

54th Annual Epidemic Intelligence Service (EIS) Conference

April 11-15, 2005
Crowne Plaza Ravinia • Atlanta, Georgia

Centers for Disease Control and Prevention
www.cdc.gov

54th ANNUAL EPIDEMIC INTELLIGENCE SERVICE (EIS) CONFERENCE - April 11-15, 2005



DEPARTMENT OF HEALTH AND HUMAN SERVICES

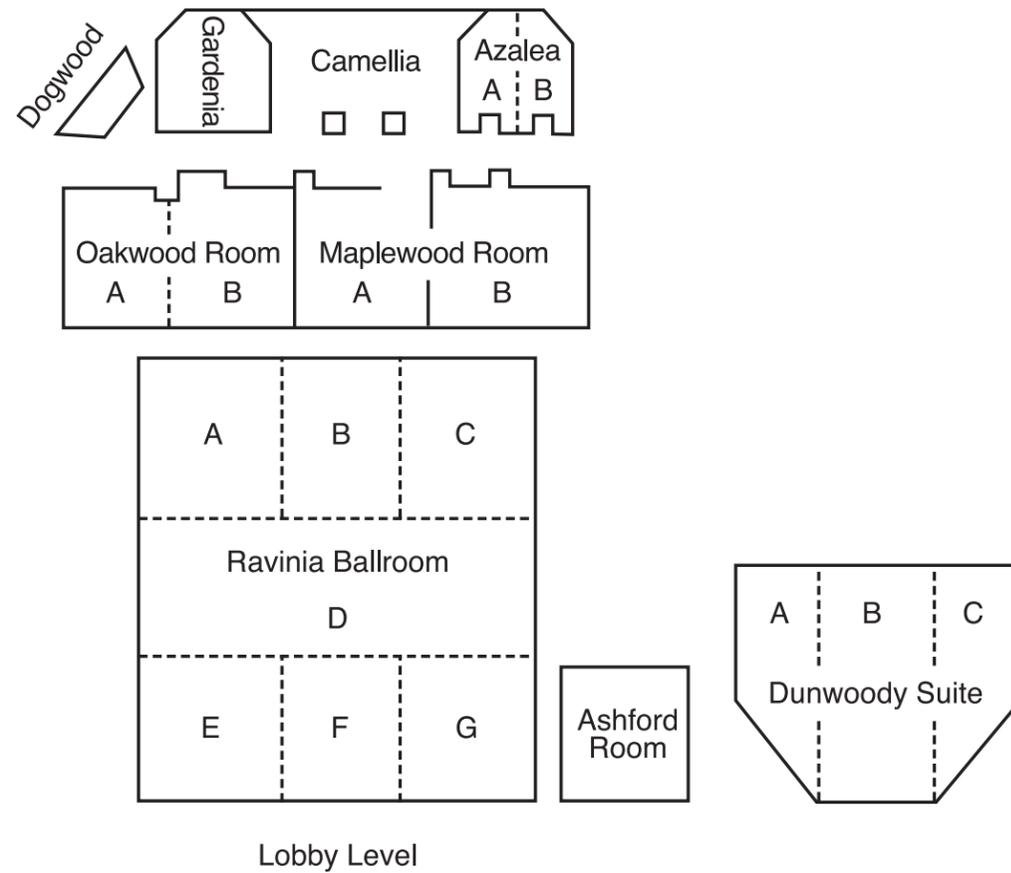


DEPARTMENT OF HEALTH AND HUMAN SERVICES



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Contents

Preface	5
Conference Committees	6
General Information	7
Conference Program	8
Overview of Awards & Prize Manuscripts	21
Alexander D. Langmuir Lectures, 1972–2004	22
Alexander D. Langmuir Prize Manuscripts, 1966–2004	24
Awards Presented at 2004 Conference	28
2005 Award Committees	29
Continuing Education Credits.....	30
EIS Class of 2005	32
Abstracts	33
Presenting EIS Officers, by Center/Institute/Office	98
Index to Presenters	99

MARK YOUR CALENDAR!!!!



**55th Annual
Epidemic Intelligence Service (EIS)
Conference**

April 24-28, 2006

Centers for Disease Control and Prevention

Atlanta, Georgia

Dear Friends of EIS:

Welcome to the 54th Annual Epidemic Intelligence Service Conference. We are delighted that you are able to attend our annual conference, which highlights the professional activities of EIS officers. 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 EIS Conference.

Last year, we approached the conference in the shadow of a brewing avian influenza emergency. Although several EIS officers were deployed to the field, the level of EIS activity never reached the intensity of the SARS response the previous year, and the potential pandemic never materialized. This year has been relatively quiet as far as large-scale deployments for infectious disease outbreaks. Instead, this last year could probably best be characterized as "The year of the flood". Hurricane season kept quite a few officers busy as Mother Nature battered the Caribbean and the southern U.S. In addition to eight separate EPI-AIDs in the U.S. for hurricane response, EIS officers also deployed to Haiti and, more recently, to Guyana.

Of course, the big flood disaster this year was the tsunami in Southeast Asia. Although my office was inundated with calls from officers eager to deploy, very few EIS officers have been involved in the response to date. While CDC personnel posted in the disaster area—many of them EIS alumni—have been playing an active role in the field response, relatively few staff and only two EIS officers have deployed from Atlanta so far. However, the public health response to this disaster will go on for months to years, and I fully expect that the active involvement of EIS officers will increase as the international relief activities move from the initial response to the recovery phase.

As always, we extend a special welcome to the incoming members of the EIS Class of 2005. This year, as in the past several years, we have received additional funding to increase the size of the incoming class above the budgeted 65 officers and have accepted 82 candidates for the new class. The incoming officers are a select group of men and women with a broad array of interests and skills. Fifty (61%) of the new officers are women, and 12 (15%) are citizens of other nations. Among the 70 who are U.S. citizens, 25 (36%) represent racial/ethnic minority groups. The class includes 46 physicians, 27 doctoral level scientists, five veterinarians, and four nurses.

To accommodate the increasing number of EIS officers in the two classes, we will again be running concurrent oral sessions on Tuesday and Wednesday mornings, so please check your program carefully. There will also be several special sessions in this year's conference. On Tuesday, there will be a lunchtime session on "Pregnant Women and Emerging Infections: From Being Forgotten To Counting For Two!" There will be a special session on Thursday at lunch on "Emergence of Community-Associated Methicillin-Resistant Staphylococcus Aureus". Finally, on Friday at lunch, there will be a special session on "Do We Have What It Takes? Evaluating EIS: From Competencies to Competence".

The 2005 Conference provides you with the opportunity to hear about many current applications of epidemiology to public health and prevention by EIS officers. 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 Public Health Training
Epidemiology Program Office

Scientific Program Committee

Kate M. Brett, National Center for Health Statistics, Chair

Janet Blair, Office of Workforce and Career Development

Lisa Cairns, National Immunization Program

Susan T. Goldstein, National Center for Infectious Diseases

Doug Hamilton, Office of Workforce and Career Development

Lauren B. Lewis, National Center for Environmental Health

Michele C. Lynberg, National Center for Injury Prevention and Control

David E. Nelson, National Center for Chronic Disease Prevention and Health Promotion

Cynthia Ogden, National Center for Health Statistics

Jennita Reefhuis, National Center on Birth Defects and Developmental Disabilities

Linda Valleroy, National Center for HIV, STD, and TB Prevention

Erica Lowe, EIS Program Liaison

Latebreaker Committee

David Nelson (chair, EIS '89)

Michele Lynberg (EIS '88)

Patricia Griffin (EIS '02)

Program Production

Erica R. Lowe, EIS Program

Lisa N. Pealer, EIS Program

Becky Cole, EIS Program

Deborah Sorgel, Visions, USA, Inc.

Danielle M. Turnage, Visions, USA, Inc.

Keshia Jones, Visions, USA, Inc.

GOAL OR 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 their significance to public health and maintain and increase their skills in determining the appropriateness of epidemiological methods, presenting and interpreting results clearly and developing appropriate conclusions and recommendations.

OVERALL CONFERENCE GOALS

- To provide a forum for EIS officers and alumni to engage in the scientific exchange of current epidemiologic topics.
- To highlight and 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 will be available at the conference registration desk located in front of the Ravinia Ballroom on the main floor of the hotel. Check-in for those who have pre-registered will be available Sunday, April 10, from 5:00 pm through 7:00 pm. Check-in and on-site registration will be available from Monday-Friday, 7:30 am through 5:00 pm.

At registration, you will receive your conference folder with a program book, quick guide, general information and your name badge. Please wear your conference badge at all times during the conference. Your name badge includes your code to access messages in the Communications Center. If you lose or misplace your name badge, the staff at the Registration desk will assist you in securing a new one.

Conference staff will be wearing purple badges for any additional questions you may have.

Non-Smoking Conference: Smoking is not permitted in any of the conference sessions, hallways or meeting rooms.

Cellular Phones and Pagers: As a courtesy to presenters and all meeting attendees, please turn ringers on phones and pagers off (or to silent) during conference sessions. Use of cellular phones is restricted to the meeting room foyers and public areas outside meeting rooms.

MESSAGE CENTER

Located in the Camellia Room, the Message Board System will handle messaging needs during this year's conference. Please check the large-screen monitors for waiting messages. Messages can be accessed by using the registration number on your name badge.

Computers in the Message Center can also be used to access the Internet for email or the continuing education evaluation forms. Please limit your computer use to 10 minutes at a time, to allow other Conference attendees an opportunity to use these services as well.

SPEAKER READY ROOM

Located in Dogwood Room, this room is available for presenters who need to make changes to their presentations. Computers with PowerPoint software, re-writable CD-Rom drives, and a printer will be available from 8:00 am--6:00 pm Monday--Thursday and Friday, 8:00 am – 2:00 pm.

CIO EXHIBIT ROOM

Monday--Thursday, 8:00 am--5:00 pm in the Pre-Convene Area outside the Ravinia Ballroom. Check out what's going on at each of CDC's Centers, Institutes and Offices when you stop by their information tables.

The EIS Program Office gratefully acknowledges the invaluable assistance and cooperation of the Management Analysis and Services Office and the editorial and support staffs of all CDC administrative units participating in the 2005 EIS Conference.

Color Key for Name Tags

Blue	EIS Alumni
Green	Current EIS Officers
Red	EIS Recruits
Black	Conference Participants
Purple	Conference Staff
Light Blue Dot	Field EIS
Orange Dot	Recruiters
Pink Dot	Media

Abstracts in this publication were edited and officially cleared by the respective Centers/Institute/Offices. Therefore, the EIS Program Office 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 Public Health Service or the Department of Health and Human Services.

Monday, April 11, 2005

- 7:30 Registration Desk Opens**
- 8:15 Welcome and Call to Order** **Stephen B. Thacker, Director, Office of Workforce and Career Development**
- 8:30 Session A: Let the Games Begin: A Tapestry of EIS Presentations** **Ravinia Ballroom**
Moderators **Julie L. Gerberding and Stephen B. Thacker**
- 8:35 More for the Money? Differences in the Prevalence of Adult Obesity by Income Level--
 United States, 1999--2002. **Allison A. Hedley**
- 8:55 Consistent Condom Use and Risk of Human Immunodeficiency Virus (HIV) Infection--
 Botswana, 2000--2004. **Allan W. Taylor**
- 9:15 All Roads Lead to Roma: Multi-State Outbreak of Salmonella Braenderup Infections
 Associated with Roma Tomatoes--Northeastern United States, 2004. **Sundeep K. Gupta**
- 9:35 Surveillance for Epidemic Disease Among Internally Displaced Persons--
 Darfur, Sudan, 2004 **Ondrej Mach**
- 9:55 Botulism Related to Cosmetic Injections of Botulinum Toxin Type A--Florida, 2004.
 **Daniel S. Chertow**
- 10:15 BREAK**
- 10:45 Session B: We Can Work it Out: Occupational Safety & Health** **Ravinia Ballroom**
Moderator **John Howard**
- 10:50 Workplace Homicide--Alaska, 1990--2003. **Rebecca S. Noe**
- 11:10 Pneumoconiosis Mortality--United States, 1968--2000. **Vinicius C. Antao**
- 11:30 Exposure to Unsuspected Brucella suis Isolates in a Microbiology Laboratory--
 Louisiana, 2004 **Peter J.E. Vranken**
- 11:50 Headache and Dizziness in Cosmetology School Students--
 California, 2004 **Austin D. Sumner**
- 12:15 LUNCH**
- 12:30 Public Health Veterinarians Meeting** **Dunwoody Suites**
- 12:30 Monday--Wednesday Poster Session — Meet the Authors** **Ravinia Ballroom**
 (All posters in the Conference will be on display Monday, 9:00 a.m.--Wednesday, 5:00 p.m.)
 (The following authors will be present to discuss their studies on Monday, 12:30-1:30 p.m.)

The Germinators: Bacterial Diseases

- P1. A Large Outbreak of Cryptosporidiosis and Escherichia coli O111 Infections Associated with
 Consumption of Unpasteurized Apple Cider--New York, 2004. **Fatima Coronado**

Monday, April 11, 2005 cont.

- P2. Resistance on the Rise: Outbreak of Multidrug-Resistant Salmonella Typhimurium DT104 Linked
 to Ground Beef--Northeastern United States, 2003--2004 **Amy M. Dechet**
- P3. Salmonella-Rians at the Gate: The Fall of the Roma Empire? Multi-state Outbreak of
 Salmonellosis associated with Consumption of Roma Tomatoes- July 2004 **Amy E. DuBois**
- P4. Methicillin-resistant Staphylococcus aureus in Two Neonatal Intensive Care Units--
 Washington, DC, 2004 **Sukhminder K. Sandhu**
- P5. Outbreak of Cutaneous Bacillus cereus Infections among Cadets at a Military University--
 Georgia, 2004 **Carrie M. Shuler**
- P6. Joint Public Health and Law Enforcement Investigation of Tularemia after the Republican National
 Convention--New York City, 2004 **Benjamin W. Tsoi**

From Here to Eternity: Chronic Diseases

- P7. Evaluation of Alternative Methods for Characterizing Air Quality to Estimate Population
 Exposures--Wisconsin **Dawn H. Burmeister**
- P8. Family History: Its Link with Coronary Heart Disease, Related Conditions, and Risk-Reducing
 Behaviors **Shauna Lyn**
- P9. Age-related Eye Diseases and Visual Impairment--United States, 2002 **Asel A. Ryskulova**
- P10. Complementary and Alternative Medicine Use among Adults with Diagnosed Diabetes--
 United States, 2002 **Sharon H. Saydah**

All Over the World: International Health

- P11. High Seroprevalence and Active Infection with Schistosomiasis and Strongyloidiasis in the Lost
 Boys of Sudan Refugee Group--Arizona, 2004 **Brian G. Blackburn**
- P12. Costly Adverse Reactions to Lymphatic Filariasis Treatment--
 Leogane, Haiti, 2004 **Natasha S. Hochberg**
- P13. Knowledge, Attitudes, and Practices Regarding Latrine Utilization as Part of a Trachoma Control
 Program--Ethiopia, 2004 **Rosalyn E. O'Loughlin**
- P14. Risk of Secondary Transmission from Imported Lassa Fever--New Jersey, 2004 **Esther T. Tan**

- 1:30 Session C: Surf's Up!: Leisure & Hobby-Associated Investigations** **Ravinia Ballroom**
Moderator **Laura J. Fehrs**

- 1:35 Travel and Tribulations: An Explosive Outbreak of Legionellosis among Guests of a Hotel--
 Oklahoma, 2004 **Lauri A. Hicks**
- 1:55 International Outbreak of Shigella sonnei among Airline Passengers--
 Honolulu, Hawaii, August 2004 **Kate Gaynor**
- 2:15 Scombroid from Escolar Consumption--Washington, 2004 **Eric M. Sergienko**

Monday, April 11, 2005 cont.

- 2:35 A Massive International Outbreak of Gastroenteritis with Multiple Etiologies among Resort Island Visitors and Residents---Ohio, 2004. **Ciara E. O'Reilly**
- 3:00 BREAK**
- 3:15 Session D: I've Got You Under My Skin: Vaccine Preventable Diseases** **Ravinia Ballroom**
Moderator **Melinda Wharton**
Presentation of the Iain C. Hardy Award
- 3:20 Risk Factors for Death from Invasive Pneumococcal Disease---United States, 2001--2003 **Deron C. Burton**
- 3:40 Evaluation of Meningococcal Vaccination Practices Among Colleges and Universities---Maryland, 2004. **Amanda D. Castel**
- 4:00 Invasive Haemophilus Influenzae Disease in the Era of Hib Vaccine---United States, 1998--2002 **Michelle A. Chang**
- 4:20 Projected Cost-Effectiveness of Rotavirus Vaccination of Children---Asia. **Laura J. Podewils**
- 4:40 Investigation of Deaths and Serious Illnesses following Influenza Vaccination---Michigan, October 2004. **Alison M. Rue**
- 5:00 Bacterial Meningitis in the United States---2002--2003. **Michael C. Thigpen**
- 5:30 Cash-Bar Social** **Conference Pre-Convence Area**

Tuesday, April 12, 2005

- 8:30 Concurrent Session E1: Strangers in the Night: HIV and STDs** **Ravinia Ballroom**
Moderators **John Douglas and Rob Janssen**
- 8:35 Can Data from Programs for the Prevention of Mother-to-Child Transmission of HIV be used for HIV Surveillance?---Kenya, 2003. **Nicole Seguy**
- 8:55 HIV Transmission among Black Male College Students Who Have Sex with Men---North Carolina, 2003. **Linda Ahdieh-Grant**
- 9:15 Labeling Changes Following an Investigation of Inadvertent Administration of a Non-Standard Penicillin Regimen for Syphilis---Los Angeles, 2004 **Michael E. Greenberg**
- 9:35 HIV Transmission among Black Women---North Carolina, 2004. **Fatu M. Forna**
- 9:55 Rapid Ethnographic Assessment of HIV/AIDS: Garifuna Communities---Honduras, 2004 **Miriam Sabin**
- 8:30 Concurrent Session E2: Gone with the Wind: Respiratory Illnesses** **Dunwoody Suites**
Moderators **Tim Uyeki and Cindy Whitney**
- 8:35 Hantavirus Pulmonary Syndrome---Randolph County, West Virginia, July 2004 **Julie R. Sinclair**

Tuesday, April 12, 2005

- 8:55 The Burden of Respiratory Syncytial Virus Infections among Patients Hospitalized with Pneumonia---Rural Thailand **Natalie M. Keeler**
- 9:15 Community Outbreak of Legionnaires' Disease among Nursing Home Residents and Others---North Carolina, 2004 **Christina R. Phares**
- 9:35 An Alternate Approach to Syndromic Surveillance for Early Detection of Inhalational Anthrax Cases **Elizabeth M. Begier**
- 9:55 Investigation of Risk Factors for Fatal Asthma among Children---Baltimore, Maryland, 2003--2004 **Michael E. King**
- 10:15 BREAK**
- 10:45 Concurrent Session F1: Natural Woman: Reproductive and Women's Health** **Ravinia Ballroom**
Moderator **Coleen Boyle**
- 10:50 Pregnancy Planning and Lifestyle Behaviors among Nonpregnant Women of Childbearing Age---Southern California, 1998--2000 **Kathleen G. Raleigh**
- 11:10 Validity of a Clinical Screening Tool and Total Lymphocyte Count to Determine Advanced HIV Disease in Pregnant Women---Cape Town, South Africa, 2004 **Chineta R. Eure**
- 11:30 Lower Rates of Preterm Birth in Women of Arab Ancestry: an Epidemiologic Paradox---Michigan, 1993--2002 **Darline K. El Reda**
- 11:50 Reported Use of Human Papillomavirus Tests for Approved and Non-Approved Indications by Primary Care Clinicians---United States, 2004 **Zsakeba T. Henderson**
- 10:45 Concurrent Session F2: In Harm's Way: Injury Epidemiology** **Dunwoody Suites**
Moderator **Jim Mercy**
- 10:50 Rapid Assessment of the Needs and Health Status after Hurricane Ivan---Santa Rosa and Escambia Counties-- Florida, 2004 **Tesfaye M. Bayleyegn**
- 11:10 Adolescent Suicide---Maine, 2004 **Victor Balaban**
- 11:30 An Evaluation of Death Certificate-Based Surveillance for Traumatic Brain Injury---Oklahoma, 2002. **Sara J. Russell**
- 11:50 Nonfirearm-Related Homicides---New Mexico, 2001--2003 **Neely N. Kazerouni-Frederick**
- 12:15 LUNCH**
- 12:30 Special Session: Pregnant Women and Emerging Infections: From Being Forgotten to Counting for Two!** **Dunwoody Suites**
Moderator **José Cordero**

Tuesday, April 12, 2005 cont.

- 1:45 Session G: It's a Small World After All: International Health** Ravinia Ballroom
Moderators Linda Venczel and Brad Woodruff
Presentation of the Paul C. Schnitker Award
- 1:50 Emergence of Community Strains of Methicillin-Resistant Staphylococcus aureus as a Potential Cause of Healthcare-Acquired Infections---Uruguay, 2002--2004 **Stephen R. Benoit**
- 2:10 Yellow Fever Immunization Coverage in Host Communities for Internally Displaced Persons ---Liberia, 2004. **Jennifer A. Brown**
- 2:30 Diphtheria--Haiti, 2004. **Amanda C. Cohn**
- 2:50 Health-Care Costs of Rotavirus Diarrhea and Cost-Effectiveness of Rotavirus Immunization--Vietnam. **Thea K. Fischer**
- 3:10 Impact of Haemophilus Influenzae Type B Conjugate Vaccine--Dominican Republic, 2004 **Ellen H. Lee**
- 3:30 Emergency Nutrition Assessment--Darfur, Sudan, 2004. **Tami Zalewski**
- 4:00 BREAK**
- 6:00 Prediction Run** **Brook Run Park**

Wednesday, April 13, 2005

- 8:30 Concurrent Session H1: Paint by Numbers: Peavy Award Finalists** Ravinia Ballroom
Moderator **Donna F. Stroup**
- 8:35 Brachial Neuritis Associated with Childhood Vaccines: Do We Know What We Think We Know?---Puerto Rico, 2004 **Angela Calugar**
- 8:55 Adverse Events in HIV-infected Patients Receiving Antiretroviral Therapy in a Treatment Program in a Nairobi Slum--Kenya, 2003--2004. **Andrea A. Kim**
- 9:15 Prevalence of Meeting Physical Activity Recommendations as a Predictor of State Obesity Prevalence---United States, 2003. **Karen K. Lee**
- 9:35 Maternal Smoking Is Associated with Increased Odds of Childhood Overweight--United States, 1996--2003. **Andrea J. Sharma**
- 9:55 Weight Regain in Persons Successful at Substantial Weight Loss--United States, 1999--2002. **Edward C. Weiss**
- 8:30 Concurrent Session H2: Super Size Me: Obesity/Physical Activity** Dunwoody Suites
Moderator..... **David Freedman**
- 8:35 Cluster of Deaths in a Bariatric Surgery Program--San Juan, Puerto Rico, 2004 **Brett B. Cauthen**

Wednesday, April 13, 2005 cont.

