

CHARLES C. SHEPARD 2018 SCIENCE AWARDS

# INNOVATION & CREATIVITY

in modern public health



**Keynote Speaker: Dr. Roberta Ness**

June 14, 2018 • 10:00 A.M. to 11:30 P.M.



## CHARLES C. SHEPARD • BIOGRAPHY



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 14, 2018 • 10:00 a.m.**



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

## Welcome

John Iskander, MD (CAPT, USPHS)

## Introduction of Keynote Speaker

Anne Schuchat, MD (RADM, USPHS)

## “Innovation and Creativity in Modern Public Health”

Roberta Ness, MD

## Presentation of the 2018 Charles C. Shepard Science Awards

John Iskander, MD (CAPT, USPHS)

Assessment

Data Methods and Study Design

Laboratory Science

Prevention and Control

Lifetime Scientific Achievement

## Closing

Robert R. Redfield, MD



## KEYNOTE SPEAKER'S BIOGRAPHY



### **Roberta B. Ness, MD, MPH**

Roberta B. Ness, MD, MPH, Rockwell Professor of Public Health at The University of Texas, has been called one of America's foremost experts in innovative thinking. She is author of four books, *Innovation*

*Generation*, a systematic method about how to maximize your creativity; *Creativity in the Sciences*, *Genius Unmasked*; and *The Creativity Crisis*, a workbook, storybook, and critical appraisal of institutional barriers to innovation. Dr. Ness has given over 90 talks and workshops on innovative thinking at America's top universities, research and development-intensive corporations, and science and technology professional societies including the National Academies, American Association for the Advancement of Science, the Association for American Physicians, and the American Society for Clinical Investigation. She offers a free online course, *Reimagining Innovation*, which has been accessed by more than 100,000 viewers. She has given two TED talks and was featured on the Bill Nye-hosted podcast, *StarTalk*.

A recognized expert in medicine and public health, Dr. Ness is former dean of The University of Texas School of Public Health, one of the largest such schools in the nation.

Dr. Ness is a member of the most prestigious scientific professional society in the United States, the National Academies of Science, as well as other honorary societies including the American Society for Clinical Investigation, Delta Omega Honorary, and the American Epidemiologic Society. She is former president of the top two professional societies in her field, a fellow of the American College of Physicians, and associate editor or on the editorial board of numerous scientific journals.

Other honors include a 1996 Leadership Award from the Family Health Council, 2006 Laureate Award from the American College of Physicians, 2008 Distinguished Professor of Women's Health from the Society for General Internal Medicine, 2011 presidential appointment to the Mickey Leland Center for Environmental Research, 2013 Petersdorf Lectureship from the American Association of Medical Colleges, and 2014 Athena Swan lectureship at Oxford University. She has received two of the most prestigious lifetime achievement awards in her field: the 2013 Snow Award from the American Public Health Association and the 2017 Lillienfeld Award from the American College of Epidemiology.

Dr. Ness received her medical degree from Cornell University and her master's in public health from Columbia University. She established the leading paradigm in the field of women's health research, termed "gender-based biology" in her book, *Health and Disease Among Women*. In almost 400 publications and more than three dozen federally funded grants, Dr. Ness has discovered causes and established best prevention and treatment approaches for diseases and conditions as varied as cancer, pregnancy complications, and cardiovascular disease. Dr. Ness has been an adviser to the National Institutes for Health, the Centers for Disease Control and Prevention, NASA, and the Department of Defense, among others.

Dr. Ness's insights as a scientist and administrator have put her in a unique position to imagine and prove the usefulness of techniques to improve creativity, both personal and organizational.







# 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 2018 Charles C. Shepard Science Awards. The nominated articles were judged on scientific merit and the significance of their effect on the CDC/ATSDR mission. 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

Yutaka Aoki, Jennifer Yee, and Mary E. Mortensen

## **Blood Cadmium by Race/Hispanic Origin: The Role of Smoking**

*Environmental Research* 201;155:193-198

Cadmium, a soft, bluish-white metal that shares characteristics with zinc and mercury, causes lung cancers and is associated with kidney and prostate cancer. The authors used NHANES data, which included blood cadmium and self-reported smoking status, to explore how blood cadmium varied by race/ethnicity and smoking status among U.S. adults and the extent to which the difference may be explained by intensity of smoking, a known major source of cadmium exposure.

Nancy F. Butte, Kathleen B. Watson, Kate Ridley, Issa F. Zakeri, Robert G. McMurray, Karin A. Pfeiffer, Scott E. Crouter, Stephen D. Herrmann, David R. Bassett, Alexander Long, Zekarias Berhane, Stewart G. Trost, Barbara E. Ainsworth, David Berrigan, and Janet E. Fulton

## **A Youth Compendium of Physical Activities: Activity Codes and Metabolic Intensities**

*Medicine and Science in Sports and Exercise* 2018;50(2):246–256

Gathering accurate data on human energy expenditure can improve the design and evaluation of physical activity and obesity interventions. This study describes the development of a compilation tool used to identify the energy expenditure of 196 physical activities using data on youth only. The tool fills a critical gap and can be used by a variety of audiences—including researchers, health professionals, teachers and coaches, and fitness professionals.

Zhuo Chen, Katherine Kolor, Scott D. Grosse, Juan L. Rodriguez, Julie A. Lynch, Ridgely Fisk Green, W. David Dotson, M. Scott Bowen, and Muin J. Khoury

## **Trends in Utilization and Costs of BRCA Testing Among Women Aged 18–64 years in the United States, 2003–2014**

*Genetics in Medicine* 2017; doi: 10.1038/gim.2017.118

About 300,000 U.S. women have mutations of *BRCA* genes, which help suppress tumors. *BRCA* genetic mutations increase the risk of breast and ovarian cancers. Early discovery of *BRCA* mutations allows for prevention measures. This study identified changes in *BRCA* testing rates and costs consistent with effects of several influencing factors that could help inform public health approaches to promoting effective and appropriate *BRCA* testing.

Nicole L. Davis, Donna L. Hoyert, David A. Goodman, Ashley H. Hirai,  
and William M. Callaghan

**Contribution of Maternal Age and Pregnancy Checkboxes on Maternal Mortality Ratios  
in the United States, 1978–2012**

*American Journal of Obstetrics and Gynecology* 2017;217:352 e1–e7

Women in the United States are more likely to die from childbirth or pregnancy-related causes than women in other high-income countries. The authors characterized maternal death in the United States and examined potential contributors to increasing maternal death ratios from 1978 through 2012. The results show the urgent need for partnerships between state maternal mortality review committees and vital statistics offices to identify the best opportunities for improving reporting of pregnancy status on death certificates.

Gibrilla F. Deen, Nathalie Broutet, Wenbo Xu, Barbara Knust, Foday R. Sesay, Suzanna L. R. McDonald, Elizabeth Ervin, Jaclyn E. Marrinan, Philippe Gaillard, Ndema Habib, Hongtu Liu, William Liu, Anna E. Thorson, Francis Yamba, Thomas A. Massaquoi, Faustin James, Archchun Ariyaratnam, Christine Ross, Kyle Bernstein, Antoine Coursier, John Klena, Marylin Carino, Alie H. Wurie, Yong Zhang, Marion S. Dumbuya, Neetu Abad, Baimba Idriss, Teodora Wi, Sarah D. Bennett, Tina Davies, Faiqa K. Ebrahim, Elissa Meites, Dhamari Naidoo, Samuel J. Smith, Patricia Ongpin, Tasneem Malik, Anshu Banerjee, Bobbie R. Erickson, Yongjian Liu, Yang Liu, Ke Xu, Aaron Brault, Kara N. Durski, Jörn Winter, Tara Sealy, Stuart T. Nichol, Margaret Lamunu, James Bangura, Sihem Landoulsi, Amara Jambai, Oliver Morgan, Guizhen Wu, Mifang Liang, Qiudong Su, Yu Lan, Yanzhe Hao, Pierre Formenty, Ute Ströher, and Foday Sahr

**Ebola RNA Persistence in Semen of Ebola Virus Disease Survivors—Final Report**

*The New England Journal of Medicine* 2017;377(15):1428–1437

The West Africa Ebola epidemic presented the opportunity to test a large number of male Ebola survivors for Ebola virus RNA in their semen, and it was urgent to understand how long sex could be a risk factor for Ebola transmission. The study showed that many survivors had virus RNA persisting in their semen and emphasized the importance of testing and counseling programs for Ebola survivors to reduce the risk of sexual transmission.

Alpha Oumar Diallo, Heidi M. Soeters, Issaka Yameogo, Guetawendé Sawadogo, Flavien Aké, Clément Lingani, Xin Wang, Andre Bitá, Amadou Fall, Lassana Sangaré, Rasmata Ouédraogo-Traoré, Isaïe Medah, Brice Bicaba, and Ryan T. Novak, for the MenAfriNet Consortium

**Bacterial Meningitis Epidemiology and Return of *Neisseria meningitidis* Serogroup A Cases in Burkina Faso in the Five Years Following MenAfriVac Mass Vaccination Campaign**

*PLoS One* 2017;12(11):e0187466

The authors evaluated the effectiveness over a 5-year period of a new serogroup A meningococcal conjugate vaccine introduced during national mass vaccination campaigns in sub-Saharan Africa. This paper measures progress toward CDC's Strategic Framework for Global Immunizations by 2020 goal to control, eliminate, or eradicate vaccine-preventable diseases, which includes the elimination of *Neisseria meningitidis* serogroup A epidemics in the meningitis belt.

