2012–2013**

*Clinical Infectious Diseases* 2015;61(12):1792–1799

Before the introduction of vaccines, rotavirus gastroenteritis killed nearly half a million children worldwide annually. In the United States, it led to about 300,000 hospitalizations every year. This study evaluated rotavirus vaccine effectiveness, with unique long-term assessments of potential waning immunity and vaccine prevention against an emergent strain. The results on the preventive performance of both licensed vaccines provide sources of data for clinicians and policymakers to consider.

Jacinta Smith, Denise Gangadharan, and Robbin Weyant

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**Review of Restricted Experiment Requests, Division of Select Agents and Toxins, Centers for Disease Control and Prevention, 2006–2013**

*Health Security* 2015;13(5):307–316

This study analyzes the regulatory oversight and interventions to reduce the risk of unintended releases of select agents and toxins by academic, government, and private institutions conducting restricted work with these biohazards. The paper promotes awareness of the type of experiments that meet the regulatory definition of a restricted experiment and shows the complexity of the CDC biosafety and biosecurity regulatory program and the restricted experiment review process that safeguards the nation's health security.



# LIFETIME SCIENTIFIC ACHIEVEMENT

The following current or former CDC/ATSDR employees were nominated for the Lifetime Scientific Achievement Award, which recognizes individuals for a body of work contributing to public health. Nominees were judged on their work's scientific merit, its effect on public health and the mission of CDC/ATSDR, and on their leadership and recognition by peers.





## **William J. Bellini, PhD**

*National Center on Immunization and Respiratory Diseases*

Since receiving his PhD in microbiology from Emory University in 1976, Dr. William Bellini has spent most of his career contributing to measles elimination. His research efforts have focused on genetic characterization of measles viruses, development of improved diagnostics, and the prevention and control of measles around the world. Throughout his career at CDC, Dr. Bellini has lent his expertise to several important outbreak investigations. His team performed the initial characterization of Nipah virus after its emergence in Malaysia and Singapore in 1999. He coordinated CDC's laboratory response to the global outbreak of SARS in 2003. These viruses posed significant laboratory challenges that had to be overcome to characterize the viruses and develop improved diagnostic tests.

His work encompassed measles vaccine efficacy, measles vaccine safety, and geographic spread of measles. Not only did Dr. Bellini perform some of the early work on the molecular genetics of measles, he also helped develop the nomenclature for describing the genetic characteristics of wild-type measles viruses. Evidence produced by his lab was critical to recognizing that measles was no longer endemic in the United States as of 2000. Likewise, his lab's analysis of rubella strain variation was vital to documenting elimination of rubella in the United States in 2005 and for efforts to control it in the rest of the world. This body of work was instrumental in transforming how laboratories would support surveillance and regional measles elimination goals.

Dr. Bellini's leadership has provided invaluable service on multiple CDC biosafety and laboratory management committees including an unprecedented 10 years as chair of the Radiation Safety Committee. He has been instrumental in building the bioinformatics capacity at CDC and in developing the initial proposal for the advanced molecular detection program.

Dr. Bellini has authored or co-authored nearly 300 publications including 228 peer-reviewed manuscripts, book chapters, and reports. He has also participated in an untold number of peer reviews, and served on the editorial boards of several virology journals. The organizations for which Dr. Bellini has served as a consultant include the Task Force for Global Health, the World Health Organization, the British Department of Health, and the Program for Appropriate Technology in Health.



## **Cecil M. Burchfiel, PhD**

*National Institute of Occupational Safety and Health*

Dr. Cecil M. Burchfiel began his government service in 1974 as a physician assistant in the National Health Service Corps, later earning a PhD in chronic disease epidemiology at the University of Michigan. Returning to government service, Dr. Burchfiel assumed a joint position at the Veterans Administration Medical Center in Denver and the Department of Preventive Medicine and Biometrics, University of Colorado Health Sciences Center. In the next 5 years he established his grounding in chronic cardiovascular disease and diabetes epidemiology research, a grounding that would be the foundation for a career as one of the nation's leaders in cardiovascular epidemiology research.

Dr. Burchfiel's experiences have laid the foundation for the effort to establish and maintain the NIOSH Buffalo Cardio-metabolic Occupational Police Stress (BCOPS) Study, a study of the consequences of job stress in police officers. Dr. Burchfiel established and maintained one of the most successful research efforts assessing associations between job stress and cardiovascular disease in police officers. BCOPS study investigators have made over 70 stakeholder presentations to large police organizations representing over 40,000 worldwide agencies. This has made an impact by increasing awareness of health issues in policing in the U.S. and Canada.

Dr. Burchfiel has served as a physician assistant in the National Health Service Corps of the U.S. Public Health Service, professor at several universities, research scientist and epidemiologist at government institutions, and currently as branch chief of the Biostatistics and Epidemiology Branch at NIOSH.

Dr. Burchfiel is the lead author or co-author of 175 peer-reviewed scientific publications. He also has given numerous presentations at national and international conferences. He has been a fellow of the American Heart Association, Council on Epidemiology and Prevention, and the American College of Epidemiology. He serves on the NIOSH Cancer, Reproductive and Cardiovascular Research Program Steering Committee. He is also a member of the Jackson Heart Study Publications and Presentations Subcommittee. He was a finalist for the NIOSH Director's Intramural Award of Extraordinary Science in 2012. Three BCOPS study manuscripts were nominated for the CDC Charles C. Shepard Science Award. One BCOPS Study manuscript received the Alice Hamilton Award Honorable Mention in the Epidemiology and Surveillance category.

## Rear Admiral Kenneth G. Castro, MD

*National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention*

Since beginning his career as an Epidemic Intelligence Service officer in 1983, Dr. Kenneth G. Castro has been an important contributor to the body of scientific knowledge on some of the most challenging and consequential public health problems of the 20th and 21st centuries. He progressed steadily from medical epidemiologist to assistant surgeon general and acting director of CDC's Division of HIV/AIDS Prevention. He now serves as a guest researcher in the Center for Surveillance, Epidemiology, and Laboratory Services. His scientific achievements in the fields of human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) and tuberculosis (TB) include discovery and explanation of risk factors, transmission modes, vulnerable population needs, and racial and ethnic disparities.

During his career at CDC, Dr. Castro has inspired some 230 professionals he supervised or mentored during investigations of HIV/AIDS and TB incidence, risk factors, and transmission modes. Together, they opened new areas of research into bacterial genotyping for virulence and drug resistance. They also improved diagnostic techniques, evaluated the effectiveness of preventive and treatment regimens, and revolutionized the approach to TB outbreak investigation.

Scientific obstacles in preventing and controlling HIV/AIDS and TB are among the most difficult to overcome because of political controversy surrounding sexual orientation, unsafe sex practices, unsafe drug use, and poverty, all of which are crucial social determinants of both diseases. Dr. Castro's leadership and body of scientific work illustrate the exceptional effort, political judgment, and social insight that were required to secure his numerous achievements.

Dr. Castro's leadership has earned him recognition by peers as an expert in two often-interrelated disease areas. He is frequently invited to write editorial commentaries and co-author reports, to deliver keynote addresses and grand rounds at prestigious institutions and scientific conferences. He is continually sought to review manuscripts and serves on the editorial boards of *Emerging Infectious Diseases* and *The International Journal of Tuberculosis and Lung Diseases*. His expertise and guidance has consistently been acknowledged for evidence-based guidelines and recommendations for the diagnosis, treatment, and prevention of TB. He is relied upon to provide professional testimony before the U.S. Congress and international ministries of health. His work and publications clearly enjoy global reach.

