



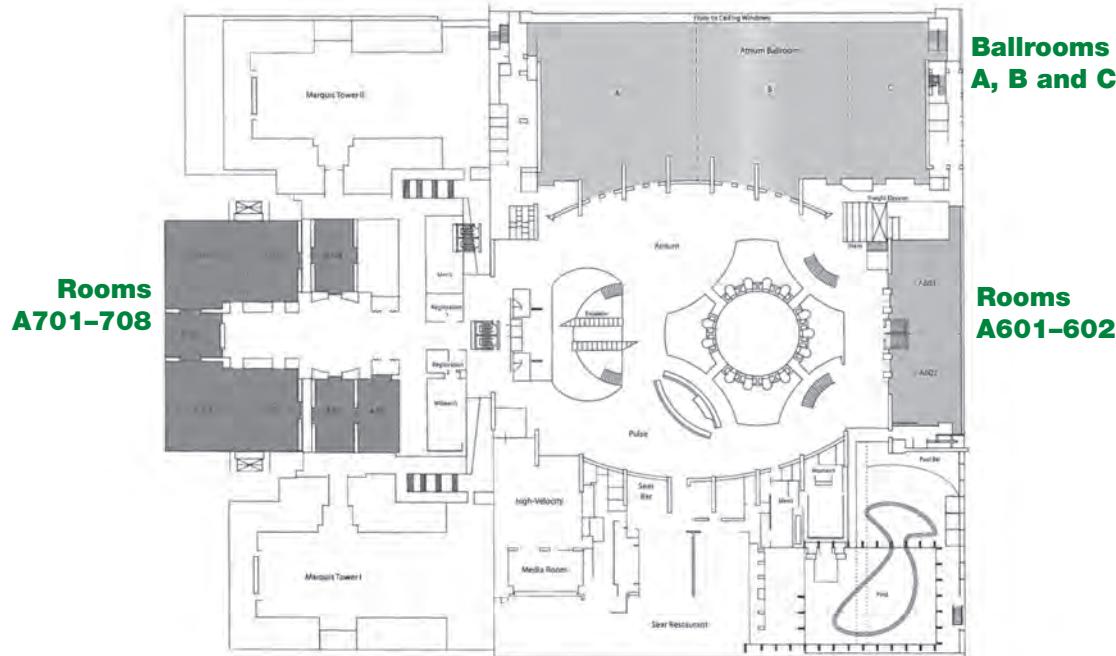
Annual EIS Conference

April 11-15, 2011
Atlanta Marriott Marquis
265 Peachtree Center Avenue

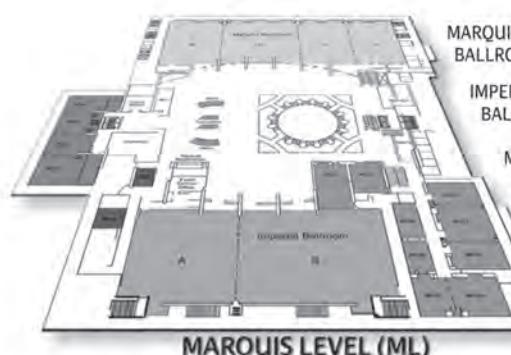
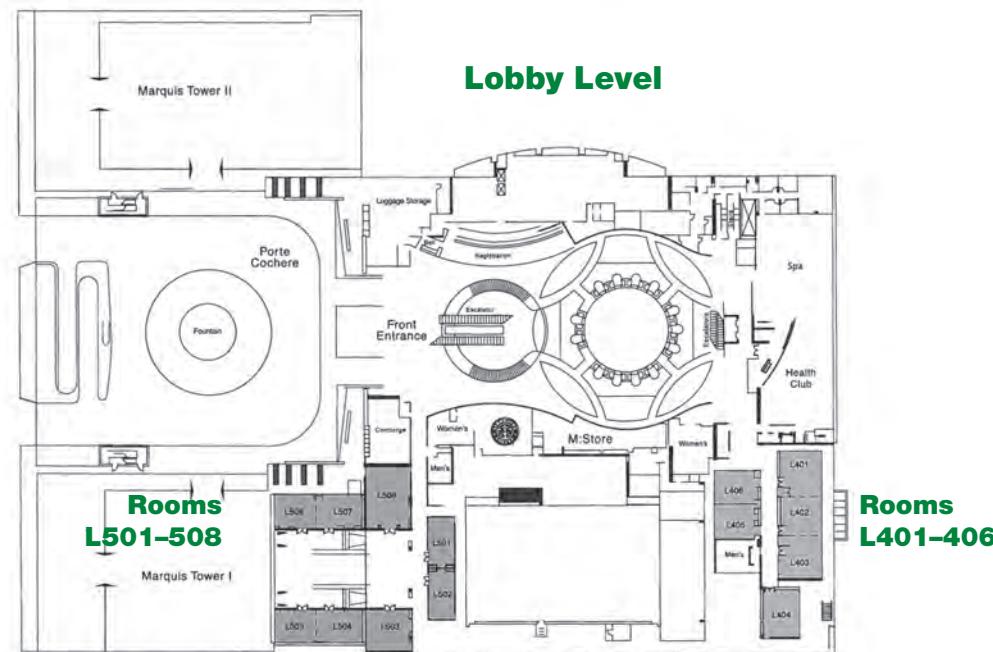


Floorplan

Atrium Level



Lobby Level



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Color Key Name Tags

- Blue – EIS Alumni
- Green – Current EIS Officers
- Red – Incoming EIS Officers
- Black – Conference Participants
- Purple – Conference Staff
- Blue Dot – Field EIS Alumni
- Orange Dot – Recruiters
- Pink Dot – Media

SAVE THE DATE

61st Annual Epidemic Intelligence Service (EIS) Conference

April 16–20, 2012
Centers for Disease Control and Prevention
Atlanta, Georgia

Dear Friends of EIS:

Welcome to the 60th Annual Epidemic Intelligence Service (EIS) Conference. We are delighted that you are able to attend our annual conference, which highlights the professional activities of EIS officers (EISOs). The scientific program this year includes 95 oral presentations and 30 poster presentations. In addition, your experience this week will be enriched by International Night, the EIS skit, the Prediction Run, special award presentations, and other activities that have long been a tradition at the conference. This year, in recognition of the 60th anniversary of the EIS Program, the Scientific Program Committee elected to forgo the traditional tongue-in-cheek session titles for something slightly more historic (besides, the movie or television show metaphors were getting old). In addition to the purely descriptive titles (e.g., Opening Session, HIV, Environmental Health, and so forth), each session title incorporates a newspaper headline or manuscript title related to the session's subject matter. Also, for each session, we chose examples of initial or early EIS investigations and important or seminal EIS investigations. These selections will not necessarily link to the specific papers in the session but have been chosen to represent the wide spectrum of EIS activities throughout the last 60 years. In your program book, these elements are listed in the conference schedule as titles for the individual sessions and also in a separate consolidated list with notes as to why they were chosen (see Spotlight pages).

As always, we extend a special welcome to the new incoming EISOs, members of the 2011 class. For the second year in a row, we have received a record number of applications for the program. During the last decade, we averaged approximately 280 completed applications each year. Last year, we received 412, and this year the number of applications increased to 470. Although this meant substantially more work for us in the initial screening process, it also meant that we had a much richer pool of candidates from which to choose. I am confident that we have selected an excellent group of new officers.

This year's 79 red name tags are a select group of men and women with a broad array of interests and skills. Fifty-five (70%) of the new officers are women, and 13 (16%) are citizens of other nations. The other countries represented in this year's class are Austria, Canada (2), China, Denmark, Ghana, Jordan, Kenya, New Zealand, Nigeria, Sweden, United Kingdom, and Vietnam. Among the 55 U.S. citizens or permanent residents who have supplied race/ethnicity data, 21 (38%) represent racial or ethnic minority groups. Twenty-six are PhD-level scientists (33%); 47 (59%) are physicians; 5 (6%) are veterinarians; and 1 is a dentist. Two of the MDs also hold PhDs. Nine members of the class have accepted prematched assignments in state health departments.

This year, we will again be running concurrent oral sessions on Tuesday and Wednesday mornings; please check your program carefully. Special sessions also are included in this year's conference. Tuesday's lunchtime session is The National Institute for Occupational Safety and Health's (NIOSH) Role in the Deepwater Horizon Response, and on Wednesday, NCCDPHP will host the session, "Extinguishing the Tobacco Epidemic: How We Can Win the Battle." A special session on Thursday at lunchtime is "Guns, Germs, and Steel — Public Health Response and Systems Reconstruction: CDC's Efforts After disasters in Haiti and Pakistan."

The 2011 Conference provides you the opportunity to hear about the current applications of epidemiology to public health and prevention by EISOs. We welcome you to an exciting series of days and evenings in the EIS experience, an opportunity to learn, to meet old and new friends, and to welcome the incoming officers. I look forward to seeing you during the week.



Douglas Hamilton, MD, PhD
Director, Epidemic Intelligence Service
Division of Applied Sciences
Scientific Education and Professional Development Program Office

60th Conference Theme Spotlight

SESSION A

An Elite Team of Sleuths, Saving Lives in Obscurity

April 6, 2010, by Lawrence K. Altman, MD

The New York Times

Early Epi-Aid: 1951-012, Report of Investigation of Suspected Encephalitis Outbreak - Richmond, Virginia (first Epi-Aid with an EIS officer, *William H. Clark*)

Opening Session 39

SESSION B

Intestinal Bug Hit Many on North Side

April 18, 1993, by Neil D. Rosenberg

Milwaukee Journal

Early Epi-Aid: 1953-019, Summary of Outbreak of Amebiasis in South Bend, Indiana (first water-borne disease-associated Epi-Aid investigation)

Seminal Epi-Aid: 1993-057, Cryptosporidiosis in Milwaukee

Spotlighted EIS Manuscript: W. R. MacKenzie, N. J. Hoxie, M. E. Proctor, M. S. Gradus, K. A. Blair, D. E. Peterson, J. J. Kazmierczak, D. G. Addiss, K. R. Fox, J. B. Rose, and J. P. Davis (1994). *A Massive Outbreak in Milwaukee of Cryptosporidium Infection Transmitted through the Public Water Supply*. *N Engl J Med*, 1994; 331:161-7.

Waterborne Diseases 42

POSTER SESSION 1

The Doctor's World; The Rewards and The Roadblocks of Medical Sleuthing

May 1, 2001, by Lawrence K. Altman, MD

The New York Times

Meet the Authors 44

SESSION C

Grim Reaper Cutting Near Says Legionnaire Survivor

August 5, 1976, by Paul Carpenter

The Evening News (Harrisburg, PA)

Early Epi-Aid: 1951-024, Outbreak of Pulmonary Disease, Boulder, Montana (first respiratory disease related Epi-Aid investigation)

Seminal Epi-Aid: 1976-101, Legionnaires Disease, Philadelphia, Pennsylvania

Spotlighted EIS Abstract: 1977, Legionnaires Disease — How New Is It? *Stephen B. Thacker*

Respiratory Diseases 52

SESSION D

Studies Warn Parents About Link of Aspirin to Childhood Disease

November 9, 1980

The New York Times

Early Epi-Aid: 1952-001, Infectious Hepatitis, Windham, Ohio (first pediatric population investigated by a pediatrician, EIS Officer *Paul F. Wehrle*)

Seminal Epi-Aid Investigation: 1980- Reyes Syndrome in Arizona

Spotlighted EIS Abstract: 1980, Reyes Syndrome Associated with Salicylate Consumption, *Karen M. Starko*

Spotlighted Alexander D. Langmuir EIS Lecture: 1976, The Future of Epidemiology in the Hospital. *Paul F. Wehrle*

Pediatrics 55

SESSION E 1

An Awful Howl: Andrew Hits Hardest in South Dade

August 24, 1992, by A. Markowitz

The Miami Herald

Early Epi-Aid: 1953-001, Association of Aplastic Anemia in Humans with Cattle Showing Similar Syndrome Fed Trichloroethylene Extracted from Soybean Oil Meal (first environmental exposure Epi-Aid investigation)

Seminal Epi-Aid: 1992-083, Hurricane Andrew Disaster Assistance

Spotlighted EIS Abstract: 1980, Casualties of the May 18, 1980, Eruption of Mount St. Helens, *Roy T. C. Ing, G. Rogers, H. Falk, J. Horan*.

Environmental and Occupational Health .. 58

SESSION E2**Rare Cancer Seen in 41 Homosexuals**

July 3, 1981, by Lawrence K. Altman, MD

The New York Times

Early/Seminal Epi-Aid: 1981-064, Kaposi's Sarcoma, Pneumocystis Pneumonia, and Opportunistic Infections Among Homosexual Men in New York City and California (first HIV-related Epi-Aid investigation)

Spotlighted EIS Abstract: 1982, Kaposi Sarcoma and Opportunistic Infections Among Homosexual Men: Epidemiology, United States, Alexander Kelter, D.M. Auerbach, H. Haverlocks, P.A. Thomas, M.E. Guinan, H.W. Jaffee, CDC Taskforce on Kaposi Sarcoma and Opportunistic Infections

Spotlighted EIS Manuscript: CDC. Kaposi's sarcoma and *Pneumocystis* pneumonia among homosexual men — New York City and California. MMWR 1981;30:305–8.

HIV **61**

SESSION F1**30 Years Ago, Atlanta Battled Most Infamous Killing Spree in City's History**

August 7, 2009, by Christian Boone

The Atlanta Journal-Constitution

Early Epi-Aid: 1973-076, Epidemiologic Study of Homicides in Atlanta (first injury-related Epi-Aid investigation)

Seminal Epi-Aid: 1981-016, Homicides in Children in Atlanta

Spotlighted EIS Abstract: 1985, Spouse Homicide in the United States: An Epidemiologic Assessment, James A. Mercy, L.E. Saltzman

Injury **64**

SESSION F2**Virus Carried by Mice Is a Mysterious Killer**

August 20, 1997, By Don Knapp

CNN

Early Epi-Aid: 1953-014, Investigation of Human Case of Anthrax (first zoonosis-related Epi-Aid investigation)

Seminal Epi-Aid: 1993-071, Outbreak of Hantavirus Infection, Arizona

Spotlighted EIS Abstract: 1994, Emergence of a Newly Recognized Hantavirus in the United States, Jeffrey S. Duchin, C. Peters, R. Breiman, et al.

Zoonoses **67**

SESSION G**New Rules for Safe-Handling Labels on Raw Meat**

October 31, 1993, by Washington United Press

The New York Times

Early Epi-Aid: 1953-011, Report of an Investigation of an Outbreak of Shigellosis Madison county, Tennessee (first foodborne-related Epi-Aid investigation)

Seminal Epi-Aid: 1993-037, Jack in the Box, Escherichia coli O157:H7 Infection

Spotlighted EIS Manuscript: B. P. Bell, et al. A Multistate Outbreak of *Escherichia coli* O157:H7-Associated Bloody Diarrhea and Hemolytic Uremic Syndrome from Hamburgers: The Washington Experience. JAMA 1994; 272:1349–53.

Foodborne and Enteric Diseases **70**

60th Conference Theme Spotlight

SESSION H1

Vital Statistics; A Mixed Report on American Health

January 26, 2010, by Nicholas Bakalar

The New York Times

Early Epi-Aid: 1957-015, Investigation of a staphylococcal outbreak in infants and mothers recently delivered in a South Carolina hospital (first use of chi-square and *p*-value in an Epi-Aid)

Spotlighted EIS Abstract: 2003, Associations of Body Mass Index and Perceived Weight Category with Suicide Ideation and Suicide Attempts Among Adolescents — United States, 2001. *Danice Eaton* (first Peavy Award recipient)

Peavy Award Finalists 73

SESSION H2

Experts Explore ‘Staph’ Infections; Cleanliness is Still the Best Safeguard Against Bacilli, Antibiotics

November 7, 1959, by Bess Furman

The New York Times

Early Epi-Aid: 1951-004, Investigation of Outbreak of Hepatitis in the State of New Mexico (first Epi-Aid investigation in a healthcare institution)

Seminal Epi-Aid: 1958-022, Epidemic Investigation — Hospital Nursery Staphylococcal Infections, Kansas City, Kansas

Spotlighted EIS Abstract: 1958, The Surveillance of Staphylococcal Infections in A General Hospital. *F. Robert, Fekety*

Healthcare 76

SESSION I1

Where Vigilance Never Sleeps

January 28, 2011, by Mike Hale

The New York Times

Early Epi-Aid: 1957-018, Epidemic Aid - Streptococcal Infections, Rhode Island (first surveillance system reported in an Epi-Aid)

Seminal Epi-Aid: 2002-019, Assistance in Surveillance following 9/11

Spotlighted EIS Abstract: 2002, World Trade Center Rescue Worker Injury and Illness Surveillance System — New York 2001, *Sandra I. Berrios-Torres, et al.*

Surveillance 79

SESSION I2

Doctors and Patients Are Pushed to Their Limits by Grim New TB

October 12, 1992, by Elizabeth Rosenthal

The New York Times

Early Epi-Aid: 1973-042, Simian Tuberculosis Outbreaks in Several States Related to a Single Animal Importer (first human exposed tuberculosis-associated Epi-Aid investigation with an EIS officer)

Seminal Epi-Aid: 1991-041, Tuberculosis on a Cruise Ship

Spotlighted EIS Abstract: 1992, The Emergence of Drug-Resistant Tuberculosis, New York City, *Thomas R. Frieden, et al.*

Tuberculosis 82

POSTER SESSION 2

The Doctor’s World; A Correspondent Recalls His Days as a Medical Sleuth

April 17, 2001, by Lawrence K. Altman, MD

The New York Times

Meet the Authors 85

SESSION J

Judge Allows Big Lawsuit on Tobacco

February 1985, by Glen Collins

The New York Times

Early Epi-Aid: 1961-031, Leukemia — Cook County (Niles), Illinois (first chronic disease-related Epi-Aid investigation)

Seminal Epi-Aid: 1986-041, Assessment of Smoking Control Measures, New York City

Spotlighted EIS Abstract: 1987, Socioeconomic Differences in Smoking Behavior in Selected States, Thomas E. Novotny, et al.

Chronic Diseases 93

SESSION K

Germ War Defense Set Up; Epidemic Intelligence Service Created by Health Unit

September 27, 1951

The New York Times

Spotlighted EIS Manuscript: A.D. Langmuir and J. M. Andrews. *Biological Warfare Defense, The Epidemic Intelligence Service of the Center for Disease Control*, American Journal of Public Health, 1952; 42(3)

First Alexander D. Langmuir Lecture: 1972, Prevention of Rheumatic Heart Disease — Fact or Fancy. Charles H. Rammelkamp

First Alexander D. Langmuir Prize Manuscript: J.M. Neff, J.M. Lane, J.H. Pert, R. Moore, J.D. Millar, D.A. Henderson. *Complications of Smallpox Vaccination: I. National Survey in the United States*, 1963. N Engl J Med 1967; 276:125-32.

Alexander D. Langmuir Lecture and Reception 96

INTERNATIONAL NIGHT POSTER SESSION Romanian Orphans Face Risk of AIDS; Can't Guarantee Health of Adoptees

February 21, 1991, by Bruce Bonham

The Waterloo Record (Kitchener, ON)

International Night Poster Session 97

SESSION L

Scientists Make Progress Against Mystery Pneumonia

March 23, 2003

The China Post

Spotlighted EIS Abstract: 1991, Risk Factors for HIV Infection Among Abandoned Romanian Children, Bradley Hersh, F. Popovici, Z. Jezek, G. Satten, R. Apetrei, R. George, C. Shapiro, H. Gayle, D. Heymann

International Night 105

SESSION M

The Plague of Medical Research

September 22, 2009, by Stephen Dubner

The New York Times

Early Epi-Aid: 1954-006, Epidemic Aid, Amoebic Dysentery, Devil's Lake, North Dakota (Donald Mackel's first Epi-Aid investigation; laboratory collaboration discovered two distinctive cooccurring outbreaks of amebic and bacillary dysentery)

Spotlighted EIS Abstract: 1987, Fatal Parathion Poisoning-Sierra Leone. Ruth A. Etzel (first Mackel Award recipient)

Mackel Award Finalists 108

SESSION N

Uncle Sam Probes Polio Cases Following Salk Inoculations

April 29, 1955, by Washington United Press

News Dispatch (Jeannette, PA)

Early Epi-Aid: 1953-017, Epidemic Aid, Suspected Smallpox, Seward, Nebraska (first vaccine related Epi-Aid investigation)

Seminal Epi Investigation: 1955, The Cutter Incident

Spotlighted EIS Manuscript: N. Nathson and A. D. Langmuir. *The Cutter Incident. Poliomyelitis Following Formaldehyde-Inactivated Poliovirus Vaccination in the United States During the Spring of 1955*. The American Journal of Hygiene, 1963; 78 (1).

Vaccine Preventable Diseases 111

60th Conference Theme Spotlight

SESSION O

Doctors Warn Women About an Acne Drug

January 21, 2000

The New York Times

Early Epi-Aid: 1967-60, Sudden Infant Deaths in Vermont (first reproductive health Epi-Aid investigation)

Seminal Epi-Aid: 1999-045, Investigation of Isotretinoin Exposed Pregnancies, California

Spotlighted EIS Manuscript: M.A. Honein, L.J. Paulozzi, J. D. Erickson *Continued occurrence of Accutane(r)-Exposed Pregnancies.* Teratology, 2001; 64:142-147.

Reproductive Health 114

SESSION P

Swine Flu Origins Mysterious in “Genetic Arms Race”

May 6, 2009, by Elizabeth Landau

CNN

Early Epi-Aid: 1950-006, Final report of field activities and preliminary report of laboratory results, the poliomyelitis epidemic (investigators later become EIS officers in the first EIS class)

Seminal Epi-Aid: 1977-019, The Epidemiology of Ebola Haemorrhagic Fever in Zaire, 1976

Spotlighted EIS Abstract: 1958, Inhalation Anthrax Epidemic in New Hampshire Mills, Philip S. Brachman

Potpourri 117

SESSION Q

Painful, Flu-Like Tropical Virus Can Be Deadly

September 18, 1995, by Anita Manning

USA TODAY

Early Epi-Aid: 1951-012, Report of Investigation of Suspected Encephalitis Outbreak — Richmond, Virginia (first vectorborne disease-related Epi-Aid investigation)

Seminal Epidemiological Investigation: 1969, Outbreak of Tickborne Relapsing Fever, Spokane County, Washington

Spotlighted Alexander D. Langmuir EIS

Lecture: 1995, Epidemiology and the Elucidation of Lyme Disease. *Allen C. Steere*

Vectorborne Diseases 120

SESSION R

The Doctor’s World; When Everything Changed at the CDC

November 13, 2001, by Lawrence K. Altman, MD

The New York Times

Late-Breaking Reports 122

SESSION S

Eradication of Smallpox To Be Announced Today

May 8, 1980, by United Nations (NY)

The New York Times

Early Epi-Aid: 1950-004, Red River of the North Flood City of Winnipeg and South Manitoba Province (Alexander D. Langmuir conducted the first international Epi-Aid)

Seminal Epi-Aid: 1958-037, Epidemic Aid — Smallpox and Cholera, East Pakistan

Spotlighted EIS Abstract: 1975, Global Smallpox Eradication, *William H. Foege*

Global Health 123

Scientific Program Committee

Chair, **Priti Patel**, National Center for Immunization and Respiratory Diseases

Chair Elect, **Emad Yanni**, National Center for Emerging and Zoonotic Infectious Disease

Center for Global Health	Alexandre Macedo De Oliveira
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Scientific Education and Professional Development Program Office	Kris Bisgard, Edward Weiss*

* Late-breaking session subcommittee



Front row, left to right: *Emad Yanni, Priti Patel, Edward Weiss*

Middle row, left to right: *Jacqueline Miller, Jacqueline Tate, Mary Anne Duncan, Kris Bisgard, Alexa Oster*

Back row, left to right: *Benjamin Park, Joseph Logan, Cynthia Hinton, Mary Reynolds, Kathryn Porter, Alexandre Macedo De Oliveira, Jacek Mazurek*

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Abstracts in this publication were edited and officially cleared by the respective national centers. Therefore, the EIS Program is not responsible for the content, internal consistency, or editorial quality of this material. Use of trade names throughout this publication is for identification only and does not imply endorsement by the U.S. Public Health Service or the U.S. Department of Health and Human Services.

The findings and conclusions in this report are those of the author(s) and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

General Information

Purpose Statement

The primary purpose of the EIS Conference is to provide a forum for EIS officers to give scientific presentations (oral or poster), increase their knowledge of recent investigations and the significance to public health, and maintain and increase their skills in determining the appropriateness of epidemiologic methods, presenting and interpreting results clearly, and developing appropriate conclusions and recommendations.

Overall Conference Goals

- To provide a forum for EIS officers, alumni, and other public health professionals to engage in the scientific exchange of current epidemiologic topics.
- To highlight the breadth of epidemiologic investigations at CDC.
- To provide a venue for recruitment of EIS graduates into leadership positions at CDC and state and local departments of health.

Registration and Information

Staff are available at the conference registration desk located outside the Atrium Ballroom. Check-in and onsite registration are available Monday–Friday, 7:30 a.m.–5:00 p.m.

Please wear your conference badge at all times during the conference. Your name badge includes your code to access messages in the Communications Center.

Conference staff are wearing purple badges and are available to assist if you need additional information or misplace your badge.

Message Center

To facilitate conference networking, computers with internet access are located in room A703. Preregistered attendees have immediate access to find, communicate, and network with other conference participants, speakers, and staff. LinkedIn profiles can easily be uploaded to the conference messaging system, and you can upload a picture of yourself to facilitate easy identification. If you are not already registered with the system, please see conference staff for assistance. Please limit computer time to 10 minutes per session to allow other conference attendees an opportunity to use the system as well.

Speaker Ready-Room

Located in Room A705, the speaker ready room is available for presenters who need to review or make changes to their presentations. Computers with PowerPoint software, rewritable CD-ROM drives, and a printer will be available Monday–Thursday, 8:00 a.m.–6:00 p.m.

Exhibit Hall

Monday–Thursday, 8:00 a.m.–5:00 p.m., Atrium Foyer.

Environmental Considerations

Smoking is not permitted in any of the conference sessions, hallways, or meeting rooms. As a courtesy to presenters and all meeting attendees, please turn off ringers on cellular phones during conference sessions. Please limit use of cellular phones to the meeting room foyers and public areas outside the meeting rooms.

Lactation Room

Please visit the EIS information table, next to the registration area if you need to use the lactation room. A sign-up schedule and key will be available at the table Monday–Friday, 7:30 a.m.–5:00 p.m.

2011 EIS Conference Schedule At-a-Glance

Monday, April 11, 2011

7:30 Registration Desk Opens

8:15 Welcome and Call to Order **Atrium Ballroom B and C**

Stephen B. Thacker, Deputy Director for Surveillance, Epidemiology, and Laboratory Services, CDC

8:30 Session A: An Elite Team of Sleuths, Saving Lives in Obscurity **Atrium Ballroom B and C**

April 6, 2010, by Lawrence K. Altman, MD, *The New York Times*

Opening Session **Atrium Ballroom B and C**

Moderator: *Thomas R. Frieden and Stephen B. Thacker*

8:35 In a Puff of Smoke: Legionnaires' Disease Associated with Travel to Hotel A — Starkville, Mississippi, July 2010. *Tarayn Fairlie*

8:55 Cracking the Case: *Salmonella Enteritidis* and the 2010 Egg Recall. *Joanna Gaines*

9:15 Cervical Cancer Survivors Are at Increased Risk for Subsequent Malignancies, Including Tobacco-Related Cancers, When Compared to Breast and Colorectal Cancer Survivors — United States, 1992–2007. *J. Michael Underwood*

9:35 Large Outbreak of Trichosporonosis Among Intensive Care Unit Patients — Jamaica, 2010. *Robyn N. Fanfair*

9:55 Risk Factors for Prescription Opioid Death — Utah, 2008–2009. *William A. Lanier*

10:25 Break

10:45 Session B: Intestinal Bug Hit Many on North Side

April 18, 1993, by Neil D. Rosenberg, *Milwaukee Journal*

Waterborne Diseases **Atrium Ballroom B and C**

Moderator: *Michael Beach*

10:50 Rapid Assessment of Cholera Mortality — Artibonite, Haiti, 2010. *Janell A. Routh*

11:10 Impact of a Novel Hollow Fiber Household Water Filter on the Health of Rural Kenyan Children. *Laura B. Gieraltowski*

11:30 Protection Against Epidemic Cholera in an Urban Setting — Port-au-Prince, Haiti, 2010. *Stacie E. Dunkle*

11:50 Impact of Safe Water and Hygiene Program in Rural Health Facilities, Zambia, 2010. *Linda G. Capewell*

Schedule At-a-Glance

12:15 LUNCH

12:30 POSTERS ON DISPLAY

Meet the Authors, Poster Session 1 **Atrium Ballroom B and C**

All posters presented during the conference will be on display Monday 9:00 a.m.–Friday 12:00 p.m.

The following authors will be present to discuss their studies on Monday, 12:30–1:30 p.m.

Poster Session 1: The Doctor's World; The Rewards and The Roadblocks of Medical Sleuthing May 1, 2001, by Lawrence K. Altman, MD, *The New York Times*

- P1. Evaluation of Active Surveillance of Stillbirth: Utility of an Existing Birth Defects Surveillance Program — Atlanta, Georgia. *Alejandro Azofeifa*
- P2. Epidemic Features of Human Anaplasmosis — Wisconsin, 2006–2009. *Michael L. Bartholomew*
- P3. Factors Associated with Receipt of the 2009 Influenza A (H1N1) Monovalent Vaccination Among School-Aged Children — Maricopa County, Arizona, October 2009–April 2010. *Steven A. Baty*
- P4. Are Depression and Diabetes Associated with Asthma Control? *Jeneita M. Bell*
- P5. Dangerous Liaisons? Association Between Pandemic Influenza A (H1N1) and Pneumococcal Pneumonia. *Katherine E. Fleming-Dutra*
- P6. Desperately Seeking CTF: Colorado Tick Fever Surveys of Humans and Ticks — Wyoming, 2010. *Aimee L. Geissler*
- P7. Environmental and Behavioral Risk Factors for West Nile Virus Infection During an Outbreak — Arizona, 2010. *Katherine B. Gibney*
- P8. Wise Up on Water: Drinking Water Intake Among U.S. Adults — US, 2007. *Alyson B. Goodman*
- P9. Babesiosis in a 1-Month Old Infant — New York, September 2010. *Angela M. Maxted*
- P10. Effectiveness of Novel Occupational Heat Regulations on Reducing Fatal and Serious Cases of Occupational Heat-Related Illness — California, 2005–2008. *Francisco A. Meza*
- P11. Risk Factors for Plague Mortality — Uganda, 2008–2010. *Jeffrey R. Miller*
- P12. Exposure to Vampire Bats and Rabies in Two Communities in the Peruvian Amazon. *Brett W. Petersen*
- P13. Rabies Knowledge, Attitudes and Practices of Deer Farmers Following a Cluster of Rabies in Captive Deer — Pennsylvania, July 2010. *Danielle M. Tack*
- P14. Laboratory Detection as First Indicator of Influenza Season — West Virginia, 2010. *Tegwin K. Taylor*
- P15. Survey of Animal Trappers, a Potentially Overlooked Occupational Group, Regarding Emerging Local Rabies Exposure Risks — Denver Metropolitan Area, 2010. *Nancy J. Williams*

1:30 Session C: Grim Reaper Cutting Near Says Legionnaire Survivor

August 5, 1976, by Paul Carpenter, *The Evening News* (Harrisburg, PA)

Respiratory Diseases **Atrium Ballroom B and C**

Moderator: Lauri Hicks

- 1:35** Base is Loaded: Legionnaires' Disease and Pontiac Fever Among Employees at a Military Base — Michigan, 2010. *Katherine E. Fleming-Dutra*
- 1:55** Receipt of Antiviral Treatment for Influenza Infection — United States, 2009–2010. *Shikha Garg*
- 2:15** Outbreak of Severe Respiratory Illness Associated with Human Enterovirus 68 Among American Indian Children — Arizona, 2010. *Lara M. Jacobson*
- 2:35** The Lung Fungus Among Us: A Large Urban Outbreak of Bastomycosis — Marathon County, Wisconsin, 2010. *Monika Roy*

3:00 BREAK

Schedule At-a-Glance

3:15 Session D: Studies Warn Parents About Link of Aspirin to Childhood Disease

November 9, 1980, *The New York Times*

Pediatrics **Atrium Ballroom B and C**

Moderator: Susan Lukacs

3:20 Trends in Intussusception Among United States Infants Before and After Implementation of the Rotavirus Vaccination Program, 2000–2008. *Catherine Yen*

3:40 Pediatric Influenza Hospitalizations During the 2009 H1N1 Pandemic. *Chad M. Cox*

4:00 Breaking the Sound Barrier: Evaluating Early Hearing Detection and Intervention Data Collection—Iowa, 2010. *Jill Glidewell*

4:20 Reduced Prevalence of Hepatitis B Vaccination Among Children and Adolescents Aged 2–19 Years Without a Usual Source of Health Care — United States, 2005–2008. *Caitlin G. Reed*

4:40 Public Health Response to a Severe and Rapidly Progressive *Neisseria meningitidis* Outbreak in an Elementary School — Oklahoma, 2010. *Steven M. Grube*

5:00 Race/Ethnic Differences in Low-Fat Milk Consumption Among Children and Adolescents — United States, 2005–2008. *Brian K. Kit*

5:30 EIS Conference Social.....A602

Cash bar and snacks

Tuesday, April 12, 2011

8:30 Concurrent Session E1: An Awful Howl: Andrew Hits Hardest in South Dade

August 24, 1992, by A. Markowitz, *The Miami Herald*

Environmental and Occupational Health **Atrium Ballroom B and C**

Moderator: Judy Qualters

8:35 Mental Health Needs Assessment After the Gulf Coast Oil Spill — Alabama and Mississippi, 2010. *Danielle E. Buttke*

8:55 Aflatoxin Exposure in Kenya. *Ellen E. Yard*

9:15 Public Health Consequences from Chlorine Released at a Metal Recycling Facility — California, 2010. *Ekta Choudhary*

9:35 Regional Differences of Coal Workers' Pneumoconiosis Prevalence 40 Years After Implementation of the 1969 Coal Act — United States, 2005–2009. *Eva Suarthana*

9:55 Laboratory-Acquired Human Cowpox Virus Infection in the US — 2010. *Andrea M. McCollum*

8:30 Concurrent Session E2: Rare Cancer Seen in 41 Homosexuals

July 3, 1981, by Lawrence K. Altman, MD, *The New York Times*

HIV **Atrium Ballroom A**

Moderator: Linda Valleroy

Schedule At-a-Glance

- 8:35** Homophobia and HIV Risk Among Black Men Who Have Sex with Men — New York City and Philadelphia, 2005–2006. *William L. Jeffries IV*
- 8:55** HIV Testing Among Men Who Have Sex with Men Surveyed in the National HIV Behavioral Surveillance System — St. Louis, Missouri, 2008. *Yi-Chun Lo*
- 9:15** HIV Testing Among Patients Infected with *Neisseria gonorrhoeae* — STD Surveillance Network, United States, 2009–2010. *Heather M. Bradley*
- 9:35** Smoking Prevalence and Associations Among HIV-Infected Persons — Oregon, 2007–2008. *John Y. Oh*
- 9:55** Adverse Events in Infants Born to HIV-Infected Mothers Receiving 3-Drug Antiretroviral Regimens for Prevention of Mother-to-Child HIV Transmission — Kenya, 2003–2006. *Timothy D. Minniecear*

10:15 BREAK

10:45 Concurrent Session F1: 30 Years Ago, Atlanta Battled Most Infamous Killing Spree in City's History

August 7, 2009, by Christian Boone, *The Atlanta Journal-Constitution*

Injury **Atrium Ballroom B and C**
Moderator: Jim Mercy

- 10:50** Associations Between Intimate Partner Violence Victimization and Other Health Indicators Among Women and Men — Puerto Rico, 2005. *Kanako Ishida*
- 11:10** Risk and Resiliency Factors Associated with Gang Affiliation Among High-Risk Youths. *Dawn D. McDaniel*
- 11:30** Gender-Based Violence and Mental Health in Urban Refugees and Asylum Seekers in Kampala, Uganda. *Diane Morof*
- 11:50** Post-Earthquake Injuries and Surgical Procedures Performed at the University of Miami/Project Medishare Field Hospital — Haiti, 2010. *Monica U. Selent*

10:45 Concurrent Session F2: Virus Carried by Mice Is a Mysterious Killer

August 20, 1997, by Don Knapp, CNN

Zoonoses **Atrium Ballroom A**
Moderator: Carol Rubin

- 10:50** Ocular Toxocariasis: A First Look — United States, 2009–2010. *Dana M. Woodhall*
- 11:10** Vampire Bat Human Rabies, Louisiana, 2010. *Brett W. Petersen*
- 11:30** A Multistate Outbreak of *Salmonella* I-Infections Associated with Reptile Frozen Feeder Rodents — US, 2010. *Emily J. Cartwright*
- 11:50** Human Paragonimiasis — Missouri, July 2006–October 2010. *Yi-Chun Lo*

Schedule At-a-Glance

12:15 LUNCH

12:30 Special Session: **Atrium Ballroom A**
The National Institute for Occupational Safety and Health's (NIOSH) Role in the Deepwater Horizon Response

Moderator: Margaret Kitt

Speakers: Renee Funk, Bruce Bernard, Michelle Lackovic

1:45 Session G: New Rules for Safe-Handling Labels on Raw Meat

October 31, 1993, by Washington United Press, *The New York Times*

Foodborne and Enterics..... **Atrium Ballroom B and C**

Moderators: Chris Braden and Susan Lance

1:50 Fatal Gastroenteritis at a State Psychiatric Hospital — Louisiana, 2010. Armand G. Sprecher

2:10 Multistate Outbreak of *Escherichia coli* O145 Infections Associated with Romaine Lettuce Consumption — 2010. Ethel V. Taylor

2:30 *Salmonella* Thompson Outbreak Associated with Hollandaise Sauce Among Restaurant Patrons — Alaska, 2010. Kimberly A. Porter

2:50 Locally Acquired Acute Hepatitis E Virus Infection — San Antonio, Texas, 2009. Rania A. Tohme

3:10 Duration of Shedding of Shiga-Toxin-Producing *Escherichia coli* O26 During an Outbreak in a Child Care Center — Oregon, October 2010. Mathieu Tourdjman

3:30 Typhoid Fever Outbreak Associated with Exposure to Frozen Mamey Pulp from Guatemala — Western United States, 2010. Anagha Loharikar

4:00 BREAK

6:00 Prediction Run **Piedmont Park**

5:00 p.m. Shuttle transportation to Piedmont Park departs. Load bus on the main side of the hotel (Peachtree Center Avenue).

Wednesday, April 13, 2011

8:30 Concurrent Session H1: Vital Statistics; A Mixed Report on American Health

January 26, 2010, by Nicholas Bakalar, *The New York Times*

Peavy Award Finalists **Atrium Ballroom B and C**

Moderator: Betsy Cadwell Gunnels

8:35 Novel Approach To Monitoring Impact of Rotavirus Vaccination Using Internet Search Data — United States, 2004–2010. Rishi Desai

8:55 Seasonality of Tuberculosis — United States, 1993–2008. Matthew D. Willis

9:15 Physical Activity and the Risk of Incident and Progressive Radiographic Osteoarthritis of the Knee: The Johnston County Osteoarthritis Project. Kamil E. Barbour

Schedule At-a-Glance

9:35 Effects of School Organized Pandemic Influenza Vaccination on All-Cause Absenteeism — Maine, 2009–2010. *Samuel B. Graitcer*

9:55 Sociodemographic and Healthcare Characteristics Associated with Influenza Vaccination Coverage Among Young Children — Oregon, 2006–2008. *Timothy J. Cunningham*

8:30 Concurrent Session H2: Experts Explore ‘Staph’ Infections; Cleanliness is Still the Best Safeguard Against Bacilli, Antibiotics

November 7, 1959, by Bess Furman, *The New York Times*

Healthcare **Atrium Ballroom A**
Moderator: Denise Cardo

8:35 Invasive Group A Streptococcal Infections Among Residents at a Long-Term–Care Facility — Pennsylvania, 2009–2010. *Allison H. Longenberger*

8:55 Post-Myelography Bacterial Meningitis Among Patients at an Outpatient Radiology Facility — Missouri, 2010. *Amit S. Chitnis*

9:15 Acute Hepatitis B Virus Infection Outbreak in a Long-Term–Care Facility — North Carolina, 2010. *James M. Colborn*

9:35 Transmission of a Novel, Pan-Resistant Verona Intergron-Encoded Metallo-Beta-Lactamase–Producing *Klebsiella pneumoniae* — Washington, 2010. *Neil Gupta*

9:55 Healthcare–Associated Outbreak of Tuberculosis — Puerto Rico, 2010. *Brian J. Baker*

10:15 BREAK

10:30 Concurrent Session I1: Where Vigilance Never Sleeps

January 28, 2011, by Mike Hale, *The New York Times*

Surveillance **Atrium Ballroom B and C**
Moderator: James Buehler

10:35 Impact of a Pilot Intervention To Decrease Overreporting of Heart Disease Deaths — New York City, 2009–2010. *Teeb Al-Samarrai*

10:55 Using Hospitalization Data To Evaluate and Improve Invasive Pneumococcal Disease Surveillance — New Mexico, 2007–2009. *Mam I. Ibraheem*

11:15 Mandatory Reporting Firearm Injury Surveillance — Alaska, 2003–2007. *Asha Z. Ivey*

11:35 Rapid Assessment of Pneumonia and Influenza-Related Mortality — Ohio, 2009–2010. *Loren E. Rodgers*

Schedule At-a-Glance

10:30 Concurrent Session I2: Doctors and Patients Are Pushed to their Limits by Grim New TB

October 12, 1992, by Elizabeth Rosenthal, *The New York Times*

Tuberculosis Atrium Ballroom A Moderator: Kenneth Castro

- 10:35** Symptom-Based Screening for Highly Infectious Tuberculosis in People Living with HIV/AIDS — Cambodia, Thailand, and Vietnam, 2006–2008. *Lindsay Kim*
- 10:55** Poop Matters. Stool Culture as a Predictor of Pulmonary Tuberculosis in People Living with HIV — Cambodia, Thailand and Vietnam, 2006–2008. *Gloria E. Oramasionwu*
- 11:15** TB Row — *Mycobacterium tuberculosis* Cluster Investigation Using Current and Historical Genotyping Methods to Supplement Traditional Epidemiology — Detroit, Michigan 1960s–2010. *Jenna M. Webeck*
- 11:35** Tuberculosis Mortality: Death from a Curable Disease — Connecticut, 2007–2009. *Jessica A. Kattan*

12:00 LUNCH

12:30 Special Session: Extinguishing the Tobacco Epidemic: How We Can Win the Battle Atrium Ballroom A

Moderator: Ursula Bauer

Speakers: Timothy McAfee, Andrew Hyland, Brian King

12:30 POSTERS ON DISPLAY

Meet the Authors, Poster Session 2 Atrium Ballroom B and C

All posters presented during the conference will be on display Monday 9:00 a.m.–Friday 12:00 p.m.

The following authors will be present to discuss their studies on Wednesday, 12:30–1:30 p.m.

Poster Session 2: The Doctor's World; A Correspondent Recalls His Days as a Medical Sleuth

April 17, 2001, by Lawrence K. Altman, MD, *The New York Times*

- P16. Evaluation of the Use of Tuberculosis Genotyping and the Tuberculosis Genotyping Information Management System in State and Local Health Departments — United States, 2010. *Brian J. Baker*
- P17. Nutrition Surveillance and Malnutrition Patterns in Chronic Humanitarian Emergency — West Bank and Gaza Strip, October 2010. *Sudhir Bunga*
- P18. *Salmonella enterica* Serotype Javiana Outbreak Associated with a Mexican Restaurant Chain — Indiana, 2010. *Melissa G. Collier*
- P19. Gastroenteritis Among Attendees of a Youth Conference — North Carolina, February 2010. *Natalie J.M. Dailey*
- P20. Life Inside an Outbreak: A Qualitative Assessment of Cholera Response Efforts, Artibonite Department, Haiti, 2010. *Joanna Gaines*
- P21. Using the Internet To Trace Contacts of a Fatal Meningococcemia Case — New York City, 2010. *Prabhu P. Gounder*
- P22. Knowledge, Attitudes, and Practices Related to Cholera Prevention and Treatment — Artibonite Department, Haiti, 2010. *Lara M. Jacobson*
- P23. *Vibrio mimicus* Infection After Consumption of Crayfish — Spokane, Washington, 2010.

Schedule At-a-Glance

- Meagan K. Kay
- P24. *Neisseria gonorrhoeae* Infections with High Minimum Inhibitory Concentrations to Azithromycin — San Diego County, California, 2009. *Christina B. Khaokham*
- P25. Sustained Implementation of a School-Based Safe Water and Hygiene Program After 3 Years — Rarieda District, Kenya, 2010. *Adamma Mba-Jonas*
- P26. *Acinetobacter baumannii* Infection, Colonization, and Transmission Related to a Long-Term-Care Facility — California, 2009–2010. *Eva Mortensen*
- P27. Trends in Cephalosporin Susceptibility Among *Neisseria gonorrhoeae* Isolates — United States, January 2006–June 2010. *Erin L. Murray*
- P28. Antimicrobial Prescribing Practices for Treatment of Diarrheal and Respiratory Diseases in Guatemalan Children — 2010. *George E. Nelson*
- P29. Risk Factors for Cholera Early in the Epidemic — Haiti, 2010. *Katherine A. O'Connor*
- P30. Dengue Infections Among Travelers Returning from Haiti — Nebraska and Georgia, 2010. *Parvathy Pillai*

1:30 Session J: Judge Allows Big Lawsuit on Tobacco

February 1985, by Glen Collins, *The New York Times*

Chronic Diseases **Atrium Ballroom B and C**
Moderator: Ursula Bauer

- 1:35** Prevalence of Adherence to 2008 Physical Activity Guidelines for Americans Among Adolescents — United States, 1999–2006. *MinKyoung Song*
- 1:55** Rising Incidence Rates of Renal Cell Carcinoma. *Sallyann M. Coleman-King*
- 2:15** Is Polycystic Ovary Syndrome Another Risk Factor for Venous Thromboembolism? — U.S., 2003–2008. *Ekwutosi M. Okoroh*
- 2:35** Cancer Survivors in the United States, 2007. *Arica White*
- 2:55** Exposure to Secondhand Smoke in Motor Vehicles Among Middle and High School Students — United States, 2000–2009. *Brian A. King*
- 3:15** Physical Activity Associated with Transit-Use — United States, 2001–2009. *Amy L. Freeland*

3:45 BREAK

4:00 Session K: Germ War Defense Set Up; Epidemic Intelligence Service Created By Health Unit

September 27, 1951, *The New York Times*

Alexander D. Langmuir Memorial Lecture and Reception..Atrium Ballroom B and C
Moderator: Thomas R. Frieden and Stephen B. Thacker

Skirmishes, Battles, and Wars: Tracking Infection Control Success in the Age of Social Networks *Robert A. Weinstein*

Prior to Dr. Weinstein's lecture, the following awards will be presented:

- Alexander D. Langmuir Prize Manuscript Award
- Distinguished Friend of EIS Award

This event is cosponsored by the EIS Alumni Association and the Scientific Education and Professional Development Program Office

Schedule At-a-Glance

5:30 EIS Alumni Association Meeting A602

6:00 International Night Poster Session: Romanian Orphans Face Risk of AIDS; Can't Guarantee Health of Adoptees Atrium Ballroom A

February 21, 1991, by Bruce Bonham, *The Waterloo Record* (Kitchener, ON)

- IP1. Prevalence and Associated Factors for Peripheral Neuropathy Among Patients on Stavudine Attending Meru District Hospital Comprehensive Care Centre — Kenya, 2010. *Martin Thuranira*
- IP2. Knowledge, Attitudes, and Practices About Cholera Prevention in Santo Domingo, Dominican Republic During November–December, 2010. *Yira Tavarez*
- IP3. Outbreak of Cholera Among Workers of a Jute Mill in Kolkata, West Bengal, India. *Prakash Mridha*
- IP4. Assessment of Public Awareness for Guinea Worm Disease Reporting — Nigeria, 2010. *Ifeoma Anagbogu*
- IP5. Prevalence of Undetected, Untreated, and Uncontrolled Hypertension Among Attendants of Primary Health Care Centers in Nasiriyah City, Iraq. *Faris Al-Lami*
- IP6. Risk Factors for Tuberculosis Treatment Failure Among Pulmonary Tuberculosis Patients — Four Health Regions of Burkina Faso, 2009. *Bernard Sawadogo*
- IP7. Outbreak of Cholera, East-Akim Municipality, Ghana, November 2010. *Joseph Opare*
- IP8. Risk Assessment of HCV and HIV Infections Among Prisoners in Punjab, Pakistan. *Aslam Pervaiz*
- IP9. Case-Fatality and Risk Factors for Death in Adult Patients with Nosocomial Infection Caused by Multi-Drug–Resistant Organisms in Hungary, 2007–2009. *Saverio Caini*
- IP10. Measles Outbreak Among Unvaccinated Children of Migrant Workers: Zhejiang Province, June to August, 2010. *Jie Gao*
- IP11. Evaluation of Two Containment Strategies During a Measles Outbreak in an Asylum Seeker Shelter at Neum, Germany, 2010. *Anja Takla*
- IP12. Diphtheria Outbreak in an Urban City in Central Philippines, 2010. *Norvie Jalani*
- IP13. Provision of Treated Water for Mitigation of a Cholera Outbreak, Handeni District, Tanga, Tanzania, 2009. *M. Mponela*
- IP14. Evaluation of Measles Case-Based Surveillance System — Nigeria, 2010. *Mohammed Abdulaziz*
- IP15. Factors Associated with Changes in Vaginal Cytology in a Health Center — Costa Rica, 2009. *Leandra Abarea*

7:30 Session L: Scientists Make Progress Against Mystery Pneumonia

March 23, 2003, *The China Post*

International Night Speakers Atrium Ballroom A
Moderators: Kevin DeCock and Mark Rosenberg

7:35 Assessment of Water, Sanitation, and Hygiene Interventions in Response to an Outbreak of Typhoid Fever in Neno District, Malawi. *Sarah D. Bennett*

7:55 Hepatitis Outbreak Caused by Contaminated Tamarind Water Served in a Mobile Food Kiosk in an Affluent Urban School of Mayurbhanj, Orissa, India, September 2010. *Prameela Baral*

8:15 Prevalence and Factors Associated with Percutaneous Injuries and Splash Exposures Among Health-Care Workers in Rift Valley Provincial and War Memorial Hospitals — Kenya, 2010. *Everline Mbaisi*

8:35 Effect of H1N1 Pandemic Monovalent Vaccines on the Influenza Outbreak in a Prison — Thailand, 2010. *Hirunwut Praekunatham*

8:55 Evaluation of the Effect of High Concentrations of Environmental Manganese on Young Children in Zestaphoni, Georgia, 2010. *Nana Mebonia*

Schedule At-a-Glance

- 9:15** Risk Factors for Hand, Foot and Mouth Disease Transmission in the Kindergarten Setting, Zhejiang Province, China, 2010. *Jie Gao*
- 9:35 Presentation of William H. Foege Award Atrium Ballroom A**
Reception To Follow

International Night is cosponsored by the Center for Global Health (CGH)/ Division of Public Health Systems and Workforce Development and the Training Programs in Epidemiology and Public Health Interventions Network (TEPHINET).

The posters and presentations featured during International Night are from participants in international programs in applied field epidemiology similar to that of EIS. Some of the programs are sponsored by or partnered with CDC and some are independent. All conference attendees are invited to these sessions.

Thursday, April 14, 2011

8:30 Session M: The Plague of Medical Research

September 22, 2009, by Stephen Dubner, *The New York Times*

Mackel Award Finalists Atrium Ballroom B and C
Moderators: Rima Khabbaz and May Chu

- 8:35** Outbreak of *Mycobacterium Abscessus* Skin Abscesses Following Allergy Injections at Outpatient Clinic A — Texas, 2009. *Susan N. Hocevar*
- 8:55** Fatal Amebic Encephalitis Caused by Transplant-Transmitted *Balamuthia mandrillaris* — Arizona, 2010. *Chukwuma Mbaeyi*
- 9:15** Serum 25-Hydroxyvitamin D3 Status and Determinants of Vitamin D Deficiency Among Non-Pregnant Women of Reproductive Age — Jordan, 2010. *Erin M. Koers*
- 9:35** Changing Geographic Range of Primary Amebic Meningoencephalitis — Minnesota, 2010. *Sarah K. Kemble*
- 9:55** Outbreak of Nosocomial Listeriosis — Texas, 2010. *Noha H. Farag*

10:15 BREAK

10:30 Session N: Uncle Sam Probes Polio Cases Following Salk Inoculations

April 29, 1955, by Washington United Press, *News Dispatch* (Jeanette, PA)

Vaccine Preventable Diseases Atrium Ballroom B and C
Presentation of the Iain C. Hardy Award
Moderator: Greg Armstrong

- 10:35** Potential Intussusception Risk Versus Benefits of Rotavirus Vaccination Among Infants in the United States. *Rishi Desai*
- 10:55** Utility of Death Certificate Data for Estimating Herpes Zoster Mortality in the US, 1979–2007. *Abdirahman Mahamud*
- 11:15** Factors Associated with Tdap and Meningococcal Vaccination Coverage Among Middle School Students — North Dakota, 2010. *Jennifer R. Cope*

Schedule At-a-Glance

11:35 Case-Control Study of Risk Factors for Serogroup B Meningococcal Disease Among Students During a University Outbreak — Ohio, 2010. *Sema Mandal*

12:00 LUNCH

12:30 SPECIAL SESSION: Guns, Germs, and Steel: Public Health Response and Systems Reconstruction: CDC's Efforts after Disasters in Haiti and Pakistan.....Atrium Ballroom A

Moderators: *Scott Dowell and Chris Braden*

Speakers: *Jordan W. Tappero, Muireann Brennan, Raquel Pimentel, Alessandro Colombo*

1:30 Session O: Doctors Warn Women About an Acne Drug

January 21, 2000, *The New York Times*

Reproductive Health**Atrium Ballroom B and C**

Moderator: *Laura Schieve*

1:35 Reasons for Discontinuation of Breastfeeding Among Mothers Who Do Not Breastfeed As Long As They Intend — United States, 2005–2007. *Erika C. Odom*

1:55 Depression and Mental Health Treatment Among Women of Reproductive Age — US, 2004–2008. *Jean Ko*

2:15 Maternal Age and Risk for Nonchromosomal Birth Defects — US, 1997–2005. *Simerpal Gill*

2:35 Prevention Strategies for the Perinatal Period Among Nebraska Birthing Facilities, 2010. *Parvathy Pillai*

2:55 Dual Use of Condoms with Other Contraceptive Methods Unmarried Young Women — United States, 2006–2008. *Crystal P. Tyler*

3:15 BREAK

3:30 Session P: Swine Flu Origins Mysterious in “Genetic Arms Race”

May 6, 2009, by Elizabeth Landau, CNN

Potpourri**Atrium Ballroom B and C**

Moderator: *Denise Koo*

3:35 Understanding Factors Associated with 2009 Pandemic Influenza A (H1N1) Vaccination Among Pregnant Women — Seattle, Washington, 2010. *Meagan K. Kay*

3:55 *Escherichia coli* O157:H7 Infections Associated with an Aged Raw-Milk Cheese — Multiple Western States, 2010. *Jeffrey T. McCollum*

4:15 *Escherichia coli* O157 Infections Associated with Consumption of Artisanal Raw Cheeses — Multiple States, September–December, 2010. *Mathieu Tourdjman*

4:35 Acute Exertional Rhabdomyolysis and Triceps Compartment Syndrome Among High School Football Players — Oregon, 2010. *John Y. Oh*

Schedule At-a-Glance

8:30 EIS Satirical Revue **Atrium Ballroom B and C**
Presentation of Philip S. Brachman Award

Friday, April 15, 2011

8:30 Session Q: Painful, Flu-Like Tropical Virus Can Be Deadly
September 18, 1995, by Anita Manning, USA TODAY

Vectorborne Diseases **Atrium Ballroom B and C**
Moderators: Jennifer McQuiston and Kay Tomashek

8:35 An Island Wide Dengue Epidemic — Puerto Rico, 2010. *Tyler M. Sharp*

8:55 Emergence of a New Focus of Rocky Mountain Spotted Fever — South Central Arizona, 2009–2010.
Steven A. Baty

9:15 Malaria Imported from West Africa by Flight Crews — Florida and Pennsylvania, 2010. *Valery M. Beau De Rochars*

9:35 Rise in Reported Rocky Mountain Spotted Fever — South Texas, 2007–2010. *Adam Bjork*

10:00 BREAK

10:15 Presentation of Awards..... **Atrium Ballroom B and C**
Moderator: Douglas H. Hamilton

- Donald C. Mackel Memorial Award
- J. Virgil Peavy Memorial Award
- Paul C. Schnitker International Health Award
- James H. Steele Veterinary Public Health Award
- Outstanding Poster Presentation Award

10:30 Session R: The Doctor's World; When Everything Changed at the CDC
November 13, 2001, by Lawrence K. Altman, MD, *The New York Times*

Late-Breaking Reports **Atrium Ballroom B and C**

10:30–11:45 a.m. See supplement for presenters and abstracts.
Moderators: Douglas H. Hamilton and Edward Weiss

12:00 LUNCH

1:30 Session S: Eradication of Smallpox to Be Announced Today
May 8, 1980, United Nations (NY), *The New York Times*

Global Health **Atrium Ballroom B and C**
Moderator: Larry Slutsker

1:35 Accuracy of Coverage Survey Recall After Integrated Mass Drug Administration — Togo, 2008–2009.
Philip J. Budge

Schedule At-a-Glance

- 1:55** Risk Factors and Epidemiology of *Neisseria meningitidis* Carriage Among 1–29 Year Olds in Burkina Faso, 2009. *Lara K. Misegades*
- 2:15** Mercury Exposure Among Artisanal Gold Miners — Peru, July 2010. *Ellen E. Yard*
- 2:35** Recovery of National HIV Service Provision Following the January 12th Earthquake — Haiti, 2010. *Jenny A. Walldorf*
- 2:55** Unprecedented Outbreak of Acute Childhood Lead Poisoning — Zamfara State, Nigeria, 2010. *Carrie A. Dooyema*

3:15 Closing Remarks and Adjournment

Stephen B. Thacker, Deputy Director for Surveillance, Epidemiology and Laboratory Services, CDC

Presenting EIS Officers

EIS OFFICERS BY AGENCY OR CDC ORGANIZATIONAL UNIT

National Center on Birth Defects and Developmental Disabilities (NCBDDD)

Azofeifa, Alejandro
Gill, Simerpal
Glidewell, Jill
Okoroh, Ekwutosi

National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP)

Barbour, Kamil
Coleman-King, Sallyann
Cunningham, Timothy
Goodman, Alyson
King, Brian
Ko, Jean
Koers, Erin
Odom, Erika
Song, MinKyoung
Tyler, Crystal
Underwood, J. Michael
White, Arica

National Center for Environmental Health/ Agency for Toxic Substances and Disease Registry (NCEH/ATSDR)

Bell, Jeneita
Buttke, Danielle
Choudhary, Ekta
Christensen, Bryan
Dooyema, Carrie
Freeland, Amy
Yard, Ellen

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Baker, Brian
Bradley, Heather
Jeffries IV, William L.
Kim, Lindsay
Minniear, Timothy
Oramasionwu, Gloria
Tohme, Rania
Willis, Matthew

National Center for Health Statistics (NCHS)
Kit, Brian

National Center for Injury Prevention and Control (NCIPC)

Ivey, Asha
McDaniel, Dawn

National Center for Immunization and Respiratory Diseases (NCIRD)

Cox, Chad
Desai, Rishi
Fairlie, Tarayn
Fleming-Dutra, Katherine
Garg, Shikha
Graitcer, Samuel
Mahamud, Abdirahman
Mandal, Sema
Misegades, Lara
Nelson, George
Yen, Catherine

National Center for Emerging and Zoonotic Infectious Diseases (NCEZID)

Bennett, Sarah
Bjork, Adam
Capewell, Linda
Cartwright, Emily
Chitnis, Amit
Dunkle, Stacie
Gaines, Joanna
Gibney, Katherine
Gieraltowski, Laura
Gupta, Neil
Hocevar, Susan
Loharikar, Anagha
Mbaeyi, Chukwuma
Mba-Jonas, Adamma
McCollum, Andrea
Miller, Jeffrey
Neblett-Fanfair, Robyn
O'Connor, Katherine
Petersen, Brett
Routh, Janell
Roy, Monika
Selent, Monica
Sharp, Tyler
Tack, Danielle

National Institute for Occupational Safety and Health (NIOSH)

Suarthana, Eva

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Al-Samarrai, Teeb
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Colborn, James
Collier, Melissa
Cope, Jennifer
Dailey, Natalie
Farag, Noha
Geissler, Aimee
Gounder, Prabhu
Grube, Steven
Ibraheem, Mam
Jacobson, Lara
Kanako, Ishida
Kattan, Jessica
Kay, Meagan
Kemble, Sarah
Khaokham, Christina
Lanier, William
Lo, Yi-Chun
Longenberger, Allison
Maxted, Angela
McCollum, Jeffrey
Meza, Francisco
Mortensen, Eva
Murray, Erin
Oh, John
Pillai, Parvathy
Porter, Kimberly
Reed, Caitlin
Rodgers, Loren
Sprecher, Armand
Taylor, Tegwin
Tourdjman, Mathieu
Webeck, Jenna
Williams, Nancy

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Budge, Philip
Bunga, Sudhir
Jacobson, Lara
Morof, Diane
Walldorf, Jenny
Woodhall, Dana

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Trong Thanh Hoang Ao, MSc, ScD
Kristie Elizabeth Appelgren, MD, MSc
Sara Auld, MD
Rachel Rubin Bailey, MPH, PhD(c)
Charlotte Baker, DrPH(c), MPH
Penelope J. Baughman, MPA, MPH, PhD(c)
Jane Awuramma Gwira Baumblatt, MD
Behrooz Behbod, MBChB, MSc, ScD(c)
Melissa Briggs, MD, MPH
Carla L. Britton, MS, PhD
Genevieve Louise Buser, MDCM
Grace L. Chen, MD, MPH
Cindy Hsin-yi Chiu, MPH(c), PhD
Kevin Richard Clarke, MD
Raymund Barretto Dantes, MD, MPH
Stephanie Marie Davis, MD, MPH(c)
Kainne Emily Dokubo, MD, MPH
Kathleen Lillian Dooling, MD, MPH
Jennifer Espiritu, MD, MPH
Tala Hani Fakhouri, MPH(c), PhD
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Katherine Alexa Fowler, PhD
Tiana Aisha Garrett, MPH, PhD
Paul Arturo Gastanaduy, MD, MPH
Nafisa Ghaji, MBBS, MPH(c)
Yoran Tamara Grant, MPH, PhD
Adena Greenbaum, MD, MPH
Stephanie Elaine Griese, MD, MPH(c)
Michael Paul Gronostaj, PharmD, MD, MPH
Cara Nicole Halldin, PhD(c)
William Thane Hancock, MD, MPH
Brooke Elizabeth Hoots, MSPH, PhD(c)
James Cochran Houston, MD, MPH
Keisha Andrea Houston, DrPH(c), MPH
Maho Imanishi, MPH(c), VMD
Camille Elizabeth Introcaso, MD
Neena S. Jain, MD, MS
Matthew Girard Johnson, MD
Rachael Hope Joseph, MPH(c), VMD
Michael Hanlin Kinzer, MD , MPH
Sonali Prakash Kulkarni, MD, MPH
Eugene Ka Ki Lam, MD, MSc, MScPH
Alison Sheehan Laufer, MPhil, PhD(c)
Terrence Quock-kit Lo, DrPH(c), MPH
Robert Fang Luo, MD, MPH
Reena Mahajan, MD, MHS
Rennatus Magina Mdodo, DrPH, MPhil, MS
Sarah Anne Meyer, MD, MPH
Christina Ann Mikosz, MD, MPH
Kristin Maria Musolin, DO, MS(c)
Lina Malena Carolina Nerlander, BMBS, MPH
Duc Bui Nguyen, MD, MSc
Thomas Niederkrotenthaler, MD, PhD, MMS
Jonathan J. Nunez, MD
Erin Margaret Parker, MA, PhD
Prabasaj Paul, MPH, MSc, PhD
Satish Krishna Pillai, MD, MPH(c)
Kerry Rae Pride, DVM, MPH
Gregory Aaron Raczniak, MD, MPhil, PhD
Maria Aneesa Said, MD, MHS
Heather Melissa Scobie, PhD, MPH(c)
Isaac See, MD
Rachel Mann Smith, MD, MPH
Maroya D. Spalding, PhD, ScM
Nandini Sreenivasan, MD
Timothy S. Styles, MD, MPH
Eboni Monique Taylor, MPH, PhD
Niu Tian, MD, MS, PhD
Amita Toprani, MD, MPH
Rebecca J. Tsai, MS, PhD(c)
Joyanna Wendt, MD, MPH
Emily R. Wheeler, MS, DVM(c), PhD(c)
Karen Kai-lun Wong, MD, MPH
Jonathan Maurice Wortham, MD
Stephanie Joy Yendell, DVM(c), MPH(c)
Kristin Yeoman, MD, MPH

Alexander D. Langmuir Prize Manuscript**Award**

The Alexander D. Langmuir Prize, established in 1966 by the EIS Alumni Association, recognizes a current EIS officer or recent alumnus (1 year) for excellence in a written report or an epidemiological investigation or study.