Elaine W. Flagg and Elizabeth A. Torrone

**Declines in Anogenital Warts Among Age Groups Most Likely to Be Impacted by Human Papillomavirus Vaccination, United States, 2006–2014**

*American Journal of Public Health* 2018;108(1):112–119

Vaccine monitoring is crucial for assessing the progress of immunization programs, demonstrating impact on disease, and evaluating policy needs. This study assesses the impact of human papillomavirus vaccination on the prevalence of anogenital warts among private insurance enrollees in the United States. The authors report that decreases in the occurrence of anogenital warts among U.S. females, previously limited to those aged 15–19 years, are now occurring through age 29 years.

Katherine A. Fowler, Linda L. Dahlberg, Tadesse Haileyesus, Carmen Gutierrez, and Sarah Bacon

**Childhood Firearm Injuries in the United States**

*Pediatrics* 2017;140(1):e20163486

International studies indicate that 91% of firearm deaths of children living in high-income countries occur in the United States. This paper characterizes firearm injuries and their causes among children in the United States. Reported data on fatal and nonfatal firearm injuries include the magnitude and nature of these injuries for the nation, by state, over time, and across age, sex, and racial and ethnic groups. The authors also discuss prevention strategies.



H. Frederick Frasch and Ana M. Barbero

***In Vitro* Human Epidermal Permeation of Nicotine from Electronic Cigarette Refill Liquids and Implications for Dermal Exposure Assessment**

*Journal of Exposure Science & Environmental Epidemiology* 2017;27(6):618–624

Use of electronic cigarettes has grown substantially over the past several years. E-cigarettes can potentially help wean nicotine addicts from cigarette smoking, but their use raises several concerns. These include use of these products by young people and the potential for e-cigarettes to become a gateway to cigarette smoking. This paper describes a new data-driven approach to determine the risk of skin contact with nicotine contained in liquids used in e-cigarettes.

Chaitra Gopalappa, Stephanie L. Sansom, Paul G. Farnham, and Yao-Hsuan Chen

**Combinations of Interventions to Achieve a National HIV Incidence Reduction Goal: Insights from an Agent-based Model**

*AIDS* 2017;31(18):2533–2539

A major goal of CDC's mission is to allocate resources efficiently. Understanding which intervention combinations best help reach national HIV prevention goals will inform decision makers and program directors about how to allocate HIV prevention resources. This paper used modeling to analyze combinations of care-continuum targets that can generate a 25% reduction in new infections by 2020. Findings will help health departments fine tune their HIV prevention efforts.

Jeremy A. Grey, Kyle T. Bernstein, Patrick S. Sullivan, Sarah E. Kidd, Thomas L. Gift, Eric W. Hall, Abigail Hankin-Wei, Hillard S. Weinstock, and Eli S. Rosenberg

**Rates of Primary and Secondary Syphilis Among White and Black Non-Hispanic Men Who Have Sex With Men, United States, 2014**

*Journal of Acquired Immune Deficiency Syndromes* 2017;76(3):e65–e73

The number of syphilis cases has risen among men who have sex with men. Early detection of disparities and improved prevention of syphilis among groups at risk can influence overall syphilis rates. This paper characterizes the burden of syphilis among racial, ethnic, and sexual minority populations, specifically non-Hispanic black and white men who have sex with men. Findings supplement what can be determined by using national surveillance data alone.



José E. Hagan, Yoshihiro Takashima, Amarzaya Sarankhuu, Otgonbayar Dashpagma, Baigalmaa Jantsansengee, Roberta Pastore, Gunregjav Nyamaa, Buyanjargal Yadamsuren, Mick N. Mulders, Kathleen A. Wannemuehler, Raydel Anderson, Bettina Bankamp, Paul Rota, and James L. Goodson

**Risk Factors for Measles Virus Infection Among Adults During a Large Outbreak in Postelimination Era in Mongolia, 2015**

*The Journal of Infectious Diseases* 2017;216(10):1187–1195

CDC contributes to global efforts to control vaccine-preventable diseases. This study analyzed measles risks during a nationwide outbreak. Authors identified a previously unknown risk group for measles susceptibility in Mongolia (young adults, particularly those born outside the capital). They also found evidence suggesting that latent effects of the immunization program breakdown that occurred during the collapse of the Soviet Union might have led to waning measles immunity among certain populations.

Cynthia J. Hines, Matthew V. Jackson, James A. Deddens, John C. Clark, Xiaoyun Ye, Annette L. Christianson, Juliana W. Meadows, and Antonia M. Calafat

**Urinary Bisphenol A (BPA) Concentrations Among Workers in Industries that Manufacture and Use BPA in the USA**

*Annals of Work Exposure and Health* 2017;61(2):164–182

Practically every American is exposed to bisphenol A (BPA), a man-made chemical used to make plastics, and epoxy resins that are used to protectively line some food cans. BPA may also be added to certain specialty waxes used to make wax patterns for casting metal parts in manufacturing plants. This manuscript describes the first assessment of exposure to BPA, a chemical suspected to affect the endocrine system, among American manufacturing workers.

Joy Hsu, Jessica Chen, and Maria C. Mirabelli

**Asthma Morbidity, Comorbidities, and Modifiable Factors Among Older Adults**

*The Journal of Allergy and Clinical Immunology: In Practice* 2018;6(1):236–243

By 2030, the number of U.S. adults aged 65 or older will more than double. This rapid growth in the number of older Americans will place strong demands on health care and aging-related services. This paper identifies and assesses causes and risk factors for higher rates of asthma deaths among older U.S. adults. The authors found that health professionals can use existing reporting systems to identify those with asthma who could benefit from additional interventions.



A. Danielle Iuliano, Katherine M. Roguski, Howard H. Chang, David J. Muscatello, Rakhee Palekar, Stefano Tempia, Cheryl Cohen, Jon Michael Gran, Dena Schanzer, Benjamin J. Cowling, Peng Wu, Jan Kyncl, Li Wei Ang, Minah Park, Monika Redlberger-Fritz, Hongjie Yu, Laura Espenhain, Anand Krishnan, Gideon Emukule, Liselotte van Asten, Susana Pereira da Silva, Suchunya Aungkulanon, Udo Buchholz, Marc-Alain Widdowson, and Joseph S. Bresee, for the Global Seasonal Influenza-associated Mortality Collaborator Network

**Estimates of Global Seasonal Influenza-associated Respiratory Mortality: A Modelling Study**  
*The Lancet* 2018;391:1285-1300

Reliable country-specific influenza death estimates that describe influenza burden are critical for national and international decision making. Although influenza vaccines are distributed globally, vaccine use is limited due to uncertainty about influenza burden. This study analyzed methods used and accounted for differences among countries. The authors worked with collaborators from 47 countries to model vital records and surveillance data to calculate death estimates for 1999–2015 and applied estimates to countries without data.

Heesoo Joo, Brian Maskery, Tarissa Mitchell, Andrew Leidner, Alexander Klosovsky, and Michelle Weinberg

**A Comparative Cost Analysis of the Vaccination Program for U.S.-bound Refugees**

*Vaccine* 2017; doi: 10.1016/j.vaccine.2017.09.023

This study estimates the cost of the Vaccination Program for U.S.-bound Refugees (VPR) and can help inform policies. The VPR, a collaboration between CDC and the State Department, offers vaccines to U.S.-bound refugees overseas. By providing vaccines before departure, the VPR improves the health of refugees and U.S. communities by reducing the probability that refugees arrive with vaccine-preventable diseases. The assessment of costs of strategies clarifies VPR expenses and assists governments with refugee health programs.

Kathleen N. Ly, Ruth B. Jiles, Eyasu H. Teshale, Monique A. Foster, Rick L. Pesano, and Scott D. Holmberg

**Hepatitis C Virus Infection Among Reproductive-aged Women and Children in the United States, 2006 to 2014**

*Annals of Internal Medicine* 2017;166(11):775–782

Hepatitis C virus (HCV) infection in pregnant women has been difficult to quantify because this population is not routinely screened. Many HCV infections among women and their infants go undetected because of under-recognition of risk behaviors and concerns about stigma and legal repercussions. This study describes the nature of HCV infection among pregnant women and their infants and advances understanding of the changing epidemiology of HCV during the nation's opioid crisis.

Marilyn J. Manco-Johnson, J. Michael Soucie, and Joan Cox Gill, for the Joint Outcomes Committee of the Universal Data Collection U.S. Hemophilia Treatment Center Network

**Prophylaxis Usage, Bleeding Rates, and Joint Outcomes of Hemophilia, 1999 to 2010: A Surveillance Project**

*Blood* 2017;129(17):2368–2374

Hemophilia is a genetic disorder primarily affecting males and characterized by the lack of a protein critical to normal blood clotting. This paper uses surveillance data from a large population of boys and men with severe hemophilia to track changes in the use and outcomes of treatment to prevent bleeding into joints. The same data analyzed longitudinally provides insights that will guide efforts to improve the health impact of this prevention strategy.



Louise B. Murphy, Miriam G. Cisternas, Kurt J. Greenlund, Wayne Giles, Casey Hannan, and Charles G. Helmick

### **Defining Arthritis for Public Health Surveillance: Methods and Estimates in Four U.S. Population Health Surveys**

*Arthritis Care & Research* 2017;69(3):356–367

Arthritis is a common chronic disease in the United States with significant economic, personal, and societal impact. Accurate prevalence estimates of arthritis are important to public health. This study examined arthritis prevalence from four frequently used U.S. population health surveys. The authors used two definitions (arthritis defined by doctor diagnosis and by ICD codes) to make comparisons between the surveys and guided readers in appropriately interpreting and choosing estimates.