## **Patrick Lammie, PhD**

*Center for Global Health*

Dr. Patrick Lammie's career at CDC has been distinctive. He is the rare scientist whose work has included parasite immunology, pathology, diagnostics, vector biology, chemotherapy, surveillance, public health practice, and global eradication programs. His impact on control and elimination of neglected tropical diseases (NTD), and particularly lymphatic filariasis (LF) and other tropical diseases, cannot be overstated. LF affects over 120 million people in 73 countries, 40 million of whom are significantly impaired or completely disabled. Dr. Lammie has made major scientific contributions to fighting the disease and its transmission, publishing more than 175 journal articles and book chapters. His many innovations in the field are also applied to other parasitic infections, magnifying their impact. Much of the global strategy for control of NTDs would not exist without his contributions.

Dr. Lammie's vision extends not just to LF, but also to the commonalities of all the infections of neglected populations. Because of the demonstrated successes of mass drug administration in LF control, this strategy is now being applied in numerous NTD control programs. Dr. Lammie has made major, pioneering efforts in linking programs targeting diseases such as malaria, schistosomiasis, onchocerciasis, and blinding trachoma because there are so many similarities in the needs of and responses to these conditions.

Dr. Lammie has used his knowledge and understanding of human immunologic responses to start projects to develop antibody-based surveillance tools for trachoma and for enteric parasitic diseases such as cryptosporidiosis. The surveillance tools developed in these early studies later resulted in research and surveillance programs at CDC that have improved understanding of the diseases.

Dr. Lammie has contributed to every aspect of lymphatic disease research and treatment. His career progressed from the study of LF disease development in laboratory animals to identifying risk factors for elephantiasis in humans. He has conducted field studies on optimal treatment and managed mass drug treatment campaigns and studies on the efficacy of drug delivery in table salt. He also directed genealogy studies to explore the role of heredity. At the program level, Dr. Lammie helped secure the donation of drugs required for treatment and assisted countries in developing surveillance and treatment programs. He has also made important contributions in detecting infection and managing disease pathology.

## **Leonard Paulozzi, MD, MPH**

*National Center for Injury Prevention and Control*

Dr. Leonard Paulozzi has advanced the health and well-being of all Americans. His body of work has focused on prescription drug overdose and violence, both of which fall within the top 10 leading causes of death for all ages. His work has changed the approach to prescription drug overdose, shifting focus from a substance abuse perspective to a broader consideration of the role of opioid prescribing by physicians and how inappropriate prescribing has led to the overdose problem. By focusing on providers, he pioneered a strategy to stem the tide using a primary prevention approach.

Dr. Paulozzi has addressed the challenges of better understanding violent deaths by developing a system to pool data on violent deaths from multiple sources into a usable, anonymous database, the National Violent Death Reporting System. The sources of data for this system include state and local medical examiners and coroners, law enforcement agencies, crime labs, and vital statistics records. His research on the epidemiology of prescription drug overdose served as the scientific foundation of the White House Office of National Drug Control Policy Prescription Drug Abuse Prevention Plan. His work on the relation between drug dose and duration and overdose is helping develop the CDC Opioid Prescribing Guideline to improve the safety of pain treatment with opioids.

Beyond prescription drug overdose, Dr. Paulozzi's work has focused on reducing risks for birth defects among premature infants, the impact of folic acid fortification on neural tube defects, and risks of developmental disabilities in children with major birth defects. In motor vehicle injury prevention, he has investigated motorcycle fatalities associated with alcohol-impaired driving and investigated pedestrian fatality rates according to vehicle type. In violence prevention, he documented homicide risks during the first year of life, school-associated violent deaths, and methods for identifying child maltreatment through surveillance.

Dr. Paulozzi is one of the most cited scientists at CDC and an icon in the field of public health. He is devoted to improving the health of Americans and remains an example for many at CDC of how to do ground-breaking scientific work that has population-level impact. He is nationally recognized and sought-after subject matter expert with more than 175 scientific publications, cited 5,174 times, and his publications appear in 46 different journals.

## **Terry Frank Pechacek, PhD**

*National Center for Chronic Disease Prevention and Health Promotion*

Dr. Terry Pechacek has dedicated his scientific career to translating into global action the scientific findings needed to reduce tobacco use and tobacco-related disease and death. Tobacco use is the leading cause of preventable death in the world and every year causes 6 million deaths globally, including almost 500,000 in the United States. Dr. Pechacek's contributions over nearly three decades have provided a scientific bedrock for tobacco control research, surveillance, policy, and interventions.

From his early work in community heart disease prevention at the University of Minnesota, he went on to lead a shift in tobacco control from individually focused smoking cessation in the 1970s to now standard population-based approaches. In his work at the National Cancer Institute's (NCI's) Smoking, Tobacco and Cancer Program, in the ASSIST study (which NCI and the American Cancer Society funded in 17 states), and as a lead consultant to the formation of the California Tobacco Control Program in 1989, he helped establish the model for comprehensive tobacco control programs now being implemented around the world.

Dr. Pechacek helped negotiate and write the WHO Framework Convention on Tobacco Control and has provided vision for the Bloomberg Initiative to Reduce Tobacco Use. Also, for more than two decades, he has served as a senior technical advisor to the Chinese Ministry of Health. With his technical input, the Chinese Ministry of Health prepared a major white paper, *Comparing China and International Smoking Burden, May 2012*, analogous to the country's first Surgeon General's Report.

Dr. Pechacek has authored more than 100 peer-reviewed publications and more than 15 book chapters, and has published extensive surveillance data, having authored more than 60 *MMWR* articles. He has made pivotal contributions to the publication of 20 Surgeon General's Reports on tobacco and health. These reports have educated policy makers and the public about the dangers of tobacco use and secondhand smoke exposure, convened experts to review and interpret the evidence, and provided a forum for national public health efforts to reduce the scourge of tobacco use in the United States and abroad. In 2006, Dr. Pechacek was awarded the Surgeon General's Medallion for his accomplishments in educating the public on the health hazards of tobacco use.

# PREVIOUS WINNERS OF THE CHARLES C. SHEPARD SCIENCE AWARDS

## 2015

### Assessment

Shelley S. Magill, Jonathan R. Edwards, Wendy Bamberg, Zintars G. Beldavs, Ghinwa Dumyati, Marion A. Kainer, Ruth Lynfield, Meghan Maloney, Laura McAllister-Hollod, Joelle Nadle, Susan M. Ray, Deborah L. Thompson, Lucy E. Wilson, and Scott K. Fridkin, for the Emerging Infections Program Healthcare-Associated Infections and Antimicrobial Use Prevalence Survey Team

Multistate Point-Prevalence Survey of Health Care–Associated Infections  
*The New England Journal of Medicine* 2014;370(13):1198–1208

### Data Methods and Study Design

Krista S. Crider, Owen Devine, Ling Hao, Nicole F. Dowling, Song Li, Anne M. Molloy, Zhu Li, Jianghui Zhu, and Robert J. Berry

Population Red Blood Cell Folate Concentrations for Prevention of Neural Tube Defects: Bayesian Model

*The BMJ* (clinical research edition) 2014;349:g4554

### Laboratory Science

Hua Yang, Jessie C. Chang, Zhu Guo, Paul J. Carney, David A. Shore, Ruben O. Donis, Nancy J. Cox, Julie M. Villanueva, Alexander I. Klimov, and James Stevens

Structural Stability of Influenza A(H1N1)pdm09 Virus Hemagglutinins

*Journal of Virology* 2014;88(9):4828–4838

### Prevention and Control

The RTS,S Clinical Trials Partnership

Efficacy and Safety of the RTS,S/AS01 Malaria Vaccine During 18 Months After Vaccination: A Phase 3 Randomized, Controlled Trial in Children and Young Infants at 11 African Sites

*PLoS Medicine* 2014;11(7):e1001685

## Lifetime Scientific Achievement

Patricia M. Griffin, MD

Dr. Griffin was recognized for her expertise in foodborne and enteric infections and her contributions to the science of food safety.

