

# BIG DATA

- Unlocking
- Big Data and
- Analytics for
- Public Health

Keynote Speaker:

Jon D. Duke MD, MS

*Presented by the CDC Office of Science*

June 26, 2019 • 10:00 A.M. to 11:30 A.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 including 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 26, 2019 • 10:00 a.m.**

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

## Welcome

Joanne Cono, MD, ScM

## CDC Director Welcome

Robert R. Redfield, MD

## Remarks from the CDC Office of Science Director and Introduction of Keynote Speaker

Rebecca Bunnell, PhD, MEd

## “Unlocking Big Data and Analytics for Public Health”

Jon Duke, MD, MS

## Presentation of the 2019 Charles C. Shepard Science Awards

Joanne Cono, MD, ScM; John Beltrami, MD, MPH&TM, FACPM  
(CAPT, USPHS)

Assessment

Data Methods and Study Design

Laboratory Science

Prevention and Control

Lifetime Scientific Achievement

## Closing Remarks

Anne Schuchat, MD (RADM, USPHS Ret)

# Keynote Speaker's Biography



## Jon Duke, MD, MS

Jon Duke, MD, MS is the director of health informatics at Georgia Tech's College of Computing, School of Computational Science & Engineering, and holds a joint appointment as a principal research scientist in the Georgia Tech Research Institute's Information & Cyber Sciences Directorate. He leads big data in medicine research projects.

Duke previously held an appointment as a senior scientist and director of health analytics and advanced text mining at the Regenstrief Center for Biomedical Informatics. While at Regenstrief, he also led the Drug Safety Informatics Lab as well as a 5-year partnership with Merck & Co, which conducted more than 45 projects involving at least 70 faculty and staff.

Duke leads Georgia Tech's initiative to improve human health through better capture, interpretation, and applications of data. This effort incorporates a spectrum of expertise, including machine learning, natural language processing, high-performance computing, sensors, cybersecurity and health data interoperability. While applying advanced technology, these efforts manifest through real-world projects supporting not only research environments but also healthcare systems, government and industry partners, and community collaborators.

Duke's previous work focused on advancing techniques for conducting research through structured, unstructured, and patient-generated healthcare data, with applications spanning research, quality, and clinical domains. His areas of expertise include the following:

- Big data analytics and natural language processing in health care
- Structured and unstructured clinical phenotypes
- Drug safety and clinical decision support
- UI/UX (user-interface/user experience) design in health IT applications
- Academic-industry collaborations

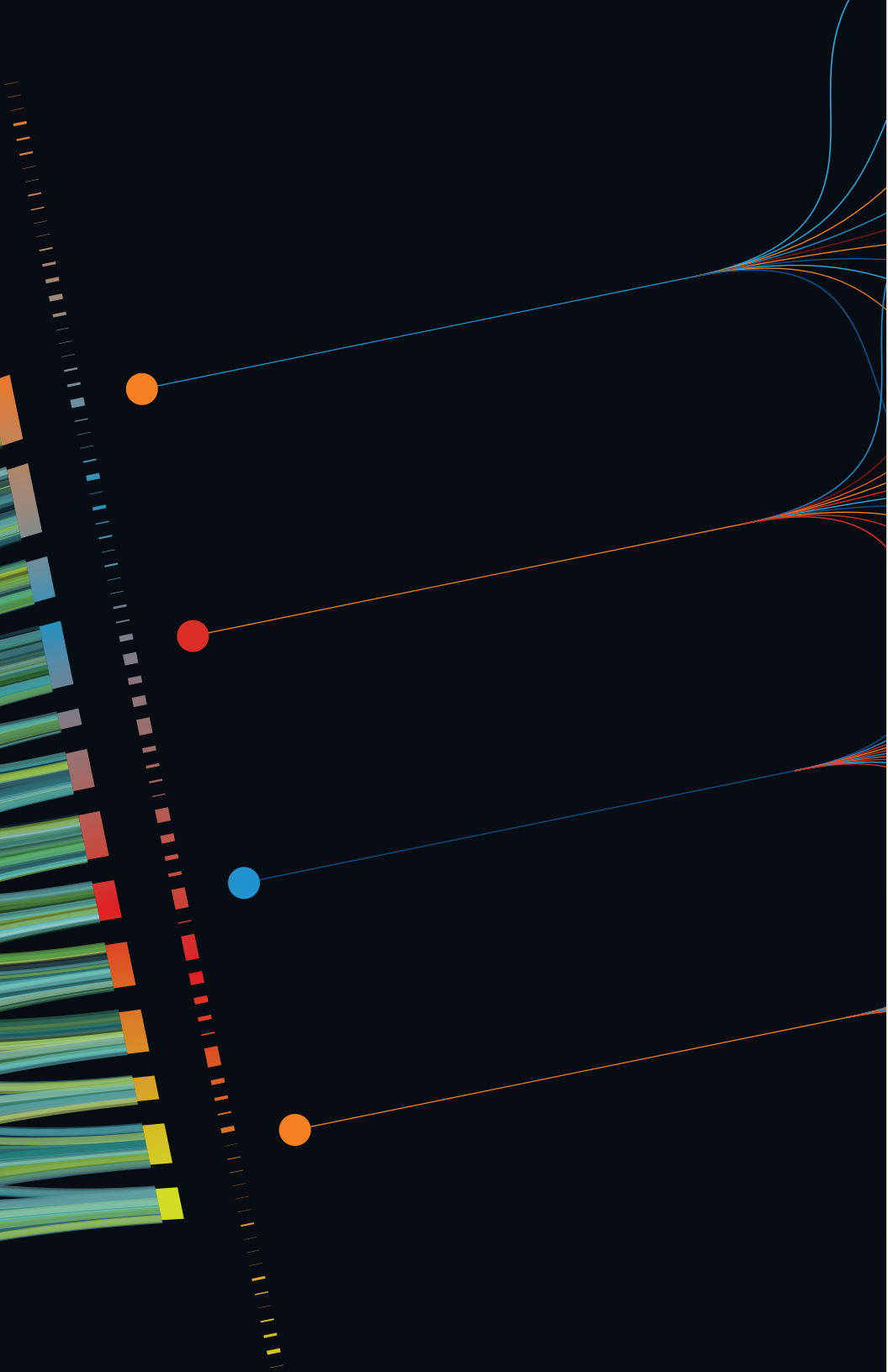
During the past several years, Duke has directed more than \$21 million in data research for industry and government sponsors. He has worked to multiply strategies for capturing better healthcare data, streamlining insights for stakeholders and delivering effective data-based interventions. In 2014, Duke helped found the Observational Health Data Sciences and Informatics (OHDSI, pronounced “Odyssey”) program, which aims to develop open-source solutions to deliver value in health data through large-scale analytics.

Duke received his bachelor’s degree in 1994 from Emory University and his MD from Harvard Medical School in 2000. He completed his internal medicine residency with Brigham and Women’s Hospital in Boston in 2003. In 2010, he earned a master’s degree in human–computer interaction from Indiana University. During this same time he had a fellowship in medical informatics with the Regenstrief Institute.

Board certified in internal medicine since 2003, Duke has served as an adjunct professor of medicine, informatics, and knowledge informatics and translation at the Indiana School of Medicine from 2010 to 2014. He was a resident clinical instructor at Harvard Medical School from 2000 to 2003.

In addition to co-founding the OHDSI Collaborative, Duke is a member of the Health Information and Management Systems Society, the American Medical Informatics Association, and the American College of Physicians.









# 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 2019 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

Zoe Bamberg, Cynthia H. Cassell, Rebecca E. Bunnell, Kakoli Roy, Zara Ahmed, Rebecca L. Payne, and Martin I. Meltzer

**Impact of a Hypothetical Infectious Disease Outbreak on U.S. Exports and Export-based Jobs**  
*Health Security* 2018;16(1):1–7

Asia over three stages (starting in one country and spreading to nine countries if left uncontained) on U.S. exports and export-related jobs. The authors show how global health security is improved and the U.S. economy is protected when public health threats are rapidly detected and contained at their source. The assessment helped illustrate the importance of global health security funding.

Rebecca H. Bitsko, Joseph R. Holbrook, Reem M. Ghandour, Stephen J. Blumberg, Susanna N. Visser, Ruth Perou, and John T. Walkup

**Epidemiology and Impact of Health Care Provider-diagnosed Anxiety and Depression Among U.S. Children**

*Journal of Developmental and Behavioral Pediatrics* 2018;39(5):395–403

Monitoring the prevalence of childhood mental disorders such as anxiety and depression is vital for understanding their impact and informing public health strategies to improve the health and well-being of affected children. However, data on the prevalence of these disorders among children is lacking. This paper uses nationally representative data to show the increasing prevalence and wide-ranging impact of current diagnoses of anxiety and depression on children and families in the United States.

David J. Blackley, Laura E. Reynolds, Connie Short, Ron Carson, Eileen Storey, Cara N. Halldin, and A. Scott Laney

**Progressive Massive Fibrosis in Coal Miners from 3 Clinics in Virginia**

*JAMA* 2018;319(5):500–501

CDC has noted a recent rise in coal workers' pneumoconiosis, or black lung disease. This study described the largest cluster of progressive massive fibrosis—the most severe form of the potentially lethal disease—ever identified in the United States and led to national efforts to improve early identification of black lung, to improve patient-level data collection at black lung clinics, and to increase funding for vital medical services for coal miners with disabling pneumoconiosis.

Susan A. Carlson, E. Kathleen Adams, Zhou Yang, and Janet E. Fulton  
**Percentage of Deaths Associated With Inadequate Physical Activity in the United States**  
*Preventing Chronic Disease* 2018;15:E38

About half of U.S. adults do not exercise enough. Given the inadequate amounts of physical activity and the health risks associated with it, insufficient physical activity can be a substantial public health problem in the United States. This study estimates the percentage of deaths attributable to levels of physical activity that were inadequate to meet the current aerobic physical activity guideline. Overall, 8.3% of deaths were attributed to inadequate levels of physical activity.

Robert D. Daniels

**Occupational Asthma Risk from Exposures to Toluene Diisocyanate:  
A Review and Risk Assessment**

*American Journal of Industrial Medicine* 2018;61(4):282–292

Using epidemiology, statistics, and risk-assessment methods, the authors describe an effort to establish exposure limits for the organic chemical compound toluene diisocyanate (TDI), which is used to manufacture polyurethane foams. Previous workplace recommendations have been based on qualitative assessments. This assessment provides a clearer picture of the workplace risks of TDI exposure and the adverse health outcome of occupational asthma and can also inform environmental assessments.