- 8:55 Family History of Diabetes, Obesity, and Diabetes-preventing Behaviors---United States, 2004 **Susan Hariri**
- 9:15 Chewing The Fat: Do Health Care Professionals Talk to Their Pediatric Patients about Weight Status? **Carolyn J. Tabak**
- 9:35 Physical Education and Sufficient Physical Activity Levels Among High School Students---United States, 2003 **Eric A. Miller**
- 9:55 Ecological Relationship between Physical Inactivity and Diabetes Across States---United States, 2003 **Sanjeeb Sapkota**
- 10:15 BREAK**
- 10:30 Concurrent Session I1: Wild Thing: Investigations Associated with Pets and Animals** Ravinia Ballroom
Moderators **David Addiss and Patricia Griffin**
Presentation of the James H. Steele Award
- 10:35 Why is the Lake Killing our Dogs? Harmful Algal Blooms--Nebraska, 2004 **Zandra H. Duprey**
- 10:55 Outbreak of E. coli O157:H7 at a State Fair--North Carolina, 2004 **Brant B. Goode**
- 11:15 Outbreak of Multidrug-Resistant Salmonella Typhimurium Infections Associated with Small Rodents Purchased at Retail Pet Stores--United States, December 2003--October 2004 **Stephen J. Swanson**
- 11:35 New War Against Raccoon Rabies--Ohio, 2004 **Mysheika LeMaile-Williams**
- 10:30 Concurrent Session I2: Separate and Unequal: Health Disparity Investigations** Dunwoody Suites
Moderator **Walter W. Williams**
- 10:35 Racial Disparities in the Incidence of End-Stage Renal Disease--Georgia--2002 **Karon Abe**
- 10:55 Immunization Assessment in Four Women, Infants, and Children Clinics---Colorado **Tista S. Ghosh**
- 11:15 Hepatitis A Before and After Universal Childhood Vaccination Recommendations---Oregon, 1996--2004 **Sean D. Schafer**
- 11:35 Just One More Visit: Achieving >90% Vaccination Coverage and Reducing Racial Disparities with One Catch-Up Visit--United States, 2003 **Tom T. Shimabukuro**
- 12:00 LUNCH**
- 12:30 Monday--Wednesday Poster Session. Meet the Authors** Ravinia Ballroom
 (All posters in the Conference will be on display Monday, 9:00 a.m.--Wednesday, 5:00 p.m.)
 (The following authors will be present to discuss their studies on Wednesday, 12:30-1:30 p.m.)
- Can't Take My Eyes Off of You: Surveillance Analyses**
- P15. Leptospirosis: A Seroprevalence Survey on American Samoa, 2004 **Kirk P. Winger**

Wednesday, April 13, 2005 cont.

- P16. Wound Infections: An Important Cause of Vibrio Morbidity and Mortality---
United States, 1997--2003 **Amy M. Dechet**
- P17. Adverse Drug Events Presenting to a Nationally Representative Sample of Hospital
Emergency Departments---United States, 2003 **Aaron B. Mendelsohn**
- P18. Eating Dinner with Family Associated with Decreased Risk for Delinquent Behaviors and
Depression and Increased Likelihood of Fruit and Vegetable Intake **Jonathan H. Siekmann**

Infection Detection: Tuberculosis Investigations

- P19. Genotyping Identifies Ongoing Mycobacterium tuberculosis Transmission Associated with
Delayed Diagnosis---Mississippi, 1996--2004 **Rana Jawad Asghar**
- P20. Assessing Risk for Latent Tuberculosis Infection: Validation of a Novel Risk Assessment
Tool---Tennessee, 2004 **Kevin P. Cain**
- P21. Nosocomial Mycobacterium tuberculosis Transmission in a Newborn Nursery and Maternity
Ward---New York City, 2003 **Alyssa M. Finlay**
- P22. Investigation of an Increase in Tuberculosis Cases in Children Aged <5 Years---Maricopa
County, Arizona, 2002--2003. **N. Sarita Shah**

Bloodsuckers: Vector Borne Diseases

- P23. Age and Sex as Risk Factors for West Nile Virus Neuroinvasive Disease in
Children **Lora Davis**
- P24. Rash in West Nile Virus Infection Associated with Improved Prognosis---
Colorado, 2003 **Dayna D. Ferguson**
- P25. Assessment of Community Knowledge and Practices following Outbreak Investigation and
Control Efforts for Rocky Mountain Spotted Fever---Arizona, 2004. **Elizabeth J. Melius**
- P26. Knowledge, Attitudes, and Behaviors Regarding Lyme Disease Prevention: Summary of
Surveys Conducted in Seven Communities in the Northeastern
United States **Larissa A. Minicucci**

Here, There & Everywhere: Epidemiology In Action

- P27. Disparities in Testing for HIV by Race/Ethnicity and Risk Status---
Los Angeles County, 2002 **Elizabeth A. Baraban**
- P28. What Works in Public Health: The Evidence Base for Preventing Disease, Injury and
Disability. **Karen E. Giesecker**
- P29. Risk Factors for Death among Patients with Plague---United States,
1960--2003 **J. Erin Staples**
- P30. How Much Do Binge Drinkers Really Drink? **Ernest E. Sullivent**

Wednesday, April 13, 2005 cont.

- 1:30 Session J: Nowhere Man: Vulnerable Population Investigations Ravinia Ballroom**
Moderator Alyssa Easton

1:35 Incarcerating Hepatitis B: An Outbreak Demonstrates the Importance of Vaccination in
Correctional Settings **Rose A. Devasia**

1:55 Streptococcus Pneumoniae Serotype 12F Outbreak in a Homeless Population---
California, 2004 **Ellen H. Lee**

2:15 Pertussis Outbreak at a Summer Camp for HIV-Infected Children---
Nebraska, 2004 **Anand Date**

2:35 Chronic Abdominal Pain, Schistosomiasis, and Strongyloidiasis among the Lost Boys and
Girls of Sudan Refugee Group **Drew L. Posey**

2:55 Elevated Blood Lead Levels in Refugee Children---
New Hampshire, 2004 **Rachel N. Plotinsky**

3:15 Health of Sheltered Homeless Persons---New York City, 2001-2003 **Benjamin W. Tsoi**

3:45 BREAK

- 4:00 Session K: Alexander D. Langmuir Memorial Lecture and Reception Ravinia Ballroom**
Announcement of Langmuir Prize Winner
Presentation of Distinguished Friends of EIS Award
Sponsored by the EIS Alumni Association and the Epidemiology Program Office
Speaker: Alexander C. Wagenaar, PhD
Department of Epidemiology & Health Policy Research and Institute
for Child Health Policy
University of Florida, College of Medicine

Topic: Killin' Time Alcohol and Injury

- 5:30 EIS Alumni Association Meeting Maplewood Room**

- 7:30 International Night Dunwoody Suites**
Sponsored by the Training in Epidemiology and Public Health Interventions Network (TEPHINET)

Session L: Improving Public Health by Detecting and Responding to Health Threats
Moderator Stephen B. Blount

7:35 Seroprevalence of O'Nyong Nyong Fever in Lamu Island---
Kenya, October 2004 **Sergon Kibet**

7:55 An Outbreak of Acute Febrile Respiratory Disease from Adenovirus in Schools of a Township---
Eastern China, 2004 **Zhijie An**

8:15 Immunization Coverage Cluster Survey – the Democratic Republic of Timor Leste---
December 2004 **Jonsson Jerker**

Wednesday, April 13, 2005 cont.

- 8:35 An Outbreak of Hepatitis E Caused by a Contaminated Water Supply---
Baripada, Orissa, India, 2004 **Susanta Kumar Swain**
- 8:55 Nosocomial Burkholderia cepacia Infections Associated with Exposure to Sublingual Probes
---Texas, 2004. **Richard A. Taylor**
- 9:15 A Large Outbreak of Water-Borne Paratyphoid Fever Attributed to a Contaminated Well in a Rural
Junior High School---Guangxi Province, China. **Ying Zhang**

International Night Poster Session

Posters will be on display in Dunwoody Suites from 7:30—9:30 p.m.

- P1. Occupationally Acquired Pneumonia in a Commercial Poultry Farm---Australia **Albert Tiong**
- P2. Outbreak of Hantavirus Pulmonary Syndrome—Distrito Federal and Goiás State---
Brazil, 2004. **Jose Alexandre DaSilva**
- P3. Extrinsic Contamination of Parenteral Infusions as the Source of a Large Outbreak of Klebsiella
sepsis in a Neonatal Intensive Care Unit---Dominican Republic, 2002 **Raquel Pimentel**
- P4. Outbreak of Measles in Nai, a Remote Village---Uttaranchal, India,
December 2004 **Harish Martolia**
- P5. Persistence of Iodine Deficiency in Gangetic Flood-Prone Area---West Bengal,
India, 2004 **Tapas K. Sen**
- P6. A National Survey of the Quality of Care for Diabetic Persons---
Italy, 2004 **Sandro Baldissera**
- P7. Thiamine Deficiency-Related Polyneuropathy in Davao Prison and Farm Colony---Davao City,
Philippines, 2004. **Gerna Mayas**
- P8. Mass Insecticide Poisoning in a Kindergarten School, Thailand, 2004, Using Epidemiology for
Crime Scene Investigation **Chakrarat Pittayawonganon**
- P9. Knowledge, Attitudes and Practices of Health Workers towards Voluntary Counselling and Testing
and Post-Exposure Prophylaxis at Two Urban Hospitals---Midlands Province,
Zimbabwe, 2004 **Tamisayi Chinhengo**
- P10. Olfactory Deficits among Workers at a Nickel Refinery---Bindura,
Zimbabwe, 2004 **Eric N Nyazika**

**9:35 Presentation of William H. Foege Award
Closing Remarks
Reception**

Thursday, April 14, 2005

- 8:30 Session M: Young Frankenstein: Mackel Award Finalists** **Ravinia Ballroom**
Moderators **Beth Bell and Carol Rubin**
- 8:35 Case-Control Study of an Acute Aflatoxicosis Outbreak---
Kenya, 2004 **Eduardo Azziz-Baumgartner**
- 8:55 An Outbreak of Rocky Mountain Spotted Fever Associated with a Novel Tick Vector,
Rhipicephalus Sanguineus, on an American Indian Reservation---
Arizona, 2004 **Linda J. Demma**
- 9:15 Outbreak of Burkholderia Cepacia Associated with the Use of Multi-Dose Albuterol for
Nebulization Therapy---Missouri, 2004 **Concepcion F. Estivariz**
- 9:35 Replacement Pneumococcal Disease: Increase in Non-Vaccine Type Disease in the Era of
Widespread Pneumococcal Conjugate Vaccination---United States,
1998--2003 **Lauri A. Hicks**
- 9:55 Rabies Virus Transmission by Solid Organ and Tissue Transplantation---
Texas, 2004 **Anna M. Likos**

10:15 BREAK

10:30 Preventative Medicine Residency Information Dissemination **Gardenia Room**

**10:30 Session N: Mercy Mercy Me (The Ecology): Environmental Health
Diseases** **Ravinia Ballroom**
Moderator **Henry Falk**

- 10:35 Lead Exposure Among Adults and Children Using a Volunteer-Operated Indoor Firing
Range---Alaska, 2004 **Marc-Andre R. Chimonas**
- 10:55 Outbreak of Thyrotoxicosis---Uruguay, 2003--2004 **Elizabeth J. Conrey**
- 11:15 Residential Exposures to Hydrogen Sulfide and Respiratory Outcomes---Warren, Ohio,
2004 **Preethi L. Rao**
- 11:35 Identifying Housing that Poisons: A Critical Step in Eliminating Childhood Lead Poisoning---
Chicago, 1997--2003 **Nimia L. Reyes**

12:00 LUNCH

**12:30 Special Session: Emergence of Community-Associated Methicillin-Resistant
Staphylococcus Aureus** **Dunwoody Suites**
Moderator **Daniel B. Jernigan**

1:30 Preventative Medicine Residency Information Dissemination **Gardenia Room**

1:30 Session O: Every Breath You Take: Tuberculosis Investigations **Ravinia Ballroom**
Moderator **Ken Castro**

- 1:35 Tuberculosis Outbreak among Young Marijuana Hotboxers---Seattle,
Washington, 2004 **John E. Oeltmann**
- 1:55 Time in the United States as a Method of Assessing Risk for Tuberculosis Disease among
Foreign-Born Persons---Tennessee, 2004. **Kevin P. Cain**
- 2:15 Clinical Outcomes of Multidrug-Resistant Tuberculosis Patients Treated Under the WHO
DOTS-Plus strategy---Estonia, 2001--2002. **Alyssa M. Finlay**

Thursday, April 14, 2005 cont.

- 2:35 Tuberculosis Outbreak in a Low-Incidence State---Allen County, Indiana, 2001--2004 **Kathrine Tan**
- 2:55 Tuberculosis Contact Identification---Louisiana, 2004 **Peter J. E. Vranken**
- 3:15 BREAK**
- 3:30 Session P: General Hospital: Nosocomial Infections Ravinia Ballroom Moderator Michele Pearson**
- 3:35 Outbreak of Burkholderia Cepacia Pseudobacteremia Associated with Nonsterile Practices of Phlebotomists---Chicago, 2004 **Lyn James**
- 3:55 Transmission of Hepatitis C Virus at a Pain Remediation Clinic---San Diego, California, 2003 **Mark C. Janowski**
- 4:15 A Hospital Outbreak of Diarrhea Reveals Emergence of an Epidemic Strain of Clostridium Difficile---Maine, 2003. **Sophia V. Kazakova**
- 4:35 Pseudomonas Aeruginosa Outbreak in a Neonatal Intensive Care Unit---Illinois, 2004 **Kathleen A. Ritger**
- 8:30 EIS Satirical Revue Ravinia Ballroom Presentation of Philip S. Brachman Award**

Friday, April 15, 2005

- 8:30 Session Q: He Sees You When You're Sleeping: Surveillance Presentations Ravinia Ballroom Moderator Denise Koo**
- 8:35 Outbreak of Invasive Pneumococcal Disease Detected by Surveillance---Rural Alaska, 2003--04. **Laura L. Hammitt**
- 8:55 Evaluation of Surveillance for Reportable Neisseria Meningitidis Invasive Disease---Iowa, 2002--2003. **Luca Flamigni**
- 9:15 Assessment of Post-Tropical Storm Jeanne Disease Surveillance---Gonaives, Haiti, 2004. **Seema Jain**
- 9:35 Reporting of Nosocomial Outbreaks of Acute Gastroenteritis---Georgia, 2002--2004. **Eileen W. Lau**
- 10:00 BREAK**
- 10:15 Presentation of Awards Ravinia Ballroom Mackel Award Virgil Peavy Award Poster Award**
- 10:30 Session R: Late-Breaking Reports Ravinia Ballroom Moderator Doug Hamilton**
- 10:35 Latebreaking Report – TBD
- 10:45 Latebreaking Report – TBD
- 10:55 Latebreaking Report – TBD
- 11:05 Latebreaking Report – TBD
- 11:15 Latebreaking Report – TBD
- 11:25 Latebreaking Report – TBD
- 11:35 Latebreaking Report – TBD
- 11:45 Latebreaking Report – TBD
- 12:00 LUNCH**
- 12:30 Special Session: Do We Have What It Takes? Evaluating EIS: From Competencies To Competence Dunwoody Suites Moderator Denise Koo**
- 1:30 Session S: Pièce de Résistance: Antimicrobial Resistance and Practice Patterns Ravinia Ballroom Moderator Jo Hofmann**
- 1:35 Impact of Multidrug-Resistant Acinetobacter Infections on Mortality and Length of Hospitalization---Maryland, 2002--2004. **Rebecca H. Sunenshine**
- 1:55 Recurrent Nosocomially Acquired, Community-Associated, Methicillin-Resistant Staphylococcus Aureus Infections in a Well-Baby Nursery---Los Angeles County, 2003--2004 **Dao M. Nguyen**

Friday, April 15, 2005 cont.

- 2:15 Patient Satisfaction and Antibiotic Use for Acute Upper Respiratory Tract Infections---
Wisconsin, 1999--2003. **Alexandra P. Newman**
- 2:35 Surveillance of Antimicrobial Susceptibility of Invasive Streptococcus pneumoniae---
Chicago, Illinois. **Lyn James**
- 2:55 Prevention of Neonatal Candidemia: Description of Current Antifungal Prophylaxis Practices
of Neonatologists---United States, 2004. **Lauren A. Burwell**
- 3:15 **Closing Remarks and Adjournment** **Stephen B. Thacker, Director,
Office of Workforce and Career Development**

Alexander D. Langmuir Prize Manuscript Award

The ADL Prize was established in 1966 by the EIS Alumni Association to encourage EIS officers to publish papers based on epidemiologic work done while in the EIS. The award is given to a manuscript or publication done by a current EIS officer or "first-year alumni", for a well-designed and executed, clearly and persuasively written report of an epidemiological study.

Philip S. Brachman Award

This award recognizes excellence in teaching epidemiology to EIS Officers. The Brachman Award is sponsored by the graduating class of EIS officers.

Distinguished Friend of the EIS Award

Awarded by the EIS Alumni Association, the Distinguished Friend of EIS Award, recognizes an individual for their valued contributions which have made an important difference to the health, welfare and happiness of EIS officers and the EIS Program.

Iain C. Hardy Award

The Iain C. Hardy Award recognizes a current EIS officer or an alumni within 5 years of having completed EIS training who has made an outstanding contribution to the control of vaccine-preventable diseases.

Donald C. Mackel Memorial Award

This award is sponsored by the EIS Alumni Association and recognizes a current EIS officer for the oral or poster presentation that best exemplifies the effective application of a combined epidemiological and laboratory approach to an investigation.

J. Virgil Peavy Memorial Award

Sponsored by the EIS Alumni Association, this notable award recognizes a current EIS officer for the oral or poster presentation that best exemplifies the effective and innovative application of statistics and epidemiologic methods in an investigation or study.

Outstanding Poster Presentation Award

This award recognizes a current EIS officer. The outstanding poster is selected based on (1) scientific content, including originality, study design and analysis; (2) public health impact; and (3) effectiveness of presentation.

Paul C. Schnitker International Health Award

This award recognizes a current EIS officer or first-year EIS alumni that has made an unusual contribution to international public health. Paul C. Schnitker, M.D., 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.

James H. Steele Veterinary Public Health Award

This award is given to a current or former EIS officer who has made outstanding contributions in the field of veterinary public health. This award recognizes outstanding contributions in the investigation, control, or prevention of zoonotic diseases or other animal-related human health problems.

Alexander D. Langmuir Lectures, 1972 – 2004

- 1972 Prevention of Rheumatic Heart Disease C 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 C Past, Present, and Future. *King K. Holmes*
- 1984 Poliomyelitis Immunization C Past and Future. *Jonas E. Salk*
- 1985 An Epidemiologist's View of Postmenopausal Estrogen Use, or What to Tell Your Mother. *Elizabeth Barrett-Connor*
- 1986 Hepatitis B Virus and Hepatocellular Carcinoma: Epidemiologic Considerations. *Robert Palmer Beasley*
- 1987 Environmental Hazards and the Public Health. *Geoffrey Rose*
- 1988 Lymphotropic Retroviruses in Immunosuppression. *Myron E. (Max) Essex*
- 1989 Aspirin in the Secondary and Primary Prevention of Cardiovascular Disease. *Charles H. Hennekens*
- 1990 Epidemiology and Global Health. *William H. Foege*
- 1991 Public Health Action in a New Domain: The Epidemiology and Prevention of Violence. *Garen J. Wintemute*
- 1992 Helicobacter pylori, Gastritis, Peptic Ulcer Disease, and Gastric Cancer. *Martin J. Blaser*
- 1993 Diet and Health: How Firm Is Our Footing? *Walter C. Willett*
- 1994 Alexander D. Langmuir: A Tribute to the Man. *Philip S. Brachman and William H. Foege*
- 1995 Epidemiology and the Elucidation of Lyme Disease. *Allen C. Steere*
- 1996 50 Years of Epidemiology at CDC. *Jeffrey P. Koplan*
- 1997 Public Health, Population-Based Medicine, and Managed Care. *Diana B. Petitti*
- 1998 Pandemic Influenza: Again? *Robert Couch*
- 1999 The Evolution of Chemical Epidemiology. *Philip J. Landrigan*
- 2000 Does Chlamydia pneumoniae Cause Atherosclerotic Cardiovascular Disease? Evaluating the Role of Infectious Agents in Chronic Diseases. *Walter E. Stamm*
- 2001 Halfway Through a Century of Excellence. *J. Donald Millar*
- 2002 Public Health Response to Terrorism: Rising to the Challenge. *Marcelle Layton*
- 2003 Alex Langmuir's Somewhat Quiet Legacy: Epidemiology, Sexual Health, and Personal Choices. *Willard (Ward) Cates, Jr.*
- 2004 HIV, Epidemiology, and the CDC. *James W. Curran*

Alexander D. Langmuir Prize Manuscripts, 1966 – 2004

- 1966 Complications of Smallpox Vaccination: I. National Survey in the United States, 1963. *N Engl J Med* 1967;276:125B32.
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- 1968 Salmonellosis from Chicken Prepared in Commercial Rotisseries: Report of an Outbreak. *Am J Epidemiol* 1969;90:429B37.
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- 1979 An Outbreak of Legionnaires= Disease Associated with a Contaminated Air-Conditioning Cooling Tower. *N Engl J Med* 1980;302:365B70.
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and
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Alexander D. Langmuir Prize Manuscript Award

*Risk of Bacterial Meningitis in
Children with Cochlear Implants.*
J. Reefhuis, M.A. Honein, C.G. Whitney,
S. Chamany, E.A. Mann, K.R. Biernath, K. Broder,
S. Manning, S. Avashia, M. Victor, P. Costa,
O. Devine, A. Graham, C. Boyle

Donald C. Mackel Memorial Award

Joseph J. Amon and X. Guoliang

Outstanding Poster Presentation

Myrna Charles

Philip S. Brachman Award

Jim Alexander

Distinguished Friend of the EIS Award

(Presented by the EIS Alumni Association)

David Sencer

Paul C. Schnitker International Health Award

Tracey Creek

Iain C. Hardy Award

Tim Uyeki
Montse Soriano-Gabarro

James H. Steele Veterinary Public Health Award

Jennifer McQuiston

J. Virgil Peavy Award

Lori A. Pollack

Alexander D. Langmuir Prize

Philip Brachman (EIS '54)
Christine Branche (EIS '88)
Jose Cordero (EIS '79, President)
Alan Hinman (EIS '65, Chair)
Michael Landen (EIS '95)
Kayla Laserson (EIS '97)

Donald C. Mackel Award

Lauren Lewis (EIS '99)
Patricia Mueller
Balasubr Swaminathan

Poster Award

Janet Blair (EIS '98)
Renee Maciejewski
Cynthia Ogden (EIS '94, Chair)
Linda Valleroy (EIS '91)

Paul C. Schnitker Award

Claire Broome (EIS '77)
Lisa Cairns (EIS '96)
Doug Hamilton (EIS '91, ex officio)
Rubina Imtiaz (EIS '84)
Steve Jones (EIS '69)
Linda Quick (EIS '95)
Alexander Rowe (EIS '94)
Brad Woodruff (EIS '87, chair)

Iain C. Hardy Award

Susan Chu (EIS '87)
Stephen Hadler (EIS '77)
Alison Mawle
John Modlin (EIS '73)
Gina Mootrey (chair)

James H. Steele Veterinary Public Health Award

David Ashford (EIS '94)
Peter M. Schantz (EIS '74)
Kate Glenn (EIS '96)
Nina Marano
Carol Rubin (EIS '90)

J. Virgil Peavy Award

Ileana Arias
Rob L. Lyeria (EIS '95)
Jeffrey J. Sacks (EIS '79)
David J. Sencer (EIS '75)
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54TH ANNUAL EPIDEMIC INTELLIGENCE CONFERENCE April 11-15, 2005

Centers for Disease Control and Prevention
Atlanta, Georgia

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This year ALL continuing education credits for the Epidemic Intelligence Service (EIS) Conference will be issued through the CDC/ATSDR Training and Education Online System. You must go to the Online System to complete the session evaluations in order to receive credit.