## 2014

### Assessment

Nadira K. Sultana, Samir K. Saha, Hassan M. Al-Emran, Joyanta K. Modak, M. A. Yushuf Sharkar, Shams El-Arifeen, Adam L. Cohen, Abdullah H. Baqui, and Stephen P. Luby

Impact of Introduction of the *Haemophilus influenzae* Type b Conjugate Vaccine into Childhood Immunization on Meningitis in Bangladeshi Infants  
*Journal of Pediatrics* 2013;163:573–78

### Data Methods and Study Design

Matthew W. Wheeler and A. John Bailer

An Empirical Comparison of Low-dose Extrapolation from Points of Departure (PoD) compared to Extrapolations Based upon Methods that Account for Model Uncertainty

*Regulatory Toxicology and Pharmacology* 2013;67:75–82

### Laboratory and Methods

James M. Smith, Rachna Rastogi, Ryan S. Teller, Priya Srinivasan, Pedro M. M. Mesquita, Umadevi Nagaraja, Janet M. McNicholl, R. Michael Hendry, Chuong T. Dinh, Amy Martin, Betsy C. Herold, and Patrick F. Kiser

Intravaginal Ring Eluting Tenofovir Disoproxil Fumarate Completely Protects Macaques from Multiple Vaginal Simian-HIV Challenges

*Proceedings of the National Academy of Sciences of the United States of America* 2013; 110(40):16145–16150



## Prevention and Control

Tim McAfee, Kevin C. Davis, Robert L. Alexander Jr., Terry F. Pechacek and Rebecca Bunnell Effect of the First Federally Funded U.S. Antismoking National Media Campaign

Effect of the first federally funded US antismoking national media campaign

*The Lancet* 2013;382(9909):2003–2011

## Lifetime Scientific Achievement

Nancy J. Cox, PhD

Dr. Cox was recognized for her global leadership, expertise, mentorship, and scientific innovation in the epidemiology of influenza viruses and immunization.

## 2013

### Assessment

Rachel M. Smith, Melissa K. Schaefer, Marion A. Kainer, Matthew Wise, Jennie Finks, Joan Duwve, Elizabeth Fontaine, Alvina Chu, Barbara Carothers, Amy Reilly, Jay Fiedler, Andrew D. Wiese, Christine Feaster, Lex Gibson, Stephanie Griese, Anne Purfield, Angela A. Cleveland, Kaitlin Benedict, Julie R. Harris, Mary E. Brandt, Dianna Blau, John Jernigan, J. Todd Weber, and Benjamin J. Park, for the Multistate Fungal Infection Outbreak Response Team

Fungal Infections Associated with Contaminated Methylprednisolone Injections—Preliminary Report

*The New England Journal of Medicine* 2012; doi: 10.1056/NEJMoa1213978

### Data Methods and Study Design

Joseph Y. Abrams, John R. Copeland, Robert V. Tauxe, Kashmiri A. Date, Ermias D. Belay, Rajal K. Mody, and Eric D. Mintz

Real-Time Modeling Used for Outbreak Management During a Cholera Epidemic, Haiti, 2010–2011

*Epidemiology and Infection* 2012; doi: 10.1017/S0950268812001793

## Laboratory Science

Yen T. Duong, Maofeng Qiu, Anindya K. De, Keisha Jackson, Trudy Dobbs, Andrea A. Kim, John N. Nkengasong, and Bharat S. Parekh

Detection of Recent HIV-1 Infection Using a New Infection Limiting-Antigen Avidity Assay: Potential for HIV-1 Incidence Estimates and Avidity Maturation Studies

*PLoS One* 2012;7(3):e33328

## Prevention and Control

Ryan T. Novak, Jean Ludovic Kambou, Fabien V. K. Diomandé, Tiga F. Tarbangdo, Rasmata Ouédraogo-Traoré, Lassana Sangaré, Clement Lingani, Stacey W Martin, Cynthia Hatcher, Leonard W. Mayer, F. Marc LaForce, Fenella Avokey, Mamoudou H. Djingarey, Nancy E. Messonnier, Sylvestre R. Tiendrébéogo, and Thomas A. Clark

Serogroup A Meningococcal Conjugate Vaccination in Burkina Faso: Analysis of National Surveillance Data

*The Lancet Infectious Diseases* 2012;12(1):757–764

## Lifetime Scientific Achievement

Larry J. Anderson, MD

Dr. Anderson was recognized for his innovative research on respiratory syncytial virus and its disease burden in the United States.

# 2012

## Assessment

Concepción F. Estívariz, Hamid Jafari, Roland W. Sutter, T. Jacob John, Vibhor Jain, Ashutosh Agarwal, Harish Verma, Mark A. Pallansch, Ajit P. Singh, Sherine Guirguis, Jitendra Awale, Anthony Burton, Sunil Bahl, Arani Chatterjee, and R. Bruce Aylward

Immunogenicity of Supplemental Doses of Poliovirus Vaccine for Children Aged 6–9 Months in Moradabad, India: A Community-Based Randomized Controlled Trial

*The Lancet Infectious Diseases* 2012;12(2):128–135 (published online 2011)

## Data Methods and Study Design

Alula Hadgu, Nandini Dendukuri, and Liangliang Wang

Evaluation of Screening Tests for Detecting *Chlamydia trachomatis* Bias Associated with the Patient-Infected-Status Algorithm Epidemiology

*Epidemiology* 2012;23(1):72–82 (published online 2011)

## Laboratory Science

Brian H. Bird, Louis H. Maartens, Shelley Campbell, Baltus J. Erasmus, Bobbie R. Erickson, Kimberly A. Dodd, Christina F. Spiropoulou, Deborah Cannon, Clifton P. Drew, Barbara Knust, Anita K. McElroy, Marina L. Khristova, César G. Albariño, and Stuart T. Nichol

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Rift Valley Fever Virus Vaccine Lacking the NSs and NSm Genes Is Safe, Nonteratogenic, and Confers Protection from Viremia, Pyrexia, and Abortion Following Challenge in Adult and Pregnant Sheep

*Journal of Virology* 2011;85(24):12901–12909

## Prevention and Control

Timothy R. Sterling, M. Elsa Villarino, Andrey S. Borisov, Nong Shang, Fred Gordin, Erin Bliven-Sizemore, Judith Hackman, Carol Dukes Hamilton, Dick Menzies, Amy Kerrigan, Stephen E. Weis, Marc Weiner, Diane Wing, Marcus B. Conde, Lorna Bozeman, C. Robert Horsburgh, and Richard E. Chaisson, for the TB Trials Consortium PREVENT TB Study Team

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Three Months of Rifapentine and Isoniazid for Latent Tuberculosis Infection

*The New England Journal of Medicine* 2011;365(23):2155–2166

## Lifetime Scientific Achievement

Henry Falk, MD, MPH

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Dr. Falk was recognized for his expertise and global leadership in environmental health science and public health policy and practice.