Giulia Earle-Richardson, Christine Prue, Khadija Turay, and Dana Thomas  
**Influences of Community Interventions on Zika Prevention Behaviors of Pregnant Women,  
Puerto Rico, July 2016–June 2017**

*Emerging Infectious Diseases* 2018;24(12):2251–2261

The Zika outbreak was a first with multiple facets for both outbreak control and education of the target populations for disease prevention, in particular pregnant women and women of childbearing age. This paper assesses how community education and intervention efforts influenced pregnant women's Zika prevention behaviors during the 2016 Centers for Disease Control and Prevention–Puerto Rico Department of Health Zika virus response.

Alexa B. Erck Lambert, Sharyn E. Parks, and Carrie K. Shapiro-Mendoza

**National and State Trends in Sudden Unexpected Infant Death: 1990–2015**

*Pediatrics* 2018;141(3) e20173519

Despite sharp declines in sudden unexpected infant death (SUID) during the 1990s, SUID remains a leading cause of infant death. Characterizing the epidemiology of SUID can inform prevention efforts. This paper assesses SUID estimates and trends to document geographic disparities and changes over time. It also assesses diagnostic shifts in type of SUID cases. These data will provide national and local data to improve efforts to reduce variability in infant death investigations.

Edward W. Gregg, Yiling J. Cheng, Meera Srinivasan, Ji Lin, Linda S. Geiss, Ann L. Albright, and Giuseppina Imperatore

**Trends in Cause-specific Mortality Among Adults With and Without Diagnosed Diabetes in the U.S.A.: An Epidemiological Analysis of Linked National Survey and Vital Statistics Data**

*The Lancet* 2018;391(10138):2430–2440

Conventional vital statistics are inadequate for monitoring the impact of diabetes because diabetes is underreported as a cause of death. Thus, despite the prominence of diabetes as a public health problem, its effects and causes of death in the United States are unknown. This paper provides nationally representative estimates for causes of death in the United States and shows the diverse diabetes-related complications currently underway.

Richard Lowry, Michelle M. Johns, Allegra R. Gordon, S. Bryn Austin, Leah E. Robin, and Laura K. Kann

**Nonconforming Gender Expression and Associated Mental Distress and Substance Use Among High School Students**

*JAMA Pediatrics* 2018;172(11):1020–1028

This study is among the first to examine mental distress and substance use among gender-nonconforming youth. By using a validated measure, the authors assessed gender expression with the following statement and question on the Youth Risk Behavior Survey conducted in 2015 (the latest year for which data were available): “A person’s appearance, style, dress, or the way they walk or talk may affect how people describe them. How do you think people at school would describe you?”

Brian A. Maskery, Drew L. Posey, Margaret S. Coleman, Redentor C. Asis, Weigong Zhou, John A. Painter, La’Marcus T. Wingate, Melnard Roque, and Martin S. Cetron

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

*International Journal of Tuberculosis and Lung Disease* 2018;22(4):429–436

CDC has set a goal for tuberculosis elimination. Few articles have examined the economic impact of screening activities using data from active programs. The authors estimated cost and health outcome data for Filipino immigrants to develop a decision-tree model including three arms: 1) no TB screening, 2) overseas screening and domestic follow-up with smear-based instructions, and 3) overseas screening and domestic follow-up culture-based instructions. Overseas screening with culture-based instructions reduced costs relative to the other strategies for Filipino immigrants.

Paul S. Mead, Nisha K. Duggal, Sarah A. Hook, Mark Delorey, Marc Fischer, Dana Olzenak McGuire, Heidi Becksted, Ryan J. Max, Michael Anishchenko, Amy M. Schwartz, Wen-Pin Tzeng, Christina A. Nelson, Erin M. McDonald, John T. Brooks, Aaron C. Brault, and Alison F. Hinckley

**Zika Virus Shedding in Semen of Symptomatic Infected Men**

*The New England Journal of Medicine* 2018;378(15):1377–1385

Following its arrival in 2015, Zika virus spread quickly throughout the Americas. By July 2017, more than 700,000 human infections had been reported. This study looked at virus shedding in human semen. The authors found that Zika virus RNA was detectable in the semen of over 60% of men tested within 30 days after illness onset, that shedding decreased during the following 3 months but could last as long as 281 days, and that intermittent shedding was possible but rare.

Soyoun Park, Cathleen Gillespie, Jason Baumgardner, Quanhe Yang, Amy L. Valderrama, Jing Fang, Fleetwood Loustalot, and Yuling Hong

**Modeled State-level Estimates of Hypertension Prevalence and Undiagnosed Hypertension Among U.S. Adults During 2013–2015**

*The Journal of Clinical Hypertension (Greenwich)* 2018;20(10):1395–1410

Hypertension affects nearly one-third of U.S. adults and is a primary risk factor for cardiovascular disease. Most often, hypertension estimates at the state level rely upon information reported by survey participants. However, self-reported information is subject to recall bias and does not allow for estimates of undiagnosed hypertension or blood pressure control. This study applied regression modeling techniques to fill gaps in sub-national surveillance data. These methods can be applied to other data sources, geographical areas, or outcomes.

Emiko Petrosky, Rafael Harpaz, Katherine A. Fowler, Michele K. Bohm, Charles G. Helmick, Keming Yuan, and Carter J. Betz

**Chronic Pain Among Suicide Decedents, 2003 to 2014: Findings from the National Violent Death Reporting System**

*Annals of Internal Medicine* 2018;169(7):448–455

Suicide rates have increased substantially across the United States since 1999, and opioid misuse has contributed to a national epidemic of opioid-related overdose deaths. Chronic pain is underappreciated as a public health problem because its impact is not easily measured, but chronic pain is linked to suicide. Previous studies have primarily examined nonfatal suicidal behaviors. This analysis examined suicide deaths associated with chronic pain using data from the National Violent Death Reporting System.

Ian D. Plumb, K. Danielle Lecy, Rosalyn Singleton, Michael C. Engel, Matthew Hirschfeld, James W. Keck, Joseph Klejka, Karen M. Rudolph, Thomas W. Hennessy, and Michael G. Bruce

**Invasive *Haemophilus Influenzae* Serotype A Infection in Children: Clinical Description of an Emerging Pathogen—Alaska, 2002–2014**

*The Pediatric Infectious Disease Journal* 2018;37(4):298–303

Historically, *Haemophilus influenzae* serotype b (Hib) was a major cause of invasive infections in the United States, but disease rates have fallen dramatically following routine use of pediatric Hib vaccines. In recent years, *Haemophilus influenzae* serotype a (Hia) has emerged as a cause of invasive infection in Alaska, particularly among Alaska Native children. By combining statewide bacterial disease surveillance with a systematic review of medical reports, this study described the clinical severity of this emerging pathogen.

Nicholas G. Reich, Justin Lessler, Jay K. Varma, and Neil M. Vora

**Quantifying the Risk and Cost of Active Monitoring for Infectious Diseases**

*Scientific Reports* 2018;8(1):1093

This paper presents an empirical framework for evaluating the risks and costs associated with active monitoring applied to three pathogens (Ebola, MERS-CoV, and smallpox) of significant public health concern. The approach and framework were developed to be generally applicable and to be used to develop empirically based public health policies in future outbreaks. The findings based on the analyses presented in this paper can be used to develop empirically based public health policies in future outbreaks.

Lauren M. Rossen, Holly Hedegaard, Diba Khan, and Margaret Warner

**County-level Trends in Suicide Rates in the U.S., 2005–2015**

*American Journal of Preventive Medicine* 2018;55(1):72–79

A major barrier to examining county-level trends in suicide deaths is that the rates are often unstable due to the small number of deaths that occur in a given county and year, particularly in rural counties. Subsequently, estimates of suicide rates are typically only available for larger geographies such as states or metropolitan areas, where the number of suicides exceeds 20 per year. This paper uses a novel application of hierarchical Bayesian models to overcome this challenge.



Matthew Rubinstein, Robert Hirsch, Kakali Bandyopadhyay, Bereneice Madison, Thomas Taylor, Anne Ranne, Millie Linville, Keri Donaldson, Felicitas Lacbawan, and Nancy Cornish

**Effectiveness of Practices to Support Appropriate Laboratory Test Utilization: A Laboratory Medicine Best Practices Systematic Review and Meta-analysis**

*American Journal of Clinical Pathology* 2018;149(3):197–221

Diagnostic error contributes to between 40,000 and 80,000 deaths in the United States each year and is a leading cause of malpractice claims. Identifying evidence-based laboratory practices in the pre-analytical phase is critically important to healthcare quality and patient safety. This systematic review and meta-analysis evaluates the effectiveness of practices to manage the use of laboratory tests and discusses key improvement roles for laboratory scientists.

Samir K. Saha, Stephanie J. Schrag, Shams El Arifeen, Luke C. Mullany, Mohammad Shahidul Islam, Nong Shang, Shamim A. Qazi, Anita K. M. Zaidi, Zulfiqar A. Bhutta, Anuradha Bose, Pinaki Panigrahi, Sajid B. Soofi, Nicholas E. Connor, Dipak K. Mitra, Rita Isaac, Jonas M. Winchell, Melissa L. Arvay, Maksuda Islam, Yasir Shafiq, Imran Nisar, Benazir Baloch, Furqan Kabir, Murtaza Ali, Maureen H. Diaz, Radhanath Satpathy, Pritish Nanda, Bijaya K. Padhi, Sailajanandan Parida, Aneeta Hotwani, M. Hasanuzzaman, Sheraz Ahmed, Mohammad Belal Hossain, Shabina Ariff, Imran Ahmed, Syed Mamun Ibne Moin, Arif Mahmud, Jessica L. Waller, Iftekhar Rafiqullah, Mohammad A. Quaiyum, Nazma Begum, Veeraraghavan Balaji, Jasmin Halen, A. S. M. Nawshad Uddin Ahmed, Martin W. Weber, Davidson H. Hamer, Patricia L. Hibberd, Qazi Sadeq-Ur Rahman, Venkat Raghava Mogan, Tanvir Hossain, Lesley McGee, Shalini Anandan, Anran Liu, Kalpana Panigrahi, Asha Mary Abraham, and Abdullah H. Baqui

**Causes and Incidence of Community-acquired Serious Infections Among Young Children in South Asia (ANISA): An Observational Cohort Study**

*The Lancet* 2018;392(10142):145–159

One third of the world's young infant deaths occur in South Asia. While a number of interventions, including childhood vaccines, have reduced infection-related deaths among older children, the portion of deaths in the young infant category has remained stable. The authors found that the majority of these deaths occur in the first week of life, with verbal autopsy studies attributing infection as the cause of about one-third of these deaths.