Philip S. Brachman Award

The Philip S. Brachman Award, sponsored by the graduating class of EIS officers, recognizes excellence in teaching epidemiology to EIS officers.

Distinguished Friend of EIS Award

The Distinguished Friend of EIS Award, sponsored by the EIS Alumni Association, recognizes an individual for contributions to the health, welfare, and happiness of EIS officers and the EIS Program.

Iain C. Hardy Award

The Iain C. Hardy Award, sponsored by the National Center for Immunization and Respiratory Diseases, recognizes a current EIS officer or alumnus (within 5 years) who has made an outstanding contribution to the control of vaccine-preventable diseases.

Donald C. Mackel Memorial Award

The Donald C. Mackel Memorial Award, sponsored by the EIS Alumni Association, recognizes a current EIS officer for the oral presentation that best exemplifies the effective application of a combined epidemiology and laboratory approach to an investigation or study.

J. Virgil Peavy Memorial Award

The J. Virgil Peavy Memorial Award, established in 2003 by the EIS Alumni Association, recognizes a current EIS officer for the oral presentation that best exemplifies the effective and innovative application of statistics and epidemiologic methods in an investigation or study.

Outstanding Poster Presentation Award

The Outstanding Poster Presentation Award is presented by the EIS Scientific Program Committee to a current EIS officer for the poster that best exemplifies scientific content, including originality, study design, and analysis; public health impact; and presentation effectiveness.

Paul C. Schnitker International Health**Award**

Paul C. Schnitker, MD, died in a plane crash in Nigeria in 1969. He was en route to serve as a public health officer in the response to famine and other public health problems resulting from the Biafra Civil War in Nigeria. He is the only person who has died while serving as an EIS officer.

The Paul C. Schnitker International Health Award, sponsored by the Schnitker family, recognizes a current EIS officer or alumnus (1 year) who has made a significant contribution to international public health.

Mitch Singal Excellence in Occupational and Environmental Health Award

The Mitch Singal Excellence in Occupational Safety and Environmental Health Award, co-sponsored by the National Institute for Occupational Safety and Health and the National Center for Environmental Health/Agency for Toxic Substances and Disease Registries, established in 2010 recognizes a current EIS officer for excellence in an oral or poster presentation that best exemplifies the effective application of public health in the area of occupational and/or environmental health to an investigation.

James H. Steele Veterinary Public Health Award

The James H. Steele Veterinary Public Health Award, sponsored by CDC veterinarians, recognizes a current EIS officer or alumnus (within 5 years) who has made outstanding contributions in the field of veterinary public health through outstanding contributions in the investigation, control, or prevention of zoonotic diseases or other animal-related human health problems.

2011 Award Committee Members

Alexander D. Langmuir Prize

Manuscript Award

Philip Brachman (EIS '54)
Mary Kamb (EIS '89)
Alexandre Macedo De Oliveira (EIS '02)
Janet Mohle-Boetani (EIS '90, Chair)
Priti Patel (EIS '02)
Katherine Stone (EIS '84)

Philip S. Brachman Award

Andria Apostolou (EIS '09)
Meagan Kay (EIS '09)
William Lanier (EIS '09)
Rendi Murphree (EIS '09)
Monica Selent (EIS '09, Chair)
Pritish K. Tosh (EIS '09)

Distinguished Friend of the EIS Award

Philip Brachman (EIS '54)
Mary Kamb (EIS '89)
Alexandre Macedo De Oliveira (EIS '02)
Janet Mohle-Boetani (EIS '90, Chair)
Priti Patel (EIS '02)
Katherine Stone (EIS '84)

Iain C. Hardy Award

John Modlin (EIS '73)
William Schaffner (EIS '66)
David Swerdlow (EIS '89, Chair)
Melinda Wharton (EIS '86)

Donald C. Mackel Memorial Award

Mary Anne Duncan (EIS '04)
Alexandre Macedo De Oliveira (EIS '02)
Benjamin Park (EIS '02, Chair)
Mary Reynolds (EIS '01)

J. Virgil Peavy Memorial Award

Kris Bisgard (EIS '93, Chair)
Joseph Logan (EIS '06)
Alexa Oster (EIS '07)
Kathryn Porter (EIS '92)

Outstanding Poster Presentation Award

Julie Hentz
Jacek Mazurek (EIS '02)
Jacqueline Tate (EIS '06, Chair)

Paul C. Schnitker International Health Award

J. Lyle Conrad (EIS '65)
Douglas Hamilton (EIS '91, Chair)
Thomas Handzel (EIS '00)
Asim Jani (EIS '03)
John McGowan (EIS '69)
William Schaffner (EIS '66)

Mitch Singal Excellence in Occupational and Environmental Health Award

Diana Bensyl (EIS '99)
Rick Ehrenberg (EIS '83)
John Gibbins (EIS '06)
Yulia Iossifova (EIS '05)
Jeffrey Sacks (EIS '79)
Sara Vagi (EIS '08)

James H. Steele Veterinary Public Health Award

Casey Barton Behravesh (EIS '06)
Hugh Mainzer (EIS '92)
Nina Marano (EIS '06)
Jennifer McQuiston (EIS '98, Chair)
Jennifer Wright (EIS '02)

Awards Presented at the 2010 EIS Conference

Alexander D. Langmuir Prize Manuscript Award

Increasing Compliance with Mass Drug Administration Programs for Lymphatic Filariasis in Orissa, India, 2009 — Impact of an Education and a Lymphedema Management Program. *Tropical Disease.* 2010; 4(6):e728
Paul T. Canney, Jonathan Rout, Grace Rao, John Williamson, and LeAnne M. Fox

Donald C. Mackel Memorial Award

Fatal Case of Laboratory-Acquired Infection with an Attenuated *Yersinia pestis* Strain of Plague — Illinois, 2009
Andrew Medina-Marino

Outstanding Poster Presentation

Travelers' Impressions of 2009 H1N1 Influenza National Health Messaging Campaign
Emily Jentes

J. Virgil Peavy Memorial Award

Using Spatial Analysis To Identify Areas of Increased Active Tuberculosis Incidence Among Asians — California, 2005–2008
Erin Murray

Philip S. Brachman Award

Betsy Gunnels

Distinguished Friend of the EIS Award

Robert Quick

Paul C. Schnitker International Health Award

Andrew Auld

Iain C. Hardy Award

Amy Parker Fiebelkorn

James H. Steele Veterinary Public Health Award

Kendra Stauffer

Mitch Singal Excellence in Occupational and Environmental Health Award

Paul Anderson

Alexander D. Langmuir Lectures, 1972–2010

- 1972 Prevention of Rheumatic Heart Disease — Fact or Fancy. *Charles H. Rammelkamp*
- 1973 Cytomegaloviral Disease in Man: An Ever Developing Problem. *Thomas H. Weller*
- 1974 Hepatitis B Revisited (By the Non-Parenteral Route). *Robert W. McCollum*
- 1975 Origin, Spread, and Disappearance of Kuru: Implications of the Epidemic Behavior of a Disease in New Guineans for the Epidemiologic Study of Transmissible Virus Dementias. *D. Carleton Gajdusek*
- 1976 The Future of Epidemiology in the Hospital. *Paul F. Wehrle*
- 1977 The Historical Evolution of Epidemiology. *Abraham Lilienfeld*
- 1978 The Biology of Cancer: An Epidemiological Perspective. *Sir Richard Doll*
- 1979 The Epidemiology of Antibiotic Resistance. *Theodore C. Eickoff*
- 1980 Health and Population Growth. *Thomas McKeown*
- 1981 The Pathogenesis of Dengue: Molecular Epidemiology in Infectious Disease. *Scott B. Halstead*
- 1982 The Epidemiology of Coronary Heart Disease: Public Health Implications. *Henry W. Blackburn, Jr.*
- 1983 Sexually Transmitted Diseases — Past, Present, and Future. *King K. Holmes*
- 1984 Poliomyelitis Immunization — Past and Future. *Jonas E. Salk*
- 1985 An Epidemiologist's View of Postmenopausal Estrogen Use, or What to Tell Your Mother. *Elizabeth Barrett-Connor*

Awards

- | | |
|---|--|
| <p>1986 Hepatitis B Virus and Hepatocellular Carcinoma: Epidemiologic Considerations. <i>Robert Palmer Beasley</i></p> <p>1987 Environmental Hazards and the Public Health. <i>Geoffrey Rose</i></p> <p>1988 Lymphotropic Retroviruses in Immunosuppression. <i>Myron E. (Max) Essex</i></p> <p>1989 Aspirin in the Secondary and Primary Prevention of Cardiovascular Disease. <i>Charles H. Hennekens</i></p> <p>1990 Epidemiology and Global Health. <i>William H. Foege</i></p> <p>1991 Public Health Action in a New Domain: The Epidemiology and Prevention of Violence. <i>Garen J. Wintemute</i></p> <p>1992 <i>Helicobacter pylori</i>, Gastritis, Peptic Ulcer Disease, and Gastric Cancer. <i>Martin J. Blasér</i></p> <p>1993 Diet and Health: How Firm Is Our Footing? <i>Walter C. Willett</i></p> <p>1994 Alexander D. Langmuir: A Tribute to the Man. <i>Philip S. Brachman and William H. Foege</i></p> <p>1995 Epidemiology and the Elucidation of Lyme Disease. <i>Allen C. Steere</i></p> <p>1996 50 Years of Epidemiology at CDC. <i>Jeffrey P. Koplan</i></p> <p>1997 Public Health, Population-Based Medicine, and Managed Care. <i>Diana B. Petitti</i></p> <p>1998 Pandemic Influenza: Again? <i>Robert Couch</i></p> <p>1999 The Evolution of Chemical Epidemiology. <i>Philip J. Landrigan</i></p> <p>2000 Does <i>Chlamydia pneumoniae</i> Cause Atherosclerotic Cardiovascular Disease? Evaluating the Role of Infectious Agents in Chronic Diseases. <i>Walter E. Stamm</i></p> <p>2001 Halfway Through a Century of Excellence. <i>J. Donald Millar</i></p> <p>2002 Public Health Response to Terrorism: Rising to the Challenge. <i>Marcelle Layton</i></p> | <p>2003 Alex Langmuir's Somewhat Quiet Legacy: Epidemiology, Sexual Health, and Personal Choices. <i>Willard (Ward) Cates, Jr.</i></p> <p>2004 HIV, Epidemiology, and the CDC. <i>James W. Curran</i></p> <p>2005 Killin' Time: Alcohol and Injury. <i>Alexander C. Wagenaar</i></p> <p>2006 Measuring Malaria. <i>Brian Greenwood</i></p> <p>2007 Implications of Tuberculosis Control on Evidence-Based Public Health Practice. <i>Thomas R. Frieden</i></p> <p>2008 Physical Activity and Public Health: Does the Environment Matter? <i>Ross C. Brownson</i></p> <p>2009 Epidemiology, Public Health, and Public Policy. <i>Jim Marks</i></p> <p>2010 Community Health Rankings — Epidemiology in Action. <i>Pat Remington</i></p> <p>2011 Skirmishes, Battles, and Wars: Tracking Infection Control Success in the Age of Social Networks. <i>Robert A. Weinstein</i></p> |
| <p>Alexander D. Langmuir Prize
Manuscripts, 1966–2009</p> | |
| <p>1966 Complications of Smallpox Vaccination: I. National Survey in the United States, 1963. <i>N Engl J Med</i> 1967;276:125–32. <i>J.M. Neff, J.M. Lane, J.H. Pert, R. Moore, J.D. Millar, D.A. Henderson</i></p> <p>1967 An Outbreak of Neuromyasthenia in a Kentucky Factory — The Possible Role of a Brief Exposure to Organic Mercury. <i>Am J Epidemiol</i> 1967;86:756–64. <i>G. Miller, R. Chamberlin, W.M. McCormack</i></p> <p>1968 Salmonellosis from Chicken Prepared in Commercial Rotisseries: Report of an Outbreak. <i>Am J Epidemiol</i> 1969;90:429–37. <i>S.B. Werner, J. Allard, E.A. Ager</i></p> <p>1969 Outbreak of Tick-Borne Relapsing Fever in Spokane County, Washington. <i>JAMA</i> 1969;210:1045–50. <i>R.S. Thompson, W. Burgdorfer, R. Russell, B.J. Francis</i></p> | |

Alexander D. Langmuir Prize Manuscripts, 1966–2009

- 1966 Complications of Smallpox
Vaccination: I. National Survey in the United States, 1963. *N Engl J Med* 1967;276:125–32.
J.M. Neff, J.M. Lane, J.H. Pert, R. Moore, J.D. Millar, D.A. Henderson

1967 An Outbreak of Neuromyasthenia in a Kentucky Factory — The Possible Role of a Brief Exposure to Organic Mercury. *Am J Epidemiol* 1967;86:756–64. *G. Miller, R. Chamberlin, W.M. McCormack*

1968 Salmonellosis from Chicken Prepared in Commercial Rotisseries: Report of an Outbreak. *Am J Epidemiol* 1969;90:429–37.
S.B. Werner, J. Allard, E.A. Ager

1969 Outbreak of Tick-Borne Relapsing Fever in Spokane County, Washington. *JAMA* 1969;210:1045–50. *R.S. Thompson, W. Burgdorfer, R. Russell, B.J. Francis*

- 1970 Tularemia Epidemic: Vermont, 1968 — Forty-Seven Cases Linked to Contact with Muskrats. *N Engl J Med* 1969;280:1253–60.
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- 1971 Tomato Juice-Associated Gastroenteritis, Washington and Oregon, 1969. *Am J Epidemiol* 1972;96:219–26. *W.H. Barker Jr., V. Runte*
- 1972 *Salmonella* Septicemia from Platelet Transfusions: Study of an Outbreak Traced to a Hematogenous Carrier of *Salmonella cholerae-suis*. *Ann Intern Med* 1973;78:633–41. *F.S. Rhamé, R.K. Root, J.D. MacLowry, T.A. Dadisman, J.V. Bennett*
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- 1975 Staphylococcal Food Poisoning Aboard a Commercial Aircraft. *Lancet* 1975;2:595–9.
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- 1978 Measles Vaccine Efficacy in Children Previously Vaccinated at 12 Months of Age. *Pediatrics* 1978;62:955–60.
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- and
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- 1980 Injuries from the Wichita Falls Tornado: Implications for Prevention. *Science* 1980;207:734–8.
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- 1981 Respiratory Irritation due to Carpet Shampoo: Two Outbreaks. *Environ Int* 1982;8:337–41.
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- 1989 Group A Meningococcal Carriage in Travelers Returning from Saudi Arabia. *JAMA* 1988;260:2686–9. *P.S. Moore, L.H. Harrison, E.E. Telzak, G.W. Ajello, C.V. Broome* and
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- 1997 Epidemic Meningococcal Disease and Tobacco Smoke: A Risk Factor Study in the Pacific Northwest. *Pediatr Infect Dis J* 1997;16:979–83.
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- 1998 Suicide After Natural Disasters. *N Engl J Med* 1998;338:373–8.
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- 2004 Risk of Bacterial Meningitis in Children with Cochlear Implants. *N Engl J Med.* 2003;349:435–45.
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P. T. Cantey, J. Rout, G. Rao, J. Williamson, and L. M. Fox

Philip S. Brachman Awards, 1983–2010

- 1983 Philip Brachman
1984 Michael Gregg
1985 Howard Ory
1986 J. Lyle Conrad
1987 Andrew G. Dean
1988 Richard C. Dicker
1989 Carl W. Tyler, Jr.
1990 Richard C. Dicker
1991 Richard C. Dicker
1992 Jeffrey J. Sacks
1993 J. Lyle Conrad and Michael Toole
1994 Willard (Ward) Cates and Robert Breiman
1995 John Horan
1996 Polly Marchbanks
1997 William Mac Kenzie
1998 Laura A. Coker
1999 Christine Zahmiser
2000 Jeffrey J. Sacks
2001 Douglas H. Hamilton
2002 Marcelle Layton, Steve Weirsma, James L. Hadler, Eddy Bresnitz, Elizabeth Barrett, Robert B. Stroube, Ross J. Brechner, David S.B. Blythe, Larry Siegel, Karyn Berry, Sherri Adams, John Eisold, and Greg Martin
2003 Deborah W. Gould
2004 Jim Alexander
2005 Julie Magri
2006 Ralph Henderson
2007 Joshua Mott and Peter Cegielski
2008 Lisa Pealer
2009 C. Kay Smith and Julie Magri
2010 Betsy Gunnels

Awards

Distinguished Friend of EIS Awards, 1984–2010

1984	Virgil Peavy
1985	Bill Schaffner
1986	Mary Moreman
1987	James Chin
1988	Frances H. Porcher
1989	Not Awarded
1990	J. Lyle Conrad
1991	Alexander D. Langmuir
1992	Laurence R. Foster
1993	Kenneth L. Herrmann and William Roper
1994	Louise McFarland
1995	Mike Osterholm
1996	Jim Curran and Larry Schonberger
1997	Patsy Bellamy
1998	John Horan
1999	Not Awarded
2000	James Hadler
2001	Barbara R. Holloway and William R. Jarvis
2002	Patricia Fleming and Stephen B. Thacker
2003	Paul Blake
2004	David Sencer
2005	Not Awarded
2006	Robert Tauxe
2007	Dixie Snider
2008	Denise Koo
2009	Arjun Srinivasan
2010	Robert Quick

Iain C. Hardy Awards, 1996–2010

1996	Peter Strebel
1997	D. Rebeca Prevots
1998	Beth P. Bell
1999	Charles R. Vitek
2000	Linda Quick and Nancy Rosenstein
2001	Orin S. Levine
2002	Umesh D. Parashar
2003	Karen A. Hennessey
2004	Tim Uyeki and Montse Soriano-Gabarro
2005	Julie Jacobson-Bell
2006	Gustavo Dayan
2007	Brendan Flannery
2008	Mona Marin
2009	Amanda Cohn and Rosalyn O'Laughlin
2010	Paul Canley

J. Virgil Peavy Memorial Awards, 2003–2010

2003	Danice Eaton
2004	Lori A. Pollack
2005	Andrea Sharma
2006	Andrea Sharma
2007	Abhijeet Anand and David Lowrance
2008	Katherine Ellingson
2009	Michael L. Jackson
2010	Erin Murray

Donald C. Mackel Memorial Awards, 1987–2010

1987	Fatal Parathion Poisoning — Sierra Leone <i>Ruth A. Etzel</i>
1988	Multistate Outbreak of Legionnaires Disease Involving Tours to Vermont <i>Margaret Mamolen</i>
1989	Nosocomial Outbreak of Legionnaires Disease Associated with Shower Use: Possible Role of Amoebae <i>Robert F. Breiman</i>
1990	Legionnaires Disease Outbreak Associated with a Grocery Store Mist Machine <i>Frank J. Mahoney</i>
1991	Nosocomial Outbreak of Isoniazid- and Streptomycin-Resistant Tuberculosis Among AIDS Patients, New York City <i>Brian R. Edlin</i>
1992	Bacillary Angiomatosis, New Infectious Disease: Epidemiology, Clinical Spectrum, and Diagnostics <i>Janet C. Mohle-Boetani</i>
1993	Hepatitis B Virus Transmission Associated with Thoracic Surgery, Los Angeles <i>Rafael Harpaz</i>
1994	Schistosomiasis and Lake Malawi: A New Site of Transmission Posing a Serious Risk to Expatriates and Tourists <i>Martin S. Cetron</i>
1995	Use of Urinary Antigen Testing To Detect an Outbreak of Nosocomial Legionnaires Disease in Connecticut, 1994 <i>Lisa A. Lepine</i>

1996	International Outbreak of <i>Salmonella</i> Infections Caused by Alfalfa Sprouts Grown from Contaminated Seed <i>Barbara E. Mahon</i> and <i>Malassezia pachydermatis</i> Fungemia in Neonatal Intensive Care Unit Patients: There's a [New] Fungus Among Us! <i>Huan Justina Chang</i>	2005	Case-Control Study of an Acute Aflatoxicosis Outbreak <i>E Azziz-Baumgartner</i>
1997	Epidemic of Deaths from Acute Renal Failure Among Children in Haiti <i>Katherine L. O'Brien</i>	2006	Delayed Onset of <i>Pseudomonas fluorescens</i> Group Bloodstream Infections After Exposure to Contaminated Heparin Flush – Michigan and South Dakota <i>Mark Gershman</i>
1998	And Weighing in at 25 Million Pounds – A Multistate Outbreak of <i>Escherichia coli</i> O157:H7 Infections and the Largest Ground Beef Recall in United States History <i>M. Kathleen Glynn</i>	2007	Epidemiologic and Molecular Investigation of an Outbreak of Hepatitis C Viral Infection at Hemodialysis Unit – Richmond Virginia, 2006 <i>Nicola Thompson</i>
1999	Clinical Mismanagement of Community Outbreak? The Contribution of DNA Finger-Printing to the Analysis of Chronic, Drug-Resistant Tuberculosis in Buenaventura, Colombia, 1998 <i>Kayla F. Laserson</i>	2008	Multistate Measles Outbreak Associated with an International Youth Sporting Event – Pennsylvania, Michigan, and Texas, August – September 2007 <i>Tai-Ho Chen</i>
2000	<i>Serratia liquefaciens</i> Bloodstream Infections and Pyrogenic Reactions Associated with Extrinsically Contaminated Erythropoietin – Colorado <i>Lisa Grohskopf</i>	2009	Cardiac Events and Deaths in a Dialysis Facility Associated with Healthcare Provider – Texas, 2008 <i>Melissa K. Schaefer</i>
2001	When Beauty Is More Than Skin Deep: An Outbreak of Rapidly Growing Mycobacterial Furunculosis Associated with a Nail Salon – California, 2000 <i>Kevin L. Winthrop</i>	2010	Fatal Case of Laboratory-Acquired Infection with an Attenuated <i>Yersinia pestis</i> Strain of Plague – Illinois, 2009 <i>Andrew Medina-Marino</i>
2002	Dances with Cows?: A Large Outbreak of <i>E. coli</i> O157 Infections at Multi-Use Community Facility – Lorain County, Ohio, September 2001 <i>Jay K. Varma</i>		
2003	Hepatitis C Virus Transmission from an Antibody-Negative Organ and Tissue Donor <i>Barna D. Tugwell</i>		
2004	Multiple Hepatitis A Outbreaks Associated with Green Onions Among Restaurant Patrons – Tennessee, Georgia, and North Carolina, 2003 <i>Joseph J. Amon</i>		

Outstanding Poster Presentation Award, 1986–2010

1986	Gender Gap in the Diaper Set: A Closer Look at Differences in Sex-Specific Mortality <i>Ray Yip</i>
1987	Socioeconomic Differences in Smoking Behavior in Selected States <i>Thomas E. Novotny</i>
1988	Late-Stage Diagnosis of Breast Cancer Among Women in Low Socioeconomic Groups, Connecticut, 1984–1985 <i>Thomas A. Farley</i>
1989	Malaria Infection in Early Infancy, Malawi <i>Laurence Slutsker</i>
1990	Seroprevalence of Human Immunodeficiency Virus Type I Among College Students, United States <i>Brian R. Edlin</i>

Awards

1991	Diarrheal Outbreak Associated with a Cyanobacteria (Blue-Green Algae)-Like Body, Chicago <i>Philip P. Huang</i>	2001	Counting Crows: Crow Mortality as a Sentinel for West Nile Virus Disease in Humans — Northeastern United States, 2000 <i>Kathleen G. Julian</i>
1992	Response to One Dose of Inactivated Poliovirus Vaccine after Three Doses of Oral Poliovirus Vaccine, Abidjan, Côte d'Ivoire <i>Bernard J. Moriniere</i>	2002	Outbreak of Echoavirus 18 Meningitis at a Summer Camp — Alaska, 2001 <i>Joseph B. McLaughlin</i>
1993	Cholera Outbreak in Rumonge, Burundi <i>Maureen E. Birmingham</i>	2003	Surveillance for Chlamydia in Women — South Carolina, 1998–2001 <i>Wayne A. Duffus</i>
1994	Salivary Testing as an Epidemiologic Tool During an Outbreak of Hepatitis A in an Amish Community in Indiana <i>Edmundo Muniz</i>	2004	Hospitalizations Associated with Rotavirus Diarrhea—United States, 1996–2000 <i>Myrna Charles</i>
1995	Longitudinal Predictors of Initiation of Smokeless Tobacco Use <i>Scott L. Tomar</i>	2005	Risk of Secondary Transmission from Imported Lassa Fever — New Jersey, 2004 <i>Ester Tan</i>
1996	Nonvenomous Animal-Related Fatalities in the U.S. Workplace, 1992–1994 <i>Constance C. Austin</i>	2006	Risk Factors for <i>Helicobacter pylori</i> in a Rural Community — Montana, 2005 <i>Elizabeth Melius</i>
1997	Multidrug-Resistant Pneumococcal Meningitis in a Day Care Center — Tennessee <i>Allen Craig</i>	2007	Outbreak of <i>Escherichia coli</i> 0157 Associated with Packaged Spinach — Wisconsin, 2006 <i>Arthur M. Wendel</i>
1998	Beliefs About the Tobacco Industry and Opinions About Anti-Tobacco Policies: How Tight is the Link? <i>Arthur E. Chin</i>	2008	The Power of Combining Routine Molecular Subtyping and Specific Food Exposure Interviews During <i>Escherichia coli</i> O157:H7 Outbreak — Minnesota, 2007 <i>S. M. Holzbauer</i>
1999	Cold Breakfast Cereal: A New Vehicle Implicated in a Multistate Outbreak of <i>Salmonella</i> Agona Infections <i>Thomas Breuer</i>	2009	Seroprevalence of Herpes Simplex 2 — National Health and Nutritional Examination Surveys, United States, 2005–2006 <i>Sara E. Forhan</i>
2000	Hurricane — Puerto Rico, 1998 <i>Dan O'Leary</i>	2010	Travelers' Impressions of 2009 H1N1 Influenza National Health Messaging Campaign <i>Emily Jentes</i>

Paul C. Schnitker International Health Award, 1995–2010

1995	Leslie F. Roberts
1996	Peter Kilmarx
1997	Alexander K. Rowe and Eric L. Mouzin
1998	Etienne G. Krug
1999	Kayla F. Laserson
2000	John MacArthur and Peter Salama
2001	Valerie D. Garrett
2002	Robert D. Newman and Lorna E. Thorpe
2003	Puneet Dewan, Lisa Nelson, and Pratima Raghunathan
2004	Tracey Creek
2005	Oleg Bilukha
2006	Kevin Cain
2007	Avid Reza
2008	Sapna Bamrah and David Lawrence
2009	Rinn Song
2010	Andrew Auld

James H. Steele Veterinary Public Health Award, 1999–2010

1999	Frederick J. Angulo and Jordan W. Tappero
2000	David Ashford
2001	Mary-Kathleen Glynn
2002	Kirk Smith
2003	Michael Bunnin
2004	Jennifer McQuiston
2005	John Crump
2006	Katherine Heldman and James Kile
2007	Jennifer Wright
2008	John R. Dunn
2009	Casey Barton Behravesh and Stacy Holzbauer
2010	Kendra Stauffer

Mitch Singal Excellence in Occupational and Environmental Health Award, 2010

- 2010 Surveillance and Prevention of Occupational Injury Deaths — Wyoming, 2003–2007
Paul Anderson

Instructions

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April 11–15, 2011 | Course Evaluation

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- E-mail at: ce@cdc.gov
- Fax at 404-498-6045
- Phone: 1-800-41-TRAIN or 404-639-1292, during business hours (Monday–Friday) 8 a.m.–4:00 p.m. E.T. After hours, you may leave a voice message and your call will be returned the next business day.
- Once logged on to the *CDC/ATSDR Training and Continuing Education Online* website, you will be on the Participant Services page. Select **Search and Register**. Select **CDC Courses** at the bottom right side of the page.
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2011 Conference Abstracts

MONDAY, APRIL 11

SESSION A 8:35

An Elite Team of Sleuths, Saving Lives in Obscurity

April 6, 2010, by Lawrence K. Altman, MD
The New York Times

Opening Session, 8:30–10:15 a.m.
Atrium Ballroom B and C

MODERATOR: Thomas R. Frieden

Twenty-two other infants who remained healthy after being hospitalized. In another nursery outbreak of the "stuffy nose syndrome" entirely different virus was isolated which also appeared to be acting synergistically with a Staphylococcus. These two outbreaks will be described and additional evidence favoring the concept of a bacterial-pathogen will be presented. (page 1)

Fulton County Academy of Medicine
Atlanta, Georgia
APRIL 29 – MAY 3, 1957

Spring
Conference

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HEALTH, EDUCATION, AND WELFARE
Public Health Service, Bureau of State Services
Communicable Disease Center

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sible for a large majority of the endemic hospital-acquired
coccocal infections. The method proved valuable in detecting per-
sonnel carriers, in determining the number of post-operative v...
infections, and in pin-pointing areas suitable for epidemiologic
and for the application of control measures. A brief epide-
miologic

In a Puff of Smoke: Legionnaires Disease Associated with Travel to Hotel A – Starkville, Mississippi, July 2010

AUTHORS: Tarayn Fairlie, L. Conklin, A. Medina-Marino, P. Byers, S. Hand, N. Kozak, T. Travis, E. Brown, B. Fields, L. Hicks

BACKGROUND: *Legionella pneumophila* serogroup 1 (Lp1) is an important cause of community-acquired pneumonia (CAP) and the most frequent cause of Legionnaires disease (LD). From May 1 – July 11, 2010, 5 LD cases among visitors to Hotel A in Starkville, MS, were reported to the Mississippi State Department of Health (MSDH). In July 2010, the MSDH and CDC conducted an investigation to identify the outbreak source.

METHODS: We collected information on risk factors and exposures via telephone interviews among 297 persons visiting the hotel from May 1 – July 25, 2010 using a standardized questionnaire. We defined a case as radiographically-confirmed CAP in a Hotel A visitor after May 1, 2010 with laboratory-confirmed LD by culture, urinary antigen test, or ≥ 4 -fold rise in serum antibody titer. Case and non-case responses were compared using chi-square. Environmental samples were collected from Hotel A for *Legionella* culture; environmental isolates were compared to case isolates using molecular typing.

RESULTS: Eight cases were identified; 1 case died. Increased risk of LD was associated with history of smoking (Relative Risk [RR]: 6.12; 95% CI [confidence interval]: 1.59, 23.52), spending time on a patio near the hotel's cooling tower (RR: 13.1; 95% CI: 3.1, 55.4), and smoking in the hotel's outdoor smoking areas (RR: 10.31; 95% CI: 2.74, 38.82). Lp1 isolates from the cooling tower had an identical molecular sequence type to Lp1 cultured from 2 cases.

CONCLUSIONS: In this outbreak, both history of smoking and the act of smoking, as well as exposure to the contaminated cooling tower plume, increased risk for LD. LD prevention should include a combination of *Legionella* environmental remediation and reduction in host behaviors that lead to disease transmission.

KEYWORDS: *Legionella*, Legionnaires disease, LD, travel-associated outbreak

Abstracts

8:55

Cracking the Case: *Salmonella* Enteritidis and the 2010 Egg Recall

AUTHORS: Joanna Gaines, T. Nguyen, C. Wheeler, J. Higa, J. Lidgard, J. Rounds, I. Williams

BACKGROUND: *Salmonella* Enteritidis (SE) causes 6,000 to 7,000 laboratory confirmed illnesses annually. Shell eggs and poultry are foods commonly linked to human SE infections. SE can infect the ovaries of healthy hens, resulting in internally contaminated eggs. In July 2010, a nationwide increase in SE infections with pulsed-field gel electrophoresis (PFGE) pattern JEGX01.0004 was identified.

METHODS: A case was defined as a clinical infection yielding an SE isolate indistinguishable from the outbreak strain (JEGX01.0004). Since this pattern is commonly reported (30-40% of isolates, investigations focused on restaurant or event clusters where more than one case had eaten. Surplus incidence by state was determined by calculating the ratio of reported cases during the outbreak period to the average during the previous five year period. Tracebacks were conducted for suspect food items.

RESULTS: From May 1 to August 31, 2010, 1,608 illnesses were reported that are likely to be outbreak associated. Twenty-nine clusters were identified in 11 states. States with surplus incidence ≥ 6.0 per million were significantly more likely to have identified a cluster than those < 6.0 per million ($p < 0.001$). One producer in IA (Producer A) was reported by states to be a supplier of shell eggs in 52% (15/29) of clusters. Traceback identified a second producer as another potential source of contaminated shell eggs. Inspection of these producers identified 13 environmental samples matching the outbreak strain and found substantial potential for egg contamination. These producers recalled over 550 million shell eggs in August, 2010.

CONCLUSIONS: This outbreak of SE infections, the largest ever identified in the United States, was associated with shell eggs. Continued efforts are needed to ensure safe preparation of foods containing shell eggs.

KEYWORDS: *Salmonella*, multistate disease outbreak, foodborne disease, eggs

9:15

Cervical Cancer Survivors Are at Increased Risk for Subsequent Malignancies, Including Tobacco-Related Cancers, When Compared to Breast and Colorectal Cancer Survivors – United States, 1992–2007

AUTHORS: J. Michael Underwood, S. Rim, T. Fairley, E. Tai

BACKGROUND: According to the U.S. Surgeon General, cervical cancer is causally linked to smoking tobacco. Persistent smoking among cervical cancer survivors may increase their risk for subsequent malignancies, including tobacco-related cancers. Despite these risks, nearly 40% of the approximately 247,000 women diagnosed with cervical cancer in the U.S. continue to smoke after diagnosis. This study describes the relative risk of developing subsequent malignancies among cervical cancer survivors.

METHODS: We examined data from 13 Surveillance, Epidemiology and End Results (SEER) registries from 1992–2007. We calculated the relative risk [observed/expected incidence ratios (O/E)] and 95% confidence intervals (CI) for all subsequent and tobacco-related malignancies among cervical cancer survivors. Tobacco-related cancers (lung, pharynx, larynx, esophagus, stomach, pancreas, kidney, bladder, cervix and leukemia) were defined according to the 2004 Surgeon General's Report on *The Health Consequences of Smoking*. Relative risks for subsequent malignancies were also calculated for female survivors of breast and colorectal cancer for comparison.

RESULTS: Overall, the relative risk for diagnosis with a subsequent cancer (excluding non-melanoma skin cancers) was higher among cervical cancer survivors (O/E: 1.4; 95% CI: 1.4-1.5) compared to breast (O/E: 1.2; 95%CI: 1.2-1.2) and colorectal cancer survivors (O/E: 1.2; 95%CI: 1.1-1.2). The relative risk of developing subsequent tobacco-related cancers was also higher among cervical cancer survivors (O/E: 2.3; 95% CI: 2.1-2.5) compared to breast (O/E: 1.0; 95% CI: 1.0-1.1) and colorectal cancer survivors (O/E: 1.1; 95% CI: 1.1-1.2).

CONCLUSIONS: Women with cervical cancer are at increased risk for subsequent cancers, including tobacco-related cancers, when compared to breast and colorectal cancer survivors. Cervical cancer survivors should be targeted for intervention with evidence-based cancer preventive measures, including increased guidance about smoking-cessation and the availability of cessation treatments.

KEYWORDS: second primary neoplasms, uterine cervical neoplasms, smoking, tobacco, risk

9:35

Large Outbreak of Trichosporonosis Among Intensive Care Unit Patients – Jamaica, 2010

AUTHORS: Robyn N. Fanfair, K. Etienne, O. Heslop, J. Lindo, M. Roy, L. Gade, J. Noble-Wang, H. O'Connell, J. Peterson, M. Brandt, S. Balajee, B. Park

BACKGROUND: *Trichosporon asahii*, a fungus that may colonize the skin and gastrointestinal tract, is a rare cause of nosocomial invasive infections, which have case-fatality >50%. We investigated an outbreak of trichosporonosis among inpatients at a Jamaican hospital.

METHODS: We reviewed microbiology records to identify case-patients, defined as inpatients with culture-confirmed *Trichosporon* during May 2009 – October 14, 2010. Clinical data, including demographics, medical conditions, treatment, and outcome were collected by reviewing medical records. We performed an environmental investigation of the hospital ventilation system and surfaces in the ICUs, operating theaters, and surgical wards. Clinical and environmental *Trichosporon* isolates were identified by comparative sequence analysis.

RESULTS: We identified 63 cases; 58 (92%) had urine involvement, 1 (1.6%) had pulmonary involvement, and 3 (4.8%) had disseminated disease. Of the 53 (84%) cases with available information, median age was 64 years (range 2-93) and 25 (47%) were male. All (100%) had a urinary catheter during hospitalization preceding incident culture; 45 (85%) had prior ICU exposure; and 28 (53%) had ≥1 trichosporonosis risk factor, including diabetes, malignancy, or renal disease requiring hemodialysis. Thirty day case-fatality was 40%. Environmental investigation demonstrated reuse of disposable patient wash basins after cleaning in close proximity to soiled bedpans. *Trichosporon spp.* was recovered from ICU equipment cleaning rooms, washbasins and multiple fomites associated with case patients. Molecular genotyping demonstrated the presence of multiple genotypes from clinical and environmental isolates, indicating multiple sources.

CONCLUSIONS: This is the largest outbreak of trichosporonosis known to date, and was likely due to continuous cross-contamination of patient care items with soiled bedpans. Adherence to appropriate sodium hypochlorite concentration guidelines for disinfection was recommended to prevent additional cases.

KEYWORDS: trichosporonosis, hospital infections, nosocomial infections, fungal infections

9:55

Risk Factors for Prescription Opioid Death – Utah, 2008–2009

AUTHORS: William A. Lanier, E. Johnson, R. Rolfs, M. Friedrichs, T. Grey

BACKGROUND: Deaths from prescription opioids in Utah increased from 51 in 2000 to 263 in 2009 (>500%). Prevention efforts are hindered by an inadequate understanding of risk factors for overdose death.

METHODS: Characteristics of prescription opioid overdose decedents from 2008–2009 were gathered from medical examiner records and next-of-kin interviews. Decedents (N = 254) were compared with persons reporting prescription opioid use in the past year (N = 1,308) on state-added Utah 2008 Behavioral Risk Factor Surveillance System (BRFSS) questions. Exposure prevalence ratios (EPRs) and 95% confidence intervals (CIs) were calculated.

RESULTS: The majority (81%) of decedents had chronic pain; among those prescribed opioids, decedents were more likely to have chronic pain than opioid-using BRFSS respondents (EPR: 3.0; 95% CI: 2.6–3.3). Decedents were more likely than opioid-using BRFSS respondents to smoke daily (EPR: 5.6; 95% CI: 4.4–6.9), not graduate from high school (EPR: 9.0; 95% CI: 6.1–11.8), live alone (EPR: 3.5; 95% CI: 2.9–4.0), obtain opioids from nonprescription sources (EPR: 3.8; 95% CI: 2.8–4.7), and use opioids more than prescribed (EPR: 16.5; 95% CI: 9.3–23.7). Among females, decedents more often than opioid-using BRFSS respondents had a BMI ≥30 (EPR: 1.6; 95% CI: 1.3–1.8) and were aged 45–54 years (EPR: 2.3; 95% CI: 1.9–2.7).

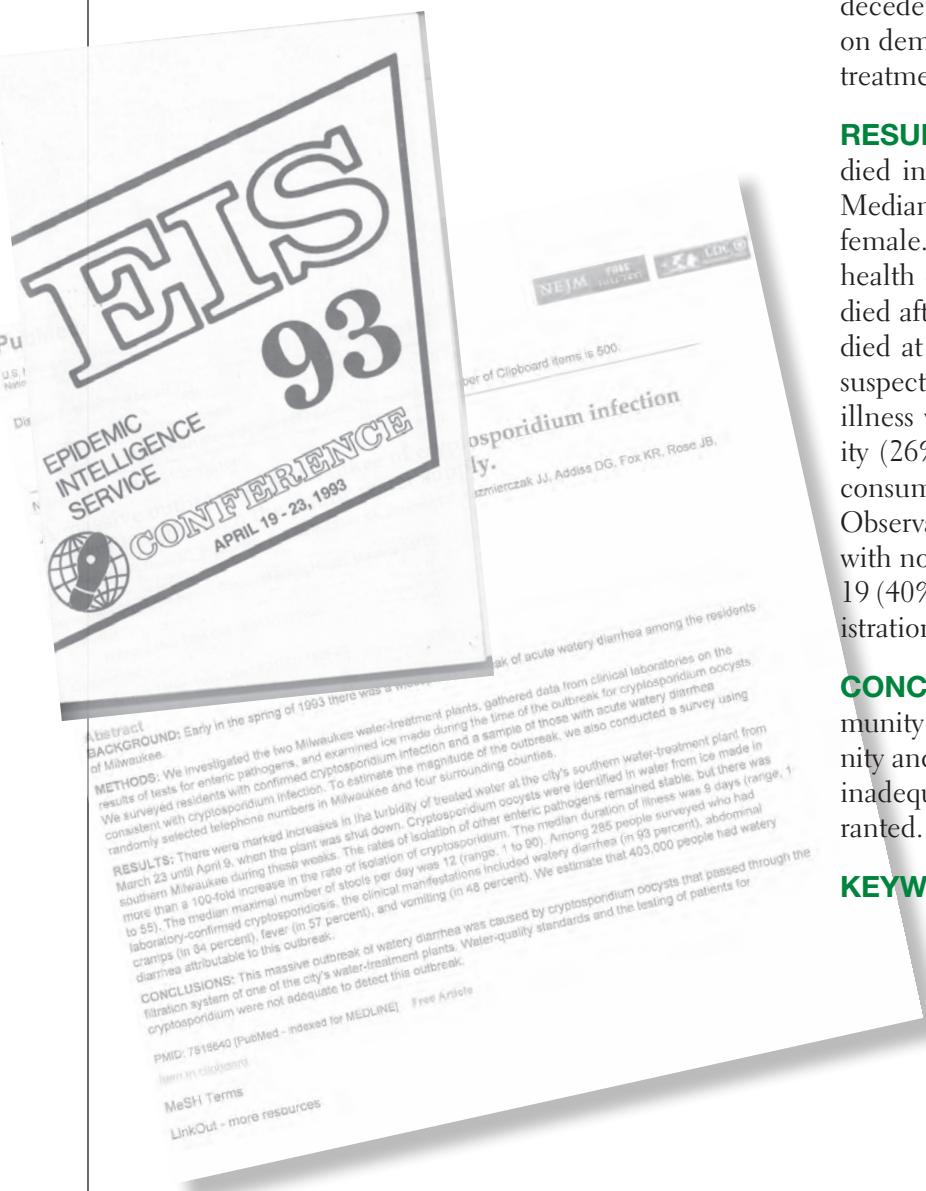
CONCLUSIONS: Chronic pain was common among decedents. The observed association with smoking might be confounded by other factors and deserves further study. When prescribing chronic opioid therapy, healthcare providers should be alert for risk factors among patients (e.g., low education level, living alone, obesity [females], being aged 45–54 years [females], obtaining opioids from nonprescription sources, and using opioids more than prescribed).

KEYWORDS: overdose, analgesics, opioid; drug prescriptions; prevalence; risk factors

Abstracts

MONDAY, APRIL 11**SESSION B** **10:50**

Intestinal Bug Hit Many on North Side

April 18, 1993, by Neil D. Rosenberg
*Milwaukee Journal***Waterborne Diseases, 10:45 a.m.-12:10 p.m.****Atrium Ballroom B and C****MODERATOR:** Michael Beach

Rapid Assessment of Cholera Mortality – Artibonite, Haiti, 2010

AUTHORS: Janell A. Routh, A. Loharikar, B. Fouché, E. Cartwright, S. Roy, E. Ailes, W. Archer, J. Tappero, T. Roels, G. Dahourou, R. Quick**BACKGROUND:** During the first month of Haiti's cholera outbreak, which began in October 2010 in Artibonite Department, the case fatality rate exceeded 4%. Cholera-naïve populations often lack knowledge critical to prevent death. We evaluated cholera mortality in Artibonite to understand care-seeking behavior and treatment of patients who died.**METHODS:** We defined a cholera decedent as a person ≥ 5 years old who died from acute, watery diarrhea, with illness onset after October 16. We identified decedents first from health facilities and subsequently through interviews with decedents' families and neighbors. We obtained information on demographics, illness severity, health-seeking behaviors, treatment, and cholera awareness.**RESULTS:** We identified 87 cholera decedents; 48 (55%) died in a health facility and 39 (45%) in the community. Median age was 50 years (range, 5-100 years); 33% were female. Among community decedents, 16 (41%) sought health care; of these, 8 died en route to the facility, and 8 died after discharge. Family members of 23 decedents who died at home gave these reasons for not seeking care: not suspecting the illness was cholera (43%), not realizing the illness was serious (26%), and distance to the health facility (26%). Of 39 community decedents, 30 (77%) did not consume oral rehydration salt (ORS) solution at home. Observations of 87 decedents' households found 57 (65%) with no ORS sachets available. Of 48 health facility deaths, 19 (40%) occurred after overnight admission despite administration of IV fluids (60%), and/or ORS (57%).**CONCLUSIONS:** Cholera patients died both in the community and the hospital. ORS availability in the community and knowledge about seeking treatment promptly were inadequate. Further study of health facility deaths is warranted.**KEYWORDS:** cholera, diarrhea, mortality, ORS, Haiti

11:10

Impact of a Novel Hollow Fiber Household Water Filter on the Health of Rural Kenyan Children

AUTHORS: Laura B. Gieraltowski, B. Nygren, I. Sadumah, E. Foote, S. Hamidah, J. Oremo, C. Ochieng, R. Quick

BACKGROUND: Diarrhea, which is common among populations without access to safe water, annually kills nearly 2 million children <5 years old. To address this problem, a novel hollow-fiber filter (LifeStraw®) was developed for household water treatment. We tested its impact on water quality and child health in rural Kenyan households.

METHODS: We conducted a cluster-randomized, longitudinal health impact evaluation, randomly selecting an intervention group and a control group of 10 villages each, and enrolling all households with children <12 months old. We conducted a baseline survey of water treatment practices and then distributed filters to all intervention households; control households had access to a local chlorine product. We then made biweekly home visits for one year to assess water treatment and occurrence of diarrhea in children <12 months old in the previous 48 hours, and tested household water samples from both groups every two months for *Escherichia coli* contamination.

RESULTS: We enrolled 120 children from intervention households and 108 children from control households. The median age of children was 6 months (range =1-15 months). At baseline, water samples from 73.7% of intervention households and 75.2% of control households were contaminated with *E. coli*. During biweekly home visits, a similar percentage of respondents from intervention households and control households reported treating their water (58.9% vs. 54.7%). Aggregated water testing results showed that a significantly lower percentage of water samples from intervention households had *E. coli* contamination than control households (5.4% vs. 75.9%, p=<0.0001). Diarrhea rates were significantly lower in intervention group children than control children (RR=0.79, 95% confidence interval = 0.66-0.95).

CONCLUSIONS: Use of the hollow-fibered filters improved water quality and reduced diarrhea risk in children.

KEYWORDS: health impact, water quality, diarrheal diseases

11:30

Protection Against Epidemic Cholera in an Urban Setting – Port-au-Prince, Haiti, 2010

AUTHORS: Stacie E. Dunkle, A. Mba-Jonas, A. Loharikar, B. Fouché, M. Peck, R. Archer, V. Beau de Rochars, T. Ayers, T. Bender, D. Moffett, T. Roels, J. Tappero, G. Dahourou, R. Quick

BACKGROUND: Haiti's current cholera outbreak began in October 2010. In response, the Haitian Ministry of Public Health and Population (MSPP) disseminated cholera prevention messages about treating drinking water and preparing hot, cooked foods. On November 7, 2010, cholera was first reported in the capital, Port-au-Prince, and by December 15, nearly 20,000 cases were reported in the city.

METHODS: We conducted a case-control study to examine exposures associated with cholera in Port-au-Prince. Between December 15–19, 2010, we enrolled cases—persons ≥5 years old with acute, watery diarrhea admitted to the Cholera Treatment Center in the slum of Cité de Dieu—and 2 age-, sex- and neighborhood-matched controls per case. We used a standard questionnaire to gather information about food and beverage exposures in the 3 days prior to illness, and water, sanitation and hygiene practices.

RESULTS: We enrolled 53 cases and 106 controls. The median age of cases was 29 years (range 6-80); 45% were female. Respondents reported obtaining drinking water from public taps (33%), private taps (21%), kiosks (20%), bottles/bags (16%), tankers (11%), and bladders (5%). In bivariate analyses, factors protective against cholera included consumption of: drinking water treated with chlorine or by boiling (matched odds ratio [mOR]: 0.3; 95% confidence interval [CI]: 0.1, 0.9); hot rice (mOR: 0.2; 95% CI: 0.1, 0.6); fried foods (mOR: 0.2; 95% CI: 0.1, 0.5); cabbage pickled in vinegar (mOR: 0.2; 95% CI: 0.1, 0.5); oranges (mOR: 0.4; 95% CI: 0.2, 0.9); and orange juice (mOR: 0.3; 95% CI: 0.1, 0.8).

CONCLUSIONS: Consumption of treated drinking water and hot, cooked food, as recommended by the MSPP, was protective against cholera. Acidic foods and drinks were also protective.

KEYWORDS: cholera, case-control studies, Haiti, urban population, prevention and control

11:50

Impact of Safe Water and Hygiene Program in Rural Health Facilities, Zambia, 2010

AUTHORS: Linda G. Capewell, A. Naz, S. Simwinga, M. Tembo, R. Quick

BACKGROUND: In developing countries, many health facilities lack access to safe water for drinking and handwashing, putting patients and health workers at risk for health facility-acquired infections. In Zambia, where only 48% of rural populations have access to improved water supplies, we installed handwashing and drinking water stations (40-liter plastic buckets with spigots and lids, metal stands, chlorine solution, and soap) in eight rural health facilities and evaluated their impact on health worker and patient knowledge and practices.

METHODS: In February 2010, we conducted baseline surveys of health worker and patient knowledge and practices regarding handwashing, safe water storage, and water treatment in eight health facilities, tested stored water in clinics and households for residual chlorine as an objective measure of water treatment, and observed handwashing technique in patients. In March 2010, we installed handwashing and drinking water stations in the health facilities and trained health facility staff. In July 2010, we conducted a follow-up evaluation using baseline survey instruments.

RESULTS: Chlorination of stored water was observed in 0 clinics at baseline and 4/8 at follow-up; 7/8 clinics were using the installed water stations at follow-up. Compared to baseline, a higher percentage of patients at follow-up used improved water storage containers (24% vs. 61% [$p<0.001$]), had detectable residual chlorine in stored water (3% vs. 15%, $p=0.025$), and demonstrated correct handwashing procedure (42% vs. 65% [$p=0.006$]).

CONCLUSIONS: Installation of water stations combined with hygiene training in rural Zambian clinics resulted in improved water treatment and storage practices in health clinics and patients, and increased ability to demonstrate proper handwashing technique among patients. This intervention has now expanded to 150 additional health facilities in Zambia.