# 2011

## Assessment and Epidemiology

Stacy M. Holzbauer, Aaron S. DeVries, James J. Sejvar, Christine H. Lees, Jennifer Adjemian, Jennifer H. McQuiston, Carlota Medus, Catherine A. Lexau, Julie R. Harris, Sergio E. Recuenco, Ermias D. Belay, James F. Howell, Bryan F. Buss, Mady Hornig, John D. Gibbins, Scott E. Brueck, Kirk E. Smith, Richard N. Danila, W. Ian Lipkin, Daniel H. Lachance, P. James B. Dyck, and Ruth Lynfield

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Epidemiologic Investigation of Immune-Mediated Polyradiculoneuropathy Among Abattoir Workers Exposed to Porcine Brain

*PLoS One* 2010;5(3):e9782

## Laboratory and Methods

Robert D. Gilmore, Jr., Rebekah R. Howison, Gabrielle Dietrich, Toni G. Patton, Dawn R. Clifton, and James A. Carroll

.....  
The *bba64* Gene of *Borrelia burgdorferi*, the Lyme Disease Agent, Is Critical for Mammalian Infection via Tick Bite Transmission

*Proceedings of the National Academy of Sciences of the United States of America* 2010;107(16):7515–7520

## Prevention and Control

Charles S. Chasela, Michael G. Hudgens, Denise J. Jamieson, Dumbani Kayira, Mina C. Hosseinipour, Athena P. Kourtis, Francis Martinson, Gerald Tegha, Rodney J. Knight, Yusuf I. Ahmed, Deborah D. Kamwendo, Irving F. Hoffman, Sascha R. Ellington, Zebrone Kacheche, Alice Soko, Jeffrey B. Wiener, Susan A. Fiscus, Peter Kazembe, Innocent A. Mofolo, Maggie Chigwenembe, Dorothy S. Sichali, and Charles M. van der Horst, for the Breastfeeding, Antiretroviral, and Nutrition Study Group

.....  
Maternal or Infant Antiretroviral Drugs to Reduce HIV-1 Transmission

*The New England Journal of Medicine* 2010;362(24):2271–2281

## Lifetime Scientific Achievement

Kathleen Kreiss, MD

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Dr. Kreiss was recognized as a world-renowned expert in occupational respiratory disease. She has improved workplace safety by encouraging the use of safer materials and better work practices and controls.

## 2010

### Assessment and Epidemiology

Fatimah S. Dawood, Seema Jain, Lyn Finelli, Michael W. Shaw, Stephen Lindstrom, Rebecca J. Garten, Larisa V. Gubareva, Xiyan Xu, Carolyn B. Bridges, and Timothy M. Uyeki

.....  
Emergence of a Novel Swine-Origin Influenza A (H1N1) Virus in Humans

*The New England Journal of Medicine* 2009;360:2605–2615

## Laboratory and Methods

Joseph U. Igietseme, Qing He, Kahaliah Joseph, Francis O. Eko, Deborah Lyn, Godwin Ananaba, Angela Campbell, Claudiu Banda, and Carolyn M. Black

Role of T Lymphocytes in the Pathogenesis of Chlamydia Disease

*The Journal of Infectious Diseases* 2009;200:926–934

## Prevention and Control

Sandra L. Decker

Changes in Medicaid Physician Fees and Patterns of Ambulatory Care

*Inquiry* 2009;46(3)291–304

Manish Patel, Cristina Pedreira, Lucia Helena De Oliveira, Jacqueline Tate, Maribel Orozco, Juan Mercado, Alcides Gonzalez, Omar Alespin, Juan José Amador, Jazmina Umaña, Angel Balmaseda, Maria Celina Perez, Jon Gentsch, Tara Kerin, Jennifer Hull, Slavica Mijatovic, Jon Andrus, and Umesh Parashar

Association Between Pentavalent Rotavirus Vaccine and Severe Rotavirus Diarrhea Among Children in Nicaragua

*JAMA* 2009;301(21):2243–2251

## Lifetime Scientific Achievement

Polly Marchbanks, PhD, MSN

Dr. Marchbanks was recognized for her global leadership and research, particularly in the area of contraception.

## 2009

### Assessment and Epidemiology

H. Irene Hall, Ruiguang Song, Philip Rhodes, Joseph Prejean, Qian An, Lisa M. Lee, John Karon, Ron Brookmeyer, Edward H. Kaplan, Matthew T. McKenna, and Robert S. Janssen, for the HIV Incidence Surveillance Group

Estimation of HIV Incidence in the United States

*JAMA* 2008;300:520–529

### Laboratory and Methods

Tracie L. Williams, Leah Luna, Zhu Guo, Nancy J. Cox, James L. Pirkle, Ruben O. Donis, and John R. Barr

Quantification of Influenza Virus Hemagglutinins in Complex Mixtures Using Isotope Dilution Tandem Mass Spectrometry

*Vaccine* 2008;26:2510–2520

### Prevention and Control

Larissa Roux, Michael Pratt, Tammy O. Tengs, Michelle M. Yore, Teri L. Yanagawa, Jill Van Den Bos, Candace Rutt, Ross C. Brownson, Kenneth E. Powell, Gregory Heath, Harold W. Kohl III, Steven Teutsch, John Cawley, I-Min Lee, Linda West, and David M. Buchner

Cost Effectiveness of Community-Based Physical Activity Interventions

*American Journal of Preventive Medicine* 2008;35:578–588

### Lifetime Scientific Achievement

Stephen B. Thacker, MD, MSc

Dr. Thacker was recognized for his leadership and his work in fostering scientific communication and training of future leaders in public health. He has overseen the Epidemic Intelligence Service (EIS) program since 1989, and under his direction, the first CDC plan for surveillance was completed in 1985.

## 2008

### Assessment and Epidemiology

Earl S. Ford, Umed A. Ajani, Janet B. Croft, Julia A. Critchley, Darwin R. Labarthe, Thomas E. Kottke, Wayne H. Giles, and Simon Capewell

Explaining the Decrease in U.S. Deaths from Coronary Disease, 1980–2000

*The New England Journal of Medicine* 2007;356:2388–2398

### Laboratory and Methods

Terrence M. Tumpey, Christopher F. Basler, Patricia V. Aguilar, Hui Zeng, Alicia Solórzano, David E. Swayne, Nancy J. Cox, Jacqueline M. Katz, Jeffery K. Taubenberger, Peter Palese, and Adolfo García-Sastre

A Two-Amino Acid Change in the Hemagglutinin of the 1918 Influenza Virus Abolishes Transmission

*Science* 2007;315:655–659



## Prevention and Control

R. Louise Floyd, Mark Sobell, Mary M. Velasquez, Karen Ingersoll, Mary Nettleman, Linda Sobell, Patricia Dolan Mullen, Sherry Ceperich, Kirk von Sternberg, Burt Bolton, Bradley Skarpness, and Jyothi Nagaraja, for the Project CHOICES Efficacy Study Group

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Preventing Alcohol-Exposed Pregnancies: A Randomized Controlled Trial

*American Journal of Preventive Medicine* 2007;32:1–10

## Lifetime Scientific Achievement

Vincent Castranova, PhD

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Dr. Castranova was recognized for his leadership in laboratory-based occupational health research. His contributions to the understanding of the biology of lung cells have been translated into the practical study of lung diseases and development of prevention programs.