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- Go to the CDC/ATSDR Training and Continuing Education Online at <http://www.phppo.cdc.gov/phtnonline/>. If you have not registered as a participant, click on **New Participant** to create a user ID and temporary password; otherwise click on **Participant Login** and login.

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A message will come up with information about the conference. You may choose to go right to the evaluation. Answer each of the questions listed and then click on **Submit**.

You will have 30 days (until 11:59PM EST on May 15, 2005) from the date of the Conference to complete and submit your on-line evaluations. Evaluations will not be accepted after this date.

Once the evaluation is submitted, you will be redirected to the **Participant Services** page. From there, you can view your transcript and certificate.

If you experience any problems completing the evaluation, please contact OWCD using the contact information above.

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 Grant, Juliana, MD, MPH
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 Haley, Clinton, MD
 Hlavsa, Michele, BSN, MPH
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 Huang, Angela, MD, MPH
 Huot, Rebecca, PhD
 Jarman, Dwayne, DVM, MPH
 Jung, Michael, MD, MPH, MS
 Jordan, Hannah, MD
 Joseph, Djenaba, MD, MPH
 Kapella, Bryan, MD, MS
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 Kutty, Preeti, MBBS, MD, MPH
 Lazarus, Carrie, PhD(c), MS
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 Liang, Jennifer, DVM, MPVM
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 Nguyen, Trang, PhD(c), MPH
 Novak, Ryan, PhD, MS
 Ortiz, Justin, MD
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 Patel, Ami, PhD(c), MPH
 Patel, Manisha, MD
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 Schaffzin, Joshua, MD, PhD
 Schmitz, Ann Marie, DVM, MA
 Schumacher, Sandra, MD, MPH
 Skarbinski, Jacek, MD
 Sosa, Lynn, MD
 Soud, Fatma, PhD(c)
 Stern, Eric, MD
 Suchdev, Parminder, MD, MPH
 Tak, Sangwoo, ScD(c), MPH
 Tao, Min, PhD(c), MM
 Thompson, Nicola, PhD(c), MS
 Voetsch, Andrew, PhD(c), MPH
 Wallengren, Kristina, PhD, MPH
 Weiser, Thomas, MD, MPH
 Wendel, Arthur, MD, MPH
 Yanni, Emad, MBCh, MS
 Yuan, Jean, MD, MPH
 Zapata, Lauren, PhD(c), MSPH

Monday, April 11, 2005
Session A – Ravinia Ballroom
8:30 a.m. – 10:15 a.m.

Let the Games Begin: A Tapestry of EIS Presentations
 Moderators: Julie L. Gerberding and
 Stephen B. Thacker

**More for the Money? Differences in the
 Prevalence of Adult Obesity by Income
 Level – United States, 1999-2002**
8:35 a.m.

Authors: Allison A. Hedley, C. Ogden

Background: The high prevalence of obesity among adults is one of the leading health issues in the United States. In 1999-2002, the prevalence of adult obesity was significantly higher among non-Hispanic blacks than among non-Hispanic whites and Mexican-Americans. It is often assumed by the general public that obesity is a greater problem among low-income than high-income groups. This study examines the prevalence of obesity within racial/ethnic groups to determine if significant differences exist by income level. The results could influence the design of public health programs to reduce obesity.

Methods: Using data from 6,997 adults aged 20 years and older in the National Health and Nutrition Examination Survey (NHANES) 1999-2002, differences in the prevalence of adult obesity by income level within age (20-49 years, 50 years and older), sex, and racial/ethnic (non-Hispanic white, non-Hispanic black, Mexican American) groups were tested using the t-statistic at a 0.05 level. Obesity was defined as a body mass index (BMI, weight/height² (kg/m²)) of 30.0 or greater. The poverty-income ratio (PIR), the ratio of self-reported income to the U.S. poverty threshold, was used to define low (<130%), middle (130-350%), and high-income (>350%) groups.

Results: No significant differences were found between low and high-income females for any age and racial/ethnic group. For males, significant differences in the prevalence of obesity between the low-income and high-income groups were found only among Mexican American males aged 20-49 years (22.7 vs. 38.5 percent) and non-Hispanic black males aged 50 years and older (22.5 vs. 39.6 percent).

Conclusions: The prevalence of obesity among low-income adults does not exceed that of high-income adults. Public health interventions for obesity should target all income levels.

Key words: obesity, body mass index, income, poverty

**Consistent Condom Use and Risk of
 Human Immunodeficiency Virus (HIV)
 Infection – Botswana, 2000-2004**
8:55 a.m.

Authors: Allan W. Taylor, T. Creek, T. Roels,
 M. G. Alwano, R. Moatshe, R. Molosiwa, D. Fleming,
 P. Kilmarx

Background: National estimates suggest that over 25% of adults (age 15-49) in Botswana are infected with HIV. National prevention efforts promote condom use among other strategies. The impact of this approach has been questioned, and population-level condom effectiveness data are needed to guide prevention efforts.

Methods: We analyzed anonymous cross-sectional data from national voluntary HIV counseling and testing system visit records, 2000-2004 (N=90,820). We used multivariate logistic regression to model the association of self-reported consistent condom use ("always" compared to "sometimes/never" in recent months) with HIV infection among strata defined by sex, marital status, age, and number of recent sex partners, controlling for year, education and reason for testing. We used a hierarchical backward elimination procedure to explore interactions.

Results: Overall, 39% of women and 32% of men in the sample tested HIV-positive; 45% of women and 49% of men reported consistent condom use. The unadjusted odds ratio (OR) for infection in consistent condom users was 0.61 (95% Confidence Interval [CI] 0.60-0.63). Controlling for confounders, the adjusted OR (AOR) remained significant at 0.72 (95% CI 0.69-0.74). Odds of HIV infection were decreased with consistent condom use in almost all strata, with larger decreases in men, unmarried persons, and those <25 years old. However, consistent condom use increased the odds of infection among married individuals 25 years old (20.1% of the study population)(AOR=1.13 [1.01-1.26]).

Conclusions: These data demonstrate that consistent condom use was associated with decreased HIV infection overall and support the continued promotion of condoms to prevent HIV transmission in Botswana. Complementary prevention efforts should be strengthened for older married individuals, in whom condom use may be associated with an unmeasured risk factor.

Key words: HIV infection, HIV epidemiology, Condom use, Botswana, cross-sectional studies, sexual behavior

All Roads Lead to Roma: Multi-State Outbreak of Salmonella Braenderup Infections Associated with Roma Tomatoes — Northeastern United States, 2004
9:15 a.m.

Authors: Sundeep K. Gupta, S. Montgomery, C. Snider, D. Burmeister, M. Perch, M. Balasegaram, J. Lockett, V. Kistler, B. Miller, K. Waller, K. Nalluswami, M. Moll, C. Sandt, D. Krouse, P. Gadani, E. Gould, M.K. Cichon, US FDA, C. Braden

Background: Salmonella causes approximately 1.4 million foodborne illnesses and 600 deaths annually in the United States. We investigated a multi-state outbreak of Salmonella Braenderup, one of three simultaneous roma tomato-associated Salmonella outbreaks in 2004.

Methods: We defined cases as infections of *S. Braenderup* with the outbreak pulsed-field gel electrophoresis pattern, with onset date after June 15, 2004. A case-control study was conducted among persons aged 15 – 60 years; controls were enrolled through sequential digit dialing using case-patient area codes. Applying meal information obtained from case-patients and controls, restaurant managers were asked about cheese, lettuce, and tomato varieties in dishes consumed.

Results: We identified 125 cases of *S. Braenderup* in 16 states. The median age was 30 years (range, 1 day to 84 years); 65 (66%) were female. Onset of illness ranged from June 18 to July 21, 2004. We enrolled 38 case-patients and 79 controls in the study. Case-patients were more likely than controls to have eaten out multiple times during the five days preceding illness (53% vs. 34%, OR – 2.1, 95% confidence interval (CI) – 1.0-4.7). Analysis suggested a link between cheese, lettuce and tomatoes eaten out and illness, but did not reveal any significant associations. We obtained food variety information from restaurants for 27 case-patients and 29 controls. Roma tomatoes (41% vs. 14%, OR – 4.1, 95% CI – 1.1-15.3) were the only exposure significantly associated with illness. A traceback investigation of the three simultaneous roma tomato-associated outbreaks converged on a single tomato packing house. Environmental investigation is ongoing.

Conclusions: Roma tomatoes were implicated as the vehicle of this large outbreak. Further understanding of tomato contamination during production and processing is needed to prevent future outbreaks.

Key words: Salmonella infections, tomato, outbreaks, fruits

Surveillance for Epidemic Disease Among Internally Displaced Persons — Darfur, Sudan, 2004
9:35 a.m.

Authors: Ondrej Mach, T. Handzel, M. Brennan

Background: Since December 2003, approximately 1.2 million persons have been displaced throughout Darfur, Sudan. Crowded conditions and poor sanitation contribute to risk for widespread epidemic disease. In May 2004, the World Health Organization and the Sudanese Ministry of Health established a weekly clinic-based Early Warning and Response Network (EWARN) to detect outbreaks and measure disease incidence. We conducted this analysis to understand the dynamics of communicable diseases during humanitarian emergencies and to evaluate the ability of EWARN to detect outbreaks.

Methods: We analyzed EWARN data collected from internally displaced persons (IDPs) living in 56 camps during May–October 2004 to determine the leading causes of morbidity and mortality.

Results: A total of 455,922 conditions and 1,586 deaths were reported through EWARN. Leading causes of morbidity were acute respiratory infections (76,311, 16.7%) and malaria (72,363, 15.9%). Malaria accounted for the most deaths among persons aged >5 years (116, 12.2%), followed by acute jaundice (105, 11.0%). The leading causes of mortality among children aged <5 years included severe malnutrition (138, 21%), malaria (55, 8.5%); and measles (36, 5.6%). EWARN detected an outbreak of hepatitis E, involving 8,910 IDPs; an outbreak of meningitis involving 70 persons; and 12 cases of acute flaccid paralysis, 10 of which were confirmed as wild poliovirus infections. Notification of these outbreaks occurred <1 week from onset.

Conclusions: The epidemiological situation in Darfur is within expectations for conditions of massive displacement when compared with similar situations in the past. Data from EWARN was extensively utilized to guide public health response among non-governmental organizations and donors. EWARN successfully detected outbreaks. Poliomyelitis cases in previously polio-free area highlight gaps in vaccination coverage.

Key words: surveillance, disease outbreak, Sudan, communicable diseases

Botulism Related to Cosmetic Injections of Botulinum Toxin Type A — Florida, 2004.
9:55 a.m.

Authors: Daniel S. Chertow, E. Tan, J. Schulte, E. Bresnitz, R. Weisman, J. Bernstein, S. Marcus, C. Braden, S. Maslanka, J. Malecki, A. Alonso, S. Kumar

Background: On November 27, 2004, four cases of suspected botulism with a possible link to cosmetic botulinum toxin injections were reported to CDC by Florida and New Jersey facilities. Botulism is a potentially lethal paralytic disease caused primarily by toxins of the anaerobic, spore-forming bacterium, *Clostridium botulinum*. Botulinum toxin A has recently become widely used for cosmetic and therapeutic purposes. The only Food and Drug Administration (FDA) approved formulation of this drug is BOTOX®. No laboratory-confirmed cases of botulism have been attributed to cosmetic or therapeutic botulinum toxin injections.

Methods: An epidemiologic investigation conducted by local, state, and national officials included patient and clinic staff interviews, medical record review, and examination of the medical facility in question. Mouse bioassay neutralization tests were performed on patient specimens.

Results: The epidemiologic investigation revealed a single link between the four patients: botulinum toxin injections for cosmetic purposes. No further associated cases of botulism were identified. Investigators identified a likely source of botulism toxicity, a highly concentrated botulinum toxin A that was not an FDA-approved product and was not intended for human use. Results from the mouse bioassay neutralization tests confirmed botulism type A in three of four patients. Pretreatment serum from the fourth, epidemiologically linked case was not available for testing.

Conclusion: Results of this investigation reveal the first documented cluster of botulism related to cosmetic injections of botulinum toxin A. Only one company is licensed to distribute botulinum toxin A for human use in the United States. Marketing and sale of botulinum toxin A from other sources for human use can result in severe illness.

Key Words: BOTOX®, botulism, botulinum toxin A, toxicity

Monday, April 11, 2005
Session B
Ravinia Ballroom
10:45 a.m. – 12:15 p.m.

We Can Work it Out: Occupational Safety & Health
Moderator: John Howard

Workplace Homicide — Alaska, 1990-2003
10:50 a.m.

Authors: Rebecca S. Noe, J. Lincoln

Background: Homicide is the third leading cause of death in the workplace in the U.S. Annually there are approximately 870 workplace homicides with taxi drivers and police officers at highest risk. Nationally, 85% of workplace homicides are categorized as criminal intent, 8% worker-on-worker with the remaining categorized as client/customer or personal relationship outside the workplace. This study will describe and categorize workplace homicides in Alaska and identify high risk groups.

Methods: Data were abstracted from the National Institute for Occupational Safety and Health's Alaska Occupational Injury Surveillance System (AOISS). AOISS data sources include reports from state troopers and medical examiners.

Results: Forty workplace homicides were identified in Alaska from 1990-2003. Victims were male (93%, n=37), Caucasian (85%, n=34), with a median age of 38 years (range 16-63). The greatest number of workplace homicides occurred to taxi drivers (n=8) and police officers (n=7). Fifty percent (n=20) of the homicides occurred in urban census areas. Thirty percent (n=12) occurred in rural census areas and of these, 67% (n=8) of the victims lived at their workplace (e.g. fishing vessels, logging camps). A firearm was used in 88% (n=35) of the homicides. Workplace homicides were categorized as criminal intent 60% (n=24), worker-on-worker 15% (n=6), personal relationship 13% (n=5), customer/client 10% (n=4) and unknown 2% (n=1).

Conclusions: Compared nationally, Alaska has a similar pattern of occupations at risk for workplace homicide but a higher proportion of incidents categorized as worker-on-worker. Jobs which place workers together in remote conditions for extended periods of time pose unique challenges to workplace violence prevention. Maintaining a safe workplace through training management and staff on how to respond to conflict and potential violence is warranted.

Key words: homicide, occupational, Alaska, workplace, violence

**Pneumoconiosis Mortality—
United States, 1968—2000**
11:10 a.m.

Authors: Vinicius C. Antao, G. Pinheiro, J. Wood, M. Attfield

Background: Pneumoconioses are irreversible lung diseases caused by the inhalation of coal mine dust, silica, asbestos, and other mineral dusts. Disability and premature deaths are frequently associated with these conditions. The National Institute for Occupational Safety and Health maintains surveillance of pneumoconiosis mortality, which is important to provide historical perspective on mortality, to assess the effectiveness of preventive measures, and to target disease-management and preventive intervention resources.

Methods: Mortality data from 1968—2000 were drawn from national vital statistics records as either underlying or contributing cause of death using International Classification of Diseases (ICD 8, 9 and 10) codes for coal workers' pneumoconiosis (CWP), silicosis, asbestosis, and unspecified/other pneumoconiosis. Age-adjusted death rates (per million population per year) for periods of interest were calculated by using the mid-year population as a denominator. Age standardization was performed by using the 2000 U.S. Census population.

Results: During 1968—2000, pneumoconiosis was recorded on 124,846 death certificates. Comparing 1968—1981 with 1982—2000, death rates among males declined 36% for CWP and approximately 70% for both silicosis and unspecified/other pneumoconiosis, but increased nearly 400% for asbestosis. The geographic distribution of mortality rates for the two study periods indicate that asbestosis increased substantially throughout the United States, particularly in the coastal states, where asbestos was used frequently in shipbuilding.

Conclusions: The overall burden of CWP and silicosis in the U.S. has decreased over the last 30 years, reflecting both fewer workers exposed and the efficacy of dust control measures. In contrast, asbestosis mortality has increased, largely a legacy of increased use of asbestos from 1940 through the 1970s, given the long latency period of the disease.

Key words: pneumoconiosis, surveillance, mortality

**Exposure to Unsuspected *Brucella suis*
Isolates in a Microbiology Laboratory**
— Louisiana, 2004
11:30 a.m.

Authors: Peter J.E. Vranken, G. Balsamo, C. Jones-Nazar, R. Ratard

Background: Although *Brucella* is notable for its potential use as a bioterrorism agent, brucellosis often occurs naturally. Unsuspected *Brucella* has been reported to cause laboratory outbreaks with attack rates of 30%-100%. In July, 2004, an unsuspected case of natural *Brucella suis* infection was identified in a Louisiana microbiology laboratory. We investigated to assess laboratory worker exposure and to review incident management.

Methods: We defined high-risk exposure as handling the *Brucella* isolates without appropriate safety precautions. We administered a questionnaire to all laboratory workers about their routine activities, exposure to the *Brucella* isolates, use of chemoprophylaxis and serologic testing, and evidence of brucellosis.

Results: Of 13 workers, two were determined to be unexposed, a housekeeper and a maintenance worker. The remaining 11 were technical staff exposed through routine laboratory procedures (e.g. inspecting and inoculating plates, preparing subcultures and slides) without observing appropriate precautions (e.g. using a biological safety hood, laboratory coat, mask, or gloves). In addition, eight admitted routinely sniffing culture plates to assist identification; three (27%) admitted sniffing the *Brucella suis* plates. Two (18%) declined postexposure prophylaxis; nine (82%) started doxycycline and rifampicin a median of 20 days after the midpoint of the exposure period. Seven (78%) completed 4 weeks of treatment; two (22%) discontinued treatment early; five (56%) reported side effects of treatment. All received *Brucella suis* serologic testing, with initial tests performed a median of 20 days after the midpoint of the exposure period; all tests were negative. No active disease occurred.

Conclusion: In this incident, immediate and adequate response to *Brucella* exposure might have averted infection and disease. Similar incident investigations should be conducted to confirm the effectiveness of these interventions.

Key words: brucellosis, *Brucella*, exposure, laboratory, prophylaxis

**Headache and Dizziness in Cosmetology
School Students – California, 2004**
11:50 a.m.

Authors: Austin D. Sumner, E Katz, B Materna, G Windham

Background: Cosmetologists working in poorly ventilated work stations are at risk for developing acute symptoms of central nervous system intoxication. In August 2004, a cosmetology student notified the California Department of Health Services about several students reporting frequent headaches, dizziness, and unsanitary work conditions at a cosmetology school. A public health investigation was initiated to establish the source and extent of the problem and to suggest prevention measures.

Methods: We conducted a cross-sectional survey and an industrial hygiene (IH) evaluation on November 18, 2004. Symptom frequency was compared between students assigned to the customer service area (CSA), which was thought to be the source of symptom development, and the classroom. The IH evaluation included an inspection and limited air sampling. Carbon dioxide (CO₂) >1000 ppm was used as an indicator for inadequate ventilation.

Results: All 72 students attending class during the investigation completed a survey. Students working in the CSA (n=62) reported all 12 symptoms more frequently than those working in the classroom (n=10), with 52 (84%) reporting headache, 25 (40%) reporting dizziness, 23 (37%) reporting eye irritation, and 22 (36%) reporting nose irritation compared with four (40%), zero, two (20%), and one (10%), respectively. Students working in the CSA were significantly more likely to report headache and dizziness (Fisher's Exact Test p-value <0.01). Air sampling in the customer service area indicated peak CO₂ levels of 1650 ppm, compared with peak CO₂ levels of 935 ppm in the classroom.

Conclusion: Students developed headaches and dizziness that were associated with working in the customer service area, where CO₂ sampling indicates inadequate ventilation. To reduce symptoms, we recommend increasing outside air ventilation and other control measures.

Key Words: occupational health, hair preparations, cosmetics, ventilation, occupational medicine

**Monday--Wednesday Poster Session
Meet the Authors
Ravinia Ballroom
12:30 p.m. - 1:30 p.m.**
Posters #1-14

**Poster Number 1
A Large Outbreak of Cryptosporidiosis and
Escherichia coli O111 Infections Associated
with Consumption of Unpasteurized
Apple Cider — New York, 2004**

Authors: Fatima Coronado, G. Johnson, M. Kacica, M. Lurie, A. Teal, T. Root, S. Zansky, P. Calkins-Lacombe, D. Simmerly, T. Halse.

Background: Pasteurization of apple cider is federally required for commercial distribution but not for direct-to-consumer sales by orchards. In fall 2004, an increase in gastrointestinal illness was reported among persons who consumed unpasteurized apple cider from a New York orchard. We investigated to determine the outbreak's extent and implement control measures.