KEYWORDS: safe water, water storage, water treatment, hygiene intervention

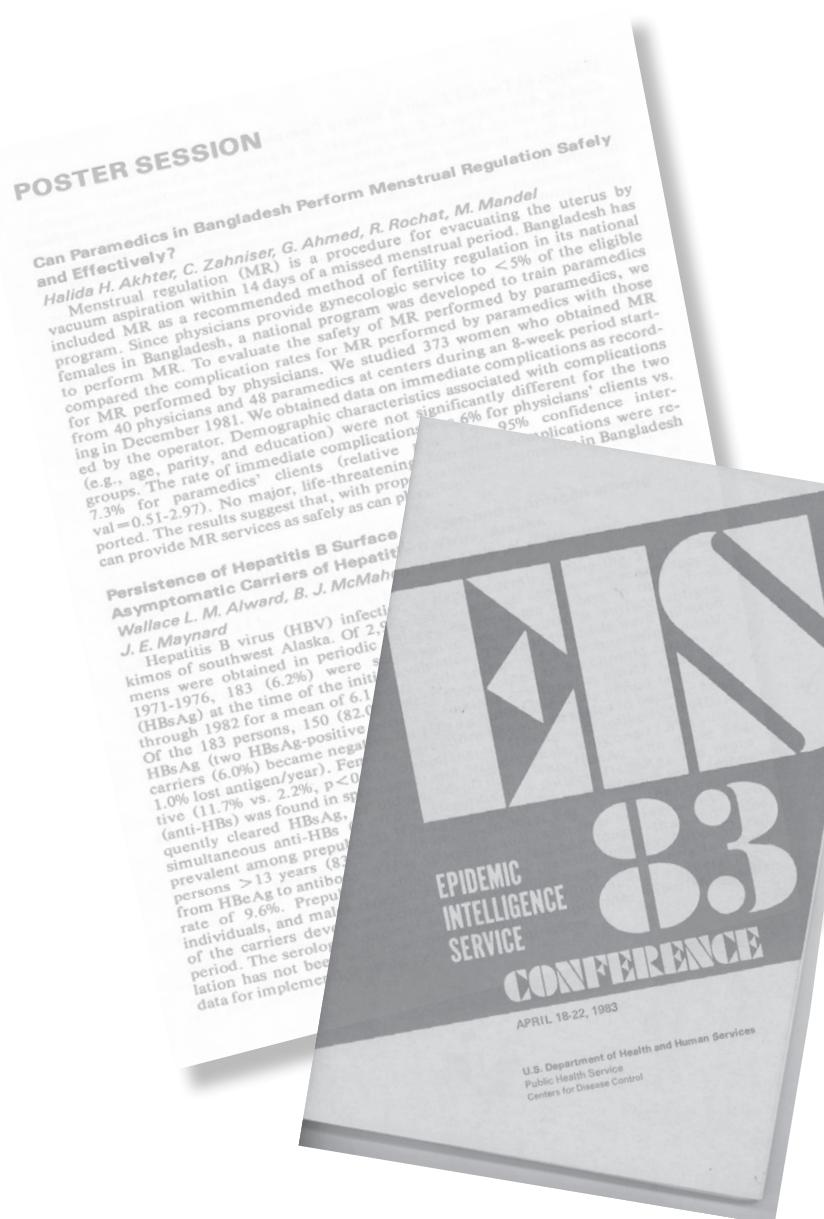
POSTER SESSION 1

The Doctor's World; The Rewards and The Roadblocks of Medical Sleuthing

May 1, 2001, by Lawrence K. Altman, MD

The New York Times

Meet the Authors of Posters 1–15
12:30–1:30 p.m.
Atrium Ballroom B and C



POSTER 1

Evaluation of Active Surveillance of Stillbirth: Utility of an Existing Birth Defects Surveillance Program – Atlanta, Georgia

AUTHORS: Alejandro Azofeifa, C. Duke, S. Gilboa, A. Correa, L. Yeung

BACKGROUND: In 2005, the prevalence of stillbirths in the United States was 6.2/1,000 live births and fetal deaths. This probably represented an underestimate because the numerator was based on fetal death certificates (FDCs) data, which are limited by case underreporting. We evaluated the utility of using FDCs and an existing active birth defects surveillance program, the Metropolitan Atlanta Congenital Defects Program (MACDP), to improve stillbirth surveillance.

METHODS: We assessed MACDP's flexibility, data quality, simplicity, and sensitivity. We conducted stakeholder interviews; reviewed MACDP methods; and used capture-recapture methods to estimate the total number of stillbirth cases (defined as any intrauterine fetal death at ≥ 20 weeks of gestation age or weight ≥ 350 grams if age was unknown), sensitivities, and stillbirth prevalence using FDC data alone and when combined with MACDP data.

RESULTS: MACDP is flexible in its ability to update information on stillbirth cases and to expand to capture new information. Compared to FDC data, MACDP's data quality is improved through use of multiple data sources and standard procedures to collect detailed maternal and stillbirth information. MACDP is labor intensive, requiring trained abstractors and multiple sources for case finding. Based on 2006 data, sensitivity was 78.5% based on FDC data alone and 95% when combined with MACDP data; the prevalence of stillbirths per 1,000 live births and fetal deaths was 8.2 (95% confidence interval [CI]: 7.5–9.0) based on FDC data alone and 9.9 (95% CI: 9.1–10.8) when combined with MACDP data.

CONCLUSIONS: Use of MACDP as an additional data source for stillbirth surveillance resulted in higher levels of case ascertainment, and better data quality and estimates of stillbirth prevalence than use of FDC data alone.

KEYWORDS: surveillance, stillbirth, prevalence, sensitivity

POSTER 2

Epidemic Features of Human Anaplasmosis – Wisconsin, 2006–2009

AUTHORS: Michael L. Bartholomew, R. Heffernan, D. Johnson, K. Hardy, K. Bisgard, J. Davis

BACKGROUND: Human anaplasmosis (HA) is an acute, severe, febrile illness caused by *Anaplasma phagocytophylum* and transmitted in Wisconsin by *Ixodes scapularis*. We describe epidemiologic features of Wisconsin HA cases reported during 2006–2009.

METHODS: We reviewed and classified anaplasmosis case reports (2006–2009) by using the 2008 Council of State and Territorial Epidemiologists/CDC ehrlichiosis/anaplasmosis case definition. Confirmed HA is clinically compatible illness (acute fever and ≥ 1 of the following: headache, myalgia, malaise, anemia, leukopenia, thrombocytopenia, or elevated liver enzymes) with laboratory confirmation (four-fold change in anti-*A. phagocytophylum* IgG levels; polymerase chain reaction (PCR) detection of *A. phagocytophylum* DNA or antigen; or *A. phagocytophylum* isolation). Probable HA is clinically compatible illness with supportive laboratory results (single elevated anti-*A. phagocytophylum* IgG level or identified neutrophilic morulae).

RESULTS: A total of 890 confirmed (28%) and probable (72%) HA cases were reported; 88% were from northwestern Wisconsin counties. Reported cases increased from 158 (21% confirmed) in 2006 to 278 (34% confirmed) in 2009. Among 890 patients, 535 (60%) were male; median age was 58 years (range: 3–92); 94 (11%) had immunosuppressive conditions; 90 (10%) had complications, including acute respiratory distress syndrome, disseminated intravascular coagulation, meningitis/encephalitis, and renal failure; 218 (24%) were hospitalized; and one (0.1%) died. Confirmation was enhanced with PCR (85% of 249 confirmed cases) and limited by infrequent serum pair collection (4.7% of 890 cases).

CONCLUSIONS: Because reported HA increased substantially during 2006–2009 associated with frequent hospitalization, additional HA prevention strategies are warranted. Opportunities to confirm HA were impaired because of infrequent pairing of sera. Improved understanding of HA-related provider practices and laboratory capabilities is needed to design timely approaches to diagnose and confirm HA.

KEYWORDS: anaplasmosis, tickborne diseases, *Anaplasma phagocytophylum*, *Ixodes*

Abstracts

Monday

POSTER 3

Factors Associated with Receipt of the 2009 Influenza A (H1N1) Monovalent Vaccination Among School-Aged Children – Maricopa County, Arizona, October 2009–April 2010

AUTHORS: Steven A. Baty, A. Ayala, M. Odish, B. Cadwell, M. Schumacher, R. Sunenshine

BACKGROUND: Annually in the United States, >200,000 persons are hospitalized and ~24,000 die from influenza-related illnesses; school-aged children can facilitate community-wide influenza spread. Additionally, because school-age children were recommended as one of the initial target groups for vaccination during the 2009–2010 influenza season, Maricopa County initiated school-located influenza vaccination in 576 (76%) of its' 752 public schools. We evaluated factors associated with receipt of the 2009 influenza A (H1N1) monovalent vaccination among school-age children.

METHODS: Random-digit telephone dialing was used to identify and survey 600 households with a willing adult (aged ≥18 years) participant and Maricopa County school-aged children (grades K–12), information was obtained on a maximum of two randomly selected school-aged children and all adults. Multivariate logistic regression analyses were used to identify factors associated with receipt of H1N1 vaccination among school-aged children.

RESULTS: To survey 600 (21%) eligible households, 2843 were contacted. Information was provided for 909 school-aged children; 402 (44%) had received H1N1 vaccination. After adjusting for respondent's education and race/ethnicity, total household income, any adult household member with a high-risk medical condition, and having health insurance, factors independently associated with H1N1 vaccination included influenza vaccine availability at school (adjusted odds ratio [AOR]: 1.6; 95% confidence interval [95% CI]: 1.1–2.4); high-risk medical condition in child (AOR: 2.3; 95% CI: 1.5–3.7); and elementary compared with high school attendance (AOR: 2.1; 95% CI: 1.4–3.1).

CONCLUSIONS: Our analyses indicate H1N1 influenza vaccine availability at school was independently associated with H1N1 vaccination among Maricopa County school-aged children. These data highlight the potential role of school-located influenza vaccination campaigns as a strategy to increase influenza vaccination rates among school-aged children.

KEYWORDS: school health services; seasonal influenza; influenza A virus, H1N1 subtype; immunization programs

POSTER 4

Are Depression and Diabetes Associated with Asthma Control?

AUTHORS: Jeneita M. Bell, T. Boehmer

BACKGROUND: Asthma exacerbation is the leading cause of activity limitation, responsible for \$20.7 billion in healthcare costs annually. Proper asthma control can help reduce exacerbations but a person's ability to achieve control can be influenced by co-morbid diseases. We examined whether a co-morbid diagnosis of depression or diabetes was associated with poorer asthma control among adults with asthma.

METHODS: Using 2006–2008 Behavioral Risk Factor Surveillance System and Asthma Call-Back Survey data, we conducted secondary analysis among adult respondents with "active" asthma, i.e., those who indicated that they had seen a doctor for asthma, taken asthma medication, or had asthma symptoms in the past 12 months. We used logistic regression to calculate adjusted prevalence risk ratios (RR) estimating the association between each co-morbid condition and six asthma control indicators (symptoms, nighttime awakening, medication use, activity limitation, urgent care visits, hospitalization), controlling for age, sex, and race/ethnicity.

RESULTS: During 2006–2008, 31,172 adults with active asthma from 37 states completed the Asthma Call-Back Survey. Of these, 11.5% (95% confidence interval [CI]: 10.8%–12.3%) reported a history of diabetes and 34.4% (95% CI: 33.0%–35.7%) reported a history of depression. Indicators of poor asthma control were significantly higher among those with co-morbid diabetes and co-morbid depression; namely, the risk of asthma hospitalization was 2.5 (95% CI: 1.9–3.3) and 2.0 (95% CI: 1.6–2.6) times higher among adults with diabetes and depression, respectively.

CONCLUSIONS: Depression and diabetes are negatively associated with asthma control among adults with active asthma and should be considered in comprehensive asthma management. Continued research is needed to help understand the causal nature of the association and the role of possible contributing factors.

KEYWORDS: asthma, depression, diabetes, comorbidity

POSTER 5

Dangerous Liaisons? Association Between Pandemic Influenza A (H1N1) and Pneumococcal Pneumonia

AUTHORS: Katherine E. Fleming-Dutra, T. Taylor, S. Garg, M. Jhung, L. Finelli, S. Jain, D. Shay, R. Link-Gelles, J. Baumbach, B. Beall, N. Bennett, S. Zansky, M. Cartter, M. Farley, K. Gershman, L. Harrison, C. Lexau, R. Lynfield, K. Yousey-Hindes, A. Reingold, P. Ryan, W. Schaffner, A. Thomas, M. Moore

BACKGROUND: *Streptococcus pneumoniae* (pneumococcus) pneumonia is the most common vaccine-preventable bacterial cause of death in the United States and a well-recognized influenza complication. We examined pneumococcal pneumonia incidence during the 2009 influenza A(H1N1) [pH1N1] pandemic (April 2009–March 2010).

METHODS: We identified cases in residents of Emerging Infections Program (EIP) sites (in CA, CT, GA, MD, MN, NM, NY, OR, TN). Influenza-associated hospitalizations were laboratory-confirmed; invasive pneumococcal pneumonia (IPP) cases had pneumococcus isolated from normally sterile sites and discharge diagnoses of “pneumonia.” We calculated the mean monthly IPP cases for each age group during April 2004–March 2009. Excess IPP cases were those that exceeded 2 standard deviations (SD) above the mean during the peak month of pH1N1 activity, defined as the month in each site during the pandemic with the greatest total influenza-associated hospitalizations. Using age-adjusted rates, we extrapolated excess IPP cases nationally.

RESULTS: During the pandemic, 1666 IPP cases and 5827 influenza-associated hospitalizations were identified. Influenza-associated hospitalizations peaked in September (2 EIP sites), October (5) or November (2). During peak months, we observed excess IPP cases among persons ages 5–24 (excess: 14.7 cases, mean: $4.6 \pm SD 1.3$), 25–49 (excess: 7.7, mean: $34.2 \pm SD 3.0$) and 50–64 years (excess: 21.1, mean: $30.6 \pm SD 4.2$). We observed no excess IPP among those <5 or ≥65 years. Applying EIP rates nationally, an estimated 1240 excess IPP cases may have occurred during pH1N1 peak months.

CONCLUSIONS: Our findings suggest the pandemic resulted in excess IPP among older children and non-elderly adults. The lack of excess IPP in other age groups may indicate the effect of pneumococcal vaccination in the young and pH1N1 immunity among the elderly.

KEYWORDS: *Streptococcus pneumoniae*, pneumonia, pneumococcal, influenza A virus, H1N1 subtype

POSTER 6

Desperately Seeking CTF: Colorado Tick Fever Surveys of Humans and Ticks – Wyoming, 2010

AUTHORS: Aimee L. Geissler, E. Thorp, C. Van Houten, R. Lanciotti, N. Panella, T. Murphy

BACKGROUND: Colorado tick fever (CTF) is an emerging and underreported tickborne viral disease in the western United States. CTF illness includes fever, headache, and severe myalgia lasting ≤3 weeks. In 2009, Wyoming had the highest CTF incidence (2/100,000 persons); 30% of patients reported tick exposure in Wyoming National Parks/Forests. This is the first study to assess CTF prevalence among humans and its vector, *Dermacentor andersoni*.

METHODS: During June–August, a baseline and 3-month follow-up serosurvey were conducted on a cohort of 526 Grand Teton National Park (GTNP) and Bridger Teton National Forest (BTNF) employees. Seropositivity was defined as antibody levels ≥1:10 by plaque-reduction neutralization test. Participants completed risk behavior surveys during baseline and follow-up serosurveys. Ticks collected at 27 GTNP/BTNF sites were tested by reverse-transcriptase-polymerase chain reaction for presence of virus.

RESULTS: Three (2%) of 126 GTNP/BTNF participating employees had baseline seropositive results. During the study, 47 (37%) participants had found unattached ticks on themselves, and 12 (10%) had found attached ticks; no participants seroconverted. Walking through sage brush ($P = 0.007$) and spending time at ≥7,000 feet elevation ($P = 0.001$) were significantly associated with tick exposure. Forty percent of ticks tested CTF-positive and were found at 10 (37%) of 27 sites; 177/179 (99%) of ticks collected were *D. andersoni* and all were found at ≥7,000 feet elevation in sage brush areas.

CONCLUSIONS: GTNP/BTNF employees exposed to sage brush and elevations ≥7,000 feet were at increased exposure risk for CTF-infected ticks; therefore, that no study participants acquired CTF infection is noteworthy. CTF education and personal protection measures against tick exposure are needed for visitors and employees traveling to high-risk environs identified in this study.

KEYWORDS: Wyoming, Colorado tick fever, *Dermacentor andersoni*

Abstracts

Monday

POSTER 7

Environmental and Behavioral Risk Factors for West Nile Virus Infection During an Outbreak – Arizona, 2010

AUTHORS: Katherine B. Gibney, J. Colborn, S. Baty, A. Bunko-Patterson, T. Sylvester, G. Briggs, T. Stewart, C. Levy, K. Komatsu, K. MacMillan, M. Delorey, J. Mutebi, M. Fischer, J. Staples

BACKGROUND: West Nile virus (WNV) is the leading cause of mosquito-borne disease in the United States. Despite annual focal outbreaks, modifiable risk factors for WNV infection are poorly defined. We performed a population-based, case-control study to identify environmental and behavioral risk factors for WNV infection during an outbreak in the East Valley of the Phoenix metropolitan area.

METHODS: We enrolled East Valley residents evaluated for WNV infection from May–July, 2010. Case-patients had laboratory evidence of recent WNV infection while control-subjects had negative serology for recent and previous WNV infection. We interviewed participants, performed household assessments, and reviewed environmental data (e.g., vector surveillance, irrigation systems, green spaces, unmaintained pools). Categorical variables were compared using chi square or Fisher's exact tests and continuous variables using Student's t-test.

RESULTS: We enrolled 49 case-patients and 74 control-subjects. Case-patients were more likely than control-subjects to be ≥ 60 years of age (31% vs. 15%; $P=0.04$), reside in City A (49% vs. 28%; $P=0.02$) or Water District X (33% vs. 16%; $P=0.03$), live within 500 m of an unmaintained swimming pool (45% vs. 27%; $P=0.04$), or have potential mosquito breeding sites in their yard (93% vs. 70%; $P<0.01$); case-patients were less likely to work outside of the home (33% vs. 55%; $P=0.02$). Most case-patients (86%) and control-subjects (82%) never used insect repellants. Multivariable analysis is pending.

CONCLUSIONS: Most survey participants do not use recommended personal protective measures to reduce mosquito bites. However, WNV infections were associated with household and community characteristics. Public health messages to reduce mosquito bites should be strengthened but identifying and reducing household and community-level environmental risk factors for WNV infection may provide more effective prevention strategies.

KEYWORDS: West Nile virus, risk factors, case-control studies, disease outbreaks, Arizona

POSTER 8

Wise Up on Water: Drinking Water Intake Among U.S. Adults—U.S., 2007

AUTHORS: Alyson B. Goodman, H. Blanck, B. Sherry, S. Park, A. Yaroch, L. Nebeling

BACKGROUND: Sugar-sweetened beverage (SSB) consumption contributes to obesity. Although replacing SSBs with plain drinking water (DW) is one strategy to reduce energy intake, there is limited information on the characteristics of DW consumers. To assist practitioners in designing interventions to help people replace SSBs with DW, we examined characteristics of high DW consumers.

METHODS: In analyses of data from a nationally representative sample of 3,397 U.S. adults who participated in the National Cancer Institute's Food Attitudes and Behaviors Survey in 2007, we used multivariable logistic regression to assess associations between self-reported daily DW intake and selected sociodemographic characteristics and health behaviors.

RESULTS: Results indicated that 7% of adults reported drinking zero cups of DW daily, 36% 1–3 cups, 35% 4–7 cups, and 22% ≥ 8 cups. Drinking ≥ 4 cups of DW daily was associated with being aged 18–34 years versus >55 years (adjusted odds ratio [aOR] = 1.4; 95% confidence interval [95% CI]: 1.1–1.8); living in the south (aOR = 1.3; 95% CI: 1.1–1.7) or west (aOR = 1.4; 95% CI: 1.1–1.8) versus the northeast; consuming ≥ 4.5 cups of fruits or vegetables/day versus ≤ 1 cup (aOR = 2.7; 95% CI: 2.0–3.5); exercising ≥ 5 days/week versus not exercising (aOR = 2.2; 95% CI: 1.7–2.8); never having smoked cigarettes versus ever smoking (aOR = 1.3; 95% CI: 1.1–1.6), and consuming no fast-food versus ≥ 2 fast-food meals/week (aOR = 1.5; 95% CI: 1.2–1.9).

CONCLUSIONS: Low DW intake was associated with a cluster of unhealthful behaviors. Understanding the reasons for these associations may aid in the development of interventions to help people replace SSBs with DW.

KEYWORDS: water intake, sociodemographics, behavior, beverages

POSTER 9**Babesiosis in a 1-Month-Old Infant — New York, September 2010**

AUTHORS: Angela M. Maxted, R. Rockwell, T. Levin, A. Huang, J. Hallisey, K. Noyes

BACKGROUND: Incidence of babesiosis, a sometimes severe or fatal parasitic infection of red blood cells, is increasing in southern New York State. Babesiosis is naturally transmitted by *Ixodes scapularis* ticks and less commonly acquired from transfusion with infected blood products. Vertical transmission rarely has been described. We investigated a case of babesiosis in an infant aged 1 month from an endemic area to determine the probable transmission route.

METHODS: Medical charts and laboratory results for both infant and mother were reviewed. The mother was interviewed to determine both patients' clinical histories and outdoor exposures. All available clinical parasitology and serologic tests were confirmed by the New York State public health reference laboratory.

RESULTS: At age 36 days, after a normal full-term pregnancy, uneventful vaginal delivery, and initial neonatal period, the infant was hospitalized with fever, jaundice, lower-leg petechiae, anemia, and thrombocytopenia. Direct microscopy on the infant's peripheral blood revealed 3% parasitemia; *Babesia microti* presence was confirmed by polymerase chain reaction. The infant had been outdoors at home and during transport for well-child visits but had no history of tick bite. The mother denied illness or tick bite during pregnancy. No parasites were detected in maternal blood samples collected at 38 and 93 days postpartum; however, polyclonal serum antibody titers $\geq 1:1,024$ strongly indicated ongoing or recent maternal infection. The infant recovered with medical treatment.

CONCLUSIONS: Given the evidence of recent maternal infection and absence of a known tick bite on the infant, this case is consistent with vertical transmission. However, direct tick transmission cannot be ruled out. Although rare, physicians in endemic areas should remain alert for babesiosis among newborns.

KEYWORDS: babesiosis; infectious disease transmission, vertical; *Ixodes scapularis*; tickborne diseases; New York

POSTER 10**Effectiveness of Novel Occupational Heat Regulations on Reducing Fatal and Serious Cases of Occupational Heat Related Illness — California, 2005–2008**

AUTHORS: Francisco A. Meza, A. Neidhardt, D. Shusterman, G. Windham, B. Materna

BACKGROUND: In the United States during 1992–2008, approximately 29 heat-related worker deaths occurred annually. In 2005, the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA), enacted an occupational heat illness prevention regulation to decrease mortality. We analyzed demographics and illness severity, in relation to occupational prevention programs, after the new regulation to evaluate its potential impact on heat-related illness cases.

METHODS: Using surveillance data from all serious and fatal heat-related illness cases investigated by Cal/OSHA for 2005–2008, we described the characteristics of the population. We compared prevention programs, number and severity of cases, mortality rates, and demographics for each year after program implementation.

RESULTS: Overall, 142 cases occurred. Among investigated cases, 21% of employers had a heat illness prevention program in 2005, which increased to 61% in 2008. Reported heat-related illness cases increased from 25 (2005) to 63 (2008), whereas case-fatality rates declined from 52% (2005) to 10% (2008). Mean core body temperature of nonfatal cases decreased from 102.8°F in 2005 to 98.8°F in 2008. Demographic changes included 96% of cases were among males in 2005 versus 78% in 2008; 68% of cases were among Hispanics in 2005 versus 56% in 2008; and primary language spoken was 68% Spanish in 2005 versus 50% in 2008. The majority of cases were in construction and agriculture, which was consistent across time.

CONCLUSIONS: Since regulation implementation, heat illness prevention programs increased, and severity of illness among investigated cases decreased. Demographic changes indicate that male, Hispanic, and Spanish-speaking workers are being reached with targeted information, or a greater diversity among cases is being reported.

KEYWORDS: mortality, heat stress disorders, occupational health, prevention and control

Abstracts

POSTER 11

Risk Factors for Plague Mortality – Uganda, 2008–2010

AUTHORS: Jeffrey R. Miller, T. Apangu, I. Weber, R. Acidri, N. Babi, J. Borchert, B. Yockey, M. Schriefer, K. Griffith, P. Mead

BACKGROUND: Plague is a severe, life-threatening disease. Over 95% of cases are reported from rural Africa. Although treatable, mortality rates range from 10% in developed countries to 40% in underdeveloped countries. We conducted a case-control study in Uganda to evaluate risk factors for mortality.

METHODS: We used clinic-based surveillance in the plague endemic region of Uganda to identify patients with suspected plague. We collected patient specimens for laboratory confirmation and provided treatment per national guidelines. We administered a questionnaire to assess knowledge, attitudes, and behaviors regarding plague and health care access. We limited analyses to enrolled patients with laboratory-confirmed plague. We compared the frequency of risk factors using Chi-squared analyses.

RESULTS: Among 183 patients evaluated, 59 (32%) had laboratory-confirmed plague; 15 (25%) died. Among 26 patients with laboratory-confirmed plague who were enrolled, 6 (23%) died. There were no significant differences between patients who lived or died with respect to age or sex. Twelve (60%) patients who suspected plague as a cause of their illness survived as compared to one (17%) who died ($p = 0.07$). Reasons for suspecting plague included knowing the symptoms of plague or knowing a person diagnosed with plague. The median time from symptom onset to clinic presentation was 1 day and 3 days in those who survived versus died, respectively. The median travel time to the clinic was 42.5 and 45 minutes for those who lived versus died, respectively.

CONCLUSIONS: Plague can be treated successfully if diagnosed early. In Uganda, patient knowledge of plague symptoms resulted in higher survival. Access to health care was not a factor. These findings suggest plague education campaigns may reduce mortality in Uganda.

KEYWORDS: plague, mortality, risk factors, death

POSTER 12

Exposure to Vampire Bats and Rabies in Two Communities in the Peruvian Amazon

AUTHORS: Brett W. Petersen, A. Turmelle, J. Ellison, S. Recuenco, J. Gomez-Benavides, C. Rupprecht

BACKGROUND: Vampire bats have become the primary source of rabies in humans and cattle throughout Latin America. The Amazon region in particular has experienced several recent outbreaks of human rabies associated with vampire bats. However, data on human exposures to bats is lacking and sparse information exists regarding the knowledge, attitudes and practices of persons at risk.

METHODS: We conducted a cross-sectional survey in two communities in the Peruvian Amazon in May, 2010. A questionnaire was administered to an adult representative of each household and any family member with possible bat exposure (defined as physical contact with a bat). Blood samples were collected from consenting respondents to investigate the connection between bat contact and rabies virus exposure.

RESULTS: We interviewed 92 people from 52 households and collected blood samples from 63 respondents. The median age of respondents was 25 years (range 2–67), 41 (45%) of 92 were female, 73 (79%) of 92 reported bat exposures, and 2 (2%) of 92 reported receiving rabies postexposure prophylaxis (PEP). When asked how people are infected by rabies, 16 (23%) of 70 respondents reported an animal bite while 50 (71%) of 70 indicated they didn't know. Sera was tested for rabies virus neutralizing antibodies (rVNA) and 7 (11%) of 63 individuals were seropositive, all of whom reported a history of bat exposure.

CONCLUSIONS: High rates of bat exposures, low rates of PEP, and limited rabies knowledge are present in these Peruvian Amazon communities. The presence of rVNA in unvaccinated individuals suggests a strong connection between contact with bats and rabies virus exposure. New strategies are needed to protect humans at risk of exposure to vampire bats from rabies.

KEYWORDS: rabies, human, epidemiology, prophylaxis

POSTER 13

Rabies Knowledge, Attitudes and Practices of Deer Farmers Following a Cluster of Rabies in Captive Deer – Pennsylvania, July 2010

AUTHORS: Danielle M. Tack, A. Longenberger, B. Petersen, J. Blanton, R. Holman, M. Moll, M. Deasy, A. Simeone, C. Rupprecht

BACKGROUND: Outbreaks of rabies among farm animals are rare in the USA. In July 2010, five deer from a Pennsylvania deer farm tested positive for rabies. We investigated this cluster of rabies to identify additional cases, characterize the risk to the human population, and to guide rabies prevention and control efforts.

METHODS: Site visits to deer farms, interviews with deer farmers, and a mail survey of Pennsylvania Deer Farmer Association (PDFA) members were performed to investigate deer farming practices, assess deer farmer knowledge, attitudes and practices regarding rabies, and to identify targets for education and control efforts.

RESULTS: Since 2007, a total of 10 rabid deer from 4 deer farms were identified. Four people received rabies post-exposure prophylaxis due to exposures from these captive deer. No significant differences in farming practices were identified between case and control farms. Half of PDFA respondents (103/206) have incomplete knowledge of rabies vectors, transmission, severity, and prevention measures. Birds and/or snakes were identified incorrectly as vectors by 45% (96/213) of respondents. Thirty-nine percent (90/231) identified death as an outcome of rabies and 78% (184/235) would seek emergency treatment if they suspected exposure; however only 26% (62/235) would wash a wound immediately. Seventy-two percent (173/239) did not know the signs of rabies in deer. While only 9 farmers vaccinate their deer against rabies, the majority (158/214) would be willing to vaccinate.

CONCLUSIONS: Deer farmer knowledge, attitudes and practices regarding prevention of rabies transmission could be considerably improved. Education focusing on post-bite measures, disease severity, recognition of rabies in deer, and changes in management practices, such as vaccination, may help minimize the risk of rabies to deer owners and their deer.

KEYWORDS: rabies, deer, knowledge, attitudes, practices, questionnaire

POSTER 14

Laboratory Detection as First Indicator of Influenza Season – West Virginia, 2010

AUTHORS: Tegwin K. Taylor, R. Radcliffe, D. Bixler

BACKGROUND: Annually, 5-20% of the United States population is infected with influenza. Early detection of influenza activity is essential for an effective public health response to decrease morbidity and mortality. The West Virginia Influenza Surveillance System receives data from four sources: local health departments (LHDs), sentinel providers, hospital laboratories, and the state's office of laboratory services. We assessed ways to improve influenza detection.

METHODS: Existing influenza surveillance data from 2002-09 was used to describe influenza detection patterns and determine the earliest indicator of influenza activity in the state. Questionnaires addressing data quality and acceptability of current surveillance practices were distributed to stakeholders, including hospital laboratories with capability to detect influenza virus by culture, polymerase chain reaction, and immunofluorescence.

RESULTS: During 6 (75%) of the past 8 influenza seasons, laboratory detection of influenza preceded the influenza-like illness (ILI) increase over baseline by 2–18 weeks (median: 8 weeks). ILI never exceeded baseline during the 2008–09 season. During the 2009 H1N1 pandemic, influenza infections were first detected through state laboratory isolates at *Morbidity and Mortality Weekly Report* (MMWR) week 20. Ongoing activity was documented through laboratory reports and outbreak investigations until MMWR week 38, when ILI exceeded baseline. Among survey responders, 36/38 (95%) of LHDs and 16/33 (48%) of sentinel providers used the CDC ILI case definition. Hospital laboratories reported weekly, but 3/5 (60%) of laboratories expressed interest in daily automated electronic laboratory reporting (ELR).

CONCLUSIONS: ILI reporting was useful for situational awareness; however, laboratory surveillance was the earliest indicator of influenza activity in West Virginia. ELR could improve early influenza detection and be endorsed by hospital laboratories.

KEYWORDS: West Virginia; influenza, human; laboratories, sentinel surveillance

Abstracts

Monday
POSTER 15

Survey of Animal Trappers, a Potentially Overlooked Occupational Group, Regarding Emerging Local Rabies Exposure Risks – Denver Metropolitan Area, 2010

AUTHORS: Nancy J. Williams, T. Ghosh, R. Vogt

BACKGROUND: Rabies is a fatal viral encephalitis transmitted between mammals. Although preventive measures have made human rabies rare in the United States, worldwide, >55,000 persons die from rabies annually. In Colorado, bats were historically the primary rabies virus (RV) reservoir (bat RV variant). However, in 2007, skunk RV variant was detected in rural Colorado, reaching the Denver-metropolitan suburbs in 2010. Skunks interact frequently with terrestrial animals; therefore, skunk rabies puts these animals and the humans who interact with them at risk. To address this, using Advisory Committee on Immunization Practices recommendations, we began a campaign to educate and improve RV vaccination among workers with elevated occupational risk of contracting rabies. Because data were limited regarding animal trappers, we surveyed this group to better understand their rabies-related risks.

METHODS: We used MapQuest® to identify pest-control companies located within 10 miles of our jurisdiction then surveyed managers/owners about mammals trapped, workers' rabies education, and workers' RV vaccination.

RESULTS: We reached 57 (90%) of 63 eligible companies; 22 (39%) of 57 reported trapping mammals. Sixteen (89%) of 18 respondents had personal protective equipment (PPE) and mammal-handling policies, 7 (41%) of 17 had written prevention policies; 3 (19%) of 16 reported recent rabies education of themselves or their employees; and 1 (6%) of 18 had a vaccination policy, although 4 (21%) of 19 had vaccinated employee(s). RV-vaccinated employees were rarer in companies with only 1 trapper (0/10 [0%]), compared with companies having ≥2 trappers (4/9 [44%]) (Fisher's exact test P <.05).

CONCLUSIONS: In geographic areas with increased rabies exposure risks, PPE-related education and vaccination of animal trappers and others in high-risk occupations might help prevent cases of human rabies.

KEYWORDS: rabies, occupational exposure, prevention and control, vaccination, pest control

MONDAY, APRIL 11

SESSION C

Grim Reaper Cutting Near Says Legionnaire Survivor

August 5, 1976, by Paul Carpenter
The Evening News (Harrisburg, PA)

Respiratory Diseases, 1:30–2:55 p.m. Atrium Ballroom B and C

MODERATOR: Lauri Hicks

in other visitors to the hotel. There were 29 deaths. The epidemic curve suggested a common-source exposure that was continuous during the period of the convention. Secondary spread of clinical illness to family members did not occur.

A census of all Legionnaires who had attended the convention, a study of the cohort of registrants at the headquarters hotel during the conference, case-control studies examined risk factors for illness, cigarette smoking were strongly implicated. No

option of water and
only implicated. No
inty.
use of 1 Legionnaire
d fluorescent antibody
serum specimens from
piedemic agent. Further
criterion are in progress.

EIS '77

Epidemic Intelligence Service Conference

ATLANTA, April 25-29

in tissue specimens from
have shown a serologic
reaks of illness. The first
Washington, D.C., in July
loyees, patients, and visi
n, during July and August
ational convention of Odd
74, which centered about
res disease in 1976.

ington outbreak were similar
(14.8%-18.2%), and clinical
spiratory disease and often
reaks the mean incubation
ferred from the others in its
, absence of fatalities, mild-
pneumonia), and incubation

sent serum samples from pa
s, 87%-93% tested were posi
disease agent (seroconversion,
Serum was collected from 6
had high titers.

As part of the National Influenza Surveillance Program (NIP), all state epidemiologists were asked to develop comprehensive influenza surveillance programs and report data weekly to CDC. The NIP Surveillance and Assessment Center developed computer programs and data processing systems to analyze and link these data with data from the National Center for Health Statistics (NCHS) Health Interview Survey, laboratory data, and pneumonia and influenza (P&I) mortality data. In 1976-1977 we received adequate data for analysis from 34% of 173 virus surveillance programs, 64% of 359 industries, 54% of 1,223 schools, 63% of 593 hospital emergency rooms,

1:35

Base Is Loaded: Legionnaires Disease and Pontiac Fever Among Employees at a Military Base — Michigan, 2010

AUTHORS: Katherine E. Fleming-Dutra, L. Hampton, J. Ambrose, C. Marten, C. Perry, Z. McCormic, S. Peik, J. Mancuso, L. Hicks

BACKGROUND: *Legionella* bacteria are the leading waterborne cause of severe pneumonia (Legionnaires' disease (LD)), and also cause Pontiac fever (PF), a poorly understood flu-like illness. LD and PF rarely co-occur in outbreaks. During August, 2010, CDC helped investigate a large LD and PF outbreak among employees exposed to two buildings on a Michigan military base. The source and host factors associated with the outbreak were investigated.

METHODS: Confirmed and suspected LD cases were defined as pneumonia by chest radiography with and without laboratory confirmation, respectively. PF cases had fever with headache, vomiting, cough, myalgia and/or dyspnea. Employees associated with buildings A and B were interviewed using a standardized questionnaire and responses compared using chi-square. Clinical and environmental specimens were cultured for *Legionella*, and isolates underwent molecular typing.

RESULTS: Seven confirmed and 27 suspect LD and 40 PF cases were identified; 15 (14 LD, 1 PF, 20%) of 74 case-patients were hospitalized. Of 369 employees in both buildings, 293 (79%) were interviewed. Persons with LD were older (mean age 50 years vs. 43 for well, $p=0.004$), more likely to smoke (relative risk (RR) 2.2, 95% confidence interval (CI) 1.3-3.8) and have chronic medical conditions (RR 1.7, CI 1.05-2.6). Characteristics of those with PF did not differ from well persons. Working in building A was associated with risk for LD (RR 2.3, CI 1.7-3.0) and PF (RR 2.1, CI 1.6-2.8). Samples from a cooling tower outside building A grew *Legionella pneumophila* serogroup 1, matching a case-patient's sputum isolate by molecular typing.

CONCLUSIONS: A cooling tower was the source for this large mixed LD and PF outbreak. Host factors may influence whether exposed individuals develop LD or PF.

KEYWORDS: *Legionella pneumophila*, Legionnaires disease, Pontiac fever, occupational, outbreak

1:55

Receipt of Antiviral Treatment for Influenza Infection — United States, 2009–2010

AUTHORS: Shikha Garg, M. Biggerstaff, M. Jhung, L. Balluz, L. Finelli, A. Fry

BACKGROUND: The 2009–10 influenza pandemic resulted in an estimated 270,000 hospitalizations and 12,500 deaths in the United States. Treatment with influenza antiviral agents was recommended for outpatients with high-risk conditions to prevent influenza-associated hospitalization and death. We utilized a new Behavioral Risk Factor Surveillance System (BRFSS) module to assess whether persons with high-risk conditions received antiviral treatment.

METHODS: BRFSS is a state-based, random-digit-dialed household survey of non-institutionalized U.S. adults aged ≥ 18 years. From September 2009 to March 2010, respondents were asked if they had an influenza-like illness (ILI) (fever with cough or sore throat), sought care, were diagnosed with influenza, and received antiviral treatment. We estimated the weighted percentage of persons diagnosed with influenza that reported receiving antiviral treatment by respondent demographics, access to healthcare, and presence of a high-risk condition (asthma, diabetes, cardiovascular disease, stroke, or age ≥ 65 years).

RESULTS: Of 217,120 respondents, 8.1% reported ILI, 40% of persons with ILI sought medical care, 26% of those who sought care were diagnosed with influenza, and 36% with an influenza diagnosis reported receiving antiviral treatment. Factors associated with receiving treatment included age < 65 years (OR: 2.01; $P = 0.027$) and having a primary healthcare provider (OR: 2.31; $P = 0.028$). Receipt of treatment did not vary by race-ethnicity, health insurance, education, or high-risk condition. Among persons with high-risk conditions diagnosed with influenza, only 32% reported receiving antiviral treatment.

CONCLUSIONS: The majority of high-risk adults diagnosed with influenza were not prescribed antiviral agents. Efforts are underway to improve use of antivirals for treatment of high-risk persons. BRFSS has been modified for the 2010–11 influenza season to obtain additional measures of antiviral receipt.

KEYWORDS: influenza, human; antiviral agents; behavioral risk factor surveillance system; adult

Abstracts

Monday

2:15

Outbreak of Severe Respiratory Illness Associated with Human Enterovirus 68 Among American Indian Children – Arizona, 2010

AUTHORS: Lara M. Jacobson, J. Redd, E. Schneider, X. Lu, M. Oberste, D. Erdman, G. Fischer, G. Armstrong, J. Montoya, J. Cheek

BACKGROUND: Human enterovirus 68 (HEV-68) is rarely reported and inadequately characterized clinically. In August 2010, the Indian Health Service detected a possible increase in pediatric respiratory admissions at a hospital serving an isolated community in Arizona. We investigated to confirm and characterize the outbreak.

METHODS: We reviewed hospital admission records for August–September 2010 to identify cases of respiratory illness, defined as cough and either tachypnea or hypoxia upon admission, among children aged 6 months–18 years. We characterized cases through chart review, family interviews, and nasopharyngeal swab testing.

RESULTS: Pediatric respiratory illness admissions increased during August–September 2010 (31/80; 39%) compared with August–September 2007–2009 (32/205; 16%; $P = 0.02$). Eighteen cases were identified (mean age: 7 years; range: 6 months–18 years). Symptoms included cough (100%), difficulty breathing (83%), fever (61%), and congestion (61%). Twelve (71%) patients of 17 with available information reported exposure to non-hospitalized ill contacts with respiratory symptoms during the week before admission. Of 10/18 patients (56%) who presented with wheezing, 6 (60%) had no prior asthma history. Nine of sixteen (56%) patients with chest radiographs had infiltrates; 15/18 (83%) required supplemental oxygen; and 1/18 (6%) required intensive care. Nasopharyngeal swabs tested positive for HEV by real-time reverse transcription-polymerase chain reaction in 5/7 samples (71%) and were confirmed as HEV-68 by amplicon sequencing.

CONCLUSIONS: This outbreak of severe pediatric respiratory illness was associated with HEV-68. Clinicians should include HEV-68 as a possible etiology of severe respiratory disease. Reported exposure to nonhospitalized ill contacts indicates that milder clinical presentations might occur and HEV-68 might have circulated more widely within the community.

KEYWORDS: disease outbreaks; enterovirus; Indians, North American

2:35

The Lung Fungus Among Us: A Large Urban Outbreak of Blastomycosis – Marathon County, Wisconsin, 2010

AUTHORS: Monika Roy, E. Deak, K. Benedict, M. Kirby, J. Trask, C. Sickler, P. Moua, D. Grosskurth, S. Brown, R. Mroczenksi, R. Trowbridge, E. Eckardt, R. Marx, J. Theurer, R. Hefferman, J. Archer, J. Davis, B. Park

BACKGROUND: During 2010 a large outbreak of blastomycosis, a potentially life-threatening fungal infection, was detected in Wisconsin. We conducted an investigation to characterize this occurrence.

METHODS: We analyzed laboratory-confirmed blastomycosis case data reported to the Wisconsin Electronic Disease Surveillance System, mapped case residences and recreational sites using GIS, and examined data on climate, soil, and major construction projects. After demonstrating geographic case clustering, we conducted a case-control study to determine factors associated with this finding. A cluster was defined as either two household cases with ≥ 1 additional neighborhood case or ≥ 4 neighborhood cases. Controls were matched (3:1) by age and residence; data were obtained during in-person interviews. We calculated matched odds ratios and conducted multivariate logistic regression modeling.

RESULTS: During September 1, 2009 – June 14, 2010, 55 blastomycosis case-patients were identified. Of these, 33 (60%) were hospitalized, 2 (3.6%) died, 30 (55%) were in a cluster, and 21 (38%) were Hmong. Estimated annual incidence during the outbreak was higher among Asians than non-Asians (413 vs. 33/ 100,000, $p < 0.0001$), but incidence increased in both groups (275% and 198% increase above baseline, respectively). Typical risk factors, including outdoor activities, were not associated with case cluster occurrence; Asian race (aOR: 19.3, CI: 1.966->999) and having a chronic medical condition (aOR: 8.9, CI: 1.189->999) were associated. Weather patterns and soil conditions were favorable for *B. dermatitidis* conidia release; major construction occurred near several case cluster areas.

CONCLUSIONS: This outbreak was likely related to multi-focal environmental sources and involved unique clustering among Hmong persons without traditional risk factors. The reasons for the high Hmong-related incidence of blastomycosis are unclear, but may involve genetic predisposition.

KEYWORDS: blastomycosis, outbreaks, environment, Wisconsin

MONDAY, APRIL 11

SESSION D 3:20

Monday

Studies Warn Parents About Link of Aspirin to Childhood Disease

November 9, 1980

The New York Times

Pediatrics, 3:15–5:20 p.m.
Atrium Ballroom B and C
MODERATOR: Susan Lukacs



Reye Syndrome Associated with Salicylate Consumption Karen M. Starko

During an outbreak of influenza A, 7 patients with Reye syndrome and 16 ill classmates chosen as controls were evaluated for characteristics of the patients' prodromal illness and the controls' illness and for both groups' use of medication. Patients during the prodromal illness and controls had similar rates of sore throat, coryza, cough, headache, and gastrointestinal complaints but had different rates of documented fever, which occurred significantly more often in cases than in controls ($p = .05$). While medications that did not contain salicylate were taken as frequently by patients as by controls, patients took more different types of salicylate-containing medications than did controls ($p < .01$). All 7 patients took salicylate, whereas only 8 of 16 controls did ($p < .05$). Patients took larger doses of salicylate than all controls ($p < .01$). When the 8 controls who took salicylate were compared with the patients, the patients still tended to take larger doses ($p = .05$). Patients with fever took salicylate more frequently than did controls with fever ($p < .01$). In addition, salicylate consumption was correlated with severity of Reye syndrome ($p < .05$). It is postulated that salicylate, operating in a dose-dependent manner, possibly potentiated by fever, represents a primary etiologic agent in Reye syndrome.

Waterborne Outbreak of Norwalk-Agent Gastroenteritis Cornelia E. Davis

At least 255 persons who visited a recreational park in Michigan between July 13 and 16, 1979, contracted gastroenteritis. The incubation period ranged from 6 to 78 hours, with a median of 39 hours. Nausea, vomiting, and diarrhea or abdominal cramps were noted in all cases, and fever and other systemic manifestations occurred in a large majority of them. The illness was mild and self-limiting, ending in 24–48 hours. The causative agent was

Trends in Intussusception Among United States Infants Before and After Implementation of the Rotavirus Vaccination Program, 2000–2008

AUTHORS: Catherine Yen, J. Tate, C. Steiner, M. Cortese, M. Patel, U. Parashar

BACKGROUND: In 1999, a previous rotavirus vaccine was withdrawn in the US because it caused intussusception, a form of bowel obstruction that often requires surgical treatment. While US data have shown no increased risk of intussusception with rotavirus vaccines introduced since 2006, data from international settings suggest a low-level risk, primarily after the first vaccine dose. We assessed population-level trends in intussusception among US infants before and after introduction of rotavirus vaccination.

METHODS: We examined intussusception hospitalization rates among infants <12 months in 22 states using hospital discharge data. We compared rates for prevaccine years 2000–2005 with postvaccine years 2007 and 2008.

RESULTS: Compared with the overall intussusception hospitalization rate for 2000–2005 (32.7 hospitalizations/100,000 infants), the rate increased in 2007 (39/100,000; rate ratio [RR]: 1.2; 95% confidence interval [CI]: 1.1–1.3), but was similar in 2008 (32.8/100,000; RR: 1.0, 95% CI: 0.9–1.1). Among 6–14 week-old infants who receive most first rotavirus vaccine doses, rates were greater in both 2007 (13.2 hospitalizations/100,000 infants 6–14 weeks; RR: 1.3; 95% CI: 1.0–1.8) and 2008 (15.4/100,000; RR: 1.6; 95% CI: 1.2–2.1) compared with 2000–2005 (9.8/100,000). An estimated 25 and 40 excess intussusception hospitalizations occurred nationally among 6–14 week-old infants in 2007 and 2008, respectively, when compared with 2000–2005.

CONCLUSIONS: Although no sustained change in overall intussusception hospitalization rates among US infants <12 months occurred after rotavirus vaccine introduction, among 6–14 week-old infants, a small significant increased risk of intussusception was observed, suggesting a possible risk with the first dose of rotavirus vaccine that requires further evaluation. This low-level risk, if confirmed, is substantially outweighed by well-documented benefits of vaccination in US children (e.g., prevention of ~50,000 gastroenteritis hospitalizations in 2008).

KEYWORDS: rotavirus vaccines, viral vaccines, intussusception, rotavirus

3:40

Pediatric Influenza Hospitalizations During the 2009 H1N1 Pandemic

AUTHORS: Chad M. Cox, L. Kamimoto, T. D'Mello, A. Perez, A. Reingold, K. Gershman, K. Yousey-Hindes, K. Arnold, M. Farley, P. Ryan, R. Lynfield, J. Baumbach, S. Zansky, N. Bennett, A. Thomas, W. Schaffner, L. Finelli

BACKGROUND: Since 2003, the Emerging Infections Program (EIP) Network has conducted population-based surveillance for laboratory-confirmed influenza hospitalizations among children. Prior to the 2009 H1N1 pandemic, the highest pediatric hospitalization rate (31 per 100,000 children) was during the 2003-04 influenza season. We analyzed EIP Network data to quantify intra-pandemic hospitalization rates and describe characteristics of hospitalized children.

METHODS: From April 15, 2009 through April 30, 2010, the EIP Network conducted surveillance among 5.4 million children in 10 states. Patient demographics, medical history, and clinical course were abstracted from hospital records. Incidence rates per 100,000 population were calculated using age-specific U.S. census data.

RESULTS: During the study time period, the overall pediatric influenza-related hospitalization rate was 45. Age specific rates for children aged < 6 months, 6–23 months, 2–4 years and 5–17 years were 206, 92, 50 and 32 respectively. Of the 2,543 children hospitalized, 462 (18%) were admitted to an intensive care unit, 145 (6%) required mechanical ventilation and 24 (1%) died. Fifty-seven percent of hospitalized children had ≥1 underlying medical condition including asthma (32%), seizure disorder (5%) and cardiovascular disease (4%). Influenza complications included pneumonia (32%), invasive bacterial infection (3%) and acute respiratory distress syndrome (2%).

CONCLUSIONS: Pediatric hospitalization rates during the pandemic varied by age and were highest among infants and younger children. More than half of children hospitalized during the pandemic had an underlying medical condition and many developed influenza-related complications. During the pandemic, the overall pediatric hospitalization rate for influenza-related illness was higher than any year since EIP surveillance began.

KEYWORDS: influenza, pediatric, hospitalizations, pandemic, H1N1

4:00

Breaking the Sound Barrier: Evaluating Early Hearing Detection and Intervention Data Collection – Iowa, 2010

AUTHORS: Jill Glidewell, T. O'Hollearn, J. Thorud, K. Crider, C. Hinton

BACKGROUND: Congenital hearing loss affects 2–3 infants per 1,000 live births. Newborn hearing screening ensures early detection of hearing loss. State hearing screening programs need accurate, timely tracking and follow-up to enable early intervention services, which reduce language and developmental delays. Accuracy of data can be affected by method of data entry; manual entry is associated with increased errors. In Iowa, one-third of infants referred from screening are lost to follow-up. Iowa law mandates that results be reported within six days of screening. We evaluated follow-up and data reporting processes to assess limitations in meeting these standards.

METHODS: We electronically surveyed newborn hearing screening facilities (birthing hospitals and Area Education Agencies (AEAs)) to determine methods and timeliness of data entry and reporting. We defined “untimely” as >6 days. We compared electronic versus manual data entry and reporting by facility type and hospital level of care.

RESULTS: Of 146 surveys distributed, 128 were completed (response rate = 88%). 13 of the 90 birthing hospitals reported manual entry (versus electronic import) of screening results with variation by hospital type: 88% for level I (community) hospitals ($n = 43$) versus 50% for Level III (specialized care) hospitals ($n = 4$) ($p < 0.001$). All AEAs reported manual entry of results. Untimely reporting occurred in 10% of hospitals ($n = 5$) and 15% of AEAs ($n = 4$).

CONCLUSIONS: Facilities reported limited electronic data reporting, with the greatest need for improvement among Level I hospitals and AEAs. Overall, facility reporting was timely. However, selected facilities did not meet the reporting requirement. Our findings will guide improvements in data reporting processes to aid tracking and to reduce loss to follow up.

KEYWORDS: hearing loss, neonatal screening, early intervention, hospital birth center

4:20

Reduced Prevalence of Hepatitis B Vaccination Among Children and Adolescents Aged 2–19 Years Without a Usual Source of Health Care — United States, 2005–2008

AUTHORS: Caitlin G. Reed, D. Dassey, L. Mascola

BACKGROUND: Hepatitis B (HepB) virus infection is a vaccine-preventable cause of cirrhosis and liver cancer. In 1991, the Advisory Committee for Immunization Practices recommended universal childhood HepB vaccination. Vaccines for Children (VFC) provides free vaccines to uninsured and underinsured children, but limited access to care might prevent children from receiving vaccines. We evaluated associations between hepatitis B immunization (HBI), usual source of care (USC), insurance coverage and demographic factors.

METHODS: In-home interview data from the nationally representative 2005–2008 National Health and Nutrition Examination Survey were analyzed for 7,308 children and adolescents aged 2–19 years. Respondents or proxies (for participants aged <16 years) reported vaccination status, insurance coverage, and demographic factors. HBI was defined as receipt of 3 doses of HepB vaccine. Data were weighted to account for complex survey design. Logistic regression was used to identify factors associated with HBI.

RESULTS: Prevalence of HBI was 88% overall, 89% among children with USC, and 76% among children without USC. Compared with children with USC, those without USC had reduced HBI prevalence ($P<0.00001$). Having no USC also was associated with lower HBI, compared to those with USC (adjusted odds ratio [AOR]: 0.48; 95% confidence interval [CI]: 0.33–0.69) in multivariate analysis. HBI was not significantly associated with age, sex, or education. Uninsured non-Hispanic whites and Mexican-Americans had lower HBI (AOR: 0.32; 95% CI: 0.18–0.57 and AOR: 0.62; 95% CI: 0.44–0.89, respectively) compared to their counterparts who were insured.

CONCLUSIONS: Despite availability of free vaccines through VFC, children who lack USC have lower HepB vaccine coverage than children with USC. Health system reforms that increase access to USC might help to reduce this disparity.

KEYWORDS: hepatitis B vaccines, child welfare, health services accessibility, insurance, health, health status disparities

4:40

Public Health Response to a Severe and Rapidly Progressive *Neisseria meningitidis* Outbreak in an Elementary School — Oklahoma, 2010

AUTHORS: Steven M. Grube, L. Smithee, H. Wu, C. Hatcher, B. Harcourt, L. Mayer, R. Mair, T. Clark, K. Bradley

BACKGROUND: Invasive serogroup C meningococcal (*Neisseria meningitidis*) disease (SCMD) outbreaks require urgent prevention and control measures, are associated with high case-fatality ratios, and cause concern about secondary transmission in affected communities. Mass chemoprophylaxis might be indicated in certain settings; vaccination should be considered if primary attack rate exceeds 10 cases/100,000 persons. During March 10–31, 2010, the Oklahoma State Department of Health (OSDH) investigated an SCMD outbreak with 2 deaths in a 1,850-student school complex in rural Oklahoma.

METHODS: Active case finding was implemented to identify outbreak-associated cases. Cases were classified according to Council of State and Territorial Epidemiologists case definitions. *N. meningitidis* serogrouping was performed at the state public health laboratory; pulsed-field gel electrophoresis (PFGE) and multilocus sequence typing (MLST) were performed at CDC. Chemoprophylaxis and vaccine campaigns were performed at the school, county health department, and a local physician's office.

RESULTS: Five SCMD cases (1 probable, 4 confirmed) with onsets during March 9–11 were identified; 4 occurred in 2 elementary classrooms (kindergarten and 2nd grade), and 1 in a high-school classroom. The school-complex primary attack rate was 162 cases/100,000 persons. All meningococcal isolates had indistinguishable MLST and PFGE patterns. Beginning March 11, a chemoprophylaxis campaign was targeted to approximately 975 elementary students, faculty, and nonelementary students' contacts; 1,063 persons received prophylaxis. Beginning March 19, school-complex-wide clinics administered meningococcal vaccine to 1,459 students and faculty; 79% of the school-complex population. After these campaigns, OSDH identified no additional cases.

CONCLUSIONS: Chemoprophylaxis and vaccination achieved high compliance among the school population. Although the individual effectiveness of each control measure was not evaluated, the rapid, two-pronged intervention appears to have successfully interrupted this SCMD outbreak.

KEYWORDS: *Neisseria meningitidis*, postexposure prophylaxis, meningococcal vaccines

Abstracts

5:00

Race/Ethnic Differences in Low-Fat Milk Consumption Among Children and Adolescents – United States, 2005–2008

AUTHORS: Brian K. Kit, C. Ogden

BACKGROUND: In childhood, obesity is associated with elevated lipid concentrations and blood pressure. Furthermore, obese children often become obese adults. To prevent childhood obesity, the American Academy of Pediatrics has endorsed dietary recommendations that include promotion of low-fat milk (LFM) for children 2+years. Because of race/ethnic differences in the prevalence of childhood obesity, we sought to describe differences by race/ethnicity in LFM consumption.

METHODS: Data from 7,909 children ages 2-19 years in the 2005-2008 National Health and Nutrition Examination Survey, a representative sample of the US population were analyzed. During a limited food frequency interview, frequency of milk consumption and type of milk consumed over the last 30 days was collected. Milk type was dichotomized as LFM (skim and 1%) or other (whole and 2%). Age-stratified multivariable logistic regression models were used to assess differences in LFM consumption by race/ethnicity controlling for gender and household income.

RESULTS: Overall, 74.1% (SE= 1.1), 15.6% (SE=0.8), and 10.2% (SE=0.5) of children reported consuming milk daily, weekly, and rarely/never/varied. Among milk drinkers, 19.7% (SE=1.5) consumed LFM. In the fully adjusted models, non-Hispanic black (NHB) children 2-5 years (aOR=0.08 [95%CI: 0.04-0.16]), 6-11 years (aOR=0.15 [95%CI: 0.09-0.26]), and 12-19 years (aOR=0.19 [95%CI: 0.11-0.30]) had lower odds of LFM consumption compared to non-Hispanic white (NHW) children. Mexican American (MA) children 2-5 years (aOR=0.19 [95%CI: 0.11-0.34]), 6-11 years (aOR=0.34 [95%CI: 0.19-0.60]), and 12-19 years (aOR=0.46 [95%CI: 0.28-0.75]) had lower odds of LFM consumption compared to NHW children.

CONCLUSIONS: LFM consumption among children was low. Compared with NHW children, NHB and MA children had lower consumption of LFM. Interventions designed to prevent childhood obesity by promoting LFM consumption may be informed by these findings.

KEYWORDS: child welfare, nutrition, obesity, milk

TUESDAY, APRIL 12

SESSION E1

An Awful Howl: Andrew Hits Hardest in South Dade

August 24, 1992, by A. Markowitz

The Miami Herald

Environmental and Occupational Health

8:30-10:15 a.m.

Atrium Ballroom B and C

MODERATOR: Judy Qualters

Risk Factors for Heatstroke: A Case-Control Study

Edwin M. Kilbourne, T. S. Jones, K. Choi, S. B. Thacker
To elucidate risk factors for heatstroke, a case-control study was conducted in St. Louis and Kansas City, Mo., during July and August 1980; 147 cases of heatstroke (severe heat illness with documented hyperthermia) and 441 age- and sex-matched, neighborhood controls (3 controls per heatstroke patient) were interviewed using a standard questionnaire. Preliminary results indicated patients were more likely than controls to be inactive or bedridden; to have underlying alcoholism, mental illness, depression, or diabetes mellitus; and to be taking a major tranquilizer or anticholinergic drug. Controls were more likely to own air conditioners and to spend extra time in air-conditioned places; to protect themselves by taking extra liquid, wearing light clothing, and reducing their activity during the heat; to report having been warned about danger from the heat; to live in single-family dwellings; and to have moderate or heavy tree growth near their residences. This study identifies characteristics associated with high risk for heatstroke and should help officials directing heat-wave relief efforts to focus on persons at highest risk.