## 2007

### Assessment and Epidemiology

Wolfgang Hladik, Shelia C. Dollard, Jonathan Mermin, Ashley L. Fowlkes, Robert Downing, Minal M. Amin, Flora Banage, Esau Nzaro, Peter Kataaha, Timothy J. Dondero, Philip E. Pellett, and Eve M. Lackritz

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Transmission of Human Herpesvirus 8 by Blood Transfusion

*The New England Journal of Medicine* 2006;355:1331–1338

### Laboratory and Methods

Mary A. Hoelscher, Sanjay Garg, Dinesh S. Bangari, Jessica A. Belser, Xiuhua Lu, Iain Stephenson, Rick A. Bright, Jacqueline M. Katz, Suresh K. Mittal, and Suryaprakash Sambhara

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Development of Adenoviral-Vector-Based Pandemic Influenza Vaccine against Antigenically Distinct Human H5N1 Strains in Mice

*The Lancet* 2006;368:1495–1502



## Prevention and Control

Cynthia G. Whitney, Tamar Pilishvili, Monica M. Farley, William Schaffner, Allen S. Craig, Ruth Lynfield, Ann-Christine Nyquist, Kenneth A. Gershman, Marietta Vazquez, Nancy M. Bennett, Arthur Reingold, Ann Thomas, Mary P. Glode, Elizabeth R. Zell, James H. Jorgensen, Bernard Beall, and Anne Schuchat

Effectiveness of Seven-Valent Pneumococcal Conjugate Vaccine Against Invasive Pneumococcal Disease: A Matched Case-Control Study

*The Lancet* 2006;368:1495–1502

## Lifetime Scientific Achievement

Roger I. Glass, MD, PhD, MPH

Dr. Glass was recognized for his leadership and accomplishments in viral gastroenteritis. His work led to the recognition of rotavirus as a problem in the United States and to development of a rotavirus vaccine to be used worldwide.

## 2006

### Assessment and Epidemiology

Lee Warner, Maurizio Macaluso, Harland D. Austin, David K. Kleinbaum, Lynn Artz, Michael E. Fleenor, Ilene Brill, Daniel R. Newman, and Edward W. Hook III

Application of the Case-Crossover Design to Reduce Unmeasured Confounding in Studies of Condom Effectiveness

*American Journal of Epidemiology* 2005;161:765–773

Katherine M. Flegal, Barry I. Graubard, David F. Williamson, and Mitchell H. Gail

Excess Deaths Associated With Underweight, Overweight, and Obesity

*JAMA* 2005;293:1861–1867

### Laboratory and Methods

Terrence M. Tumpey, Christopher F. Basler, Patricia V. Aguilar, Hui Zeng, Alicia Solórzano, David E. Swayne, Nancy J. Cox, Jacqueline M. Katz, Jeffery K. Taubenberger, Peter Palese, and Adolfo García-Sastre

Characterization of the Reconstructed 1918 Spanish Influenza Pandemic Virus

*Science* 2005;310(5745):77–80

## Prevention and Control

Stephen P. Luby, Mubina Agboatwalla, Daniel R. Feikin, John Painter, Ward Billhimer, Arshad Altaf, and Robert M. Hoekstra

Effect of Handwashing on Child Health: A Randomised Controlled Trial

*The Lancet* 2005;366:225–233

## Lifetime Scientific Achievement

Robert V. Tauxe, MD, MPH

Dr. Tauxe was recognized for his leadership in the prevention and control of foodborne diseases in the United States and internationally. His work and that of his colleagues have resulted in dramatic changes in foodborne disease surveillance, outbreak detection, practices, and policies.

## 2005

### Assessment and Epidemiology

Barbara Lopes Cardozo, Oleg O. Bilukha, Carol A. Gotway Crawford, Irshad Shaikh, Mitchell I. Wolfe, Michael L. Gerber, and Mark Anderson

Mental Health, Social Functioning, and Disability in Postwar Afghanistan

*JAMA* 2004;292:575–584

### Laboratory and Methods

Justin M. Hettick, Michael L. Kashon, Janet P. Simpson, Paul D. Siegel, Gerald H. Mazurek, and David N. Weissman

Proteomic Profiling of Intact Mycobacteria by Matrix-Assisted Laser Desorption/ Ionization Time-of-Flight Mass Spectrometry

*Analytical Chemistry* 2004;76:5769–5776

### Prevention and Control

Marc Bulterys, Denise J. Jamieson, Mary Jo O’Sullivan, Mardge H. Cohen, Robert Maupin, Steven Nesheim, Mayris P. Webber, Russell Van Dyke, Jeffrey Wiener, and Bernard M. Branson, for the Mother-Infant Rapid Intervention at Delivery (MIRIAD) Study Group

Rapid HIV-1 Testing During Labor: A Multicenter Study

*JAMA* 2004;292:219–223

## **Outstanding Scientific Contribution to Public Health**

William H. Hannon, Barbara W. Adams, and Robert F. Vogt

---

National Center for Environmental Health/Agency for Toxic Substances and Disease Registry

Newborn Screening Quality Assurance Program

## **Lifetime Scientific Achievement**

James M. Hughes, MD

---

Dr. Hughes was recognized for his expertise in infectious diseases and bioterrorism and response. His leadership in addressing emerging and reemerging global threats has brought global prominence to CDC and improved public health infrastructures nationwide.

## **2004**

### **Assessment and Epidemiology**

Jennita Reefhuis, Margaret A. Honein, Cynthia G. Whitney, Shadi Chamany, Eric A. Mann, Krista R. Biernath, Karen Broder, Susan Manning, Swati Avashia, Marcia Victor, Pamela Costa, Owen Devine, Ann Graham, and Coleen Boyle

---

Risk of Bacterial Meningitis in Children with Cochlear Implants

*The New England Journal of Medicine* 2003;349:435–445

### **Laboratory and Methods**

Thomas G. Ksiazek, Dean Erdman, Cynthia S. Goldsmith, Sherif R. Zaki, Teresa Peret, Shannon Emery, Suxiang Tong, Carlo Urbani, James A. Comer, Wilina Lim, Pierre E. Rollin, Scott F. Dowell, Ai-Ee Ling, Charles D. Humphrey, Wun-Ju Shieh, Jeannette Guarner, Christopher D. Paddock, Paul Rota, Barry Fields, Joseph DeRisi, Jyh-Yuan Yang, Nancy Cox, James M. Hughes, James W. LeDuc, William J. Bellini, Larry J. Anderson, and the SARS Working Group

---

A Novel Coronavirus Associated with Severe Acute Respiratory Syndrome

*The New England Journal of Medicine* 2003;348:1953–1966

## Prevention and Control

Cynthia G. Whitney, Monica M. Farley, James Hadler, Lee H. Harrison, Nancy M. Bennett, Ruth Lynfield, Arthur Reingold, Paul R. Cieslak, Tamara Pilishvili, Delois Jackson, Richard R. Facklam, James H. Jorgensen, and Anne Schuchat, for the Active Bacterial Core Surveillance of the Emerging Infections Program Network

---

Decline in Invasive Pneumococcal Disease After the Introduction of Protein-Polysaccharide Conjugate Vaccine

*The New England Journal of Medicine* 2003;348:1737–1746

## Lifetime Scientific Achievement

Harold W. Jaffe, MD

---

Dr. Jaffe was recognized as a national and international leader in the disease investigation of HIV/AIDS, which has increased scientific knowledge about HIV/AIDS and improved national and international approaches to prevention and control.