Methods: Confirmed case-patients were persons with 1) diarrhea (>3 loose stools/24 hours), 2) history of visiting or consuming foods produced at the orchard during September 1–October 15, and 3) laboratory evidence of Shiga-toxin I, *Escherichia coli* O111, or *Cryptosporidium parvum* in stool. Suspect cases met criteria 1 and 2 only. An unmatched case-control study was conducted using random-digit-dialing. Controls were healthy persons who visited the orchard or consumed orchard products during this period. Remaining cider and environmental samples from equipment surfaces and stools from nearby calves were collected.

Results: We identified 57 confirmed and 156 suspect cases; median age was 24 years (range: 1–77); 120 (56%) were female. Among confirmed case-patients, 30 (53%) had *C. parvum*; 14 (25%) had *E. coli* O111; 12 (21%) had both; one case-patient (2%) had Shiga-toxin I only. The case-control study included 23 confirmed case-patients and 46 controls. Eighteen (82%) case-patients versus eight (26%) controls reported drinking cider from the orchard (odds ratio=12.1; 95% confidence interval=3.3–49.8). Cider and environmental samples yielded fecal coliforms; however, *E. coli* O111 and *C. parvum* have not yet been identified. Stools from two calves were Shiga-toxin I positive on preliminary testing.

Conclusions: To our knowledge this is the first documented outbreak of *E. coli* O111 associated with unpasteurized cider. Proper handling, including pasteurization of all direct-to-consumer cider, could prevent such outbreaks.

Key words: *Escherichia coli* O111, *Cryptosporidium parvum*, unpasteurized apple cider

Poster Number 2
Resistance on the Rise: Outbreak of
Multidrug-Resistant Salmonella
Typhimurium DT104 Linked to Ground Beef
– Northeastern United States, 2003-2004

Authors: Amy M. Dechet, E. Scallan, K. Gensheimer, J. Gunderman-King, R. Hoekstra, J. Lockett, D. Wrigley, G. Beckett, D. Heisey-Grove, L. Wotherspoon, L. Anderson, B. Jensen, K. Marschner, K. McNamara, J. Greenblatt, R. Marcus, K. Holmes-Talbot, G. Johnson, D. Schoonmaker-Bopp, D. Morse, T. Cooper, D. Sizemore, D. Itani, L. Finck, S. Giguere, F. Ramsey, W. Chege, S. Van Duynne, J. Sobel

Background: Multidrug-resistant Salmonella Typhimurium Definitive Type 104 (DT104) emerged in the 1990's and is associated with higher morbidity and mortality than non-resistant S. Typhimurium. While the pathogen is increasingly common in human isolates, it rarely causes outbreaks. In late 2003, 31 cases of DT104 infections with indistinguishable pulsed-field gel electrophoresis (PFGE) patterns were identified in five northeastern states.

Methods: Case finding was performed by searching a national database for identical PFGE patterns. A case-control study assessing exposures compared 28 cases to 74 age- and geographically-matched controls. Evaluation of consumer purchasing information and suppliers of grocery stores aided with a traceback of implicated food.

Results: The outbreak caused 56 illnesses in eight states. Of study patients, 39% were hospitalized for a median of four days. Tested isolates were resistant to ampicillin, chloramphenicol, streptomycin, sulfamethoxazole, and tetracycline (R-type ACSSuT). Cases had more medical co-morbidities than controls (OR=4.0, 95% CI 1.6-10.2). Illness was associated with consuming store-bought ground beef prepared as a hamburger at home (OR=5.4, 95% CI 2.0-14.7) and with eating raw ground beef ($p < 0.001$ by Fischer's Exact Test). Over 40% of cases, but no controls, ate raw ground beef. A traceback linked cases to a single large producer of ground beef that was previously implicated in a multistate outbreak of highly resistant Salmonella Newport infections in 2002. This producer processes culled dairy cows from herds throughout the country as its main source of beef.

Conclusions: This first multistate outbreak of highly resistant S. Typhimurium DT104 from store-bought ground beef underscores the need for improvements in prudent antimicrobial use in animals, animal health surveillance, beef processing and pathogen reduction, product tracking, and consumer education to prevent illnesses.

Key words: Salmonella Typhimurium; drug resistance, multiple; Salmonella food poisoning; meat; risk factors

Poster Number 3
Salmonella-Rians at the Gate: The Fall of
the Roma Empire? Multi-state Outbreak of
Salmonellosis Associated with
Consumption of Roma Tomatoes—
July 2004

Authors: Amy DuBois, E. Staples, N. Koram, D. Bixler, C. Clark, L. Edwards, K. Larson, A. Jani, S. Nowicki, S. York, E. Brandt, P. Jenkins, J. Lockett, A. Weltman, V. Dato, K. Waller, L. Meloro, US Food and Drug Administration Team, M. Lynch

Background: Salmonella causes 1.4 million infections in the United States each year. Fresh produce is increasingly identified as the source of salmonellosis. Because mechanisms of produce contamination are poorly understood, produce safety interventions are ill defined. In July 2004, we investigated a multi-state outbreak of salmonellosis associated with eating at Deli Chain A.

Methods: Cases were identified through state health department surveillance. To ascertain the cause of the outbreak we conducted a case-control study and a product traceback investigation. Cases were culture-confirmed salmonellosis in persons who had eaten at Deli Chain A June 28–July 26, 2004. Controls were well meal-companions of case-patients. Traceback activities included visits to tomato processors, farms and packers.

Results: We identified 429 cases in nine states; 30% of patients were hospitalized, no patients died. Salmonella isolates included serotype Javiana (383) and 4 other serotypes. We enrolled 169 cases and 83 controls in the case-control study. Among 53 case-patients matched to a meal-companion control, 90% consumed pre-sliced roma tomatoes compared to 48% of their controls (Matched odds ratio=11, $p < 0.0001$). Traceback identified four possible sources of roma tomatoes from three states; of these sources, one packing shed was identified as a possible source for two other concurrent roma tomato-associated salmonellosis outbreaks. Operations at the time of visits met FDA's current good manufacturing practice guidelines. Although potential sites of contamination were identified, effective interventions could not be defined.

Conclusions: Contaminated roma tomatoes were responsible for a large, multi-state outbreak of salmonellosis. Current practice guidelines are insufficient to prevent contamination. Further research is critically needed to determine how Salmonella may contaminate fresh tomatoes and to identify interventions that can maximize produce safety.

Key words: Salmonella, tomatoes, outbreak, produce

Poster Number 4
Methicillin-resistant Staphylococcus aureus
in Two Neonatal Intensive Care Units —
Washington, DC, 2004

Authors: Sukhminder K. Sandhu, Singh, N., Sprague, B., Temple, R., Donegan, N., Cherian, Z., Pic-Aluas, L., Yuan, C., Sisk, M., Glymph, C., Berry, K., J Davies-Cole

Background: Methicillin-resistant Staphylococcus aureus (MRSA) contributes substantially to morbidity and mortality in infected neonates. On October 20, 2004, the District of Columbia Department of Health was notified of a MRSA outbreak at one neonatal intensive care unit (NICU). Prior studies indicate up to 50% mortality in infected neonates, warranting an immediate public health response to this outbreak.

Methods: After notification of an increase in MRSA-positive isolates at one NICU, an investigation was launched identifying another facility with a MRSA outbreak among neonates. Data on patient demographics, infant transport lists, staff rotation lists and specimens for molecular testing were obtained from both NICUs. NICUs conducted staff and environmental testing. Patient medical charts were also reviewed. An outbreak case was defined as a MRSA positive test occurring in a patient or staff member at NICU-A and/or NICU-B during September 1, 2004–November 30, 2004. Repetitive sequence Polymerase Chain Reaction (Rep-PCR) fingerprinting was used to determine if the outbreaks in the two NICUs were associated with a common strain.

Results: During the outbreak, 52 MRSA cases were identified, 44.2% at NICU-A (20 infants and 3 staff) and 55.8% at NICU-B (28 infants and 1 staff). Of 33 isolates typed, 68.9% (22, 17 in NICU-A and 5 in NICU-B) belonged to a single clone group. The first isolate from the most prevalent clone was obtained at NICU-B on September 30, 2004. Although environmental testing was negative, and the source of the infection remained unidentified, active surveillance, cohorting of infants and staff, mupirocin therapy and education prevented further spread at NICU-A.

Conclusions: MRSA can spread rapidly within and between NICUs, as demonstrated by Rep-PCR. Understanding MRSA transmission dynamics facilitates prevention.

Key words: Methicillin-resistant Staphylococcus aureus, Neonatal Intensive Care Unit, infants, molecular epidemiology

Poster Number 5
Outbreak of Cutaneous Bacillus cereus
Infections among Cadets at a Military
University — Georgia, 2004

Authors: Carrie M. Shuler, K. Arnold, M. Salter, C. Drenzek, J. Noble-Wang, A. Hoffmaster, J. Gee, P. Wilkins, J. Jordan, R. Morey, M. Daneshvar, A. De, M. Arduino

Background: Outbreaks of primary cutaneous B. cereus infections in immunocompetent persons have never been reported. In August 2004, the Georgia Division of Public Health was notified by a military university of 97 cadets with cutaneous head lesions after orientation week; three of three cultured lesions grew B. cereus. We investigated risk factors for infection to prevent future outbreaks.

Methods: We conducted a cohort study by using a self-administered questionnaire to 660 cadets who were asked about their demography, hygiene, and participation in orientation events. Environmental samples were collected from shared equipment, sites of common events, and personal items belonging to affected cadets. Bacterial isolates were characterized by biochemical analysis. We evaluated risk factors for infection by multivariate logistic regression.

Results: Of 97 cadets who had been treated with oral antibiotic therapy for head lesions in August and September, 89 (96%) had a short haircut on the first day of orientation week; 33 (39%) were in Headquarters Company; and all had participated in at least one orientation event. Cadets who had a haircut on the first day of orientation (AOR = 21; 95% CI = 5.0–90.1), shared sunscreen (AOR = 3.1; 95% CI = 1.5–6.3), and were in Headquarters Company (AOR = 8.3; 95% CI = 2.9–23.5) had the highest likelihood of developing head lesions.

Conclusions: Certain exposures (e.g., shared housing, orientation events, and sunscreen) might have resulted in widespread transmission of B. cereus infections among military cadets. Our investigation indicated that trauma to the scalp from a short haircut, followed by use of sunscreen, might compromise the skin and promote B. cereus infection in immunocompetent persons.

Key Words: Bacillus cereus, military university, cutaneous infection, immunocompetent

Poster Number 6
Joint Public Health and Law Enforcement
Investigation of Tularemia after the
Republican National Convention —
New York City, 2004

Authors: Benjamin W. Tsoi, E. Lee, S. Slavinski, L. Lee, J. Ackelsberg, M. Layton

Background: One week after the Republican National Convention (RNC), the New York City (NYC) Department of Health and Mental Hygiene (DOHMH) laboratory diagnosed tularemia in a 21-year-old female resident of Staten Island. Given the recent RNC and that *Francisella tularensis* is a Category A terrorism agent, NYCDOHMH jointly investigated this case with the NYC Police Department (NYPD), using a recently established protocol.

Methods: NYCDOHMH staff and a plain-clothes female NYPD detective jointly interviewed the patient and family regarding potential risk exposures. To enhance reporting, NYCDOHMH notified NYC medical and veterinary providers about the case. Active surveillance at all Staten Island hospitals for unexplained cases of pneumonia, sepsis, or acute respiratory distress syndrome was implemented. Dead rabbits found in Staten Island were tested for tularemia.

Results: No other human tularemia cases were identified. The joint interview indicated that the probable source of exposure was the patient's dog, which had caught two wild rabbits in a nearby park 7–10 days before the patient's illness onset and which had most likely licked the patient's face upon returning home. No aspects of this case indicated an intentional cause. Four of eight dead rabbits collected from the park frequented by the patient's dog tested positive for tularemia.

Conclusions: Although this isolated tularemia case after the RNC was most likely acquired naturally, through indirect exposure to an infected rabbit, the joint investigation ensured that no unusual aspects of this case were overlooked. The NYC joint investigation protocol should be a model for other jurisdictions to ensure collaboration between public health and law enforcement personnel when investigating potential terrorism-related cases.

Key words: tularemia, terrorism, laboratories, rabbits, transmission

Poster Number 7
Evaluation of Alternative Methods for
Characterizing Air Quality to Estimate
Population Exposures—Wisconsin

Authors: Dawn H. Burmeister, M. Bekkedal, V. Boothe, W. Daley, D. Sagaram, P. Calame, M. Werner, H. Anderson

Background: Five percent of six million annual hospital admissions for cardiovascular disease in the United States can be attributed to airborne particulate matter (PM_{2.5}). Air monitors rarely provide daily PM_{2.5} measurements and few are located in rural areas. This study evaluates if EPA's Community Multi-Scale Air Quality (CMAQ) model can be used to classify exposure among sensitive populations when spatial and temporal gaps in air monitoring data exists.

Methods: CMAQ output was used to compute a county-wide PM_{2.5} estimate and compared to average PM_{2.5} concentration estimates from air monitors within the same or adjacent counties for six Wisconsin counties. To compare differences in exposure classification we defined unhealthy exposure as a daily PM_{2.5} concentration estimate of >40.4 µg/m³, and used air monitoring data as the gold standard. Cardiovascular disease hospitalization cases were aggregated at the county level and exposure status was assigned using the CMAQ model and air monitoring data for Milwaukee County.

Results: The correlation between CMAQ PM_{2.5} concentration estimates and air monitoring data ranged from 0.71 to 0.80. Milwaukee County had the greatest mean difference [3.42 µg/m³, 95% CI=2.79-4.04]; of cases who were exposed according to the monitor, 81.6% would have been categorized as exposed using CMAQ, and of those who were unexposed, 98.2% would have been so categorized by CMAQ.

Conclusions: In these Wisconsin counties, CMAQ PM_{2.5} estimates correlated moderately with monitor readings. In the county with the greatest mean difference, exposure classification of cardiovascular cases was similar using CMAQ and air monitors. These findings suggest that CMAQ can address the spatial and temporal gaps of air monitoring data making it a valuable tool for studies exploring the relation between cardiovascular disease and PM_{2.5}, and for nationwide environmental surveillance networks.

Keywords: Cardiovascular disease, air pollution

Poster Number 8
Family History: Its Link with Coronary Heart
Disease, Related Conditions, and
Risk-Reducing Behaviors

Authors: Shauna Lyn, W. Whitworth, H. McGruder, M. Scheuner, P. Yoon

Background: Heart disease is the leading cause of death in the United States; coronary heart disease (CHD) causes about 70% of those deaths. Family history, which reflects the interacting genetic and nongenetic factors that contribute to CHD, can help identify high-risk individuals who may benefit from lifestyle changes.

Methods: We analyzed data from a 2003 consumer mail survey that questioned 4,035 adults about their personal and family medical histories and disease-reducing behaviors. To classify respondents' familial risk for CHD (weak, moderate, or strong), we assessed the number and type of affected relatives (e.g., first- or second-degree relative with early or late CHD onset). We used multivariate logistic regression and adjusted for demographic variables (age, race, sex, marital status, education, and income) to ascertain how familial risk for CHD was associated with having CHD, CHD-associated conditions (diabetes, hypertension, hypercholesterolemia, obesity), and risk-reducing behaviors (visiting health professionals and checking blood pressure, cholesterol, and blood sugar).

Results: Individuals with strong familial CHD risk (31%) were more likely than those with a weak risk (57%) to have CHD (odds ratio [OR]=4.4, 95% confidence interval [CI]=3.1-6.0), hypercholesterolemia (OR=1.7, 95% CI=1.4-1.9); diabetes (OR=1.7, 95% CI=1.3-2.0), and hypertension (OR=1.6, 95% CI=1.4-1.9), and to be obese (OR=1.5, 95% CI=1.2-1.8). They also were more likely to have visited a health professional within the year (OR=1.5, 95% CI=1.1-1.9) and to have been tested for diabetes and elevated cholesterol (OR=1.6, 95% CI=1.4-1.9; OR=2.2, 95% CI=1.7-2.8). We found no substantial demographic variations.

Conclusion: Strategies for identifying persons with strong familial CHD risk should be investigated for their potential to strengthen clinical monitoring and promote lifestyle changes and early treatment.

Key words: cardiovascular disease, family history, risk factors

Poster Number 9
Age-related Eye Diseases and Visual
Impairment – United States, 2002

Authors: Asel Ryskulova, K. Turczyn

Background: Although age-related eye diseases (ED) and associated visual impairment (VI) are important causes of disability in the United States, and the economic and societal cost of ED exceeds \$68 billion annually, very limited national data on prevalence of ED and VI exist. To better understand the burden of ED and VI, a study analyzing new 2002 National Health Interview Survey (NHIS) vision data was conducted.

Methods: The NHIS, a nationally representative household survey, was used to estimate prevalence of selected ED and VI by demographic characteristics and by vision and diabetes status. SUDAAN was used to account for the complex survey design. Estimates among socio-demographic groups were compared using two-tailed statistical tests at the 0.05 level. Results: In 2002 among US adults 18 years and older, the estimated prevalence rates for selected ED were: cataract - 8.6%, glaucoma - 2.0%, macular degeneration - 1.1%, and diabetic retinopathy - 0.73%. The prevalence of diabetic retinopathy among persons with diabetes was 9.9%. About 30.1% of persons with cataract, 33.1% of persons with glaucoma, 50.4% of persons with macular degeneration, and 52.1% of persons with diabetic retinopathy reported VI. The prevalence of ED increased significantly with increasing age, particularly in people over age 65. Age-adjusted prevalence of ED was higher among women, adults with diabetes, adults with low income, and adults with less than a high school education than their respective counterparts.

Conclusions: This study presents new national data on self-reported prevalence of selected ED and VI. With the aging of the population, the number of Americans with major eye diseases will likely increase, and vision loss become an even greater public health problem.

Keywords: diabetic retinopathy, cataract, glaucoma, macular degeneration, visual impairment, National Health Interview Survey

Poster Number 10
Complementary and Alternative Medicine
Use among Adults with Diagnosed
Diabetes—United States, 2002

Authors: Sharon H. Saydah, M. S. Eberhardt

Background: In 2002, over 60% of adults used some form of Complementary and Alternative Medicine (CAM), which includes acupuncture, herbs, and healing prayer. It is unclear how CAM may or may not affect the treatment of the 13 million people in the U.S. with diagnosed diabetes. This study investigates the pattern of CAM use among adults with diagnosed diabetes in the U.S.

Methods: We used cross-sectional data from the 2002 National Health Interview Survey obtained for adults with diagnosed diabetes over 18 years of age (n = 2,517). We compared the characteristics of CAM users and non-users, and examined the most prevalent types of CAM using SUDAAN to account for the complex survey design.

Results: In 2002, 76.5% (Standard Error [SE] 1.19) of adults with diabetes reported use of some form of CAM, although only 6.9% (SE 0.75) reported use specifically for diabetes. Among respondents who used CAM in the past 12 months, 22.0% (SE 1.28) reported telling their conventional health care professional about CAM use. Women were more likely to report CAM use in the past 12 months (84.3%, SE 1.3) compared to men (68.4%, SE 1.8; $\chi^2 p < 0.001$). There was no significant difference of in overall use by age, race/ethnicity, education, duration of diabetes or type of diabetes treatment. Biologically based CAM was common among adults with diabetes: 68.2% (SE 1.2) used megavitamins, 22.5% (SE 1.1) used natural herbs and 7.4% (SE 0.7) used specific diet.

Conclusions: CAM use among adults with diagnosed diabetes in the U.S. is common, especially among women. Health care providers should query their diabetes patients for use of CAM since use may impact diabetes management.

Key words: diabetes, alternative medicine, adults, national health interview survey

Poster Number 11
High Seroprevalence and Active Infection
with Schistosomiasis and Strongyloidiasis
in the Lost Boys of Sudan Refugee Group –
Arizona, 2004

Authors: Brian G. Blackburn, D. Posey, M. Weinberg, L. Ortega, M. Wilson, K. Won, K. Sanders-Lewis, W. Secor, E. Flagg, B. England, R. Jones, G. Briggs, J. Stewart, J. Gibbon, S. Santana, D. Campos-Outcalt, R. Woods, J. Maguire

Background: Schistosomiasis and strongyloidiasis are serious diseases that afflict hundreds of millions of people worldwide. Prevalence of these parasitoses in many refugee groups is unknown because stool and urine examinations are insensitive and infrequently performed. A novel application of more sensitive serologic tests assessed seropositivity, active versus past infection, and infecting schistosome species during an evaluation of abdominal pain reported among resettled Lost Boys of Sudan (LBOS) at their 2004 reunion in Phoenix, Arizona.

Methods: All consenting LBOS answered questions about symptoms and were tested by enzyme-immunoassay for schistosomiasis (seroprevalence) and strongyloidiasis (active infection, given that untreated infection is lifelong), an *S. mansoni* antigen assay (active infection), and schistosomiasis immunoblot (speciation).

Results: Of 462 LBOS, 203 (43.9%) and 214 (46.3%) were seropositive for schistosomiasis and strongyloidiasis, respectively. Forty-eight (10.4%) persons had *S. mansoni* antigenemia, indicating active infection of at least moderate intensity. Immunoblot testing (n=21) indicated 12 persons (57.1%) infected with *S. mansoni*, 2 (9.5%) with *S. haematobium*, 4 (19.0%) with both, and 3 (14.3%) with neither. There was no association between potential clinical indicators of these parasitoses (e.g., abdominal pain, hematuria, hematochezia, diarrhea, cough, dyspnea, rash, or fever) and schistosomiasis seropositivity, *S. mansoni* antigenemia, or strongyloidiasis.

Conclusions: Many LBOS had active schistosomiasis and strongyloidiasis, despite leaving Africa several years earlier. These dramatic seroprevalence data, combined with the evidence of ongoing active infection and lack of clinical indicators, support presumptive treatment of all LBOS. These laboratory methods could also be used to determine the parasitic burden for other refugee populations. Current refugee policies inadequately address testing/treatment for these diseases; these data support reevaluation of such policies for all refugees from schistosomiasis or strongyloidiasis endemic areas.

Key Words: Schistosomiasis, strongyloidiasis, refugees, abdominal pain

Poster Number 12
Costly Adverse Reactions to Lymphatic
Filariasis Treatment – Leogane, Haiti, 2004

Authors: Natasha S. Hochberg, MC. Michel, P. Lammie, E. Mathieu, A. Direny, M. Beauderochars and D. Addiss

Background: Six million Haitians are at risk for lymphatic filariasis, a parasitic disease that causes limb-disfiguring elephantiasis. Annual mass drug administrations can eliminate infection, but drug-induced parasite death can cause adverse reactions (ARs). As repeated drug administrations reduce infection prevalence, AR incidence should decrease. In Leogane, Haiti, however, AR symptoms continue to occur; treating them costs the program greatly. We investigated symptoms following the fifth drug administration to determine whether they were true ARs, and if not, whether AR treatment could be withdrawn and funds redirected.