Laura A. Schieve, Lin H. Tian, Carolyn Drews-Botsch, Gayle C. Windham, Craig Newschaffer, Julie L. Daniels, Li-Ching Lee, Lisa A. Croen, and M. Danielle Fallin

**Autism Spectrum Disorder and Birth Spacing: Findings from the Study to Explore Early Development (SEED)**

*Autism Research* 2018;11(1):81–94

Autism spectrum disorder (ASD) occurs in an estimated 1 million to 1.5 million children in the United States and is associated with extensive impairments in communication and social abilities, numerous co-occurring health and psychiatric conditions, and increased risk for suicide attempts and early death. The detailed developmental data available in SEED helped researchers find that ASD is associated with both short and long intervals between pregnancies, informing public health and clinical guidelines about optimal pregnancy spacing, a modifiable risk factor.



Dawn K. Smith, Michelle Van Handel, and Jeremy Grey

**Estimates of Adults with Indications for HIV Pre-exposure Prophylaxis by Jurisdiction, Transmission Risk Group, and Race/Ethnicity, United States, 2015**

*Annals of Epidemiology* 2018;28(12):850–857 e9

About 40,000 new cases of HIV infection are diagnosed each year. Pre-exposure prophylaxis (PrEP) is more than 90% effective in preventing sexually acquired infections and more than 70% effective among people who inject drugs. This assessment estimates the distribution of PrEP needed for effectively targeted action. It details an analytic method that can be used at other geographic levels (e.g., city or county) and provides data that allow jurisdictions to plan for PrEP delivery and monitor its equitable use.

J. Michael Soucie, Paul E. Monahan, Roshni Kulkarni, Barbara A. Konkle, and Marshall A. Mazepa, for the U. S. Hemophilia Treatment Center Network

**The Frequency of Joint Hemorrhages and Procedures in Nonsevere Hemophilia A vs. B**

*Blood Advances* 2018;2(16):2136–2144

Hemophilia is a genetic disorder primarily affecting males and characterized by the lack of a protein critical to normal blood clotting. This study used surveillance data compiled from nearly 5,000 boys and men with hemophilia across the United States. The authors quantified rates and risk factors for bleeding into joints that results in chronic debilitating joint disease. The same data analyzed using prediction models provides important insights to guide future preventive therapies.

Ian H. Spicknall, Katharine J. Looker, Sami L. Gottlieb, Harrell W. Chesson, Joshua T. Schiffer, Jocelyn Elmes, and Marie-Claude Boily

**Review of Mathematical Models of HSV-2 Vaccination: Implications for Vaccine Development**

*Vaccine* 2018; doi: 10.1016/j.vaccine.2018.02.067

Herpes simplex 2 (HSV-2) is an infection found in more than 1 in 6 sexually active women in the United States. Infection can reduce quality of life and is a major risk factor for HIV acquisition. Annually, HSV-2 imposes a direct medical cost of about \$650 million per year in the United States. The authors analyzed mathematical models, assessed their potential for prophylactic or therapeutic HSV-2 vaccination at the population level, and identified characteristics essential for future models.

Heather M. Strosnider, Howard H. Chang, Lyndsey A. Darrow, Yang Liu, Ambarish Vaidyanathan, and Matthew J. Strickland

**Age-Specific Associations of Ozone and PM<sub>2.5</sub> with Respiratory Emergency Department Visits in the U.S.**

*American Journal of Respiratory and Critical Care Medicine* 2018; doi: 10.1164/rccm.201806-11470C

Exposure to ozone and fine particulate matter is associated with increases in sickness and death, particularly among older adults. In this study, the authors used secondary surveillance data and time-series methods on respiratory health conditions and air pollution to examine the association between respiratory emergency department visits and air pollution. Findings can be used to evaluate national air pollution standards and establish standards that help protect people of all ages.

Saleena Subaiya, Collins Tabu, James N’Ganga, Abdulkadir Amin Awes, Kibet Serгон, Leonard Cosmas, Ashley Styczynski, Samson Thuo, Emmaculate Lebo, Reinhard Kaiser, Robert Perry, Peter Ademba, Katrina Kretsinger, Iheoma Onuekwusi, Howard Gary, and Heather M. Scobie

**Use of the revised World Health Organization Cluster Survey Methodology to Classify Measles-Rubella Vaccination Campaign Coverage in 47 Counties in Kenya, 2016**

*PLoS One* 2018;13(7):e0199786

To evaluate vaccination coverage of the national measles-rubella campaign in Kenya, the authors conducted a multistage cluster survey among children aged 9 months–14 years a month after the campaign. This survey tested methods recommended in the World Health Organization 2015 draft manual for vaccination coverage cluster surveys. The revised manual updated earlier WHO guidance with recommendations for probability-based sampling, minimizing selection bias, and improving data quality.





Elizabeth A. Torrone, Charles S. Morrison, Pai-Lien Chen, Cynthia Kwok, Suzanna C. Francis, Richard J. Hayes, Katharine J. Looker, Sheena McCormack, Nuala McGrath, Janneke H. H. M. van de Wijgert, Deborah Watson-Jones, Nicola Low, and Sami L. Gottlieb, on behalf of the STIMA Working Group

**Prevalence of Sexually Transmitted Infections and Bacterial Vaginosis Among Women in Sub-Saharan Africa: An Individual Participant Data Meta-analysis of 18 HIV Prevention Studies**

*PLoS Med* 2018;15(2):e1002511

Accurate estimates of sexually transmitted infection (STI) rates are essential for prevention and control efforts. But few population-based studies of STIs and bacterial vaginosis (BV) rates exist for low- and middle-income countries. For this paper, researchers accessed raw data from 18 prospective HIV prevention studies that collected STI and BV data at baseline and conducted an individual participant meta-analysis to generate new estimates of the prevalence of five STIs and BV among women in sub-Saharan Africa.

Daniel Weibel, Miriam Sturkenboom, Steven Black, Maria de Ridder, Caitlin Dodd, Jan Bonhoeffer, Ann Vanrolleghem, Nicoline van der Maas, Gert Jan Lammers, Sebastiaan Overeem, Angela Gentile, Norberto Giglio, Vanesa Castellano, Jeffrey C. Kwong, Brian J. Murray, Karen Cauch-Dudek, Diana Juhasz, Michael Campitelli, Alexandre N. Datta, Ulf Kallweit, Wan-Ting Huang, Yu-Shu Huang, Chung-Yao Hsu, Hsi-Chung Chen, Maria Giner-Soriano, Rosa Morros, Carles Gaig, Ester Tió, Silvia Perez-Vilar, Javier Diez-Domingo, Francisco Javier Puertas, Lawrence W. Svenson, Salaheddin M. Mahmud, Bruce Carleton, Monika Naus, Lisen Arnheim-Dahlström, Lars Pedersen, Frank DeStefano, and Tom T. Shimabukuro

**Narcolepsy and Adjuvanted Pandemic Influenza A (H1N1) 2009 Vaccines—Multi-country Assessment**

*Vaccine* 2018;36(41):6202–6211

Effective vaccination is a cornerstone in preventing and controlling influenza pandemics. Beginning in summer 2010, reports emerged from northern Europe describing narcolepsy in children vaccinated with Pandemrix, an influenza vaccine. Narcolepsy is a rare sleep disorder with deceptive onset that often requires years to diagnose. This study relied upon collaboration among nine countries using a common protocol and data network for central analysis. The study results support the safety of ASO3 and MF59, components used in pandemic influenza vaccines.

## Data Methods and Study Design

David M. Berendes, Clara E. O'Reilly, Sunkyung Kim, Richard Omore, John B. Ochieng, Tracy Ayers, Kirsten Fagerli, Tamer H. Farag, Dilruba Nasrin, Sandra Panchalingam, James P. Nataro, Karen L. Kotloff, Myron M. Levine, Joseph Oundo, Kayla Laserson, Robert F. Breiman, and Eric D. Mintz

### **Diarrhoea, Enteric Pathogen Detection and Nutritional Indicators Among Controls in the Global Enteric Multicenter Study, Kenya Site: An Opportunity to Understand Reference Populations in Case-control Studies of Diarrhoea**

*Epidemiology and Infection* 2018; doi: 10.1017/S0950268818002972

Diarrhea and its causes remain global priorities, with an estimated 4 billion episodes of acute diarrhea and 600,000 diarrheal deaths worldwide each year. The incidence and health consequences of sub-clinical infections with diarrheal pathogens, particularly in infants and young children, is more difficult to estimate. This paper highlights efficient use of existing data collected from controls through simple tools (a diarrhea memory aid and follow-up interviews) that can be replicated in other sites of this and other multisite case-control studies.

Krista S. Crider, Yan Ping Qi, Owen Devine, Sarah C. Tinker, and Robert J. Berry

### **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.

Mary-Margaret A. Fill, Angela M. Miller, Rachel H. Wilkinson, Michael D. Warren, John R. Dunn, William Schaffner, and Timothy F. Jones

### **Educational Disabilities Among Children Born With Neonatal Abstinence Syndrome**

*Pediatrics* 2018;142(3):e20180562

Neonatal abstinence syndrome (NAS) is a drug withdrawal syndrome that occurs in the womb after opioid exposure. NAS has become a growing problem around the world, but data regarding long-term outcomes are limited and inconsistent. The authors linked various health and educational data sets and used primary regression models to determine that children with a history of NAS were more likely to later experience educational disabilities.

Diba Khan, Lauren M. Rossen, Holly Hedegaard, and Margaret Warner  
**A Bayesian Spatial and Temporal Modeling Approach to Mapping Geographic Variation in Mortality Rates for Subnational Areas with R-INLA**

*Journal of Data Science* 2018;16(1):147–182

Most counties in the United States report fewer than 20 suicide deaths per year. Counties suppress death rates below that figure, which impedes examination of rate variation across counties over time. In this study, the authors used a new approach to Bayesian spatio-temporal models that can borrow strength across counties and years to produce smoothed yearly county-level death rates for suicide. This allows for a clearer understanding of small-scale geographic patterns.

Bo-Hyun Kim, Mark K. Larson, and Heather E. Lawson  
**Applying Robust Design to Study the Effects of Stratigraphic Characteristics on Brittle Failure and Bump Potential in a Coal Mine**

*International Journal of Mining Science Technology* 2018;28(1):137–144

Dynamic failures, also termed “bumps,” “bounces,” and “bursts,” in underground mines kill miners every year. Although scientists have sought to understand rock bursts for decades, prediction remains elusive due to its complexity. The authors used Monte Carlo methods to develop ranges of physical property values and applied those value ranges to numerical models. They then performed multivariate analyses to determine the significance of those properties, yielding a more efficient approach to understanding mine dynamic failures.