Walter A. Orenstein, MD

---

Dr. Orenstein was recognized for his leadership in reducing the occurrence of vaccine-preventable diseases in children. His work has been critical to the development of national vaccine policy and global immunization strategies.

## 2003

### Assessment and Epidemiology

Polly A. Marchbanks, Jill A. McDonald, Hoyt G. Wilson, Suzanne G. Folger, Michele G. Mandel, Janet R. Daling, Leslie Bernstein, Kathleen E. Malone, Giske Ursin, Brian L. Strom, Sandra A. Norman, Linda K. Weiss, Phyllis Wingo, Michael S. Simon, Ronald T. Burkman, Jesse A. Berlin, and Robert Spirtas

---

Oral Contraceptives and the Risk of Breast Cancer

*The New England Journal of Medicine* 2002;346:2025–2032

## Laboratory and Methods

Bharat S. Parekh, M. Susan Kennedy, Trudy Dobbs, Chou-Pong Pau, Robert Byers, Timothy Green, Dale J. Hu, Suphak Vanichseni, Nancy L. Young, Kachit Choopanya, Timothy D. Mastro, and J. Steven McDougal

---

Quantitative Detection of Increasing HIV Type 1 Antibodies After Seroconversion: A Simple Assay for Detecting Recent HIV Infection and Estimating Incidence

*AIDS Research and Human Retroviruses* 2002;18:295–307

## Prevention and Control

Robert E. Quick, Akiko C. Kimura, Angelica Thevos, Mathias Tembo, Isidore Shamputa, Lori Hutwagner, and Eric Mintz

---

Diarrhea Prevention Through Household-Level Water Disinfection and Safe Storage in Zambia

*The American Journal of Tropical Medicine and Hygiene* 2002;66:584–589

## Outstanding Scientific Contribution to Public Health

Barbara Lopes Cardozo, Bradley A. Woodruff, Muireann Brennan, and Paul B. Spiegel

---

National Center for Environmental Health

International Emergency and Refugee Health Branch

## Lifetime Scientific Achievement

William R. Jarvis, MD

---

Dr. Jarvis was recognized as a leader in the study of nosocomial infections and other threats to the safety of patients and healthcare workers.

His research has led to interventions to reduce these risks and to the development of prevention guidelines.

## 2002

### Assessment and Epidemiology

Trudy V. Murphy, Paul M. Gargiulio, Mehran S. Massoudi, David B. Nelson, Aisha O. Jumaan, Catherine A. Okoro, Lynn R. Zanardi, Sabeena Setia, Elizabeth Fair, Charles W. LeBaron, Melinda Wharton, John R. Livengood, and Benjamin Schwartz, for the Rotavirus Intussusception Inspection Team

---

Intussusception Among Infants Given an Oral Rotavirus Vaccine

*The New England Journal of Medicine* 2001;344:564–572

### Laboratory and Methods

Brent S. Davis, Gwong-Jen J. Chang, Bruce Cropp, John T. Roehrig, Denise A. Martin, Carl J. Mitchell, Richard Bowen, and Michel L. Bunning

---

West Nile Virus Recombinant DNA Vaccine Protects Mouse and Horse from Virus Challenge and Expresses in vitro a Noninfectious Recombinant Antigen that Can Be Used in Enzyme-Linked Immunosorbent Assays

*Journal of Virology* 2001;75:4040–4047

### Prevention and Control

Belinda E. Ostrowsky, William E. Trick, Annette H. Sohn, Stephen B. Quirk, Stacey Holt, Loretta A. Carson, Bertha C. Hill, Matthew J. Arduino, Matthew J. Kuehnert, and William R. Jarvis

---

Control of Vancomycin-Resistant Enterococcus in Health Care Facilities in a Region

*The New England Journal of Medicine* 2001;344:1427–1433

### Outstanding Scientific Contribution to Public Health

Ronald M. Davis, Gary A. Giovino, Michael D. Erikson, and the Office on Smoking and Health

---

National Center for Chronic Disease Prevention and Health Promotion  
Surgeon General's Reports on Smoking and Health

### Lifetime Scientific Achievement

Gerald R. Cooper, MD, PhD

---

Dr. Cooper was recognized for his leadership in improving laboratory measures of lipids that led to the establishment of the CDC Lipid Standardization Program.

## 2001

### Assessment and Epidemiology

Paul B. Spiegel and Peter Salama

---

War and Mortality in Kosovo, 1998–99: An Epidemiological Testimony

*The Lancet* 2000;335:2204–2209

### Laboratory and Methods

K.B. Chua, William J. Bellini, Paul A. Rota, Brian H. Harcourt, Azaibi Tamin, S.K. Lam, Thomas G. Ksiazek, Pierre E. Rollin, Sherif R. Zaki, Wun-Ju Shieh, Cynthia S. Goldsmith, Duane J. Gubler, John T. Roehrig, B. Eaton, A.R. Gould, Jim Olson, H. Field, P. Daniels, A.E. Ling, Clarence J. Peters, Larry J. Anderson, and Brian W.J. Mahy

---

Nipah Virus: A Recently Emergent Deadly Paramyxovirus

*Science* 2000;288:1432–1435

### Prevention and Control

Carolyn Buxton Bridges, William W. Thompson, Martin I. Meltzer, Gordon R. Reeve, Walter J. Talamonti, Nancy J. Cox, Heather A. Lilac, Henrietta Hall, Alexander Klimov, and Keiji Fukuda

---

Effectiveness and Cost-Benefit of Influenza Vaccination of Healthy Working Adults: A Randomized Controlled Trial

*JAMA* 2000;284:1655–1662

### Outstanding Scientific Contribution to Public Health

National Center for Chronic Disease Prevention and Health Promotion  
Behavioral Risk Factor Surveillance System

### Lifetime Scientific Achievement

Joseph Edward McDade, PhD

---

Dr. McDade was the first to identify the bacterium *Legionella pneumophila* as the cause of the well-known outbreak of Legionnaires' disease.

In the 1980s, he identified the cause of a previously unknown tickborne disease, ehrlichiosis.