Methods: This cross-sectional study selected five representative health facilities. During the 2004 drug administration, persons who sought AR treatment were administered questionnaires and underwent blood tests for filarial antigen (indicating active infection.)

Results: At the five sites, 3,781 persons took anti-filarial medication. Of these, 314 (8.3%) returned seeking care for AR symptoms (most common: headache (36%), dizziness (28%) and gastrointestinal complaints (28%)); 294 consented to blood tests. Only 47 (16%) persons had evidence of filarial infection, and infection was not significantly associated with any symptom. Of 150 (48.1%) persons reporting ARs that interfered significantly with daily activities, 137 (91%) reported they would take anti-filarial medication if AR treatment were unavailable. Overall, 228 (73%) said they would take anti-filarial medication even if charged for AR treatment.

Conclusions: In 2004, persons with AR symptoms after mass drug administration were unlikely to have filarial infection. Free AR medicine may motivate people reporting symptoms and seeking treatment, but charging for AR treatment would not discourage those with ARs from participating in future drug administrations. The \$12,000 for treating ARs in Leogane alone could be redirected to provide anti-filarial medication to 31,000 additional Haitians.

Key words: filariasis; filaricides; helminth antigens; Haiti; adverse drug reaction reporting system

Poster Number 13
Knowledge, Attitudes, and Practices
Regarding Latrine Utilization as Part of a
Trachoma Control Program – Ethiopia, 2004

Authors: Rosalyn E. O'Loughlin, P. Emerson, G. Fentie, B. Flannery

Background: In Ethiopia, 60-85% of children have active trachoma, an infection that can cause blindness. Latrine use reduces the number of flies that transmit trachoma. A Carter Center-supported educational program in one district in Ethiopia recently yielded an increase in reported household latrine coverage from 7% to 58%. We sought to verify latrine presence and assess knowledge, attitudes, and practices regarding latrines.

Methods: This cross-sectional survey included households in eight randomly-selected counties in one intervention district. We selected a systematic random sample of 20 households from each kebele using lists of individuals reported as having latrines. We interviewed the head (or representative) of each selected household to establish knowledge and attitudes regarding latrines and we examined latrines to determine use. When possible, we interviewed neighbors with no latrines for comparison.

Results: Of 160 listed households selected, 129 (81%) were visited. Of these, 111 (88%) had a latrine and 100 (78%) were being used. In addition, 15 neighbors without latrines were visited, totaling 144 households overall (111 with and 33 without latrines). Cleanliness (56/144, 39%) and health benefits (44/144, 31%) were reported as the main advantages of latrines. Nearly all respondents with no latrine (29/30, 97%) recall being advised to build one, but their main reason for not doing so was lack of manpower (11/30, 37%). Latrines were used by 94% (32/34) of town dwellers listed versus 72% (68/95) of rural dwellers listed, (p=0.007).

Conclusion: We verified the presence and utilization of latrines and recommend that similar latrine promotion programs be replicated in other districts. Further efforts to promote latrines should focus on rural areas and on providing assistance for those unable to build their own.

Keywords: Trachoma control program, latrines, Ethiopia, KAP study

Poster Number 14
Risk of Secondary Transmission from
Imported Lassa Fever — New Jersey, 2004

Authors: Esther T. Tan, N. Karabulut, M. Bell, P. Aufiero, S. Shah, D. Rumowitz, C. Tan, C. Robertson, B. Piepszak, J. Nsubuga, M. Guerra, M. Cetron, S. Shapiro, S. Zaki, T. Ksiazek, E. Bresnitz

Background: Lassa fever (LF) is a viral hemorrhagic fever endemic in regions of West Africa. Although importation of LF into developed countries is rare, each imported case still raises concerns because of the perception of high risk for person-to-person transmission and possible use in bioterrorism. In August 2004, the risk of secondary transmission of LF was assessed in an investigation of a laboratory-confirmed person who traveled from West Africa to New Jersey.

Methods: We identified persons who might have been exposed to the case-patient or his body fluids. Contacts were categorized as high-risk if they had direct, unprotected exposure to the case-patient's body fluids during his illness. All other contacts were categorized as low-risk. To detect secondary cases, all contacts were monitored for temperature of 38.3 C (101 F) twice daily for 21 days after their last potential exposure to the case-patient.

Results: A total of 188 contacts were identified. Five (3%) family members had high-risk exposures. The remaining 183 (97%) persons had low-risk exposures; of these, nine were family members, 139 were health-care and laboratory workers, and 19 were passengers who traveled on the same flight as the case-patient. At the end of the surveillance period, no symptomatic secondary cases were identified.

Conclusions: Our findings, consistent with previous exposures in health care facilities in developed countries, indicate a low risk of secondary transmission of imported LF, even with high-risk exposures. This study suggests that Lassa virus may not pose a substantial public health risk in the United States. Additional research is needed to identify factors that protect against symptomatic disease in developed countries.

Key words: Lassa fever, viral hemorrhagic fevers, Arenaviridae, emerging infections, travel

Monday, April 11, 2005
Session C
Ravinia Ballroom
1:30 p.m. – 3:00 p.m.

Surf's Up!: Leisure & Hobby-Associated Investigations
 Moderator: Laura J. Fehrs

Travel and Tribulations: An Explosive
Outbreak of Legionellosis among Guests of
a Hotel—Oklahoma, 2004
1:35 p.m.

Authors: Lauri A. Hicks, L. Burnsed, L. Smithee, B. Fields, R. Benson, N. Pascoe, S. Richards, L. Littrell, K. Bradley, S. Mallonee, M. Moore

Background: Legionellosis is caused by the bacteria Legionella and encompasses Pontiac fever (PF), a flu-like illness, and Legionnaires' disease (LD), a severe pneumonia. Approximately 21% of legionellosis cases are travel-associated, but most of these go undiagnosed. We investigated a large outbreak among visitors to an Oklahoma hotel in March 2004 to identify the source of the outbreak and to evaluate the use of diagnostic tests for PF.

Methods: We evaluated guests and employees who were exposed to the hotel from March 15-22. PF was defined as fever or chills and > one symptom including headache, cough, dyspnea, myalgias, vomiting, or diarrhea. LD was defined as radiograph-confirmed pneumonia with laboratory confirmation of Legionella infection. Urine and paired sera were collected on consenting symptomatic and asymptomatic persons. We tested swimming pool and whirlpool specimens for Legionella using polymerase chain reaction (PCR).

Results: Of 317 respondents, 107 (34%) met either legionellosis case definition. Exposure to the pool and whirlpool were associated with increased risk for legionellosis (relative risk [RR] 3.2, 95% confidence interval [CI] 2.4-4.4; RR 2.8, 95% CI 2.1-3.8, respectively). We observed a dose-response trend among those exposed to the pool area (<2 hours, RR 2.5; >4 hours RR 67.3, p<0.01). Among those who met the PF case definition, urinary antigen was 32.4% and 100% sensitive and specific, respectively; serology was 42.0% and 91.2% sensitive and specific, respectively. Specimens from the pool and whirlpool were PCR positive for Legionella.

Conclusions: Our investigation identified the pool and the whirlpool as sources for the outbreak, which resulted in disinfection and control measures. Legionella urinary antigen and serology are sufficiently sensitive and specific to be used to identify PF outbreaks.

Key words: legionellosis, Pontiac fever, Legionnaires' disease, infections Legionella pneumophila

International Outbreak of Shigella sonnei
among Airline Passengers –
Honolulu, Hawaii, August 2004
1:55 p.m.

Authors: Kate Gaynor, B. Kanenaka, R. Colindres, E. Mintz, P. Kalluri, P. Kitsutani, M. Nakata, S. Wedel, D. Boxrud, D. Jennings, H. Yoshida, N. Tosaka, S. Y. Park, P.V. Effler

Background: Approximately 10 million airline passengers depart Honolulu annually, and air travel is increasingly implicated in infectious disease transmission. On September 2, 2004, the Hawaii Department of Health was notified that air travelers from Honolulu developed diarrhea; stool cultures yielded Shigella sonnei. We investigated this international outbreak to determine the source and extent of illness.

Methods: Confirmed cases were defined as S. sonnei isolation and probable cases as reported diarrhea in air travelers departing Honolulu during August 22-24. Shigella isolates were compared by pulsed-field gel electrophoresis (PFGE). Case-finding identified affected flights. We conducted a cohort study of all passengers on one of these flights and random cross-sectional surveys of another two. Investigation of the caterer servicing affected flights included site visits, interviews, and stool collection.

Results: Forty-four confirmed patients from four countries and 22 U.S. states traveled on 12 flights. Diarrhea was reported by 138 (41% [114 probable, 24 confirmed]) of 334 passengers surveyed on affected flights. PFGE patterns for 39 cases were closely related. The caterer provided 2,700 meals for the 12 flights. Salad consumption was significantly associated with diarrhea (relative risk=6.4, 95% confidence interval=3.0-13.9). The only salad component present on all 12 flights was raw carrots. Caterer site visits identified food hygiene deficiencies. All employees denied illness; their stool specimens did not yield Shigella.

Conclusions: Raw carrots were the probable vehicle for Shigella in this outbreak. With 2,700 meals served on known affected flights and the 41% attack rate, we estimate this event resulted in at least 1,100 persons having diarrhea. This investigation highlights the potential for rapid global spread of illness from a point source contamination at a major airline hub.

Key words: diarrhea, foodborne, Shigella sonnei, outbreak, airline, international

Scombroid from Escolar Consumption –
Washington, 2004
2:15 p.m.

Authors: Eric M. Sergienko, L. Kidoguchi, K. Lofy, J. Hofmann

Background: Scombroid is caused by consuming fish contaminated by bacteria that produce histamine. Illness occurs shortly after consumption, resulting in an allergy-like reaction that usually resolves within hours; hospitalizations and death have been reported in association with scombroid. Contamination results from improper refrigeration of various fish, including escolar. In November 2004, we investigated an escolar-associated scombroid outbreak involving a cooking class to detect cases, identify the source of the fish and prevent further cases.

Methods: All affected class participants were surveyed by telephone using questions regarding foods eaten during class, symptom onset and treatment. A case was defined as a person who had at least one symptom of histamine intoxication (flushing, numbness, hives or itching) within 24 hours of the meal. A trace-back was conducted to identify the source of escolar and to obtain samples for testing.

Results: We interviewed 23 of 24 (95.8%) class participants. All respondents had eaten escolar. Twelve (52.2%) experienced symptoms of scombroid, all within 1 hour of ingesting escolar. Flushing (10/12) was most common, followed by headache (9/12) and hives (8/12). Five class participants sought healthcare; four took over-the-counter medications. Trace-back identified other contaminated fish of the same lot from a common wholesaler. Histamine was detected in escolar samples. The wholesaler advised distributors to return or dispose of unsold product.

Conclusions: We investigated an outbreak of escolar-associated scombroid. Histamine production occurs whenever fish temperatures exceed safe limits. In this case, contamination may have occurred anywhere from capture of escolar to handling by the wholesaler. Better strategies should be developed to ensure that adequate chilling starts early, as soon as the fish is caught, and continues to point of delivery.

Keywords: marine toxins, scombrotoxin, scombroid histamine poisoning

A Massive International Outbreak of Gastroenteritis with Multiple Etiologies among Resort Island Visitors and Residents – Ohio, 2004
2:35 p.m.

Authors: Ciara E. O'Reilly, A. Bowen, N. Perez, N. Osborn, J. Wertenbach, S. Young, Ohio Department of Health, Ohio Environmental Protection Agency, Ohio Department of Agriculture, J. Sarisky, C. Shepherd, M. Miller, B. Hubbard, M. Herring, S. Buchanan, C. Fitzgerald, C. Bopp, L. Browne, V. Hill, M. Arrowood, L. Xiao, E. Mintz, M. Lynch

Background: The implementation of treated municipal water systems in the 20th century led to dramatic declines in waterborne disease in the US. However, communities with deficient water systems may experience waterborne outbreaks. In August 2004, we investigated an outbreak of gastroenteritis on South Bass Island, Ohio, an island of 900 residents that receives >500,000 visitors each year.

Methods: To identify the source of illness, we conducted a case-control study and environmental investigation. A case was defined as diarrhea in a person who traveled to the island between May 16 and August 8 and became ill within two weeks of the visit. Well travel companions served as matched controls. An environmental assessment and extensive testing of island water sources was performed, including use of a novel ultrafiltration water collection system developed at CDC.

Results: Of the 1,450 persons reporting illness, *Campylobacter jejuni*, norovirus, *Giardia intestinalis*, and *Salmonella* Typhimurium were identified in 16, 9, 3, and 1 persons, respectively. We interviewed 100 cases and 117 matched controls. Cases were more likely than controls to drink water on the island (68% cases, 35% controls, matched odds ratio 4.3; 95% confidence interval 2.2-9.3). Water supply was from a municipal surface water system and ground water wells. Sampling of ground water wells indicated contamination with multiple fecal microbes, including *Escherichia coli*, *Campylobacter jejuni*, *Salmonella* spp, and *Giardia* spp. Irregularities in sewage disposal practices that could have contaminated the underground aquifer were noted.

Conclusions: The combined epidemiological and environmental investigation indicated that sewage-contaminated ground water was the likely source of this large outbreak. Changes to the island's water supply and sewage management infrastructure will be implemented based on this investigation.

Key words: Gastroenteritis, campylobacter, norovirus, outbreak, ground water, sewage

Monday, April 11, 2005
Session D

Ravinia Ballroom
3:15 p.m. – 5:20 p.m.

I've Got You Under My Skin: Vaccine Preventable Diseases
Moderator: Melinda Wharton

Risk Factors for Death from Invasive Pneumococcal Disease – United States, 2001-2003
3:20 p.m.

Authors: Deron C. Burton, C. Greene, M. Kyaw, N. Barrett, N. Bennett, K. Gershman, R. Lynfield, S. Ray, W. Schaffner, C. Whitney

Background: *Streptococcus pneumoniae* is a leading cause of pneumonia and bacterial meningitis. Pneumococcal polysaccharide vaccine (PPV) can prevent invasive pneumococcal disease (IPD) in elderly and immunocompetent persons with certain underlying illnesses, but vaccine coverage and efficacy in some groups remain low. We sought to identify IPD patients at greatest risk of dying to focus primary prevention efforts.

Methods: We identified persons > 18 years with IPD in six sites through CDC's Active Bacterial Core Surveillance/Emerging Infections Program Network during 2001-2003. IPD was defined as isolation of pneumococcus from a normally sterile site. Outcome, demographics, vaccine history, and underlying conditions were collected from medical records, provider questionnaires, and patient interviews. We generated adjusted relative risk (ARR) estimates for risk factors for death using log binomial regression. We used chi square to compare vaccination between subgroups of patients.

Results: Among 1,885 patients enrolled, overall case fatality rate (CFR) was 16%. Among immunocompetent persons with a vaccine indication (n=787), CFR was 19%. In multivariate analysis, risk factors for death included age ≥ 80 (ARR=2.0, 95% Confidence Interval [CI]=1.4-2.9), nursing home residence (ARR=1.8, CI=1.2-2.5), history of intravenous drug use (ARR=2.1, CI=1.3-3.4), and history of alcohol abuse (ARR=1.5, CI=1.1-2.3); previous PPV vaccination was not significantly associated with death. Prior PPV receipt was significantly lower among intravenous drug users and alcohol abuse patients as a group (26/216 [12%]) compared to elderly patients and nursing home residents as a group (114/245 [47%]; p<0.001).

Conclusions: To enhance primary prevention among groups at highest risk for death from IPD, efforts to improve vaccine coverage and efficacy should target the elderly and potentially underserved groups such as intravenous drug users and persons with alcohol abuse.

Key words: *Streptococcus pneumoniae*, pneumococcal infections, risk factors, death

Evaluation of Meningococcal Vaccination Practices Among Colleges and Universities – Maryland, 2004
3:40 p.m.

Authors: Amanda D. Castel, G. Reed, D. Blythe, M. Davenport, C. Hammond

Background: *Neisseria meningitidis* can cause life-threatening illnesses (e.g. meningitis and bacteremia), resulting in death in approximately 10% of cases. The incidence of *N. meningitidis* is higher among college students living on campus than among those residing off campus. In 2000, Maryland became the first state to require meningococcal vaccination or a waiver for students living in on-campus housing at institutions of higher learning. Neither a formal assessment of the Maryland law, nor a review of the methods employed by institutions regarding its enforcement had been conducted. This project evaluated the policies and practices that Maryland educational institutions have implemented in response to the law.

Methods: A standard questionnaire was mailed to administrators at all Maryland colleges and universities with on-campus housing (N = 32). We evaluated information from the questionnaires regarding institutional requirements, methods for information dissemination, vaccination and waiver coverage, accessibility concerns, and barriers to vaccination. The frequencies of practices, vaccination coverage, and waiver rates were determined.

Results: Twenty-seven institutions responded (response rate: 84%), representing a student population of 114,802 students. Nineteen institutions (70%) required meningococcal vaccination or waiver solely because it was mandated by Maryland law. In 2003-4, the median vaccination coverage among students living on campus at these institutions was 68.0% (range: 6.3%-100%). The median waiver rate among students living on-campus was 11.8 % (range: 0.2%-60.7%).

Conclusions: The establishment of mandatory vaccination laws does not ensure uniformity with respect to implementation by institutions. Vaccination coverage is partially dependent on institutional policies and practices. Guidelines based on effective policies and practices should be developed and provided to institutions of higher learning.

Key words: *Neisseria meningitidis*, vaccination policy, universities, colleges, students

Invasive Haemophilus Influenzae Disease in the Era of Hib Vaccine – United States, 1998-2002
4:00 p.m.

Authors: Michelle A. Chang, M. Farley, L. Harrison A. Reingold, A. Craig, R. Lynfield, N. Barrett, K. Stefonek, N. Bennett, K. Gershman, E. Zell, S. Bernhardt, G. Barnett, S. Schmink, N. Rosenstein for the ABCs/Emerging Infections Program Network

Background: *Haemophilus influenzae* (Hi) type b was historically a major cause of disease in children <5 years old. Since 1990, introduction of Hib vaccine successfully decreased Hib disease by 95%, but raised concern about emergence of other pathogenic Hi serotypes. To address these concerns and strengthen Hi disease elimination strategies, we evaluated serotype trends and epidemiology.

Methods: Cases were identified from 1/01/1998-12/31/2002 using active, population-based surveillance representing approximately 12% of the U.S. population. A case was defined as isolation of Hi from normally sterile sites from a surveillance area resident; cases were categorized by serotype as b, non-b serotypes, and nontypeable. We used general linear models to assess rate trends, and the Chi-squared test to compare observed proportions.

Results: We identified 2,106 cases of Hi. Median age was 61 years (range <1 -110 years); overall, 45% of patients were ≥ 65 years old. Case-fatality ratio (CFR) was 16% and was higher in ≥ 65 year olds than <2 year olds (23% vs. 9%, p<0.001). Pneumonia was the most common syndrome occurring in 49% of all cases. Of 1,743 with serotype results, 6% were serotype b, 25 % non-b, and 69% nontypeable. Within ≥ 65 age group, 72% of cases were due to nontypeable Hi. From 1998-2002, the rate of Hib decreased from 0.11 to 0.02 per 100,000 population (R²=0.86, p=0.02); rates of non-b serotypes (0.33 to 0.36) and nontypeables (0.76 to 0.80) did not change (R²=0.35 and 0.32).

Conclusions: Widespread use of Hib vaccine has not precipitated emergence of other Hi serotypes. Hi burden is now in adults among whom most disease is due to nontypeables. Future prevention and control strategies should address the role of nontypeables in adults.

Key words: *Haemophilus influenzae*, epidemiology, *Haemophilus influenzae* type b, vaccines

Projected Cost-Effectiveness of Rotavirus Vaccination of Children – Asia
4:20 p.m.

Authors: Laura Jean Podewils, L. Antil, E. Hummelman, J. Bresee, U. Parashar, R. Rheingans

Background: New rotavirus vaccines may soon be licensed and decisions regarding their implementation will likely be based on the health and economic benefits of vaccination. We examined the cost-effectiveness of introducing rotavirus vaccines in Asia, the region accounting for approximately 40% of the estimated 440,000 annual deaths from rotavirus worldwide.

Methods: We estimated cost-effectiveness of vaccination at various hypothetical vaccine prices by using published estimates of rotavirus disease incidence, healthcare expenditures, vaccine coverage rates, and vaccine efficacy.

Results: Without a rotavirus vaccination program, an estimated 1.9 million Asian children will be hospitalized, 13.5 million will require an outpatient visit, and 171,000 will die from rotavirus diarrhea by the time the Asian birth cohort reaches 5 years of age. The medical costs associated with these events approximate \$191 million; however, the total burden would be higher with the inclusion of societal costs, such as lost productivity. A universal rotavirus vaccination program could avert approximately 1.4 million hospitalizations, 7.7 million outpatient visits, and 109,000 deaths among these children. Based on medical costs alone, the breakeven price for a two-dose rotavirus vaccine is \$0.18, \$1.46, and \$15.20 among low-, middle-, and high-income Asian countries, respectively. However, vaccination could be considered cost effective at higher prices, depending on the country's income level and the cost-effectiveness standard.

Conclusions: A vaccine could avert a substantial proportion of the disease burden and associated healthcare costs of rotavirus disease in Asia and could be cost effective. Decisions regarding vaccine implementation should be based not only on whether the intervention is cost saving but also on the value of preventing rotavirus morbidity and mortality, particularly in low-income countries with great disease burden.

Key words: viral disease, prevention, immunization, cost analysis, health policy

Investigation of Deaths and Serious Illnesses Following Influenza Vaccination – Michigan, October 2004
4:40 p.m.

Authors: Alison M. Rue, S. Lyn, J. Blostein, J. Iskander, P. Gargiullo, S. Shadomy, J. Seward, R. Chen

Background: Millions of elderly and chronically ill persons are vaccinated against influenza annually. In October 2004, a Michigan long-term care facility (LTCF) reported 4 deaths and 4 serious illnesses among 114 recent influenza vaccinees; all had received vaccine from the same lot (lot A).

Methods: We conducted a retrospective cohort study of LTCF residents during October, 2004, to assess if deaths and hospitalizations following influenza vaccination were associated with lot A. We compared the incidence rates for death and hospitalization within two weeks of influenza vaccination for recipients of lot A, recipients of another lot used in the facility (lot C), and unvaccinated residents. We also reviewed medical records from the initial case series, and the Food and Drug Administration (FDA) tested residual vaccine from lot A, including biological, chemical and physical analysis, and inspection for tampering.