Christopher T. Lee, Andrea Winquist, Ellen W. Wiewel, Sarah Braunstein, Hannah T. Jordan, L. Hannah Gould, R. Charon Gwynn, and Sungwoo Lim  
**Long-term Supportive Housing is Associated with Decreased Risk for New HIV Diagnoses Among a Large Cohort of Homeless Persons in New York City**

*AIDS and Behavior* 2018;22(9):3083–3090

Successful HIV prevention and treatment strategies have brought the goal of ending the epidemic in sight. This study evaluates whether supportive housing can decrease risk for new HIV infection and improve prevention policies. The authors applied propensity score weighting, marginal structural models, and time-varying Cox proportional hazards models to overcome sequential sources of bias. Findings suggest that long-term supportive housing is associated with decreased new HIV diagnosis rates.



Hua Lu, Xingyou Zhang, James B. Holt, Dafna Kanny, and Janet B. Croft  
**Quantifying Spatial Accessibility in Public Health Practice and Research: An Application to On-premise Alcohol Outlets, United States, 2013**

*International Journal of Health Geographics* 2018;17(1):23

Excessive alcohol use is a leading preventable cause of death and disability, and alcohol availability is a risk factor for excessive drinking. By using various data sets, the authors computed time and distance to alcohol outlets for the entire United States. The study provides a spatial access measure at the local level that could enable targeted interventions such as educating users about the health effects of excessive drinking and reducing the density of neighborhood alcohol outlets.

Alexandra M. Oster, Anne Marie France, Nivedha Panneer,  
M. Cheryl Bañez Ocfemia, Ellsworth Campbell, Sharoda Dasgupta,  
William M. Switzer, Joel O. Wertheim, and Angela L. Hernandez

**Identifying Clusters of Recent and Rapid HIV Transmission Through Analysis of Molecular Surveillance Data**

*Journal of Acquired Immune Deficiency Syndromes* 2018;79(5):543–550

Public health officials have said that, with the right prevention methods properly deployed, the end of the AIDS epidemic could be less than a decade away, but the increase in injection-drug use related to the opioid crisis has complicated the picture. In this study, the authors show a way to apply routinely collected HIV data to identifying and detecting clusters of recent, rapid HIV transmission for public health response.

Eli S. Rosenberg, Elizabeth M. Rosenthal, Eric W. Hall, Laurie Barker, Megan G. Hofmeister, Patrick S. Sullivan, Patricia Dietz, Jonathan Mermin, and A. Blythe Ryerson

**Prevalence of Hepatitis C Virus Infection in U.S. States and the District of Columbia, 2013 to 2016**

*JAMA Network Open* 2018;1(8):e186371

Since 2010, reported cases of acute hepatitis C (HCV) infection have more than tripled, reflecting increases in injection-drug use resulting from the nation's opioid crisis. However, HCV case-based surveillance is inconsistent across the country, requiring better ways to estimate each state's burden. Standardized, small-area estimation is needed to determine the distribution of HCV. The small-area estimates presented in this paper use a multistep statistical approach that is relatively economical and easily conceived.

Adam S. Vaughan, Linda Schieb, Harrison Quick, Michael R. Kramer, and Michele Casper

**Before the Here and Now: What We Can Learn from Variation in Spatiotemporal Patterns of Changing Heart Disease Mortality by Age Group, Time Period, and Birth Cohort**

*Social Science and Medicine* 2018;217:97–105

Trends in heart disease death rates have recently reversed after more than 40 years of sustained decline. However, researchers have little age-group-specific risk factor prevalence data to explore what is driving this reversal. The authors of this paper develop, evaluate and apply a method of examining spatial patterns in heart disease mortality trends by time period, age group, and birth cohort. Findings suggest cohort-related exposures, such as obesity and diabetes, are behind recent increases.



Anthony Waruru, Thomas N. O. Achia, James L. Tobias, James Ng'ang'a, Mary Mwangi, Joyce Wamicwe, Emily Zielinski-Gutierrez, Tom Oluoch, Evelyn Muthama, and Thorkild Tylleskär

**Finding Hidden HIV Clusters to Support Geographic-oriented HIV Interventions in Kenya**

*Journal of Acquired Immune Deficiency Syndromes* 2018;78(2):144–154

Geographic units based on generalized epidemic distributions are difficult to define for disease response and planning. This paper's findings show that in HIV epidemics, identifying geographic clusters with higher HIV rates and characterizing populations living in those clusters can help focus prevention and control efforts. The authors show how to use Kulldorff spatial scan statistics from household survey data in HIV research in sub-Saharan Africa to detect HIV clusters.





## Laboratory Science

Nancy A. Chow, Lalitha Gade, Sharon V. Tsay, Kaitlin Forsberg, Jane A. Greenko, Karen L. Southwick, Patricia M. Barrett, Janna L. Kerins, Shawn R. Lockhart, Tom M. Chiller, and Anastasia P. Litvintseva, on behalf of the U.S. *Candida auris* Investigation Team

### **Multiple Introductions and Subsequent Transmission of Multidrug-resistant *Candida auris* in the USA: A Molecular Epidemiological Survey**

*The Lancet Infectious Diseases* 2018;18(12):1377–1384

*Candida auris* has recently emerged as a transmissible multidrug-resistant yeast. Since its first report in Japan in 2009, highly fatal outbreaks of invasive infections have been reported in healthcare settings worldwide, and in 2016, *C. auris* infections were first reported in the United States. This paper describes the use of whole-genome sequencing and bioinformatics analysis to identify and characterize how *C. auris* entered and spread in the United States.

Roberto Colangeli, Hannah Jedrey, Soyeon Kim, Roy Connell, Shuyi Ma, Uma D. Chippada Venkata, Soumitesh Chakravorty, Aditi Gupta, Erin E. Sizemore, Lois Diem, David R. Sherman, Alphonse Okwera, Reynaldo Dietze, W. Henry Boom, John L. Johnson, William R. Mac Kenzie, and David Alland, for the DMID 01-009/Tuberculosis Trials Consortium Study 22 Teams

### **Bacterial Factors That Predict Relapse After Tuberculosis Therapy**

*The New England Journal of Medicine* 2018;379(9):823–833

In 2017, the world saw more than 10 million new tuberculosis cases that resulted in 1.6 million associated deaths. Effective TB therapy has been available for more than 60 years, but its deployment is not always successful. About 20 percent of treated patients are not cured. The authors used TB strains obtained and preserved from trials begun 10–15 years earlier. Findings suggest modest increases in drug resistance play a principal role in therapy outcomes.

Nsa Dada, Mili Sheth, Kelly Liebman, Jesus Pinto, and Audrey Lenhart

### **Whole Metagenome Sequencing Reveals Links Between Mosquito Microbiota and Insecticide Resistance in Malaria Vectors**

*Scientific Reports* 2018;8(1):2084

For the past two years, the World Health Organization has reported dwindling progress in global malaria control partly due to insecticide resistance. The mechanisms underlying insecticide resistance in mosquitoes, the world's deadliest animal, are not well understood. In this study, medical entomologists used whole metagenome sequencing, an advanced molecular biology method, to characterize microbial genomes within mosquitoes and their association with host resistance to insecticides.

Nisha K. Duggal, Erin M. McDonald, Jana M. Ritter, and Aaron C. Brault  
**Sexual Transmission of Zika Virus Enhances *In Utero* Transmission in a Mouse Model**  
*Scientific Reports* 2018;8(1):4510

The discovery that Zika virus can be spread sexually, as well as by mosquito bite, and can cause congenital neurological abnormalities in pregnant women were only made in 2016. These poorly understood aspects of infection contributed to the epidemic that swept through the Americas during 2015–2017. This paper describes the development of a Zika virus mouse model to understand questions about sexual transmission that would be difficult or impossible to study in humans.

Lauryn M. Falcone, Aaron Erdely, Varmsi Kodali, Rebecca R. Salmen, Lori A. Battelli, Tiana Dodd, Walter G. McKinney, Samuel Stone, Michelle Donlin, Howard D. Leonard, Jared L. Cumpston, James B. Cumpston, Ronnee N. Andrews, Michael Kashon, James M. Antonini, and Patti C. Zeidler-Erdely  
**Inhalation of Iron-abundant Gas Metal Arc Welding-mild Steel Fume Promotes Lung Tumors in Mice**  
*Toxicology* 2018;409:24–32

In 2017, the International Agency for Research on Cancer reclassified welding fumes as carcinogenic to humans. Experimental data focused on the cancer-causing, metal-containing welding fumes, while epidemiological data showed both stainless steel (chromium- and nickel-containing) and mild steel (iron- and manganese-containing) welding fumes increased lung cancer risk in welders. The authors provide animal evidence, using an inhalation model, that links mild steel welding fumes and lung cancer.

Briana R. Flaherty, Eldin Talundzic, Joel Barratt, Kristine J. Kines, Christian Olsen, Meredith Lane, Mili Sheth, and Richard S. Bradbury  
**Restriction Enzyme Digestion of Host DNA Enhances Universal Detection of Parasitic Pathogens in Blood via Targeted Amplicon Deep Sequencing**  
*Microbiome* 2018;6(1):164

Confirming a parasitic infection requires a sequence of morphologic characterization followed by either single-species PCR based on clinical suspicion or potentially multiple genus- or family-level PCRs and sequencing. The selective reduction of human DNA in diagnostic samples allows the effective deployment of the UPDx single-sequencing test. This test allows for accurate and sensitive characterization of parasitic pathogens. Clinical diagnoses can be made faster, unrecognized parasites can be identified, and the epidemiologic characteristics of multiple pathogens can be determined simultaneously.

David A. Garber, James Mitchell, Debra Adams, Patricia Guenther, Frank Deyoungs, Shanon Ellis, Kristen Kelley, Ryan Johnson, Charles Dobard, Walid Heneine, and Janet McNicholl

**Development of a Repeat-exposure Penile SHIV Infection Model in Macaques to Evaluate Biomedical Preventions Against HIV**

*PLoS One* 2018;13(3):e0194837

About 35 million people are living with HIV, including 17 million men, a majority of whom acquired their HIV infections through the penis during sex. Penile HIV acquisition accounts for about half of new infections, and yet a preclinical animal model for assessing the suitability of HIV prevention measures has been lacking. The authors used simian HIV to develop a model of penile HIV acquisition. Data will improve decisions on prioritizing HIV prevention strategies for human clinical trials.