Casualties of the May 18, 1980, Eruption of Mount St. Helens

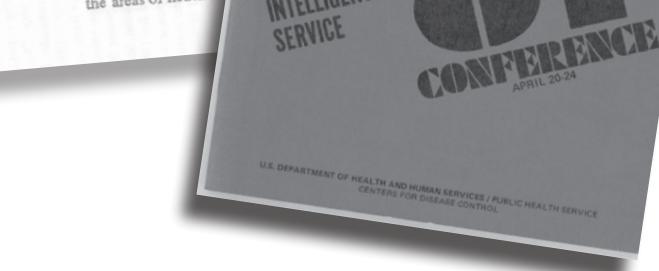
Roy T. C. Ing, G. Rogers, H. Falk, J. Horan
On May 18, 1980, Mount St. Helens, in Washington, erupted as a massive landslide followed by a strong lateral blast toward the north, resulting in a 12 by 20 mile area of destroyed or blown down trees and heavy mudflow into the North Fork of the Toutle River. As of Feb. 1, 1981, bodies of 33 persons had been recovered, 2 rescued victims later died of burn complications, and at least 23 persons were still missing and presumed dead. We reviewed autopsy findings and investigated the circumstances surrounding the deaths and also interviewed 100 survivors to determine factors related to survival.

All but 2 of the 28 dead and missing had been in the areas of mudflow, tree blowdown, and tree destruction. The causes of death were trauma in 10, asphyxiation from mudflow in 1, carbon monoxide poisoning in 1, and drowning in 1. These areas, giving a fatality rate of 100 percent, were located within the blowdown area or within the 10-mile radius of the blast. One person had a 20-degree burn and another 6 had a 10-degree burn. All but 2 of the 28 dead and missing had been in the areas of mudflow, tree blowdown, and tree destruction. The causes of death were trauma in 10, asphyxiation from mudflow in 1, carbon monoxide poisoning in 1, and drowning in 1. These areas, giving a fatality rate of 100 percent, were located within the blowdown area or within the 10-mile radius of the blast.

Beyond the tree destruction were identified, giving a fatality rate of 100 percent. The causes of death were trauma in 10, asphyxiation from mudflow in 1, carbon monoxide poisoning in 1, and drowning in 1. These areas, giving a fatality rate of 100 percent, were located within the blowdown area or within the 10-mile radius of the blast.

Respiratory Morbidity in the Areas of Ashfall from the May 18, 1980, Eruption of Mount St. Helens

Peter J. Baxter, R. T. C. Ing, G. Rogers, H. Falk, J. Horan
Shortly after the major eruption of Mount St. Helens, a surveillance system was established to monitor the areas of ashfall in western Washington and Oregon. On May 25 and June 12, 1980, there were 100 hospitalizations for pulmonary complications in the areas of heaviest ashfall.



8:35

Mental Health Needs Assessment After the Gulf Coast Oil Spill – Alabama and Mississippi, 2010

AUTHORS: Danielle E. Buttke, S. Vagi, T. Bayleyegn, K. Sircar, T. Strine, M. Morrison, M. Allen, A. Wolkin

BACKGROUND: On April 20, 2010, the Deepwater Horizon drilling unit exploded 40 miles off the coast of Louisiana, resulting in 11 deaths and the largest marine petroleum release in history. Previous oil spill disasters have been associated with negative mental health outcomes in affected communities. In response to requests from Mississippi and Alabama, we identified potential mental health issues resulting from this event by implementing a novel use of a Community Assessment for Public Health Emergency Response (CASPER).

METHODS: We used a two-stage cluster sampling method to select a representative sample of 210 households from three separate sampling frames, two in Alabama and one in Mississippi. We administered a questionnaire that included questions about exposure; physical and behavioral symptoms; and standardized behavioral health questions that were adopted from Behavioral Risk Factor Surveillance System (BRFSS). We conducted individual and household weighted cluster analysis and compared BRFSS questions to the most recent (2006 and 2009) state and national BRFSS reports.

RESULTS: Among the sampling frames, 15.4–24.5% of individuals reported depressive symptoms, with 21.4–31.5% reporting symptoms consistent with an anxiety disorder, and 16.3–22.8% reporting 14 or more mentally unhealthy days in the past 30 days. Overall, a higher proportion of negative quality of life indicators and social context outcomes were reported as compared to BRFSS surveys. Between 32.1 and 35.7% of all households reported decreased income since the oil spill, and 35.5 to 38.2% of all households reported being exposed to oil.

CONCLUSIONS: The increased prevalence of negative quality of life indicators, depressive and anxiety symptoms, suggest that the public health response should include mental health intervention. This illustrates a novel use of CASPER methodology.

KEYWORDS: oil spill, mental health, BRFSS, CASPER, disaster

8:55

Aflatoxin Exposure in Kenya

AUTHORS: Ellen E. Yard, J. Daniel, R. Breiman, D. Mutonga, Y. Rono, M. Thurania, M. Abdirizak, M. Rybak, C. Powers, L. Lewis

BACKGROUND: Aflatoxin, a potent fungal toxin that contaminates crops worldwide, is highly hepatotoxic and carcinogenic. Since 2004, >500 poisonings and >200 deaths have occurred in Kenya from consuming aflatoxin-contaminated maize. In 2010, Kenya reported widespread maize aflatoxin contamination. Subsequently, the Kenyan government requested CDC technical support to assess national aflatoxin exposure from commercial maize flour and to investigate an aflatoxicosis outbreak.

METHODS: Teams collected maize flour samples from 20 of the 21 large commercial millers throughout Kenya and tested for aflatoxin using immunoaffinity chromatography. Teams also searched for suspected aflatoxicosis case-patients (a person ≥ 2 years old with clinical jaundice, onset <30 days from the outbreak onset) by visiting households in villages where suspected cases had been reported. Teams collected blood samples and questionnaire data from all suspected case-patients and asymptomatic family members. We measured serum aflatoxin B1-albumin adducts using LC-MS/MS.

RESULTS: In Kenya, commercial maize flour aflatoxin ranged from 2–81 parts per billion (ppb) (median: 12 ppb). Overall, 65% percent of flour samples exceeded Kenya's 10-ppb regulatory limit. Teams identified 15 suspected aflatoxicosis case-patients and 47 asymptomatic family members. Serum aflatoxin-albumin adducts were detected among all persons assessed, including asymptomatic family members (median: 0.09; range: 0.02–14.3 ng/mg albumin). In addition to jaundice, suspected case-patients often reported recent abdominal pain (87%), swollen stomach (87%), vomiting (80%), and fever (73%).

CONCLUSIONS: Findings suggest aflatoxin contamination of commercial maize flour could be widespread throughout Kenya. Finding elevated serum aflatoxin-albumin concentrations in all persons assessed, including asymptomatic family members, suggests a significant public health risk. Systems to identify and destroy contaminated maize are needed to prevent future aflatoxicosis outbreaks and decrease chronic exposure.

KEYWORDS: maize, aflatoxin, exposure assessment, aflatoxicosis

Abstracts

Tuesday

9:15

Public Health Consequences from Chlorine Released at a Metal Recycling Facility — California, 2010

AUTHORS: Ekta Choudhary, K. Kelsey, R. Roisman, M. Orr, A. Anderson, Y. Iossifova, P. Ruckart, R. Kreutzer, B. Materna, M. Duncan

BACKGROUND: On June 8, 2010, chlorine gas, which can cause severe respiratory symptoms, was unintentionally released from a ruptured 1-ton low-pressure tank at a California recycling facility, affecting 29 people and sending 23 to seven area hospitals. The California Department of Public Health (CDPH) received assistance from ATSDR and CDC to determine the extent of exposure from the chlorine gas release and associated health effects.

METHODS: We used ATSDR's Assessment of Chemical Exposures (ACE) survey to collect demographic information, exposure characteristics, symptoms experienced, health services used, and medical history from exposed persons. We also obtained medical charts for exposed persons treated at area hospitals. We used Chi-square analyses to compare exposure characteristics of hospitalized and non-hospitalized persons.

RESULTS: Twenty-seven (93.1%; 16 employees, 11 non-employees) of 29 exposed persons were interviewed using the ACE survey. Of these, 13 (48.1%) were exposed to chlorine gas for ≥ 30 minutes before decontamination and 23 (85.1%) reported experiencing acute health effects within 24 hours of the chlorine release. Of 29 exposed persons, 23 (79.3%) received care at a hospital; 17 (58.6%) were treated and discharged from the emergency department, 6 (20.7%) were hospitalized. All hospitalized persons received nebulized 2-agonists, 5 (83.4%) received oxygen, and 1 (16.7%) required mechanical ventilation for 4 days. No statistically significant associations were observed between exposure time, proximity to the explosion, or pre-existing medical conditions and hospitalization.

CONCLUSIONS: The rapid investigation revealed significant morbidity associated with the accidental release of chlorine gas and described exposed persons' characteristics. The CDPH created and mailed a Chemical Release Alert to >1200 recycling facilities in California to educate them on how to prevent future incidents and health effects from releases of hazardous chemicals.

KEYWORDS: Assessment of Chemical Exposures (ACE), chlorine exposure, chemical release

9:35

Regional Differences of Coal Workers' Pneumoconiosis Prevalence 40 Years After Implementation of the 1969 Coal Act — United States, 2005–2009

AUTHORS: Eva Suarthana, A. Laney, E. Storey, J. Hale, M. Attfield

BACKGROUND: Coal workers' pneumoconiosis (CWP) prevalence in the United States declined from an 11.2% five-year average during 1970–1974 to 2.0% during 1995–1999. However, CWP prevalence has been increasing since 2000 with geographic clustering in central Appalachia. We examined the potential causes of this increase.

METHODS: CWP prevalence was calculated for 12,425 underground coal miner participants in the Coal Workers' Health Surveillance Program for 2005–2009 by Mine Safety and Health Administration (MSHA) geographical districts. Inspector-measured coal dust concentration, seam height, and hours worked per miner data were obtained from MSHA. District-specific predicted prevalences were estimated using a published logistic regression exposure-response model applicable to U.S. miners. The predictors were miner's age, tenure, coal rank, and measured coal dust concentration. The resulting observed and predicted CWP prevalences were compared using chi-square testing.

RESULTS: Observed prevalence was significantly higher than predicted in the central Appalachian region (10.1% versus 4.2%; prevalence ratio (PR) = 2.4; $P < 0.001$). It was significantly lower than predicted in other regions (1.6% versus 3.6%; PR = 0.4; $P < 0.001$). The central Appalachian region had a significantly older workforce with greater mining tenure, slightly longer hours worked per miner, higher proportion of smaller mines, and lower seam heights than other regions. Lower average coal dust levels were reported for central Appalachia.

CONCLUSIONS: The high CWP prevalence in central Appalachia was not explained by the reported dust concentration. Besides the possibility of under-reporting of dust concentration, likely contributing factors include smaller mine size and low-seam mining, which may be associated with higher silica exposure. These results suggest that extra effort is needed to control dust in small mines and low-seam mining.

KEYWORDS: coal mining, dust, pneumoconiosis, silica

9:55

TUESDAY, APRIL 12

CONCURRENT
SESSION E2

Laboratory-Acquired Human Cowpox Virus Infection in the US – 2010

AUTHORS: Andrea M. McCollum, C. Austin, J. Nawrocki, J. Howland, J. Pryde, A. Vaid, D. Holmes, R. Weil, Y. Li, K. Wilkins, H. Zhao, S.K. Smith, K. Karem, M. Reynolds, I.K. Damon

BACKGROUND: Human cowpox virus infections can be severe. Neither human nor animal infection has been reported in the US. In July, an unvaccinated laboratory researcher, who worked with a non-human pathogenic poxvirus, developed a painful, ulcerated lesion on a finger. The patient recovered, without incident, approximately three months after lesion onset.

METHODS: We interviewed the patient and laboratory personnel, and conducted a biosafety assessment. Molecular diagnostic assays and DNA sequencing were employed to identify the patient's infection and to assess the extent of environmental contamination.

RESULTS: In October, biopsy specimens were submitted to CDC for suspect orthopoxvirus testing. A series of realtime PCR assays on the biopsy tissue tested positive for non-variola orthopoxvirus, negative for vaccinia, and positive for cowpox DNA. There were cowpox virus stocks in the laboratory's freezer, but no known or intentional use of cowpox in the patient's laboratory in the past five years. Sequencing of the patient's isolate revealed a recombinant region consistent with recombinant cowpox strains stored in the freezer. Cowpox was detected in multiple viral stocks, including the viral stock used by the patient prior to illness onset. *Orthopoxvirus* DNA, but no live virus, was present from environmental swabs of several surfaces in the laboratory and a shared freezer room. There were no additional suspect cowpox cases in the patient's family, pets, or laboratory colleagues.

CONCLUSIONS: Data suggest that the patient was likely infected by handling laboratory reagents or environmental surfaces which were contaminated with cowpox. Vaccination is recommended for laboratory workers with risk of exposure to orthopoxviruses, including cowpox. Prompt diagnosis and reporting of orthopoxvirus infections to appropriate public health agencies can help reinforce appropriate infection control practices.

KEYWORDS: orthopoxvirus, cowpox, occupational exposure, disease notification

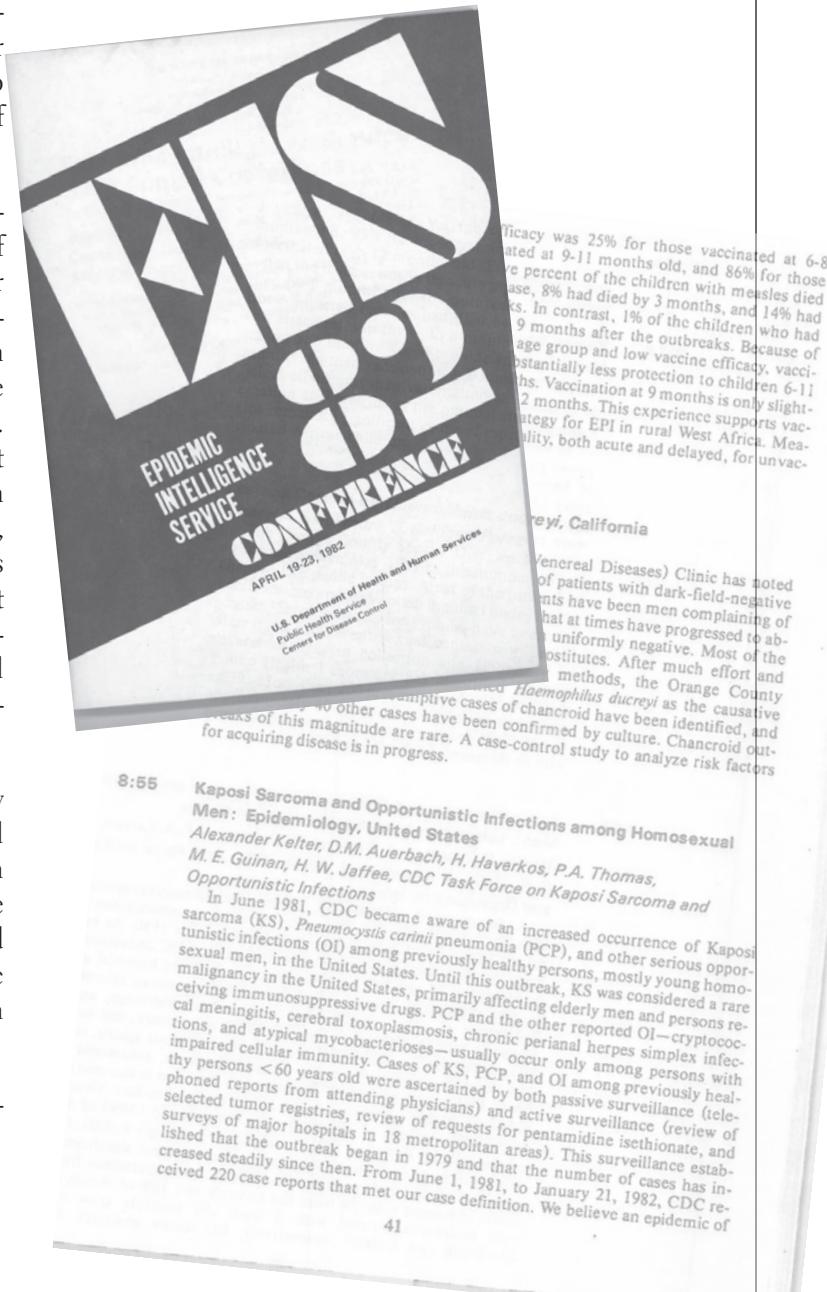
Rare Cancer Seen in 41 Homosexuals

July 3, 1981, by Lawrence K. Altman, MD

The New York Times

HIV, 8:30–10:15 a.m.
Atrium Ballroom A

MODERATOR: Linda Valleroy



Abstracts

Tuesday

8:35

Homophobia and HIV Risk Among Black Men Who Have Sex with Men — New York City and Philadelphia, 2005–2006

AUTHORS: William L. Jeffries IV, G. Millett, J. Bertolli, J. Lauby, C. Murrill, G. Marks

BACKGROUND: The rate of new HIV diagnoses among US men who have sex with men (MSM) is 44 times that of other men. Among racial/ethnic subgroups of MSM, HIV prevalence is highest among blacks. Despite advances in behavioral interventions, different interventions may be needed because social forces may promote HIV risk behaviors. Homophobia has been proposed as a social determinant of risk. We investigated whether experiencing homophobia predicts behaviors associated with HIV acquisition and transmission among black MSM.

METHODS: During 2005–2006, 1,154 black MSM aged ≥ 18 years in New York City and Philadelphia were recruited through a peer-recruitment sampling method. We measured experiences of homophobia. Among noninfected men, the outcome measure was risk of acquiring HIV (any unprotected anal sex). Among HIV-infected men, the outcome measure was risk of transmitting HIV (unprotected anal sex with men at risk of infection). We used multiple logistic regression models to examine the association between homophobia and unprotected anal sex, as well as the interactive effects of homophobia and social support, social network connections, and attachment to the gay community.

RESULTS: Overall, 61% of our sample experienced homophobia (12% physically assaulted; 36% treated improperly; 39% ridiculed). High levels of experienced homophobia predicted unprotected anal sex among noninfected men (adjusted odds ratio [AOR]: 2.2; 95% confidence interval [CI]: 1.4–3.6) and HIV-infected men (AOR: 2.7; CI: 1.5–5.0). We found no statistically significant interactions between experiencing homophobia and social relationship variables.

CONCLUSIONS: Homophobia may promote HIV acquisition and transmission among black MSM. Relationships with others might not mitigate homophobia's effect. Interventions to reduce societal homophobia experienced by black MSM should be considered in addition to existing HIV behavioral interventions.

KEYWORDS: human immunodeficiency virus, sexual behavior, homosexuals, men, blacks

8:55

HIV Testing Among Men Who Have Sex with Men Surveyed in the National HIV Behavioral Surveillance System — St. Louis, Missouri, 2008

AUTHORS: Yi-Chun Lo, S. Patrick, G. Turabelidze, M. Lin, Y. Friedberg

BACKGROUND: Approximately 70% of new human immunodeficiency virus (HIV) diagnoses in St. Louis occur among men who have sex with men (MSM), many of whom receive HIV diagnoses late in the course of disease (i.e., ≤ 12 months from an acquired immunodeficiency syndrome diagnosis). To decrease HIV morbidity, mortality, and transmission through earlier diagnosis, CDC recommends MSM receive HIV testing at least annually. We investigated recent HIV testing among MSM in St. Louis.

METHODS: The 2008 National HIV Behavioral Surveillance System survey was conducted in 21 U.S. cities through venue-based, time-space sampling. Men were interviewed for behavioral risks and HIV testing history. We included men in St. Louis with male-male sex within 12 months and excluded men who had tested HIV-positive as of 12 months before interviews. We identified factors associated with HIV testing within 12 months by multivariable log-binomial regression.

RESULTS: Among 339 MSM, 198 (58%) had been tested within 12 months; 15 (7.6%) tested positive. MSM were more likely to have been tested if they were black (adjusted prevalence ratio [APR]: 1.60; 95% confidence interval [CI]: 1.02–2.50); had visited health-care providers within 12 months (APR: 1.63; 95% CI: 1.27–2.09); or had discussed sexual identity or behaviors with health-care providers (APR: 1.56; 95% CI: 1.21–2.01). Of 141 untested, 89 (63%) stated perceived low HIV risk as the reason for not testing.

CONCLUSIONS: Although MSM in St. Louis were at high HIV risk, nearly half were not tested within the previous year. Annual visits to health-care providers with whom sexual identity and behaviors are discussed might help increase awareness of HIV risk and promote HIV testing among MSM in St. Louis.

KEYWORDS: HIV; population surveillance; homosexuality, male

9:15

HIV Testing Among Patients Infected with *Neisseria gonorrhoeae* — STD Surveillance Network, United States, 2009–2010

AUTHORS: Heather M. Bradley, L. Asbel, K. Bernstein, M. Mattson, P. Pathela, R. Pino, M. Samuel, J. Schwebke, M. Stenger, I. Tabidze, J. Zenilman, D. Dowell, H. Weinstock

BACKGROUND: An estimated 21% of 1.1 million HIV-infected US residents do not know they are infected and may unknowingly transmit HIV. Because people with sexually transmitted diseases (STDs) are at increased risk of HIV, CDC recommends HIV screening for patients seeking STD treatment. We investigated whether patients given a diagnosis of *Neisseria gonorrhoeae* during January 2009–June 2010 had also been tested for HIV.

METHODS: We used data from interviews with randomly selected gonorrhea-infected patients in the 12 state and local health jurisdictions constituting the STD Surveillance Network. We compared the prevalence of HIV testing concurrent with gonorrhea testing or treatment among patients seeking care in STD clinics and patients in other practice settings (emergency rooms, public and private outpatient facilities, hospitals, and family planning clinics).

RESULTS: Of 6,658 eligible patients, 3,462 (52%) were successfully interviewed. Complete data were available for 1,845/3,462 (53%). Of these, 51% were tested for HIV when they were tested or treated for gonorrhea. STD clinic patients were more likely to be tested for HIV than those in other practice settings (61% vs. 46%, $\chi^2=35.06$, $P < 0.01$). HIV testing was statistically significantly more common among black (53%) and Hispanic women (54%) compared with white women (36%) and among men who have sex with men (56%) compared with other men (48%). We found no association between HIV testing and sex, race (among men), age, or multiple sex partners.

CONCLUSIONS: HIV testing among gonorrhea-infected patients is sub-optimal. Interventions are needed to minimize missed opportunities for HIV testing of STD patients, particularly in settings other than STD clinics.

KEYWORDS: gonorrhea, HIV testing, STD clinic, STD surveillance

9:35

Smoking Prevalence and Associations Among HIV-Infected Persons — Oregon, 2007–2008

AUTHORS: John Y. Oh, K. Greene, H. He, S. Schafer, K. Hedberg

BACKGROUND: Previous studies have shown that smoking, the leading preventable cause of death, is highly prevalent in human immunodeficiency virus (HIV)-infected persons. As HIV-infected persons survive longer through combination antiretroviral therapy, reducing smoking prevalence is critical to further extending survival. In Oregon, 18% of adults smoke. We determined smoking prevalence and associations among Oregon HIV-infected persons to enhance prevention strategies.

METHODS: We examined 2007–2008 Oregon data from the Medical Monitoring Project, a population-based surveillance system for HIV-infected persons receiving care. We interviewed participants and abstracted medical records. Smokers were defined as participants who currently smoked “every day” or “some days”. Adjusted prevalence ratios (aPRs) were calculated from log-binomial regression.

RESULTS: The 538 HIV-infected persons had a mean age of 45.5 years (range: 18–76 years); 90% were male. Among males, 78% were men who had sex with men. Smoking prevalence was 46% (95% confidence interval [CI]: 41%–51%), more than twice the prevalence of adults statewide. Smoking was associated with education less than college degree (53% versus 21% with college degree; aPR: 2.3; 95% CI: 2.0–2.5), age <45 years (55% versus 39% in age ≥45 years; aPR: 1.2; 95% CI: 1.1–1.3), injection-drug use (64% versus 38%; aPR: 1.5; 95% CI: 1.4–1.6), and binge drinking (67% versus 43%; aPR: 1.3; 95% CI: 1.3–1.4). Smoking was not associated with sex, race/ethnicity, rural residence, depression, same sex or heterosexual activity, or high-risk sexual behavior.

CONCLUSIONS: To reduce tobacco-related morbidity and mortality in HIV-infected persons, aggressive strategies to combat smoking and overcome barriers to quitting are needed among HIV-infected persons, particularly among younger, less-educated persons, and those with histories of substance abuse.

KEYWORDS: HIV, smoking, prevalence, smoking cessation, alcohol drinking

9:55

Tuesday

Adverse Events in Infants Born to HIV-Infected Mothers Receiving 3-Drug Antiretroviral Regimens for Prevention of Mother-to-Child HIV Transmission – Kenya, 2003–2006

AUTHORS: Timothy D. Minniece, C. Zeh, N. Polle, P. Peters, B. Oyaro, B. Akoth, R. Ndivo, F. Angira, S. Oswago, P. Omolo, L. Mills, T. Thomas

BACKGROUND: Each year, over 300,000 children worldwide acquire HIV through mother-to-child transmission (MTCT). In many developing countries, nevirapine-based antiretroviral regimens are administered during pregnancy and breastfeeding to prevent MTCT. Nevirapine, unlike nelfinavir, is associated with life-threatening hepatic and cutaneous toxicities. It is unknown whether exposure to nevirapine in utero or during breastfeeding places infants at risk for toxicity. We evaluated toxicity rates among infants exposed to maternal nevirapine versus infants exposed to nelfinavir.

METHODS: During 2003–2006, we enrolled 522 HIV-infected pregnant women, initiating 3-drug antiretroviral regimens at 34 weeks' gestation and continuing through 6 months postpartum. We used Fisher exact test (>80% power to detect a 5% difference) to compare risk of age-specific hyperbilirubinemia, elevated alanine aminotransferase (ALT) level, and grade 2 (severe) rash among nevirapine- versus nelfinavir-exposed infants. We also assessed the association between these toxicities and other clinical factors.

RESULTS: Hyperbilirubinemia developed in 17 (6.3%) of 270 nevirapine-exposed and 16 (7.8%) of 206 nelfinavir-exposed infants ($P = 0.65$) and in 8 (22%) of 36 low-birth-weight infants ($P = 0.001$). ALT levels were elevated in 1 (0.4%) nevirapine-exposed infant and 4 (1.9%) nelfinavir-exposed infants ($P = 0.23$). Severe rash developed in 7 (2.6%) of nevirapine-exposed infants and 1 (0.5%) nelfinavir-exposed infant ($P = 0.15$). All outcomes were transient and resolved without change in the mother's antiretroviral regimen. Neither elevated levels of ALT nor severe rash was associated with any factor evaluated.

CONCLUSIONS: Infants exposed to nevirapine in utero and through breastfeeding were not at increased risk of hyperbilirubinemia, elevated ALT, or severe rash. Our data indicate that to prevent MTCT, nevirapine-based antiretroviral regimens during pregnancy and breastfeeding are as safe as nelfinavir-based regimens.

KEYWORDS: HIV; antiretroviral agents; nevirapine; nelfinavir; toxicity; infant, newborn

TUESDAY, APRIL 12

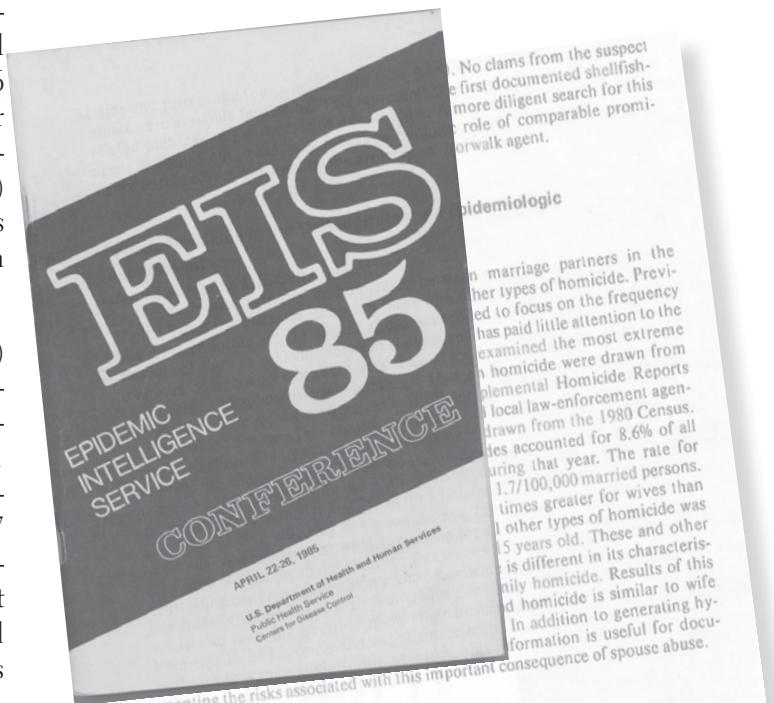
CONCURRENT SESSION F1

30 Years Ago, Atlanta Battled Most Infamous Killing Spree in City's History

August 7, 2009, by Christian Boone

The Atlanta Journal-Constitution

**Injury, 10:45 a.m.–12:10 p.m.
Atrium Ballroom B and C
MODERATOR: Jim Mercy**



1:05 Suicide and Homicide among Hispanics in the Southwest
Jack C. Smith, J. A. Mercy, M. L. Rosenberg
Although Hispanics are the largest ethnic minority in the United States, very little is known about their health status, especially in the areas of self-directed and interpersonal violence. To study suicide and homicide patterns for Hispanics of Mexican origin (Mexican Americans), we focused on five southwestern states (Arizona, California, Colorado, New Mexico, and Texas) in which more than 60% of all Hispanics in the United States reside (86% of whom are Mexican American). We obtained vital statistics data from state health departments on the number and characteristics of suicides and homicides for the white population for 1976-1982, with Hispanics and Anglos (white, non-Hispanic) identified separately. Suicide and homicide deaths of Anglos were used for comparison. Results show that the age-adjusted suicide rate for Hispanics (10.5/100,000 population) was almost one-half that of Anglos residing in the same area (18.5/100,000). Although Hispanic suicide rates were lower than Anglo rates, the differences were most marked in older age groups; younger Hispanic cohorts had suicide rates successively closer to the higher Anglo rates. For homicide, the age-adjusted rate for Hispanics (21.6/100,000) was more than 2.5 times greater for wives than for husbands. The rate for wife homicide was 1.5 times greater than for husbands. These and other findings are different in its characteristics and homicide is similar to wife homicide. In addition to generating information is useful for documenting the risks associated with this important consequence of spouse abuse.

10:50

Associations Between Intimate Partner Violence Victimization and Other Health Indicators Among Women and Men – Puerto Rico, 2005

AUTHORS: Kanako Ishida, B. Rivera-García, J. Rullán, W. Daley

BACKGROUND: In the United States, >496,000 women and >117,000 men reported physical or sexual assault by an intimate partner in 2009. Intimate partner violence (IPV) can have adverse effects on physical and mental well-being. This is the first study to explore associations between IPV and health in Puerto Rico.

METHODS: In this cross-sectional analysis of 2005 Behavioral Risk Factor Surveillance System data from Puerto Rico, we examined associations between IPV and 13 health indicators, using logistic regression to control for demographic, socioeconomic, and psychosocial variables. IPV was defined as physical or sexual assault (actual, attempted, or threatened) by a current or former spouse or dating partner.

RESULTS: Lifetime prevalence of IPV was 19.6% (95% confidence interval [CI]: 17.0–22.2) among women and 14.5% (CI: 11.4–17.7) among men. Among women, IPV victimization was associated with self-assessed poor physical (adjusted odds ratio [aOR]: 1.88; CI: 1.31–2.68) and mental (aOR: 1.86; CI: 1.31–2.63) health status, low level of life satisfaction (aOR: 3.39; CI: 2.00–5.75), cardiovascular disease (aOR: 1.69; CI: 1.08–2.66), human immunodeficiency virus (HIV)-related risk factors (aOR: 2.38; CI: 1.08–5.21), smoking (aOR: 2.72; CI: 1.63–4.53), and binge drinking (aOR: 2.27; CI: 1.34–3.85). Among men, IPV was associated with low level of life satisfaction (aOR: 2.90; CI: 1.31–6.41), asthma (aOR: 2.56; CI: 1.07–6.16), and HIV-related risk factors (aOR: 3.53; CI: 1.24–10.07).

CONCLUSIONS: We identified associations between IPV and multiple health indicators, which varied by sex. Although causality cannot be determined, these results indicate complex associations between IPV and health beyond physical lesions caused by abuse. Understanding this association offers opportunity for more comprehensive health interventions among IPV victims.

KEYWORDS: domestic violence, mental health, chronic disease, health behavior, Puerto Rico

11:10

Risk and Resiliency Factors Associated with Gang Affiliation Among High-Risk Youths

AUTHORS: Dawn D. McDaniel

BACKGROUND: Gang violence accounted for 25% of homicides in large cities from 2002-2006. Preventing gang affiliation (i.e., youth who either desire or have gang membership) might reduce subsequent gang activity. Previous research has focused on identifying risk factors for gang affiliation; however, little information is available on resiliency (i.e., protective factors). The objective of this study is to identify risk and resiliency factors to provide more direction for gang violence prevention strategies.

METHODS: We analyzed survey data from 4,131 youths in grades 7, 9, 11, and 12. Data were collected in 2004 from students in a high-risk, urban public school district. Regression analyses were conducted to assess the association between gang affiliation and alcohol and drug use, depression, suicidal ideation, victimization, parental supervision and reinforcement, adult, family, and peer support, coping skills, and school connectedness. Analyses controlled for sex, race/ethnicity, and age.

RESULTS: An estimated 7% of youths were gang affiliated. Adjusting for all factors, gang affiliation was positively associated with frequent alcohol use (prevalence odds ratio [OR]: 2.90; 95% confidence interval [CI]: 1.87-4.50), frequent drug use (OR: 2.00; 95% CI: 1.35-2.97) and suicidal ideation (OR: 1.45; 95% CI: 1.04-2.03). Gang affiliation was negatively associated with parental supervision (OR: 0.62; 95% CI: 0.45-0.86) and coping skills (OR: 0.29; 95% CI: 0.21-0.41). As the number of resiliency factors a youth endorsed increased their odds of gang affiliation decreased ($p<0.05$).

CONCLUSIONS: Although the cross-sectional nature of the data preclude defining causal relationships, findings suggest the potential benefit of increasing parenting and coping skills and reducing alcohol and drug use, and suicidal ideation to prevent gang affiliation.

KEYWORDS: gangs, resiliency, risk factors, primary prevention

Abstracts

Tuesday

11:30

Gender-Based Violence and Mental Health in Urban Refugees and Asylum Seekers in Kampala, Uganda

AUTHORS: Diane Morof, S. Sami, M. Mangeni, C. Blanton, B. Tomczyk

BACKGROUND: The relationship between gender-based violence (GBV) and mental health outcomes among conflict-affected populations has been documented. However data on urban refugees, a population representing nearly half of the world's 10.5 million refugees, is limited. We assessed the relationship between GBV and mental health outcomes among a population of female urban refugees.

METHODS: Using a computerized database, we selected a stratified simple random sample of Congolese and Somali refugees/asylum seekers aged 15–59 living in Kampala during September 2010. Due to security concerns, women were asked to report to a centralized location where trained interviewers assessed history of violence, depressive symptoms (using the Hopkins Symptom Checklist-25) and post-traumatic stress disorder (PTSD) (using the Harvard Trauma Questionnaire). To measure the association between violence and PTSD, we used logistic regression, adjusting for age and relationship status.

RESULTS: Of the 500 women selected, 119 presented to the survey center (23.4% response rate, 0.4% refusal rate). The mean age of participants was 32 years. Women lived in Kampala an average of 3 years. The lifetime prevalence of experiencing any violence (physical and/or sexual violence), physical violence and sexual violence were 77.5%, 76.2% and 63.3%, respectively. Almost all women (92%) had depression symptoms and 71.1% had PTSD symptoms. Women with a history of physical violence were more likely to report symptoms of PTSD (adjusted odds ratio [AOR]=8.4, 95% confidence interval [CI]=2.3–30.5), as were women with a history of sexual violence (AOR=4.2, 95% CI=1.5–11.7).

CONCLUSIONS: Despite a low response rate, a history of violence was strongly associated with PTSD among the majority of women surveyed. Survey findings expanded access to psychosocial programs for refugees however additional GBV and mental health services are needed.

KEYWORDS: violence, mental health, depression, PTSD, Uganda, refugee

11:50

Post-Earthquake Injuries and Surgical Procedures Performed at the University of Miami/Project Medishare Field Hospital – Haiti, 2010

AUTHORS: Monica U. Selent, G. Hotz, E. Ginzburg, G. Wurm, V. De Gennaro, L. Xu, V. Coronado, S. Basavaraju

BACKGROUND: On January 12, 2010, a 7.0 magnitude earthquake struck Haiti resulting in an estimated 222,570 deaths and 300,000 injured persons. The University of Miami Global Institute / Project Medishare (UMGI/PM) established the first field hospital in Port-au-Prince, Haiti following the earthquake, and then expanded their services, developing into a referral hospital. To gain a better understanding of the injury burden after an earthquake and determine the long term health care needs of injured patients, UMG/PM and CDC characterized the injuries and surgical procedures performed while the field hospital was open.

METHODS: We conducted a retrospective medical record review and descriptive analysis of all available inpatient records admitted from 12 January through 28 May 2010.

RESULTS: Of the 1,369 admissions, median age was 22.7 years (mean: 25.7 years; range: 1 day-96 years), with 504 patients aged <14 years and 682 aged >55 years, and 688 (50.3%) admissions were male. Median length of stay was 4 days (mean: 9 days; range: 1-87 days). Injury-related diagnoses were recorded for 581 (42.4%) patients, of which 346 (59.6%) required a surgical procedure. The most common injury-related diagnoses were fractures/dislocations, post-traumatic/surgical wound infections, and head/face/brain injuries. The most common injury-related surgical procedures were wound debridement/skin grafting, orthopedic trauma, and surgical amputation. Among all injured patients, 76.5% were discharged to a residential setting and 2.9% died. Among earthquake-specific injured patients, 67.5% presented within 4 weeks of the earthquake.

CONCLUSIONS: Disaster preparedness planning should account for intensive injury-related medical and surgical needs of large numbers of acute casualties seen immediately after moderate and severe earthquakes. During the recovery phase, many injury patients will require on-going post-surgical care and long term rehabilitation services.

KEYWORDS: injuries, earthquakes, disasters, disaster planning, rehabilitation, Haiti

TUESDAY, APRIL 12

CONCURRENT
SESSION F2**Virus Carried by Mice Is
a Mysterious Killer**

August 20, 1997, by Don Knapp

CNN

Zoonoses, 10:45 a.m.-12:10 p.m.**Atrium Ballroom A****MODERATOR:** Carol Rubin

Tuesday, April 19, 1994

Conclusions: Our findings show that agricultural and cleaning activities and an increased number of rodents at the household are associated with HPS. Control measures should focus on minimizing human contact with rodents.

***Emergence of a Newly Recognized Hantavirus in the United States**
Jeffrey S. Dugchin, C. Peters, R. Breiman, et al.

Background: In May 1993, an outbreak of acute, unexplained, rapidly progressive respiratory distress syndrome (URDS) occurred in the southwestern U.S. We conducted an investigation to identify the etiology, characterize the clinical illness, and develop strategies for prevention and control.

Methods: Sera from patients meeting a clinical case definition for URDS were screened for antibodies to a variety of pathogens, and recent hantaviral infection was indicated in several patients. A case of hantavirus pulmonary syndrome (HPS) was defined as URDS and laboratory evidence of hantavirus infection. Medical records were reviewed using a standardized data abstraction form for case-patients with hantaviral infection.

Results: Evidence of hantavirus infection was found in 17 patients (12/77% died). Antibodies to hantaviruses were detected in 14 patients; 9 patients had hantavirus RNA in lung tissue detected by polymerase chain reaction; 10 had hantavirus antigens in tissue detected by immunohistochemistry. Patient ages ranged from 13 to 64 years (mean, 32). All patients had a prodromal illness for 2-15 days (median, 4) prior to admission. Common symptoms included fever and myalgia (100%), cough or dyspnea (94%), tachypnea, tachycardia, and hypotension. Laboratory abnormalities included leukocytosis with left shift, thrombocytopenia, and prolonged partial thromboplastin time (PTT). Multivariate analysis demonstrated that age, PTT, and hemococoncentration were associated with death.

Conclusions: This outbreak of acute illness, designated hantavirus pulmonary syndrome, was caused by a previously unrecognized hantavirus. Clinical predictors for mortality may identify patients for therapeutic trials.

Vancomycin-Resistant Enterococcal Bloodstream Infections: Do These Infections Increase the Mortality Risk?
Leonardo A. Sirio, L. Danzig, R. Gaynes, and the National Nosocomial Infection Surveillance System

Epidemic Intelligence Service confirmed a rising vancomycin resistance among nosocomial enterococcal infections, but was able to discern if the high mortality rates among these infections are a result of the resistance pattern or other factors that influence mortality.

Methods: To determine risk factors for mortality in patients with nosocomial enterococcal primary bloodstream infections (NEPBIs), we conducted a retrospective cohort study in four NNIS hospitals. We abstracted data from patient medical records of all NEPBIs identified from January 1989 to June 1993 by NNIS personnel.

Results: Of 286 patients identified with NEPBIs, 100 had medical records available for review; 96 (31%) died, and 28 (15%) had a vancomycin-resistant isolate. We compared patients with NEPBIs who survived to those who died. We found no association

April 18-22, 1994

*Candidate for the Donald C. Mackel Award.



U.S. DEPARTMENT OF COMMERCE/CENTERS FOR DISEASE CONTROL AND PREVENTION

CDC
Centers for Disease Control and Prevention

10:50

Ocular Toxocariasis: A First Look — United States, 2009-2010

AUTHORS: Dana M. Woodhall, M. Starr, S. Montgomery, J. Jones, F. Lum, R. Moorthy, R. Read

BACKGROUND: Ocular toxocariasis (OT) is a manifestation of a parasitic infection by *Toxocara canis* or *Toxocara cati* causing debilitating ophthalmologic disease primarily affecting children. However, there is no data available on how frequently ophthalmologists encounter patients with OT. A better understanding of the impact of OT could spur efforts to implement and evaluate prevention measures.

METHODS: In collaboration with the American Academy of Ophthalmology, an electronic survey was distributed to uveitis, retinal and pediatric ophthalmology specialists nationwide to collect epidemiological, demographic and clinical information. A confirmed OT patient was a person who had ophthalmologic visualization of a larva, positive *Toxocara* ELISA test result, or clinical diagnosis based on signs and symptoms of OT. OT patients diagnosed between 9/2009-9/2010 were classified as newly diagnosed while patients diagnosed prior to 9/2009 were classified as having recurrent disease.

RESULTS: Of 3,020 ophthalmologists invited to participate, 559 (19%) responded and reported a total of 159 OT patients. Sixty-eight (43%) patients had newly diagnosed OT; of these patients, 44 had complete demographic information. The median patient age was 8.5 years (range: 1-60 years), 24 (55%) were male and 25 (57%) lived in the Southern region. Pet ownership information was available for 33 patients; of those 21 (64%) had pets. The most common symptom reported was vision loss affecting 25 (83%) patients; 17 (68%) suffered permanent vision loss. Of 20 patients who had serum ELISA testing, 14 (70%) were positive.

CONCLUSIONS: OT transmission persists in the United States. Case-patients are predominately children; most reported patients suffered permanent vision loss. Research on risk factors is needed to decrease morbidity and to strengthen strategies to reduce infection rates in animals and people.

KEYWORDS: parasitology, ocular toxocariasis, risk factors, prevention

Abstracts

Tuesday

11:10

Vampire Bat Human Rabies, Louisiana 2010

AUTHORS: Brett W. Petersen, A. Sprecher, G. Balsamo, R. Ratard, D. Thoppil, M. Thoppil, C. Rupprecht

BACKGROUND: Though human cases are rare in the U.S., rabies remains an important public health issue and significant burden to society. Rabies is nearly universally fatal but is preventable with postexposure prophylaxis (PEP). Data from case investigations and disease surveillance are essential in guiding human rabies prevention efforts.

METHODS: In August, 2010 public health officials investigated a case of human rabies in Louisiana. The patient's clinical course and exposure history were summarized using medical records, autopsy results, and interviews with family and friends. Patient contacts were traced to perform exposure risk assessments and provide PEP recommendations.

RESULTS: On August 3, 2010 a 19 year old male presented to a Louisiana hospital with left shoulder pain, left hand paresthesias, and generalized fatigue. The patient developed fever and progressive neurologic deterioration leading to his death on August 21. CDC confirmed a diagnosis of rabies and identified a vampire bat rabies virus variant through RT-PCR analysis. The patient was bitten by a bat in his home state of Michoacán, Mexico on July 15 prior to legally immigrating to the U.S. for work. He did not seek medical attention for this bite and did not receive PEP. Successful cooperation among international public health officials identified 204 close contacts and caregivers of which 95 (46.5%) received PEP.

CONCLUSIONS: This case represents the first reported death from a vampire bat rabies virus variant in the U.S. Efforts to increase awareness of the risk of rabies from wildlife species (particularly bats) and the importance of prompt PEP following an exposure are needed. International coordination among public health officials is important in investigating cases of infectious diseases and improving prevention and control efforts.

KEYWORDS: rabies, human, epidemiology, prophylaxis

11:30

A Multistate Outbreak of *Salmonella* I – Infections Associated with Reptile Frozen Feeder Rodents – US, 2010

AUTHORS: Emily J. Cartwright, T. Nguyen, A. Hodges, X. Li, C. Melluso, J. Quammen, T. Ayers, I. Williams, C. Lane, C. Barton Behravesh, J. Wright

BACKGROUND: *Salmonella* causes an estimated 1 million illnesses annually in the United States; although most infections are from foodborne exposures, animal contact remains an important mode of transmission. The United Kingdom notified CDC of an outbreak of *Salmonella* infections associated with a frozen feeder rodent (FFR) distributor (Distributor A) in the United States. A multistate cluster of *Salmonella* I 4,[5],12:i:- cases with pulsed-field gel electrophoresis (PFGE) patterns indistinguishable from the United Kingdom strain was subsequently identified in the United States.

METHODS: Cases were any person infected with the outbreak strain between 1/1/2010 and 7/30/2010. Controls were any person infected with *Salmonella* Enteritidis between 1/1/2010 and 7/30/2010, matched by State and age group (<18 years or ≥18 years). Reptile, FFR, and environmental samples were characterized using PFGE.

RESULTS: We identified 34 cases in 17 states; 47% were female and median age was 12 years (range <1 to 57 years). We enrolled 15 cases and 29 controls from 10 states. Cases were significantly more likely to report reptile contact (matched odds ratio [mOR] 15.8; 95% confidence interval [CI] 2.0, 124.2), being in a room with a reptile (mOR: 14.7; CI: 2.0, 650.8), and feeding FFR to reptiles (mOR: 10.0; CI: 1.1, 473.0) during the week before illness. The outbreak strain was isolated from environmental swabs, FFR from Distributor A, and a case-patient's reptile.

CONCLUSIONS: Infection with the outbreak strain of *Salmonella* I 4,[5],12:i:- was associated with FFR contact. Distributor A recalled FFR in July 2010 and began irradiating products. Testing of irradiated FFRs by the Food and Drug Administration was negative for *Salmonella*. Pet stores and veterinarians should encourage diligent hand hygiene after handling reptiles or rodents.

KEYWORDS: reptiles, rodentia, *Salmonella*, pulsed-field gel electrophoresis

11:50

Human Paragonimiasis — Missouri, July 2006–October 2010

AUTHORS: Yi-Chun Lo, S. Patrick, G. Turabelidze, J. Jones, P. Wilkins

BACKGROUND: *Paragonimus* is a lung parasite acquired through eating raw or undercooked freshwater crustaceans. Only six nonimported U.S. cases were reported during 1965–2007. In 2009, physicians published a report of three paragonimiasis cases diagnosed in Missouri during 2006–2008. We enhanced case finding and investigated epidemiologic characteristics.

METHODS: We collaborated with two medical centers to collect clinical and exposure information retrospectively and prospectively through chart review and patient/parent interview. A clinical case was defined as fever, pneumonia or pleural effusion, eosinophilia (>500 eosinophils/mm³ in peripheral blood), and a prompt response to praziquantel, the recommended paragonimiasis treatment. Cases were confirmed if testing revealed *Paragonimus* eggs in respiratory specimens (sputum, bronchoalveolar lavage fluid, or tissue) or antibodies in serum.

RESULTS: During July 2006–October 2010, 8 laboratory-confirmed and 2 additional clinical cases were identified. All 10 patients, aged 10–32 years, had eaten raw or undercooked crayfish collected from Missouri rivers while canoeing or camping. Seven patients had been intoxicated by alcohol; 2 had eaten raw crayfish as dares, and 1 had eaten raw crayfish to demonstrate survival skills. Three patients had undergone multiple clinical tests and empiric treatments 9–11 months before paragonimiasis was diagnosed; four experienced severe manifestations: pneumothorax (1), cardiac tamponade (1), and cerebral lesions causing blurred vision (2).

CONCLUSIONS: Paragonimiasis cases reported in Missouri occurred after eating raw or undercooked crayfish. Delayed diagnosis and severe manifestations were common. Health-care providers should consider paragonimiasis and inquire about eating raw or undercooked crayfish among patients with unexplained fever, pneumonia or pleural effusion, and eosinophilia. Owners and patrons of campgrounds and canoe rental businesses should be alerted that crayfish should be thoroughly cooked before ingestion.

KEYWORDS: paragonimiasis, Astacoidea, Missouri

12:30

Atrium Ballroom A

SPECIAL SESSION: The National Institute for Occupational Safety and Health's (NIOSH) Role in the Deepwater Response

MODERATORS: Margaret Kitt, NOISH, Deputy Director for Program

SPEAKERS: Renee Funk, NIOSH; Bruce Bernard, NIOSH; John Halpin, NIOSH; Michelle Lackovic, Louisiana Department of Health and Hospitals

HOSTED BY: NIOSH

On April 20, 2010, an explosion occurred on the Deepwater Horizon, an ultra-deepwater, semi-submersible offshore oil drilling rig in the Gulf of Mexico. The explosion killed 11 workers and ignited a fire visible from 35 miles away. The resulting fire could not be extinguished, and on 22 April 2010, the rig sank, leaving the well gushing at the sea floor and causing the largest offshore oil spill in United States history. On July 15, the leak was stopped after it had released about 205 million gallons of crude oil.

On May 2, 2010, at the request of the Occupational Safety and Health Administration (OSHA) NIOSH personnel arrived as part of the federal interagency effort to anticipate and address the occupational safety and health needs of oil spill response workers. The unprecedented circumstances and magnitude of the disaster posed numerous challenges for NIOSH. The session speakers will describe the objectives of the NIOSH response: 1) Prevent worker illness and injury during the event by reducing or eliminating exposures and 2) Provide every response worker the opportunity to be accounted for their participation. This session will demonstrate how NIOSH response efforts addressed those objectives through various activities, including: Health Hazard Evaluation (HHEs), rostering of response workers, health surveillance, toxicity testing, and technical guidance and communications. NIOSH epidemiologic activities related to the oil spill response and findings from exposure and health symptom assessments will be presented.

The session should have high audience appeal due to the compelling nature of this disaster that occurred during last year's EIS conference, and its ensuing extensive media coverage. The response involved approximately 60,000 workers. This will be the first time the findings will be presented to an epidemiology audience exclusively.

Abstracts

TUESDAY, APRIL 12

SESSION G 1:50

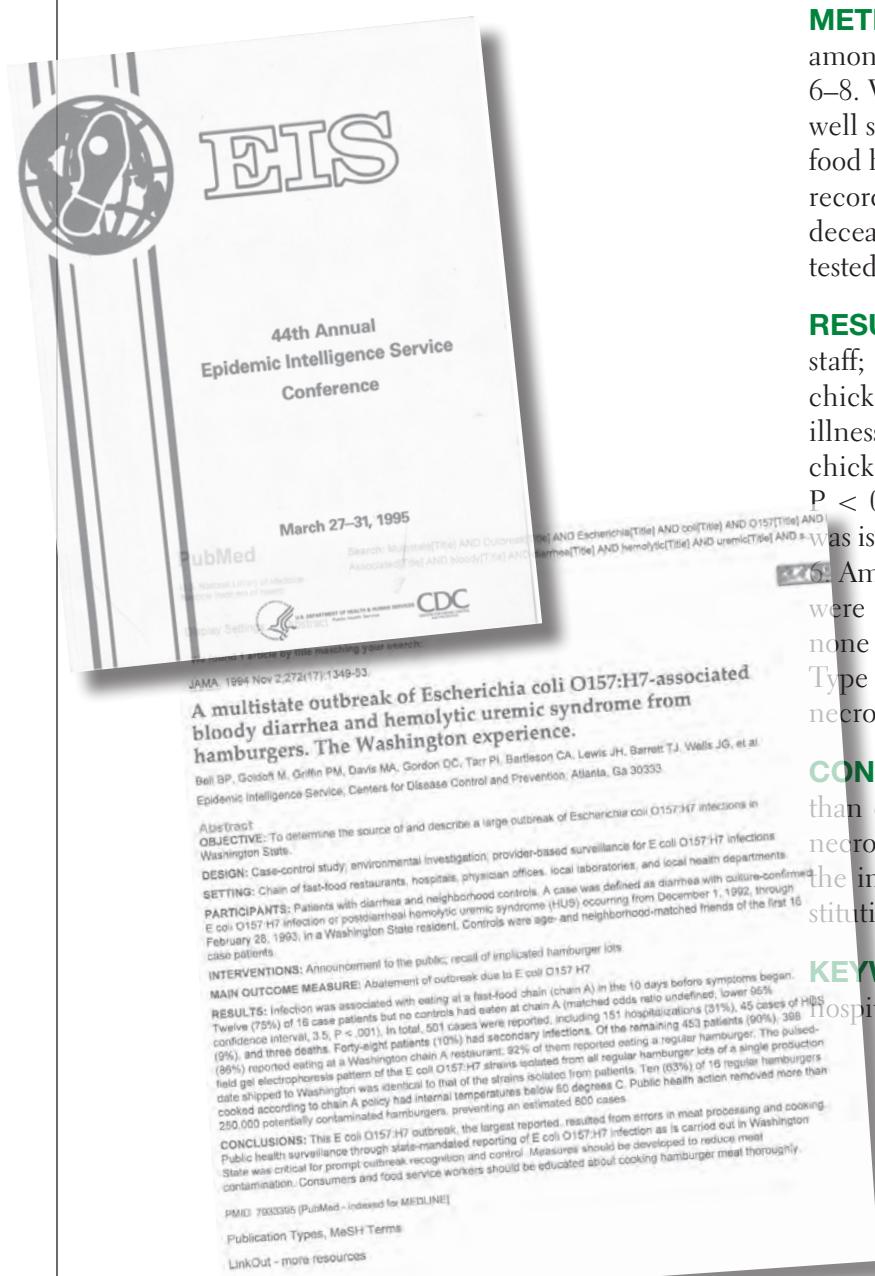
New Rules for Safe-Handling Labels on Raw Meat

October 31, 1993, by Washington United Press

The New York Times

**Foodborne and Enteric Diseases
1:45-3:50 p.m.
Atrium Ballroom B and C**
MODERATORS: Chris Braden and Susan Lance

Tuesday



Fatal Gastroenteritis at a State Psychiatric Hospital — Louisiana, 2010

AUTHORS: Armand G. Sprecher, E. Delaune, S. Straif-Bourgeois, R. Ratard, P. Melstrom, E. Yard, S. Reedy, J. Schier, G. Gómez, D. Talkington, S. Sodha, J. Dykes, C. Luquez, L. Tynes

BACKGROUND: In the United States, *Clostridium perfringens* Type A causes approximately one million cases of food poisoning each year; however, only 1 of about 37,000 cases causes death, usually from dehydration. On May 7, 2010, Louisiana's health department was notified of a sudden increase in cases of vomiting and diarrhea, resulting in 3 deaths among 136 patients at a psychiatric facility. We investigated to determine the cause of illness and death.

METHODS: A case was defined as vomiting or diarrhea among patients or staff of the psychiatric facility during May 6–8. We performed a retrospective cohort study of sick and well staff only, given data reliability concerns. We collected food history questionnaires from staff and reviewed medical records of hospitalized patients and autopsy reports of the deceased patients. Food samples and stool specimens were tested for viruses, bacteria, and toxins.

RESULTS: Cases occurred among 42 patients and 12 staff; no further deaths resulted. Among staff, only eating chicken served with dinner on May 6 was associated with illness (attack rate [AR]: 75% among those who had eaten chicken; AR: 0% among those who had not eaten chicken; $P < 0.001$). Enterotoxin-producing *C. perfringens* (CPE) was isolated from samples of leftover chicken served on May 6. Among 20 stool specimens from ill patients and staff, 15 were positive for CPE by polymerase chain reaction, and none was positive for beta toxin, implicating *C. perfringens* Type A. The cause of death for 2/3 autopsied patients was necrotizing colitis.

CONCLUSIONS: This outbreak demonstrated higher than expected numbers of *C. perfringens* Type A-induced necrotizing colitis and subsequent mortality, highlighting the importance of preventing foodborne illness among institutionalized populations.

KEYWORDS: *Clostridium perfringens*; foodborne diseases; hospitals, psychiatric; enterocolitis, necrotizing

2:10

Multistate Outbreak of *Escherichia coli* O145 Infections Associated with Romaine Lettuce Consumption – 2010

AUTHORS: Ethel V. Taylor, T. Nguyen, K. Machesky, E. Koch, A. Kupper, A. Emanuel, N. Gantner, R. Bokanyi, E. Brandt, L. Woo, L. King, S. Stroika, M. Patel, M. Sotir, I. Williams

BACKGROUND: While *Escherichia coli* O157 is the most commonly recognized Shiga toxin-producing *E. coli* (STEC) in the United States, over 50 non-O157 STEC serogroups have been isolated from ill persons. STEC O145 (O145) is the sixth most commonly reported non-O157 STEC and can cause severe illness, including hemolytic uremic syndrome (HUS); outbreaks have been infrequently reported. In April 2010, we investigated a multistate outbreak of O145 infections.

METHODS: Confirmed cases were O145 infections matching the outbreak pulsed-field gel electrophoresis pattern. Probable cases were diarrheal illnesses with Shiga toxin 2 positive stools in persons epidemiologically linked to a confirmed case. We conducted a case-control study of restaurant food exposures restricted to a cluster of case-patients at an Ohio university; cases included those matching the national confirmed and probable case definitions and cases of bloody diarrhea in students not seeking medical care. Study controls were selected from students without reported diarrhea living on-campus. Exposures were analyzed at the restaurant, menu, and ingredient level.