Sara E. Oliver, Elizabeth R. Unger, Rayleen Lewis, Darius McDaniel, Julia W. Gargano, Martin Steinau, and Lauri E. Markowitz

### **Prevalence of Human Papillomavirus Among Females After Vaccine Introduction-National Health and Nutrition Examination Survey, United States, 2003–2014**

*The Journal of Infectious Diseases* 2017;216(5):594–603

This paper provides an assessment of the human papillomavirus (HPV) vaccine program in the United States using high-quality, nationally representative data. The authors showed that within 8 years of HPV vaccine introduction, vaccine-type HPV prevalence decreased 71% among 14- to 19-year-olds and 61% among 20- to 24-year-olds. Estimated vaccine effectiveness was high. A decrease in HPV vaccine-type prevalence among unvaccinated females suggests herd immunity.

Robert M. Park and Shannon L. Berg

### **Manganese and Neurobehavioral Impairment. A preliminary risk assessment**

*Neurotoxicology* 2017; doi: 10.1016/j.neuro.2017.08.003

Exposure to manganese dust occurs primarily in mining and metallurgy. Recent studies indicate neurological deficits may occur when workers are exposed to manganese. The authors used quantitative risk assessment methods to determine the risks of impairment in workers' exposure in several industries. Although there is clear scientific evidence of the health effects at higher exposure levels, this study helps inform decision makers of the health effects of low-level exposures.

Gabriela Paz-Bailey, Eli S. Rosenberg, Kate Doyle, Jorge Munoz-Jordan, Gilberto A. Santiago, Liore Klein, Janice Perez-Padilla, Freddy A. Medina, Stephen H. Waterman, Carlos Garcia Gubern, Luisa I. Alvarado, and Tyler M. Sharp

### **Persistence of Zika Virus in Body Fluids—Preliminary Report**

*The New England Journal of Medicine* 2017; doi: 10.1056/NEJMoa1613108

Between the discovery of Zika virus in the 1950s and its emergence in the early 2000s, only 20 human cases of Zika virus infection had been documented. As such, little was known about Zika virus infection. The authors enrolled 150 people early in the course of their infection and followed them for 6 months after their illness began. CDC made two major public health recommendations because of this study.

Matthew D. Ritchey, Fleetwood Loustalot, Hilary K. Wall, Claudia A. Steiner, Cathleen Gillespie, Mary G. George, and Janet S. Wright

### **Million Hearts: Description of the National Surveillance and Modeling Methodology Used to Monitor the Number of Cardiovascular Events Prevented During 2012–2016**

*Journal of the American Heart Association* 2017; doi: 10.1161/JAHA.117.006021

Despite being the number one cause of death in the United States, there is no national surveillance system to track cardiovascular events. This study describes how the Million Hearts initiative combines emergency department, hospital, and mortality data systems to track cardiovascular events while preventing double-counting. Development of this method has helped overcome the limitations of national surveillance and helped the initiative to measure its success in meeting the aim of preventing 1 million events.





Jorge Rosenthal, Natalia Largaespada, Lynn B. Bailey, Michael Cannon, C. J. Alverson, Dayrin Ortiz, Gail Pa Kauwell, Joe Snizek, Ramon Figueroa, Robyn Daly, and Peter Allen

**Folate Deficiency Is Prevalent in Women of Childbearing Age in Belize and Is Negatively Affected by Coexisting Vitamin B-12 Deficiency: Belize National Micronutrient Survey 2011<sup>(1-4)</sup>**

*The Journal of Nutrition* 2017;147(6):1183–1193

Neural tube defects such as spina bifida and anencephaly result in death or lifelong disability for those affected, but they are usually prevented when women consume enough folic acid before and during early pregnancy. However, many countries have not established prevention policies, often because awareness of the burden of neural tube defects is low. To guide public health programs such as food fortification, this paper assesses the risk of folate and other micronutrient deficiencies.

Lauren M. Rossen, Katherine A. Ahrens, and Amy M. Branum

**Trends in Risk of Pregnancy Loss Among U.S. Women, 1990–2011**

*Paediatric and Perinatal Epidemiology* 2018;32(1):19–29

Pregnancy loss is an experience shared by about 20% of U.S. women who become pregnant, and the risk of loss appears to have increased over the past several decades. More recently, there have been population-level changes in various risk factors for pregnancy loss, including the prevalence of obesity and increases in maternal age. Using nationally representative data on women of childbearing age, this paper details how the risk has increased over the past several decades.

Isaac See, Paul Wesson, Nicole Gualandi, Ghinwa Dumyati, Lee H. Harrison, Lindsey Leshner, Joelle Nadle, Susan Petit, Claire Reisenauer, William Schaffner, Amy Tunali, Yi Mu, and Jennifer Ahern

**Socioeconomic Factors Explain Racial Disparities in Invasive Community-Associated Methicillin-Resistant *Staphylococcus aureus* Disease Rates**

*Clinical Infectious Diseases* 2017;64(5):597–604

Methicillin-resistant *Staphylococcus aureus* (MRSA) is a common cause of antibiotic-resistant infections. Since CDC began surveillance in 2005, incidence has declined significantly for invasive healthcare-associated but not community-associated MRSA. This paper suggests strategies for reducing health disparities in invasive community-associated MRSA rates, based on the finding that depressed socioeconomic status drives racial disparities in invasive MRSA rates. These findings provide insights into interventions that could reduce racial disparities and community-associated invasive MRSA.

N. Sarita Shah, Sara C. Auld, James C. M. Brust, Barun Mathema, Nazir Ismail, Pravi Moodley, Koleka Mlisana, Salim Allana, Angela Campbell, Thuli Mthiyane, Natasha Morris, Primrose Mpangase, Hermina van der Meulen, Shaheed V. Omar, Tyler S. Brown, Apurva Narechania, Elena Shaskina, Thandi Kapwata, Barry Kreiswirth, and Neel R. Gandhi

### **Transmission of Extensively Drug-resistant Tuberculosis in South Africa**

*The New England Journal of Medicine* 2017;376(3):243–253

Drug-resistant tuberculosis is the leading cause of antimicrobial resistance-related deaths worldwide. Drug-resistant TB is 50–100 times more expensive to treat than drug-susceptible TB, yet only 50% of patients are cured. This paper challenged a long-standing belief about drug-resistant TB and involved groundbreaking work to characterize how and where transmission is occurring in South Africa, the epicenter of the HIV and drug-resistant TB epidemic.

Aakash Shrivastava, Anil Kumar, Jerry D. Thomas, Kayla F. Laserson, Gyan Bhushan, Melissa D. Carter, Mala Chhabra, Veena Mittal, Shashi Khare, James J. Sejvar, Mayank Dwivedi, Samantha L. Isenberg, Rudolph Johnson, James L. Pirkle, Jon D. Sharer, Patricia L. Hall, Rajesh Yadav, Anoop Velayudhan, Mohan Papanna, Pankaj Singh, D. Somashekar, Arghya Pradhan, Kapil Goel, Rajesh Pandey, Mohan Kumar, Satish Kumar, Amit Chakrabarti, P. Sivaperumal, A. Ramesh Kumar, Joshua G. Schier, Arthur Chang, Leigh Ann Graham, Thomas P. Mathews, Darryl Johnson, Liza Valentin, Kathleen L. Caldwell, Jeffery M. Jarrett, Leslie A. Harden, Gary R. Takeoka, Suxiang Tong, Krista Queen, Clinton Paden, Anne Whitney, Dana L. Haberling, Ram Singh, Ravi Shankar Singh, Kenneth C. Earhart, A.C. Dhariwal, L.S. Chauhan, S. Venkatesh, and Padmini Srikantiah

### **Association of Acute Toxic Encephalopathy with Litchi Consumption in an Outbreak in Muzaffarpur, India, 2014: A Case-control Study**

*The Lancet Global Health* 2017;5(4):e458–e466

Outbreaks of an acute neurological illness with high rates of death among children occur every year in Muzaffarpur—India's largest litchi cultivation region. In 2014, the authors investigated the cause and risk factors for this illness. In this hospital-based surveillance and age-matched case-control study, laboratory investigators assessed potential causes of the illness. Findings suggested minimizing litchi consumption, ensuring receipt of an evening meal, and carrying out rapid glucose correction for suspected illness.



James Tsai, Italia V. Rolle, Tushar Singh, Sheree L. Boulet, Timothy A. McAfee, and Althea M. Grant

**Patterns of Marijuana and Tobacco Use Associated with Suboptimal Self-rated Health Among U.S. Adult Ever Users of Marijuana**

*Preventive Medicine Reports* 2017;6:251–257

Although studies have evaluated the effects of marijuana and tobacco use on health, combined patterns of their impact on health are uncertain. This paper characterized marijuana and tobacco use in relation to self-rated health among U.S. adults aged 20 years or older using data from the National Health and Nutrition Examination Survey. In the context of legalization of marijuana in some U.S. states, this study provides important information about the health impact of these activities.

John M. Violanti, Desta Fekedulegn, Michael E. Andrew, Tara A. Hartley, Luenda E. Charles, Diane B. Miller, and Cecil M. Burchfiel

**The Impact of Perceived Intensity and Frequency of Police Work Occupational Stressors on the Cortisol Awakening Response (CAR): Findings from the BCOPS Study**

*Psychoneuroendocrinology* 2017;75:124–131

Because law enforcement can be stressful, police officers are ideal for examining workplace stress on physical and psychological health. This cross-sectional study identified five types of workplace stressors and examined their effect on poor health in a high-stress occupation. Findings indicated that officers who experience elevated levels of the most stressful events had a dysregulated stress response system that could lead to a variety of adverse health outcomes including cardiovascular disease.