Crystal M. Gigante, Lisa Dettinger, James W. Powell, Melanie Seiders, Rene Edgar Condori Condori, Richard Griesser, Kenneth Okogi, Maria Carlos, Kendra Pesko, Mike Breckenridge, Edson Michael M. Simon, Maria Yna Joyce V. Chu, April D. Davis, Scott J. Brunt, Lillian Orciari, Pamela Yager, William C. Carson, Claire Hartloge, Jeremiah T. Saliki, Susan Sanchez, Mojgan Deldari, Kristina Hsieh, Ashutosh Wadhwa, Kimberly Wilkins, Veronica Yung Peredo, Patricia Rabideau, Nina Gruhn, Rolain Cadet, Shrikrishna Isloor, Sujith S. Nath, Tomy Joseph, Jinxin Gao, Ryan Wallace, Mary Reynolds, Victoria A. Olson, and Yu Li

**Multi-site Evaluation of the LN34 Pan-lyssavirus Real-time RT-PCR Assay for Post-mortem Rabies Diagnostics**

*PLoS One* 2018;13(5):e0197074

Rabies is nearly always fatal after symptoms present, but it is 100 percent preventable with timely treatment. Therefore, rapid diagnosis is crucial to effective public health measures. Real-time PCR is a sensitive and rapid method for disease diagnosis, but developing these diagnostic assays for rabies is a challenge. This paper describes the large-scale validation of a new laboratory method for diagnosing and monitoring rabies infection in humans and animals.

Markus H. Kainulainen, Jessica R. Spengler, Stephen R. Welch,  
JoAnn D. Coleman-McCray, Jessica R. Harmon, John D. Klena, Stuart T. Nichol,  
César G. Albariño, and Christina F. Spiropoulou

**Use of a Scalable Replicon-particle Vaccine to Protect Against Lethal Lassa Virus Infection in the Guinea Pig Model**

*The Journal of Infectious Diseases* 2018;217(12):1957–1966

Vaccine development involves a substantial investment in time, effort, and resources. Developing vaccines against most viral hemorrhagic fevers was considered purely an academic endeavor. Rarely did health organizations attempt to produce such vaccines. The West African Ebola virus outbreak changed that evaluation. This paper describes a novel Lassa fever vaccine candidate, a system to produce it in large scale, and provides preclinical data on its safety and effectiveness.

Matthew W. Keller, Benjamin L. Rambo-Martin, Malania M. Wilson,  
Callie A. Ridenour, Samuel S. Shepard, Thomas J. Stark, Elizabeth B. Neuhaus,  
Vivien G. Dugan, David E. Wentworth, and John R. Barnes

**Direct RNA Sequencing of the Coding Complete Influenza A Virus Genome**

*Scientific Reports* 2018;8(1):14408

Influenza viruses are ever-mutating human pathogens that affect the world population annually and pose a significant threat for pandemics. The ability to directly sequence the influenza virus's RNA genome will lead to a deeper understanding of the virus and its lifecycle. Genomic characterization of influenza viruses is central to preparedness and response efforts. This paper details the development, validation, and use of a new laboratory method to target and directly sequence the influenza A virus RNA genome.

Zsuzsanna Kuklenyik, Jeffery I. Jones, Michael S. Gardner, David M. Schieltz,  
Bryan A. Parks, Christopher A. Toth, Jon C. Rees, Michael L. Andrews,  
Kayla Carter, Antony K. Lehtikoski, Lisa G. McWilliams, Yulanda M. Williamson,  
Kevin P. Bierbaum, James L. Pirkle, and John R. Barr

**Core Lipid, Surface Lipid and Apolipoprotein Composition Analysis of Lipoprotein Particles as a Function of Particle Size in One Workflow Integrating Asymmetric Flow Field-flow Fractionation and Liquid Chromatography-tandem Mass Spectrometry**

*PLoS One* 2018;13(4):e0194797

Cardiovascular disease is the leading killer of Americans, accounting more than 800,000 deaths each year. This paper reports the development and application of a workflow that can quantify the lipoprotein size distribution, particle number, lipid, and protein compositions in individual patient samples. The analysis of protein and lipid structure in size fractions enables better diagnosis and risk assessment for cardiovascular and other lipid metabolism-related diseases.

Feng Liu, Wen-Pin Tzeng, Lauren Horner, Ram P. Kamal, Heather R. Tatum, Elisabeth G. Blanchard, Xiyao Xu, Ian York, Terrence M. Tumpey, Jacqueline M. Katz, Xiuhua Lu, and Min Z. Levine

**Influence of Immune Priming and Egg Adaptation in the Vaccine on Antibody Responses to Circulating A(H1N1)pdm09 Viruses After Influenza Vaccination in Adults**

*The Journal of Infectious Diseases* 2018;218(10):1571–1581

Humans have complex immune profiles for response to influenza due to repeated vaccination and infection throughout individuals' lifespan. Using data from six influenza seasons, this study aimed to identify the immune basis of the low antibody responses to circulating influenza viruses observed in groups of adults after vaccination containing a particular vaccine component and to further explore how immune priming shapes antibody responses to vaccination.

Adam C. Retchless, Cécilia B. Kretz, How-Yi Chang, Jose A. Bazan, A. Jeanine Abrams, Abigail Norris Turner, Laurel T. Jenkins, David L. Trees, Yih-Ling Tzeng, David S. Stephens, Jessica R. MacNeil, and Xin Wang

**Expansion of a Urethritis-associated *Neisseria meningitidis* Clade in the United States with Concurrent Acquisition of *N. gonorrhoeae* Alleles**

*BMC Genomics* 2018;19(1):176

Urethritis, a painful urethral inflammation accompanied by discharge, accounts for millions of clinical visits each year in the United States. It is commonly caused by *Neisseria gonorrhoeae* or occasionally by its sister species, *N. meningitidis*. This paper traces the origins and early evolution of a subsection of *N. meningitidis* that was recently recognized as a substantial cause of urethritis in some localities.

Aleksandr B. Stefaniak, Lauren N. Bowers, Alycia K. Knepp, M. Abbas Virji, Eileen M. Birch, Jason E. Ham, J. R. Wells, Chaolong Qi, Diane Schwegler-Berry, Sherri Friend, Alyson R. Johnson, Stephen B. Martin, Jr., Yong Qian, Ryan F. LeBouf, Quinn Birch, and Duane Hammond

**Three-dimensional Printing with Nano-enabled Filaments Releases Polymer Particles Containing Carbon Nanotubes into Air**

*Indoor Air* 2018;28(6):840-851

Three-dimensional (3-D) printing and nanotechnology are coming together in creating objects using polymers. This paper describes results from laboratory emissions testing of a 3-D printer that uses polymer filaments that contain engineered nanomaterials. Polymer filaments with and without carbon nanotubes (CNTs) were printed and analyzed. Only 3-D printing with filaments that contained CNTs released polymer particles into the air. Findings suggest these particles could deposit in the deep lung where clearance is slow.

Todd A. Stueckle, Donna C. Davidson, Ray Derk, Tiffany G. Kornberg, Lori Battelli, Sherri Friend, Marlene Orandle, Alixandra Wagner, Cerasela Zoica Dinu, Konstantinos A. Sierros, Sushant Agarwal, Rakesh K. Gupta, Yon Rojanasakul, Dale W. Porter, and Liying Rojanasakul

### **Short-term Pulmonary Toxicity Assessment of Pre- and Post-incinerated Organomodified Nanoclay in Mice**

*ACS Nano* 2018;12(3):2292–2310

Organomodified nanoclay (ONC) has experienced rapid and broad development for use in nano-enabled polymer composite technologies. These two-dimensional nanometer-thin particles give organic polymers added physical and chemical properties for use in industrial, consumer, and healthcare technologies. Exposure to airborne ONC in the workplace is projected to quickly become a significant inhalation hazard, but little is known about pulmonary health risks. This study evaluated pre- and post-incinerated coated and uncoated nanoclay for inflammation, toxicity, and systemic blood response after pulmonary exposure.

Toni Whistler, Patranuch Sapchookul, David W. McCormick, Ornuma Sangwichian, Possawat Jorakate, Sirirat Makprasert, Anchalee Jatapai, Sathapana Naorat, Uraivan Surin, Surathinee Koosakunwat, Surachai Supcharassaeng, Barameht Piralam, Mathew Mikoleit, Henry C. Baggett, Julia Rhodes, and Christopher J. Gregory

### **Epidemiology and Antimicrobial Resistance of Invasive Non-typhoidal Salmonellosis in Rural Thailand from 2006–2014**

*PLoS Neglected Tropical Diseases* 2018;12(8):e0006718

Invasive strains of non-typhoidal salmonella are a common cause of bloodstream infection in Southeast Asia, but limited epidemiologic and antimicrobial resistance data are available and no population-based studies have been published from the region. The authors use 9 years of bloodstream infection data from surveillance conducted in two Thai border provinces to report on the incidence, serotype distribution, and antimicrobial resistance patterns. Findings suggest the need to improve microbiological surveillance, strengthen rational antibiotic use, and improve control methods.

Shannon L. M. Whitmer, Jason T. Ladner, Michael R. Wiley, Ketan Patel, Gytis Dudas, Andrew Rambaut, Foday Sahr, Karla Prieto, Samuel S. Shepard, Ellie Carmody, Barbara Knust, Dhamari Naidoo, Gibrilla Deen, Pierre Formenty, Stuart T. Nichol, Gustavo Palacios, and Ute Ströher, for the Ebola Virus Persistence Study Group

### **Active Ebola Virus Replication and Heterogeneous Evolutionary Rates in EVD Survivors**

*Cell Reports* 2018;22(5):1159–1168

After the end of continuous Ebola virus transmission in Western Africa, sporadic cases continued to reemerge beyond the expected viral incubation period. Contact

tracing suggested that this represented transmission from persistently infected, convalescent survivors. This paper discusses the development of laboratory methods to evaluate Ebola virus replication in persistently infected male survivors. The goal was to determine whether viral replication in immune-privileged sites occurs after disease recovery and whether persistently infected male survivors could reignite viral spread.



## PREVENTION AND CONTROL

Steve Ahuka-Mundeke, Rebecca M. Casey, Jennifer B. Harris, Meredith G. Dixon, Pierre M. Nsele, Gabriel M. Kizito, Grace Umutesi, Janeen Laven, Gilson Paluku, Abdou S. Gueye, Terri B. Hyde, Guylain K. M. Sheria, Jean-Jacques Muyembe-Tanfum, and J. Erin Staples

### **Immunogenicity of Fractional-dose Vaccine during a Yellow Fever Outbreak—Preliminary Report**

*The New England Journal of Medicine* 2018; doi: 10.1056/NEJMoa1710430

Yellow fever, a vaccine-preventable, often fatal, mosquito-borne viral disease, is a major global public health threat. A yellow fever vaccine has been available for more than 80 years, but production is complex and lags behind the doses needed in endemic countries. This paper provides the evidential foundation for using fractional doses of the vaccine to respond to epidemics when vaccine is in limited supply.