RESULTS: We identified 23 confirmed and 7 probable cases from 5 states. Of these, 12 (36%) were hospitalized, 3 (9%) developed HUS, none died. We enrolled 14 case-patients and 70 controls in the case-control study. Illness was only associated with consumption of shredded romaine lettuce (73% of cases vs. 24% of controls, Odds Ratio=8.1, 95% confidence interval 1.3-48.0). Samples from an unopened bag of shredded romaine lettuce yielded the outbreak strain.

CONCLUSIONS: This outbreak is the first foodborne outbreak of O145 infections identified in the United States. Current food safety efforts focus on *E. coli* O157, however some non-O157 STEC can cause similar disease and outbreaks, therefore policies addressing these pathogens may be warranted.

KEYWORDS: STEC, *Escherichia coli* O145, non-O157 STEC, produce, hemolytic uremic syndrome

2:30

Salmonella Thompson Outbreak Associated with Hollandaise Sauce Among Restaurant Patrons – Alaska, 2010

AUTHORS: Kimberly A. Porter, K. Spink, G. Fleagle, J. Walker, L. Castrodale, D. Bensyl, J. McLaughlin

BACKGROUND: *Salmonella* is a leading cause of foodborne illness-related hospitalizations. On August 27, 2010, the Alaska Section of Epidemiology (SOE) was notified of a *Salmonella* infection in a tourist; additional reports quickly followed. Initial interviews revealed that patients had eaten at Restaurant A on August 21–22. We conducted a case-control study to determine the source of the outbreak and implement control measures.

METHODS: We classified a case as laboratory-confirmed *Salmonella* infection in a person who experienced gastroenteritis during August 22–28 after eating at Restaurant A. Control subjects were nonill Restaurant A patrons identified through credit card receipts. We calculated odds ratios, 95% confidence intervals, and attributable risks (AR) for consumed foods. Environmental health officers (EHOs) inspected Restaurant A. We collected stool samples from food-handlers. *Salmonella* isolates were evaluated by pulsed-field gel electrophoresis (PFGE).

RESULTS: We identified 7 case-patients (median age: 50 years; range: 24–72). Four case-patients were out-of-state tourists; 2 were hospitalized. Hollandaise sauce, seafood, and green salad were associated with illness. The hollandaise sauce (AR: 1.0) was implicated as the transmission vehicle, whereas the seafood (AR: 0.65) and salad (AR: 0.55) were unlikely vehicles. EHOs identified major food safety violations, including storage of unpasteurized eggs used to prepare hollandaise sauce at incorrect temperatures. All case-patient stools were positive for PFGE-matched *Salmonella* Thompson. No associated foods were available for testing. No food-handlers tested positive for *Salmonella*. Restaurant A was instructed to take immediate corrective actions; a follow-up inspection documented substantial improvement.

CONCLUSIONS: Hollandaise sauce prepared with incorrectly stored raw eggs was the probable outbreak source. The high proportion of case-patients who were tourists highlights the importance of interstate notification of illness.

KEYWORDS: *Salmonella* food poisoning, disease outbreaks, gastroenteritis

Abstracts

2:50

Locally Acquired Acute Hepatitis E Virus Infection – San Antonio, Texas, 2009

AUTHORS: Rania A. Tohme, J. Drobeniuc, R. Sanchez, G. Heseltine, B. Alsip, S. Kamili, D. Hu, S. Holmberg, F. Guerra, E. Teshale

BACKGROUND: Hepatitis E virus (HEV) infection, a major cause of acute hepatitis worldwide, is an endemic waterborne infection in several developing countries (among pregnant women, mortality rates of 25% have been reported). In industrialized countries, locally acquired HEV infections, unrelated to travel, have increased. In September 2009, two patients with no recent travel history presented with acute hepatitis to hospital A; HEV infection was suspected after excluding other causes. We investigated to determine source of infection and identify additional cases.

METHODS: We reviewed medical records, interviewed case-patients and contacts, and investigated undetected HEV infection among nursing home residents where case-patient 2 worked. A suspected HEV case was defined as (1) acute hepatitis symptoms; (2) elevated transaminase levels; (3) negative serologic results for hepatitis A, B, and C; and (4) no identified cause for hepatitis. Case-patients and contacts were tested for anti-HEV immunoglobulins (Ig) M and G and HEV RNA.

RESULTS: Both case-patients were anti-HEV IgM positive; HEV genotype 3, with 98% similarity to US-2 HEV strain (similar to US HEV swine strains) was isolated from case-patient 2. In July 2009, case-patient 1 reported a positive home pregnancy test result; in October 2009, she died of liver failure. All 13 household contacts were anti-HEV negative. Of 5 suspected cases among nursing home residents, all were anti-HEV IgM negative; one tested anti-HEV IgG positive. No sources of HEV infection were identified.

CONCLUSIONS: This is the first investigation of a locally acquired acute HEV infection causing death in the United States. Homologic similarity between HEV RNA sequence and US-2 strain in case-patient 2 suggests foodborne or zoonotic exposure. Physicians should consider HEV infection in patients with unexplained hepatitis.

KEYWORDS: hepatitis E virus, autochthonous, foodborne diseases, acute hepatitis, zoonoses

3:10

Duration of Shedding of Shiga-Toxin-Producing *Escherichia coli* O26 During an Outbreak in a Child Care Center – Oregon, October 2010

AUTHORS: Mathieu Tourdjman, T. Hostetler, J. Reuer, P. Lewis, C. Ciaffoni, W. Keene, A. Thomas, P. Cieslak, R. Leman

BACKGROUND: Shiga-toxin-producing *Escherichia coli* O26 (O26) is an emerging cause of gastroenteritis in the United States. Strains producing Shiga-toxin type 2 are associated with higher risk for hemolytic-uremic syndrome (HUS) than strains producing Shiga-toxin 1 (*stx*-1) alone. Duration of O26 shedding is not well-documented. In October 2010, an outbreak of O26 infections was identified among attendees of an Oregon child care center. Infected and non-infected attendees were separated. We investigated extent of illness and duration of bacterial shedding to guide public health measures.

METHODS: Stool samples from all attendees and staff were tested for Shiga toxin by polymerase chain reaction (PCR). Isolation and serotyping of the causative organism were performed on all positive samples. Cases were defined as laboratory-confirmed O26 infection among child care attendees or staff during October 2010. Infected staff and parents of infected children were interviewed to collect demographic and clinical information. Serial Shiga-toxin PCR assays were performed to assess duration of shedding among attendees.

RESULTS: All 58 attendees and 13 staff were tested. Ten cases were identified, including in 1 staff member. Patients were in 3 different classrooms and not obviously clustered. The median age was 1 year; 50% were female. Four patients (40%) experienced diarrhea, including 1 with bloody diarrhea. No patients experienced HUS, were hospitalized, or received antibiotics. All patients tested positive for *stx*-1 only. The duration of Shiga-toxin shedding ranged from 12 to 46 days.

CONCLUSIONS: This is the first reported outbreak of O26 infections in a U.S. child care setting. No severe illness was noted. O26 shedding might be prolonged; the need for separating infected children to address this apparently low-virulence infection remains uncertain.

KEYWORDS: *Escherichia coli* O26, infectious disease outbreaks, child day care centers, Shiga toxin

3:30

Typhoid Fever Outbreak Associated with Exposure to Frozen Mamey Pulp from Guatemala – Western United States, 2010

AUTHORS: Anagha Loharikar, A. Newton, P. Rowley, C. Wheeler, T. Bruno, L. Theobald, S. Lance, E. Mintz, E. Barzilay, R. Fagan,

BACKGROUND: Domestically-acquired typhoid fever is rare in the United States; <60 outbreaks have occurred in the past 50 years. In July, 2010, the Southern Nevada Health District detected an outbreak of typhoid fever among non-travelers; an epidemiologic investigation was conducted.

METHODS: We conducted a case-control study to examine the relationship between illness and exposures. A case was defined as illness with the outbreak strain of *Salmonella* serotype Typhi, as determined by pulsed-field gel electrophoresis (PFGE), with onset during 2010. Controls were matched by neighborhood, age, and sex. Product testing and traceback investigation were completed.

RESULTS: We identified 12 case-patients in 3 states with onset from April to September, 2010. The median age was 18 years (range 4-48), 67% were female, and all were Hispanic. Of 11 case-patients with clinical information, all reported fever>102°F and 82% were hospitalized; none died. In the case-control study, exposure to or consumption of frozen mamey pulp in a fruit shake from a home or Hispanic-style market was reported by 75% (6/8) of case-patients compared with no (0/33) controls (matched odds ratio [mOR]=33.9, 95% confidence interval [CI]: 4.9-undefined, $P=0.0001$). Non-Typhi *Salmonella* was isolated from an unopened package of frozen mamey pulp from a case-patient home. Traceback investigations implicated two brands of frozen mamey pulp from a single manufacturer in Guatemala; that manufacturer was also implicated in an outbreak of typhoid fever in Florida in 1998-99. Both brands issued voluntary recalls.

CONCLUSIONS: This outbreak of domestically-acquired typhoid fever was associated with a “ready to eat” food imported from a typhoid endemic region. We alerted public health authorities in Guatemala; an investigation of the plant and employee testing for carrier status is ongoing.

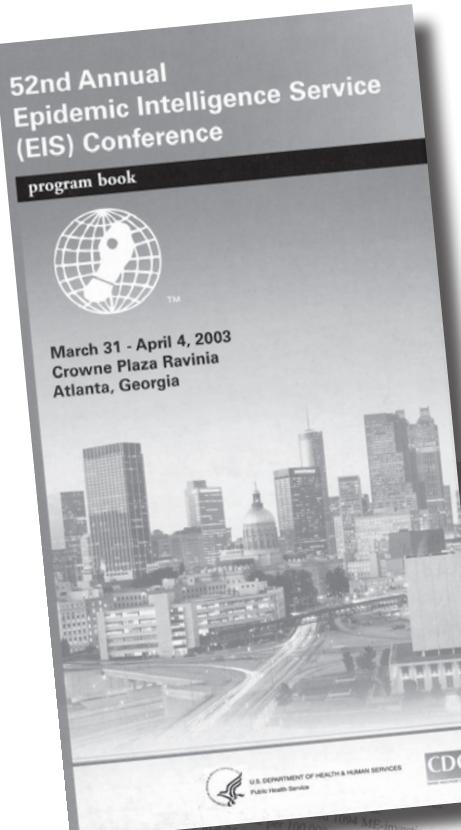
KEYWORDS: typhoid fever, *Salmonella*, mamey, Hispanic

WEDNESDAY, APRIL 13
CONCURRENT SESSION H1

Vital Statistics; A Mixed Report on American Health

January 26, 2010, by Nicholas Bakalar
The New York Times

Peavy Award Finalists, 8:30-10:15 a.m.
Atrium Ballroom B and C
MODERATOR: Betsy Cadwell Gunnels



Wednesday

Associations of Body Mass Index and Perceived Weight Category with Suicide Ideation and Suicide Attempts Among Adolescents — United States, 2001

Authors: Danice K. Eaton, PhD, MPH, R. Lowry, N.D. Breitlow

Background: The percentage of adolescents who are overweight has tripled over the past 20 years. Although long-term health effects of adolescent obesity are increasingly recognized, mental health implications of body weight should not be ignored. This study investigated how body mass index (BMI) and perceived weight are associated with suicide ideation and attempts.

Methods: We analyzed data from the 2001 Youth Risk Behavior Survey, a representative sample of 13,601 U.S. high school students. Perceived weight was defined as self-described weight every underweight, slightly underweight, about right, slightly overweight, or very overweight. A similar five-category BMI variable was calculated from self-reported height and weight. Adjusted odds ratios (ORs) were calculated to describe how BMI and perceived weight were associated with self-reports of having seriously considered suicide and attempted suicide in the past year. We controlled for sex, age, physical activity, weight management practices, and smoking.

Results: In general, BMI was associated with suicide ideation and attempts when we did not control for perceived weight, but these associations were not significant when perceived weight was included in models. Suicide ideation was significantly associated with perceiving oneself as very underweight ($OR=2.29$), slightly underweight ($OR=1.36$), slightly overweight ($OR=1.33$), or very overweight ($OR=2.50$). Suicide attempts were significantly associated with perceiving oneself as very overweight among white students ($OR=2.74$) and as very underweight among white ($OR=3.04$), black ($OR=2.86$), and Hispanic ($OR=3.40$) students.

Conclusions: Perceived weight appears to mediate the associations between BMI and suicide ideation and attempts. Perceiving oneself as very overweight or very underweight was associated with an increased risk for suicide ideation and attempts. Further research is needed to understand factors associated with perceived weight and suicide among adolescents.

Key words: fatal poisoning, narcotics, methadone, pain

Abstracts

8:35

Novel Approach To Monitoring Impact of Rotavirus Vaccination Using Internet Search Data – United States, 2004–2010

AUTHORS: Rishi Desai, B. Lopman, J. Harris, M. Patel, U. Parashar

BACKGROUND: Google Insights for Search (GIS) is a new application that allows users to measure Google search query volume in defined time periods and regions. We compared US rotavirus search trends with national laboratory surveillance data in the pre- (2004 to 2006) and post-vaccine era (2008 to 2010) to assess whether GIS data can be used to monitor rotavirus vaccine (RV) impact.

METHODS: From January 1, 2004 to August 30, 2010, US weekly totals of rotavirus “search query share” were obtained through GIS. GIS data were compared with counts of rotavirus detections in US clinical laboratories. A regression model was fit to the GIS trends using Fourier terms to adjust for seasonal and in the post-vaccination era biennial cycles. Projections of search volume were made assuming that rotavirus vaccine uptake would increase at the same rate as had pneumococcal conjugate vaccine in the 1990s.

RESULTS: Peaks in US rotavirus search volume and rotavirus laboratory detections both decreased between pre and post-vaccine years (56% and 44%, respectively). Search volume and laboratory detections correlated best ($R^2 = 0.78$) when a lag of 3 weeks was introduced into the search volume data. The predictive model projected a reduction of 69% (95% CI: 63%–75%) and 77% (95% CI: 70%–83%) in the peak weeks of the predicted 2011 and 2012 rotavirus season, respectively, compared with the pre-vaccine era.

CONCLUSIONS: GIS data can be used to monitor RV impact and may provide advance data about rotavirus trends in the US, offering an inexpensive, real-time adjunct to traditional surveillance methods. The prediction model will aid in interpretation of future GIS data as they become available.

KEYWORDS: rotavirus, population surveillance, Internet, United States, vaccination

8:55

Seasonality of Tuberculosis – United States, 1993–2008

AUTHORS: Matthew D. Willis, C. Winston, C. Heilig, K. Cain, N. Walter, W. MacKenzie

BACKGROUND: Tuberculosis (TB) is a worldwide epidemic. Seasonal variation in TB diagnoses has been described overseas. Understanding the mechanisms underlying the seasonality of TB can inform prevention strategies. Low wintertime levels of vitamin D, an immune regulator synthesized in sun-exposed skin, have been hypothesized to increase risk of TB disease. Latitude is the primary determinant of seasonal sunlight exposure. We sought to determine whether TB is seasonal in the United States and if so, which factors are contributory.

METHODS: We analyzed laboratory-confirmed TB cases reported to CDC with a treatment start date during January 1993–November 2008. Using a time series decomposition method, seasonal factors were isolated from trend and irregular factors (noise). Seasonal amplitude, expressed as a proportion of annual mean case counts, was defined as the peak-to-trough difference between the months with the highest and months with the lowest numbers of cases. States were stratified by latitude based on the midpoint on the north-south axis.

RESULTS: Among 243,432 TB cases, diagnoses peaked in March; a trough occurred in November. The mean seasonal amplitude—21.4%—did not vary by latitude overall or within subgroups of the same age, race, or gender. However, seasonal amplitudes varied substantially by race and age: black race, 29.2% versus white race, 15.4%; children aged <5 years, 55.3% versus persons aged ≥5 years, 20.5%.

CONCLUSIONS: Tuberculosis is a seasonal disease in the US. The peak in diagnoses in early spring is consistent with a vitamin D-mediated seasonality but the absence of discernable change with latitude is not. Further research is needed to understand the causes of seasonal fluctuations in TB risk, especially among children and persons of black race.

KEYWORDS: tuberculosis epidemiology, seasons, Vitamin D, United States, statistical model

9:15

Physical Activity and the Risk of Incident and Progressive Radiographic Osteoarthritis of the Knee: The Johnston County Osteoarthritis Project

AUTHORS: Kamil E. Barbour, J. Hootman, C. Helmick, L. Murphy, Y. Cheng, B. Do, J. Jordan

BACKGROUND: Osteoarthritis (OA) of the knee is a leading cause of expensive total joint replacement and disability among adults. Physical activity (PA) has been shown to reduce risk of cardiovascular disease, diabetes and hypertension. However, the impact of PA on OA incidence and progression remains unclear.

METHODS: Using data from the Johnston County Osteoarthritis Project (baseline: n = 1,590, age 62.4 ± 7.9 years, follow-up 6.5 ± 1.9 years) we tested associations between PA and incident and progressive radiographic knee osteoarthritis (ROA). Incident ROA was defined as the development of a Kellgren-Lawrence (K-L) grade of ≥ 2 in either knee. Progression was defined as an increase of at least 1 K-L grade in a knee with prior ROA. Minutes per week of moderate-to-vigorous intensity physical activity were calculated using the Minnesota Leisure Time Physical Activity questionnaire. Weibull parametric regression estimated hazard ratios (HR) for interval censored data. Sampling weights and standard errors adjusted for the complex sampling design. Multivariate analyses adjusted for age, race, sex, body mass index, education, diabetes status, and history of knee injury.

RESULTS: Participants with the recommended (≥ 150 min/week) amount of PA had a 92% higher risk of incident ROA (HR: = 1.92; 95% CI: 1.16–3.17) compared with those with < 150 min/week of PA. Conversely, PA had no impact on progression of ROA (HR: = 1.07; 95% CI: 0.57–2.03).

CONCLUSIONS: Results indicate that participation in the recommended level of PA may increase risk of knee OA, but not progression among older adults. These contrasting findings suggest further investigation is needed to clarify public health implications regarding physical activity and risk of incident and progressive knee OA.

KEYWORDS: osteoarthritis incidence, progression, physical activity, risk, Weibull regression

9:35

Effects of School Organized Pandemic Influenza Vaccination on All-Cause Absenteeism — Maine, 2009–2010

AUTHORS: Samuel B. Graitcer, N. Dube, R. Basurto-Davila, P. Smith, J. Ferdinand, M. Thompson, A. Uzicanin, S. Chaves, L. Foster, J. Chen, P. Gargiullo, S. Sears, R. Jackson, M. Tipton, A. Monto, D. Mills, D. Shay

BACKGROUND: Maine prioritized its federally allotted supply of 2009 pandemic influenza A(H1N1) (2009 H1N1) vaccine for school-aged children, using school-organized vaccine campaigns to administer the vaccine. We evaluated the direct and possible indirect effects of vaccinating students on school absenteeism.

METHODS: Individual-level student and aggregate teacher all-cause absenteeism and vaccination data were obtained from a convenience sample of 46 K-8 schools in four Maine counties during October, 2009–March, 2010. Mean daily absenteeism was calculated for vaccinated and unvaccinated students and all teachers, who were not targeted for vaccination. We used a generalized linear model to estimate the association between student vaccination rates and absenteeism, adjusting for absenteeism adjacent to weekends and the Thanksgiving holiday, baseline absenteeism during non-influenza weeks, and the percentage of students receiving reduced-cost lunches. We accounted for the joint effects of influenza circulation and the daily proportion of students vaccinated.

RESULTS: The mean cumulative school vaccination rate was 55% (range: 17–84%). Mean daily absenteeism was 4.9% among vaccinated and 6.6% among unvaccinated students ($P<0.01$). During peak influenza activity (October–November), students in schools with a 55% vaccination rate had 17% fewer absences if they were vaccinated ($P<0.01$) and 13% fewer absences if they were unvaccinated ($P<0.01$), compared with students in schools with the lowest vaccination rate of 17%. In schools with a 55% student vaccination rate, absenteeism among teachers was 9% lower ($P=0.03$). Absenteeism among both vaccinated and unvaccinated students and teachers decreased with increasing student vaccination.

CONCLUSIONS: Reductions in absenteeism during the peak of the 2009 influenza pandemic in Maine schools vaccinating more than 50% of their students suggest that large-scale school vaccine campaigns had indirect as well as direct effects.

KEYWORDS: influenza, schools, vaccination, absenteeism, influenza A H1N1 subtype

Abstracts

9:55

Sociodemographic and Healthcare Characteristics Associated with Influenza Vaccination Coverage Among Young Children — Oregon, 2006–2008

AUTHORS: Timothy J. Cunningham, K. Rosenberg, I. Ahluwalia, C. Kroelinger, D. Barradas, A. Sandoval

BACKGROUND: Seasonal influenza attack rates among young children have been as high as 40%. Influenza vaccination is the best way to prevent influenza and related complications. The Advisory Committee on Immunization Practices recommends annual influenza vaccination for all children ≥ 6 months. In this study, we sought to estimate vaccination coverage and identify sociodemographic and healthcare correlates of vaccination status among 2-year-old children in Oregon.

METHODS: We analyzed data from the 2006–2008 Oregon Pregnancy Risk Assessment Monitoring Survey follow-back survey (Oregon PRAMS-2) of women with a live birth originally interviewed in 2004–2005 and reinterviewed shortly after their child's second birthday. The weighted response rate was 56.7%. We calculated population-weighted prevalence estimates of influenza vaccination by selected sociodemographic and healthcare characteristics and used a Cox proportional hazards model with constant follow-up time to calculate adjusted prevalence ratios (APRs).

RESULTS: The estimated prevalence of influenza vaccination among 2-year-old children was 37.7%. Factors positively associated with recent influenza vaccination in the multivariable-adjusted model were children's influenza vaccination in the previous year (APR: 3.3; 95% confidence interval [CI]: 2.5–4.4), children's receipt of all recommended immunizations (APR: 2.8; 95% CI: 1.4–5.7), children's uninterrupted health insurance coverage (APR: 1.4; 95% CI: 1.0–2.0), and mothers' unmarried status (APR: 1.2; 95% CI: 1.0–1.6); the only factor negatively associated was use of a family doctor rather than a pediatrician for well-child visits (APR: 0.7; 95% CI: 0.5–0.9).

CONCLUSIONS: This study helps us to better understand sociodemographic and healthcare characteristics that may be associated with influenza vaccination status among young children. To increase influenza vaccination coverage in this population, health officials should consider these findings as they develop and implement effective, targeted strategies.

KEYWORDS: influenza, vaccination, preschool children, health insurance, immunization

WEDNESDAY, APRIL 13
CONCURRENT SESSION H2

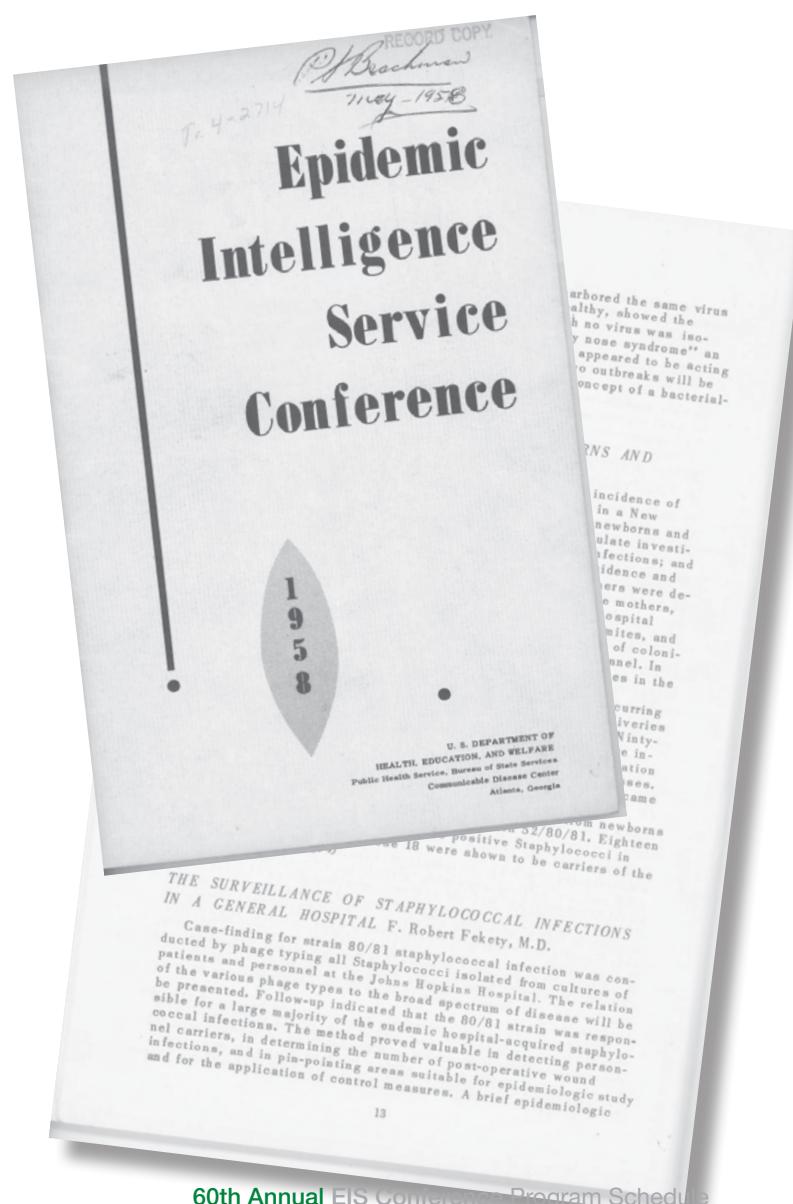
Experts Explore Staph Infections; Cleanliness is Still the Best Safeguard Against Bacilli, Antibiotics

November 7, 1959, by Bess Furman

The New York Times

Healthcare, 8:30–10:15 a.m.
Atrium Ballroom A

MODERATOR: Denise Cardo



8:35

Invasive Group A Streptococcal Infections Among Residents at a Long-Term-Care Facility – Pennsylvania, 2009–2010

AUTHORS: Allison H. Longenberger, A. Palumbo, N. Gupta, J. Marsden, C. Van Beneden, N. Stone, C. Gould, K. Waller

BACKGROUND: Group A *Streptococcus* (GAS) causes 11,500 invasive infections and 1,900 deaths annually in the United States. In September 2010, the Pennsylvania Department of Health was notified of a prolonged outbreak of invasive GAS infections among residents of a skilled long-term-care facility (LTCF). We investigated to prevent additional cases and identify modifiable risk factors.

METHODS: A case was defined as symptomatic, culture-confirmed GAS infection in a resident during January 2009–September 2010. Cases were categorized as invasive (cultured from a normally sterile site) or noninvasive. A 1:3 matched case-control study was performed; control subjects were selected randomly after matching by residence on positive culture date. Infection control practices were evaluated. All 297 residents and 139 staff were cultured to identify asymptomatic GAS carriers. Available GAS isolates were *emm* typed at CDC.

RESULTS: We identified 13 GAS invasive cases (including 2 deaths) and 10 noninvasive cases during October 12, 2009–September 22, 2010. Five carriers (1 resident, 2 nurses, and 2 housekeepers) were identified. On multivariable analysis, having >2 wounds was associated with infection (adjusted odds ratio: 4.5; 95% confidence interval: 1.1–18). Four of 8 typed isolates (from 1 case-patient, 1 resident carrier, and 2 nurse carriers) were *emm* 89; 2 cases were *emm* 11. Multiple infection control deficiencies were noted, including inadequate hand hygiene and sharing of wound care supplies. Carriers received antibiotics; infection control practices were reinforced. Active surveillance is ongoing.

CONCLUSIONS: This extensive outbreak likely started with introduction of ≥2 GAS strains into a vulnerable population followed by spread caused by suboptimal infection control practices. Infection control practices, particularly during wound care, are critical in preventing GAS outbreaks among LTCF residents.

KEYWORDS: *Streptococcus*, disease outbreaks, case-control studies, infection control, long-term care

8:55

Post-Myelography Bacterial Meningitis Among Patients at an Outpatient Radiology Facility – Missouri, 2010

AUTHORS: Amit S. Chitnis, I. Benowitz, V. Srinivasan, R. Gertz, Jr, P. Shewmaker, B. Beall, H. O'Connell, J. Noble-Wang, C. Van Beneden, A. Kallen, S. Patrick, G. Turabelidze, A. Guh, P. Patel

BACKGROUND: Approximately 350,000 myelograms—radiology procedures requiring spinal injections—are performed annually in the United States. Bacterial meningitis is a rare but serious complication of myelograms linked to breaches in recommended infection control (IC) practices (e.g., facemask use during spinal injections). During October 2010, several patients at an outpatient radiology facility (Facility A) developed post-myelography meningitis, prompting an investigation.

METHODS: We defined a case as laboratory findings and clinical presentation consistent with bacterial meningitis in a patient undergoing myelography at Facility A during October 11–25. We interviewed patients undergoing injection procedures at Facility A during October 11–25, reviewed medical records, and conducted an IC assessment. Case-patient cerebrospinal fluid (CSF) specimens, oral specimens from two healthcare providers (HCPs) (i.e., radiology physician assistant [RPA] and technician), and opened contrast vials were tested for bacteria. Identified isolates were compared using pulsed-field gel electrophoresis.

RESULTS: Three cases were identified among 7 of 9 myelogram patients interviewed; no infections were reported among 21 of 26 patients interviewed who had other injection procedures. Case-patients were males 44–67 years old whose myelography was performed by the same RPA and technician on October 25. All case-patients required hospitalization; two in an intensive care unit. HCPs did not wear facemasks and used single-dose injectable medication vials for multiple patients. *Streptococcus salivarius*, a common oral bacterium, was detected in two case-patients' CSF and oral specimens from the RPA and technician, but not in medication vials. *S. salivarius* from a case-patient and the RPA were indistinguishable.

CONCLUSIONS: Cases likely resulted from failure of HCPs to wear facemasks. Targeted education regarding facemask use and safe injection practices is needed in outpatient radiology facilities.

KEYWORDS: myelography, bacterial meningitis, infection control, outbreak

9:15

Acute Hepatitis B Virus Infection Outbreak in a Long-Term-Care Facility – North Carolina, 2010

AUTHORS: James M. Colborn, R. Williams, A. Moorman, H. Roberts, Y. Khudyakov, N. Thompson, M. Schaefer, A. Sena, Z. Moore

BACKGROUND: Since 1996, a total of 27 outbreaks of hepatitis B virus (HBV) infection related to inadequate infection control (IC) practices have been reported among older residents at U.S. long-term-care facilities (LTCFs). After notification of 6 residents with acute HBV infection in a 123-bed North Carolina LTCF, we sought to determine the outbreak source and make recommendations to prevent additional cases.

METHODS: All residents ($n = 114$) were tested for HBV infection. We conducted a 1:4 matched case-control study. An acute case ($n = 6$) was defined as a positive result for hepatitis B surface antigen (HBsAg) and hepatitis B core (anti-HBc) IgM during June 2009–February 2010; control subjects ($n = 24$) were susceptible to HBV (HBsAg, anti-HBc, and anti-HBs-negative) during the same period. We collected demographic and risk factor data during exposure periods (6 months–6 weeks before diagnosis) from medical records, conducted conditional logistic-regression analyses, and reviewed facility IC policies and practices.

RESULTS: Age (median: 79 versus 83 years for case-patients and control subjects, respectively) was similar. No statistically significant differences among case-patients and control subjects were observed in receiving blood glucose monitoring (odds ratio [OR]: 3.4; $P = 0.43$), podiatry (OR: 0.7; $P = 1.00$), wound care (OR: 3.9; $P = 0.66$), or phlebotomy (OR: 1.7; $P = 1.00$); traditional high-risk behaviors were not identified. IC practices facilitating bloodborne pathogen transmission were not observed; the LTCF was not in compliance with state law requiring dedicated IC personnel onsite.

CONCLUSIONS: Although infections occurred among LTCF residents, no single procedure explaining all cases was identified. LTCFs should comply with national IC recommendations, including employing or contracting with personnel with IC training.

KEYWORDS: hepatitis B virus, long-term care, disease outbreaks, infection control

9:35

Transmission of a Novel, Pan-Resistant Verona Integron-Encoded Metallo-Beta-Lactamase-Producing *Klebsiella pneumoniae* – Washington, 2010

AUTHORS: Neil Gupta, S. Hocevar, K. Anderson, N. Clark, D. MacCannell, J. Rasheed, B. Kitchel, A. Marfin, C. Gould, B. Limbago, A. Kallen

BACKGROUND: *Enterobacteriaceae*, including *Klebsiella pneumoniae*, are common bacterial pathogens responsible for >20% of U.S. healthcare-associated infections. In July 2010, a pan-resistant *K. pneumoniae* producing a Verona integron-encoded metallo-beta-lactamase (VIM), an enzyme reported only once before among *Enterobacteriaceae* in the United States, was identified from a patient in Hospital A. An investigation was performed to describe the epidemiology of this pathogen and assess for transmission.

METHODS: Chart review and interviews with the index patient were conducted. Cases were defined as VIM-producing *Enterobacteriaceae* identified in clinical cultures from patients at Hospital A between August 1, 2009 and August 20, 2010 or in surveillance cultures from 24 patient and family contacts during the index hospitalization of the case-patient. Potential VIM-producing isolates were characterized using polymerase chain reaction and pulsed-field gel electrophoresis (PFGE). Infection prevention practices were evaluated.

RESULTS: The index case-patient was a 76 year-old woman with VIM-producing *K. pneumoniae* (VIM-KP) isolated from a catheter-drawn blood culture upon transfer to a U.S. hospital from a hospital in Greece. No additional cases were identified on laboratory review or surveillance cultures. Recommended prevention practices and ongoing surveillance were in place. The index case-patient was discharged and readmitted following the investigation. During the subsequent hospitalization, another VIM-KP was identified from a patient in a neighboring room. Both isolates were indistinguishable by PFGE.

CONCLUSIONS: This novel, pan-resistant VIM-KP was likely acquired in Greece, where such organisms are endemic. Although no domestic transmission was found during the investigation, transmission occurred during a subsequent hospitalization. These organisms have the potential to add to the increasing burden of highly resistant *Enterobacteriaceae* in the United States and highlight the need for ongoing adherence to prevention practices.

KEYWORDS: multidrug resistance, gram-negative bacteria, carbapenemase, *Enterobacteriaceae*

9:55

Healthcare-Associated Outbreak of Tuberculosis — Puerto Rico, 2010

AUTHORS: Brian J. Baker, S. Bamrah, B. Heath, M. Fernández, M. Bermúdez, N. Palacios, A. Martínez

BACKGROUND: Tuberculosis (TB) is an airborne disease that can be life-threatening when treatment is delayed. Recognizing TB symptoms early is crucial to prevent transmission, particularly in healthcare settings. In 2010, TB was diagnosed for 3 healthcare personnel (HCP) at a hospital; one died after a 6-month delay in diagnosis. The Puerto Rico Department of Health and CDC investigated the outbreak.

METHODS: An outbreak case was defined as TB disease diagnosed January 1, 2008–October 1, 2010, in a person who had spent time at the hospital. We interviewed patients, reviewed medical records, and examined annual and postoutbreak tuberculin skin test (TST) results for all HCP.

RESULTS: Nine total cases were identified (including the 3 HCP); the 7 with isolates available had matching genotypes. The index case-patient was not effectively isolated during a 3-month hospitalization in 2008 for known infectious TB. Three HCP with undiagnosed TB worked a total of 444 days while infectious. TB was diagnosed for 6 of the 9 because they sought medical attention for TB symptoms; median time from first contact with medical care to initiation of treatment was 56 days. In 2010, TST results for 45 of 299 HCWs were newly positive. For HCP, the relative risk of a newly positive TST was 3.3 times (95% confidence interval: 1.5–4.7) higher among those who worked in an area where infectious HCP had worked.

CONCLUSIONS: This outbreak highlights how undiagnosed TB can contribute to transmission in healthcare settings, placing HCP and patients at risk. Educational efforts in Puerto Rico should focus on increasing TB awareness to promote early identification and treatment of disease, as well as initiation of recommended infection control precautions.

KEYWORDS: tuberculosis, Puerto Rico, hospital infections

WEDNESDAY, APRIL 13
CONCURRENT SESSION I1

Where Vigilance Never Sleeps

January 28, 2011, by Mike Hale

The New York Times

Surveillance, 10:30–11:55 a.m.

Atrium Ballroom B and C

MODERATOR: James Buehler



51st Annual Epidemic Intelligence Conference (EIS) Conference

April 22–26, 2002

Centers for Disease Control and Prevention
Atlanta, Georgia

Monday Morning — April 22, 2002

Background: The terrorist attack on the World Trade Center (WTC) on September 11, 2001, killed and injured more people than any previous attack on a civilian target in United States history. The New York City Department of Health and CDC investigation conducted a rapid epidemiologic assessment of a series of hospitals to characterize the injuries and medical needs of survivors. Methods: Trained personnel manually reviewed hospital medical records and clinical charts. Results: Of the 2,700 survivors treated for WTC-related injuries and presented for emergency care within 6 months of the first attack, 139 (1%) were admitted for further treatment. Injuries sustained by survivors relative to civilians accounted for 279 (22%) of survivors treated for emergency care within 6 months of the first attack. Subsequently, greater numbers of workers presented for treatment were rescue workers (207, 54%) and civilian injuries (204, 26%) were the most common injuries (39% vs 19%, p<0.0001). Conclusions: Most WTC attack survivors who presented for emergency care at the sampled hospitals did so soon after the attack and sustained injuries created on an outpatient basis. Identification of injuries sustained by rescue workers supported ongoing, targeted safety interventions. Lessons learned from this rapid assessment can improve surveillance and response in the aftermath of future disasters.

Key words: injury, terrorism, disaster planning, New York City, accidents, occupational

11:10 Sandra L. Berrios-Torres, J. Greenko, M. Phillips, J. Miller, T. Treadwell, R. Ikeda
World Trade Center Rescue Worker Injury and Illness Surveillance System — New York 2001.

Background: The September 11, 2001 terrorist attacks on the World Trade Center (WTC) prompted an unprecedented rescue and recovery response. Rescue operations were conducted around the clock. The New York City Department of Health and CDC implemented prospective surveillance to characterize rescue worker-related injuries and illnesses and implement public health interventions.

Methods: From September 14 to October 11, 2001, trained personnel reviewed medical records at four Manhattan hospital emergency departments, and health care providers completed data collection forms at five temporary Disaster Medical Assistance Team (DMAT) facilities located at the WTC site. A rescue worker or any construction worker, police officer, or firefighter evaluated at any of these facilities. Data collected included demographic characteristics, worker category, injury type, illness and disposition. Data were analyzed and summarized daily.

Results: Of 4721 rescue worker visits recorded, 4497 (95%) were evaluated at DMAT facilities and 234 (5%) in emergency departments. Respiratory complaints were the leading cause of visits (n=90, 13%), followed by eye irritation (n=64, 12%), and lacerations (n=25, 5%). Other visits included requests for medications and supplies (n=36), 8%, and personal protective equipment (n=350, 7%). Fifty-two (1%) rescue workers were transported to area hospitals, and 12 (c=1%) resulted in hospitalization.

Conclusions: DMAT facilities were an important resource for ongoing treatment and triaging of rescue workers, thus including these facilities in the surveillance system was crucial. Timely recognition of respiratory and eye complaints prompted increased efforts to distribute and encourage the proper use of personal protective equipment among rescue workers.

Key words: injury, surveillance, disaster, terrorism, occupational

11:30 Debra M. Feldman, P. Edelman, S. Baron, C. Mueller, B. Bernard, B. Lushniak, K. Kelly, D. Present
Health Effects, Respirator Use and Biomonitoring Results Among New York City Firefighters Responding to the World Trade Center (WTC) Disaster — September, 2001.

Wednesday

10:35

Impact of a Pilot Intervention To Decrease Overreporting of Heart Disease Deaths — New York City, 2009–2010

AUTHORS: Teeb Al-Samarrai, A. Madsen, R. Zimmerman, G. Maduro, W. Li, C. Greene, E. Begier

BACKGROUND: Valid cause-of-death (COD) reporting on death certificates is essential for accurate vital statistics, which are used to establish and monitor progress of public health priorities. Heart disease (HD) deaths are overreported in the United States, particularly in New York City (NYC) where a study revealed overreporting of coronary heart disease deaths by 91%. We evaluated the impact of a pilot intervention to improve COD reporting.

METHODS: A pilot intervention at 8 hospitals reporting the highest proportion of HD deaths in NYC was implemented during August 1, 2009–January 31, 2010. The intervention had multiple components, including an in-service and e-learning module to educate hospital staff on COD reporting. We analyzed death certificate data and compared leading underlying COD in the 6-month pre- and post-intervention periods February 1–July 30, 2009, and 2010, respectively, for all NYC hospitals.

RESULTS: At intervention institutions, reported HD deaths declined 50.4%, from 1,589 (62.9%) of 2,527 deaths during the pre-intervention period to 758 (31.2%) of 2,431 deaths during the post-intervention period. Reported deaths from underlying malignant neoplasms increased from 12.7% to 17.7%; influenza and pneumonia deaths increased from 4.4% to 10.0%; and chronic lower respiratory disease deaths increased from 2.7% to 5.1%. At nonintervention hospitals, reported HD deaths decreased from 37.0% to 34.9%; other leading causes changed by <0.3%.

CONCLUSIONS: NYC's intervention to decrease overreporting of HD deaths was effective and led to substantial changes in HD reporting and other leading COD. Intervention scale-up and monitoring the durability of this effect are planned. The marked increase in reported influenza and pneumonia deaths post-intervention requires further investigation, because the pre-intervention NYC rate already exceeded the national average.

KEYWORDS: heart disease, death certificates, vital statistics, research design

10:55

Using Hospitalization Data To Evaluate and Improve Invasive Pneumococcal Disease Surveillance — New Mexico, 2007–2009

AUTHORS: Mam I. Ibraheem, M. Landen

BACKGROUND: Invasive pneumococcal disease (IPD) is vaccine-preventable and commonly manifests as septicemia or meningitis. IPD underreporting can influence policy decisions regarding vaccine use. We evaluated IPD reporting completeness and how hospitalization data can benefit surveillance.

METHODS: Combined IPD data from passive surveillance and Emerging Infections Program Active Bacterial Core surveillance during 2007–2009 were linked with Hospital Inpatient Discharge Data (HIDD) by deterministic data linkage. Potential IPD cases in HIDD were identified by using 2 IPD-specific International Classification of Diseases, Revision 9 (ICD-9) codes (meningitis or septicemia caused by *Streptococcus pneumoniae*) and 3 nonspecific codes. For potential cases identified only through HIDD, laboratory reports confirming *S. pneumoniae* isolation from a normally sterile site were reviewed for all those with IPD-specific codes and a systematic sample of 17% of those with nonspecific codes. Capture-recapture was used to estimate surveillance sensitivity.

RESULTS: Surveillance detected 1,191 cases, 396 initially through active surveillance. HIDD identified 1,287 potential cases; 558 cases were identified by both HIDD and surveillance. Of 729 potential cases identified only by HIDD, 104 had IPD-specific and 625 had IPD-nonspecific codes; 32 were true IPD cases. We estimated 36 additional cases missed by both sources, yielding 95% overall system sensitivity. Predictive value positive was 78% for IPD-specific codes and 30% for nonspecific codes.

CONCLUSIONS: The high sensitivity of New Mexico IPD surveillance is likely because of combined active and passive surveillance. Hospitalization data yielded additional IPD cases not identified through surveillance. For states that rely on passive reporting, using IPD-specific ICD-9 codes from hospitalization data might be an efficient way to improve surveillance. To track cases adequately, IPD case-ascertainment deficiencies, including hospitalization coding problems, should be addressed.

KEYWORDS: disease notification, epidemiology, hospitalization, hospital records, *Streptococcus pneumoniae*

11:15

Mandatory Reporting Firearm Injury Surveillance – Alaska, 2003–2007

AUTHORS: Asha Z. Ivey, D. Hull-Jilly, J. McLaughlin

BACKGROUND: Among violence-related deaths in Alaska, firearm injuries are the leading cause, resulting in 734 deaths from 2003–2007. Firearm fatalities and hospitalizations are captured in the Alaska Violent Death Reporting System (AKVDRS) and the Alaska Trauma Registry (ATR), respectively. The state mandated reporting in 1996 to better understand the public health burden of firearm injuries. No active database captures the reports submitted by healthcare providers. The objectives of this investigation were to determine the sensitivity of Alaska's Mandatory Firearm Injury Reporting Surveillance System (AMFIRSS) and to make recommendations for ongoing surveillance.

METHODS: Archived firearm injury report forms from 1996–2007 were entered into a database. Data from AMFIRSS were matched using demographic variables to data available between 2003–2007 for AKVDRS and ATR. Sensitivity of AMFIRSS was examined in comparison to AKVDRS and ATR.

RESULTS: Of the 1334 firearm injuries identified in Alaska from 2003–2007, only 169 were reported in AMFIRSS; 734 were unique to AKVDRS, 518 to ATR, and 84 to AMFIRSS. Of the 734 firearm fatalities captured in AKVDRS, only 10 were reported in AMFIRSS (sensitivity=1.4%). Of the 581 firearm hospitalizations captured in ATR, only 83 were reported in AMFIRSS (sensitivity=14.3%).

CONCLUSIONS: The investigation documented the limited compliance with AMFIRSS and the very low sensitivity of the data obtained. Based on recommendations from this investigation Alaska has developed a new database for mandatory reporting and identified a personnel resource responsible for maintenance of the system. In addition, Alaska is considering conducting a healthcare provider survey and/or focus groups to assess knowledge, attitudes, and barriers related to reporting firearm injuries.

KEYWORDS: firearm injuries, mandatory reporting, fatalities, hospitalization, Alaska, surveillance

11:35

Rapid Assessment of Pneumonia and Influenza-Related Mortality – Ohio, 2009–2010

AUTHORS: Loren E. Rodgers, J. Paulson, B. Fowler

BACKGROUND: The Ohio Department of Health (ODH) Electronic Death Reporting System (EDRS) reports mortality causes 3 months postmortem. To enhance timeliness during the 2009–2010 influenza A (H1N1) pandemic, ODH activated a checkbox within EDRS for surveillance for pneumonia- and influenza-related deaths within 5 days postmortem. We compared checkbox and *International Classification of Diseases* (10th Rev.) (ICD-10) systems to determine agreement and identify opportunities for improvement.

METHODS: Registrars generated checkbox data when filing death certificates, and the National Center for Health Statistics assigned ICD-10 codes by using mortality descriptions from filed death certificates. For deaths occurring in Ohio during September 2009–March 2010, we compared pneumonia and influenza checkbox selections with corresponding assigned ICD-10 codes, treating ICD-10 codes as the standard.

RESULTS: Among 44,236 decedents, agreement of checkbox and ICD-10 data was 97% for pneumonia ($\kappa = 0.76$) and >99% for influenza ($\kappa = 0.75$). Of 2,872 pneumonia-related deaths detected by the ICD-10 system, 2,301 were also detected by checkbox (sensitivity: 80%). Additionally, 782 had checkbox selections of pneumonia without corresponding pneumonia ICD-10 codes. Of these, 578 (74%) had codes for chronic obstructive pulmonary disease (COPD) with acute lower-respiratory infections, excluding influenza. Among 64 influenza-related deaths detected by the ICD-10 system, 46 were also detected by checkbox (sensitivity: 72%). No predominant ICD-10 code existed among 15 identified as influenza-related deaths only by the checkbox system. Predictive value positive (PVP) was 75% for both influenza- and pneumonia-related deaths.

CONCLUSIONS: The checkbox system enhanced timeliness while maintaining high agreement with the ICD-10 system. To improve pneumonia PVP and better target limited public health resources during pneumonia-related mass-fatality events, registrar training should enhance discernment between COPD and pneumonia.

KEYWORDS: epidemiology; sentinel surveillance; influenza A virus, H1N1 subtype; vital statistics, mortality; International Classification of Diseases

Abstracts

WEDNESDAY, APRIL 13
CONCURRENT SESSION I2

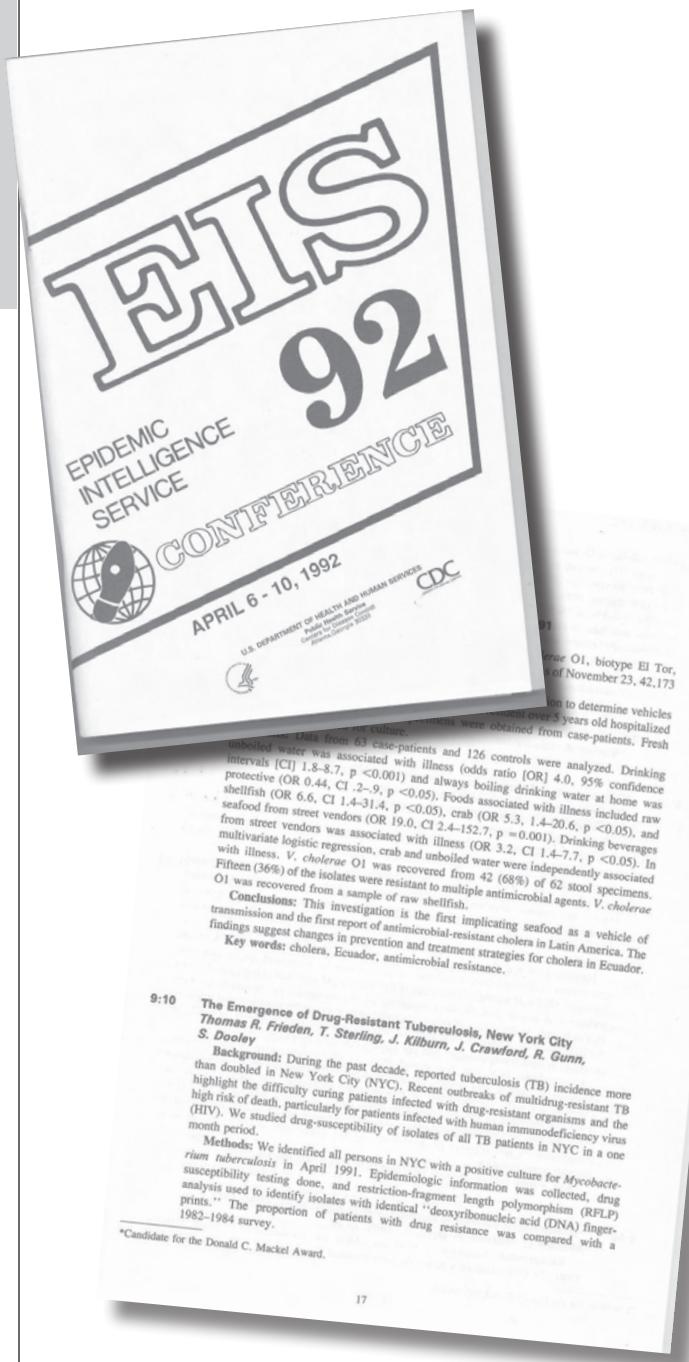
Doctors and Patients Are Pushed To Their Limits by Grim New TB

October 12, 1992, by Elizabeth Rosenthal
The New York Times

Tuberculosis, 10:30-11:55 a.m.

Atrium Ballroom A

MODERATOR: Kenneth Castro



10:35

Symptom Based Screening for Highly Infectious Tuberculosis in People Living with HIV/AIDS – Cambodia, Thailand, and Vietnam, 2006–2008

AUTHORS: Lindsay Kim, C. Heilig, N. Phanuphak, P. Chheng, N. Kanara, H. Quy, B. Sar, K. Cain, and J. Varma

BACKGROUND: Tuberculosis (TB), an airborne disease that is the leading cause of death among people living with HIV/AIDS (PLHA), is frequently transmitted among this susceptible group. Transmission among PLHA with highly infectious TB can be reduced by infection control practices such as isolation or mask use; however, simple, evidence-based methods for identifying such patients are not well described in the literature. We developed a symptom-based screening method for use at resource-limited health care facilities to identify PLHA with highly infectious TB.

METHODS: Participants were 1,745 PLHA at 8 outpatient facilities in Cambodia, Thailand, and Vietnam who underwent a standardized diagnostic evaluation for TB. Highly infectious TB was defined as sputum smear with ≥ 1 bacterium per field in 50 microscope fields and *Mycobacterium tuberculosis* culture growth. To develop an ideal symptom algorithm with high sensitivity and specificity, but low prevalence, we calculated these characteristics for 73 individual symptoms and 1,105 symptom combinations.

RESULTS: Of 266 PLHA found to have TB, 46 (17%) were highly infectious. Sensitivity for detecting highly infectious TB was highest for cough in the past 4 weeks (94%), cough in the past 24 hours (89%), daily cough (87%), and difficulty breathing (87%); however, specificity was 50%–66%, and prevalence was 36%–51%. Having at least two of three symptoms (prevalence, 22%)—cough in the past 24 hours, difficulty breathing, and night sweats for >3 weeks—was 85% sensitive and 80% specific for highly infectious TB.

CONCLUSIONS: Our 3-symptom combination was sensitive and specific for highly infectious TB. Resource-limited health care facilities can use this combination to identify PLHA who should be isolated or given masks to decrease TB transmission.

KEYWORDS: tuberculosis, *Mycobacterium tuberculosis*, HIV, screening, infectiousness, infection control

9:10 The Emergence of Drug-Resistant Tuberculosis, New York City
Thomas R. Frieden, T. Sterling, J. Kilburn, J. Crawford, R. Gunn,
S. Dooley

Background: During the past decade, reported tuberculosis (TB) incidence more than doubled in New York City (NYC). Recent outbreaks of multidrug-resistant TB highlight the difficulty curing patients infected with drug-resistant organisms and the high risk of death, particularly for patients infected with human immunodeficiency virus (HIV). We studied drug-susceptibility of isolates of all TB patients in NYC in a one month period.

Methods: We identified all persons in NYC with a positive culture for *Mycobacterium tuberculosis* in April 1991. Epidemiologic information was collected, drug susceptibility testing done, and restriction-fragment length polymorphism (RFLP) analysis used to identify isolates with identical deoxyribonucleic acid (DNA) fingerprints. The proportion of patients with drug resistance was compared with a 1982–1984 survey.

*Candidate for the Donald C. Mackel Award.

10:55

Poop Matters. Stool Culture as a Predictor of Pulmonary Tuberculosis in People Living with HIV – Cambodia, Thailand and Vietnam, 2006–2008

AUTHORS: Gloria E. Oramasionwu, C. Heilig, N. Udomsantisuk, M. Kimerling, B. Eng, N. Huy Dung, C. Keo, K. McCarthy, J. Varma, K. Cain

BACKGROUND: In 2009, twenty-five percent of 1.7 million tuberculosis (TB) deaths worldwide were of people living with HIV (PLHIV). Delayed TB diagnosis increases mortality. Diagnosing TB in PLHIV is challenging: their chest radiographs may be atypical, and they may not expectorate adequate sputum for examination by microscopy. We examined whether stool culture (SC; easily obtainable and possibly indicative of swallowed pulmonary bacteria) improves diagnosis of pulmonary TB.

METHODS: We analyzed data from a cross-sectional study of PLHIV conducted in Cambodia, Thailand, and Vietnam during 2006–2008. Sputum and extrapulmonary specimens were collected from 1,693 participants. TB was diagnosed if a specimen was culture-positive for TB. We calculated the sensitivity of SC for pulmonary TB. Logistic regression was performed to assess the association between positive SC and more infectious, smear-positive pulmonary TB (>4 bacteria/high-powered field on sputum microscopy), smear-negative pulmonary TB, and extrapulmonary TB.

RESULTS: Of 1,693 PLHIV, 228 had TB (206, pulmonary; 22, extrapulmonary only). Of the 228, 101 had a positive SC, and of the 101, 91 had pulmonary TB (sensitivity: 44%). After we controlled for age, country, body mass index, abnormal chest radiograph, and CD4 count, a positive SC was associated with smear-positive (odds ratio [OR]: 127.2; 95% confidence interval [CI]: 47.8–338.8) and smear-negative (OR: 25.9; CI: 11.3–59.4) pulmonary TB, compared with no pulmonary TB, and with extrapulmonary TB (OR: 2.4; CI: 1.1–5.2), compared with no extrapulmonary TB.

CONCLUSIONS: Nearly half of PLHIV with TB had a positive SC, which is strongly associated with pulmonary TB. Among PLHIV who have difficulty expectorating sputum, SC may be an alternative tool for diagnosing TB and thus may help to decrease TB mortality.

KEYWORDS: *Mycobacterium tuberculosis*; HIV; diagnostic tests, routine; bacteriological techniques; microscopy; Asia, Southeastern

11:15

TB Row – *Mycobacterium tuberculosis* Cluster Investigation Using Current and Historical Genotyping Methods To Supplement Traditional Epidemiology – Detroit, Michigan, 1960s–2010

AUTHORS: Jenna M. Webeck, A. Flournoy, L. Cowan, R. Kramer, M. Wilkins, P. Davidson, V. Green, N. Mollon

BACKGROUND: In 2010, widespread *Mycobacterium tuberculosis* (TB) clusters were identified in Michigan. In one cluster, 8 cases of multidrug-resistant TB were diagnosed in an area known historically as “TB Row.” We investigated to determine associations among cases, assess continued transmission, and identify risk factors.

METHODS: To define cluster inclusion, we used current (polymerase chain reaction-based) and historical (restriction fragment length polymorphism [RFLP]) genotyping methods to supplement traditional epidemiologic links. Additional data were collected from medical records, case files, patient interviews, and national, state, and local databases.

RESULTS: Using current genotyping methods and epidemiological links, this cluster comprised 43 persons with active TB diagnosed during 1966–2010; persons were members of 1 extended family and close contacts (1966–2009), their neighbors (1993–2009), or residents of nearby homeless shelters (2007–2010). Traditional epidemiology linked 18 cases. An additional 25 cases were linked by using genotyping. Five used both methodologies. All patients were U.S.-born and black; 13 (30.2%) had history of homelessness; 23 (53.5%) had history of substance abuse; 10 (23.3%) were human immunodeficiency virus-infected; 10 (23.3%) had multidrug-resistant TB; 5 (11.6%) required court commitment to complete treatment; and 16 (37.2%) failed to complete appropriate treatment. RFLP results from historical cases (1996–2000) linked 71 additional persons to this cluster; these data are currently being analyzed.

CONCLUSIONS: Molecular analysis can help define inclusion in TB clusters when epidemiologic links are difficult to determine because of uncooperative or transient populations. Multigenerational, neighborhood transmission revealed missed opportunities for TB prevention among persons with high prevalence of risk factors. Active and routine use of genotyping might assist with prompt case identification, improve contact investigations, and enhance ongoing TB cluster management.