## 2000

### **Assessment and Epidemiology**

Nathan Shaffer, Rutt Chuachoowong, Philip A. Mock, Chaiporn Bhadrakom, Wimol Siriwasin, Nancy L. Young, Tawee Chotpitayasunondh, Sanay Chearskul, Anuvant Roongpisuthipong, Pratharn Chinayon, John Karon, Timothy D. Mastro, and R.J. Simonds

---

### **Short-Course Zidovudine for Perinatal HIV-1 Transmission in Bangkok, Thailand: A Randomised Controlled Trial**

*The Lancet* 1999;353:773–780

## 1999

Robert S. Janssen, Glen A. Satten, Susan L. Stramer, Bhupat D. Rawal, Thomas R. O'Brien, Barbara J. Weiblen, Frederick M. Hecht, Noreen Jack, Farley R. Cleghorn, James O. Kahn, Margaret A. Chesney, and Michael P. Busch

---

### **New Testing Strategy to Detect Early HIV-1 Infection for Use in Incidence Estimates and for Clinical and Prevention Purposes**

*JAMA* 1998;280:42–48

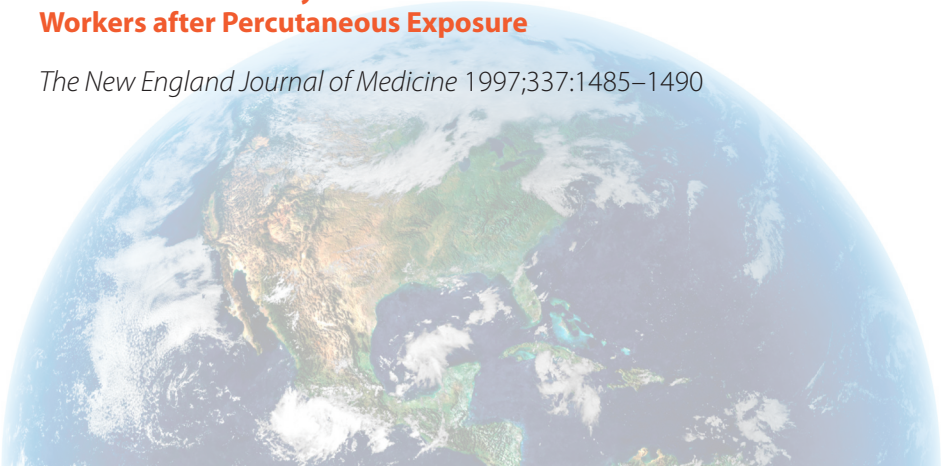
## 1998

Denise M. Cardo, David H. Culver, Carol A. Ciesielski, Pamela U. Srivastava, Ruthanne Marcus, Dominique Abiteboul, Julia Heptonstall, Giuseppe Ippolito, Florence Lot, Penny S. McKibben, and David M. Bell, for the Centers for Disease Control and Prevention Needlestick Surveillance Group

---

### **A Case-Control Study of HIV Seroconversion in Health Care Workers after Percutaneous Exposure**

*The New England Journal of Medicine* 1997;337:1485–1490



## 1997

Jennifer S. Rota, Janet L. Heath, Paul A. Rota, Gail E. King, María L. Celma, Juan Carabaña, Rafael Fernandez-Muñoz, David Brown, Li Jin, and William J. Bellini

---

### **Molecular Epidemiology of Measles Virus: Identification of Pathways of Transmission and Implications for Measles Elimination**

*The Journal of Infectious Diseases* 1996;173:32–37

Diana E. Schendel, Cynthia J. Berg, Marshalyn Yeargin-Allsopp, Coleen A. Boyle, and Pierre Decoufle

---

### **Prenatal Magnesium Sulfate Exposure and the Risk for Cerebral Palsy or Mental Retardation Among Very Low-Birth-Weight Children Aged 3 to 5 Years**

*JAMA* 1996;276:1805–1810

## 1996

Peter M. Strebel, Nicolae Ion-Nedelcu, Andrew L. Baughman, Roland W. Sutter, and Stephen L. Cochi

---

### **Intramuscular Injections Within 30 Days of Immunization with Oral Poliovirus Vaccine—A Risk Factor for Vaccine-Associated Paralytic Poliomyelitis**

*The New England Journal of Medicine* 1995;332:500–506

## 1995

Robert D. Brewer, Peter D. Morris, Thomas B. Cole, Stephanie Watkins, Michael J. Patetta, and Carol Popkin

---

### **The Risk of Dying in Alcohol-Related Automobile Crashes Among Habitual Drunk Drivers**

*The New England Journal of Medicine* 1994;331:513–517

## 1994

Michael E. St. Louis, Munkolenkole Kamenga, Christopher Brown, Ann Marie Nelson, Tarande Manzila, Veronique Batter, Frieda Behets, Uwa Kabagabo, Robert W. Ryder, Margaret Oxtoby, Thomas C. Quinn, and William L. Heyward

---

### **Risk for Perinatal HIV-1 Transmission According to Maternal Immunologic, Virologic, and Placental Factors**

*JAMA* 1993;269:2853–2859

## 1993

Brian R. Edlin, Jerome I. Tokars, Michael H. Grieco, Jack T. Crawford, Julie Williams, Emelia M. Sordillo, Kenneth R. Ong, James O. Kilburn, Samuel W. Dooley, Kenneth G. Castro, William R. Jarvis, and Scott D. Holmberg

---

### **An Outbreak of Multidrug-Resistant Tuberculosis Among Hospitalized Patients with the Acquired Immunodeficiency Syndrome**

*The New England Journal of Medicine* 1992;326:1514–1521

## 1992

Marta Gwinn, Marguerite Pappaioanou, J. Richard George, W. Harry Hannon, Shari C. Wasser, Martha A. Redus, Rodney Hoff, George F. Grady, Anne Willoughby, Antonia C. Novello, Lyle R. Petersen, Timothy J. Dondero, and James W. Curran

---

### **Prevalence of HIV Infection in Childbearing Women in the United States**

*JAMA* 1991;265:1704–1708



## 1991

Edward A. Belongia, Craig W. Hedberg, Gerald J. Gleich, Karen E. White, Arthur N. Mayeno, David A. Loegering, Sandra L. Dunnette, Phyllis L. Pirie, Kristine L. MacDonald, and Michael T. Osterholm

---

### **An Investigation of the Cause of the Eosinophilia-Myalgia Syndrome Associated with Tryptophan Use**

*The New England Journal of Medicine* 1990;323:357–365

## 1990

Patricia M. Griffin, Robert V. Tauxe, Stephen C. Redd, Nancy D. Puhr, Nancy Hargrett-Bean, and Paul A. Blake

---

### **Emergence of Highly Trimethoprim-Sulfamethoxazole-Resistant *Shigella* in a Native American Population: An Epidemiologic Study**

*American Journal of Epidemiology* 1989;129:1042–1051

## 1989

Chin-Yih Ou, Shirley Kwok, Sheila W. Mitchell, David H. Mack, John J. Sninsky, John W. Krebs, Paul Feorino, Donna Warfield, and Gerald Schochetman

---

### **DNA Amplification for Direct Detection of HIV-1 in DNA of Peripheral Blood Mononuclear Cells**

*Science* 1988;239:295–297

## 1988

Rebeca Rico-Hesse, Mark A. Pallansch, Baldev K. Nottay, and Olen M. Kew

---

### **Geographic Distribution of Wild Poliovirus Type 1 Genotypes**

*Virology* 1987;160:311–322

## 1987

J. Steven McDougal, M. Susan Kennedy, Julie M. Sligh, Sheila P. Cort, Alison C. Mawle, and Janet K. A. Nicholson

---

### **Binding of HTLV-III/LAV to T4+ T Cells by a Complex of the 100K Viral Protein and the T4 Molecule**

*Science* 1986(4736);231:382–385

## 1986

Arthur L. Reingold, Claire V. Broome, Allen W. Hightower, Gloria W. Ajello, Gail A. Bolan, Catherine Adamsbaum, Ellen E. Jones, Catherine Phillips, Hilaire Tiendrebeogo, and Adamou Yada

---

### **Age-Specific Differences in Duration of Clinical Protection After Vaccination with Meningococcal Polysaccharide A Vaccine**

*The Lancet* 1985;2:114–118



# KEYNOTE SPEAKERS

Following is a list of colleagues who have made keynote speeches at the Shepard Science Awards Ceremony since its inception.