## DATA METHODS AND STUDY DESIGN

Pallavi D. Annambhotla, Brian M. Gurbaxani, Matthew J. Kuehnert,  
and Sridhar V. Basavaraju

### **A Model to Estimate the Probability of Human Immunodeficiency Virus and Hepatitis C Infection Despite Negative Nucleic Acid Testing Among Increased-risk Organ Donors**

*Transplant Infectious Disease* 2017;19(2):e12676

According to the Organ Procurement and Transplant Network, more than 120,000 people are waiting for organs, but only 30,000 transplant surgeries take place each year. Further complicating the picture, about 20% of organs offered for transplant are designated “increased risk” due to their potential for harboring HIV and hepatitis viruses. This paper describes a non-laboratory mathematical model to better estimate the risk of undetected HIV and hepatitis C transmission related to organ transplantation.

Henry C. Baggett, Nora L. Watson, Maria Deloria Knoll, W. Abdullah Brooks, Daniel R. Feikin, Laura L. Hammitt, Stephen R.C. Howie, Karen L. Kotloff, Orin S. Levine, Shabir A. Madhi, David R. Murdoch, J. Anthony G. Scott, Donald M. Thea, Martin Antonio, Juliet O. Awori, Vicky L. Baillie, Andrea N. DeLuca, Amanda J. Driscoll, Julie Duncan, Bernard E. Ebruke, Doli Goswami, Melissa M. Higdon, Ruth A. Karron, David P. Moore, Susan C. Morpeth, Justin M. Mulindwa, Daniel E. Park, Wantana Paveenkittiporn, Baramheht Piralam, Christine Prosperi, Samba O. Sow, Milagritos D. Tapia, Khalequ Zaman, Scott L. Zeger, and Katherine L. O’Brien, for the Perch Study Group

### **Density of Upper Respiratory Colonization with *Streptococcus pneumoniae* and Its Role in the Diagnosis of Pneumococcal Pneumonia Among Children Aged <5 Years in the PERCH Study**

*Clinical Infectious Diseases* 2017; 64(Suppl 3):S317–S327

Pneumococcal pneumonia is difficult to diagnose in young children because commonly available methods (blood culture) lack sensitivity. This study employed improved estimates of childhood pneumonia caused by *Streptococcus pneumoniae*, a leading and vaccine-preventable cause of severe disease and death in children under 5 years old. The investigators used data from the Pneumonia Etiology Research for Child Health (PERCH) study, a seven-country case-control study that aimed to determine the causes of pneumonia in young children.

Ellsworth M. Campbell, Hongwei Jia, Anupama Shankar, Debra Hanson, Wei Luo, Silvina Masciotra, S. Michele Owen, Alexandra M. Oster, Romeo R. Galang, Michael W. Spiller, Sara J. Blosser, Erika Chapman, Jeremy C. Roseberry, Jessica Gentry, Pamela Pontones, Joan Duwve, Paula Peyrani, Ron M. Kagan, Jeannette M. Whitcomb, Philip J. Peters, Walid Heneine, John T. Brooks, and William M. Switzer

**Detailed Transmission Network Analysis of a Large Opiate-driven Outbreak of HIV Infection in the United States**

*The Journal of Infectious Diseases* 2017;216(9):1053–1062

The U.S. opioid epidemic and increase in the number of people who inject drugs are a health emergency. Researchers merged data science, a simulation, and network theory with traditional epidemiology and laboratory methods. They also adapted methods and developed computational techniques to answer questions during the investigation. Findings suggest most infections were present when the investigation began, and early transmission may have been associated with sexual activity and injection drug use.

Brigette L. Gleason, Stephanie L. Foster, Grete E. Wilt, Barbara Miles, Brian Lewis, Katherine Cauthen, Michael King, Francis Bayor, Sorie Conteh, Tom Sesay, Sorie I.B. Kamara, Greg Lambert, Patrick Finley, Walter Beyeler, Thomas Moore, Jennifer Gaudioso, Peter H. Kilmarx, and John T. Redd

**Geospatial Analysis of Household Spread of Ebola Virus in a Quarantined Village—Sierra Leone, 2014**

*Epidemiology and Infection* 2017;145(14):2921–2929

Allocating scarce resources during the 2014 Ebola outbreak proved contentious. This paper describes a field study aimed at reducing death from Ebola virus disease (EVD) in Sierra Leone by using household interview data and the household GPS for onsite geocoding with Google Earth to characterize the spread of EVD within one affected village. Researchers identified risk factors for household Ebola acquisition that can help guide public health interventions in future outbreaks.





Lee S. Katz, Taylor Griswold, Amanda J. Williams-Newkirk, Darlene Wagner, Aaron Petkau, Cameron Sieffert, Gary Van Domselaar, Xiangyu Deng, and Heather A. Carleton

**A Comparative Analysis of the Lyve-SET Phylogenomics Pipeline for Genomic Epidemiology of Foodborne Pathogens**

*Frontiers in Microbiology* 2017; doi: 10.3389/fmicb.2017.00375

Modern epidemiology of foodborne bacterial pathogens relies increasingly on whole genome sequencing (WGS). Since 2013, U.S. agencies responsible for food safety have performed WGS on all *Listeria monocytogenes* found in clinical, food, and environmental samples. The authors built a whole-genome single-nucleotide polymorphism phylogenomics pipeline called Lyve-SET to aid in epidemiological investigations. Lyve-SET has been placed in the public domain and is used routinely worldwide to enhance public health practice and reduce the burden of infectious disease.

Diba Khan, Lauren M. Rossen, Brady Hamilton, Erin Dienes, Yulei He, and Rong Wei

**Spatiotemporal Trends in Teen Birth Rates in the USA, 2003–2012**

*Journal of the Royal Statistical Society* 2018;181(1):35–58

Teen birth rates have declined over the past several years across the United States. However, county-level variations and trends over time have not been explored. Although teen births are collected at the county level, resulting raw county rates are often too imprecise for practical use for many small counties. In this analysis researchers explored county variations in teen birth rates across counties in the United States, from 2003 to 2012, by using hierarchical Bayesian models.

Ji Lin, Xiaohui Zhuo, Barbara Bardenheier, Deborah B. Rolka, W. Edward Gregg, Yuling Hong, Guijing Wang, Ann Albright, and Ping Zhang

**Cost-effectiveness of the 2014 U.S. Preventive Services Task Force (USPSTF) Recommendations for Intensive Behavioral Counseling Interventions for Adults with Cardiovascular Risk Factors**

*Diabetes Care* 2017;40(5):640–646

Diabetes is the nation's most expensive disease and cardiovascular disease is our number one killer. This study used a diabetes computer simulation model to assess the long-term cost-effectiveness of the newly recommended behavioral counseling service for preventing diabetes and cardiovascular disease by the U.S. Preventive Services Task Force. The model can be used to accurately quantify the long-term health and economic consequences of several interventions used for preventing and managing type 2 diabetes.

Claire M. Midgley, Amber K. Haynes, Jason L. Baumgardner, Christina Chommanard, Sara W. Demas, Mila M. Prill, Glen R. Abedi, Aaron T. Curns, John T. Watson, and Susan I. Gerber

**Determining the Seasonality of Respiratory Syncytial Virus in the United States: The Impact of Increased Molecular Testing**

*The Journal of Infectious Diseases* 2017;216(3):345–355

Respiratory syncytial virus (RSV) is a major cause of respiratory infections in children and older adults. RSV diagnostic testing increasingly employs molecular diagnostic assays. Polymerase chain reaction results are now reported more widely and have become increasingly important for routine RSV surveillance. Determining RSV seasonality with PCR-based reports yields a better understanding of virus circulation for epidemiologic purposes. This paper assesses the impact of such methods on RSV surveillance and determining the seasonality of RSV.

Cora Peterson, Curtis Florence, Robert Thomas, and Joanne Klevens

**Cost-Benefit Analysis of Two Child Abuse and Neglect Primary Prevention Programs for U.S. States**

*Prevention Science* 2017; doi: 10.1007/s11121-017-0819-8

One in four children experience child maltreatment such as neglect, physical or sexual abuse, and psychological maltreatment, all of which can lead to serious health effects, but maltreatment can be prevented. The authors merged and translated a variety of unrelated previous scientific findings on prevention programs' effectiveness. In presenting cost-benefit results specific to each U.S. state, this paper can help scale up cost-effective public health approaches to a serious public health problem.

Harrison Quick, Lance A. Waller, and Michele Casper

**A Multivariate Space–time Model for Analysing County Level Heart Disease Death Rates by Race and Sex**

*Journal of the Royal Statistical Society Series C Applied Statistics* 2017;67(1):291–304

While many researchers have employed multivariate spatial or spatiotemporal extensions of the conditional autoregressive model, multivariate space-time analyses have been scarce. In this study, the authors developed, evaluated, and applied a Bayesian multivariate spatiotemporal statistical model applied to heart disease death. The model can be used for other health conditions and data sources, and the approach yields precise local-level data that allow researchers to accurately assess the burden of heart disease in communities.

Steven Russell, Kyle Ryff, Carolyn Gould, Stacey Martin, and Michael Johansson

**Detecting Local Zika Virus Transmission in the Continental United States: A Comparison of Surveillance Strategies**

*PLoS Currents: Outbreaks* 2017; doi: 10.1371/ currents.outbreaks.cd76717676629d47704170ecbdb5f820

Public health decisions are often based on uncertain data and potential outcomes. The 2015–2017 Zika virus epidemic drove efforts to improve surveillance systems and to develop interventions, testing, and travel recommendations. The authors developed a simulation model to incorporate the uncertainties and estimate outcomes reflecting those uncertainties. This approach included critical components of each approach and allowed assessment of all outcomes of interest.