KEYWORDS: *Mycobacterium tuberculosis*; drug resistance, multiple; genotype; risk factors; cluster analysis

11:35

Tuberculosis Mortality: Death from a Curable Disease – Connecticut, 2007–2009

AUTHORS: Jessica A. Kattan, L. Sosa, M. Lobato

BACKGROUND: In the United States, 550 persons die from tuberculosis (TB) annually. CDC recommends review of TB-related deaths to determine if they were preventable and to develop death-reduction policies. Health departments rarely perform such reviews, and no standardized method exists. We reviewed recent deaths of Connecticut TB patients.

METHODS: The study population was all persons in Connecticut reported with TB to the state health department during 2007–2009. Health department and medical records of decedents were reviewed. An algorithm developed by the California Department of Public Health based on TB severity and complications and national care standards was used to determine TB-relatedness of deaths and missed prevention opportunities. For selected surveillance variables, chi-square was used to identify risk factors for death; decedents were compared with survivors.

RESULTS: Of 300 persons reported with TB, 20 (7%) died. Seventeen (85%) deaths were TB-related. Of these, 16 patients had ≥ 1 missed prevention opportunity, including delay in reporting TB to the health department ($n = 10$), inappropriate TB drug regimen ($n = 5$), laboratory delay in completing drug susceptibility results ($n = 6$), and provider delay in initiating ($n = 5$) or completing ($n = 5$) diagnostic evaluation. Decedents were more likely to have alcohol use (risk ratio [RR]: 4.4; 95% confidence interval [CI]: 1.8–11.0) or combined pulmonary and extrapulmonary TB (RR: 3.3; 95% CI: 1.2–9.1).

CONCLUSIONS: The majority of deaths among TB patients were TB-related; almost all had missed prevention opportunities. Interventions targeted to Connecticut health-care providers are needed to increase awareness of TB-related deaths and to optimize prevention opportunities.

KEYWORDS: tuberculosis, death, prevention and control, Connecticut, epidemiology

12:30

Atrium Ballroom A

SPECIAL SESSION: Extinguishing the Tobacco Epidemic: How We Can Win the Battle

MODERATORS: Ursula Bauer, Director, National Center for Chronic Disease Prevention and Health Promotion

SPEAKERS: Timothy McAfee, Director, Office on Smoking and Health; Andrew Hyland, Department of Health Behavior, Director of the Survey Research and Data Acquisition Resource, Roswell Park Cancer Institute, Buffalo; Brian King, Office on Smoking and Health

HOSTED BY: NCCDPHP

A common misconception is that everything about tobacco use is known and with passage of legislation enabling FDA to regulate tobacco the tobacco problem is solved. The session will show that continued efforts in tobacco control are needed but that now may be the best chance public health has to extinguish this epidemic. We will present the latest national and state tobacco control initiatives which have tremendous potential for decreasing initiation and driving the prevalence of tobacco use down to levels not seen in decades. These initiatives include passage of state and local comprehensive smoke-free indoor air laws and expansion of smoke-free environments into public housing, increases in state excise taxes, funding for state and community tobacco control efforts through the Communities Putting Prevention to Work initiative, the new HHS Tobacco Control Strategic Action Plan, the FDA's new regulatory authority over tobacco products and their proposed rules for placing graphic warning labels on product packaging, and the Affordable Care Act, Medicaid, and Medicare cessation treatment provisions. Examples will be given for how epidemiologic research, surveillance, and evaluation findings have directly led to the implementation of these policy initiatives. Challenges to making progress will also be presented (i.e., increased revenue from excise taxes is not dedicated to tobacco control, other tobacco is not taxed the same as cigarettes, emergence of e-cigarettes, tobacco industry, etc.) The session will conclude with a charge to the EIS officers and audience on what work they can undertake to hasten the end of the tobacco epidemic in the U.S., including targeted efforts in their communities.

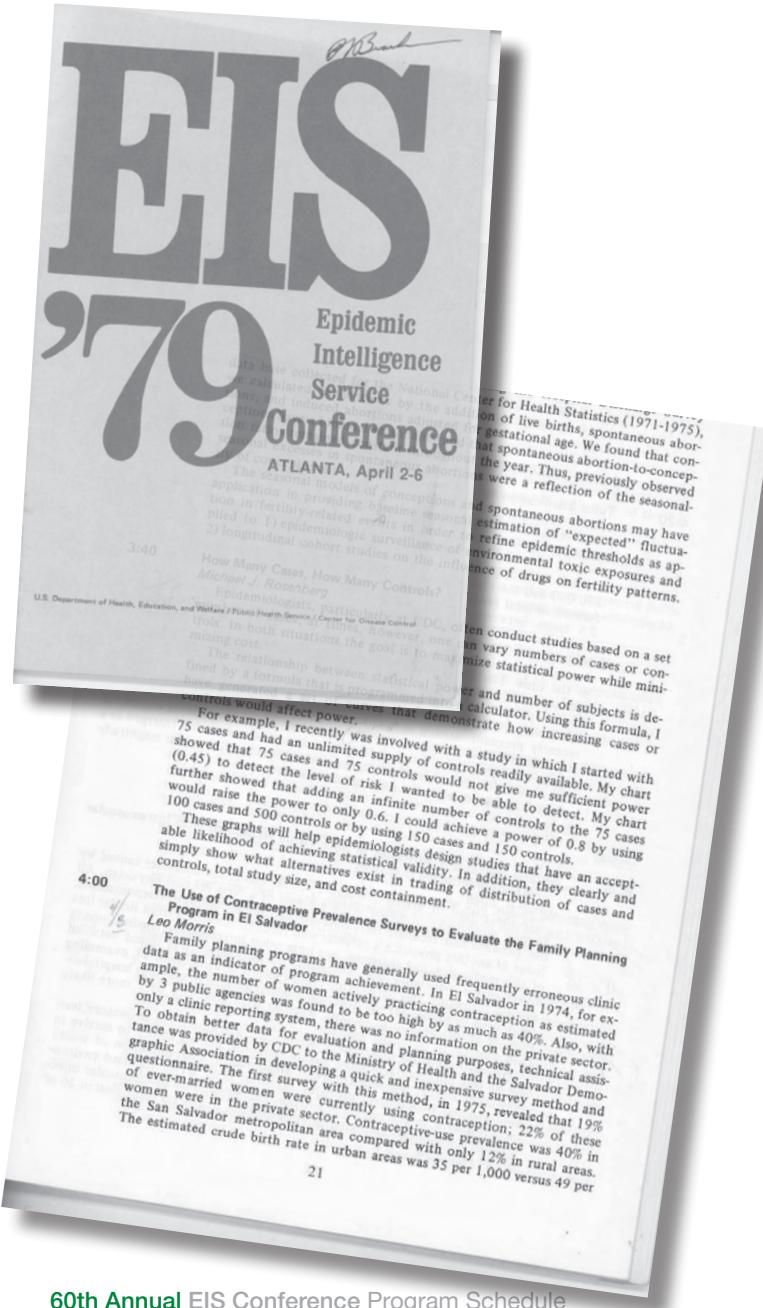
This session is timely with the designation of tobacco by CDC's director as a "Winnable Battle", targeted funding for tobacco initiatives through the American Recovery and Reinvestment Act and FDA being given the authority to regulate tobacco in 2009. Tobacco remains the leading cause of disease and death in the U.S. killing over 443,000 persons and costing over \$193 billion in health care costs and lost productivity each year. Effective strategies have been identified for decreasing initiation, increasing cessation and eliminating exposure to secondhand smoke and epidemiologic research and surveillance have contributed to identification and implementation of these policies. The audience has an important role in supporting these efforts in their communities so that the battle can be won.

POSTER SESSION 2

The Doctor's World; A Correspondent Recalls His Days as a Medical Sleuth

April 17, 2001, By Lawrence K. Altman, MD
The New York Times

Meet the Authors of Posters 16–30
12:30–1:30 p.m.
Atrium Ballroom B and C



POSTER 16

Evaluation of the Use of Tuberculosis Genotyping and the Tuberculosis Genotyping Information Management System in State and Local Health Departments – United States, 2010

AUTHORS: Brian J. Baker, A. Langer, L. Cowan, S. Ghosh, J. Grant

BACKGROUND: Despite declining incidence over the past decade, tuberculosis (TB) remains a substantial public health problem in the United States, with 11,545 reported cases in 2009. Genotyping of TB isolates has several applications to TB control; however, challenges in managing genotyping data have impeded its use. In March 2010, CDC launched the TB Genotyping Information Management System (TBGIMS), a secure Web-based genotyping data management application. We evaluated TBGIMS and the use of genotyping 6 months after launch.

METHODS: We created a Web-based survey to collect data regarding user's jurisdiction, job title, and experience with the system, including timeliness of receiving results, uses of genotyping data, and overall satisfaction with TBGIMS. We also analyzed system data to evaluate timeliness of genotype results.

RESULTS: Of 477 active users, 189 (40%), from 50 states, responded to the survey. TB epidemiologists (27%) and laboratorians (25%) predominated; 60% of respondents used TBGIMS in their routine activities, and 64% accessed TBGIMS at least monthly. Respondents commonly used genotyping data to confirm known epidemiologic links among cases (67%) and find previously unknown epidemiologic links (60%). Twenty percent were very satisfied with TBGIMS, and 50% were "satisfied but wished they could do more," including generate multi-jurisdictional reports and track epidemiologic links. Over half (55%) were extremely or somewhat satisfied with improved access to genotyping data. Regarding the timeliness of results, 33% indicated that results were later than desired; median time from specimen collection to receipt of genotyping results was 67 days.

CONCLUSIONS: TBGIMS has been successfully integrated into genotyping activities. Future efforts should seek to add additional features to TBGIMS, as well as identify and overcome barriers to timely reporting of genotyping results.

KEYWORDS: tuberculosis, genotyping, outbreak detection, informatics, information technology

Abstracts

POSTER 17

Nutrition Surveillance and Malnutrition Patterns in Chronic Humanitarian Emergency – West Bank and Gaza Strip, October 2010

AUTHORS: Sudhir Bunga, A. AbuRub, N. Rizkallah, D. Araki, L. Talley, O. Bilukha, T. Handzel

BACKGROUND: After 50 years of conflict and humanitarian crisis, 4 million people in West Bank (WB) and Gaza Strip (GS) are predisposed to poor nutrition outcomes. Since 2006, the Palestine National Authority and UNICEF have implemented the National Nutrition Surveillance System (NNSS). Using NNSS data, we examined the nutritional status of children in WB and GS.

METHODS: NNSS collects age, sex, length, weight and hemoglobin information from children 9–12 months of age, at 70 geographically representative sentinel-site clinics. After assessing data quality using Emergency Nutrition Assessment Software, we analyzed 2009 data. Prevalence and Z-scores were calculated using WHO 2006 references. Z-scores < – 2SD for length for age, weight for length, and weight for age, defined stunting, wasting and underweight respectively. Z-score > + 2SD weight for age defined overweight. Hemoglobin < 11 mg/dl defined anemia.

RESULTS: NNSS captured 20,188 children (WB = 12,301; GS = 7,887), representing approximately 80% of children in the age-group. Overall, prevalence of wasting (2.5%), stunting (4.6%), and underweight (2.5%) were low, while prevalence of overweight (26%) and anemia (57%) were relatively high. Prevalence of overweight was significantly higher in WB (31%) than in GS (20%) (OR: 1.6; 95%CI: 1.5–1.7). Prevalence of anemia was significantly higher in GS (74%) than in WB (47%) (OR: 3.1; 95%CI: 2.9–3.3).

CONCLUSIONS: Children in WB were more likely than children in GS to be overweight, while children in GS more likely to be anemic. Findings suggest poor feeding practices among these children, and limited diet, particularly in GS, due to human and supplies movement restrictions and poor health infrastructure. NNSS data should be used to improve targeting of nutrition interventions addressing overweight and anemia.

KEYWORDS: malnutrition, nutrition, surveillance, humanitarian crisis, West Bank, Gaza Strip

POSTER 18

Salmonella enterica Serotype Javiana Outbreak Associated with a Mexican Restaurant Chain – Indiana, 2010

AUTHORS: Melissa G. Collier, K. O'Connor, J. Pringle, L. Hausman, C. Barton Behravesh, A. May, T. Duszynski, L. Gieraltowski, I. Williams, P. Pontones

BACKGROUND: *Salmonella* infections cause an estimated 1.4 million illnesses and 400 deaths annually in the United States. In July 2010, the Indiana State Department of Health received increased *Salmonella* Javiana isolates with identical pulsed-field gel electrophoresis (PFGE) banding patterns. Patients frequently reported eating at Chain Mexican Restaurant X. A case-control study was conducted to identify the source of illness and guide prevention measures.

METHODS: A case was defined as illness in an Indiana resident with *Salmonella* Javiana isolates matching the outbreak strain PFGE pattern and onset during June 24–August 6. Control subjects were matched by geography and age group. Exposures to local grocery stores and restaurants, fresh produce items, and Mexican-style restaurant foods were assessed. Environmental and product trace-back investigations were completed.

RESULTS: The study included 34 case-patients and 71 matched control subjects. Among case-patients, 70% were female, and the median age was 38 years (range: 12–83). Eating at Chain Mexican Restaurant X increased odds of illness (matched odds ratio [mOR]: 20.7; 95% confidence interval [CI]: 3.3–infinity) as did eating fresh salsa from any restaurant (mOR: 4.9; 95% CI: 1.2–28.3). No other exposures were significantly associated with illness. The environmental investigation and the product trace-back of the salsa ingredients did not reveal a source.

CONCLUSIONS: Involvement of multiple restaurant locations in this outbreak indicates a regionally distributed product. Contamination of any ingredients in fresh salsa is possible, and consuming multiple food items together makes identifying each independent contribution to illness difficult. For these reasons, epidemiologic methods were limited in identifying the specific ingredient, highlighting the importance of timely product trace-back and environmental investigation.

KEYWORDS: *Salmonella*, foodborne diseases, disease outbreaks, case-control studies

POSTER 19**Gastroenteritis Among Attendees of a Youth Conference — North Carolina, February 2010**

AUTHORS: Natalie J.M. Dailey, N. Lee, A. Fleischauer, Z. Moore, E. Alfano-Sobsey, F. Breedlove, A. Pierce, S. Ledford, S. Greene, G. Gómez, D. Talkington, M. Sotir, A. Hall, D. Sweat

BACKGROUND: Because norovirus is a commonly identified etiologic agent during gastroenteritis outbreaks, North Carolina outbreak specimens are first tested for norovirus and for other pathogens if results are negative. On February 13, 2010, a gastroenteritis outbreak occurred among attendees at a youth conference. We investigated to identify a possible vehicle and causative agent.

METHODS: We performed a retrospective cohort study by using an online survey. We defined a case as onset of vomiting or diarrhea during February 11–14 in a conference attendee. We tested stool from patients for norovirus by reverse-transcription polymerase chain reaction and for *Clostridium perfringens* enterotoxin (CPE) by using a commercial assay.

RESULTS: Of 1,020 attendees, 534 (52%) completed the survey, including 307 who met the case definition. Among 307 patients, 297 (97%) reported diarrhea, whereas 47 (15%) reported vomiting. Seventy-five percent of patients had illness onset during 3–9 a.m. on February 13. Risk for gastroenteritis was higher among attendees who had eaten the banquet dinner on February 12 (risk ratio [RR]: 2.5; 95% confidence interval [CI]: 1.5–4.1). Among 481 attendees who had eaten the banquet dinner, risk for gastroenteritis was higher among those who had eaten chicken (RR: 2.8; 95% CI: 1.7–4.5). Norovirus was initially detected among 5 of 9 stool samples. Because the low prevalence of vomiting and short incubation period were inconsistent with norovirus, all 9 samples were subsequently retested and determined negative for norovirus. Eight were positive for CPE.

CONCLUSIONS: Although norovirus was initially implicated, epidemiologic findings were more consistent with *C. perfringens* toxicoinfection. This outbreak emphasizes the value of additional targeted laboratory testing when epidemiology during a gastroenteritis outbreak is inconsistent with norovirus.

KEYWORDS: *Clostridium perfringens*, enterotoxins, food-borne diseases, norovirus, disease outbreaks

POSTER 20**Life Inside an Outbreak: A Qualitative Assessment of Cholera Response Efforts, Artibonite Department, Haiti, 2010**

AUTHORS: Joanna Gaines, A. Gieselman, L. Jacobson, S. Demas, B. Person, T. Roels, J. Tappero, R. Quick, T. Handzel

BACKGROUND: On October 21, 2010, Haiti confirmed its first cholera outbreak; Artibonite Department reported 9,694 hospitalized cases and 595 deaths in the first 3 weeks. The Haitian government and non-governmental organizations initiated a communication campaign about cholera, including preparation of homemade sugar-salt solution (SSS) for treatment, through radio, television, and community workers on October 22. Water treatment products and oral rehydration salts (ORS) were distributed. Household surveys in Artibonite revealed that 55% of families had water treatment products and 36% had ORS. A survey of cholera decedents' families suggested that nearly half did not know cholera was treatable.

METHODS: To understand discrepancies between response activities and household preparedness, from November 12–17, we conducted 7 focus group discussions (median size=8 persons) and 5 semi-structured interviews with women regarding cholera prevention and treatment, household water treatment methods, and hygiene. Data were analyzed for dominant themes and concepts using ATLAS-ti software.

RESULTS: Analysis revealed that most respondents feared cholera and lacked understanding about cholera prevention, transmission, and spectrum of illness. Discussants expressed a desire for in-depth cholera education. Product distribution events were described as chaotic and stressful, with inequitable distribution of supplies and insufficient education about specific products. Many discussants could describe neither proper dosing for water treatment products, nor correct SSS preparation. Most knew proper ORS preparation, and all discussants noted an insufficient supply. Discussants noted that water treatment products lasted only a few days and replacement supplies were unaffordable.

CONCLUSIONS: Three weeks into the outbreak, despite intensive communication and product distribution, there were substantial cholera knowledge gaps and insufficient supplies for cholera prevention and treatment. This qualitative assessment rapidly identified correctable deficiencies in cholera response efforts.

KEYWORDS: cholera, qualitative methods, health behaviors, health education, Haiti

Abstracts

POSTER 21

Using the Internet To Trace Contacts of a Fatal Meningococcemia Case – New York City, 2010

AUTHORS: Prabhu P. Gounder, P. Del Rosso, K. Middleton, C. Rivera, D. Weiss

BACKGROUND: Reports indicate that prophylaxis of all members of a defined social network, even those without an obvious direct contact with infectious persons, can interrupt *Neisseria meningitidis* transmission. Common techniques for mapping social networks (e.g., serial interviews and environmental observation) might be of limited value in uncovering hidden sexual and drug-sharing networks, especially with patients who have died. A New York City Department of Health and Mental Hygiene (DOHMH) investigation of a fatal meningococcemia case demonstrates how tracing network members for prophylaxis by using an online community can help overcome these challenges.

METHODS: DOHMH identified the decedent's direct contacts who met traditional criteria for ciprofloxacin prophylaxis through interviews. Upon DOHMH's request, the administrator of an online community's website regularly used by the person to arrange casual sexual encounters notified members who had communicated with that person to seek prophylaxis regardless of whether they had directly met him. Similarly, the host of a drug-sharing party, held during the decedent's infectious period and attended by members of his social network, advised attendees to seek prophylaxis.

RESULTS: Contact tracing by traditional criteria identified 2 household members, 1 intimate partner, and 17 healthcare workers, all of whom received prophylaxis. Mapping the decedent's social network identified 36 members potentially at risk, but no additional intimate contacts were confirmed; 6 took prophylaxis. No secondary cases were reported during the subsequent 2 months.

CONCLUSIONS: Although additional contacts at risk were identified, we cannot empirically prove that treating indirect social networking contacts prevented transmission. Rather, our investigation illustrates how online social communities can aid epidemiologic investigations in tracing hidden social contacts, especially when patients have died and contact identification is urgent.

KEYWORDS: *Neisseria meningitidis*, prevention and control, interpersonal relations, risk factors, community network

POSTER 22

Knowledge, Attitudes, and Practices Related to Cholera Prevention and Treatment – Artibonite Department, Haiti, 2010

AUTHORS: Lara M. Jacobson, A. Gieselman, J. Gaines, C. Blanton, E. McCormick, K. Barbour, C. Hyppolite, W. Roodly Archer, T. Roels, J. Tappero, T. Handzel

BACKGROUND: During the first 30 days of Haiti's cholera outbreak, the Artibonite Department reported > 31,000 cases and 670 deaths. The public health response included health prevention messages and distribution of soap, oral rehydration salts (ORS), and water purification products. We surveyed knowledge, attitudes, and practices (KAP) and the delivery of cholera prevention and treatment.

METHODS: We conducted a 35x15 cluster survey among rural and urban communities in Artibonite Department targeted for hygiene interventions. A standardized questionnaire was administered to female heads of households, and stored household drinking water was tested for free chlorine levels.

RESULTS: We surveyed 512 households in 8 urban zones and 26 rural villages during November 12–19. Median household size was 6 (range 1–28). Overall, 27% reported a family member thought to have had cholera. Knowledge of cholera was high; the majority had heard that an outbreak was occurring (99.4%) and could identify diarrhea as a symptom of cholera (89.1%). Only 55.5% households reported receiving any supplies [water purification tablets (51.6%), ORS (36.8%), and/or soap (29.8%)]. Respondents indicated they would use water purification tablets if available (97.8%), and 107 (72.8%) of 147 with remaining tablets and stored water available for testing had detectable chlorine levels. Only 64.8% reported knowing how to prepare ORS, of which 81.5% demonstrated how to do so properly.

CONCLUSIONS: Only half of intended recipients received cholera prevention and treatment supplies in an area heavily impacted by cholera, and substantial gaps existed in knowledge of ORS preparation. It is critical that further outbreak-response efforts improve the distribution of needed supplies and reinforce health messages.

KEYWORDS: cholera; Haiti; Knowledge, Attitudes, Practices (KAP)

POSTER 23

***Vibrio mimicus* Infection After Consumption of Crayfish – Spokane, Washington, 2010**

AUTHORS: Meagan K. Kay, E. Cartwright, E. Barzilay, K. MacDonald, J. McCullough, D. MacEachern, J. Duchin, C. Tarr, D. Talkington, A. Marfin

BACKGROUND: *Vibrio mimicus* can cause potentially severe bacterial gastroenteritis. No *V. mimicus*-associated foodborne outbreaks have been reported to CDC since 1998. In June 2010, Spokane Regional Health District was notified of *V. mimicus* infections among 3 persons who had consumed leftover crayfish at a potluck dinner; 2 were hospitalized under intensive care. We investigated to identify the infection source and additional ill persons.

METHODS: We conducted a retrospective cohort study of attendees of a party where freshly cooked crayfish were served or a potluck where leftovers were served the next day. The host was interviewed; he provided an attendee list and menu for both events. A case was defined as diarrheal illness (>3 stools/day) ≤ 5 days after the potluck. Leftover crayfish and stool from ill persons were tested by culture.

RESULTS: Of 22 attendees, 21 (95%) completed questionnaires. Four cases were identified; 3 persons provided stool specimens, all of which were culture-positive. Eight (38%) persons had eaten freshly cooked crayfish only; 4 (19%), leftover crayfish only; and 4, both types. Of 8 persons who had consumed leftover crayfish, 4 became ill compared with 0 / 13 who did not consume leftover crayfish (relative risk: undefined; Fisher's exact $P = 0.02$). Cooked crayfish had been served from a cooler that had contained live crayfish and had not been cleaned before being used to serve the cooked crayfish. After the party, remaining crayfish were refrigerated in different containers and served cold the next day. Leftover frozen crayfish were culture-negative.

CONCLUSIONS: The *V. mimicus* infections likely resulted from cross-contamination in the cooler. Consumers and clinicians should consider *V. mimicus* as a cause of diarrhea after recent crayfish consumption.

KEYWORDS: *Vibrio mimicus*, Astacoidea, diarrhea, foodborne diseases

POSTER 24

***Neisseria gonorrhoeae* Infections with High Minimum Inhibitory Concentrations to Azithromycin – San Diego County, California, 2009**

AUTHORS: Christina B. Khaokham, M. Pandori, E. Yee, R. Kirkcaldy, H. Weinstock, K. Katz

BACKGROUND: *Neisseria gonorrhoeae* (NG) is a common cause of genitourinary infection. NG has developed resistance, indicated by minimum inhibitory concentrations (MICs), to certain antimicrobials, limiting treatment options. One 2-g azithromycin dosage has been used to treat uncomplicated gonorrhea among cephalosporin-allergic persons, but is not recommended because of resistance concerns. During August–October 2009, a total of 5 of 55 (9.1%) NG isolates collected from men with symptomatic urethritis at San Diego County's municipal sexually transmitted disease clinic had high MICs to azithromycin. We investigated to describe the outbreak and characterize the isolates.

METHODS: We interviewed patients and performed contact tracing. High MIC was defined as ≥ 8 $\mu\text{g/mL}$ by agar dilution. Isolate genotyping was performed by using NG multi-antigen sequence typing (NG-MAST) to determine strain type (ST). Polymerase chain reaction-based methods were used to sequence the gene encoding the 23S rRNA subunit and the *mtrR* gene's coding and promoter regions.

RESULTS: Three isolates had 8 $\mu\text{g/mL}$ MICs, and 2 had 16 $\mu\text{g/mL}$ MICs. All were from human immunodeficiency virus-uninfected men who have sex with men. The median age was 29 years (range: 19–31). The men reported 13 total sex partners (range: 1–4 partners/man) within 90 days of diagnosis. None named partners in common. Four isolates were assigned a novel NG-MAST ST and the fifth, a closely related ST. Sequencing of the 23S rRNA gene and *mtrR* gene's coding and promoter regions demonstrated mutations associated with azithromycin resistance in all 4 sequenced isolates.

CONCLUSIONS: Lack of common sex partners indicates that NG strains with high MICs might be widespread in the county. Continued surveillance for antibiotic resistance patterns is critical in guiding gonorrhea control efforts.

KEYWORDS: *Neisseria gonorrhoeae*, gonorrhea, azithromycin, drug resistance

POSTER 25

Sustained Implementation of a School-Based Safe Water and Hygiene Program After 3 Years — Rarieda District, Kenya, 2010

AUTHORS: Adamma Mba-Jonas, G. Oluoch, A. Mwaki, T. Ayers, A. Bowen, R. Quick

BACKGROUND: Primary school programs designed to teach hygiene to children, and indirectly to their families, have been implemented in many developing countries to mitigate diarrheal illness. In 2007, we partnered with 17 primary schools in rural Kenya. In each school, we installed six water stations for drinking and handwashing (metal stands, containers with lids and taps, chlorine products for water treatment, and soap, costing \$144 per school), trained two teachers about hygiene, and provided a complementary curriculum for students. Evaluations conducted 3 and 12 months after implementation demonstrated persistent increases in water chlorination in schools and students' homes and decreased student absenteeism. Recently, we assessed the long-term sustainability of this program.

METHODS: In September 2010 – 3 years after implementation - we surveyed headmasters at each school regarding water station use, water treatment, and handwashing activities. We inspected water stations and tested stored water for residual chlorine.

RESULTS: All 17 headmasters reported continued use of water stations, 7 (44%) reported always chlorinating stored water, and 7 (44%) reported sometimes chlorinating. We observed 15 (88%) schools with water stations in use, 6 (35%) with residual chlorine in stored water, and 2 (12%) with soap at handwashing stations. Of 91 observed containers, 71 (78%) were functional. Sixteen headmasters (94%) reported that containers or taps broke in the past year; 4 (25%) made replacements. Among 11 schools with no residual chlorine in stored water, 10 headmasters reported inadequate funding to purchase water treatment products.

CONCLUSIONS: Most schools continued use of water stations and 35% had evidence of water treatment. The main obstacle to full adherence to this inexpensive intervention was economic. Modest funding could sustain full implementation.

KEYWORDS: diarrhea, sanitation, school-based services, water purification

POSTER 26

Acinetobacter baumannii Infection, Colonization, and Transmission Related to a Long-Term-Care Facility — California, 2009–2010

AUTHORS: Eva Mortensen, K. Trivedi, S. Cody, J. Long, B. Jensen, J. Rosenberg, D. Vugia

BACKGROUND: Gram-negative *Acinetobacter baumannii* bacteria cause emerging nosocomial infections with substantial morbidity and mortality but have rarely been studied among long-term-care facility (LTCF) residents. When a hospital reported a multidrug-resistant *A. baumannii* cluster that included LTCF patients (Facility A), we investigated its role at Facility A.

METHODS: We reviewed local hospitals' records of Facility A patients with laboratory-confirmed *A. baumannii* infection during January 2009–February 2010 and classified patients as having infection or incidental colonization on the basis of clinical presentation. In March 2010, we implemented a sputum survey of Facility A patients receiving respiratory support or who could cough to determine colonization. Using sputum survey data, we performed a multivariate analysis to evaluate potential factors associated with colonization. From the study period, available Facility A clinical and survey isolates and hospital isolates underwent pulsed-field gel electrophoresis (PFGE); patients with related isolates were evaluated for overlapping stay in the same or adjacent room.

RESULTS: During January 2009–February 2010, we identified 21 Facility A tracheostomy patients with infection, leading to 11 (52%) intensive care unit admissions and 3 (14%) deaths. From the sputum survey, 14 (20%) of 70 Facility A patients were colonized with *A. baumannii*, which was independently associated with ventilator use (adjusted odds ratio: 5.08; 95% confidence interval: 1.19–21.70). Of Facility A patients with infection or colonization, 33% had multidrug-resistant isolates. Three related PFGE patterns among patient clusters at Facility A and at a local hospital indicate localized transmission.

CONCLUSIONS: We documented substantial *A. baumannii* infection, colonization, and probable spread associated with an LTCF. To control *A. baumannii*, acute-care hospital infection control practices and antimicrobial stewardship should be extended to LTCFs.

KEYWORDS: *Acinetobacter baumannii*, extended care facilities, nosocomial infection

POSTER 27

Trends in Cephalosporin Susceptibility Among *Neisseria gonorrhoeae* Isolates – United States, January 2006–June 2010

AUTHORS: Erin L. Murray, R. Kirkcaldy, C. Del Rio, E. Hook, G. Hall, W. Whittington, J. Papp, H. Weinstock

BACKGROUND: Cephalosporins are the only remaining antibiotics recommended for gonorrhea treatment. Decreased gonococcal cephalosporin (cefixime and ceftriaxone) susceptibility and treatment failures have been reported in Asia. We evaluated cephalosporin susceptibility among U.S. gonococcal isolates during January 2006–June 2010.

METHODS: The Gonococcal Isolate Surveillance Project (GISP) monitors *N. gonorrhoeae* antibiotic susceptibility among isolates collected from men attending selected sexually transmitted disease clinics in the United States. Cephalosporin decreased susceptibility is defined as minimum inhibitory concentrations (MICs) $\geq 0.5 \mu\text{g/mL}$. Because MIC elevations might precede resistance, we calculated the percentage of isolates with cefixime MICs $\geq 0.25 \mu\text{g/mL}$ and ceftriaxone MICs $\geq 0.125 \mu\text{g/mL}$ by year, region, and among men who have sex with men (MSM) by using GISP data for January 2006–June 2010. Cochran-Armitage trend tests were performed.

RESULTS: On average, 5,785 gonococcal isolates (range: 5,630–6,089) were tested annually. During 2006–2010, the proportion of isolates with cephalosporin MIC elevations increased for cefixime (0.1% in 2006, 1.8% in 2010; $P < 0.001$) and ceftriaxone (0.1%, 0.4%; $P = 0.13$). The West (California, Hawaii, Oregon, and Washington) had increases in the proportion of isolates with MIC elevations for cefixime (0.2%, 5.1%; $P < 0.001$) and ceftriaxone (0%, 0.7%; $P < 0.001$). Other U.S. regions had slight increases (cefixime [0%, 0.3%; $P = 0.01$]; ceftriaxone [0.1%, 0.2%; $P = 0.21$]). Among isolates collected from MSM, the overall proportion of isolates with MIC elevations increased for cefixime (0.2%, 6.0%; $P < 0.001$) and ceftriaxone (0%, 1.2%; $P < 0.001$).

CONCLUSIONS: Gonococcal isolates from GISP remain cephalosporin susceptible. However, recent elevations in cephalosporin MICs in the West and among MSM highlight the importance of continued surveillance, clinician vigilance, and enhanced surveillance for gonococcal treatment failures.

KEYWORDS: gonorrhea, cephalosporins, trends, microbial sensitivity tests

POSTER 28

Antimicrobial Prescribing Practices for Treatment of Diarrheal and Respiratory Diseases in Guatemalan Children – 2010

AUTHORS: George E. Nelson, W. Arvelo, J. Verani, T. Taylor, J. Fuller, L. Reyes, J. Moir, K. Lindblade

BACKGROUND: In developing countries, inappropriate antimicrobial use leads to poor disease outcomes and contributes to the emergence of resistant infections. Little is known about antimicrobial use in Guatemala, a country with a large pediatric infectious disease burden.

METHODS: We administered a standardized survey in two geographic areas of Guatemala to all prescribers (outpatient physicians and nurses). We identified prescribers through official registries of physicians and nurses with further input from local health authorities and attempted to enroll all prescribers. Participants were asked about hypothetical management of fifteen clinical vignettes of diarrhea or acute respiratory illness (ARI) in children. Correctness of responses was based on national clinical guidelines.

RESULTS: Three hundred eleven prescribers (160 physicians and 151 nurses) completed the survey. For nine vignettes where antimicrobials were indicated, seven (2%) prescribers reported they would use antimicrobials for all nine; 113 (36%) would use antimicrobials for > 5 . For six vignettes where antimicrobials were not indicated, 204 (66%) prescribers reported they would not use antimicrobials for all six; 299 (96%) would not use antimicrobials for > 3 . For diarrhea management, 68 (22%) prescribers responded correctly for all five vignettes; eight (3%) prescribers responded correctly for all 10 ARI vignettes. Only 82 (26%) prescribers responded that clinical guidelines were the primary guide in determining appropriateness of antimicrobial prescriptions.

CONCLUSIONS: We found both under- and over-prescribing of antimicrobials for the self-reported management of clinical scenarios among antimicrobial prescribers in Guatemala. Interventions aimed at improving adherence to national clinical guidelines for respiratory and diarrheal disease are needed. Although antimicrobial over-use is the primary concern in developed countries, improving antimicrobial prescribing in developing countries must address under-use as well.

KEYWORDS: drug resistance, bacterial, anti-bacterial agents, diarrhea, acute respiratory illness

Abstracts

POSTER 29

Risk Factors for Cholera Early in the Epidemic — Haiti, 2010

AUTHORS: Katherine A. O'Connor, E. Cartwright, A. Loharikar¹, J. Routh, J. Gaines, B. Fouché, R. Jean-Louis, T. Ayers, J. Tappero, T. Roels, W. Archer, G. Dahourou, E. Mintz, R. Quick, B. Mahon

BACKGROUND: On October 21, 2010, cholera was confirmed in Haiti. Within 1 month, laboratory-confirmed cases were reported from all 10 Haitian departments; Artibonite, one of the earliest affected departments, had over 60% of cases and deaths.

METHODS: We conducted a case-control study of risk factors for cholera in Artibonite. We enrolled 49 cases — persons ≥ 5 years old with acute, watery diarrhea admitted to the Cholera Treatment Unit in Petite Rivière between October 25 and November 9, 2010 — and two age- and neighborhood-matched controls per case. We interviewed participants about food and beverage exposures, water, sanitation, and hygiene, and made household observations. Household drinking water was tested for detectable free chlorine, an indication of water treatment.

RESULTS: Not treating drinking water in the 3 days before the case's illness onset was associated with illness (matched odds ratio [mOR]: 3.5; 95% confidence interval [CI]: 1.5, 8.7). Seventy-three percent of respondents had water treatment products in their homes, including a chlorine product (67%). Twenty-seven percent of case-patients and 39% of controls had detectable free chlorine in their drinking water, which was associated, though not significantly, with lower odds of illness (mOR: 0.5; CI: 0.2, 1.3). About half of cases and controls reported treating drinking water before the outbreak, but cases were less likely than controls to have begun treating water since the outbreak (16% vs. 37%; mOR: 0.3; CI: 0.1, 0.7).

CONCLUSIONS: Drinking untreated water was strongly associated with cholera. Water treatment products distributed during the outbreak had not reached the entire population and were not used by all. Distribution of water treatment supplies and education on their use are critical cholera prevention strategies that should continue.

KEYWORDS: cholera, Haiti, diarrhea, water

POSTER 30

Dengue Infections Among Travelers Returning from Haiti — Nebraska and Georgia, 2010

AUTHORS: Parvathy Pillai, T. Sharp, B. Buss, T. Safranek, R. Williams, D. Leschinsky, A. Bredthauer, T. Anderson, J. Collinson, T. Vap, J. Gabel, M. Sotir, E. Jentes, J. Muñoz-Jordán, E. Hunsperger, D. Argüello

BACKGROUND: Dengue, a potentially fatal illness caused by 1 of 4 dengue viruses (DENV-1–4), is a leading cause of febrile illness among travelers returning from the Caribbean. Dengue epidemiology has not been clearly defined in Haiti; travel to Haiti for postearthquake relief appears to pose a risk for disease acquisition. On 10/18/2010, the Nebraska state health department was notified of dengue-like illnesses among Nebraska and Georgia missionaries returning from short-term (7–11 days) travel to Haiti. We sought to confirm dengue diagnosis and characterize travelers' knowledge and prevention practices.

METHODS: In a retrospective cohort study, cases were defined as dengue if positive by reverse transcription-polymerase chain reaction (RT-PCR) or convalescent anti-DENV IgM. We administered a 53-item questionnaire; associations between knowledge or prevention practices and infection were examined by Fisher's exact test.

RESULTS: Twenty-two (79%) of 28 travelers completed questionnaires and had laboratory testing. Seven (32%) had dengue determined by RT-PCR and caused by DENV-1 infection; all had illness onset ≤ 7 days after returning home; 5 were hospitalized (no intensive-care admissions); 4 had hemorrhagic manifestations; and none died. Before travel, of 22 respondents, 86% sought professional healthcare advice; 50% reported knowledge about dengue; 45% knew DENV is mosquito-transmitted; and 27% knew exposure was possible in Haiti. During travel, 27% used insect repellent multiple times a day; 50% and 14% wore long pants and long-sleeved shirts at least once, respectively; and none used insecticide-treated clothing. DENV infection was not significantly associated with dengue pretravel knowledge or with prevention practices.

CONCLUSIONS: Short-term travelers to Haiti are at risk for DENV infection. Pretravel health consultations to all DENV-endemic areas should include education regarding dengue risks and mosquito-avoidance strategies.

KEYWORDS: dengue, travel medicine, arbovirus infections, Haiti

WEDNESDAY, APRIL 13

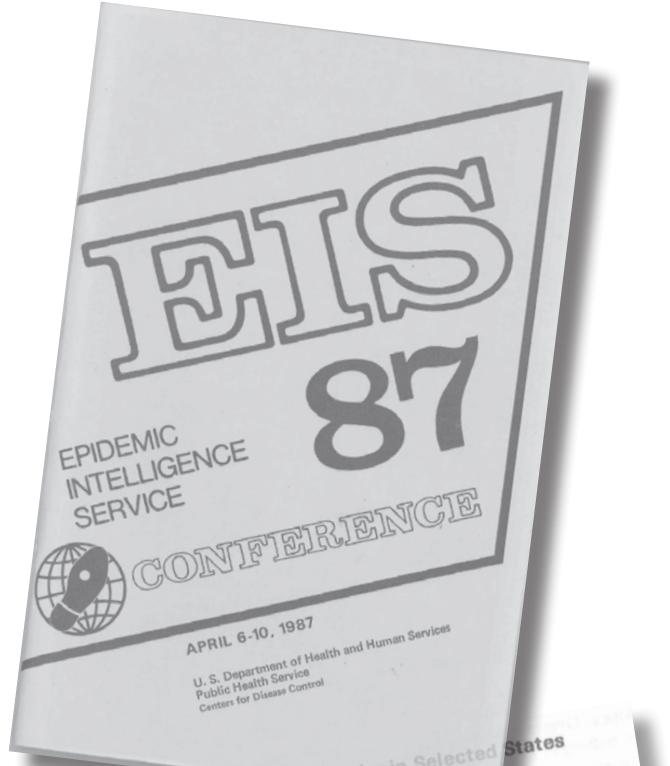
SESSION J

1:35

Judge Allows Big Lawsuit on Tobacco

February 1985, by Glen Collin
The New York Times

Chronic Diseases, 1:30–3:35 p.m.
Atrium Ballroom B and C
MODERATOR: Ursula Bauer



Socioeconomic Differences in Smoking Behavior in Selected States
 Thomas E. Novotny, J. S. Kendrick, P. L. Remington, F. M. Gentry,
 G. Hogelin

Although the prevalence of smoking has decreased in the United States since 1965, prevalence and cessation rates differ among the various socio-economic groups. In the 1985 Behavioral Risk Factor Surveillance System, 22 states supplied data from telephone interviews of 25,218 persons. We examined smoking and quitting behavior by sex, race, education, income, and employment. Among men in the sample, 29.6% were current smokers. The ratio of former smokers to persons who had ever smoked ("quit ratio") was 50.8%. Among women, 25.0% were current smokers, and the quit ratio was 40.0%. Women had lower quit ratios across all educational, income, racial, and age strata. Blacks had higher rates of current smoking and lower quit ratios than whites. When we controlled for household income and sex, there was an inverse linear association between educational level and current smoking and a positive association between educational level and quit ratio. When we controlled for education and sex, no association was seen between income and either current smoking or quit ratio. Unemployed persons of both sexes and of both racial groups had higher current smoking rates and lower quit ratios than employed persons. In 1985, the subgroups with the highest rates of current smoking were unemployed persons (45.4%), persons with less than a high school education (30.2%), and black males (33.9%). Conversely, quitting was less evident in these subgroups. These data 1) indicate that past interventions have not affected blacks and lower socioeconomic groups and 2) help explain the greater burden of smoking-related illness among these persons.

Prevalence of Adherence to 2008 Physical Activity Guidelines for American Among Adolescents – United States, 1999–2006

AUTHORS: MinKyoung Song, D. Carroll, J. Fulton

BACKGROUND: Participation in physical activity benefits adolescents' cardio-respiratory fitness and musculoskeletal health. However, the percentage of U.S. adolescents who engage in levels of aerobic and muscle-strengthening (MS) activities recommended in the 2008 *Physical Activity Guidelines for Americans* has not been estimated.

METHODS: Through analyses of data from an interviewer-administered questionnaire in the 1999-2006 National Health and Nutrition Examination Survey, we estimated the percentage of adolescents aged 12-17 years who engaged in recommended levels of aerobic and MS activities (≥ 60 minutes of aerobic activity/day and participation in MS activities ≥ 3 times/week). Using multivariable logistic regression, we also evaluated whether sex, age, race/ethnicity, family poverty income ratio (PIR), and body mass index (BMI) (<85, 85-95, and ≥ 95 percentile) were independently associated with meeting both guidelines.

RESULTS: Among 6,547 U.S. adolescents 12-17 years of age, 20.3% (95% confidence interval [CI]: 18.7–22.0) met guidelines for both aerobic and MS activity. Multivariable logistic regression results showed that the odds of meeting both guidelines were significantly ($P < 0.05$) higher among boys than among girls (odds ratio [OR] = 1.67; 95% CI: 1.41–1.98) and among those with a family PIR $> 300\%$ than among those with a family PIR $< 100\%$ (OR = 1.46; 95% CI: 1.20–1.78). We found no significant differences in prevalence of adherence to both guidelines by age, race/ethnicity, or BMI categories.

CONCLUSIONS: Only 2 out of 10 U.S. adolescents reported engaging in recommended levels of aerobic and MS activities. Boys and those with high family income were more likely to meet the guidelines. Effective approaches to increase physical activity among U.S. adolescents need to be implemented with particular focus on girls and those from low income families.

KEYWORDS: adolescent, physical activity, guideline, National Health and Nutrition Examination Survey

1:55

Rising Incidence Rates of Renal Cell Carcinoma

AUTHORS: Sallyann M. Coleman King, L. Pollack, J. Li

BACKGROUND: Of more than 36,000 cases of kidney cancer (excluding renal pelvis) diagnosed each year in the United States, 85% are renal cell carcinoma (RCC). U.S. *Cancer Statistics* (USCS), which represents 94% of the U.S. population, can be used to determine RCC incidence, including racial differences, and trends. Our objective was to present the most recent RCC incidence data.

METHODS: Using USCS data on microscopically confirmed cases of invasive RCC diagnosed during 2001-2007, we calculated age-adjusted RCC incidence rates (per 100,000) overall and by age, sex, and race as well as the annual percent change (APC) to examine trends in incidence.

RESULTS: USCS data indicated 228,188 cases of RCC were diagnosed during 2001-2007. Overall, the age-adjusted incidence rate was 11.6 and higher among men (15.8) than women (8.1). The incidence rate was substantially lower among Asians/Pacific Islanders (5.2) than among blacks (12.0), whites (11.7), or American Indians/Alaska Natives (11.5), and the race and sex-specific rate was highest among black men (16.8). Incidence rates increased for each 5-year age group before peaking among those aged 70-74 years (51.1). From 2001 to 2007, the overall APC in the RCC incidence rate was 3.1% (3.5% among women and 2.7% among men); with the largest increase occurring among young adults (9.1% among those aged 30-34 and 7.8% among those aged 25-29).

CONCLUSIONS: Between 2001 and 2007, the annual incidence of RCC in the United States increased, especially among young adults. Future studies should attempt to identify factors contributing to the overall increase in RCC and the associated gender and racial differences and look for opportunities to reverse these disturbing findings.

KEYWORDS: renal cell carcinoma, cancer, epidemiology, population surveillance, kidney neoplasms

2:15

Is Polycystic Ovary Syndrome Another Risk Factor for Venous Thromboembolism? — U.S., 2003–2008

AUTHORS: Ekwutosi M. Okoroh, C. Hooper, A. Grant, H. Atrash, H. Yusuf, S. Boulet

BACKGROUND: Venous thromboembolism (VTE) kills 30,000–60,000 Americans each year. Polycystic ovarian syndrome (PCOS), the most common endocrine disorder affecting reproductive-age women, is thought to be prothrombotic, but has not been examined for its association with VTE. We estimated the prevalence of VTE and assessed risk differences among women with and without PCOS.

METHODS: We used the MarketScan® Commercial Database to identify women aged 18–45 with *International Classification of Diseases*, Ninth Revision codes associated with VTE and PCOS (hyperandrogenism, ovulatory dysfunction, and polycystic ovaries) during 2003–2008. We grouped PCOS phenotypes using available criteria as defined by the National Institutes of Health, Rotterdam, and the Androgen Society. We calculated prevalence of VTE among women with and without PCOS, and we assessed risk difference by age and oral contraceptive (OC) pill use.

RESULTS: We identified over 15 million women, 79,590 (0.5%) of whom had PCOS. The Rotterdam phenotype was the most common (96%). Prevalence of VTE per 1,000 was 4.26 in the PCOS group compared with 1.73 in the non-PCOS group ($P < 0.00001$). The odds of having VTE among women with PCOS compared with women without PCOS was (OR: 2.5; confidence interval [CI]: 2.23–2.79). This increased odds persisted regardless of age and OC use (OR: 2.43; confidence interval [CI]: 2.17–2.72).

CONCLUSIONS: Women with PCOS are twice as likely to have VTE compared with women in the general population, a factor that persisted despite age and OC use. This is the first population-based evaluation of the associated risk of PCOS on VTE. Providers and women should be aware of this potential risk as management options are discussed.

KEYWORDS: polycystic ovary syndrome, venous thromboembolism, hyperandrogenism, oral contraceptives

2:35

Cancer Survivors in the United States, 2007

AUTHORS: Arica White, L. Pollack, H. Weir

BACKGROUND: Cancer incidence and mortality data do not adequately reflect the burden of cancer on the U.S. population and health care system. In this study, we estimated U.S. cancer prevalence, the number of persons living with a history of cancer (cancer survivors), which is a better indicator of that burden.

METHODS: To do so, we used a three-step method. First, we used incidence and survival data from 9 Surveillance, Epidemiology, and End Results Program cancer registries, which represent approximately 10% of the U.S. population, to estimate the number of people alive on January 1, 2007 in whom cancer had been diagnosed during 1975–2006, accounting for cases lost to follow-up. Second, while controlling for age, sex, and race, we applied these estimates to the average of U.S. population estimates for 2006 and 2007. Third, we used a statistical model, which also accounted for survivors whose cancer was diagnosed prior to 1975, to estimate the total number of U.S. cancer survivors by cancer site, survivors' age, and time since diagnosis.

RESULTS: We estimated that 11.7 million U.S. residents were living with cancer in 2007; that breast, prostate, and colorectal cancers were the most common types of cancer among them (22.1%, 19.4%, and 9.5%, respectively); that 60.0% were aged 65 years or older; and that 64.8% had been living with cancer for 5 or more years.

CONCLUSIONS: Cancer disproportionately affects the elderly, a growing segment of the U.S. population, and many cancer survivors are living more than 5 years after their cancer diagnosis. Medical and public health professionals need to understand the clinical and psychosocial needs of long-term cancer survivors, especially the elderly.

KEYWORDS: neoplasm, survivors, prevalence, Surveillance, Epidemiology and End Results (SEER) Program

2:55

Exposure to Secondhand Smoke in Motor Vehicles Among Middle and High School Students — United States, 2000–2009

AUTHORS: Brian A. King, S. Dube, M. Tynan

BACKGROUND: Exposure to secondhand smoke (SHS) from cigarettes and other tobacco products causes health problems in nonsmokers. With the implementation of smoke-free policies in public areas, the home has become a major source of SHS among youth. However, the extent to which youth are exposed to SHS in other non-public areas, particularly motor vehicles, is uncertain.

METHODS: We analyzed 2000, 2002, 2004, 2006, and 2009 data from the National Youth Tobacco Survey (NYTS), which used 3-stage cluster sampling to select U.S. middle and high school students. Data were weighted to be nationally representative. The primary outcome of our analysis was self-reported exposure to SHS in a motor vehicle within the previous 7 days. We compared the prevalence of such exposure within and between survey years by participants' smoking status, sex, race/ethnicity, and school level (middle or high) and used Chi-Square analyses with alpha = 0.05 to determine statistical significance.

RESULTS: From 2000 to 2009, the prevalence of exposure to SHS in motor vehicles declined significantly among both non-smokers (39.0% to 22.8%; P <0.01) and smokers (82.3% to 75.3%; P <0.01). Among non-smokers in 2009, the prevalence of exposure was significantly lower among males (20.2%; 95% confidence interval [CI]: 18.2–22.3) than females (25.4%; CI: 23.4–27.6) and among Asians (14.1%; CI: 10.6–18.4) than non-Hispanic whites (24.8%; CI: 22.7–26.9).

CONCLUSIONS: Exposure to SHS in motor vehicles decreased significantly among U.S. middle and high school students from 2000 to 2009. However, even in 2009, millions of nonsmoking students were exposed to SHS in motor vehicles. Further research, including evaluation of ongoing policy initiatives, could determine which approaches are most effective in promoting smoke-free motor vehicles.

KEYWORDS: smoking, tobacco smoke pollution, motor vehicles, adolescent

Abstracts

3:15

Physical Activity Associated with Transit-Use – United States, 2001-2009

AUTHORS: Amy L. Freeland, S. Sloop, A. Wendel, A. Dannenberg

BACKGROUND: Half of Americans do not meet 2008 HHS Physical Activity (PA) Recommendations for duration and intensity of exercise. Walking to and from public transit (transit-walking) may contribute to meeting PA-duration recommendations. Characterizing transit-walking could augment efforts to align transportation and public health goals.

METHODS: National Household Travel Survey data from 2001 and 2009 were used to examine transit-walking among adults (≥ 18 years) through a cross-sectional, nationally-representative probability sample analysis. Transit-associated walk-time was defined as total daily walk-time to and from transit. Kolmogorov-Smirnov tests were used to examine differences between 2001 and 2009 in characteristics of transit-walkers.

RESULTS: There were an estimated 9,176,229 transit-walkers in 2009, compared with 7,465,181 in 2001 (+22.9%). Between 2001 and 2009, the median age of a transit-walker increased from 43.0 years to 45.0 years; the percent with household income $>\$100,000$ /year increased from 11.7% to 18.9%; the percent from smaller communities ($<500,000$ population) increased from 8.8% to 19.0%, and the percent identifying transportation costs as a severe problem increased from 12.0% to 24.9%. Estimated numbers of transit-walkers achieving ≥ 30 minutes of transit-associated walk-time increased from 2,467,608 to 3,260,749 (32.1%). Comparing 2009 to 2001, an increased proportion of transit-walkers who achieve ≥ 30 minutes of transit-associated walk-time are from smaller communities, are males, and walk >7 times per week. All comparisons were statistically significant ($P < 0.001$).

CONCLUSIONS: Transit-walking contributes to meeting PA recommendations. Transit-walking has increased; nearly 800,000 more people achieve ≥ 30 minutes of transit-associated walk-time. Factors influencing this difference may include changes in transit infrastructure, economic conditions, and transportation costs. Improvements in transit service and in the walking environment near transit stations may encourage further increases in transit-associated physical activity.

KEYWORDS: environmental health, physical activity, walking, commuting, transportation

WEDNESDAY 4:00

SESSION K

Germ War Defense Set Up; Epidemic Intelligence Service Created by Health Unit

September 27, 1951

The New York Times

Alexander D. Langmuir Memorial Lecture and Reception, 4:00–5:00 p.m. Atrium Ballroom B and C

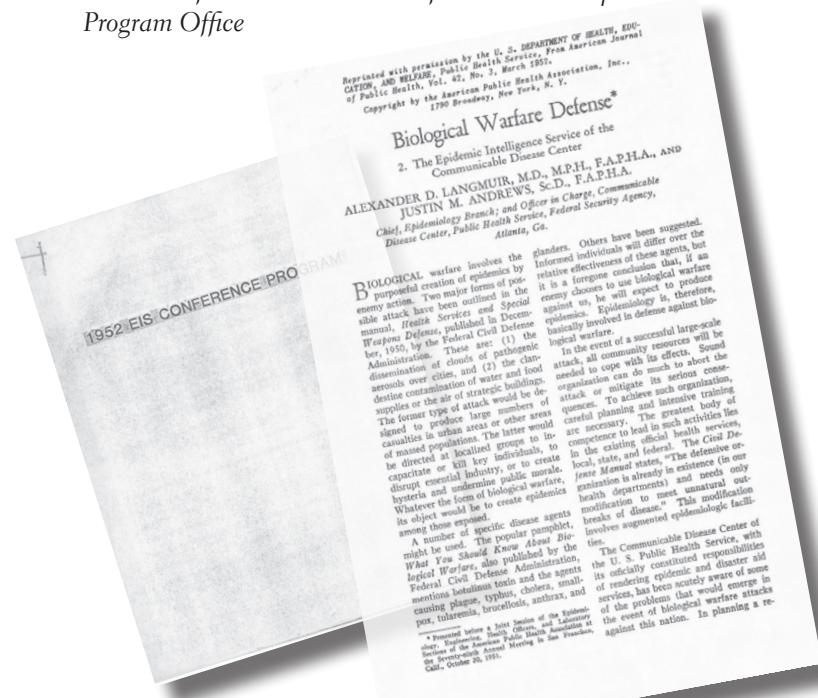
MODERATOR: Stephen B. Thacker

Skirmishes, Battles, and Wars: Tracking Infection Control Success in the Age of Social Networks Robert A. Weinstein

Prior to Dr. Weinstein's lecture, the following awards will be presented:

- Alexander D. Langmuir Prize Manuscript Award
- Distinguished Friend of EIS Award

This event is cosponsored by the EIS Alumni Association and the Scientific Education and Professional Development Program Office

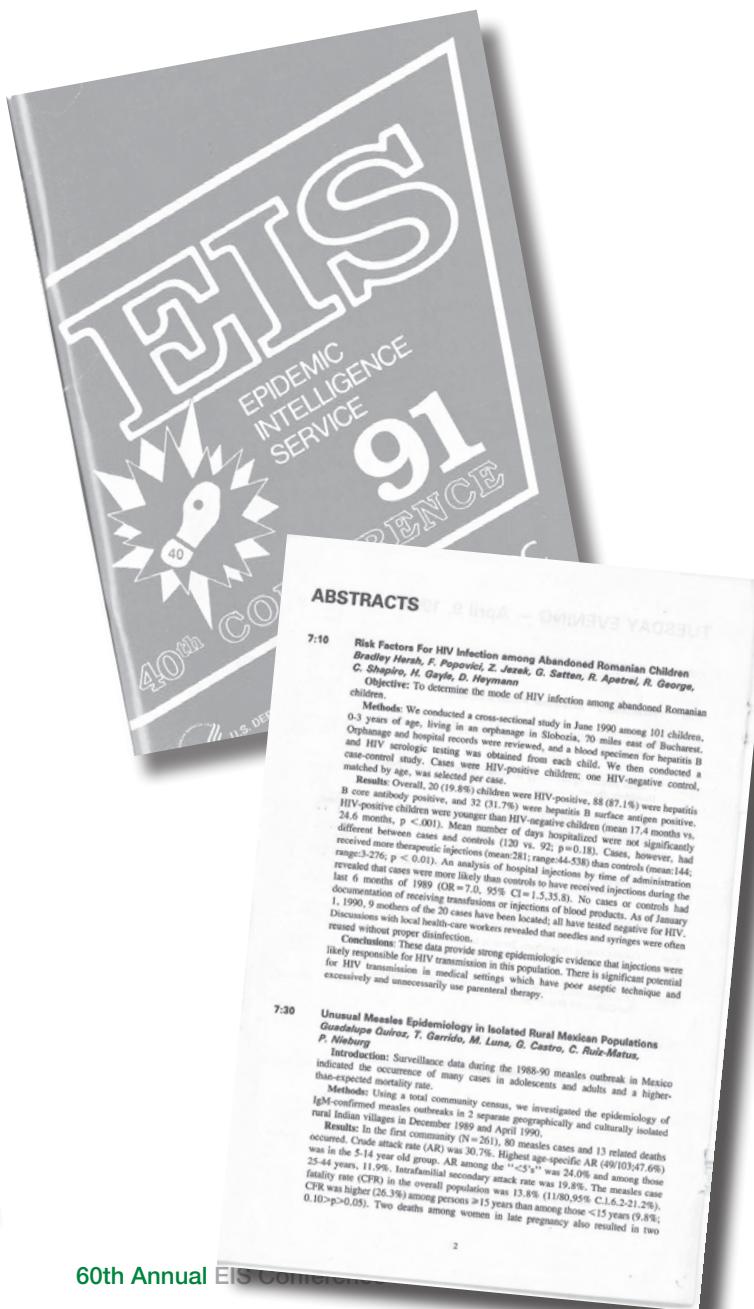


**WEDNESDAY 6:00 INTERNATIONAL NIGHT
POSTER SESSION**

Romanian Orphans Face Risk of AIDS; Can't Guarantee Health of Adoptees

February 21, 1991, by Bruce Bonham,
The Waterloo Record (Kitchener, ON)

**International Night Posters
6:00–7:30 p.m.
Atrium Ballroom A**



INTERNATIONAL POSTER 1

Prevalence and Associated Factors for Peripheral Neuropathy Among Patients on Stavudine Attending Meru District Hospital Comprehensive Care Centre – Kenya, 2010

AUTHORS: Martin Thuranira, J. Omolo, S. Amwayi, A. Abade, J. Oundo, M. Kiptoo, Z. Ng'ang'a

BACKGROUND: Peripheral neuropathy has been recognized as one of the undesired side effects of antiretroviral therapy particularly nucleoside transcriptase inhibitors (NRTI). Stavudine a NRTI is used widely to manage HIV/AIDS in Kenya. Following a WHO recommendation that stavudine use be discontinued, health authorities sought information on the local magnitude of the problem to guide policy change. We determined the prevalence and associated factors for peripheral neuropathy among patients on stavudine attending Meru District Hospital Comprehensive Care Centre.