## 2014

### **John E. Wennberg, MD, MPH**

Founder/Director of Emeritus

Dartmouth Institute for Health Policy and Clinical Practice

*Unwarranted Variation in Health Care*

## 2013

No keynote speech

## 2012

### **James S. Marks, MD, MPH**

Robert Wood Johnson Foundation Health Group

*Making Science and Health Matter*

## 2011

### **Brian Greenwood, MD, CBE, FRCP, FRS**

London School of Hygiene & Tropical Medicine

University of London

*Vaccines for Global Health*

## 2010

### **John Holdren, PhD**

Princeton University

*Science and Technology Policy for Ensuring the Public's Health*

## 2009

### **Paul Krugman, PhD**

Princeton University

Columnist, *The New York Times*

*Health and the Economic Future*

## 2008

### **Neal Nathanson, MD**

University of Pennsylvania School of Medicine  
*AIDS Vaccine at the Crossroads*

## 2007

### **Michael Marmot, MBBS, MPH, PhD, FRCP, FFPHM, FMedSci**

Institute for Society and Health  
University College, London  
*Health in an Unequal World*

## 2006

### **Donald M. Berwick, MD, MPP**

Institute for Healthcare Improvement  
*The 100,000 Lives Campaign: Lessons from a National Mobilization*

## 2005

### **Harvey V. Fineberg, MD, PhD**

Institute of Medicine  
The National Academies  
*Science, Policy, and Public Trust*

## 2004

### **Shiriki Kumanyika, PhD, MPH**

University of Pennsylvania School of Medicine  
*Obesity, Health Disparities, and Prevention Paradigms:  
Hard Questions and Hard Choices*

## 2003

### **Jo Ivey Boufford, MD**

Robert F. Wagner Graduate School of Public Health  
New York University School of Medicine  
*Assuring the Public's Health in the 21st Century: A Research Agenda*



**2002**

**Marc L. Miringoff, PhD**

Fordham Institute for Innovation in Social Policy  
Fordham University Graduate Center  
*The Social Determinants of Health*

**2001**

**Jeffrey D. Sachs, PhD**

Harvard University  
*Reinvigorating the Fight Against Disease in the Developing World*

**2000**

**Lynn R. Goldman, MD, MPH, MS**

The Johns Hopkins University  
School of Hygiene and Public Health  
*Health of the World*

**1999**

**Steven N. Blair, PED**

Cooper Institute for Aerobics Research  
*Physical Inactivity as a Public Health Problem*

**1998**

**Frederick P. Rivara, MD, MPH**

Harborview Injury Prevention and Research Center  
*Injury Control—The Uses of Science for Prevention*

**1997**

**David R. Cox, MD, PhD**

Stanford University  
School of Medicine  
*The Human Genome Project and Human Disease*

**1996**

**Walter E. Massey, PhD**

Morehouse College

*Science—The (Ever-Expanding) Endless Frontier*

**1995**

**Nancy S. Wexler, PhD**

Columbia University

*Uncongenial Genealogies: Prediction and Protection in the Public Interest*

**1994**

**Thomas J. Coates, PhD**

University of California at San Francisco

*HIV Prevention Programs in Research: What Have We Accomplished and Where Do We Need to Go?*

**1993**

**W. French Anderson, MD**

University of Southern California School of Medicine

*The Scientific, Ethical, and Regulatory Issues of Gene Therapy*

**1992**

**Barry R. Bloom, PhD**

Howard Hughes Medical Institute

Albert Einstein College of Medicine

*Revisiting Mycobacteria*

**1991**

**Lawrence K. Altman, MD**

*The New York Times*

*Science and the Media*

**1990**

**Purnell W. Choppin, MD**

Howard Hughes Medical Institute

*The Role of a Private Medical Research Organization in Biomedical Research and Education*

**1989**

**Joseph L. Goldstein, MD**

University of Texas Health Sciences Center

*Lipoprotein Receptors: A Genetic Defense Against  
Hypercholesterolemia and Atherosclerosis*

**1988**

**David Baltimore, PhD**

Whitehead Institute

Massachusetts Institute of Technology

*Genetics and Modern Disease*

**1987**

**Frank Press, PhD**

National Academy of Sciences

*DNA in Washington*

**1986**

**James O. Mason, MD**

Centers for Disease Control

*CDC, Science, and the Future*

# COMMITTEE MEMBERS OF THE 2016 CHARLES C. SHEPARD SCIENCE AWARDS

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Co-Chair: Nicole Dowling, PhD

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Carla Black, PhD

Gil Chavez, MD, MPH

Laura Fehrs, MD

Albert Hyacinth, MS

Charlotte Kent, PhD

Joanne Klevens, MD, PhD, MPH

Bill Levine, MD

Ramal Moonesinghe, PhD

Sandra Steiner, PhD, MS

Maria Sweeney, PhD, MPH

Anjel Vahratian, PhD, MPH

Lorraine Yeung, MD

Lead Statistician: Glen Satten, PhD

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Gil Chavez, MD, MPH

Laura Fehrs, MD

Scott Fridkin, MD

Gery P. Guy Jr., PhD, MPH

Kristin Holland, PhD, MPH

Michael King, PhD

Maria Mirabelli, PhD, MPH

Hanyu Ni, PhD, MPH

Monica Parise, MD

Terry Wassell, PhD, MS  
Lorraine Yeung, MD  
Statistician: Noelle-Angelique Molinari, PhD

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Lawrence Barker, PhD  
Gwen Bergen, PhD  
Achintya Dey, MA  
Timothy Green, PhD  
Yulei He, PhD  
Paul Henneberger, ScD  
Albert Hyacinth, MS  
Bill Levine, MD  
Marco Mesa Frias, PhD  
Ann Schmitz, DVM, MA  
Nong Shang, PhD  
Statistician: Phil Rhodes, PhD

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Bin Chen, PhD  
Mike Elliott, PhD, MPH, MS  
Jodi Jackson, PhD  
Suzanne Kalb, PhD  
Yury Khudyakov, PhD  
Anne Sowell, PhD  
Sandra Steiner, PhD, MS  
Tun Ye, MD, PhD, MSPH  
Statistician: Melissa Danielson, MSPH

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Garrett Asay, PhD  
Lina Balluz, PhD, ScD  
Stephen Banspach, PhD  
Joe Bresee, MD  
Kate Curtis, PhD, MSPH  
Charlotte Kent, PhD  
Joanne Klevens, MD, PhD, MPH  
Art Liang, MD, MPH  
Joann Thierry, PhD  
Timothy W. Van Wave, DPH, MPH  
Anjel Vahratian, PhD, MPH  
Statistician: Betsy Gunnels, MSPH

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Ron Otten, PhD

## **Executive Secretaries**

Deliash Bryant  
John Murphy, MBA

## **Administrative Assistant**

Nina Ware

## **Incentive Awards, Human Resources**

Claudia Turner, MA

## **Publicity**

Catherine Carter  
Susan K. Laird, MSN, RN

## **SharePoint Site Manager**

Sofia Espinoza Aguillar, PhD

## **Graphic Design and Editing**

Mark Conner  
Linda Elsner  
Luis M. Luque, MFA, MPA











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