Pavithra Vijayakumar, Annika Hoyer, Robert G. Nelson, Ralph Brinks, and Meda E. Pavkov

**Estimation of Chronic Kidney Disease Incidence from Prevalence and Mortality Data in American Indians with Type 2 Diabetes**

*PLoS One* 2017;12(2):e0171027

No population-based incidence data exist on chronic kidney disease, except for during its advanced stages. This paper validates a new use of the illness-death model—a mathematical relationship between incidence, prevalence, and mortality—for computing the incidence density rate of chronic kidney disease. The new procedure adds a methodological tool with which to derive information from CDC cross-sectional surveys to improve understanding of chronic disease processes.

Fuyuen Yip, Bryan Christensen, Kanta Sircar, Luke Naeher, Nigel Bruce, David Pennise, Matthew Lozier, Tamara Pilishvili, Jennifer Loo Farrar, Debbi Stanistreet, Ronald Nyagol, Justus Muoki, Lindsey de Beer, Michael Sage, and Vikas Kapil

**Assessment of Traditional and Improved Stove Use on Household Air Pollution and Personal Exposures in Rural Western Kenya**

*Environment International* 2017; 99:185–191

More than 40% of families rely on solid fuels for heating and cooking. This poses risks for respiratory and cardiovascular diseases that most often affect women and children. This study improves our understanding of exposures to cookstove emissions from traditional and improved stoves. The authors used a single-arm pre- and post-intervention study to determine the performance of six improved cookstoves in a setting of daily stove use.



## LABORATORY SCIENCE

Justin M. Hettick, Brandon F. Law, Chen-Chung Lin, Adam V. Wisnewski,  
and Paul D. Siegel

**Mass Spectrometry-based Analysis of Murine Bronchoalveolar Lavage Fluid Following Respiratory Exposure to 4,4'-Methylene Diphenyl Diisocyanate Aerosol**  
*Xenobiotica* 2017; doi: 10.1080/00498254.2017.1344791

Diisocyanates are a family of chemical building blocks used to manufacture polyurethane products, particularly spray foam insulation, truck bed liners, and adhesives. They are also known to cause asthma and allergic reactions. Methylene diphenyl diisocyanate (MDI) is the most widely used diisocyanate. This study confirms that albumin is the major protein haptenated by MDI and shows the specific amino acids to which it reacts after live exposure.

Amrita Kumar, Jin Hyang Kim, Priya Ranjan, Maureen G. Metcalfe, Weiping Cao, Margarita Mishina, Shivaprakash Gangappa, Zhu Guo, Edward S. Boyden, Sherif Zaki, Ian York, Adolfo García-Sastre, Michael Shaw, and Suryaprakash Sambhara

**Influenza Virus Exploits Tunneling Nanotubes for Cell-to-Cell Spread**  
*Scientific Reports* 2017; doi: 10.1038/srep40360

The findings of this study provide an explanation for observations regarding lower-than-expected vaccine and antiviral effectiveness for influenza. The study fills the knowledge gap in our understanding by proposing a mechanism by which influenza viruses can spread from an infected cell to an uninfected cell using intercellular networks that connect epithelial cells and thereby evade detection by the immune surveillance system and inhibition by antiviral drugs.

Sreekumar Othumpangat, Nicole B. Bryan, Donald H. Beezhold, and John D. Noti

**Upregulation of miRNA-4776 in Influenza Virus Infected Bronchial Epithelial Cells Is Associated with Downregulation of NFKB1B and Increased Viral Survival**

*Viruses* 2017; doi: 10.3390/v9050094

In the United States, the annual costs of influenza are about \$4.6 billion. Another \$7 billion are lost to sick days and lost productivity. Understanding how influenza spreads is essential for developing intervention strategies. The failure of vaccines to combat influenza emphasizes the need to develop new methods that target host genes used by the virus for its survival. This study identified a regulatory molecule involved in the survival and replication of the influenza virus.

Carrie L. Pierce, Tracie L. Williams, Wanda I. Santana, Marnie Levine, Li-Mei Chen, Hans C. Cooper, Maria I. Solano, Adrian R. Woolfitt, Wayne A. Marasco, He Fang, Ruben O. Donis, and John R. Barr

**Immunocapture Isotope Dilution Mass Spectrometry in Response to a Pandemic Influenza Threat**

*Vaccine* 2017;35(37):5011–5018

The spread of an unknown influenza type can quickly become a public health emergency. Vaccination is the primary means to reduce sickness and death caused by influenza, but preparing vaccines for a new strain takes 6 to 9 months. The authors describe the use of immunocapture coupled with isotope dilution mass spectrometry to ensure high-quality vaccines. The result of this work can accelerate vaccine delivery to combat pandemics.

Eric Rogier, Mateusz Plucinski, Naomi Lucchi, Kimberly Mace, Michelle Chang, Jean Frantz Lemoine, Baltazar Candrinho, James Colborn, Rafael Dimbu, Filomeno Fortes, Venkatachalam Udhayakumar, and John Barnwell

**Bead-based Immunoassay Allows Sub-picogram Detection of Histidine-rich Protein 2 from *Plasmodium Falciparum* and Estimates Reliability of Malaria Rapid Diagnostic Tests**

*PLoS One* 2017;12(2):e0172139

Malaria affects nearly 50% of the world population, causing millions of clinical cases and contributing to about 400,000 deaths annually. This paper describes a new assay that is more than 200 times more sensitive than conventional field diagnostic tests for malaria and can be used to screen large numbers of samples for detection. The assay has been used to develop additional studies of malaria infection dynamics in various settings.



Mary E. Schmitz, Simon Agolory, Muthoni Junghae, Laura N. Broyles, Muthusi Kimeu, Joseph Ombayo, Mamo Umuro, Irene Mukui, Kennedy Alwenya, Moses Baraza, Kenneth Ndiege, Samuel Mwalili, Emilia Rivadeneira, Lucy Ng'ang'a, Chunfu Yang, and Clement Zeh, for the VL-DBS Study Group

**Field Evaluation of Dried Blood Spots for HIV-1 Viral Load Monitoring in Adults and Children Receiving Antiretroviral Treatment in Kenya: Implications for Scale-up in Resource-limited Settings**

*Journal of Acquired Immune Deficiency Syndrome* 2017;74(4):399–406

In 2013, the World Health Organization recommended use of HIV viral load testing to monitor patients on antiretroviral therapy. However, such testing requires blood samples be transported to laboratories within 24 hours or centrifuged to obtain plasma, which must then be transported. In this paper the authors determined that collecting dried blood spot specimens, which are easily collected, stored, and transported at regular temperatures, is a reasonable alternative to standard viral load testing.

Amy J. Schuh, Brian R. Amman, Megan E. B. Jones, Tara K. Sealy, Luke S. Uebelhoer, Jessica R. Spengler, Brock E. Martin, Jo Ann D. Coleman-McCray, Stuart T. Nichol, and Jonathan S. Towner

**Modelling Filovirus Maintenance in Nature by Experimental Transmission of Marburg Virus Between Egyptian Rousette Bats**

*Nature Communications* 2017;8:14446

It has long been unclear how Marburg virus (the close cousin of Ebola virus) is spread from host animals. This study, using Marburg virus and its natural host, the Egyptian fruit bat, describes the development of a working animal model for measuring the spread of the virus from a bat species. The authors' use of biosafety level-4 laboratory conditions enabled them to measure and understand virus and host considerations that drive spillover to humans.

James M. Smith, John A. Moss, Priya Srinivasan, Irina Butkyavichene, Manjula Gunawardana, Rob Fanter, Christine S. Miller, Debbie Sanchez, Flora Yang, Shanon Ellis, Jining Zhang, Mark A. Marzinke, Craig W. Hendrix, Amita Kapoor, and Marc M. Baum

**Novel Multipurpose Pod-intravaginal Ring for the Prevention of HIV, HSV, and Unintended Pregnancy: Pharmacokinetic Evaluation in a Macaque Model**

*PLoS One* 2017;12(10):e0185946

Preexposure prophylaxis (PrEP) for preventing HIV acquisition has shown encouraging results. Sticking to PrEP use in clinical trials is a major factor in its effectiveness. This paper describes the development and evaluation of the pod-intravaginal ring. The ring should help women maintain their medication regimen better and should work more effectively than taking pills every day.

Aleksandr B. Stefaniak, Ryan F. LeBouf, Matthew G. Duling, Jinghai Yi, Alaeddin B. Abukabda, Carroll R. McBride, and Timothy R. Nurkiewicz

### **Inhalation Exposure to Three-dimensional Printer Emissions Stimulates Acute Hypertension and Microvascular Dysfunction**

*Toxicology and Applied Pharmacology* 2017;335:1–5

Before the expiration of patents, three-dimensional printers cost thousands of dollars, but today they can be bought for less than \$300. As three-dimensional printing becomes more common it is critical that exposures and risks of emissions are understood. This paper describes the harm from exposure to three-dimensional printer emissions and should stimulate research on the toxicity of exposures. Findings suggest exposure levels that cause adverse responses were lower than many known hazardous materials.