Amy DeGross, Krishna Sharma, Anamika Satsangi, Kristy Kenney, Djenaba Joseph, Katherine Ross, Steven Leadbetter, William Helsel, William Kammerer, Rick Firth, Tanner Rockwell, William Short, Florence Tangka, Faye Wong, and Lisa Richardson

### **Increasing Colorectal Cancer Screening in Health Care Systems Using Evidence-based Interventions**

*Preventing Chronic Disease* 2018;15:E100

Strong evidence suggests colorectal cancer (CRC) screening reduces death rates either by detecting cancer early, when treatments are more effective, or by removing precancerous polyps. This paper gives year-1 findings from CDC's Colorectal Cancer Control Program (CRCCP), a public health initiative to increase screening among medically underserved populations. The CRCCP includes 30 CDC-funded state, university, and tribal grantees. Grantees collaborate with health system clinics to increase the use of evidence-based interventions such as patient reminders.

Emily Kainne Dokubo, Annika Wendland, Suzanne E. Mate, Jason T. Ladner, Esther L. Hamblion, Philomena Raftery, David J. Blackley, A. Scott Laney, Nuha Mahmoud, Gloria Wayne-Davies, Lisa Hensley, Eric Stavale, Lawrence Fakoli, Christopher Gregory, Tai-Ho Chen, Augustine Koryon, Denise Roth Allen, Jennifer Mann, Andrew Hickey, John Saindon, Mehboob Badini, April Baller, Peter Clement, Fatorma Bolay, Yatta Wapoe, Michael R. Wiley, James Logue, Bonnie Dighero-Kemp, Elizabeth Higgs, Alex Gasasira, Desmond E. Williams, Bernice Dahn, Francis Kateh, Tolbert Nyenswah, Gustavo Palacios, and Mosoka P. Fallah

### **Persistence of Ebola virus After the End of Widespread Transmission in Liberia: An Outbreak Report**

*The Lancet Infectious Diseases* 2018;18(9):1015–1024

Outbreak response efforts for the 2014–2015 Ebola virus disease (EVD) epidemic in West Africa brought widespread transmission to an end. But an EVD cluster in Liberia in November 2015, after the end of widespread transmission, raised the possibility of transmission from a persistently infected person. The authors conducted case and molecular investigations and explored possible links between the virus isolated from cases in this cluster and epidemiologically linked cases in a prior cluster.

Edward W. Gregg, Ji Lin, Barbara Bardenheier, Haiying Chen, W. Jack Rejeski, Xiaohui Zhuo, Andrea L. Hergenroeder, Stephen B. Kritchevsky, Anne L. Peters, Lynne E. Wagenknecht, Edward H. Ip, and Mark A. Espeland, for the Look Ahead Study Group

### **Impact of Intensive Lifestyle Intervention on Disability-free Life Expectancy: The Look AHEAD Study**

*Diabetes Care* 2018;41(5):1040–1048

The long-term effects of intensive weight loss programs for people with diabetes remains unclear, and effects on cardiovascular disease and death are insignificant. As a



result, there are few consensus-based recommendations. However, this study found that weight loss among people with diabetes increases the proportion of remaining life that is active and free of disability, rather than affecting lifespan. This study looks at how effectively lifestyle change can reduce disability related to chronic disease.

**Deliana Kostova, Xin Xu, Stephen Babb, Sara B. McMenamin, and Brian A. King**  
**Does State Medicaid Coverage of Smoking Cessation Treatments Affect Quitting?**

*Health Services Research* 2018;53(6):4725–4746

Smoking is one of the leading causes of preventable disease, death, and economic costs in the United States. Previous studies examining the relationship between Medicaid cessation coverage and smoking cessation have been limited by unmeasured and residual confounding. This study provides evidence showing that combined coverage of smoking cessation counseling and medication, by state Medicaid programs, could significantly reduce cigarette smoking among Medicaid beneficiaries.

**Eva Lathrop, Lisa Romero, Stacey Hurst, Nabal Bracero, Lauren B. Zapata, Meghan T. Frey, Maria I. Rivera, Erin N. Berry-Bibee, Margaret A. Honein, Judith Monroe, and Denise J. Jamieson**

**The Zika Contraception Access Network: A Feasibility Programme to Increase Access to Contraception in Puerto Rico During the 2016–17 Zika Virus Outbreak**

*The Lancet Public Health* 2018;3(2):e91–e99

Contraception could be a key response strategy in public health emergencies in which prenatal exposures pose a severe risk to pregnant women and their infants. Prevention of unintended pregnancy was a primary strategy to reduce adverse pregnancy and birth outcomes related to Zika virus infection. This paper describes the Zika Contraception Access Network program, a short-term response (from May 2016 to September 2017) for rapidly establishing reversible contraceptive services in Puerto Rico during the 2016–2017 Zika virus outbreak.

**Duncan MacKellar, Haruka Maruyama, Oscar Ernest Rwabiyago, Claire Steiner, Haddi Cham, Omari Msumi, Rachel Weber, Gerald Kundi, Chutima Suraratdecha, Tewodaj Mengistu, Johnita Byrd, Sherri Pals, Eliufoo Churi, Caitlin Madevu-Matson, Kokuhumbya Kazaura, Fernando Morales, Thomas Rutachunzibwa, Jessica Justman, and Anath Rwebembara**

**Implementing the Package of CDC and WHO Recommended Linkage Services: Methods, Outcomes, and Costs of the Bukoba Tanzania Combination Prevention Evaluation Peer-delivered, Linkage Case Management Program, 2014–2017**

*PLoS One* 2018;13(12):e0208919

This paper reports on a peer-delivered case management intervention that provides the package of services recommended by CDC and the World Health Organization to help people living with HIV enroll in care and start antiretroviral therapy soon after

diagnosis. Reducing HIV-related sickness and death—and effectively eliminating the risk of spreading the virus—depends on starting therapy early, following treatment guidelines precisely, and sticking with the treatment.

Tarissa Mitchell, Deborah Lee, Michelle Weinberg, Christina Phares, Nicola James, Kittisak Amornpaisarnloet, Lalita Aumpipat, Gretchen Cooley, Anita Davies, Valerie Daw Tin Shwe, Vasil Gajdaziev, Olga Gorbacheva, Chutharat Khwan-Niam, Alexander Klosovsky, Waritorn Madilokkowitz, Diana Martin, Naing Zaw Htun Myint, Thi Ngoc Yen Nguyen, Thomas B. Nutman, Elise M. O'Connell, Luis Ortega, Sugunya Prayadsab, Chetdanai Srimanee, Wasant Supakunatom, Vattanachai Vesessmith, and William M. Stauffer

### **Impact of Enhanced Health Interventions for United States-bound Refugees: Evaluating Best Practices in Migration Health**

*The American Journal of Tropical Medicine and Hygiene* 2018;98(3):920–928

There are currently 68.5 million forcibly displaced people worldwide, the greatest number in history. This paper evaluates preventive measures to improve health among refugees resettling in the United States. The measures evaluated go beyond those required by U.S. regulation. They include interventions to reduce the occurrence of parasites, anemia, and malnutrition; to prevent the spread of infections; and to improve fitness to fly for resettling refugees and health security for U.S. communities where refugees resettle.

S. A. Nanduri, B. J. Metcalf, M. A. Arwady, C. Edens, M. A. Lavin, J. Morgan, W. Clegg, A. Beron, J. P. Albertson, R. Link-Gelles, A. Ogundimu, J. Gold, D. Jackson, S. Chochua, N. Stone, C. Van Beneden, K. Fleming-Dutra, and B. Beall

### **Prolonged and Large Outbreak of Invasive Group A *Streptococcus* Disease Within a Nursing Home: Repeated Intrafacility Transmission of a Single Strain**

*Clinical Microbiology and Infection* 2018; doi: 10.1016/j.cmi.2018.04.034

Invasive infections due to group A *streptococcus* are an important cause of sickness and death in the United States. This paper describes an investigation at a long-term care facility of an outbreak of group A *streptococcus* infections that continued despite multiple interventions. The authors used results from whole-genome sequencing and phylogenetic analysis in conjunction with epidemiologic data to understand why the outbreak continued despite the initial interventions and to help guide further control measures.

Ju-Hyeong Park, Sook Ja Cho, Sandra K. White, and Jean M. Cox-Ganser  
**Changes in Respiratory and Non-respiratory Symptoms in Occupants of a Large Office Building over a Period of Moisture Damage Remediation Attempts**

*PLoS One* 2018;13(1):e0191165

More than 8 percent of the U.S. population had asthma in 2016, and dampness and mold in built environments accounted for at least 21% of this current asthma, which costs at least \$3.5 billion annually. This study reports effectiveness of remediation and the history of occupants' health in a water-damaged office building in relation to attempts to remediate moisture damage. Findings yield important information on actions to decrease disease burden among occupants of water-damaged buildings.

Judy A. Stevens and Robin Lee

**The Potential to Reduce Falls and Avert Costs by Clinically Managing Fall Risk**

*American Journal of Preventive Medicine* 2018;55(3):290–297

Among older adults age 65 and older, falls are the leading cause of injury and injury-related death. More than one in four older adults reports falling each year, totaling more than 29 million falls and costing more than \$50 billion annually. This study combined prevention strategies, prevalence estimates, and cost data to assess direct medical costs that may be avoided by carrying out evidence-based fall prevention programs on a broad scale.

Jacqueline E. Tate, Jason M. Mwenda, George Armah, Bhavin Jani, Richard Omore, Ayesheshem Ademe, Hilda Mujuru, Evans Mpabalwani, Bagrey Ngwira, Margaret M. Cortese, Richard Mihigo, Hope Glover-Addy, Mwajabu Mbagu, Francis Osawa, Amezene Tadesse, Bothwell Mbuwayesango, Julia Simwaka, Nigel Cunliffe, Benjamin A. Lopman, Goitom Weldegebriel, Daniel Ansong, David Msuya, Billy Ogwel, Thomas Karengera, Portia Manangazira, Bruce Bvulani, Catherine Yen, Felicitas R. Zawaira, Clement T. Narh, Lazaro Mboma, Peter Saula, Fasil Teshager, Halle Getachew, Rebecca M. Moeti, Christabel Eweronu-Laryea, and Umesh D. Parashar, for the African Intussusception Surveillance Network

**Evaluation of Intussusception After Monovalent Rotavirus Vaccination in Africa**

*The New England Journal of Medicine* 2018;378(16):1521–1528

In 2013, rotavirus, the most common cause of severe diarrhea among young children, caused 215,000 deaths around the world, mostly in sub-Saharan Africa. This paper evaluated the safety of rotavirus vaccine in a resource-poor setting and found no risk of a severe vaccine adverse event of concern to policymakers. Generating data on the safety of rotavirus vaccines will help encourage vaccine introduction and reduce sickness and death of the most common cause of severe gastroenteritis in young children.