METHODS: We conducted a cross sectional study. HIV-infected patients who were ≥ 13 years and older and had been on stavudine for six to thirty-six months were systematically enrolled. We excluded those with history of neurological complaints prior to commencing anti-retroviral therapy. We determined neuropathy status using a standard peripheral neuropathy screening tool. A semi-structured questionnaire was administered to elicit data on socio-demographic and potential risk factors. Record review was done to validate patients' responses. We analyzed data using Epi Info.

CONCLUSIONS: In total, 275 HIV-infected patients were enrolled. Median age was 39 years (range 13-70 years); 162 (59%) were females. Prevalence of peripheral neuropathy was 23% (95% CI 18.1-28.3, n=63). Forty-two (67%) had grade I, 18 (29%) had grade II and 3 (4%) had grade III neuropathy. Patients on stavudine for ≥ 25 months (Odds Ratio [OR] = 2.37, 95% confidence interval [CI], 1.08-5.18) and those with CD4 counts less than 130 cells/mm³ were more likely to develop peripheral neuropathy (OR=2.43, 95% CI, 1.29-4.57).

CONCLUSIONS: The prevalence of peripheral neuropathy was high. The Ministry of Health should reconsider the use of stavudine. In the meantime, clinicians should monitor patients for peripheral neuropathy and non-neurotoxic regimes instituted in patients on stavudine for ≥ 2 years.

KEYWORDS: HIV/AIDS, peripheral neuropathy, prevalence

Abstracts

INTERNATIONAL POSTER 2

Knowledge, Attitudes, and Practices About Cholera Prevention in Santo Domingo During November–December, 2010

AUTHORS: Yira Tavarez, J. Harris, P. Minaya, L. Lerebours, L. Bonilla, O. Morgan, R. Pimentel

BACKGROUND: In November 2010, following an outbreak of cholera in Haiti, cholera was confirmed in Santo Domingo, Dominican Republic. The Ministry of Health (MoH) immediately launched a cholera prevention campaign. Three weeks later, we conducted a knowledge, attitudes and practices survey about cholera prevention.

METHODS: We used a two-stage sample design by selecting enumeration districts using probability proportional to population size and random selection of households. We administered questionnaires to heads of households and tested drinking water for residual chlorine. We defined socioeconomic status (SES) using the National Statistics Office method of assets ownership. We calculated frequencies and odds ratios (OR) with 95% CIs adjusting for clustering at the first sample stage.

RESULTS: We interviewed 480 households (49% low-SES, 0.2% spoke only Creole), of which 427 (89%) had received cholera prevention messages from ≥1 source (TV 81%, radio 41%, MoH leaflets 13%, and newspapers 11%); 259 and 159 respondents, respectively, understood that cholera is transmitted by eating uncooked food (54% [95%CI, 49%–60%]) and drinking untreated water (33% [27%–40%]). 408 households reported drinking only bottled water (85% [79%–90%]) and 341 reported washing hands with soap (71% [67%–78%]). In 56 (78%) of 72 households without bottled water, no residual chlorine was detected. 235 low-SES households were less likely to drink bottled water (OR=0.5 [0.2 – 0.9]), wash hands with soap (OR=0.4 [0.2 – 0.7]), or have received prevention messages (OR=0.3 [0.2 – 0.5]).

CONCLUSIONS: While the first cholera prevention campaign reached many households in Santo Domingo, knowledge of risk factors remained low. Nevertheless, many households implemented measures that reduce the risk of cholera. Additional messaging targeted at low-SES households is needed.

KEYWORDS: cholera, risk communication, socioeconomic status

INTERNATIONAL POSTER 3

Outbreak of Cholera Among Workers of a Jute Mill in Kolkata, West Bengal, India

AUTHORS: Prakash Mridha, A. Biswas, R. Ramakrishnan¹, M. Murhekar

BACKGROUND: On 10th March 2010, an outbreak of diarrheal disease was reported among workers of a jute mill in Kolkata, West Bengal, India. The cluster was investigated to identify the agent(s) and the source of infection and make recommendations.

METHODS: We defined a suspected case of cholera as occurrence of > 3 loose watery stools in a 24-hour period and searched for case-patients in workers' colony. We described the outbreak by time, place and person. We conducted a case-control study among the mill workers to identify the source of infection. We also collected rectal swabs from the hospitalized case-patients, and assessed the local water-supply system.

RESULTS: We identified 197 case-patients among 5,910 residents of workers' colony (attack rate: 3.3%). Fifteen of 24 stool samples were positive for *V. cholerae* O1. The outbreak started on 7th March, peaked on 11th and ended on 16th March'2010. Compared to 120 controls, 60 cases did not differ in terms of age and socioeconomic status. Drinking-water from the reservoir within the mill premises was associated with an increased risk of illness [Odds ratio: 26.7, 95% confidence interval (CI): 11.4 – 62.6] and accounted for most cases (population attributable risk percentage = 82%, 95% CI = 70.8-92.9).

CONCLUSIONS: An outbreak of cholera occurred among workers of the jute mill due to contamination of the drinking-water reservoir. The outbreak occurred within a few days of re-opening of the mill after workers' strike. Health authorities need to enforce disinfection of drinking-water and regularly test its bacteriological quality, particular before re-opening of the mill after the strike.

KEYWORDS: cholera, mill workers, drinking water contamination

INTERNATIONAL POSTER 4

Assessment of Public Awareness for Guinea Worm Disease Reporting – Nigeria, 2010

AUTHORS: Ifeoma N. Anagbogu, C. Ityonzughul, P. Nguku

BACKGROUND: Nigeria eliminated Guinea worm disease (GWD), a debilitating disease earmarked for eradication by the World Health Organization in 2008. Criteria for certification for GWD eradication include adequate general public awareness for GWD reporting. Nigeria's target of 80% population being knowledgeable about GWD reporting including cash reward for reporting is not achieved. Studies from 2009 and 2010 reported 43% and 41% GWD public awareness in Nigeria, respectively. Nationwide social mobilization and awareness activities were conducted and intensified using radio jingles in three States. We assessed the impact of the intensified activities with jingles on general public awareness for GWD reporting.

METHODS: A cross-sectional study was conducted in 2010 using pre-tested, structured questionnaires to collect data on knowledge about the disease, reporting and cash reward. Study population was 2,400 residents from six States using multi-stage random sampling. In three States radio jingles were aired (jingle+) whereas no intensified activities took place in others (jingle-). Level of awareness was assessed and compared between the jingle+ and jingle- States. Chi squared test was used to compare categorical variables.

RESULTS: In jingle+ States 54.9% of the respondents (654 of 1191) saw and heard of GWD compared to 23.6% in jingle- States (283/1199, $p<0.001$). Significantly more respondents in jingle+ States could describe GWD correctly (69.0% versus 48.1%, $p<0.001$). Description of correct procedures for case reporting was higher in jingle+ States (52.8% versus 17.0%, $p<0.001$). However, only 24.9% and 6.7% of respondents heard of cash reward in jingle+ and jingle- States, respectively.

CONCLUSIONS: Awareness creation activities, using radio jingles contributed to increased public awareness for GWD reporting. Using radio jingles should be scaled up nationwide to complement GWD surveillance.

KEYWORDS: guinea worm, public awareness, Nigeria

INTERNATIONAL POSTER 5

Prevalence of Undetected, Untreated, and Uncontrolled Hypertension Among Attendants of Primary Health Care Centers in Nasiriyah City, Iraq

AUTHORS: Faris Al-Lami , A. Mousa

BACKGROUND: Hypertension (HT) is a major public health concern with increasing prevalence in EMRO, where Iraq had the highest prevalence. Studies on HT are a basis for rational planning of health policy. The objective of this study is to estimate the prevalence undetected, untreated and uncontrolled HT among adult population in Nasiriyah city, Iraq.

METHODS: A cross sectional study was done in four randomly selected Primary Health Care Centers (PHCC) in Nassiriyah City, Iraq. A systematic random sample of 1,532 adults, aged ≥ 25 years attending these PHCCs were included. A questionnaire used to gather basic variables, HT risk factors, history of HT, use of anti HT medications beside measurement of BMI and two BP readings. Hypertension defined as a mean systolic blood pressure ≥ 140 mm Hg, diastolic blood pressure ≥ 90 mm Hg, and/or use of antihypertensive medications.

RESULTS: 46.1 % of study population had HT. Older age, widowed, urban residence; cigarette smoking, body mass index ≥ 25 , and family history of HT were significant risk factors ($p< 0.001$). Newly discovered hypertensives represented 39.3% of all hypertensives (95% CI: 28.3-50.3%); 21.2% of known hypertensives were not on antihypertensive medication (95% CI: 17.3-25.1%) and 17.7% only achieved controlled blood pressure ($<140/90$ mm Hg) (95% CI: 15.6-19.8%).

CONCLUSIONS: Although the prevalence of undetected HT, and the untreated HT are high but the prevalence of uncontrolled HT is extremely high. Strict implementation of recently adopted HT detection program including activities to discover undetected HT, provide effective treatment and ensure controlled BP were recommended.

KEYWORDS: prevalence, hypertension, Iraq

Abstracts

INTERNATIONAL POSTER 6

Risk Factors for Tuberculosis Treatment Failure Among Pulmonary Tuberculosis Patients – Four Health Regions of Burkina Faso, 2009

AUTHORS: Bernard Sawadogo, K. Tint, M. Tshimanga, L. Kuonza, L. Ouedraogo

BACKGROUND: In Burkina Faso, the tuberculosis (TB) treatment failure rate increased from 2.5% in 2000 to 8.3% in 2006. The risk factors for TB treatment failure in the country are not well known. The study aims to determine the risk factors for treatment failure among pulmonary tuberculosis patients in four health region of Burkina Faso and to recommend appropriate interventions.

METHODS: A case control study was conducted among pulmonary TB patients who began TB treatment in 2009. A case was any patient who remained smear-positive at fifth month of TB treatment and a control was a patient who tested smear-negative at fifth month of treatment. A structured questionnaire was administered to one hundred cases and one hundred controls to collect information on exposure factors. Odds ratio were calculated using bivariate and multivariate analysis to determine the association between exposures and outcome.

RESULTS: Multivariate analysis showed that independent risk factors for TB treatment failure were failure to take TB drugs for more than 14 consecutive days ($OR=18.53$; 95%CI:4.56 – 75.22), sputum smear-positive at two months of treatment ($OR=11.52$; 95%CI:5.18–25.60), existence of co-morbidity ($OR=5.74$; 95%CI:1.69–19.44), and use of traditional medicines or herbs ($OR=2.97$; 95%CI:1.12–7.85).

CONCLUSIONS: Early identification of patients with the above risk factors for intense case management will improve TB treatment outcome. Patient with smear positive at 2nd month of treatment require more intense follow-up, and involving traditional healers who provide traditional medicines or herbs in the educational programme on TB are required. Keywords: Pulmonary Tuberculosis, treatment failure, risk factors.

KEYWORDS: pulmonary tuberculosis, treatment failure, risk factors

INTERNATIONAL POSTER 7

Outbreak of Cholera, East-Akim Municipality, Ghana, November 2010

AUTHORS: Joseph Opere, K. Der, G. Afakye, C. Bonsu, C. Ohuabunwo, E. Afari, S. Sackey, F. Wurapa

BACKGROUND: Cholera is an acute infectious illness with profuse watery diarrhea caused by toxigenic Vibrio cholerae serogroup O1 or O139. World-wide, an estimated 3–5 million cholera cases with 100,000–120,000 deaths occur annually. In Ghana, over 9000 cholera-cases with 250 deaths were recorded in 1999. Provision of safe water and sanitation prevents cholera outbreaks. On October 29th 2010, the East-Akim Municipality (EAM) received a report of suspected cholera outbreak. We investigated to characterize the outbreak, and implement control and preventive measures.

METHODS: We interviewed health workers, reviewed medical records, conducted environmental assessment and obtained water and stool samples for laboratory test. A descriptive study followed by unmatched case-control study was conducted. A suspected cholera-case was a person with acute watery diarrhea, with or without vomiting in EAM from 1st October to 20th November, 2010. We analyzed data by person, place and time. Risk factors were identified using Chi-Square test at 95% confidence level.

RESULTS: Of 136 case-patients, 77 (56.6%) were males. Index-case occurred on October 13th, and case-patients peaked (18.4%) November 2nd. Attack rate was 2/1000 population; no fatality. Ages ranged from 1-84 years; mean of 34 ± 18 . Age-group 20-29 (30.1%) was mostly affected with Tafo Sub-Municipality having most case-patients (19.9%). Vibrio cholerae serotype ogawa was isolated from stool samples. We observed pollution of River-A with sand-washings by small-scale miners. Compared to controls, case-patients were more likely to have drunk from River-A. [$OR= 5.80$, 95% CI: 2.45-13.74].

CONCLUSIONS: Vibrio cholerae serotype ogawa caused the EAM cholera-outbreak affecting mostly young adult-males. Drinking water from contaminated River-A was the major risk-factor. Boiling or chlorination of water was initiated based on our recommendations and this controlled the outbreak.

KEYWORDS: case control studies, cholera, outbreaks, serotype-ogawa, East-Akim

INTERNATIONAL POSTER 8

Risk Assessment of HCV and HIV Infections Among Prisoners in Punjab, Pakistan**AUTHORS:** Aslam Pervaiz, R. Safdar, T. Ghafoor

BACKGROUND: Prisoners are globally considered at higher risk for acquiring blood-borne infections. In response to reported high prevalence, of viral hepatitis in Pakistan prisons in 2008, the Chief Justice of Pakistan directed for screening and management of all prisoners for viral hepatitis and HIV. We conducted this study to assess the prevalence and risk factors for HIV and HCV infections among prisoners in Jail X of Punjab Province.

METHODS: Prisoners incarcerated in Jail X were screened for HIV and HCV infections using the ELISA from July 1-15, 2009. Randomized case-control study was undertaken involving 1 case to 2 controls to determine association of behavioral risk factors and practices.

RESULTS: One thousand male prisoners incarcerated at the time of study, having mean age of 34 years (range 12 - 100 years) were screened. 197 (19.7%) were positive for HCV, 44 (4.4%) for HIV and 37 (3.7%) had co-infection. For case-control analysis, 86 cases and 172 controls were randomly selected. Before incarceration, cases were more likely to be involved in sharing of syringes (OR 4.0; 95% C.I. 1.02-16.39), history of dental procedure (OR 3.99; 95% C.I. 2.17-7.36), sharing razors (OR 2.94; 95% C.I. 1.42-6.09) and extramarital sex (OR 1.9; 95% C.I. 1.08-3.35). During incarceration odds of risk factors for developing diseases were sharing razor (OR 29.18; 95% C.I. 13.76-62.91), sharing of syringes (OR 4.89; 95% C.I. 1.01-25.4) and homosexuality (OR 3.72; 95% C.I. 1.99-6.97).

CONCLUSIONS: Multiple risk factors facilitate transmission of HIV and HCV and their aggravation during incarceration. Strengthening surveillance, targeted health education and risk reduction programs were recommended for prisons. Besides counseling, clinical management facilities were initiated for imprisoned or released HCV and HIV patients.

KEYWORDS: HIV, HCV, incarceration, surveillance

INTERNATIONAL POSTER 9

Case-Fatality and Risk Factors for Death in Adult Patients with Nosocomial Infection Caused by Multidrug-Resistant Organisms in Hungary, 2007–2009**AUTHORS:** Saverio Caini, Á. Hajdu, A. Kurcz

BACKGROUND: Nosocomial infections (NIs) due to multidrug-resistant organisms (MDROs) are associated with longer hospital stay, worse outcome and costly therapies. In Hungary, patients with NI caused by a MDRO are notified to the National Nosocomial Surveillance System (NNSS) since 2004. We aimed to determine risk factors for death in patients infected with a MDRO.

METHODS: We conducted a retrospective cohort study including all adult patients with NI caused by a MDRO notified to NNSS in 2007-2009. Case-fatality ratios (CFRs) within seven and 30 days of microbiological diagnosis were calculated, and stratified by sex, age group, site of infection and pathogen. We obtained hazard ratios (HRs) and 95% confidence intervals (CIs) for death using Cox proportional hazards models.

RESULTS: Overall, 2,437 patients (58.9% males, median age 67) were included. Seven- and 30-day CFRs were 19.8% and 40.0%, respectively. Seven-day CFRs were higher in patients ≥ 75 years (23.6%; $p=0.01$), in those with respiratory (35.5%; $p<0.01$) or bloodstream (23.6%; $p=0.04$) infection, and in those infected with multidrug-resistant *Pseudomonas aeruginosa* (31.6%; $p<0.01$) or *Acinetobacter baumannii* (26.6%; $p=0.01$). Independent risk factors for death were malnutrition (HR 1.94, 95% CI 1.35-2.79), endotracheal tube (HR 1.47, 95% CI 1.25-1.74), central venous catheter (HR 1.43, 95% CI 1.20-1.71), underlying cardiovascular (HR 1.27, 95% CI 1.10-1.47) or chronic respiratory (HR 1.20, 95% CI 1.02-1.42) disease. Patients transferred to an infectious diseases (ID) department had better prognosis (HR 0.56, 95% CI 0.36-0.85).

CONCLUSIONS: Risk of death varies according to patient characteristics, site of infection and pathogen, and procedures during hospital stay. Clinicians and infection control practitioners should be aware of specific high-risk groups, and, as soon as a MDRO is diagnosed, an ID specialist should be consulted to tailor interventions and patient care.

KEYWORDS: nosocomial infections, multidrug-resistant organisms

Abstracts

INTERNATIONAL POSTER 10

Measles Outbreak Among Unvaccinated Children of Migrant Workers: Zhejiang Province, June to August, 2010

AUTHORS: Jie Gao, H. He, J. Shen, Z. Huang, H. Ma, S. Luo, E. Chen

BACKGROUND: Improving vaccination coverage among children of migrant workers (MW) is an important part of Chinese goal of measles elimination by 2012. On July 6, 2010, the parents of a confirmed measles patient reported several similar patients in their village. An investigation was conducted to verify and understand the cause of the outbreak.

METHODS: A suspected case was onset of fever and rash among a resident of this village and other neighboring villages during June 1 to August 3, 2010. A confirmed case was a suspected case with measles-specific IgM identified in the serum. We conducted door-to-door visits and searched measles surveillance records to find cases. A retrospective cohort study among children of MW children aged 8 months-14 years was conducted to identify risk factors for measles infection.

RESULTS: We identified 19 measles cases (2 were previously reported) in the village, all among children of MW. Children aged 1-2 years had the highest attack rate (13%). The primary case-patient had onset on June 4 when she arrived from another province. All cases had been treated at 3 unlicensed private clinics that had not reported cases. From a sample, measles vaccine coverage was 81% among 315 children of MW and 100% among 23 resident children ($p < 0.02$). Among 61 unvaccinated children, the 16 who had close contact with measles patients had an 88% (14/16) attack rate compared to 4.4% (2/45) of those who did not (relative risk=20, 95% confidence interval: 5.7-94).

CONCLUSIONS: The lower measles vaccine coverage among children of MW and delayed reporting contributed to this outbreak. We recommend improved immunization services for children of MW and better targeting of surveillance in this group.

KEYWORDS: measles, immunization, surveillance

INTERNATIONAL POSTER 11

Evaluation of Two Containment Strategies During a Measles Outbreak in an Asylum Seeker Shelter – Neumünster, Germany, 2010

AUTHORS: Anja Takla, A. Barth, P. Stöcker, A. Siedler, S. Dudareva, K. Paeth, S. Jessen, O. Wichmann, Y. Deleré

BACKGROUND: In October/November 2010, a measles outbreak occurred in an asylum seeker shelter with 427 inhabitants from 18 nations. Due to specific outbreak characteristics the local health department decided for serologic testing of all inhabitants, followed by selective vaccination of those with negative test results or not tested. Actually, the German standing committee on vaccination (STIKO) recommends for measles outbreak settings vaccination of all persons <40 years unvaccinated or with unknown vaccination status. We evaluated the two strategies in terms of costs, feasibility, and potentially avoided cases.

METHODS: We compared actual costs of the implemented strategy with those of a hypothetical mass vaccination. Medical and non-medical expenditures were assessed by using bills and stakeholder interviews. We documented the logistics of serologic testing to evaluate feasibility. Potentially avoided cases were estimated from actual cases, maximum incubation period, and time of hypothetical mass vaccination.

RESULTS: A total of 300 (70%) inhabitants agreed with serologic testing, of which 39 (13%) were seronegative. Including non-testers, 144 individuals were eligible for vaccination. In contrast, mass vaccination would have targeted 359 persons. Preliminary calculations of total costs amounted to ~30,000—for selective and ~26,000—for mass vaccination. Serologic testing revealed a variety of logistical problems like misspelled names, incorrect birthdates, and interchanged samples. A total of 8 measles cases occurred. Of those, three could have potentially been avoided by mass vaccination.

CONCLUSIONS: Preliminary results demonstrate that mass vaccination would have been less expensive and might have avoided several cases. Serologic testing was very time and personnel consuming and left a degree of uncertainty concerning test results. Based on these results, we emphasize an early mass vaccination over prior serological testing in such settings.

KEYWORDS: measles, outbreak, serology, mass vaccination, evaluation, refugees

INTERNATIONAL POSTER 12

Diphtheria Outbreak in an Urban City in Central Philippines, 2010

AUTHORS: Norvie T. Jalani, M. Mapue II, J. Lopez, E. Tayag

BACKGROUND: On June 22, 2010 the National Epidemiology Center received a report of increasing diphtheria cases in Biñan City, Laguna. An investigation was done to verify the existence of an outbreak, determine mode source and transmission, and recommend control and preventive measures.

METHODS: A descriptive study was done. A probable case is a previously well person from the city who had fever, sore throat, anorexia, cough and colds, hoarseness, and pseudomembrane in the tonsils, pharynx or nose on June 4-July 14, 2010. A confirmed case is a probable case positive for *Corynebacterium diphtheriae* in culture. Active case finding and contact tracing were done in the schools and community. Throat samples were collected. Key informants were interviewed. Environmental survey was conducted.

RESULTS: Five cases were identified. Age ranged from 2-13 years (median 7). Majority (80%) were male. Three were relatives. All had fever, sore throat and pseudomembrane. None had completed their DPT immunization during infancy. Four died (CFR=80%). Two cases and one contact were positive for *Corynebacterium diphtheriae* culture. Although immunization activities were done weekly in the health facility, defaulters were followed-up only once a month. Cases live in a congested neighborhood with poor living conditions.

CONCLUSIONS: There was a diphtheria outbreak in Biñan, Laguna. This may have been due to the failure to report the first case, monitor the close contacts, and the presence of susceptible and carriers in the area. Immunization activities should be strengthened and given emphasis by the local health authorities. Health workers were re-oriented on the Expanded Immunization Program of the government. A city ordinance to have mothers immunize their children was drafted. A defaulter tracking mechanism should be adopted.

KEYWORDS: diphtheria, immunization, Philippines

INTERNATIONAL POSTER 13

Provision of Treated Water for Mitigation of a Cholera Outbreak, Handeni District, Tanga, Tanzania, 2009

AUTHORS: M. Mponela, J. Mghamba, F. Mosha, M. Mohamed, O. Oleribe, A. Simba, D. Kadigi, E. Nyale, E. Mwakapeje, F. Lyamuya, S. Sembuche, S. Masauni, S. Lyimo, Y. Kasebele

BACKGROUND: Eleven cholera outbreaks occurred in Tanzania during 2009. One outbreak in Handeni (Tanga Region) affected 588 people, with 16 deaths (case-fatality rate 2.7 %) between August and October 2009. We investigated the outbreak to determine risk factors for targeting appropriate control measures.

METHODS: An unmatched case-control study was undertaken. A case was any person in Handeni above two years of age presenting with watery diarrhea, with or without vomiting, between August 16th and October 15th, 2009. A control was any person above two years without symptoms residing in Handeni in the same period. Eighty nine cases and 89 community controls were recruited. Controls were identified by random walk method. Stool and water samples from ten case households were collected for bacteriological analysis.

RESULTS: The epidemic peaked on August 23rd, September 5th and September 27th 2009. Mean age of cases was 28.3 years; 52/89 (58.4%) were males. Implicated risk factors were inadequate knowledge of cholera disease (Odds Ratio [OR] =8.4, p <0.01), drinking unchlorinated water (OR =4.0, p <0.01), having a cholera case at home (OR=2.5, p <0.01), and no primary school education (OR=15.3, p <0.01). *Vibrio cholerae* O1 Ogawa sensitive to Ciprofloxacin, resistant to Doxycycline and Cotrimoxazole, was isolated from all stool samples. Pathogenic *Escherichia coli* was cultured from eight (80%) water samples.

CONCLUSIONS: Lack of education and untreated water contributed to the propagation of this outbreak. Public rallies to promote awareness of cholera in the community and house-to-house supervision of water treatment using chlorine tablets were done from the beginning of October 2009. By mid November 2009, the number of cases decreased to below ten cases overall.

KEYWORDS: cholera, outbreak, untreated water, Tanzania

Abstracts

INTERNATIONAL POSTER 14

Evaluation of Measles Case-Based Surveillance System – Nigeria, 2010

AUTHORS: Mohammed Abdulaziz, K. Sabitu, P. Nguku, E. Abanida

BACKGROUND: At inception of measles case-based surveillance system in 2005, Nigeria had 98,447 measles cases and 2,746 deaths, with a case fatality rate in epidemics up to 10%. The objectives of the surveillance included predicting outbreaks through identification of geographic areas and age groups at risk and evaluating vaccination strategies. We described the surveillance system, evaluated attributes and determined whether it was meeting its objectives.

METHODS: We used the CDC updated guidelines for evaluating surveillance. We described the system and stakeholders and evaluated the system attributes. We interviewed 15 national and state surveillance officers (SO) and data from 2006 to 2009 were analyzed.

RESULTS: More than 80% of the SO rated the system as useful, flexible and simple. Majority (62%) rated system as unstable. The requirement of detection of measles specific IgM antibodies for laboratory confirmation increased the complexity of the system. The data was of high quality (missing final classification of cases < 2%). Predictive value positive was 29%. The proportion of local government areas taking blood specimen for at-least one suspected case was 86%. Proportion of specimen arriving at the laboratories in good condition was 95%. By 2009 the incidence and mortality of measles had reduced by >90% compared to 2005. Northwest zone of Nigeria had the highest incidence of measles (11-15 cases/100,000/year). Children below 4 years constituted nearly 90% of cases and 71% of them were never vaccinated against measles.

CONCLUSIONS: The system was useful, flexible, representative and of high quality. The surveillance system appears to achieve some of its objectives but was not stable therefore we recommended decreasing dependency on foreign donors and improve the funding of system by government.

KEYWORDS: measles, surveillance system, evaluation

INTERNATIONAL POSTER 15

Factors Associated with Changes in Vaginal Cytology in a Health Center – Costa Rica, 2009

AUTHORS: Leandra Abarca, M. Salas, J. Freer, P. Cordero

BACKGROUND: Cervical cancer is among the leading causes of cancer in women globally; in Costa Rica it is among the top three causes. . The objective of our study was to identify factors associated with abnormal changes in vaginal cytology.

METHODS: We conducted a health center-based case-control study. A case was defined as any woman seeking care in a health center during 2009, having vaginal cytology on PAP smear positive for either cells of undetermined significance (ASCUS), mild, moderate or severe dysplasia. Controls were selected by simple random sampling using records of women seen at the same health centers in 2009 and having normal PAP smears. Odds ratios (OR) and 95% confidence intervals (95% CI) were calculated for associations between potential risk factors and abnormal PAP smears.

RESULTS: We identified 62 cases and 137 controls. The average age of cases was 43 was not significantly different from that of controls (Student t p = 0.90). ASCUS was the most frequent cause of abnormal cytology (39%). Factors found to be significantly associated with abnormal cytology were: tobacco use (OR=2.35; 95% CI=1.26-4.31), onset of sexual activity before age 18 (OR=2.0; 95% CI=1.06-3.64) and having a history of > 3 sexual partners (OR=2.0; 95% CI=1.11-3.97).

CONCLUSIONS: There was similarity between risk factors we identified Our study was limited by the failure to follow-up colposcopy results for definitive diagnoses. Considering these risk factors represent modifiable health behaviors, we recommended dissemination of our findings to local health authorities in order to generate intervention strategies to promote responsible, healthy

KEYWORDS: PAP smears, risk factors, cytology, vaginal

WEDNESDAY, APRIL 13

SESSION L

7:35

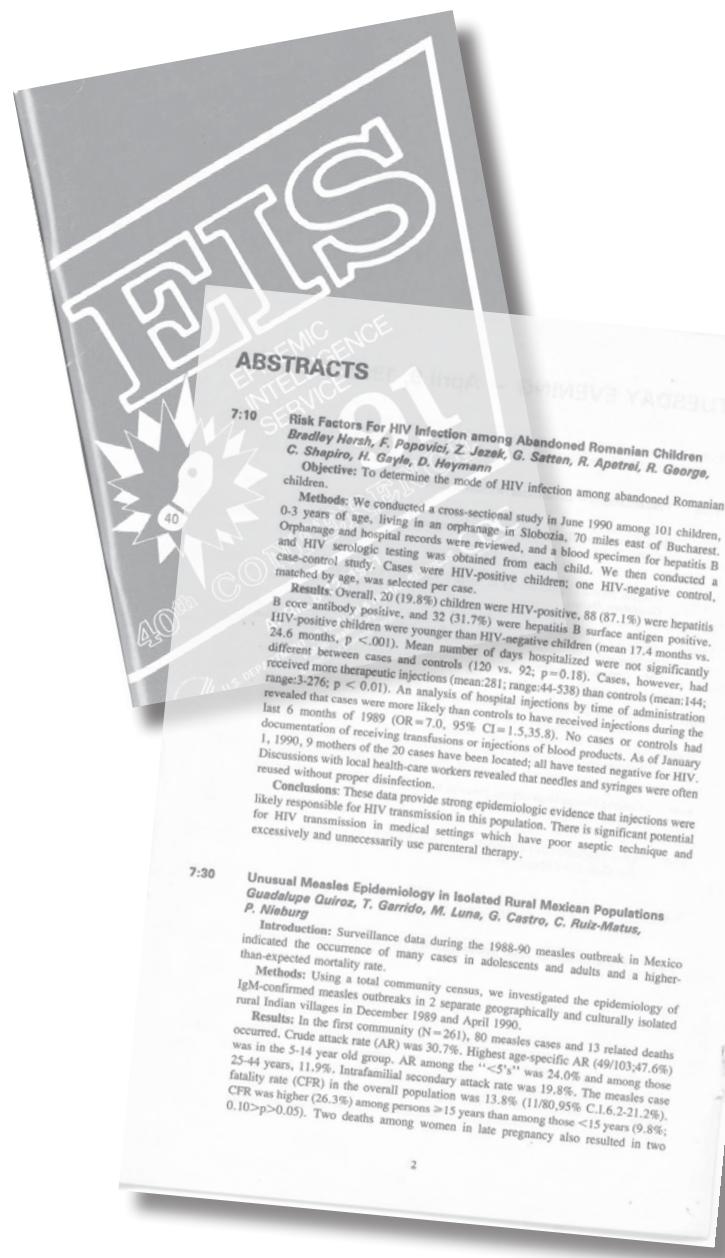
Scientists Make Progress Against Mystery Pneumonia

March 23, 2003

The China Post

INTERNATIONAL NIGHT, 7:30–9:35 p.m.

Atrium Ballroom A

MODERATORS: Kevin DeCock and
Mark Rosenberg

Assessment of Water, Sanitation, and Hygiene Interventions in Response to an Outbreak of Typhoid Fever in Neno District, Malawi

AUTHORS: Sarah D. Bennett, S. Lowther, F. Chingoli, T. Warne, T. Ayers, L. Capewell, E. Taylor, B. Nygren, E. Mintz

BACKGROUND: Typhoid fever, caused by *Salmonella enterica* serovar Typhi, results in an estimated 21 million cases and 200,000 deaths annually worldwide. On May 2, 2009 an outbreak of typhoid fever began in rural villages along the Malawi-Mozambique border resulting in 748 illnesses and 44 deaths by September 2010. Despite numerous interventions, including distribution of WaterGuard (WG) for in-home water treatment and education on its use, cases of typhoid fever continued. Information on knowledge, attitudes, and practices surrounding typhoid fever, safe water, and hygiene are necessary to plan future interventions.

METHODS: In September 2010, a survey was administered to female heads in randomly selected households in 17 villages in Neno District, Malawi. Stored household drinking water was tested for free and total residual chlorine.

RESULTS: Among 202 households, primary sources of drinking water were unimproved wells (45%), boreholes (42%) and rivers (7%). Households who previously attended a community-wide typhoid talk were more likely to report that typhoid fever is caused by drinking unsafe water compared to households not attending a talk (54.8% vs. 41.6%, P = 0.02). WG was present in 53.4% of households; only 32.8% of those households reported treatment of currently stored water. Residual free chlorine levels were adequate in stored water samples from 59.1% of households that reported water treatment.

CONCLUSIONS: Knowledge regarding the association between unsafe water and typhoid fever improved after community-wide education, but remains low. Despite the presence of WG in over half of all households, less than a third were using this method to protect their drinking water. Future interventions should focus on increasing use of WG for all stored water to prevent waterborne illnesses, including typhoid fever.

KEYWORDS: typhoid fever, outbreaks, Malawi, water, drinking

7:55

Hepatitis Outbreak Caused by Contaminated Tamarind Water Served in a Mobile Food Kiosk in an Affluent Urban School of Mayurbhanj, Orissa, India, September 2010

AUTHORS: Prameela Baral, S. Swain, P. Manickam, M. Murhekar

BACKGROUND: On 14th September, 2010 a private practitioner reported a cluster of school children studying in private English medium school suffering from hepatitis. We investigated the outbreak to plan containment measures.

METHODS: We defined a case as fever, vomiting, yellow coloration of conjunctiva or colored urine since 20th July, 2010 among the school children. We collected information regarding age, sex, residence, date of onset of symptoms, travel history, supply of drinking water and inspected the food kiosk inside the school premises. We sent sera samples for laboratory confirmation of hepatitis. We conducted a case control study among school children and calculated odds ratio with 95% confidence interval and population attributable fraction.

RESULTS: We identified 119 cases of jaundice among 1320 children with overall attack rate of 9% (Males-11%, Females-7%). All case patients were school children aged less than 19 years. The index case occurred on 20th July, 2010 and most of the hepatitis case-patients were clustered in neighborhoods around the school. We recruited 119 controls among school children. Swallowing of tamarind water containing 'gupchup' served at the mobile food kiosk in the school is associated with hepatitis (OR: 8.6, 95% CI: 4.5 – 16, PAF – 96%). Of the seven sera samples three tested positive for IgM antibody for Hepatitis E and three for Hepatitis A.

CONCLUSIONS: An outbreak of Hepatitis occurred among the children of affluent urban school due to swallowing of contaminated tamarind water in 'gupchup'. We recommended to ban the vending of 'gupchup' in the food kiosk, disinfection of drinking water and educated the school children and food vendors to practice food and personal hygiene.

KEYWORDS: hepatitis, outbreak, contaminated water, India

8:15

Prevalence and Factors Associated with Percutaneous Injuries and Splash Exposures Among Health-Care Workers in Rift Valley Provincial and War Memorial Hospitals – Kenya, 2010

AUTHORS: Everline M Mbaisi, Z. Ng'ang'a, P. Wanzala, S. Amwayi, A. Abade, J. Omolo

BACKGROUND: Accidental occupational exposure of healthcare workers to blood and body fluids after skin injury or mucous membrane contact constitutes a risk for transmission of blood-borne pathogens. Such pathogens include Human Immunodeficiency Virus (HIV), Hepatitis B virus (HBV) and Hepatitis C virus (HCV). This study was conducted to determine the prevalence and associated factors for percutaneous injuries and splash exposures among healthcare workers in Rift Valley provincial and War Memorial hospitals.

METHODS: We conducted a cross-sectional study from October to November 2010. Self reported incidents, circumstances surrounding occupational exposure and post-exposure management were sought using a semi-structured questionnaire. Records on occupational injuries for 2005 to 2010 were reviewed and an audit conducted to assess occupational exposure prevention programs.

RESULTS: Of 348 health-care workers interviewed, 83 (24%) reported having been exposed to blood and body fluids in the preceding 12 months. Sixty-four (18%) health-care workers reported sharps injuries, 25 (7.2%) reported splashes to mucous membranes and 38 (11%) reported multiple exposures. Thirty-two (50%) of the sharps injuries were observed among nurses, 19 (30%) occurred during stitching and 14 (22%) in obstetric department. Forty (48%) of the exposure incidents were reported while only 20 (24%) of the exposed health-care workers were started on post exposure prophylaxis against HIV. Health workers aged below 40 years were more likely to experience sharps injuries (OR= 3.1; 95% CI=1.08-9.13) while previous training in infection prevention was protective (OR= 0.45; 95% CI=0.03-0.90).

CONCLUSIONS: Sharps injuries and splashes are common in Rift Valley and War memorial hospitals. There is underreporting of the incidents and inadequate post-exposure management. Health institutions should develop policies and control plans for occupational risks, train health workers and institute appropriate surveillance for the risks. Key words: Health-care, Occupational exposure, Blood/body fluids, blood-borne pathogens, HIV

KEYWORDS: health-care, occupational exposure, blood/body fluids, bloodborne pathogens, HIV

8:35

Effect of H1N1 Pandemic Monovalent Vaccines on the Influenza Outbreak in a Prison – Thailand, 2010

AUTHORS: Hirunwut Praekunatham, A. Kamjanapiboonwong, W. Wanna, J. Panitchakit, N. Rungsawasd, S. Iamsirithaworn

BACKGROUND: On August 29th, 2010, an outbreak of pandemic influenza A (H1N1) 2009 in a prison was detected. About one half of female prisoners and one third of male prisoners received influenza A (H1N1) 2009 monovalent vaccine a few weeks before the outbreak started. An investigation was conducted to evaluate an effectiveness of the monovalent vaccine.

METHODS: We reviewed treatment records and conducted active case finding in the prison. An Influenza-like illness (ILI) case was defined as a person who developed fever with sore throat and/or cough during August 20th- September 8th, 2010. A laboratory-confirmed influenza case was identified by either throat swab that positive RT-PCR for influenza or \geq 4-fold rise of HI titer from paired serum samples. A retrospective cohort study was carried-out to identify risk factors and to estimate effectiveness of the monovalent H1N1 vaccine.

RESULTS: Of 2,482 male prisoners, 216 (8.7%) met ILI case definition and 65 cases (51.6%) were confirmed H1N1 2009 infection. In a cohort of 688 male prisoners, H1N1 vaccination was a significant protective factor (RR=0.52, 95%CI=0.27, 0.98). Infection rates of 50 vaccines and non-vaccinated prisoners were compared and vaccine effectiveness was estimated at 80% (95%CI=57%, 91%). However, the vaccine was 45% (95%CI= -75%, 83%) effective in prevention of ILI symptoms. Only one confirmed case was identified in female prisoners.

CONCLUSIONS: H1N1 monovalent vaccine was below 50% effective in prevention of ILI. However, the pandemic vaccine significantly reduced H1N1 2009 infections and resulted in limited transmissions and low attack rate in the prison.

KEYWORDS: Influenza A (H1N1) 2009, outbreak, prison, monovalent vaccine, effectiveness, Thailand

8:55

Evaluation of the Effect of High Concentrations of Environmental Manganese on Young Children in Zestaphoni, Georgia, 2010

AUTHORS: Nana Mebonia, K. Dadiani, N. Gabriadze, N. Chakvetadze, N. Kazachashvili, M. Mircxulava, T. Adamia, P. Innadz

BACKGROUND: Chronic inhalation of manganese and high concentration of its by-products affects respiratory organs, nervous and reproductive systems. A large manganese factory processing raw manganese is located in Zestaphoni, Georgia. We evaluated the influence of high concentration of manganese in the environment on the health of young children.

METHODS: A cohort study was designed. Residents from Zestaphoni aged 3-6 years were defined as exposed. An unexposed group was selected from aged matched residents of the neighboring city of Vani, located 50 kilometers from Zestaphoni. Both study groups were selected randomly from a large name listing of all children in local day care facilities and kindergartens. Mothers of children were interviewed by using standard questionnaire that included history of any physician diagnosed illness within the last 12 months of the study and the child's mental development status. Environmental samples of air, soil, and drinking water in homes, day cares and kindergartens were measured for levels of manganese.

RESULTS: 172 exposed and 172 unexposed children participated in the study. Bivariate analysis revealed high relative risk (RR) of cough (RR=3.12, 95%CI=1.5-6.6), acute respiratory disease (RR=2.2, 95%CI=1.3-3.7), bronchitis (RR=14.2, 95%CI=4.5-45.1), pneumonia (RR=3.1, 95%CI=0.6-14.9) among exposed group. No correlation of delayed mental development or neurological diseases and being a resident in Zestaphoni was found. Manganese concentration was 2-18 folds higher than permissible doses in different samples of air and soil from Zestaphoni.

CONCLUSIONS: High relative risk for development of acute respiratory disease, bronchitis, and pneumonia among residents of Zestaphoni region may be connected to high concentration environmental manganese. Recommendation was given to the factory management to implement air cleaning system to avoid release of hazardous chemical substances into the environment.

KEYWORDS: manganese, bronchitis, pneumonia, respiratory disease, cohort study

Risk Factors for Hand, Foot, and Mouth Disease Transmission in the Kindergarten Setting, Zhejiang Province, China, 2010

AUTHORS: Jie Gao, J. Shen, M. Wu, H. Ma, J. Lin

BACKGROUND: From 2008-2010, an epidemic of hand foot and mouth disease (HFMD) in China has reached 3,415,512 cases and 1,384 fatalities. Of 543 focal outbreaks reported, 82% occurred in kindergartens. The current practice to close kindergartens to control HFMD transmission is disruptive and unevaluated. We conducted a case-control study to identify modifiable risk factors for HFMD transmission in kindergarten.

METHODS: We defined a case-class as one with 2 or more reported HFMD cases and a control-class as only one HFMD case within 3 days during May 1st to July 31, 2010 in any kindergarten in 2 counties. We compared layout, sanitary facilities, and hygienic practices between case and control classes.

RESULTS: We identified 30 case-classes and 47 control-classes during the study period. The HFMD attack rate was 9.4% (80/853) in case-classes and 3.3% (47/1472) in control-classes. 17% of case-classes had no direct sunlight compared with 0% of control-classes ($OR=\infty$, 95% CI: 1.6- ∞). 20% of case-classes had no hand soap or sanitizer compared with 0% of control-classes ($OR=\infty$; 95% CI 2.1- ∞); 93% of case-classes had no disinfectant for drinking cups compared with 70% of control-classes ($OR=6.1$; 95% CI: 1.2-59); in 13% of case-classes the first case was sent home > 1 day after onset of HFMD compared with 0% of control-classes ($OR=\infty$, 95% CI: 1.1- ∞).

CONCLUSIONS: Increasing sunlight, improving hygiene, and promptly excluding HFMD affected children from classrooms may reduce HFMD transmission in kindergartens. The current strategy of closing kindergartens should be compared to a package of interventions as studied herein to determine which approach best minimizes both transmission and social disruption.

KEYWORDS: hand, foot, and mouth disease, HFMD, risk factors, China

The Plague of Medical Research

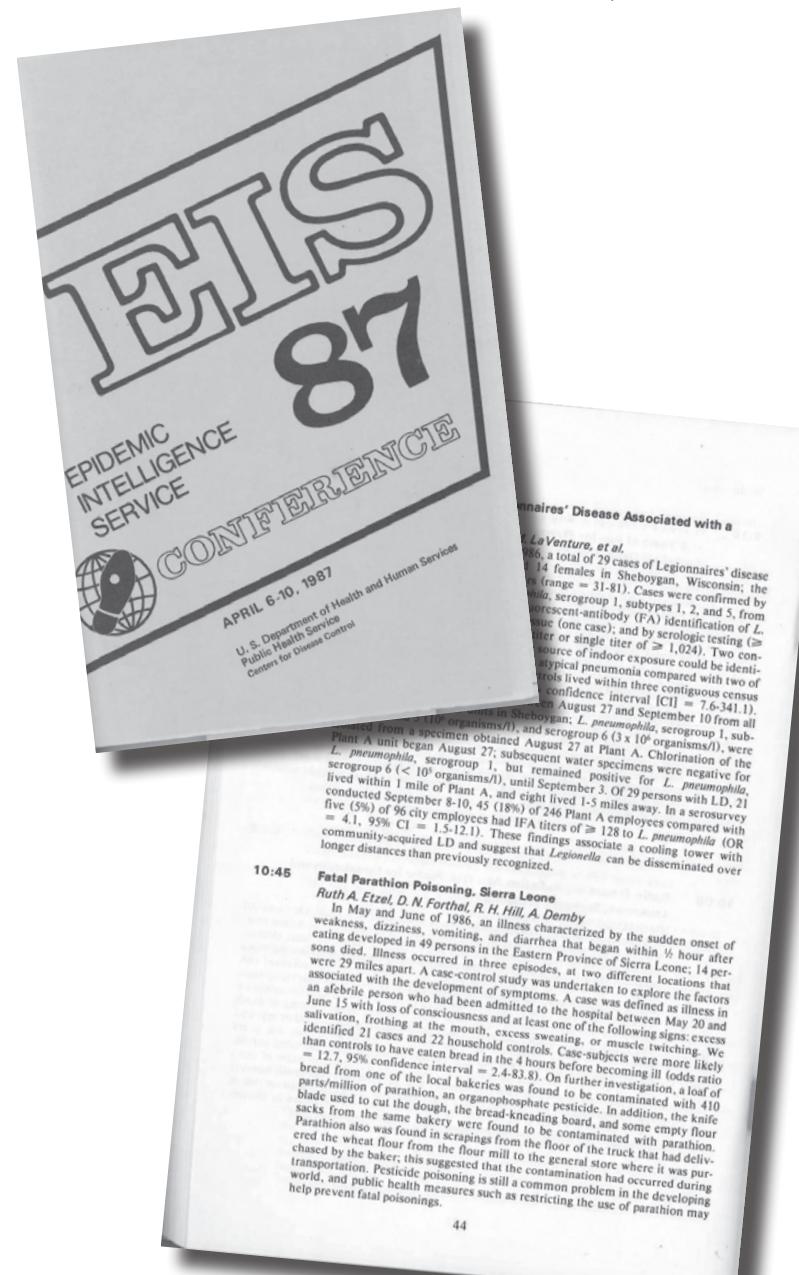
September 22, 2009, by Stephen Dubner

The New York Times.

Mackel Award Finalists, 8:30–10:15 a.m.

Atrium Ballroom B and C

MODERATORS: Rima Khabbaz and May Chu



8:35

Outbreak of *Mycobacterium abscessus* Skin Abscesses Following Allergy Injections at Outpatient Clinic A – Texas, 2009

AUTHORS: Susan N. Hocevar, E. Meite, M. Williams, H. Hatch, H. O'Connell, B. Jensen, N. Pascoe, T. MacCannell

BACKGROUND: Approximately 190 million allergy injections are given annually nationwide. A cluster of *M. abscessus* injection site abscesses was identified among allergy clinic A patients in July 2009. Previous outbreaks of *M. abscessus* have been linked to contaminated skin antiseptics. An investigation was conducted to identify the outbreak source and evaluate clinic practices.

METHODS: A retrospective cohort study was conducted among Clinic A patients. A case was defined as an abscess at an injection site that occurred in a cohort patient who received an injection from May 1– October 30, 2009. Observations directed environmental sampling; enhanced culture and recovery methods were used for *M. abscessus* detection. Environmental and patient isolates were compared using pulsed-field gel electrophoresis (PFGE). Persistence of the outbreak strain in benzalkonium chloride (BC), used for skin antisepsis, was evaluated against undiluted and serial BC dilutions.

RESULTS: Among 113 patients in the cohort, 25 cases were identified (attack rate= 22%). Cases required ≥six months of antibiotic therapy and 52% required drainage. Risk of infection did not differ with respect to clinical factors or allergy treatment regimens. Interviews and observations identified multiple infection control lapses, including dilution of BC with reverse osmosis (RO) water for skin antisepsis. *M. abscessus* recovered from RO water and in 21 clinical isolates from 13 case-patients was indistinguishable by PFGE. Disinfection studies confirmed that the outbreak strain survived in all concentrations of BC.

CONCLUSIONS: Epidemiologic observations identified sources for the outbreak; enhanced lab recovery methods and PFGE typing demonstrated that BC contaminated with *M. abscessus* from RO water was the source of this outbreak. Undiluted BC supports growth of the organism and should not be used as a skin antiseptic.

KEYWORDS: *Mycobacterium*, disease outbreak, out-patient clinics, benzalkonium chloride

8:55

Fatal Amebic Encephalitis Caused by Transplant-Transmitted *Balamuthia mandrillaris* – Arizona, 2010

AUTHORS: Chukwuma Mbaeyi, E. Farnon, J. Weiss, C. Paddock, M. MacDonald, S. Baty, C. Glaser, C. Hahn, R. Herlihy, A. daSilva, S. Roy, S. Zaki, G. Visvesvara, M. Kuehnert, for the *Balamuthia* Investigation Team

BACKGROUND: *Balamuthia mandrillaris*—a free-living ameba found in soil—is a rare cause of encephalitis with >95% case-fatality. In 2009, the first transplant-transmitted cluster of *Balamuthia* was identified. In September, 2010, we investigated a second transplant-associated cluster in order to describe the cases and identify opportunities for prevention.

METHODS: We reviewed medical records and interviewed healthcare providers of the organ donor and transplant recipients. Specimens were tested at CDC by immunohistochemistry, immunofluorescence assay and PCR.

RESULTS: The donor, a male aged 27 years with a history of cocaine use, presented with headache, fever, and a chronic skin lesion. Brain MRI revealed an enhancing lesion. He was diagnosed with likely cocaine-induced stroke and died 6 days later. His heart, liver, pancreas, and kidneys were transplanted into four adult males. Approximately 3 weeks post-transplant, the liver and kidney-pancreas recipients were admitted with neurologic signs and fever; both had ring-enhancing lesions on brain MRI. The liver recipient died on post-transplant day (PTD) 26. The kidney-pancreas recipient underwent brain biopsy on PTD 32; histopathologic examination the following day demonstrated amebic organisms. Immunostaining at CDC on brain tissue from both recipients demonstrated free-living amebic antigens; PCR confirmed *Balamuthia* infection. Despite aggressive combination antimicrobial therapy, the kidney-pancreas recipient died on PTD 39. Testing of archived donor serum also indicated evidence of *Balamuthia* infection. Based on antimicrobial regimens used in very few *Balamuthia* survivors, the heart and kidney recipients received preemptive therapy and neither has shown evidence of *Balamuthia* infection.

CONCLUSIONS: *Balamuthia* should be considered in patients with subacute encephalitis and skin lesions. Transplant centers should be aware of the risk of transmitting fatal diseases from organ donors with signs of encephalitis.

KEYWORDS: *Balamuthia*, encephalitis, ameba, organ donor, transplant, biopsy

Thursday

Abstracts

9:15

Serum 25-Hydroxyvitamin D3 Status and Determinants of Vitamin D Deficiency Among Non-Pregnant Women of Reproductive Age — Jordan, 2010

AUTHORS: Erin M. Koers, I. Khatib, N. Aburto, K. Sullivan, K. Scanlon, J. Wirth, M. Serdula

BACKGROUND: One billion people worldwide are vitamin D-deficient, a condition leading to osteomalacia in adults. Sunlight is an important vitamin D source. Previous investigations of deficiency among women whose culture encourages skin-covering have been small and not nationally representative. We investigated serum-25-hydroxyvitamin D3 (D3) status and determinants of deficiency in a nationally representative sample of nonpregnant Jordanian women.

METHODS: We analyzed data collected in 2010 from 1,932 Jordanian women who completed a questionnaire and provided blood samples from which D3 concentrations were determined by liquid chromatography-mass spectrometry. We estimated women's mean D3 concentration and prevalence of D3 deficiency, defined by the Institute of Medicine (1997) (<12 ng/mL), and used multivariable logistic regression to calculate prevalence odds ratios (PORs) for deficiency associated with skin covering (use of a headscarf or full body/face cover) versus no covering, urban residence, age, education, marital status, and parity.

RESULTS: Results indicated that 60.1% (95% confidence interval [CI]: 57.3–63.9) of Jordanian women were deficient in vitamin D, that the mean D3 concentration among them was 10.9 ng/mL (95% CI: 10.7–11.2; median: 11.0); and that 94.8% covered their skin when outside. Being covered (POR: 3.2; 95% CI: 1.6–6.4) and urban residence (POR: 2.6; 95% CI: 2.1–3.4) were positively associated with risk for deficiency, and lower education (POR: 0.7, 95% CI: 0.5–0.9) and marriage (POR: 0.7; 95% CI: 0.5–0.9) were negatively associated.

CONCLUSIONS: Three-fifths of reproductive-aged Jordanian women are vitamin D-deficient; risk is substantially higher among urban women and women who cover themselves. Jordan initiated Vitamin D flour fortification following the study; consumption of foods containing fortified flour should be encouraged and the impact of Jordan's fortification efforts evaluated.

KEYWORDS: micronutrients; Jordan; Vitamin D; food, fortified

9:35

Changing Geographic Range of Primary Amebic Meningoencephalitis — Minnesota, 2010

AUTHORS: Sarah K. Kemble, G. Visvesvara, R. Lynfield, A. DeVries, D. Drehner, W. Pomputius, M. Beach, A. da Silva, V. Hill, J. Yoder, L. Xiao, K. Smith, R. Danila

BACKGROUND: Primary amebic meningoencephalitis (PAM), a rare and nearly always fatal infection caused by the thermophilic ameba, *Naegleria fowleri*, is caused when the ameba travels up the nose to the brain after immersion in warm fresh water. Confirmed cases in the United States have been limited to southern-tier states. In August 2010, a female, aged 7 years, died; PAM was suspected on the basis of amebae observed in cerebrospinal fluid (CSF).

METHODS: Medical records were reviewed and the patient's parents interviewed. Site investigations included environmental sampling where the patient had swum during the 2 weeks preceding illness onset. Patient and environmental samples were tested for *N. fowleri* by culture and polymerase chain reaction (PCR); isolates were genotyped. Historic local ambient temperature data were obtained.

RESULTS: The patient's brain tissue and CSF tested positive for *N. fowleri* by culture and PCR. The patient had no travel or water exposures outside Minnesota. Water-related exposures included hours of swimming, including underwater handstands in 2 lakes (A and B) and 1 river in Washington County, Minnesota. *N. fowleri* was cultured and identified by PCR from water and sediment from Lake A only. *N. fowleri* isolates from brain, water, and sediment were all genotype 3. Surface water temperatures at Lake A ranged from 22.1°C to 24.5°C. August 2010 average air temperature near Lake A was 25°C, 3.5°C above normal and the third warmest for August since 1891.

CONCLUSIONS: This is the most northern latitude PAM case identified in the United States by 550 miles. Changing climate patterns and elevated water temperatures require an elevated index of suspicion for PAM in geographic locations not historically considered to be an exposure risk.

KEYWORDS: *Naegleria fowleri*, ameba, meningoencephalitis, Minnesota, climate change, fresh water

9:55

Outbreak of Nosocomial Listeriosis – Texas, 2010

AUTHORS: Noha H. Farag, L. Gaul, B. Silk, E. Trees, M. Kingsley, L. Graves, T. Ward

BACKGROUND: Invasive listeriosis is a potentially fatal foodborne disease caused by *Listeria monocytogenes*. In February 2010, a listeriosis cluster was identified in Texas. We investigated to confirm the outbreak, identify the source, and prevent additional infections.

METHODS: All clinical isolates of *L. monocytogenes* with similar pulsed-field gel electrophoresis (PFGE) subtypes were identified within the PulseNet surveillance system. We used multilocus variable-number tandem-repeats analysis (MLVA) and multilocus genotyping (MLGT) to confirm molecular subtype relatedness, interviewed patients regarding food consumption, and reviewed their medical charts. Environmental and food samples were cultured.

RESULTS: We identified 10 cases with highly related PFGE subtypes with patients' illness onsets during February–August 2010. Nine of 10 cases were among patients from 1 of 4 hospitals before illness onset, with 6 having been at Hospital A. A tenth patient had eaten at 3 hospital cafeterias. Mean patient age was 77 years (range: 56–93); case-fatality ratio was 50%. Of 198 environmental and 30 food samples collected, *L. monocytogenes* was detected in chicken salad and prepackaged diced celery only. Traceback investigation identified a celery processing plant from which *L. monocytogenes* was isolated from environmental and product samples. Subtyping of isolates identified indistinguishable PFGE patterns to clinical, celery, and chicken salad isolates from Hospital A and clinical isolates from the other hospitals. Clinical, environmental, and product isolates were indistinguishable by MLVA and MLGT.

CONCLUSIONS: Prepackaged diced celery was recalled and plant operations suspended. This investigation directly implicated celery for the first time as a vehicle in a listeriosis outbreak. Given the high case-fatality, produce should be recognized as a potential source of *L. monocytogenes*. Risk mitigation strategies should be considered for highly vulnerable populations.