Rory M. Welsh, Meghan L. Bentz, Alicia Shams, Hollis Houston, Amanda Lyons, Laura J. Rose, and Anastasia P. Litvintseva

### **Survival, Persistence, and Isolation of the Emerging Multidrug-resistant Pathogenic Yeast *Candida auris* on a Plastic Health Care Surface**

*Journal of Clinical Microbiology* 2017;55(10):2996–3005

*Candida auris* is a newly discovered multidrug-resistant yeast that is causing outbreaks of infections with high death rates on five continents. This paper shows that the survival and persistence of *C. auris* outside a human host allows ample time for transmission within a healthcare facility. The authors describe the development and evaluation of a laboratory method to isolate *C. auris* from clinical and environmental samples that often contain a complex community of microbes.



## PREVENTION AND CONTROL

Rahi Abouk, Scott D. Grosse, Elizabeth C. Ailes, and Matthew E. Oster

### **Association of U.S. State Implementation of Newborn Screening Policies for Critical Congenital Heart Disease with Early Infant Cardiac Deaths**

*JAMA* 2017;318(21):2111–2118

Before 2011, about 1,000 U.S. infants died each year of some type of congenital heart disease or defect before 6 months of age. Most U.S. states mandate screening, but most countries do not. Population-based studies of newborn screening are scarce. This study calculated reductions in early infant cardiac deaths in eight states that established screening mandates by June 1, 2013, but found no reduction in deaths associated with voluntary screening policies.

Robert Belknap, David Holland, Pei-Jean Feng, Joan-Pau Millet, Joan A. Caylá, Neil A. Martinson, Alicia Wright, Michael P. Chen, Ruth N. Moro, Nigel A. Scott, Bert Arevalo, José M. Miró, Margarita E. Villarino, Marc Weiner, and Andrey S. Borisov, for the TB Trials Consortium iAdhere Study Team

### **Self-administered Versus Directly Observed Once-weekly Isoniazid and Rifapentine Treatment of Latent Tuberculosis Infection: A Randomized Trial**

*Annals of Internal Medicine* 2017;167(10):689–697

Reactivation of latent tuberculosis infection is responsible for the majority of active TB cases in the United States. This randomized trial showed that self-administration of the 12-dose, 3-month regimen of isoniazid and rifapentine, known as 3HP, in the United States was safe and achieved a level of adherence and completion of therapy that was similar to administration by directly observed therapy, which is highly effective but intrusive and costly.

Jennifer L. Bell, Matthew A. Taylor, Guang-Xiang Chen, Rachel D. Kirk, and Erin R. Leatherman

### **Evaluation of an In-vehicle Monitoring System (IVMS) to Reduce Risky Driving Behaviors in Commercial Drivers: Comparison of In-cab Warning Lights and Supervisory Coaching with Videos of Driving Behavior**

*Journal of Safety Research* 2017;60:125–136

Roadway collisions are consistently the leading cause of injury and death for U.S. workers. This study evaluated in-vehicle monitoring systems installed in company vehicles and recorded behaviors such as hard braking, swerving, and speeding for 30 seconds before and after each incident. Data were collected from different vehicles and driving patterns (oil and gas extraction operations or local truck transportation) as drivers at 20 locations in 12 U.S. states performed their work.

Adam Bjork and Daniel M. Sosin

**Characterization of Departures from Regulatory Requirements Identified During Inspections Conducted by the U.S. Federal Select Agent Program, 2014–2015**

*Health Security* 2017;15(6):587–598

CDC's Federal Select Agent Program regulates 66 biological agents and toxins that threaten the health of people, animals, and plants. This investigation led to improved practices to increase biosafety and biosecurity of biological agents and toxins. In doing so, the United States will have a decreased risk of terrorism by constraining access to these agents and decreasing the risk of accidental release through enforcement of biosafety standards.

Tyler M. Brady, Amanda L. Strauch, Claudia M. Almaguer, George Niezgoda, Ronald E. Shaffer, Patrick L. Yorio, and Edward M. Fisher

**Transfer of Bacteriophage MS2 and Fluorescein from N95 Filtering Facepiece Respirators to Hands: Measuring Fomite Potential**

*Journal of Occupational and Environmental Hygiene* 2017;14(11):898–906

Acquiring or spreading pathogens by touching personal protective equipment is a concern within the healthcare industry. During public health outbreaks, resources become constrained and personal protective equipment, such as N95 filtering facepiece respirators, may have to be reused. The authors of this study measured the efficiency with which viruses moved from N95 respirators to human hands during exercises that mimic respirator use in health care.

Cristina V. Cardemil, Rebecca M. Dahl, Lisa James, Kathleen Wannemuehler, Howard E. Gary, Minesh Shah, Mona Marin, Jacob Riley, Daniel R. Feikin, Manisha Patel, and Patricia Quinlisk

**Effectiveness of a Third Dose of MMR Vaccine for Mumps Outbreak Control**

*The New England Journal of Medicine* 2017;377(10):947–956

Mumps cases have increased in the past 2 years to more than 5,000 cases annually in the United States, with most cases occurring during outbreaks in vaccinated populations. The effect of a third dose of the measles–mumps–rubella (MMR) vaccine in stopping a mumps outbreak is unknown. This study characterizes the effectiveness of the third dose of MMR—a critical question for the U.S. vaccination program at a time when mumps cases have surged.

Mitesh A. Desai, Dancun O. Okal, Charles E. Rose, Richard Ndivo, Boaz Oyaro, Fredrick O. Otieno, Tiffany Williams, Robert T. Chen, Clement Zeh, and Taraz Samandari

**Effect of Point-of-care CD4 Cell Count Results on Linkage to Care and Antiretroviral Initiation During a Home-based HIV Testing Campaign: A Non-blinded, Cluster-randomised Trial**  
*The Lancet HIV* 2017;4(9):e393–e401

The burden of the HIV epidemic is highest in Africa, where 68% of the 37 million people living with HIV reside. Efforts to bring HIV under control rely on promoting antiretroviral therapy. This paper reports on a randomized controlled trial of an intervention for linking people with HIV to care. The authors identified a strategy for improving that link to HIV care by giving people immune-cell testing devices.

Richard Dunville, Amy Peterson, Nicole Liddon, Mary Roach, Kenneth Coleman, and Patricia Dittus

**Sustained Reduction in Chlamydia Infections Following a School-based Screening: Detroit, 2010–2015**

*American Journal of Public Health* 2018;108(2):231–233

Chlamydia is the most commonly reported nationally notifiable disease. In 2014, an estimated 28% of infections were among those aged 15 to 19 years. This paper evaluates a school-based screening intervention in a highly vulnerable population in Detroit, Michigan; describes a reduction in chlamydia prevalence associated with the program; and offers recommendations for carrying out the intervention.

Alexander C. Ewing, Caroline C. King, Jeffrey B. Wiener, Charles S. Chasela, Michael G. Hudgens, Debbie Kamwendo, Gerald Tegha, Mina C. Hosseinipour, Denise J. Jamieson, Charles Van der Horst, and Athena P. Kourtis

**Effects of Concurrent Exposure to Antiretrovirals and Cotrimoxazole Prophylaxis Among HIV-exposed, Uninfected Infants**

*AIDS* 2017;31(18):2455–2463

Given the potential of cotrimoxazole preventive therapy (CPT) to prevent bacterial and malarial infections in HIV-exposed, uninfected (HEU) infants, the authors evaluated CPT toxicity when used with antiretroviral agents. In HIV-positive children, CPT has been associated with a 43% decrease in death, while in HEU infants, CPT is associated with decreased sickness and death. Findings suggest that interactions between CPT and antiretroviral treatment were not significant.

Leslie A. MacDonald, Stephen Bertke, Misty J. Hein, Suzanne Judd, Sherry Baron, Robert Merritt, and Virginia J. Howard

**Prevalence of Cardiovascular Health by Occupation: A Cross-sectional Analysis Among U.S. Workers Aged ≥45 Years**

*American Journal of Preventive Medicine* 2017;53(2):152–161

Heart disease and stroke are leading causes of death in the United States. In this study, the authors compile a comprehensive profile of the cardiovascular health of U.S. workers aged 45 years or older. The study informs targeted efforts to sustain the health of aging workers. Findings suggest the workforce's cardiovascular health profile is not randomly distributed within the labor market, even when adjusting for education and income.

Emily Mosites, Anna Frick, Prabhu Gounder, Louisa Castrodale, Yuan Li, Karen Rudolph, Debby Hurlburt, Kristen D. Lecy, Tammy Zulz, Tolu Adebajo, Jennifer Onukwube, Bernard Beall, Chris A. Van Beneden, Thomas Hennessy, Joseph McLaughlin, and Michael G. Bruce

**Outbreak of Invasive Infections from Subtype *emm*26.3 Group A *Streptococcus* Among Homeless Adults—Anchorage, Alaska, 2016–2017**

*Clinical Infectious Diseases* 2017;66(7):1068–1074

Group A *Streptococcus* can cause a range of infections such as strep throat and impetigo. In the past 2 years, three outbreaks of a rare invasive group A strep have been reported in Canada, and two have been reported in England. This paper describes outbreaks common among homeless populations in these countries and an inexpensive response to the outbreaks that decreased weekly incidence of the strain by 90% without increasing antibiotic resistance.

Tami H. Skoff, Amy E. Blain, James Watt, Karen Scherzinger, Melissa McMahon, Shelley M. Zansky, Kathy Kudish, Paul R. Cieslak, Melissa Lewis, Nong Shang, and Stacey W. Martin

**Impact of the U.S. Maternal Tetanus, Diphtheria, and Acellular Pertussis Vaccination Program on Preventing Pertussis in Infants <2 Months of Age: A Case-control Evaluation**

*Clinical Infectious Diseases* 2017;65(12):1977–1983

Effective pertussis vaccine programs have reduced U.S. pertussis incidence, but reported pertussis cases have been on the rise recently. Infants remain vulnerable to pertussis from birth until they receive direct protection through primary immunization beginning at 2 months old. The authors present a case-control evaluation of effectiveness of maternal Tdap (tetanus, reduced dose diphtheria, and pertussis vaccine) vaccination during pregnancy at preventing pertussis among infants under 2 months old.