Xin Tong, Jennifer L. Wiltz, Mary G. George, Erika C. Odom, Sallyann M. Coleman King, Tiffany Chang, Xiaoping Yin, Paul Coverdell National Acute Stroke Program team, and Robert K. Merritt

### **A Decade of Improvement in Door-to-Needle Time Among Acute Ischemic Stroke Patients, 2008 to 2017**

*Circulation: Cardiovascular Quality and Outcomes* 2018;11(12):e004981

Stroke is largely preventable, yet each year nearly 800,000 people in the United States experience a new or recurrent stroke, leading to approximately 130,000 deaths. The authors report on successful efforts to improve the quality of acute stroke care through a CDC program that pays for state health departments to work with hospitals and EMS providers to improve stroke care and secondary prevention of stroke.

Emine Yaylali, Paul G. Farnham, Stacy Cohen, David W. Purcell, Heather Hauck, and Stephanie L. Sansom

### **Optimal Allocation of HIV Prevention Funds for State Health Departments**

*PLoS One* 2018;13(5):e0197421

Health jurisdictions have long sought to learn how to best allocate their federal prevention funds. For example, in 2018, CDC gave \$340 million to health jurisdictions to combat HIV. This paper presents a way to estimate the most efficient allocation of HIV prevention funds and estimates the best allocation for health jurisdictions to use in preventing new HIV cases. The method can be applied to any jurisdiction's activities to improve use of federal public health funding.

Patrick L. Yorio, A. Scott Laney, Cara N. Halldin, David J. Blackley, Susan M. Moore, Kerri Wizner, Lewis J. Radonovich, and Lee A. Greenawald

**Interstitial Lung Diseases in the U.S. Mining Industry: Using MSHA Data to Examine Trends and the Prevention Effects of Compliance with Health Regulations, 1996–2015**

*Risk Analysis* 2018;38(9):1962–1971

Interstitial lung disease is an evolving concern in the mining industry. The past decade has seen a rise in lung disease cases among working coal miners in the United States. This paper discusses the prevention of interstitial lung disease among U.S. miners. The authors used data from three sources that, when taken together, were used to understand the relationship between work conditions and lung disease prevalence. Findings suggest a link between mining regulations and successful health outcomes.

Khalequ Zaman, Concepción F. Estívariz, Michelle Morales, Mohammad Yunus, Cynthia J. Snider, Howard E. Gary, Jr., William C. Weldon, M. Steven Oberste, Steven G. Wassilak, Mark A. Pallansch, and Abhijeet Anand

**Immunogenicity of Type 2 Monovalent Oral and Inactivated Poliovirus Vaccines for Type 2 Poliovirus Outbreak Response: An Open-label, Randomised Controlled Trial**

*The Lancet Infectious Diseases* 2018;18(6):657–665

The world stopped using type 2 poliovirus in trivalent oral poliovirus vaccine in April 2016. The clinical trial described in this paper led to modification of global outbreak response policy on the use of monovalent OPV type 2 (mOPV2) and inactivated poliovirus vaccine (IPV) for controlling polio outbreaks due to vaccine-derived poliovirus type 2 (cVDPV2). Since type 2 use was ended, large cVDPV2 outbreaks have been reported requiring mOPV2 vaccination for millions of children. After the policy change, fewer mOPV2 vaccination rounds with shorter intervals between have been carried out, and use of IPV has been deemphasized.







## 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.*

### Janet B. Croft, PhD, MPH

*National Center for Chronic Disease Prevention and Health Promotion*

Dr. Janet Croft has spent her career helping people overcome chronic conditions such as heart disease, hypertension, arthritis, epilepsy, mental health disorders, sleep disorders, obesity, and health disparities. As a CDC epidemiologist, she has led efforts to identify gaps in assessing these diseases and their risk factors and developing or improving surveillance systems to fill those gaps. She has further led efforts to improve epidemiologic and surveillance capabilities at state health departments.

Dr. Croft began her CDC career in 1981 analyzing findings of the Inter-Tribal Heart Project in collaboration with the Indian Health Service and the South Carolina Cardiovascular Prevention Project. She coordinated the expansion of an eight-scientist team into a mini-division by 2001 with a cardiovascular prevention program that became the Division of Heart Disease and Stroke Prevention by 2006. She helped start new partnerships with national organizations and other federal agencies to develop surveillance, prevention, and intervention activities. In 2001, she established the Paul Coverdell National Acute Stroke Registry to help states monitor and improve access to stroke care.

During her 27-year CDC career, Dr. Croft has helped CDC staff develop new ways to report local surveillance data. Early efforts resulted in mapping mortality and Medicare hospitalizations for heart disease, stroke, and COPD. Recently, this resulted in collaborations with the Robert Wood Johnson Foundation for the calculation of multiple chronic disease indicators for County Health Rankings and the 500 Cities Project—data that allow states and communities to target areas with limited resources.

Dr. Croft has authored more than 330 peer-reviewed scientific publications and CDC reports and has received numerous CDC and DHHS awards. Her sleep surveillance efforts were recognized with the 2016 Mark O Hatfield Public Policy/Advocacy Award by the American Academy of Sleep Medicine. She works to create career and publication opportunities and has mentored junior staff and midlevel scientists and provided guidance in data analysis, epidemiology, and manuscript preparation to at least 20–25 Epidemic Intelligence Service officers, fellows, and interns.



## Robert Fontaine, MD, MS

### *Center for Global Health*

Since beginning his career as an Epidemic Intelligence Service officer in 1973, Dr. Robert Fontaine's scientific work has focused on using data from outbreak investigations, surveillance systems, and applied epidemiological research to solve public health problems. For more than 45 years, he solved many of those problems in faraway places such as China, India, Jordan, Saudi Arabia, and Central America, and he achieved many of his most significant accomplishments through training and mentorship.

Two major challenges to global public health practice are the limited number of epidemiologists and the limited application of scientific data and methods to solve public health problems. The result is that too many public health decisions are not based on evidence, and the world is not ready for the next global pandemic. Dr. Fontaine's work has tackled these deficits through effective field epidemiology and solved hundreds of problems by forming and supervising field epidemiology training programs (FETPs) around the world. While serving overseas for more than 20 years, Dr. Fontaine started FETPs in Saudi Arabia and Jordan, developed a new program in China, and supported programs across Asia and Central America from CDC headquarters. He has directly mentored more than 250 trainees in 2-year FETPs and instructed more than 850 in short courses. His lectures and curriculums have helped thousands more. Before Dr. Fontaine became the first CDC resident advisor to the China FETP in 2003, China did not effectively use field epidemiology to investigate outbreaks. For 9 years, Dr. Fontaine trained 10 to 20 China FETP staff per year and eventually helped change China's approach to public health, ultimately improving the health of nearly one-fifth of the world population. Many of those Dr. Fontaine trained are now leaders in the China CDC.

Dr. Fontaine has also authored or coauthored more than 50 scientific publications, commentaries, and book chapters on a variety of field epidemiology topics. These papers have been published in some of the most influential publications including *The New England Journal of Medicine*, *JAMA*, *Nature*, *The Lancet*, and *Annals of Internal Medicine*. According to Google Scholar, a quarter of his publications have been cited more than 50 times each by other professionals.





## Jacqueline Katz, PhD

*National Center for Immunization and Respiratory Diseases*

Dr. Jacqueline Katz has dedicated her life to understanding and reducing the harm of influenza through science and public health leadership, leading to significant achievements in preventing disease through vaccination. She has used her scientific expertise to produce safe, effective influenza vaccines for the United States and the world and helped CDC, the World Health Organization, and partners around the world to understand and fight influenza.

Dr. Katz joined CDC in 1992. Since then, she has made a number of scientific achievements in development of improved influenza vaccines, clarifying cell-mediated immune responses to respiratory viruses, characterizing mucosal immunology and viral pathogenesis, and revealing the effects of imprinting on the immune system. She became the chief of the Immunology and Pathogenesis Branch of CDC's Influenza Division in 2006. Under her leadership, the branch conducted research on the pathogenesis, immunity to, and transmission of influenza viruses and received three Charles C. Shepard Science Awards for Excellence in Laboratory Methods publications.

In 2009, Dr. Katz played a key role in CDC's response to the 2009 H1N1 influenza pandemic. After the pandemic, she recognized that global research on improving influenza vaccines was stalled due to a lack of standards in serologic testing. She corralled laboratory experts and helped form the Consortium for the Standardization of Influenza Seroepidemiology. This group agreed on a method to determine serological protection from influenza vaccination. This groundbreaking work allows data from different studies to be compared and combined—allowing greater capability to show how well vaccines are working.

Dr. Katz's scientific work has had a lasting impact. She has published 281 manuscripts in peer-reviewed journals including *Nature*, *Science*, *The Lancet*, and *The New England Journal of Medicine*. She has served as an author and expert in developing biosecurity and biosafety requirements for the *Biosafety in Microbiological and Biomedical Laboratories* guidelines, the world's most authoritative document for the protection of laboratory workers, leading to a safer work environment for CDC laboratorians and their colleagues worldwide. She serves as the U.S. government's influenza global health diplomat. Her leadership with the WHO collaborating centers in selecting influenza vaccine virus components is reflected in the 154 million doses of vaccine distributed each year in the United States



## Rima Khabbaz, MD

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

Throughout her nearly four-decade career at CDC, Dr. Rima Khabbaz has been at the forefront of public health efforts to prevent and control emerging infectious diseases. Her work is reflected in two areas that correspond to two phases of her career: peer-reviewed publications from her years as a medical epidemiologist, and public health influence during her CDC leadership years.

Dr. Khabbaz's initial focus of study was on healthcare-associated infections, first as an Epidemic Intelligence Service officer, then as a fellow at hospitals in Baltimore. She joined the National Center for Infectious Retrovirus Diseases Branch as a medical epidemiologist in 1987 and during the next 7 years made major contributions to defining the epidemiology of non-HIV retroviruses, specifically human T lymphotropic viruses (HTLV) I and II. She also authored or coauthored 47 retrovirology reports in multiple peer-reviewed journals, including *The Journal of Infectious Diseases*, *JAMA*, *The Lancet*, and *The New England Journal of Medicine*. Through her research, she aimed to show how HTLVs are spread and the risks they pose to various groups such as blood donor recipients, sex partners, injecting drug users, and geographic populations.

Since 1994, Dr. Khabbaz, through leadership positions at the division, center, and agency levels, has been a steward of the Institute of Medicine's vision for preventing emerging infections. This work has included leadership in CDC emergency responses for outbreaks of anthrax, SARS, monkeypox, H1N1 influenza, West Nile virus disease, MERS, fungal meningitis, Ebola, and Zika. She supervised CDC initiatives for advanced molecular detection, antibiotic resistance, and a new high-containment laboratory, all the while interacting with partners to strengthen public health programs' epidemiology and laboratory science, preparedness, and global health.