Results: Of the 140 residents in the LTCF during October, 90 were vaccinated with lot A, 24 with lot C, 19 were unvaccinated, and 7 had unknown status. Risk of death or hospitalization was not significantly different between lot A and Lot C recipients (IRR=0.78, 95% CI=0.21-2.8); moreover, compared to not being vaccinated, vaccination with lot A or lot C was not associated with death or hospitalization (lot A IRR=1.2, 95% CI=0.3-4.3; lot C IRR=1.5, 95% CI=0.3-7.5). Medical record reviews showed no common clinical syndrome; onset intervals (1-11 days) did not cluster after vaccination. Laboratory safety testing of lot A revealed no differences from FDA vaccine standard.

Conclusions: There was no increased risk of death or hospitalization among persons vaccinated with lot A. Rapid investigations of potential adverse events are important for ensuring vaccine safety. Key words: influenza vaccine, cohort studies, skilled nursing facilities, vaccine safety

Bacterial Meningitis in the United States – 2002-2003
5:00 p.m.

Authors: Michael C. Thigpen, N. Rosenstein, C. Whitney, R. Lynfield, M. Farley, A. Craig, J. Hadler, L. Harrison, K. Gershman, N. Bennett, A. Thomas, A. Reingold, A. Schuchat for the ABCs/Emerging Infections Program Network.

Background: Bacterial meningitis is a feared illness often killing or disabling otherwise healthy people. In the United States bacterial meningitis declined 55% after introduction of childhood Haemophilus influenzae type b conjugate vaccine in 1990. Measures to prevent other etiologies of meningitis have subsequently been introduced. We analyzed population-based surveillance data on bacterial meningitis to identify potential effects of these interventions.

Methods: Meningitis was defined as isolation of H. influenzae, Streptococcus pneumoniae, group B streptococcus (GBS), Listeria monocytogenes, or Neisseria meningitidis from cerebrospinal fluid or other normally sterile site if associated with clinical meningitis in a resident of one of nine Active Bacterial Core surveillance areas in 2002-2003 (population ~ 25 million persons). We compared incidence and case characteristics with previously published surveillance data from 1995.

Results: In 2002-2003, 781 bacterial meningitis cases occurred, including 126 (16%) deaths. Median age of meningitis patients, 39 years, was higher than in 1995 (25 years). Incidence was lower in 2002-2003 compared to 1995 (1.6 cases vs. 2.4 cases/100,000 population, $p < 0.05$). Projecting to the U.S. population, approximately 4450 cases and 720 deaths occurred annually nationwide. Meningitis rates were highest among children < 2 months of age (54.0 cases/100,000 population); case-fatality was highest among elderly (28% 65+ years vs. 4.8% < 2 months, $p < 0.05$). Among adults, only 18% had immunocompromising conditions. S. pneumoniae accounted for the greatest proportion of cases (61%) followed by N. meningitidis (16%), GBS (14%), H. influenzae (7%), and Listeria (2%).

Conclusions: Rates of bacterial meningitis have decreased, but the syndrome remains deadly. Prevention in children has shifted more of the bacterial meningitis burden to adults. Strategies to prevent adult disease should be considered.

Key Words: Bacterial meningitis, Haemophilus influenzae, Streptococcus pneumoniae, group B streptococcus, Listeria monocytogenes, Neisseria meningitidis

**Tuesday, April 12, 2005
Concurrent Session E1
Ravinia Ballroom
8:30 a.m. – 10:15 a.m.**

Strangers in the Night: HIV and STDs
Moderators: John Douglas and Rob Janssen

Can Data from Programs for the Prevention of Mother-to-Child Transmission of HIV be used for HIV Surveillance? – Kenya, 2003
8:35 a.m.

Authors: Nicole Seguy, W Hladik, E Munyisia, L Marum, O Bolu

Background: In countries with a HIV prevalence $> 1\%$, antenatal clinic (ANC)-based HIV surveillance using unlinked-anonymous testing (UAT) without informed consent provides essential data for program planning. Prevention of mother-to-child transmission (PMTCT) services are expanding, but it is unknown whether PMTCT-based HIV prevalence estimates could replace those from UAT surveys. In Kenya, we evaluated the utility of PMTCT data for surveillance.

Methods: Demographic and HIV-test data from PMTCT logbooks during a UAT surveillance period were compared with UAT survey data. Data were pooled; logistic regression was used to assess determinants of HIV testing acceptance for PMTCT. HIV prevalence among PMTCT refusers was estimated as $((\# \text{ UAT HIV-positive}) - (\# \text{ PMTCT HIV-positive})) / ((\# \text{ UAT-tested}) - (\# \text{ PMTCT-tested}))$.

Results: Of 39 ANC-UAT sites, six had PMTCT data in 2003. PMTCT data were recorded in three logbooks, lacked standardization, and varied in quality. For PMTCT, 2,239 women were offered HIV testing and 1,258 (56%) accepted; for UAT, 1,852 women were sampled. The median HIV prevalence in the UAT survey was 12.8% compared with 14.4% in PMTCT programs. In five of six clinics, PMTCT-based HIV prevalence was higher than UAT-based HIV prevalence. Acceptance of HIV testing for PMTCT ranged from 48% to 69% across clinics, was more likely among primigravidae (71.5%) than multigravidae (63.4%, $P = 0.003$) but was not associated with client age. Estimated HIV prevalence was lower among PMTCT refusers (10.4%) than PMTCT acceptors (18.7%, $P < 0.001$).

Conclusion: Because of varying levels of HIV testing acceptance for PMTCT and the difference in HIV prevalence among test refusers and acceptors, PMTCT-based HIV prevalence estimates cannot reliably replace UAT-based ANC surveillance. The varying quality of PMTCT logbook data presents another challenge to its use for surveillance.

Key words: HIV surveillance, HIV program data, prevention of mother-to-child transmission, Kenya, unlinked anonymous testing

HIV Transmission among Black Male College Students Who Have Sex with Men – North Carolina, 2003
8:55 a.m.

Authors: Linda Ahdieh-Grant

Background: In May 2003, the North Carolina Department of Health identified an increase in reported HIV cases in black college men who have sex with men (MSM) and in November 2003 asked the Centers for Disease Control and Prevention to help investigate. Few studies have been conducted in this population.

Methods: A case-control study was conducted to identify behavioral risk factors for HIV infection. Case-participants were defined as black MSM students aged 18–30 years diagnosed with HIV during 2001–2003. Control-participants were HIV-negative black MSM students aged 18–30 years and were recruited during HIV pre- or post-test counseling activities at health departments and gay nightclubs. Face-to-face interviews were conducted with all participants. Eighteen of 49 eligible case-participants and 19 control-participants were interviewed.

Results: Median participant age was 21 years. No key behavioral differences were noted between the groups. Median number of lifetime sex partners was 20 for case-participants and 18 for control-participants ($p>0.05$). For case- and control-participants, respectively, mean numbers of recent steady sex partners were 1.8 and 1.5 and of recent casual sex partners, 3.8 and 3.9 ($p>0.05$). Unprotected anal sex with recent casual sex partners was reported by approximately 40% of case-participants and 33% of control-participants ($p>0.05$). Although 67% and 68% of case- and control-participants reported prior HIV testing, 72% and 63%, respectively, ($p>0.05$) felt they had been at low risk for infection 1 year before diagnosis.

Conclusions: The majority of study participants, both HIV-negative and HIV-positive, reported high-risk sexual behaviors. Despite the prevalence of high-risk behaviors and prior HIV testing, perception of HIV risk was low. These findings highlight the urgent need for enhanced HIV prevention programs for young black MSM.

Key words: HIV, men who have sex with men, college

Labeling Changes Following an Investigation of Inadvertent Administration of a Non-Standard Penicillin Regimen for Syphilis – Los Angeles, 2004
9:15 a.m.

Authors: Michael E. Greenberg, H. Weinstock, B. Bolan, M. Janowski, R. Nelson, J. Heffelfinger

Background: The recommended treatment for syphilis is 2.4 million units of benzathine penicillin G, sold in the United States as Bicillin L-A®. In March 2004, CDC investigated the magnitude and impact of inadvertent use of Bicillin C-R® for syphilis treatment at a Los Angeles (LA) gay and lesbian clinic. Bicillin C-R® contains half of the CDC-recommended dose of benzathine penicillin for syphilis found in the similarly named and packaged Bicillin L-A® and confusion of the two preparations has been documented previously.

Methods: Clinic pharmacy records indicated that Bicillin C-R® was the exclusive formulation of injectable penicillin used between January 1, 1999, and March 4, 2004 (observation period). We reviewed clinic medical records and LA County syphilis case reports to identify patients treated with Bicillin C-R® during this period for confirmed syphilis infection (cases) or for contact with a person known or suspected to have syphilis (contacts). Clinic staff attempted to contact patients by letter, telephone and through press releases to offer syphilis testing and retreatment with a recommended regimen.

Results: Of 441 cases, all were male and 215 (49%) were HIV-infected. Of 229 contacts, five (2%) were female and 10 (4%) were HIV-infected. After six months of case-finding, 281 (66%) cases and 80 (33%) contacts were retested and treated. Nineteen individuals underwent lumbar puncture for serologically-defined treatment failure, and one had been diagnosed with neurosyphilis. Fifty-nine patients refused evaluation.

Conclusions: We documented a practice which affected nearly 700 individuals and the health system that served them. Due to our investigation, CDC initiated discussions with the Food and Drug Administration (FDA). In November 2004, FDA announced prominent warnings and changes in product labeling to Bicillin C-R®.

Key words: syphilis, HIV, medication errors, penicillin, sexually transmitted diseases

HIV Transmission among Black Women – North Carolina, 2004
9:35 a.m.

Authors: Fatu M. Forna, L. Fitzpatrick, E. McLellan-Lemal, P. Leone, D. Williams, W. Chege, J.T. Brooks, G. Marks, S. Knox, A. Greenberg

Background: The human immunodeficiency virus (HIV) epidemic in the United States increasingly affects black, heterosexual women in the South. In 2003, the HIV infection rate for black women in North Carolina was 14 times higher than that for white women.

Methods: A case-control study was conducted to identify epidemiologic and behavioral factors associated with HIV infection among HIV-positive and HIV-negative, 18–40 year old, heterosexually active black women residing in North Carolina. Univariate and multivariate analyses were used to calculate odds ratios (ORs) and adjusted ORs (aORs). Variables that were found to be associated with HIV infection ($P < 0.05$) were included in the multivariate analyses.

Results: Thirty-one HIV-positive and 101 HIV-negative women were enrolled. In univariate analyses, HIV-positive women were significantly more likely to be unemployed; receive public assistance; have 20 or more lifetime sexual partners; have a history of herpes; use crack/cocaine; receive money for sex; and to report a partner with a history of incarceration, but they were less likely to have discussed sexual and behavioral histories with their male partners. In multivariate analyses, HIV-positive women were more likely to have a history of herpes infection (aOR 6.1; 95%CI 1.7, 24.0), and to receive public assistance (aOR 8.1; 95% Confidence Interval [CI] 2.2, 41.6), but they were less likely to have discussed sexual and behavioral histories with their male partners (aOR 0.1; 95%CI 0.02, 0.4).

Conclusions: Findings of both biologic and socio-economic determinants of HIV infection demonstrate the need for a multi-dimensional approach to address HIV transmission in this population. Low levels of communication between sexually active black women and their partners may act as a barrier to sexual and behavioral risk reduction.

Key words: HIV, black women, North Carolina, herpes

Rapid Ethnographic Assessment of HIV/AIDS: Garifuna Communities—Honduras, 2004
9:55 a.m.

Authors: Miriam E. Sabin, G. Luber, K. Sabin, E. Monterroso

Background: Garifuna, an Afro-Caribbean ethnic group in Honduras, have the highest prevalence of HIV/AIDS in Central America (8.4%, general population) but their HIV-related risk behaviors are poorly understood. In 2004, we performed a rapid ethnographic assessment of Garifuna in preparation for a risk behavior and seroprevalence survey to be conducted by CDC and the Honduran Ministry of Health in 2005. Both the assessment and the survey will inform efforts to reduce HIV transmission among Garifuna.

Methods: Seventeen key-informant interviews and three focus groups were conducted with Garifuna stakeholders working on HIV/AIDS. A semi-structured interview guide was used for interviews and focus groups, containing six domains: survey acceptability; acceptability of sensitive questions; awareness of HIV risk factors; gender concerns; migration patterns; and survey logistics. Data were analyzed for convergent and divergent themes within these domains.

Results: Convergent themes indicated that the survey will be acceptable due to high awareness and prevalence of HIV, but only if key stakeholders already working in HIV/AIDS are involved in survey implementation. Validity will be enhanced if the following Garifuna culture-specific factors are addressed: the common and culturally acceptable practice of having multiple sex partners among both genders; transactional sex for food, clothing or money; women's difficulty negotiating safer sex; migration within Honduras and abroad; stigma; poor access to biomedical treatment; and use of traditional healers among villages. Respondents suggested that high HIV/AIDS awareness is not sufficient to reduce risk behaviors.

Conclusions: Rapid qualitative assessment with stakeholders provided information on unique Garifuna traits required for survey development and implementation. To inform effective interventions, a 2005 survey should include stakeholders, questions about stigma, migration, sexual networks and health care use.

Key words: rapid assessment, ethnography, Garifuna, HIV/AIDS, Honduras, Central America

**Tuesday, April 12, 2005
Concurrent Session E2
Dunwoody Suites
8:30 a.m. – 10:15 a.m.**

Gone with the Wind: Respiratory Illnesses
Moderators: Tim Uyeki and Cindy Whitney

**Hantavirus Pulmonary Syndrome —
Randolph County, West Virginia, July 2004
8:35 a.m.**

Authors: Julie R. Sinclair, B. Pavlin, J. Rooney, J. Montgomery, D. Carroll, K. McCombs, J. Mills, M. Bell

Background: Hantavirus pulmonary syndrome (HPS) has a ~ 40% mortality rate and is caused by viruses of the genus Hantavirus. HPS is reported most often in the southwestern United States, but rodent vectors that carry Hantavirus are prevalent throughout the country. In July 2004, two HPS case-patients (one fatality) were identified in Randolph County, West Virginia: a wildlife-science graduate student working locally and a Randolph County resident. We conducted epidemiologic and ecologic investigations to determine potential rodent reservoir species and type of exposure.

Methods: We interviewed family members and colleagues (the surviving case-patient was comatose), reviewed medical records, and conducted environmental studies at likely exposure sites. Rodents were trapped and blood, urine, and tissue samples were submitted to CDC for enzyme-linked immunosorbent assay (ELISA) and reverse transcriptase-polymerase chain reaction (RT-PCR) analyses

Results: Laboratory analyses confirmed that both patients were infected with Monongahela hantavirus, a strain carried by the white-footed mouse, *Peromyscus leucopus*. The student's colleagues reported that he had received multiple rodent bites while trapping in a Randolph County research forest. The Randolph county man's family reported that he had killed several mice by hand at the family cabin; a white-footed mouse trapped outside the cabin was positive by ELISA for IgG antibodies to hantavirus, and RT-PCR identified Monongahela hantavirus. Reportedly, neither man used personal protective equipment when handling rodents.

Conclusion: Other than one retrospectively diagnosed case in 1981, this is the first HPS outbreak reported in West Virginia. The student likely acquired infection through occupational exposure, whereas the Randolph County man likely acquired infection peridomestically. This outbreak emphasizes the need to educate the public throughout the United States regarding Hantavirus risks and disease transmission.

Key words: hantavirus pulmonary syndrome, hantavirus, personal protective equipment, rodents.

**The Burden of Respiratory Syncytial Virus
Infections among Patients Hospitalized with
Pneumonia – Rural Thailand
8:55 a.m.**

Authors: Natalie M. Keeler, A. Fry, M. Chittaganpitch, D. Erdman, M. Simmerman, J. Bresee, L. Anderson, S. Dowell, S. Olsen

Background: Respiratory syncytial virus (RSV) is a major cause of acute respiratory illness among children and can cause severe illness in adults. Few studies have quantified RSV disease burden in developing areas, such as rural Thailand. By defining this burden, vaccine development and implementation strategies can be prioritized in Thailand.

Methods: Population-based surveillance for hospitalized patients with radiographically-confirmed pneumonia has been conducted in all hospitals in Sa Kaeo Province, Thailand since 2002. Between August 2003 and July 2004, we obtained nasopharyngeal swab samples and acute- and convalescent-phase sera from 702 (40%) of 1,738 hospitalized pneumonia patients; 140 (20%) patients were aged <5 years. Patients were considered RSV infected if they had a four-fold rise in serum antibodies or if swabs were RSV positive by reverse transcription-polymerase chain reaction assay.

Results: Five hundred sixty-one (80%) study patients were tested through May, and 28 (5%) had evidence of RSV infection. All cases occurred during August through October, and 21 (75%) and four (14%) cases occurred among children aged <5 and 5-14 years, respectively. RSV accounted for 18% of 117 pneumonia cases among children <5 years old. RSV patients more likely had wheezing than RSV-negative patients (76% vs. 44%, $p < 0.01$). The median length of hospital stay was 5 days (range 1-22). Seven patients required supplemental oxygen; none died. The incidence of RSV pneumonia was 141/100,000 for children aged <1 year, 61/100,000 for children <5 years, and 8.8/100,000 for adults >64 years.

Conclusions: In rural Thailand, RSV is an important cause of pneumonia among children, especially infants. Since RSV is likely to also cause many bronchiolitis hospitalizations, a vaccine could have substantial impact on childhood respiratory hospitalizations in Thailand.

Key words: respiratory syncytial virus, pneumonia, children, Thailand

**Community Outbreak of Legionnaires'
Disease among Nursing Home Residents
and Others — North Carolina, 2004
9:15 a.m.**

Authors: Christina R. Phares, E. Russell, M. Thigpen, M. Crist, W. Service, J. Engel, R. Benson, B. Fields, C. Whitney, M. Moore

Background: In September 2004, a nursing home in western North Carolina reported an outbreak of Legionnaires' disease (LD), a severe pneumonia transmitted by contaminated water aerosols. Because LD clusters may represent continuing common source exposures, prompt investigation is critical. We sought to identify the present source and thus prevent additional cases.

Methods: We conducted case-finding through enhanced surveillance, medical record review (n=131), and community surveys (n=258). We interviewed case-patients and their contacts. We cultured water samples from the nursing home and assayed the air-intake filters for Legionella DNA. We also sampled a cooling tower, the only outdoor aerosol source in the vicinity.

Results: We identified seven cases; two (28%) were fatal. All case-patients had some exposure to the nursing home or surrounding area, which included a cooling tower 305 meters away. Two case-patients had not been inside the nursing home; two other case-patients, bed-bound nursing home residents, lacked exposure to any other environment. We found no Legionella in 60 out of 60 nursing home water samples. Conversely, we found Legionella in all six samples from the cooling tower and Legionella DNA in the nursing home air-intake filters.

Conclusions: Aerosolized Legionella from a cooling tower most likely caused this outbreak. A unique feature of the outbreak is the two nursing home residents who, while confined to their rooms, acquired LD from a relatively remote, community source, as opposed to an immediate nosocomial source. This finding indicates that a cluster of LD cases among institutionalized patients does not necessarily indicate an institutional exposure; LD in such populations may serve as early warning of a community source. Investigation of such outbreaks, including case-finding, should include the wider community.

Key words: Disease Outbreaks; Humans; Inhalation Exposure; Legionella; Legionnaires' Disease/epidemiology; Water Supply

**An Alternate Approach to Syndromic
Surveillance for Early Detection of
Inhalational Anthrax Cases
9:35 a.m.**

Authors: Elizabeth M. Begier, N.L. Barrett, P. Mshar, J.L. Hadler

Background: During the 2001 anthrax attack, *Bacillus anthracis*, a gram-positive rod (GPR), grew rapidly in blood culture for inhalational anthrax patients, but laboratory reporting was delayed, pending final species identification. We evaluated Connecticut's new GPR reporting system designed to detect inhalational anthrax cases more rapidly, initiate around-the-clock laboratory reporting of potential bioterrorism events, and describe GPR sepsis and meningitis epidemiology.

Methods. During January 2003, clinical laboratories were notified that GPR isolates identified from cerebrospinal fluid (CSF) or blood within 72 hours of culture inoculation must be reported to the Connecticut Department of Public Health (CDPH). CDPH requested laboratories immediately report by telephone isolates identified within 24 hours of inoculation. We conducted laboratory audits to identify unreported isolates, tabulated isolation rates and isolate characteristics, and administered staff questionnaires to estimate labor resources.

Results. During March–December 2003, we identified 623 GPR isolates (five CSF, 618 blood). By genus, blood isolates were 293 *Corynebacterium*, 193 *Bacillus*, 73 *Clostridium*, 26 *Lactobacillus*, 14 *Listeria*, and 19 other genera. *Clostridium* species grew fastest (median incubation 15.3 hours). Only 24% of GPR isolates grew in 24 hours; 76% of these were reported (74% via telephone). Most telephone reports (61%) were made on the date detected; 42% were made off-hours. Overall, unreported isolates were slower growing (80% incubation >24 hours) and presumed contaminants (65% *Corynebacterium*). Average monthly staff time for system operation was 56 hours.

Conclusions. Connecticut established around-the-clock laboratory reporting for potentially serious GPR infections with substantially <1 staff position. This system initiated rapid communication between CDPH and laboratories and described GPR sepsis epidemiology. Since January 2004, to reduce reporting of contaminants, growth after 24 hours is no longer reportable.

Key words: Population Surveillance, Gram-Positive Rods, Anthrax, Sepsis

Investigation of Risk Factors for Fatal Asthma among Children — Baltimore, Maryland, 2003–2004
9:55 a.m.

Authors: Michael E. King, J. Mott, S. Redd

Background: During April–July 2003, seven children died from asthma in Baltimore. Asthma-related deaths in children are preventable with symptom management and access to appropriate care. This study was initiated to identify factors contributing to these deaths and to gather information that may be useful in preventing future deaths.

Methods: We conducted a case-control study comparing seven children with fatal asthma to 21 children with nonfatal asthma who were selected purposively from hospital discharge records to match on disease severity, age, sex, race/ethnicity, and ZIP code. Information about risk factors was obtained from caretakers, medical records, and autopsy reports.