KEYWORDS: *Listeria monocytogenes*; disease outbreaks; foodborne diseases; electrophoresis, gel, pulsed-field

THURSDAY, APRIL 14

SESSION N

Uncle Sam Probes Polio Cases Following Salk Inoculations

April 29, 1955, by Washington United Press

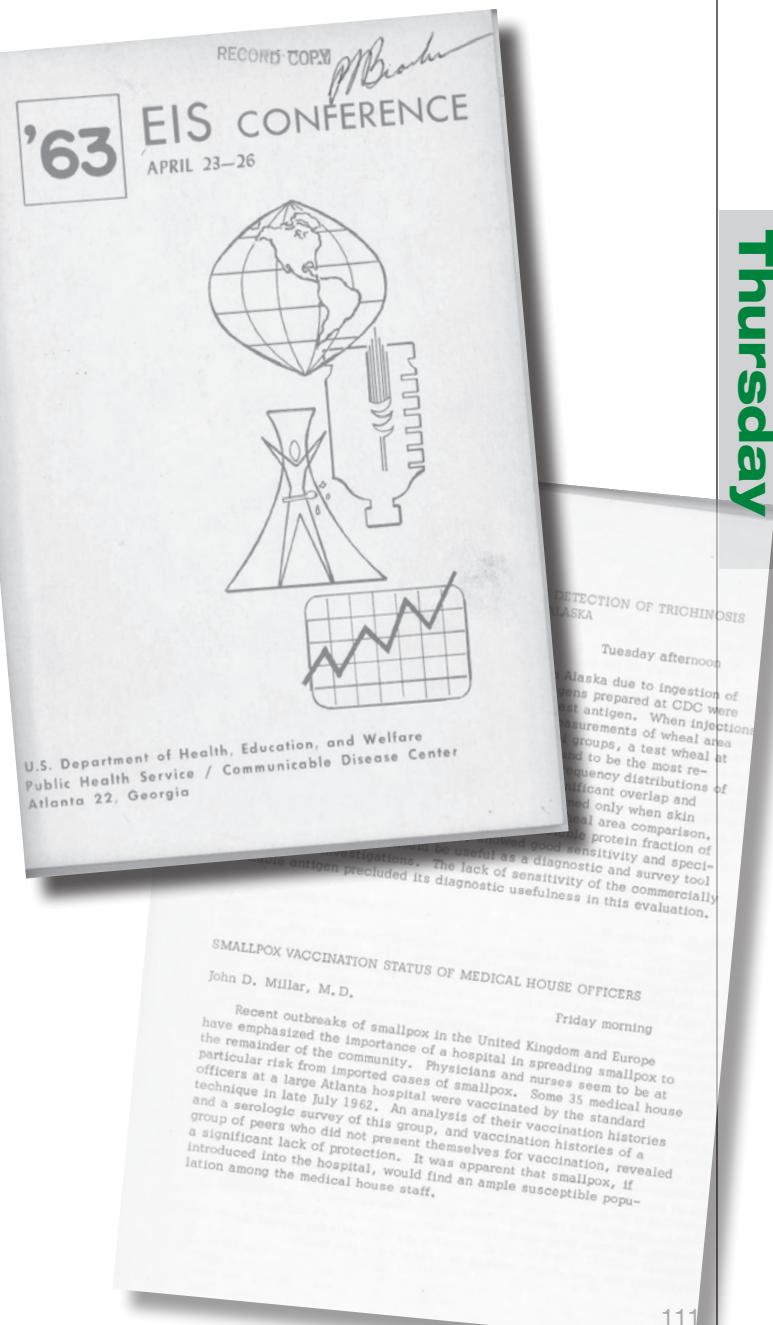
News Dispatch (Jeannette, PA)

Vaccine Preventable Diseases

10:30–11:55 a.m.

Atrium Ballroom B and C

MODERATOR: Greg Armstrong



10:35

Potential Intussusception Risk Versus Benefits of Rotavirus Vaccination Among Infants in the United States

AUTHORS: Rishi Desai, M. Cortese, J. Tate, C. Yen, M. Patel, U. Parashar

BACKGROUND: Rotavirus vaccine was introduced to the immunization schedule in 2006. While a risk has not been documented in the United States, recent findings from post-licensure studies in Latin America prompted a label change to highlight a potential risk of intussusception, a form of life-threatening bowel obstruction, during the first week after vaccination. Here, we evaluated the benefits and potential risks of rotavirus vaccine in the United States to help inform vaccination policy, assuming an intussusception risk as seen in international settings.

METHODS: We calculated excess intussusceptions events using vaccine coverage from the US National Immunization Survey, baseline intussusception hospitalizations rates from the Healthcare Cost and Utilization Project, and an assumed relative risk of intussusception of 5.9 in the first week after dose 1 that was based on the risk seen in international post-licensure studies. Rotavirus deaths and hospitalizations prevented by rotavirus vaccination were estimated using published data on pre-vaccine rotavirus burden and post-licensure vaccine effectiveness.

RESULTS: For a fully vaccinated 2007 US birth cohort of 4.3 million infants, rotavirus vaccination would potentially cause 51 excess intussusception hospitalizations and 0.2 excess deaths, if the risk of intussusceptions were similar to that seen in international settings. Conversely, rotavirus vaccination would avert 52,710 rotavirus gastroenteritis hospitalizations and 21 rotavirus deaths, yielding risk-to-benefit ratios of 1:1,526 for hospitalization and 1:153 for death, respectively.

CONCLUSIONS: The benefit from vaccination in preventing severe rotavirus disease outweighs the risk from excess intussusception, if it exists, supporting continued immunization of US infants against rotavirus. Continued monitoring is critical to evaluate the health benefits of vaccination and potential post-vaccine intussusception risk among US infants, and to update this risk benefit analysis as necessary.

KEYWORDS: intussusceptions, rotavirus, vaccination, United States, risk-benefit analysis

10:55

Utility of Death Certificate Data for Estimating Herpes Zoster Mortality in the US, 1979–2007

AUTHORS: Abdirahman Mahamud, M. Marin, S. Nickell, T. Shoemaker, S. Bialek

BACKGROUND: Herpes zoster (HZ) affects over 1 million individuals annually in the United States. In 2006, HZ vaccine was recommended for persons aged ≥ 60 years. Monitoring disease outcomes such as deaths may be important for evaluating the impact of the vaccination program. We analyzed the national HZ mortality rates and assessed the utility of HZ mortality data.

METHODS: We calculated the annual age-adjusted HZ mortality rates using national death certificate data for 1979–2007. We retrieved death certificates listing HZ as the underlying cause of death during 1990–2005 from the California vital statistics database, matched it with the California Hospital Discharge Dataset and requested medical records from hospitals where HZ deaths occurred. Two authors independently reviewed medical records to determine whether HZ or its complications such as encephalitis, pneumonia and septicemia initiated the train of events leading directly to death and the proportion of decedents with no contraindications for zoster vaccination.

RESULTS: The annual age-adjusted HZ mortality rates per 1 million population dropped by 66% from 0.78 in 1979 to 0.45 in 2007 ($P < 0.001$). Of the 40 HZ deaths in California for which medical records were available for review, HZ was determined as the underlying cause of death in 21 (52.5%), contributing in 5 (12.5%), and unrelated in 14 (35.0%). Fifty-seven percent of decedents in whom HZ was determined to be the underlying cause had no contraindications for HZ vaccination.

CONCLUSIONS: Only half of HZ deaths were validated; of those, half were potentially preventable by vaccination. Our study suggests that death certificate data on HZ are not adequately specific to be useful for monitoring the impact of the HZ vaccine program.

KEYWORDS: herpes zoster, death certificates, United States

11:15

Factors Associated with Tdap and Meningococcal Vaccination Coverage Among Middle School Students – North Dakota, 2010

AUTHORS: Jennifer R. Cope, M. Sander, A. Pierce, K. LoMurray, S. Pickard

BACKGROUND: North Dakota state law requires students to receive tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap) and meningococcal conjugate vaccine (MCV4) for middle school entry, according to the North Dakota Department of Health (NDDoH) recommended schedule. However, in 2009, vaccine coverage in North Dakota was only 72% for Tdap and 66% for MCV4 among persons aged 13–17 years.

METHODS: We added questions to the 2010 NDDoH annual vaccination survey of all public and private schools to assess school vaccination policies, school nurse assignment, and personnel who determine vaccination status. State-law-compliant vaccination policies were policies that exclude students from school who have not received required vaccinations or provided a valid exemption. We investigated factors associated with high ($\geq 90\%$) Tdap and MCV4 vaccination coverage among North Dakota middle school students.

RESULTS: Preliminary results from 51 middle schools identified 27 (53%) with state-law-compliant vaccination policies. Seventeen (33%) have a school nurse assigned at least part-time. Thirty-eight (75%) schools have a school or local public health nurse determine vaccination status, whereas the remaining 13 schools have nonhealthcare personnel make this determination. A higher, though not statistically significant, proportion of schools with state-law-compliant policies reported high Tdap coverage (56% with state-law-compliant policies, 29% with noncompliant policies; $P = 0.058$) and high MCV4 coverage (52% and 29%, respectively; $P = 0.10$). No other factors were significantly associated with high Tdap or MCV4 coverage.

CONCLUSIONS: Vaccination coverage at North Dakota middle schools regardless of the presence of state-law-compliant vaccination policies could be improved. The NDDoH should support middle schools in effective vaccination policy development, and investigate barriers to policy enforcement and student vaccination.

KEYWORDS: tetanus toxoid, diphtheria toxoid, pertussis vaccine, serogroup C meningococcal conjugate vaccine, school enrollment

11:35

Case-Control Study of Risk Factors for Serogroup B Meningococcal Disease Among Students During a University Outbreak – Ohio, 2010

AUTHORS: Sema Mandal, J. MacNeil, J. Garcia, K. Machesky, K. Quinn, S. Schmink, C. Hatcher, J. Theodore, R. Mair, L. Woo, E. Brandt, L. King, J. Gaskell, M. DiOrio, B. Plikaytis, L. Mayer, T. Clark, N. Messonnier, H. Wu

BACKGROUND: Residential students are at increased risk of meningococcal disease. Unlike for serogroups prevented by quadrivalent meningococcal vaccines, public health response to outbreaks of serogroup B meningococcal disease is limited by lack of a licensed vaccine.

METHODS: In March 2010, we conducted a matched case-control study during a prolonged serogroup B outbreak at a university. Serogroup B cases confirmed by culture (confirmed) or serogroup-specific polymerase chain reaction (probable) occurring among students during the 2008–9 and 2009–10 academic years were included. Five controls per case, matched by college year, were randomly selected. Participants completed a risk factor questionnaire. Data were analyzed using conditional logistic regression.

RESULTS: Seven cases (4 confirmed, 3 probable) and 35 controls were enrolled. All 7 cases lived in dormitories, 6 (86%) were first-years and 5 (71%) were male. One case was fatal. On matched univariate analysis, previously described risk factors of male gender and smoking were statistically non-significant. However, cases were significantly more likely to be Greek Life members (matched odds ratio [mOR]: 15.0; 95% confidence interval [CI]: 1.2–787.5); have >1 kissing partner (mOR: 13.7; CI: 1.2–708.7); and visit bars (mOR: 8.1; CI: 1.1– ∞). On multivariate analysis, controlling for male gender and smoking, a composite variable comprising behaviors associated with increased risk remained significant (adjusted MOR: 8.9; CI: 1.1– ∞).

CONCLUSIONS: Based on study findings, appropriate prevention messages were conveyed to students. However, it remains unclear whether identified behaviors increase the risk for acquiring organism carriage, developing disease, or serve as surrogate measures for other risk factors. A planned nasopharyngeal carriage study in this university population will help elucidate these factors and inform effective use of serogroup B vaccines currently under consideration for licensure.

KEYWORDS: serogroup B meningococcal meningitis, disease outbreaks, universities, risk factors, vaccines

Abstracts

12:30

Atrium Ballroom A

THURSDAY, APRIL 14

SESSION O

SPECIAL SESSION: Guns, Germs, and Steel: Public Health Response and Systems Reconstruction: CDC's Efforts After Disasters In Haiti and Pakistan

MODERATORS: Scott Dowell, Director, Division of Global Disease Detection and Emergency Response; Chris Braden, Director, Division of Foodborne, Waterborne, and Environmental Diseases

SPEAKERS/TOPICS:

Post-Earthquake Response in Haiti — Challenges and Lessons Learned *Jordan W. Tappero, Director, Health Systems Reconstruction Office*

Post-Flood Response in Pakistan — Challenges and Lessons Learned *Muireann Brennan, Medical Epidemiologist, International Emergency and Refugee Health Branch*

Controlling Cholera Outbreaks in Resource-Poor Settings *Raquel Pimentel, Dominican Republic Epidemiology Director*

Global Response Efforts and Transition following Humanitarian Emergencies *Alessandro Colombo, Director, Health Systems for the International Rescue Committee, World Health Organization*

HOSTED BY: Center for Global Health (CGH) and National Center for Emerging & Zoonotic Infectious Diseases (NCEZID)

This special session will feature four speakers and provide an overview of CDC's response, including health systems reconstruction efforts during recent international catastrophes in Haiti and Pakistan. The challenges inherent to the use of epidemiologic methods in complex international emergencies have led in the past to substantial under use of these tools in emergencies. In 2010, Haiti and Pakistan experienced major natural disasters, which captured international attention. Through the deployment of EIS officers, subject matter experts (SMEs), and collaboration with international partners, CDC is providing tremendous technical assistance in disease surveillance, outbreak investigations, and health systems reconstruction. Given the timeliness of the response to these emergencies, including the response to cholera outbreak in Haiti, this special session is an opportunity to discuss how epidemiology, as well as collaboration with international partners, was used to improve the public health response in these situations and what this means for similar situations in the future.

Thursday

Doctors Warn Women About an Acne Drug

January 21, 2000, by Atlanta
The New York Times

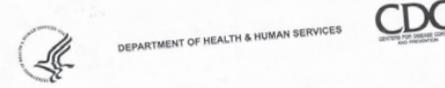
Reproductive Health, 1:30–3:15 p.m.

Atrium Ballroom B and C

MODERATOR: Laura Schieve



49th Annual
Epidemic Intelligence Service (EIS)
Conference
April 10-14, 2000
Centers for Disease Control and Prevention
Atlanta, Georgia



Continued occurrence of Accutane-exposed pregnancies.
Honan MA, Paulozzi LJ, Erickson JD.
National Center on Birth Defects and Developmental Disabilities, Centers for Disease Control and Prevention, Atlanta, Georgia 30341-3724, USA, mnh@cdc.gov

Abstract
BACKGROUND: Accutane a teratogenic prescription drug licensed to treat severe, recalcitrant nodular acne. First-trimester pregnancy exposure can cause major birth defects. The manufacturer began a Pregnancy Prevention Program (PPP) in 1993. However, exposed pregnancies continue to occur. In 1995, the manufacturer began a direct-to-consumer advertising campaign raising concerns of more exposed pregnancies.

METHODS: We examined trends in Accutane use by reproductive-aged women. We also interviewed a series of 14 women in California who had recent Accutane use by reproductive-aged women to identify opportunities for prevention.

RESULTS: The estimated number of Accutane prescriptions for reproductive-aged women has more than doubled in the past five years. It is the most widely used teratogenic drug in the United States, with approximately 2.5 per 1,000 reproductive-aged women exposed to Accutane in 1990. One-half of the women interviewed reported seeing an advertisement for Accutane and treatment before taking Accutane. Eight of the 14 women used oral contraception at the time of Accutane exposure. Five of the 14 women did not use two forms of contraception. Four of the 14 women did not have pregnancy tests before starting Accutane. None reported seeing all ACCP components, and four saw only the information on the pill packet. These 14 pregnancies resulted in four live infants who had no apparent birth defects, one live-born infant with multiple defects, four spontaneous abortions, and four induced abortions.

CONCLUSIONS: The increase in Accutane use observed among females may be exacerbated by advertising. Physician and patients must use more caution with teratogenic prescription drugs. Published 2001 Wiley-Liss, Inc.

PMID: 11516944 (PubMed - Indexed for MEDLINE)
Publication Type: MeSH Term, Substances
LinkOut - more resources

1:35

Reasons for Discontinuation of Breastfeeding Among Mothers Who Do Not Breastfeed as Long as They Intend – United States, 2005–2007

AUTHORS: Erika C. Odom, R. Li, K. S. Scanlon, L. Grummer-Strawn

BACKGROUND: Most mothers in the US initiate breastfeeding, but many stop before they intend, falling short of national recommendations to breastfeed for 12 months. To understand why mothers stop breastfeeding earlier than intended, we examined differences in self-reported reasons for weaning between mothers who met and did not meet their intention.

METHODS: We analyzed data from 1,286 mothers aged ≥ 18 years who participated in the National Infant Feeding Practice Study II and responded to monthly surveys until their child was 1 year old and had completely stopped breastfeeding. Mothers were asked whether they breastfed as long as they wanted and to rate the importance of 32 reasons for weaning on a 4-point Likert scale (4 being most important). Reasons fell into seven categories: lactation problems, lifestyle conflicts, pumping constraints, medical, nutritional, or psychosocial concerns, and self-weaning. We used logistic regression to examine associations between the importance of reasons in each category using its mean score and the likelihood of mothers being unable to breastfeed as long as they wanted after adjusting for weaning age, marital status, parity, education, and race.

RESULTS: Results indicated that 60% of mothers who terminated breastfeeding did so earlier than they intended. Early termination was positively associated with nutritional (AOR = 1.69, P<0.0001) and medical (AOR = 2.21, P<0.0001) reasons and negatively associated with mean scores on psychosocial concerns (AOR = 0.48, P<0.0001) and lifestyle conflicts (AOR = 0.43, P<0.0001).

CONCLUSIONS: Most mothers do not breastfeed as long as they intend. To help mothers do so, health care providers should address mothers' nutritional and medical concerns regarding insufficient milk supply, slow growth patterns for breastfed infants, and illness/medicines contraindicated with breastfeeding.

KEYWORDS: breastfeeding, lactation, weaning, maternal

1:55

Depression and Mental Health Treatment Among Women of Reproductive Age – US, 2004–2008

AUTHORS: Jean Y. Ko, S. Farr, P. Dietz, C. Robbins

BACKGROUND: Untreated depression during pregnancy doubles women's risk of delivering early or having a low birth weight infant, but use of antidepressants may be associated with poor neonatal development. Current national prevalence estimates for major depressive episode (MDE) and type of mental health treatment among women of reproductive age, by pregnancy status, are unknown.

METHODS: We used 2004–2008 self-reported data from the National Survey for Drug Use and Health to estimate the prevalence of MDE (as defined by *Diagnostic and Statistical Manual-IV*) and receipt of mental health treatment (counseling and/or prescription medication) during the last 12 months among U.S. women aged 18–44 years. Chi-square statistics were used to examine differences in prevalence estimates by current pregnancy status.

RESULTS: An estimated 8.0% of pregnant women and 11.6% of non-pregnant women reported symptoms occurring in the last 12 months that met the MDE criteria (P <0.001), representing 1.2 million U.S. women of reproductive age. Among women with past year MDE, the prevalence of no treatment was 51.3% among pregnant and 45.9% among non-pregnant women (P = 0.16); and the prevalence of prescription medication use, alone or in addition to counseling, was 40.2% among pregnant and 46.9% among non-pregnant women (P = 0.11).

CONCLUSIONS: A substantial percentage of women of reproductive age experience depression. Nearly half of depressed women receive no treatment, highlighting the need for increased access to mental health services. Among treated women, over 40% receive prescription medications, whose effects on infant outcomes are not fully understood and require further research.

KEYWORDS: depression, women, pregnancy, prescriptions

Abstracts

2:15

Maternal Age and Risk for Nonchromosomal Birth Defects – US, 1997–2005

AUTHORS: Simerpal Gill, C. Broussard, O. Devine, R. Fisk Green, S. Rasmussen, J. Reefhuis

BACKGROUND: Birth defects affect 3% of births in the United States, and are one of the leading causes of infant mortality. Both younger (<20 years) and older maternal age (≥ 35 years) may pose increased risks for select birth defects. These risks are of public health importance as live birth rates within these age groups are high: 41.5 and 46.7 per 1000 women, respectively. This study assessed the association between maternal age at delivery and the risk for non-chromosomal birth defects.

METHODS: Data were obtained from the National Birth Defects Prevention Study, a population-based case-control study of risk factors for birth defects using standardized telephone interviews with mothers across 10 states. Age was stratified into 6 categories: <20, 20–24, 25–29, 30–34, 35–39, and ≥ 40 years. Crude odds ratios (OR) and 95% confidence intervals (CI) were estimated for birth defect categories with at least 3 birth defect cases per age category. The 25–29 year group was the referent.

RESULTS: For maternal age <20 years, associations with amniotic band sequence (OR: 3.2; CI: 2.0–4.9), colonic atresia/stenosis (OR: 7.1; CI: 2.5–25.5) and gastroschisis (OR: 7.1; CI: 5.5–9.1) were observed. For the ≥ 40 years age group, associations with any heart defect (OR: 1.5; CI: 1.2–2.0), craniosynostosis (OR: 2.2; CI: 1.4–3.4), encephalocele (OR: 2.8; CI: 1.0–6.4), omphalocele (OR: 3.0; CI: 1.3–5.9), and hypospadias (OR: 2.1; CI: 1.3–3.2) were observed.

CONCLUSIONS: Younger and older maternal ages are associated with certain birth defects. Elucidating risk factors unique to women at either extreme of maternal age may offer prevention opportunities for specific birth defects.

KEYWORDS: birth defect, maternal age, gastroschisis, omphalocele

2:35

Prevention Strategies for the Perinatal Period Among Nebraska Birthing Facilities, 2010

AUTHORS: Parvathy Pillai, B. Buss, T. Safranek

BACKGROUND: The perinatal period is a key time to implement interventions to prevent high-morbidity diseases in infants, including rubella, varicella, pertussis, hepatitis B, and human immunodeficiency virus (HIV). Birthing facilities can increase delivery of these interventions through written policies (WPs) and standing orders (SOs); we assessed whether Nebraska birthing facilities had such WPs/SOs.

METHODS: During July 2010, we conducted an Internet-based survey of perinatal coordinators at each of Nebraska's 59 birthing facilities to determine existence of rubella-, varicella-, pertussis-, hepatitis B-, and HIV-specific comprehensive WPs/SOs. For each disease, we classified WPs/SOs as comprehensive if they required a minimum set of recommended interventions (e.g., intrapartum maternal screening/prophylaxis, postpartum infant prophylaxis, and postpartum maternal/infant vaccination) based on prenatal maternal serologic screening and vaccination status. For each disease, we calculated the proportion of facilities with a comprehensive WP/SO and proportion of Nebraska's 2009 live births at these facilities.

RESULTS: All 59 facilities participated (median 2009 live births per facility, 100; range 0–3500); >90% answered all questions regarding each disease. The following proportions of responding facilities had a comprehensive WP/SO: for rubella, 69% (representing 90% of 2009 Nebraska births); for varicella, 7% (18%); for pertussis, 63% (85%); for hepatitis B, 50% (63%); and for HIV, 5% (25%). Only for pertussis was the proportion of facilities with a comprehensive WP/SO substantially different in facilities with ≥ 100 births versus <100 births (76% vs. 48%).

CONCLUSIONS: Existence of comprehensive WPs/SOs varied considerably by disease and was lowest for varicella and HIV. Although adherence to WPs/SOs must also be assessed, all Nebraska birthing facilities should have WPs/SOs in place for these diseases. Nebraska perinatal coordinators should be educated on the importance of WPs/SOs.

KEYWORDS: perinatal care, maternal-child nursing, vaccination, postexposure prophylaxis

Dual Use of Condoms with Other Contraceptive Methods Unmarried Young Women – United States, 2006–2008

AUTHORS: Crystal P. Tyler, M. Whiteman, L. Zapata, K. Curtis, S. Hillis, P. Marchbanks

BACKGROUND: Young women experience high rates of both unintended pregnancy (UIP) and sexually transmitted infections (STIs). Dual method use (i.e., hormonal contraception or an intrauterine device (IUD) with condoms) can protect young women against both UIP and STIs; however, little is known about the prevalence and predictors of dual use in this population.

METHODS: We used 2006–2008 National Survey of Family Growth data to estimate the prevalence and identify predictors of dual use at last intercourse among unmarried U.S. women aged 15–24 years and used logistic regression to estimate adjusted odds ratios (AORs) for predictors of dual use versus other contraceptive practices.

RESULTS: Overall 16.1% of women reported dual use, 39.3% condoms alone, 27.1% hormonal contraception/IUD alone, and 17.6% other/no methods. Compared with women with 1 sexual partner, those with ≥ 3 partners were less likely to use dual methods than condoms alone (AOR: 0.29; 95% CI: 0.15–0.56) or other/no method (AOR: 0.29; 95% CI: 0.10–0.88). Compared with women receiving contraceptive services from a private provider, those receiving services from a public provider were less likely to report dual use than condoms alone (AOR: 0.53; 95% CI: 0.32–0.90). Compared with women aged ≤ 15 years at first intercourse, those > 18 were less likely to report dual use than hormonal contraception/IUD alone (AOR: 0.39; 95% CI: 0.19–0.81) or other/no method (AOR: 0.23; 95% CI: 0.09–0.58).

CONCLUSIONS: The prevalence of dual use is low among young, unmarried U.S. women who may be at greater risk for UIP or STIs. Tailored interventions are needed to increase dual use among young women.

KEYWORDS: Dual method use, condom use, unintended pregnancy, teen pregnancy

Swine Flu Origins Mysterious in “Genetic Arms Race”

May 6, 2009, by Elizabeth Landau
CNN

Potpourri, 3:30–4:55 p.m.
Atrium Ballroom B and C
MODERATOR: Denise Koo



Abstracts

3:35

Understanding Factors Associated with 2009 Pandemic Influenza A (H1N1) Vaccination Among Pregnant Women – Seattle, Washington, 2010

AUTHORS: Meagan K. Kay, K. Koelemay, T. Kwan-Gett, J. Duchin

BACKGROUND: Pregnant women and women within 2 weeks of delivery were prioritized by CDC to receive 2009 pandemic influenza A (H1N1) (pH1N1) vaccine because they and their infants are at increased risk for influenza-related complications. CDC estimated that 38% of pregnant women received pH1N1 vaccine during October–December 2009, nationally. Public Health — Seattle & King County surveyed women who had been pregnant in their third trimester when vaccine was available locally to estimate vaccination coverage and identify factors associated with pH1N1 vaccination.

METHODS: King County hospitals with maternity services were requested to provide contact and demographic information of all mothers who delivered during November 1, 2009–January 31, 2010. A multimodal survey (paper, telephone, and Internet) with questions regarding knowledge and opinions about influenza virus and vaccine was distributed to 5,341 women referred by 11 of 11 hospitals.

RESULTS: Of 4,205 (78.7%) respondents, 3,233 (76.8%) reported receiving pH1N1 vaccine during pregnancy or within 2 weeks of delivery. Women whose prenatal care provider made vaccine available (reported by 76% of women) had a higher vaccination prevalence (82%), compared with women whose provider did not (72%) (prevalence ratio: 1.1; 95% confidence interval: 1.1–1.2). Among 940 unvaccinated women, safety concerns (58.3%) and perception of not being at risk for serious illness (26%) were the most commonly reported reasons for not being vaccinated; 55% reported that their obstetrician's office would be the most convenient vaccination location.

CONCLUSIONS: pH1N1 vaccination coverage among pregnant women in King County was high. Vaccination rates might increase if more prenatal care providers offered vaccine in their offices. Strategies should be implemented to maintain high vaccination coverage among pregnant women during nonpandemic influenza seasons.

KEYWORDS: pandemics; influenza, human; vaccination; pregnancy

3:55

***Escherichia coli* O157:H7 Infections Associated with an Aged Raw-Milk Cheese – Multiple Western States, 2010**

AUTHORS: Jeffrey T. McCollum, N. Williams, F. Williams, S. Cosgrove, T. Ghosh, R. Vogt, J. Weiss, L. Nguyen, P. Ettestad, A. Cronquist

BACKGROUND: *Escherichia coli* O157:H7 (O157:H7) causes 73,000 illnesses and 60 deaths annually in the United States; older adults and children aged <5 years are at greatest risk for severe illness and sequelae, including hemolytic uremic syndrome (HUS). Regulatory guidelines require cheeses manufactured with unpasteurized (raw) milk to be aged a minimum of 60 days as a pathogen control measure. Adequacy of this aging period is controversial, and raw-milk cheese-associated outbreaks of O157:H7 are reported. In October 2010, we recognized O157:H7 illnesses with matching pulsed-field gel electrophoresis (PFGE) patterns and initiated a multistate investigation to determine the source.

METHODS: We defined a case as clinical infection yielding an O157:H7 isolate indistinguishable from the outbreak strain by PFGE. Hypothesis-generating questionnaires were used to identify commonalities among patients. Food products were tested for the presence of O157:H7 with PFGE performed on derived isolates.

RESULTS: Forty cases were identified in 5 states among persons with illness onsets during October 16–November 4; 18 (45%) were hospitalized; 1 experienced HUS, and none died. Thirty-seven (93%) patients reported shopping at a national warehouse store during October 14–17; 33 (83%) patients reported sampling cheese while shopping, and 22 (55%) reported consuming an aged raw-milk Gouda cheese made by Company A. Laboratory testing conducted on one unopened and several opened packages of Company A Gouda cheese yielded O157:H7 matching the outbreak strain by PFGE.

CONCLUSIONS: An aged raw-milk cheese likely caused this multistate outbreak. Unpasteurized fluid milk used to manufacture raw-milk cheeses might contribute to the presence of milkborne pathogens in ready-to-eat products. Further research is warranted to validate the effectiveness of aging requirements to control O157:H7 in raw-milk cheeses.

KEYWORDS: *Escherichia coli* O157:H7; electrophoresis, gel, pulsed-field; diarrhea; disease outbreak; hemolytic-uremic syndrome; cheese; milk

4:15

Escherichia coli O157 Infections Associated with Consumption of Artisanal Raw Cheeses — Multiple States, September–December, 2010

AUTHORS: Mathieu Tourdjman, K. MacDonald, C. Medus, L. Stewart, M. Pecha, C. Coles, W. Keene

BACKGROUND: Annually, *Escherichia coli* O157 causes approximately 70,000 illnesses in the United States and can cause acute renal failure and death. In December 2010, routine interviews of 2 patients with indistinguishable pulsed-field gel electrophoresis (PFGE) patterns revealed that they had patronized the same restaurant 1 day apart. We investigated to find any potential common source and take preventive action.

METHODS: We queried PulseNet to identify additional cases. Cases were defined as PFGE-matching *E.coli* O157 isolates since July 2010. We reviewed interview records; menus; sales records; and shipping invoices from restaurants, retailers, and food distributors. We reinterviewed patients as necessary. Food samples were assayed.

RESULTS: Eight cases were identified (4, Washington; 1, Oregon; 1, Vermont; 2, Minnesota). All patients had diarrhea with onset during September–November 2010. Two patients were hospitalized; none died. Seven persons reported consumption of artisanal cheeses; none recalled specific varieties or brands; some provided certain clues. Two had eaten cheeses at Restaurant X, where Cheesemaker A's raw goat cheese might have been served. One person had eaten unidentified cheeses from a store and another person from Restaurant Y; both establishments carried Cheesemaker A's cheeses. One person had eaten locally made cheese at a wedding that occurred near Cheesemaker A's facility. Regulatory inspectors visited Cheesemaker A's facility, which had failed recent inspections. Multiple hygiene violations were identified. Cheesemaker A recalled available products nationwide. PFGE-matching *E. coli* O157 was subsequently cultured from raw cheeses collected at Cheesemaker A's facility and retail locations.

CONCLUSIONS: Contaminated cheeses resulted in *E. coli* O157 infections. Although no patients specifically remembered consuming Cheesemaker A's cheeses, we identified the source through a combination of deductive reasoning, tracebacks, and molecular epidemiology.

KEYWORDS: *Escherichia coli* O157, disease outbreaks, cheese, foodborne diseases

4:35

Acute Exertional Rhabdomyolysis and Triceps Compartment Syndrome Among High School Football Players — Oregon, 2010

AUTHORS: John Y. Oh, M. Laidler, S. Fiala, K. Hedberg

BACKGROUND: Although rare, overexertion can lead to sufficient muscle injury to cause rhabdomyolysis and compartment syndrome (CS). In August 2010, a cluster of rhabdomyolysis and CS occurred among high school football players. To help prevent future morbidity among the estimated 7.5 million high school sports participants, we investigated causal and contributory factors for illness.

METHODS: We reviewed hospital records and interviewed team members by using a standardized questionnaire. Rhabdomyolysis was defined as myalgia plus creatine kinase (CK) >2,320 U/L. CS was defined as clinical diagnosis that required fasciotomy. After discharge, we tested 4 patients' urine for performance-enhancing drugs (PED) and conducted an environmental investigation of school facilities.

RESULTS: Among 43 players, 40 (93%) completed questionnaires, and 22 (51%) experienced rhabdomyolysis (peak CK range: 2,434–42,000 U/L). All 22 patients had upper-arm myalgia; 12 were hospitalized; 3 experienced triceps CS; none experienced renal failure. Illnesses started 1–3 days after an intense triceps exercise, which occurred in a non-air-conditioned room with outside temperature 92°F. Among 19 players receiving at least one vote from a teammate(s) as 1 of the 3 hardest working players, 13 (68%) experienced rhabdomyolysis, compared with 7 (33%) of 21 not considered to work hardest (relative risk: 2.1; 95% confidence interval: 1.0–4.0). Creatine supplement use, reported by 10 (25%) players, was not associated with rhabdomyolysis. No player acknowledged use of alcohol, illicit drugs, or PED; all PED tests were negative. Environmental investigation did not identify any factors contributing to illness.

CONCLUSIONS: The triceps exercise and hot conditions caused rhabdomyolysis and CS. Greater awareness of specific exercise hazards and prevention strategies can minimize the risk for clinically significant muscle injury.

KEYWORDS: rhabdomyolysis, compartment syndromes, motor activity, adolescent

Abstracts

FRIDAY, APRIL 15

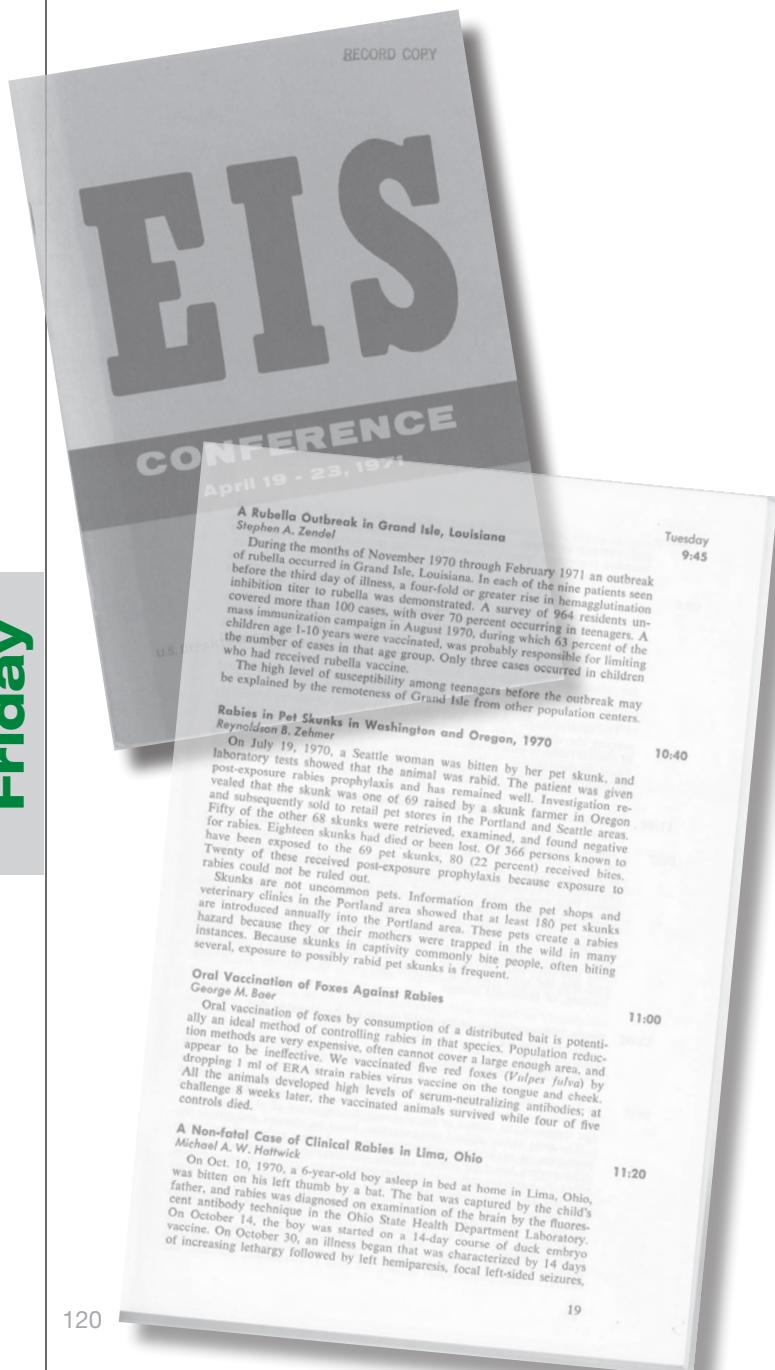
SESSION Q 8:35

Painful, Flu-Like Tropical Virus Can Be Deadly

September 18, 1995, by Anita Manning
USA TODAY

Vectorborne Diseases, 8:30–9:55 a.m.
Atrium Ballroom B and C

MODERATORS: Jennifer McQuiston and
Kay Tomashuk



Island-Wide Dengue Epidemic – Puerto Rico, 2010

AUTHORS: Tyler M. Sharp, A. Rivera, J. Munoz-Jordan, E. Hunsperger, L. Santiago, D. Arguello, H. Margolis, K. Tomashuk

BACKGROUND: Dengue, a potentially fatal febrile illness caused by four mosquito-transmitted dengue viruses (DENV-1–4), is endemic in Puerto Rico. In January, 2010, the number of suspected dengue cases reported to the Puerto Rico Department of Health/CDC passive dengue surveillance system (PDSS) exceeded the epidemic threshold. To characterize this epidemic, data from PDSS were used to describe all reported cases.

METHODS: Suspected cases were patients with a serum sample submitted to PDSS for dengue testing. Laboratory-positive cases had either (i) DENV identified via reverse transcriptase polymerase chain reaction (RT-PCR) in an acute sample, (ii) anti-DENV IgM seroconversion in paired samples, or (iii) anti-DENV IgM in a convalescent sample. Laboratory-negative cases had no anti-DENV IgM in a convalescent sample and an acute sample that was either RT-PCR-negative or not submitted. Indeterminate cases were RT-PCR-negative in an acute sample and had no convalescent sample submitted.

RESULTS: From January 1 through November 15, 22,171 suspected dengue cases were reported; 10,393 (46.9%) were laboratory-positive, 2,136 (9.6%) were laboratory-negative and 8,703 (39.3%) were indeterminate. Of 7,094 RT-PCR positive samples, DENV-1 (69.3%) and DENV-4 (23.1%) were detected more frequently than DENV-2 (7.5%) and DENV-3 (<0.1%). Of all laboratory positive cases, 38.3% were 10–19-years-old. There were 31 laboratory-positive deaths detected, of which 27 (87%) were adults.

CONCLUSIONS: The 2010 epidemic was long in duration, high in magnitude, and resulted in the most dengue-related deaths since PDSS began. For this reason and using lessons learned from the 2007 epidemic, CDC implemented an initiative to train Puerto Rico clinicians in the management of dengue patients to minimize morbidity and mortality in the present and future epidemics.

KEYWORDS: dengue, epidemic, Puerto Rico, Caribbean

8:55

Emergence of a New Focus of Rocky Mountain Spotted Fever – South Central Arizona, 2009–2010

AUTHORS: Steven A. Baty, K. McElroy, C. Levy, W. Nicholson, J. McQuiston

BACKGROUND: Rocky Mountain spotted fever (RMSF), a life-threatening but preventable tickborne disease caused by *Rickettsia rickettsii*, was rare in Arizona until 2003. Since then 93 RMSF cases resulting in 9 deaths emerged in 2 eastern Arizona communities (Communities A and B) and was transmitted by an unexpected tick species, *Rhipicephalus sanguineus*. In December 2009, a south-central Arizona community (Community C) reported two laboratory-confirmed RMSF cases. We investigated to determine the outbreak extent, assess the likelihood of infection spread from eastern Arizona, and prevent additional cases.

METHODS: Public health records were reviewed. Because RMSF causes a similar illness among dogs, we performed a communitywide convenience serosurvey of dogs for spotted fever group rickettsia (SFGR) antibodies. Ticks collected throughout Community C were tested for *R. rickettsii* DNA.

RESULTS: During the 30 days before illness onset, the 2 patients, from 1 household, reported no travel outside Community C but removing and crushing ticks from their dogs. Fifteen (5.4%) of 277 dogs were positive for anti-SFGR antibodies. Fourteen (93%) seropositive dogs either resided ($n = 13$) or were born ($n = 1$) at the index housing district. Widespread infestations with *Rh. sanguineus* ticks were noted throughout Community C; 712 ticks were collected from 256 trap sites. RMSF-infected ticks were found at 1 trap site in the index housing district; another household reported acquiring a dog 3 years prior from Community A.

CONCLUSIONS: RMSF emerged at the south-central community in 2009, possibly associated with a trans-located dog from another affected community. Investigation results allowed focusing limited public health resources to prevent spread from the index housing district; interventions included community education, pesticide application, tick treatment of dogs, and environmental modifications.

KEYWORDS: Rocky Mountain spotted fever, tickborne diseases, rickettsia, *Rickettsia rickettsii*

9:15

Malaria Imported from West Africa by Flight Crews – Florida and Pennsylvania, 2010

AUTHORS: Valery M. Beau De Rochars, M. Selent, P. Arguin, D. Bensyl, D. Stanek, B. Martin, P. Kozarsky, V. Dato, R. Hopkins, C. Blackmore

BACKGROUND: Malaria is a mosquito-borne infection, causing approximately 250 million illnesses and 1 million deaths worldwide annually. CDC was notified by the Florida and Pennsylvania departments of health of 4 *Plasmodium falciparum*-associated malaria cases among employees of a single commercial airline with travel history to Ghana during August 25–September 2, 2010. We investigated to determine the potential risk factors of common exposures and to recommend control measures.

METHODS: Each patient was administered a questionnaire, and their medical records were reviewed. A case was defined as laboratory-confirmed malaria by microscopy on blood films or detection of *P. falciparum* species by polymerase reaction chain (PCR) in any person in the United States who was an airline employee with travel history to a malaria-endemic country 30 days before illness onset.

RESULTS: Four airline employees with history of malaria were identified. All had traveled to Accra, Ghana, and had layovers of 48–80 hours. Two cases were among women aged 20–40 years, and 2 were among men aged 40–60 years. All received diagnoses of acute *P. falciparum*-associated malaria and were hospitalized and discharged after 2–15 days. Three (75%) were hospitalized >6 days and required intravenous treatment. Among them, 2 (50%) experienced respiratory distress and required intubation. All had stayed at the same hotel, reported use of insect repellent, but no use of antimalarial chemoprophylaxis.

CONCLUSIONS: Lack of preventive measures against malaria was associated with this outbreak. Travelers to West Africa, an area of intense transmission, should use chemoprophylaxis and take measures to avoid mosquito bites. Air crew should be instructed about signs and symptoms of malaria and what they should do if they become ill.

KEYWORDS: malaria, risk factors, prevention and control, chemoprevention, hospitalization

Rise in Reported Rocky Mountain Spotted Fever – South Texas, 2007–2010

AUTHORS: Adam Bjork, L. Robinson, D. Tack, A. Hurley-Bacon, J. McQuiston, J. Regan, A. Anderson, J. Taylor

BACKGROUND: Rocky Mountain spotted fever (RMSF) is a potentially fatal illness caused by *Rickettsia rickettsii*, a tick-borne bacterium. RMSF reports from South Texas have increased by >750% from 2001–2003 to 2007–2009, but diagnosis there is complicated by endemic *R. typhi*, the flea-borne agent of murine typhus that cross-reacts on RMSF serologic assays. Differentiating these infections is critical as their prevention strategies target different vectors and animal reservoirs.

METHODS: In October 2010, we investigated RMSF reports in four South Texas counties accounting for 43% of Texas's RMSF reports since 2007, but just 6% of the population. We interviewed patients and physicians, reviewed medical records, and collected ticks from homes and worksites.

RESULTS: No RMSF reports met the Council of State and Territorial Epidemiologists' criteria for laboratory confirmation. Among 73 'probable' (i.e., elevated RMSF IgM antibody levels) RMSF patients, 51(70%) were also tested for murine typhus. A likely causative agent could not be attributed for 42 (82%) of these patients due to ambiguous or possibly cross-reactive test results; 14 (27%) met a 'probable' or 'confirmed' typhus definition. Only 7 patients recalled tick bites; 24 recalled flea exposure. We collected 39 ticks, all PCR-negative for *R. rickettsii*.

CONCLUSIONS: Increased RMSF reports in Texas may result from surveillance artifact, increased RMSF infections, or misdiagnosed murine typhus. Testing strategies of South Texas medical providers do not permit adequate differentiation of RMSF versus typhus. Physicians should collect paired serum specimens to test for rising IgG antibody titers to both agents and test rash biopsies by PCR when possible. Accurate diagnosis in South Texas will ensure implementation of appropriate control measures and clarify the occurrence of these diseases in Texas.

KEYWORDS: *Rickettsia*, Rocky Mountain spotted fever, typhus, tick, surveillance, Texas

The Doctor's World; When Everything Changed at the CDC

November 13, 2001, by Lawrence K. Altman, MD

The New York Times

Late-Breaking Reports, 10:30-11:45 a.m.

Atrium Ballroom B and C

MODERATORS: Douglas H. Hamilton and Edward Weiss

See supplement for presenters
and abstracts.



FRIDAY, APRIL 15

SESSION S

1:35

Eradication of Smallpox to Be Announced Today

May 8, 1980, by United Nations (NY)

The New York Times

Global Health, 1:30–3:15 p.m.
Atrium Ballroom B and C
MODERATOR: Larry Slutsker



The image shows the front cover of the "EIS CONFERENCE 1975" program book. The title "EIS" is prominently displayed at the top in large letters, followed by "CONFERENCE" and the year "1975". Below the title, it says "U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE/PUBLIC HEALTH SERVICE". The cover features a large, stylized graphic of the letters "EIS".

Monday

9:20	Global Smallpox Eradication William H. Foege
As recently as 30 years ago, most of the world's population lived in areas set as an objective the eradication of smallpox from the entire world by 1976, 43 countries (29 with endemic smallpox) were reporting cases. Rather than containment by selective vaccination, effort was directed toward casefinding and disease control. Central and West Africa reported their last cases in May 1970, South America in May 1971, and Indonesia in April 1971. Smallpox is now endemic in only a small area of northwestern Ethiopia, in Bangladesh, and in north-eastern India (especially the 4 states of Assam, Uttar Pradesh, Bihar, and West Bengal, where 96% of all India's cases have been found). Pakistan has reported no cases since October 12, 1974, and cases in Nepal have all been traced to importations. The 10-year smallpox eradication program of the WHO seems to be on target, and barring unforeseen events worldwide the smallpox eradication should be a reality by the end of 1975.	
9:40	Cholera for a Dime—Portugal, 1974 Paul A. Blake
In 1974, Portugal had a cholera epidemic that lasted 7 months and involved 17 of the 18 districts; 2,241 hospitalized cases and 38 deaths were reported. Studies were carried out by the Center for Disease Control in cooperation with the Portuguese Department of Health to determine what vehicles of transmission were important during the epidemic. During the peak of the epidemic, <i>Vibrio cholerae</i> was isolated from 2 springs at a popular resort. The spring water was being ingested at the resort and also bottled in both a carbonated and a noncarbonated form and sold throughout the country. A cohort study demonstrated that the incidence of cholera was significantly higher among visitors to the resort. Case-control studies in 2 cities 300 km apart showed that significantly more cases than controls had consumed the bottled noncarbonated water. In view of this finding, health authorities should re-evaluate recommendations that travelers use bottled water in areas where public water supplies are of uncertain purity.	
In case-control studies on the southern coast, shellfish and spring water were found to be vehicles of cholera transmission.	
10:00	Cholera on Guam, 1974 Michael H. Merson
In August 1974, 6 cases of cholera on Guam were reported. The diagnosis of the index case was made at autopsy when <i>Vibrio cholerae</i> was isolated from the patient's small intestine. He had had severe diarrhea and acidosis and died on the ninth day of illness. The other 5 patients had a mild diarrheal illness and were not hospitalized. Epidemiologic investigation revealed that home-preserved fish caught in Agana Bay was probably the vehicle of infection. <i>V. cholerae</i> , El Tor Ogawa, was isolated from specimens from 2 patients, the Guam sewerage system, and a river emptying into Agana Bay. The Ogawa strains fermented sucrose rapidly, were nonhemolytic on sheep's blood agar, and were phage type 4, and produced toxin <i>in vitro</i> .	

Accuracy of Coverage Survey Recall After Integrated Mass Drug Administration – Togo, 2008–2009

AUTHORS: Philip J. Budge, G. Anthony, E. Sognikin, A. Akosa, E. Mathieu, M. Deming

BACKGROUND: Control or elimination of several neglected tropical diseases (NTDs) depends on achieving adequate coverage when treating at-risk populations through yearly mass drug administration (MDA). Coverage reported by drug distributors is validated through coverage surveys relying on respondent recall. However, the accuracy of such surveys has not been tested.

METHODS: We tested coverage survey accuracy by conducting surveys in Togo at 1, 6, and 12 months after an MDA in which three drugs (albendazole, ivermectin, and praziquantel) were used to treat five NTDs. Independent observers ensured MDA treatments were accurately recorded in registers. A unique sample of compounds (household groups) was systematically selected for each survey. All compound residents (mothers responded for children) were shown examples of the pills and asked which they swallowed. Coverage was defined as the percentage of the entire population that swallowed at least one pill.

RESULTS: Information was obtained for 605, 1347, and 1073 persons surveyed at 1, 6, and 12 months, respectively. Coverage within these groups was respectively 88.9% (95% confidence interval [CI] 85.9–91.8), 88.2% (CI 85.3–91.1), and 80.2% (CI 76.0–84.34), according to the treatment register; it was 88.3% (CI 85.2–91.4%), 92.4% (CI 90.9–94.0%), and 88.8% (CI 86.8–90.8%), according to survey responses. Concordance between respondents and registers on swallowing at least one pill was 97.4%. Respondents generally distinguished between pills similar in appearance; 96.9% of those taking albendazole (large, white, rectangular; maximum dose 1 tablet) reported taking $\frac{1}{2}$ or 1 tablet, while only 31.9% reported taking only 1 praziquantel tablet (large, white, oval; dose range 1–5 tablets).

CONCLUSIONS: In this population, coverage surveys provided accurate coverage estimates during the year following an MDA.

KEYWORDS: neglected tropical diseases, integration, preventive chemotherapy, coverage surveys, recall bias

Friday

1:55

Risk Factors and Epidemiology of *Neisseria meningitidis* Carriage Among 1-29 Year Olds in Burkina Faso, 2009

AUTHORS: Lara K. Misegades, S. Martin, P. Kristiansen, F. Diomandé, S. Wei, R. Ouédraogo, C. Rose, L. Sangaré, I. Sanou, D. Kandolo, P. Kaboré, F. Aké, C. Hatcher, J. Thomas, M. King, M. Djingarey, M. Preziosi, N. Messonnier, M. LaForce, D. Caugant, and T. Clark

BACKGROUND: Meningitis epidemics occur in African meningitis belt countries almost every year, and can cause tens of thousands of cases and thousands of deaths. A novel conjugate serogroup A vaccine is being introduced to eliminate these epidemics. Conjugate vaccines can confer herd immunity by interrupting carriage and transmission.

METHODS: We determined prevalence of and risk factors for carriage prior to vaccine introduction in Burkina Faso. We conducted serial, cross-sectional surveys in one urban and two rural districts during 2009. For each district, we used multistage cluster sampling to select villages and households; eligible residents of selected households were invited to participate. Participants reported demographic, health, and household characteristics. An oropharyngeal swab for culture was obtained from participants, and meningococcal identification was performed using standard laboratory methods. We used mixed-effects logistic regression modeling to explore risk factors for carriage, adjusting for district.

RESULTS: In 4 pre-vaccination surveys, 20,326 participants were enrolled. Overall, 56.3% were female, 49.6% were aged ≤ 9 years, and 66.5% lived in a rural district. Prevalence of meningococcal carriage was 3.98%, serogroup A 0.39%. The odds of carriage was higher among males (adjusted odds ratio [AOR]: 1.39; 95% confidence interval [CI]: 1.23-1.55), in rural districts (AOR: 2.83; CI: 2.51-3.15), and during the dry season (AOR: 1.49; CI: 1.29-1.70). Carriage was associated with increasing household size ($P < 0.001$) and with age group ($P < 0.001$). Younger (10-14 years) and older adolescents (15-19 years) had the highest prevalence (5.14% and 4.88%, respectively).

CONCLUSIONS: In this study, meningococcal carriage was associated with age, gender, season, household size, and geography. This variation in carriage reinforces the current vaccine implementation strategy for broad coverage among 1-29 year olds to maximize herd immunity.

KEYWORDS: meningococcal meningitis, Africa, risk factors, vaccines

2:15

Mercury Exposure Among Artisanal Gold Miners – Peru, July 2010

AUTHORS: Ellen E. Yard, J. Horton, J. Schier, C. Sanchez, K. Caldwell, R. Albalek, L. Lewis, C. Gastanaga

BACKGROUND: Exposure to mercury, a toxic metal that can cause irreversible brain and kidney damage, occurs from inhaling inorganic mercury vapors or consuming methylmercury-contaminated fish. One-third of all anthropogenic mercury emissions worldwide are from artisanal gold mining, which uses mercury to extract gold. Although recent reports suggest that the Peruvian Amazon (with >30,000 artisanal miners) has extensive mercury contamination, residents had never been assessed for mercury exposure.

METHODS: In 2010, we assisted the Peruvian government in conducting a cross-sectional mercury assessment in an artisanal gold mining town. A health campaign drew residents to a central location. We systematically selected 103 attendees aged ≥ 3 years to participate; each provided a urine and blood sample and completed a questionnaire assessing potential exposures. We calculated geometric mean (GM) inorganic and methylmercury concentrations and compared log-transformed concentrations between sub-groups using linear regression.

RESULTS: One-third (34.0%) of participants were miners. All participants had detectable inorganic mercury (GM: 5.5 $\mu\text{g/g}$ creatinine, range: 0.7-151 $\mu\text{g/g}$ creatinine) and 91% had detectable methylmercury (GM: 2.7 $\mu\text{g/L}$, range: 0.6-10 $\mu\text{g/L}$) concentrations. Two participants (1.9%) had high inorganic mercury concentrations concerning for acute poisoning, and 13 (13%) had been diagnosed with renal failure or a neurologic disorder. Inorganic mercury concentrations were higher among miners who heat gold-mercury amalgams compared to miners never heating amalgams ($P < 0.05$); methylmercury concentrations were higher among fish consumers compared to non-fish consumers ($P < 0.05$).

CONCLUSIONS: Widespread mercury exposure may represent a health threat to this region. All residents, including non-miners, had mercury exposure; some had toxic levels and several had health outcomes associated with toxicity. Next steps include warning residents about potential dangers of mercury and designing interventions to decrease exposure.

KEYWORDS: mercury, gold, mining, amalgams, exposure assessment

2:35

Recovery of National HIV Service Provision Following the January 12th Earthquake – Haiti, 2010

AUTHORS: Jenny A. Walldorf, J. Valles, J. Sabatier, B. Marston, K. Jean-Charles, P. Joseph, E. Louissant, J. Tappero

BACKGROUND: The January 2010 earthquake in Haiti resulted in infrastructure damage, displacing approximately 2 million persons and magnifying health risks for vulnerable groups including persons with HIV. Continuity of HIV-related services in post-disaster settings is essential for infected individuals and to minimize HIV transmission.

METHODS: To establish pre-earthquake HIV service baselines, we used routine monitoring data for 10/2008–12/2009 from 201 sites providing antiretroviral therapy (ART) or HIV testing at voluntary testing (VCT) centers and antenatal clinics (ANC). HIV-testing utilization was defined as median monthly number of patients seen at VCT and ANC sites and ART utilization as monthly median new patients starting ART and total current ART patients at all sites.

RESULTS: Median monthly testing baselines were 195 (VCT), 86 (ANC), and 8 (new ART enrollment); baseline total current patients on ART was 26,041 in December 2009. In February 2010, the number of adults tested at VCT was 49% of baseline, rising to 87% in May. At the same time, testing in ANC clinics was 77% and 111%, and new ART enrollment was 37% and 87%. Total current patients on ART decreased to 92% of baseline by February; recovering to 94% by May. In West Department, which includes the earthquake epicenter, testing, new ART enrollment, and total current ART patients experienced greater initial declines but showed gradual recovery toward baseline by May.

CONCLUSIONS: Following the Haiti earthquake, there was a marked decline in HIV testing and new ART patient enrollment, while follow-up of established ART patients remained impressively high. Support for HIV treatment continuity, for example through community outreach and patient education, should be explored as disaster-preparedness and response strategies for HIV epidemic settings.

KEYWORDS: HIV, Haiti, antiretroviral therapy, infectious disease transmission, continuity of patient care

2:55

Unprecedented Outbreak of Acute Childhood Lead Poisoning – Zamfara State, Nigeria, 2010

AUTHORS: Carrie A. Dooyema, A. Neri, Y. Lo, J. Durant, K. Caldwell, O. Biya, S. Haladu, S. Gidado, G. Tolough

BACKGROUND: Lead poisoning in children can cause brain and kidney damage, even death. In 2010, the Nigerian Ministry of Health learned that in four northwestern Nigerian villages, children were dying of lead poisoning. On May 8th, the ministry assembled an investigative team that included its Field Epidemiology and Laboratory Training Program and CDC. The team suspected that children were dying from an increase in ore-processing for gold.

METHODS: In two of the four villages, investigators administered a house-to-house survey. Investigators collected blood from children aged 2–59 months. CDC laboratories confirmed investigator's onsite analyses. Investigators analyzed soil samples from housing compounds for lead. Descriptive statistics and regression analysis helped identify child mortality-related environmental factors.

RESULTS: Investigators surveyed 119 housing compounds. Of the 463 children aged <5 years included in the survey, 118 (25%) had died in the last 12 months. Blood samples were collected from 204 (59%) of 345 children aged <5 years. All samples tested onsite exceeded the CDC level of concern ($\geq 10 \mu\text{g/dL}$); 97% (198/204) exceeded CDC criteria for chelation therapy ($\geq 45 \mu\text{g/dL}$). Of 86 samples sent to CDC laboratories, the average blood lead level was 130.9 $\mu\text{g/dL}$ (median: 97.0 range: 36.5–445.3 $\mu\text{g/dL}$). Eighty-four (71%) compounds reported processing ore. Grinding, drying, separating, washing, and melting ore all contributed to child mortality ($P < 0.05$). Children who died had greater odds ($OR=1.9$, 95% CI: 1.20, 2.9) of having a mother who processed ore versus children living at the time of the survey.

CONCLUSIONS: In these two villages, ore-processing activities put children at high risk for lead poisoning and death. Control measures include chelation therapy, public health messaging, contaminated soil removal, and mining activity control.

KEYWORDS: lead poisoning, nervous system, childhood, environment and public health

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