Dr. Khabbaz has led or influenced her scientific discipline by participating in professional and academic organizations, publishing her research, serving on editorial boards, and working as a part-time attending physician. She is an active member of the American Epidemiological Society and various other professional societies and academic organizations, including the Presidential Advisory Council on Combating Antibiotic-Resistant Bacteria. She has published 90 articles in peer-reviewed publications. She has taught at the University of Maryland School of Medicine and Emory University School of Medicine, and she is a part-time attending physician at Grady Memorial Hospital in Atlanta.



## Beverly Metchock, DrPH, D(ABMM)

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

For more than 30 years, Dr. Beverly Metchock, has been at the forefront of improving global understanding of antibiotic resistance and improving testing practices both in the clinical and public health laboratory setting. Her expertise and work ethic have improved our understanding of the genetic basis of drug resistance in *Mycobacterium tuberculosis*, aided efforts at standardizing phenotypic testing, and established CDC as an internationally recognized resource for clinical and reference laboratory testing. In 2009, Dr. Metchock established one of the first national programs for the rapid detection of mutations associated with drug resistance in TB. This program, the CDC Molecular Detection of Drug Resistance Service, has been a model for other nations, particularly for clear reporting and the availability of expert consultation to aid interpretation.

In just the past 8 years, Dr. Metchock's laboratory has confirmed or detected more than 850 cases of multidrug-resistant (MDR) TB disease and 33 cases of extensively drug-resistant (XDR) TB disease, representing virtually all reported MDR and XDR TB cases in the United States during that period. MDR and XDR TB cases are extraordinarily difficult to treat because the length of treatment is extended for the patient from a standard 6 months to upward of 2 years by the use of more expensive and less effective drugs that also produce more adverse side effects.

Dr. Metchock has an extensive body of work that has altered how drug resistance for *M. tuberculosis* is detected. She has worked for decades as a clinical microbiologist and participated in research collaborations and in support of the TB Trials Consortium as an expert panelist. As a frequent presenter at international and national meetings, she has advanced understanding of drug resistance in TB disease.

During her 22-year career at CDC, Dr. Metchock has led her team in revolutionizing *M. tuberculosis* clinical and reference testing. As a consequence of her work and leadership, Dr. Metchock and her team have been awarded numerous accolades. One that is particularly special to her is the Laboratorian of the Year Award from the National TB Controllers Association. Her efforts have ensured access to critical and rapid testing services that would not otherwise be available to substantial numbers of American TB programs especially in U.S. territories.



## Lynne E. Pinkerton, MD, PMP

*National Institute for Occupational Safety and Health*

Throughout Dr. Lynne Pinkerton's career at the National Institute for Occupational Safety and Health, she has shown continuous outstanding leadership in producing high-quality, high-impact cancer research and prevention accomplishments. Her groundbreaking work inspired a range of research studies. These studies affected the health of those who work in various hazardous environments, from 30,000 feet in the air to miles underground in uranium mines. Her work has led to changes in regulations and compensation for workers who had been all but forgotten. It is estimated that up to 10 percent of U.S. cancers are caused by occupational exposures, and Dr. Pinkerton's skill, diligence, and advocacy have led to some of CDC's most significant occupational health research.

Though there are many examples of the significance of Dr. Pinkerton's work, one of the most striking comes from a study involving uranium millers. The mining and milling of uranium ores for nuclear weapons began during World War II to support the Manhattan Project. While health risks associated with uranium mining are well studied, uranium-milling research was limited until Dr. Pinkerton's study, which had immediate relevance for workers seeking financial compensation under the Radiation Exposure Compensation Act. Many uranium mines and mills were located on American Indian reservations. As such, the industry employed large numbers of Indians. Dr. Pinkerton worked diligently to identify all uranium mills and records. Many American Indians living on reservations rarely had telephones or even electricity, and mail delivery was haphazard, making the development of this database of more than 50 mills a complex undertaking.

Dr. Pinkerton has been a disease detective in the truest sense of the word, beginning with her Epidemic Intelligence Service training, to her most recent work with wildland and structural firefighters, her career has provided insight into the connection between workplace hazardous exposures and chronic disease prevention that will save untold lives from cancers and renal disease. Dr. Pinkerton has received 15 Public Health Service Honor Awards, authored more than 30 journal articles and government publications, and contributed to a variety of agency guidance documents. She has received the DHHS Secretary's Award for Distinguished Service, the NIOSH Alice Hamilton Award Honorable Mention, and the NIOSH Bullard-Sherwood Research-to-Practice Award.



## Previous Winners

**2018**

### **ASSESSMENT**

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

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

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

## LABORATORY SCIENCE

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

## 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

## LIFETIME SCIENTIFIC ACHIEVEMENT

Steven L. Cochi, MD, MPH

Dr. Cochi was recognized for helping to shape national and international immunization policy and strategies to reduce the burden of vaccine-preventable diseases and helping to develop the Global Polio Eradication Initiative.

## 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 Oxymorphone 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 Rytzareva, Gilberto Vaughan, Ha-Jung Roh, Michael A. Purdy, Amanda Sue, and Yuri Khudyakov

### **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, and 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 Griese, Anne Purfield, Angela A. Cleveland, Kaitlin Benedict, Julie R. Harris, Mary E. Brandt, Dianna Blau, John Jernigan, J. Todd Weber, and Benjamin J. Park, for the Multistate Fungal Infection Outbreak Response Team

### **Fungal Infections Associated with Contaminated Methylprednisolone Injections—Preliminary Report**

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

## DATA METHODS AND STUDY DESIGN

Joseph Y. Abrams, John R. Copeland, Robert V. Tauxe, 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, Ermias D. Belay, James F. Howell, Bryan F. Buss, Mady Hornig, John D. Gibbins, Scott E. Brueck, Kirk E. Smith, Richard N. Danila, W. Ian Lipkin, Daniel H. Lachance, P. James B. Dyck, and Ruth Lynfield

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

*Maternal or Infant Antiretroviral Drugs to Reduce HIV-1 Transmission*  
*The New England Journal of Medicine* 2010;362(24):2271–2281

## LIFETIME SCIENTIFIC ACHIEVEMENT

**Kathleen Kreiss, MD**

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

### **Changes in Medicaid Physician Fees and Patterns of Ambulatory Care**

*Inquiry* 2009;46(3):291–304

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

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

*JAMA* 2009;301(21):2243–2251

## LIFETIME SCIENTIFIC ACHIEVEMENT

Polly Marchbanks, PhD, MSN

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

## 2009

## ASSESSMENT AND EPIDEMIOLOGY

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

### **Estimation of HIV Incidence in the United States**

*JAMA* 2008;300:520–529

## LABORATORY AND METHODS

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

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

*Vaccine* 2008;26:2510–2520

## PREVENTION AND CONTROL

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

### **Cost Effectiveness of Community-Based Physical Activity Interventions**

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

## LIFETIME SCIENTIFIC ACHIEVEMENT

Stephen B. Thacker, MD, MSc

Dr. Thacker was recognized for his leadership and his work in fostering scientific communication and training of future leaders in public health. He has overseen the Epidemic Intelligence Service 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 Pilišvili, 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 Guarnier, 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

### **Dedine 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. Gargiulo, 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, Marshalyn Yeargin-Allsopp, Coleen A. Boyle, and Pierre Decoufle

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

*JAMA* 1996;276:1805–1810

## 1996

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

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

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

## 1995

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

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

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

## 1994

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

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

*JAMA* 1993;269:2853–2859

## 1993

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

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

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

## 1992

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

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

*JAMA* 1991;265:1704–1708

## 1991

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



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

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

**1990**

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

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

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

**1989**

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

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

*Science* 1988;239:295–297

**1988**

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

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

*Virology* 1987;160:311–322

**1987**

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

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

*Science* 1986(4736);231:382–385

**1986**

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

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

*The Lancet* 1985;2:114–118

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

**2018**

**Roberta Ness, MD, MPH**

The University of Texas

*"Innovation and Creativity in Modern Public Health"*

**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  
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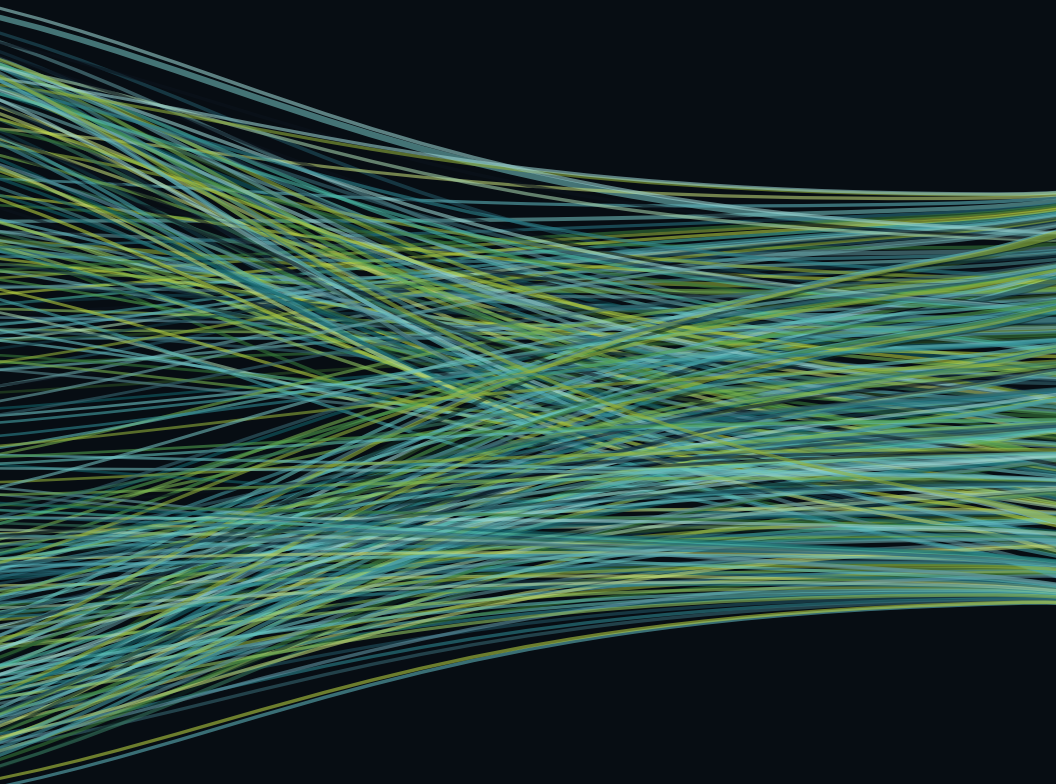
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