Results: The seven deaths represented an increase over the average of two pediatric asthma-related deaths annually during 1999–2002. The Baltimore medical examiner reported asthma as the cause of death for the six children who had autopsies. All decedents were in respiratory arrest upon arrival at the hospital. All were African American; median age was 7 years (range: 4–18). Four were female, five had persistent asthma, and two had no current asthma diagnosis. Compared to children with nonfatal asthma, decedents with current asthma were significantly less likely to use controller medication daily (86% vs. 0%; $p = 0.002$ two-sided Fisher's exact test). In addition, more decedents used "rescue" medication multiple times daily (80% vs. 36%), had elevated cockroach-specific IgE sensitivity (67% vs. 44%), and were exposed to roach allergens (57% vs. 24%); these differences were not statistically significant.

Conclusions: No unique exposure was identified for this cluster of asthma-related deaths. Among children with asthma and allergies, chronic underuse of controller medications together with overuse of "rescue" medications may have been a risk factor for death.

Key words: asthma, death, disease clustering, child, child/preschool, adolescent, risk factors

**Tuesday, April 12, 2005
Concurrent Session F1
Ravinia Ballroom
10:45 a.m. – 12:15 p.m.**

Natural Woman: Reproductive and Women's Health
Moderator: Coleen Boyle

Pregnancy Planning and Lifestyle Behaviors among Nonpregnant Women of Childbearing Age — Southern California, 1998–2000
10:50 a.m.

Authors: Kathleen G. Raleigh, J.M. Lawrence, H. Chen, O. Devine, C. Prue

Background: In the United States, approximately 50% of all pregnancies are unintended and birth defects affect approximately 1 in 33 newborns. Women whose pregnancies are unintended are less likely to report healthy prepregnancy and prenatal behaviors and more likely to report poor birth outcomes. Knowing whether healthy lifestyle behaviors vary by pregnancy planning could direct family planning programs and policies.

Methods: A random telephone survey of 2,886 nonpregnant childbearing age women enrolled in the Kaiser Permanente Medical Care Program was conducted from 1998 through 2000, with a response rate of 55%. Logistic regression was used to generate adjusted odds ratios (AORs) for associations among pregnancy plans and lifestyle behaviors: multivitamin use, cigarette smoking, alcohol use, and a health care visit. All models included age, race, education, and marital status as covariates.

Results: Compared with women not planning pregnancy, women planning pregnancy within the next year (sooner) were significantly more likely to take a multivitamin regularly (AOR=1.41, 95% Confidence Interval [CI]=1.11–1.80), less likely to smoke (AOR=0.64, 95% CI=0.42–0.96), and more likely to have a health care visit (AOR=1.6, 95% CI=1.11–2.44). However, women planning pregnancy more than one year later were significantly more likely to report alcohol use (AOR=1.29, 95% CI=1.08–1.55) compared with women not planning pregnancy. Women planning pregnancy later did not significantly differ from women not planning pregnancy in reported multivitamin use, cigarette smoking, and healthcare visits.

Conclusions: Our findings signal the need for continued efforts to inform all women of childbearing age of the adverse effects of smoking and alcohol on pregnancy and the importance of taking a multivitamin regularly in hopes of improving healthy pregnancy and birth outcomes.

Key words: pregnancy planning, pregnancy intention, lifestyle behaviors, childbearing-aged women

Validity of a Clinical Screening Tool and Total Lymphocyte Count (TLC) to Determine Advanced HIV Disease in Pregnant Women — Cape Town, South Africa, 2004
11:10 a.m.

Authors: Chineta R. Eure, M. Besser, M. Fowler, M. Earp, S. Varnell, P. Weidle, R. Sadek, A. Greenberg

Background: 25% of women attending public antenatal clinics in South Africa are HIV positive. Rapid referral of HIV+ pregnant women who may require immediate antiretroviral therapy is important. In Cape Town, a simple antenatal clinical screening tool was developed to identify pregnant women with advanced HIV disease. The purpose of this study was to assess the correlation of screening tool items and TLC with the gold standard for advanced disease, namely a CD4+ cell count <200 cells/ μ L.

Methods: 250 HIV+ pregnant women in antenatal clinics were administered the 23-item screening tool. The association between simultaneously drawn antenatal TLC and CD4+ cell count measured as continuous variables, was evaluated using Pearson's correlation coefficient (cc). Odds ratios, sensitivities, specificities, and positive predictive values were computed to test the association between individual screening tool items and maternal CD4+ cell count <200 cells/ μ L.

Results: 230 (92%) of the 250 women had CD4+ cell counts during the present pregnancy. There was a moderate correlation of TLC with CD4+ counts (Pearson's cc, $r = .63$, $p < .0001$). Statistically significant factors associated with CD4+ cell count <200 cells/ μ L included: symptoms of weight loss, white coating on tongue, cough for >2 weeks; physical exam of oral thrush; and a TLC <1250 cells/ μ L. Presence of any of these 5 factors demonstrated a sensitivity of 0.82, specificity of 0.67, and PPV of 0.50 for CD4+<200.

Conclusions: TLC <1250 cells/ μ L and 4 screening items were associated with a CD4+ cell count <200 cells/ μ L. Further refinement of an abbreviated screening tool using these factors could allow antenatal nurses in resource limited settings to make timely referrals of pregnant HIV+ pregnant women for specialized care and antiretroviral treatment.

Key words: clinical screening tool, HIV markers, South Africa, CD4+cell count, total lymphocyte count

Lower Rates of Preterm Birth in Women of Arab Ancestry: an Epidemiologic Paradox — Michigan, 1993-2002
11:30 a.m.

Authors: Darline K. El Reda, V. Grigorescu, S. Posner

Background: Preterm birth (PTB) (i.e., <37 weeks' gestation) occurs in 12.1% of live births annually and is associated with significant morbidity and mortality in the United States (U.S.). Certain racial/ethnic populations are disproportionately affected by PTB; however, although Michigan has one of the largest Arab-American communities in the U.S., PTB rates among Arab-Americans are unexplored. This study describes the maternal demographic profile of women of Arab ancestry, determines their rates and predictors of PTB, and compares them to U.S.-born whites in Michigan.

Methods: By using Michigan Vital Statistics data, we determined predictors of PTB for primiparous U.S.-born white ($n = 205,749$), U.S.-born Arab ($n = 1,697$), and foreign-born Arab ($n = 5,997$) women who had had a singleton live-born infant during 1993-2002. We controlled for the effects of age, education, marital status, insurance type, prenatal care, chronic hypertension, diabetes, tobacco use, and infant sex.

Results: Foreign-born Arabs are less educated, more likely to be on Medicaid, and receive less prenatal care than US-born whites. Rates of PTB were 8.49%, 7.96%, and 7.52% for U.S.-born Whites, U.S.-born Arabs, and foreign-born Arabs, respectively. Pregnancy-related hypertension was the only predictor of PTB that these three groups shared: (Adjusted Odds Ratio [AOR] = 2.10, 95% Confidence Interval [CI] = 1.99-2.21; AOR = 2.61, 95% CI = 1.24-5.51; and AOR = 2.59, 95% CI = 1.55-4.31) for U.S.-born whites, U.S.-born Arabs, and foreign-born Arabs, respectively.

Conclusions: Foreign-born Arab women in Michigan have a higher-risk maternal demographic profile than that of their U.S.-born white counterparts; however, their incidence of PTB is lower, which is an epidemiologic paradox. Previously established risk factors for PTB might not apply to Arab women.

Key words: preterm birth, risk factors, ancestry, Arab

Reported Use of Human Papillomavirus Tests for Approved and Non-Approved Indications by Primary Care Clinicians – United States, 2004
11:50 a.m.

Authors: Zsakeba T. Henderson, D. Montañó, D. Kasprzyk, L. Carlin, C. Freeman, N. Jain, K. Irwin

Background: Persistent infection with oncogenic types of genital human papillomavirus (HPV) causes cervical intraepithelial neoplasia (CIN) and cancer, resulting in costs of over a billion dollars, and 4000 U.S. deaths annually. Of the approximately 3 million American women diagnosed with borderline Pap test results (“ASC-US”) annually, HPV-infected women are at highest risk of CIN and cancer. In 2001, CDC and several national clinical organizations approved a recently licensed HPV test to triage women with oncogenic HPV and “ASC-US” to immediate colposcopy. We conducted a national survey to examine HPV test use patterns since the new recommendations were issued.

Methods: In 2004, we surveyed nationally representative samples of primary care clinicians identified through national internal and adolescent medicine, family/general practice, obstetrics/gynecology, nurse-midwife, physician assistant, and nurse-practitioner registries. The mail survey assessed HPV testing and Pap testing practices. We weighted our categorical analysis for differences in sampling fraction and non-response by specialty.

Results: Overall response rate was 81% (n=3365). 14.9% of respondents were unaware of the HPV test. 53.5% reported test use; of those, 2%-58% reported use for various indications not approved by clinical guidelines. 89% of respondents reported providing Pap tests; 87% of whom reported using HPV tests for triaging “ASC-US” Pap results (approved use), and 55%-77% reported use for higher-grade Pap abnormalities (non-approved use). Obstetrician/gynecologists and nurse-midwives were more likely to report using HPV tests than other specialties.

Conclusions: Our findings suggest that many clinicians are not currently using HPV tests. Of those who do, appropriate use for “ASC-US” triage is common, although many clinicians use tests inappropriately. Survey data are being used to update clinician training materials, decision support tools, and patient education materials.

Key words: papillomavirus, human; HPV DNA probes; cervix neoplasms; Papanicolaou smear; sexually transmitted diseases

**Tuesday, April 12, 2005
Concurrent Session F2
Dunwoody Suites
10:45 a.m. – 12:15 p.m.**

In Harm's Way: Injury Epidemiology
Moderator: Jim Mercy

Rapid Assessment of the Needs and Health Status after Hurricane Ivan — Santa Rosa and Escambia Counties — Florida, 2004
10:50 a.m.

Authors: Tesfaye M. Bayleyegn, A. Funk, K. Oberst, S. Young, C. Sanchez, D. Batts, S. Joan, C. Rubin

Background: Hurricane Ivan, a category 3 storm, devastated the Florida panhandle on September 16, 2004, causing extensive property damage and 24 deaths. The Florida Department of Health requested CDC assistance to conduct a rapid assessment in the two most affected counties, Escambia and Santa Rosa, to determine the health impact of the hurricane and current needs of the affected population. This information was needed to guide emergency response activities.

Methods: We administered a questionnaire six days after the hurricane made landfall. The survey instrument elicited information on house damage, illness/injury and access to utilities. We used a modified population-proportional cluster sampling method to select 30 clusters in each county. Seven households were interviewed in each cluster. Weighted cluster analysis was conducted in SAS and SUDAAN.

Results: Three-quarters of houses in each county were damaged. A portion of damaged homes in Santa Rosa (8%) and Escambia (5%) were uninhabitable. Households in Santa Rosa and Escambia lacked basic utilities, including regular garbage pickup (41% and 27%, respectively), telephone service (13% and 16%), and electricity (34% and 27%). Fifty-five percent of households in Santa Rosa and 27% in Escambia reported using a generator. The most commonly reported health conditions were sleep disturbances in Santa Rosa (54%) and upper respiratory infection symptoms in Escambia (46%). Injuries were reported in fewer than 15% of households in each county.

Conclusion: Rapid restoration of power, telephone, and debris pickup remained a priority one week after the event. Findings demonstrated the need for mental health and primary care services, as well as information about safe generator use and ways to access medical care and medications.

Keywords: disasters, needs assessment, hurricane, cluster analysis

Adolescent Suicide - Maine, 2004
11:10 a.m.

Authors: Victor Balaban, R. Bossarte, A. Crosby, K. Lubell, M. Lynberg, T. Simon, C. DiCara, C. Mervis, K. Meyer, D. Dutton

Background: Suicide is the second leading cause of death among adolescents and young adults in Maine. Multiple youth suicides in a rural area of Maine in early 2004 prompted local concern and CDC was asked by the state of Maine to provide assistance.

Methods: Rate ratios (RR) were used to compare rates of fatal and non-fatal suicidal behaviors in the county of concern and neighboring counties to rates in Maine. Rates were based on death certificates, hospitalizations and emergency department (ED) visits. Focus groups, conducted with a diverse group of youth and adults, discussed potential risk factors for suicide, and opportunities for prevention.

Results: Unlike neighboring counties, the county of concern had significantly elevated rates of suicidal behavior, compared to state rates. Significant RR's were observed for suicide-related fatalities (1.38, CI 1.02-1.83); hospitalizations (1.26, CI 1.24-1.28); and ED visits (1.21, CI 1.20-1.23) among all age groups, and for ED visits (1.40, CI 1.05-1.83) among those aged 15-19. The number of suicide-related fatalities in the county limited the ability to examine youth suicides. Focus group participants believed depression and substance use were important contributors to suicide risk. Also, previous suicides were thought to have lowered the social acceptability threshold for suicide and contributed to the belief that distressed youth view suicide as a viable option.

Conclusions: The county of concern had an elevated rate of suicidal behavior among all ages combined and suicide-related ED visits among youth. Recommendations included increasing awareness that suicide is preventable and enhancing prevention efforts for suicide and associated risk factors, including depression and substance abuse. The CDC is continuing to assist in the development of a coordinated and effective prevention program.

An Evaluation of Death Certificate-Based Surveillance for Traumatic Brain Injury – Oklahoma, 2002
11:30 a.m.

Authors: Sara J. Russell, P. Archer, S. Mallonee

Background: In the United States, 1.4 million persons sustain a traumatic brain injury (TBI) each year at a cost of \$56 billion dollars. Because death certificate data are used to estimate state and national incidence of TBI-related deaths, it is important to understand how accurate these estimates are and to identify any groups that are missed.

Methods: TBI-related death was defined by narrative diagnoses associated with CDC-designated ICD-10 codes. Using probabilistic linking software, we matched death certificates with the designated ICD-10 codes to TBI-related death records from a supplemental injury surveillance system that utilizes medical examiner reports and hospital chart review. All concordant records were assumed to be cases. This was validated by review of a 10% random sample. All discordant records were examined manually to determine case status. Logistic regression was used to determine the adjusted odds ratios (AOR) of being missed versus captured by death certificate-based surveillance. The model included sex, age, race, and cause of death.

Results: Overall, sensitivity of death certificate-based surveillance was 78%. Among missed cases, 62% were multiple trauma with no specific cause of death noted on the death certificate, 28% had incomplete or incorrect death certificates, and 10% were from missing death certificates or errors in the coding process. Death certificate surveillance was more likely to miss TBI-related deaths among persons aged 65 years (AOR=1.5; 95%CI=1.04–2.4); from traffic crashes (AOR=8.8; 95%CI=5.1–15.2); and from falls (AOR=7.1; 95%CI=3.6–13.7) than other categories.

Conclusions: Death certificate surveillance underestimated TBI-related death, especially among certain groups and might lead to inaccurate national estimates. More accurate and detailed completion of death certificates would result in better estimates of TBI-related death.

Key words: traumatic brain injury, death certificate, surveillance, Oklahoma

**Nonfirearm-Related Homicides -
New Mexico, 2001–2003**
11:50 p.m.

Authors: N. Neely Kazerouni-Frederick, N. Shah, M. Sewell, M. Landen

Background: New Mexico (NM) has the highest rate of nonfirearm-related homicide in the United States and ranks sixteenth highest in firearm-related homicide. Because nonfirearm-related homicides are inadequately described in the literature, characterization of nonfirearm-related homicide victims will enhance efforts to reduce homicides in NM.

Methods: Homicide victims were identified through the NM Office of the Medical Investigator. We calculated age-specific and age-adjusted homicide death rates for 2001–2003 by sex and race/ethnicity. Logistic regression was used to measure associations between covariates of interest and nonfirearm-related homicide.

Results: Nonfirearm-related homicides comprised 32.9% of U.S. homicide victims, 46.9% of NM homicide victims, and 74% of NM Native American (NA) homicide victims. Of nonfirearm-related homicide victims, 37.3% were beaten; 32.1% were stabbed; and 11.8% were strangled. Female victims comprised 30.2% of nonfirearm-related homicides and 18.3% of firearm-related homicides. A blood alcohol concentration (BAC) >0.08 mg/dL was detected in 43.4% of all (61.4% of NA) nonfirearm-related homicide victims and in 32.9% of all (50% of NA) firearm-related homicide victims. Nonfirearm-related homicide death rates were highest among NA males aged 25–34 years (31/100,000). NAs (rate ratio [RR]=4.8; 95%CI=1.2–20.3) and Hispanics (RR=1.6; 95%CI=0.3–8.3) had higher rates of nonfirearm-related homicide death than non-Hispanic whites. After controlling for age and urban/rural residence, nonfirearm-related homicide victims were more likely than firearm-related victims to be NA (adjusted odds ratio [AOR]= 4.0; 95%CI=2.0–7.8), female (AOR=2.0; 95%CI=1.3–3.3), and have a BAC >0.08 mg/dL (AOR=1.6; 95%CI=1.1–2.5).

Conclusions: Homicide prevention efforts among NAs in NM should be focused on nonfirearm-related homicides. The association between problem drinking and nonfirearm-related homicide should be further characterized. Continued surveillance of nonfirearm-related homicides will assist these efforts.

Key words: homicide, alcohol, nonfirearm, firearm

**Tuesday, April 12, 2005
Session G
Ravinia Ballroom
1:45 p.m. – 4:00 p.m.**

It's a Small World After All: International Health
Moderators: Linda Venczel and Brad Woodruff

**Emergence of Community Strains of
Methicillin-Resistant Staphylococcus
aureus (MRSA) as a Potential Cause of
Healthcare-Acquired Infections —
Uruguay, 2002-2004**
1:50 p.m.

Authors: Stephen R. Benoit, C. Estivariz, R. Rosa, J. Ballesteros, C. Mogdasy, A. Galiana, W. Pedreira, H. Bagnulo, A. Galiana, S. McAllister, L. McDougal, D. Longsway, M. Albin, M. Mansilla, J. Ansalone, J. Patel, G. Killgore, M. Klevens, D. Estol, R. Gorwitz, D. Jernigan

Background: Increasing numbers of infections in the U.S. are attributed to emergence of community MRSA strains with microbiologic and virulence characteristics distinct from healthcare strains. In August 2004, rising numbers of MRSA infections in Uruguay prompted an investigation.

Methods: We reviewed antimicrobial susceptibility patterns of all clinical *S. aureus* isolates from Hospital A in Montevideo during July/2002-July/2004. Information was obtained from three additional Montevideo hospitals on only those patients infected with MRSA having the community strain pattern (i.e., resistant to beta-lactams and β 1 other antimicrobial drug class) from January/2003-August/2004. To differentiate healthcare versus community-acquired infections, we compared characteristics of patients whose cultures were obtained within and after 48 hours of admission. We performed pulsed-field gel electrophoresis (PFGE) on 26 MRSA isolates.

Results: Of 1,617 *S. aureus* infections at Hospital A, the proportion caused by community MRSA strains increased from 7% to 23% ($p<0.0001$) over two years while the proportion caused by healthcare MRSA strains (i.e., resistant to beta-lactams and 2 other drug classes) decreased from 28% to 5% ($p<0.0001$). Of 186 patients infected with community MRSA strains from four hospitals, 76 (41%) were cultured >48 hours after admission, suggesting healthcare-acquisition. Multivariable analysis revealed significant ($p<0.01$) associations between infections cultured at >48 hours and increased age (OR=20.5), ICU admission (OR=5.8), and non-skin infection site (OR=3.5). PFGE determined 22 (85%) isolates were USA1100, an uncommon clone in the U.S.

Conclusions: A community MRSA strain rarely seen in the U.S. is emerging in Uruguay and appears to be replacing healthcare strains as the predominant type of MRSA at Hospital A. Infection control recommendations should incorporate measures to prevent introduction and transmission of community MRSA strains in healthcare facilities.

Key words: Staphylococcus aureus, antimicrobial resistance, healthcare, nosocomial infections, Uruguay.

**Yellow Fever Immunization Coverage in
Host Communities for Internally Displaced
Persons – Liberia, 2004**
2:10 p.m.

Authors: Jennifer A. Brown, G. Huhn, W. Perea, A. Berthe, H. Otero, G. LiBeau, N. Maksha, M. Sankoh, S. Montgomery, A. Marfin, M. Admassu

Background: A yellow fever (YF) emergency was declared in Liberia in February 2004. Immunization campaigns subsequently occurred in internal displacement camps and their host communities (HCs) in Bong County. A survey was conducted following the campaigns to determine whether immunization coverage goals were met in HCs.

Methods: Immunization coverage was estimated using the lot quality assurance method under WHO guidelines. Ten HCs were selected and population estimates were obtained from local leaders. Based on a coverage goal of 80% and precision of 8%, minimum sample size was 150 households (15 per HC). One randomly selected person was surveyed in each household. The decision value for inadequate coverage was 4 unimmunized persons per HC. Coverage in the overall population was estimated by taking a weighted average of the coverage in each HC.

Results: One person was surveyed in each of 158 households; 87 (55%) were female. Fifteen (9%) were 6 mo-4 yr, 33 (21%) were 5-14 yr, 79 (50%) were 15-44 yr, and 31 (20%) were 45 yr. Median household size was 10 persons (range: 1-32). The number of unimmunized persons met the decision value in one HC. During the campaign, 89% (95% confidence interval (CI): 0.84-0.94) of the overall population was immunized. Of these, 38% (95% CI: 0.28-0.49) had been previously immunized. Total coverage in the overall population was 96% (95% CI: 0.93-0.99).

Conclusions: Coverage goals were met in the overall population of the ten HCs, but not in one remote HC. This study showed that the campaign was effective and immunity is likely high in this population. To maintain high immunity, YF immunization should be included in routine schedules and accessible at remote sites.

Keywords: Yellow fever, Liberia, mass immunization, community surveys

Diphtheria in Haiti, 2004
2:30 p.m.

Authors: Amanda C. Cohn, M. McMorrow, J. Dobbins, A. Durena, K. St. Vil, S. Garcia, P. Cassidy, T. Tiwari, L. Cairns, P. Nuorti

Background: Diphtheria was a major killer of children in the pre-vaccine era and remains endemic in Haiti, where the routine immunization program was disrupted from 1994-2000. Currently, an estimated 50% of children receive three doses of diphtheria, tetanus and pertussis vaccine (DTP-3). In June 2004, the Ministry of Health reported an increase in diphtheria cases and invited CDC to assist in the investigation.

Methods: We classified diphtheria cases reported during June 18-October 25, 2004 as confirmed, probable or suspected using a modified WHO case definition. Vaccination status was ascertained by medical record review and family interviews. Throat and nasopharyngeal specimens from recent reported case-patients and their contacts were obtained for culture. *Corynebacterium diphtheriae* isolates were tested for toxigenicity genes by polymerase chain reaction and compared using ribotyping.