Meghan Weinberg, Stephanie Dietz, Rachel Potter, Robert Swanson, Corinne Miller, and Jevon McFadden

**Vaccine Shot-limiting: Estimating the Prevalence, Indicators, and Impact on Vaccination Status—Michigan, 2012**

*Vaccine* 2017;35(7):1018–1023

Vaccines are one of public health's best prevention tools, but this study found some parents limit the number of shots their children receive per visit and are less likely to have their children's vaccination record up to date, possibly increasing their risk for vaccine-preventable diseases. This paper encourages healthcare providers to follow the Advisory Committee on Immunization Practices-recommended schedule and to take steps to ensure children on delayed schedules finish their vaccine series.

Christine Yoshinaga-Itano, Allison L. Sedey, Mallene Wiggin, and Winnie Chung

**Early Hearing Detection and Vocabulary of Children with Hearing Loss**

*Pediatrics* 2017;140(2):e20162964

Children who are deaf or hard of hearing usually fall behind their hearing peers in language, cognition, and social-emotional development. This paper reports on a CDC-funded effort to prevent language disability in children with bilateral congenital hearing loss. Findings suggest adherence to the objectives of the Early Hearing Detection and Intervention program improves vocabulary among children with congenital hearing loss, even when controlling for a variety of factors associated with language development.





# 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 are judged on their work's scientific merit, its effect on public health and the CDC/ATSDR mission, and on their leadership and recognition by peers.*

## Steven L. Cochi, MD, MPH

*Center for Global Health*

For 35 years, Dr. Steven Cochi has been shaping and carrying out national and international immunization policy and strategies to reduce the burden of vaccine-preventable diseases. He pioneered the Global Polio Eradication Initiative, which has brought the world close to eradicating polio. Four of six World Health Organization (WHO) regions have been certified polio-free. Only three countries remain polio-endemic (Nigeria, Afghanistan, and Pakistan), and only 37 cases were reported in 2016. He also has led the Measles and Rubella Initiative, which has decreased measles deaths by 79%, from 546,800 in 2000 to 114,900 in 2014. Measles elimination goals have been established in all WHO regions. Rubella elimination has been achieved in the Americas, and elimination goals have been established in two additional WHO regions.

Dr. Cochi's contributions to studies of Hib disease were instrumental in achieving licensure of the first Hib vaccine in 1985 for routine use in children. He also coordinated a series of studies to define the burden of varicella disease in the United States, determine the cost-effectiveness of a routine varicella vaccination program, and mathematically model a vaccination program, which led to licensure of varicella vaccine in 1995 for children.

Dr. Cochi has authored or coauthored more than 130 journal articles, 150 CDC publications, and 25 book chapters that have provided an evidence base for national and international immunization policy and program strategies. He has also edited six journal supplement compilations describing progress toward global immunization initiatives.

Dr. Cochi has received more than 30 CDC awards in validation of his body of scientific work including the Public Health Distinguished Service Medal in 1996 and Charles C. Shepard Science awards in 1996 for the best overall scientific paper and in 2003 for the best scientific paper in the Assessment and Epidemiology category. He is a member of the American Academy of Pediatrics, American Public Health Association, Pediatric Infectious Diseases Society, Infectious Diseases Society of America, and the American Epidemiological Society. In 2013, he was recognized as one of 50 most influential people in the vaccine field globally. In 2016, he was nominated to the U.S. National Academy of Medicine for his contributions to the field of global immunization.

## Denise Jamieson, MD, MPH

### *National Center for Chronic Disease Prevention and Health Promotion*

Dr. Denise Jamieson's scientific work has contributed to improvements in maternal and child health worldwide. Since pediatric HIV infection was first documented, Dr. Jamieson has led landmark research on HIV in pregnancy that helped shape antiretroviral prophylaxis for HIV transmission, which decreased perinatal sickness and death around the world. From 2000 to 2003, Dr. Jamieson led in the Mother-Infant Rapid Intervention at Delivery study, which documented the role of rapid testing in reducing perinatal HIV transmission during labor and delivery. This work led to worldwide use of rapid HIV testing during labor and delivery.

Dr. Jamieson's leadership in three of CDC's most complex emergency responses over the past decade has helped protect pregnant women and their infants from influenza, Ebola, and Zika. In January 2016, she co-led the Pregnancy & Birth Defects Task Force (PBDTF) and coauthored a key paper published in *The New England Journal of Medicine* that helped establish the link between Zika virus infection and birth defects. This paper was the sixth most discussed and shared academic paper of 2016 among 2.7 million research papers tracked by Altmetric.

Beginning in October 2016, Dr. Jamieson assumed the role of incident manager for the entire Zika response, leading more than 500 staff members. Under her leadership, CDC issued travel notices for pregnant women and their partners, published clinical guidance documents for the care of pregnant women and their infants, identified sexual transmission of Zika, monitored blood and tissue safety issues in Zika-affected areas, developed laboratory kits and reagents, and carried out vector control strategies. Her work in establishing the causal link between the Zika virus and birth defects, coupled with the issuing of clinical and travel guidance, weakened the fetal effects of Zika virus infection.

Dr. Jamieson has authored more than 400 peer-reviewed publications and earned a variety of awards, including the 2005 and 2011 Charles C. Shepard Science Award. She has been a finalist for this award five times. She has also won the CDC & ATSDR Honor Award for Excellence in Emergency Response three times. She has received numerous Commissioned Corps Outstanding Service Medals and the U.S. Department of Health and Human Services Secretary's Award for Distinguished Service.

## James L. Pirkle, MD, PhD

### *National Center for Environmental Health*

During a career that has lasted more than 36 years at CDC, Dr. James Pirkle has helped solve an array of public health problems that affect every American. His efforts to improve human exposure assessment have helped establish biomonitoring as a vital part of public health practice. He helped create laboratory methods leading to efforts to limit harmful exposures, including those from tobacco smoke and lead in gasoline. Dr. Pirkle has helped the Division of Laboratory Science (DLS) improve the precision of clinical measurements used to diagnose, treat, and prevent chronic disease. He has also helped introduce the measurement of trans-fats and document a major decline in trans-fat levels through food labelling.

Through Dr. Pirkle's research and leadership, DLS has world-class expertise in all major areas of clinical analytic laboratory measurements: metals, radionuclides, small molecules, peptides, proteins, lipids, and nucleic acids. By widely sharing division laboratory methods, Dr. Pirkle and division scientists have helped to raise standards and improve methods at thousands of laboratories around the world.

Dr. Pirkle analyzed national blood lead data and identified a correlation with use of lead in gasoline in the United States. These findings influenced EPA to remove lead from gasoline. As lead was removed from gasoline, blood lead levels in the U.S. population decreased by 78% and the percentage of children 1 to 5 years of age with lead levels above the health concern threshold decreased from 88% to 8.9%. These decreases in children's blood lead levels have improved the cognitive ability of U.S. children. Further, these findings influenced many countries to remove lead from gasoline and achieve similar declines in blood lead levels. In the same way, Dr. Pirkle's team characterized the U.S. population's exposure to secondhand smoke, which led to laws prohibiting smoking in public places.

Dr. Pirkle's most important accomplishments have been his contributions to building DLS laboratories whose quality and scientific achievements in public health are widely recognized. He has authored or coauthored 133 published articles and has received more than 20 honors of recognition, including the Arnall Patz Lifetime Achievement Award, Assistant Secretary for Health's Award for Exceptional Achievement, Commissioned Corps Distinguished Service Medal, and the Charles C. Shepard Award for Laboratory and Methods.



## Lawrence B. Schonberger, MD, MPH

### *National Center for Emerging and Zoonotic Infectious Diseases*

During a career spanning more than 40 years, Dr. Lawrence Schonberger has made substantial contributions to the epidemiology of viral, prion, and rickettsial infections. He is internationally known for his contributions to discovering the epidemiology of and best preventive practices for a series of mysterious illnesses, including Reye Syndrome, vaccine-associated Guillain-Barré syndrome (GBS), and prion diseases.

Dr. Schonberger is noted for taking on challenging epidemiologic questions and analyzing data to identify risks and connections for diseases and syndromes with unknown causes. His leadership and vision have helped to control Reye syndrome, and his findings led to changes in labelling and medication practices. Similarly, his work on influenza vaccine-associated GBS altered the course of a national vaccination program in 1976, saving lives.

His work also inspired and sometimes challenged others. In 1991, an epidemiologic study on GBS associated with the 1976 influenza vaccination campaign was published that had been conducted with input from other experts who, despite Dr. Schonberger's analyses, persistently questioned the existence of an increased risk of GBS after swine flu vaccinations. A later study corroborated Dr. Schonberger's findings, showing an increased GBS risk after vaccination.

For decades, Dr. Schonberger has displayed exemplary leadership, initiative, and achievement, resulting in substantial improvements in the prevention and control of multiple diseases. He has coauthored more than 250 publications in peer-reviewed journals and CDC reports, including seven Shepard Award-nominated papers. His leadership of the Epidemiology Office in the Division of Viral Diseases has influenced the career paths of scores of CDC epidemiologists.

Dr. Schonberger has received numerous honors and awards, including Commissioned Corps medals such as the Meritorious Service Medal for his prion disease work and, from his colleagues for his support working with junior-level epidemiologists, a Phillip S. Brachman Distinguished Friend of the EIS Award. In 2011, he was awarded the James M. Hughes Medal of Excellence by the National Center for Emerging and Zoonotic Infectious Diseases for his exemplary leadership, initiative, and achievements. Dr. Schonberger is a past president of the American Epidemiological Society. Even after 40 years, he still comes to work each day, mentoring junior staff, working with peers, and creating lasting and meaningful relationships with partners across the federal government and academia.



## John W. Ward, MD,

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

Since 1984, Dr. John W. Ward has been a principal 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 began his career as an Epidemic Intelligence Service officer assigned to CDC's AIDS Activity. Since then, his scientific achievements in the field of HIV/AIDS and viral hepatitis have included the discovery and elaboration of risk factors, transmission modes, vulnerable population needs, and racial and ethnic disparities. He has also helped develop effective ways to prevent and control infection, disease complications, and premature death from HIV/AIDS and viral hepatitis.

Dr. Ward's scientific achievements are many and varied. He provided the first evidence for a new laboratory test for HIV that improved the safety of the nation's blood supply. He identified new routes by which HIV spreads, such as cornea and bone transplants and plasma donations, as well as the actions needed to stop such transmission. He conducted the first natural history study of HIV among adults and children infected with the virus by unscreened blood donations to document the high death rates for people infected with HIV and factors related to disease progression. He improved surveillance of HIV-related illnesses, to include tuberculosis, toxoplasmosis, and other opportunistic infections among people infected with HIV, to guide national recommendations for HIV prevention, care, and treatment. He expanded the case definition for HIV/AIDS surveillance, which remains the surveillance standard today. He developed the first CDC recommendations for hepatitis B and C testing for people born between 1945 and 1965. He also guided new World Health Organization policies for hepatitis A and B vaccination, hepatitis C testing, viral hepatitis modelling, and development of the WHO strategic prevention framework, including the first global goals for the elimination of hepatitis B and C as public health threats.

During his 31 years at CDC, Dr. Ward has supervised some 150 multidisciplinary senior-level professionals. He is frequently asked to provide expert reviews for *The Lancet*, *The New England Journal of Medicine*, *JAMA*, and many other journals. He is often invited to serve on organizing committees for numerous national and international conferences and to give keynote addresses, lectures, and presentations.

## Paul A. Schulte, PhD, MS

### *National Institute for Occupational Safety and Health*

Dr. Paul Schulte has made significant contributions to the field of occupational safety and health, public health, and the protection and well-being of the workforce in the United States and around the world. He has been at the leading edge of advancing scientific knowledge and workplace safety and health policy in numerous areas, including molecular epidemiology, genetics in the workplace, risk communication, prevention through design, surveillance, and nanotechnology. He was a pioneer in the development of policies and methods to ensure research study subjects are informed of study results. He was an early proponent of workers' right to know their risks of workplace exposures and identified this as an important emerging public health issue.

Among Dr. Schulte's most notable contributions has been his development of guidance to protect workers from chemical, physical, and biological hazards, which led to prevention of workforce sickness, death, and injury. He led the effort to develop a detailed protocol for identifying the level of chemical exposure that is immediately dangerous to life and health and fostered an effort to recalibrate existing values, thus providing useful information to emergency responders and others during disasters.

To combat one of the most costly occupational diseases, dermatitis, Dr. Schulte coordinated the NIOSH effort to develop guidance for more than 100 high-volume chemical substances. He has promoted the effort to consider the occupational hazards of green jobs, and he coordinated the development of a major community demonstration project to reduce needle sticks in healthcare workers.

Dr. Schulte is a three-time winner of the American College of Occupational and Environmental Medicine's Kammer Award for Merit in Authorship. He has been a Charles C. Shepard Science Award nominee three times and an Alice Hamilton Science Award Honorable Mention recipient four times. He received the Secretary of DHHS Award for Distinguished Service in 2002. In 2011, he led the group that won the Bullard-Sherwood Research-to-Practice Award for outstanding application of occupational safety and health research. He has written or contributed to more than 349 NIOSH reports and documents, 143 published papers and abstracts, and 54 chapters in books and reports, as well as 11 NIOSH blog posts and 315 scientific presentations that provided widely used information and guidance to protect workers.









## PREVIOUS WINNERS

**2017**

### **ASSESSMENT**

Katherine E. Fleming-Dutra, Adam L. Hersh, Daniel J. Shapiro, Monina Bartoces, Eva A. Enns, Thomas M. File, Jr., Jonathan A. Finkelstein, Jeffrey S. Gerber, David Y. Hyun, Jeffrey A. Linder, Ruth Lynfield, David J. Margolis, Larissa S. May, Daniel Merenstein, Joshua P. Metlay, Jason G. Newland, Jay F. Piccirillo, Rebecca M. Roberts, Guillermo V. Sanchez, Katie J. Suda, Ann Thomas, Teri Moser Woo, Rachel M. Zetts, and Lauri A. Hicks

**Prevalence of Inappropriate Antibiotic Prescriptions Among U.S. Ambulatory Care Visits,**  
*JAMA* 2016;315(17):1864–1873

### **DATA METHODS AND STUDY DESIGN**

Samuel S. Shepard, Sarah Meno, Justin Bahl, Malania M. Wilson, John Barnes, and Elizabeth Neuhaus

**Viral Deep Sequencing Needs an Adaptive Approach: IRMA, the Iterative Refinement Meta-Assembler**  
*BMC Genomics* 2016;17:801

### **LABORATORY SCIENCE**

Sabine M. G. van der Sanden, Weilin Wu, Naomi Dybdahl-Sissoko, William C. Weldon, Paula Brooks, Jason O'Donnell, Les P. Jones, Cedric Brown, S. Mark Tompkins, M. Steven Oberste, Jon Karpilow, and Ralph A. Tripp

**Engineering Enhanced Vaccine Cell Lines to Eradicate Vaccine-Preventable Diseases: The Polio End Game**  
*Journal of Virology* 2016;90(4):1694–1704

### **PREVENTION AND CONTROL**

Philip J. Peters, Pamela Pontones, Karen W. Hoover, Monita R. Patel, Romeo R. Galang, Jessica Shields, Sara J. Blosser, Michael W. Spiller, Brittany Combs, William M. Switzer, Caitlin Conrad, Jessica Gentry, Yury Khudyakov, Dorothy Waterhouse, S. Michele Owen, Erika Chapman, Jeremy C. Roseberry, Veronica McCants, Paul J. Weidle, Dita Broz, Taraz Samandari, Jonathan Mermin, Jennifer Walthall, John T. Brooks, and Joan M. Duwve, for the Indiana HIV Outbreak Investigation Team

**HIV Infection Linked to Injection Use of Oxycodone in Indiana, 2014–2015**  
*The New England Journal of Medicine* 2016;375(3):229–239

## LIFETIME SCIENTIFIC ACHIEVEMENT

Patrick J. Lammie, PhD

Dr. Lammie was recognized for his wide-ranging research and work to control and eliminate neglected parasitic diseases, particularly lymphatic filariasis.



## 2016

### ASSESSMENT

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

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

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

### DATA METHODS AND STUDY DESIGN

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

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

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



## LABORATORY SCIENCE

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 s

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

*The Journal of Infectious Diseases* 2015;213(6):957–965

## PREVENTION AND CONTROL

Concepción F. Estívariz, 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, Khalequ Zaman

### **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;15:898–904

## LIFETIME SCIENTIFIC ACHIEVEMENT

Rear Admiral Kenneth G. Castro, MD

Dr. Castro was recognized for his leadership, expertise, and pioneering body of scientific work in HIV/AIDS and tuberculosis.

## 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 Sharker, 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**

*JAMA* 2016;315(17):1864–1873

## 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 SCIENCE

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**

*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 Griesse, 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, Kashmira 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

Yan 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

### **Rift Valley Fever Virus Vaccine Lacking the NSs and NSm Genes Is Safe, Nonteratogenic, and Confers Protection from Viremia, Pyrexia, and Abortion**

*Journal of Virology* 2011;85(24):12901–1290949

## 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

### **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

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, Ermas 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

### **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**

*The 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. Hosseini, 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

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 51

### PREVENTION AND CONTROL

Sandra L. Decker

#### **Proceedings of the National Academy of Sciences of the United States of America**

*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 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

### **Preventing Alcohol-Exposed Pregnancies: A Randomized Controlled Trial**

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

## LIFETIME SCIENTIFIC ACHIEVEMENT

Vincent Castranova, PhD

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

### **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

### **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*

## 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, Marshelyn 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. Puh, 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



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



**2017**

**John Cacioppo, PhD**

University of Chicago Center for  
Cognitive & Social Neuroscience

*"Loneliness: Public Health Implications  
and Potential Mechanisms"*

**2016**

**Zulfiqar A. Bhutta, PhD, MBBS**

The Hospital for Sick Children

*"Global Child Survival: Challenges  
and Opportunities"*

**2015**

**Anthony S. Fauci, MD**

National Institute of Allergy and  
Infectious Diseases

*"Advances to Public Health  
Implementation"*

**2014**

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

The 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**

London School of Hygiene & Tropical  
Medicine, University of London

*"Vaccines for Global Health"*

**2010**

**John Holdren, PhD**

White House Office of Science  
and Technology Policy

*"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, PhD, MPH**

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**

National Academy of Medicine

*"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**

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

*"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**

Johns Hopkins University Bloomberg  
School of Public Health

*"Health of the World"*

**1999**

**Steven N. Blair, PED**

The Cooper Institute  
Columnist, *The New York Times*

*"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

*"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 and Atherosclerosis"*

**1988**

**David Baltimore, PhD**

Hospital 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"*

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