Results: A total of 93 cases were reported from six of 11 districts; 38 (41%) were hospitalized and 14 (15%) died. Twenty-three (25%) were classified as confirmed, 10 (11%) probable and 60 (64%) suspected. Among confirmed and probable cases-patients, 24 (73%) were female; children aged <10 years accounted for 27 (79%) cases and 12 (86%) deaths. Only one of eight case-patients interviewed had documentation of receiving DTP-3. Seven (30%) of 23 case-patients and one (skin lesion) of 37 case-contacts were culture positive. All isolates were toxigenic *C. diphtheriae* biotype mitis; three distinct ribotype patterns were identified.

Conclusions: As in the pre-vaccine era, ongoing transmission of several strains of diphtheria in Haiti primarily affects children aged <10 years, indicating low levels of protection in this age group. We recommended intensifying diphtheria surveillance, strengthening the routine immunization program, and catch-up vaccination for children aged <10 years in national DTP campaigns.

Key Words: diphtheria, vaccine-preventable diseases, outbreak, immunization

Health-Care Costs of Rotavirus Diarrhea and Cost-Effectiveness of Rotavirus Immunization -- Vietnam
2:50 p.m.

Authors: Thea K Fischer, D. Anh, P. Kilgore, L. Antil, D. Katz, D. Thiem, R. Rheingans, R. Glass, J. Bresee.

Background: Several rotavirus vaccines will be licensed in the near future. Economic data particularly from developing countries, where most of the ~600,000 annual rotavirus-associated deaths in children < 5 years old occur, are urgently needed to evaluate vaccination as a cost-effective strategy for reducing this cause of severe childhood diarrhea.

Methods: To estimate the national cost of rotavirus diarrhea, we collected data on direct and indirect medical and non-medical expenses associated with outpatient clinic visits and hospitalizations for rotavirus diarrhea in Khanh Hoa Province, Vietnam. Based on these data, we modelled cost-effectiveness of routine infant immunization for a hypothetical Vietnamese birth cohort over a 5-year period. We performed sensitivity analyses to evaluate cost-effectiveness for the range of known values for rotavirus disease burden, cost-of-illness and vaccine efficacy.

Results: For every 1,000 children, rotavirus diarrhea caused 120 outpatient visits, 70 hospitalizations and 1.7 deaths during the first five years of life. Nationally, rotavirus accounted for approximately \$5.1 million in societal health-care costs annually including \$3.0 million in direct medical costs, \$700,000 in non-medical direct costs and \$1.4 million in indirect costs. Routine rotavirus immunization could prevent at least 70% of rotavirus-associated treatment visits and 83% of rotavirus-associated deaths. To meet the World Bank cost-effectiveness standard of \$135 per disability-adjusted life year for low-income countries, the breakeven price would be \$7 for a two-dose rotavirus vaccine course.

Conclusions: In Vietnam, we estimate that total costs associated with rotavirus represent 0.65% of national health expenditures each year. From the healthcare system perspective, universal vaccination of infants at a cost of \$7.06 or less per course to prevent severe rotavirus gastroenteritis is a cost-effective public health intervention.

Keywords: Diarrhea, rotavirus, vaccine, children, Vietnam, Cost-Effectiveness

Impact of Haemophilus Influenzae Type B Conjugate Vaccine—Dominican Republic, 2004
3:10 p.m.

Authors: Ellen H. Lee, M. Corcino, A. Moore-Veras, C. Pena, J. Sanchez, J. Fernandez, Z. Garib Arbaje, J. Feris Iglesias, E. Gomez, A. Schuchat, B. Flannery

Background: Before 2001, Haemophilus influenzae b (Hib) was the leading cause of bacterial meningitis in young children in the Dominican Republic (DR). Hib conjugate vaccine was introduced into the routine infant immunization schedule in 2001, with donor funding available through 2006. On request of the Dominican Ministry of Health, our objective was to assess the public health impact of the vaccine to inform the decision about its use after 2006.

Methods: We reviewed laboratory surveillance data from a national referral hospital to identify children admitted with meningitis from 1998-2004. We calculated rates of meningitis due to Hib and other bacterial etiologies, and assessed trends using Pearson χ^2 . To estimate vaccine efficacy against Hib meningitis, we conducted a retrospective case-control study, enrolling 32 children hospitalized with Hib meningitis after vaccine introduction and 96 age- and neighborhood-matched control children. We confirmed Hib vaccination status by review of vaccine cards and medical records, and calculated vaccine efficacy using conditional multiple logistic regression.

Results: Data from 2002 indicate the rate of Hib meningitis was 3.6 cases per 100,000 children under five years, a decline of 70.0% ($P < 0.0001$) compared with the baseline average for 1998-1999 (12.2 cases per 100,000). Rates of meningitis caused by other bacterial pathogens did not change. All 32 cases in the case-control study had incomplete vaccination (<3 doses); with 2 doses, vaccine efficacy for Hib meningitis was 88% (95% confidence interval, 25.6-98.9%).

Conclusions: In the DR, as in many other countries, Hib conjugate vaccine use has caused dramatic disease declines. The vaccine showed high protective efficacy for young Dominican children. These benefits argue for continued use of the vaccine in the DR.

Key words: Haemophilus influenzae type b conjugate vaccine; Meningitis, Haemophilus; Dominican Republic

Emergency Nutrition Assessment — Darfur, Sudan, 2004
3:30 p.m.

Authors: Tami Zalewski, L. Talley, M. Brennan

Background: Since December 2003, violent political turmoil in Darfur, Sudan has led to the worst humanitarian crisis in present times. During the early crisis, no comprehensive nutritional data existed. In September 2004, the United Nations World Food Program and CDC conducted an emergency nutrition survey of the crisis-affected populations in Darfur to assess immediate program requirements.

Methods: We conducted a multi-stage randomized cluster survey of 1.2 million internally displaced persons and 400,000 crisis-affected residents in all three Darfur states. We collected questionnaire data to describe rations received; anthropometric measurements to assess global acute malnutrition (GAM) prevalence, defined as edema or height/weight less than -2 z-scores; and blood specimens to measure anemia, defined as hemoglobin <11.0 g/dL in children or <12.0 g/dL in mothers. To account for cluster design, we analyzed results using weighted data.

Results: The team surveyed 890 households which included 5478 persons. The GAM prevalence for children aged 6–59 months was 21.8% (95% CI = 18.2–25.3). Anemia was present in 55.3% (95% CI = 50.4–60.2) of children and in 25.5% (95% CI = 21.3–29.7) of their mothers. The proportion of persons receiving a general ration increased from 21.0% to 69.7% from April to August 2004, but only 37.0% received all ration components.

Conclusions: A childhood GAM prevalence of 21.8% is alarming over a population of 1.6 million people (15% is considered serious), especially when this rate could increase with anticipated harvest shortages. The high prevalence of anemia may indicate lack of essential ration components. Food agencies should immediately implement a comprehensive distribution of complete, properly fortified rations, and expand supplementary feeding for all Darfur children aged 6-59 months.

Key words: Sudan, nutrition assessment, malnutrition, micronutrients, emergencies

**Wednesday, April 13, 2005
Concurrent Session H1
Ravinia Ballroom
8:30 a.m. – 10:15 a.m.**

Paint by Numbers: Peavy Award Finalists
Moderator: Donna F. Stroup

Brachial Neuritis Associated with Childhood Vaccines: Do We Know What We Think We Know? – Puerto Rico, 2004
8:35 a.m.

Authors: Angela Calugar, J. Baggs, J. Iskander, R. Chen, W. Zhou, M. Roper, F. DeStefano

Background: Brachial neuritis (BN) is an acute neurological disorder characterized by muscle pain, weakness, and amyotrophy. Several well documented cases of BN following Tetanus Toxoid Containing Vaccines (TTCV) resulted in its listing as a vaccine injury eligible for compensation. A recent analysis of the Vaccine Adverse Event Reporting System also suggested associations between hepatitis B (HBV) and influenza (FLU) vaccines with BN. We conducted a population-based validation study using the Vaccine Safety Datalink (VSD).

Methods: We included all persons two months to 18 years old enrolled in several managed care organizations from 1995-2001 for at least one year or from birth. We used ICD-9 codes to identify BN cases and examined if the rate of BN was significantly elevated within 14 days after TTCV, HBV, and FLU vaccinations. We excluded hereditary and acquired diseases similar to BN and controlled for potential confounding from sex, age, and HMO site using a multivariate Cox model.

Results: In a cohort of approximately 1.65 million children, we observed ICD-9 codes for BN in 1,290 cases meeting the enrollment criteria, 57.6% of which occurred in children of ages 7 to 17 years old. The estimated incidence rate ratio of BN after TTCV = 0.87 [95% CI = (0.49, 1.53)]; but was elevated following both FLU [1.84 (0.87, 3.92)] and HBV [1.94 (1.36, 2.78)].

Conclusions: We did not observe an increase in BN following TTCV in the pediatric population; however BN may be elevated after FLU or HBV. A random chart review of the identified cases should be conducted to address potential misclassification bias of automated diagnosis codes. Our findings may have policy implications for BN in the Vaccine Injury Table.

Keywords: brachial neuritis, pediatric population, vaccine adverse event, tetanus toxoid containing vaccines, influenza vaccine, hepatitis B vaccine.

Adverse Events in HIV-infected Patients Receiving Antiretroviral Therapy in a Treatment Program in a Nairobi Slum – Kenya, 2003 – 2004
8:55 a.m.

Authors: Andrea A. Kim, L Ngan'ga, D Macharia, M Wangai, F Ilako, A Isavwa, B Marston, K DeCock, P Weidle

Background: A determinant of the success of The President's Emergency Plan for AIDS Relief, which aims to provide antiretroviral therapy (ART) for 2 million HIV-infected persons in resource-limited settings, is the extent to which patients can tolerate and stay on ART. We describe toxicities associated with ART among patients receiving care in a community clinic in the Kibera slums, Nairobi, Kenya.

Methods: From February 2003 to September 2004, patients with symptomatic HIV disease or CD4+ cell count less than 200 cells/mm³ were treated with stavudine, lamivudine, and nevirapine and evaluated for clinical toxicities at scheduled intervals. Toxicities were graded 1 to 4 (grades 3 and 4 were considered severe) and cumulative probabilities (Kaplan-Meier) were calculated.

Results: 186 patients (68% women, median CD4+ cell count: 187 cells/mm³) started ART. There were 1,524 patient-months of observation (median 8.3 months/patient). Any clinical toxicity was recorded for 63% (5% severe) of patients; these included neuropathy for 27% (2% severe); rash for 37% (2% severe); and hepatotoxicity for 2%, (2% severe). The cumulative probabilities of developing toxicities at 6 and 12 months were 0.52 and 0.74 for any clinical toxicity and 0.03 and 0.06 for a severe clinical toxicity, respectively. Seven patients (4%) changed therapy because of rash or hepatitis, 1 (1%) had ART temporarily discontinued due to neuropathy, none had ART permanently discontinued, and none were known to have died from toxicity.

Conclusion: Toxicities were common in this cohort, but most were mild. Although some patients had severe toxicities, ART was continued with an alternative regimen. These results indicate that among populations living in very resource-limited settings, ART tolerance should not represent a significant barrier to HIV care.

Key words: HIV, AIDS, antiretroviral therapy, clinical toxicity, Africa

Prevalence of Meeting Physical Activity Recommendations as a Predictor of State Obesity Prevalence — United States, 2003
9:15 a.m.

Authors: Karen K. Lee, S. Carlson, M. Pratt, H. Kohl

Background: The prevalence of obesity ranges from 16.0% to 28.4% in U.S. states. We conducted this study to determine the ecologic association between the prevalence of meeting physical activity recommendations and the prevalence of obesity in the 50 states and the District of Columbia. This study will provide guidance to states regarding the relationship between the state-level prevalence of meeting physical activity recommendations and obesity prevalence.

Methods: We used 2003 Behavioral Risk Factor Surveillance System (BRFSS) data to identify the prevalence of obesity and of meeting CDC/ACSM (American College of Sports Medicine) physical activity recommendations across states. We standardized state populations for potential confounders including age, education, nutrition-related factors, and smoking based on the distribution in the 2003 BRFSS dataset. We then used linear regression to estimate the association between state prevalence of meeting physical activity recommendations and prevalence of obesity, stratified by sex and race/ethnicity.

Results: State prevalences of meeting physical activity recommendations were inversely associated with state obesity prevalences, before adjustment ($r = -0.65$ [$r^2 = 0.42$]) and after adjustment for age, education, fruit and vegetable consumption, and smoking status ($r = -0.54$). The adjusted correlation did not differ significantly between men and women or between non-Hispanic whites and other racial/ethnic groups. Each absolute 1% higher prevalence of meeting physical activity recommendations was associated with a 0.29% lower prevalence of obesity (adjusted beta coefficient = -0.29; 95% Confidence Interval = -0.42 to -0.16).

Conclusions: Our findings confirm the importance of promoting physical activity in obesity programs. States, particularly those with high obesity prevalence, should continue efforts to increase the prevalence of their populations meeting physical activity recommendations.

Key words: obesity, physical activity, prevalence, Behavioral Risk Factor Surveillance System, risk factors

Maternal Smoking Is Associated with Increased Odds of Childhood Overweight — United States, 1996-2003
9:35 a.m.

Authors: Andrea J. Sharma, R. Li, M. Cogswell, L. Grummer-Strawn

Background: Childhood overweight increases the risk for adult obesity and may increase the risk for early onset chronic disease. Studies suggest that children exposed to cigarette smoke in utero have an increased risk for becoming overweight. Few studies have assessed whether maternal smoking cessation can reduce this risk. Therefore, we examined whether the odds differed for women who did not smoke during pregnancy, who quit smoking early during pregnancy (quitters), and who smoked throughout pregnancy (smokers).

Methods: We linked data between the Pediatric Nutrition Surveillance System and Pregnancy Nutrition Surveillance System for low-income 4-year-old children born from 1996 through 1999 in nine states. We used logistic regression to estimate the odds of overweight (body mass index-for-age-and-sex 95th percentile based on the 2000 CDC growth charts) for children born to smokers, quitters, and nonsmokers. We adjusted for the child's age, sex, ever breastfeeding, race/ethnicity, and state of birth and the mother's age, prepregnancy BMI, and gestational weight gain.

Results: Of the 31,436 children in our study, 16% were overweight, 19% were born to smokers, and 15% were born to quitters. Compared to children born to nonsmokers, children born to smokers had 1.33 times the odds of being overweight after adjusting for covariates (95% confidence interval [CI]=1.22-1.45) while those born to quitters had 1.11 times the odds (95% CI=1.01-1.21). The odds of being overweight were 16% lower among children born to quitters compared to children born to smokers (adjusted odds ratio=0.84, 95% CI 0.76-0.94). Associations did not differ by ethnic group.

Conclusions: Our findings suggest that smoking prevention and promotion of smoking cessation during pregnancy may be part of a broader public health strategy for preventing childhood overweight.

Key words: obesity, smoking, pregnancy, preschool child

Weight Regain in Persons Successful at Substantial Weight Loss — United States, 1999-2002
9:55 a.m.

Authors: Edward C. Weiss, D. Galuska, L. Kettel-Khan, C. Gillespie, M. Serdula

Background: Nearly two thirds of U.S. adults are overweight, increasing their risk for chronic diseases, including cardiovascular disease and type 2 diabetes. Among overweight adults, a 10% weight loss improves the risk factors for these diseases. Unfortunately, weight regain often follows successful weight loss. We investigated the predictors of 1-year weight regain in adults who were successful at substantial weight loss.

Methods: We analyzed self-reported data from the Fourth National Health and Nutrition Examination Survey (1999-2002), representative of the civilian noninstitutionalized U.S. population. We limited our analysis to nonpregnant adults aged 18 years, who were overweight (body mass index ≥ 25) at their maximum weight and successfully lost weight (10% of their maximum weight) by 1 year prior to their interview. After excluding adults who continued to lose weight, we compared those who maintained their weight within 5% the previous year with those who gained more than 5%. Using SUDAAN, we performed multivariate logistic regression to identify the predictors of 1-year weight regain.

Results: Among 1,309 adults successful at weight loss, 64% maintained their weight and 36% gained weight the previous year. The odds of weight regain were significantly higher among adults who were Mexican American (versus non-Hispanic white) (odds ratio [OR]=1.9; 95% confidence interval [CI]=1.3-2.8), attempted to control their weight (OR=2.3; 95% CI=1.5-3.7), lost a greater percentage of weight (20% versus 10%-<15%) (OR=2.8; 95% CI=1.9-4.0), had a shorter time since their maximum weight (5 years versus >10 years) (OR=2.2; 95% CI=1.2-4.0), and reported sedentary lifestyles (versus meeting physical activity recommendations) (OR=1.8; 95% CI=1.04-3.0).

Conclusions: Intervention studies to prevent weight regain should target persons based on ethnicity and weight loss history and should incorporate physical activity.

Key words: weight loss, weight gain, obesity, body weight changes

**Wednesday, April 13, 2005
Concurrent Session H2
Dunwoody Suites
8:30 a.m. – 10:15 a.m.**

Super Size Me: Obesity/Physical Activity
Moderator: David Freedman

**Cluster of Deaths in a Bariatric Surgery
Program — San Juan, Puerto Rico 2004
8:35 a.m.**

Authors: Brett Cauthen, R. Hanisch, L. Chiroque,
J. Alonso-Echanove

Background: Approximately 140,000 United States residents undergo gastric reduction (bariatric) surgery every year. When applied to adults with indications for surgery (body mass index [BMI] >35 kg/m²), benefits of surgery can outweigh the typically low mortality rate (<1%). In September we discovered five deaths in one bariatric surgery program, and initiated an investigation. Method: To evaluate mortality, we calculated procedure-adjusted standardized mortality ratios (SMR) during the duration (January–October 2004) of this program. To evaluate risk factors for death, we performed a retrospective cohort study for the same period. We also reviewed surgical practices.

Results: Seventy-nine patients underwent this procedure; 59 (76%) were female, median age was 41 years (range: 16–65), and median BMI was 50 kg/m² (range: 32–95). Eight (11%) did not meet basic BMI or age criteria for surgery. Forty-nine (62%) underwent a laparoscopic procedure (26 laparoscopic gastric banding and 23 laparoscopic gastric bypass versus 30 open gastric bypass). Sixteen (20%) had 27 complications (eight obstruction, seven surgical site infections [SSI], five anastomosis leak, four perforation, and three gastrointestinal bleeding), and five (6.3%) died. Mortality rates were high for all procedures (SMR=15), but were especially high for laparoscopic procedures (SMR=48). Patients who died did not differ substantially from patients who survived by age, sex, BMI, or preoperative risks. Development of an SSI was a major risk factor for death (relative risk=15; p<0.01), and observation of surgical practices revealed inadequate surgical scrub.

Conclusion: On the basis of high mortality rates and surgery being performed on inappropriately selected individuals, the Puerto Rico Health Department closed this program. Better surgical scrub technique and review of laparoscopic technique will be necessary before this program reopens.

Key words: bariatrics, obesity, weight reduction, soft tissue infections, laparoscopy

**Family History of Diabetes, Obesity, and
Diabetes-preventing Behaviors—
United States, 2004
8:55 a.m.**

Authors: Susan Hariri, Paula W. Yoon,
Maren T. Scheuner

Background: Type 2 diabetes (diabetes) is the sixth leading cause of death in the US and a major contributor to disability. Although the etiology is unclear, risk factors for this multifactorial disease include family history, obesity, ethnicity, and age.

Methods: A 2004 mail survey questioned 4345 US adults about personal history of diabetes and current or recent (within past year) obesity defined as BMI >30, making lifestyle changes such as diet and exercise to prevent diabetes, having been tested for diabetes, and family history of diabetes. Using number and type of affected relatives, respondents were classified into average (65.2%), moderate (24.0%), or high (10.8%) familial risk. Logistic regression was performed to obtain adjusted odds ratios (AOR) for association between 1) familial risk and diabetes-preventing behaviors and 2) other risk factors and diabetes within familial risk strata.

Results: Diabetes was positively associated with moderate and high familial risk (AOR=4.6, 95% confidence interval [CI]=3.6-6.0; AOR=7.3, 95%CI=5.4-9.9) compared with average-risk. Non-diabetic respondents with moderate and high familial risk were more likely than the average-risk group to report lifestyle changes (AOR=2.5, 95% CI=2.1-3.0; AOR=4.3, 95% CI=3.3-5.5) and getting tested (AOR=1.6, 95% CI=1.4-1.9; AOR=2.4, 95% CI=1.8-3.1). Overall, obesity was positively associated with diabetes but the magnitude of effect diminished with increasing familial risk (overall AOR=4.5, 95% CI=3.6-5.6; average-risk AOR=5.3, 95% CI=3.5-8.0; moderate-risk AOR=4.9, 95% CI=3.3-7.2; high-risk AOR=1.9, 95% CI=1.2-3.1).

Conclusions: Familial risk and obesity were independently associated with diabetes. The association with obesity was strongest in the average-risk group. More diabetes-preventing behaviors were reported by the high-risk group. Population stratification by familial risk may help determine the relative impact of modifiable risk factors resulting in effective prevention strategies.

Key words: family history, diabetes, obesity, risk factor, prevention

**Chewing The Fat: Do Health Care
Professionals Talk to Their Pediatric
Patients about Weight Status?
9:15 a.m.**

Authors: Carolyn J. Tabak, C. Ogden

Background: Annual well child care visits to health professionals should include measurement of body mass index (BMI) to determine weight status. Given that over 9 million children are overweight and that overweight is associated with many chronic diseases, it is important that providers inform their overweight patients of their weight status. We determined the percentage of overweight children who have ever been told by a health professional that they were overweight.

Methods: We analyzed data from 8264 children aged 2-19 years who participated in the National Health and Nutrition Examination Survey (NHANES) between 1999-2002. Overweight was defined as BMI 95th percentile on the sex specific CDC growth charts using measured weights and heights. Subjects were asked (by proxy for children aged 2-15 years) whether they had ever been told by a doctor or health professional that they were overweight. T-tests and logistic regression were performed to determine differences by age, race/ethnicity, and sex.

Results: Health professionals told 36.7% of overweight youth that they were overweight. Rates did not differ significantly by race/ethnicity or sex, but among overweight 2-5 year olds, only 17.4% were told of their weight status, compared with 32.6% of overweight 6-11 year olds (p<0.013) and 45.3% of overweight 12-19 year olds (p<0.0001). Multivariate analysis showed similar results.

Conclusions: Pediatric health professionals are not often informing their overweight patients of their weight status. This problem is worse in young children. Knowledge of weight status is critically important, as it may prompt children and their parents to make changes in diet and physical activity. Therefore, barriers that prevent the sharing of weight status between health providers and pediatric patients need to be identified and addressed.

Keywords: obesity, overweight, children, health professionals, diagnosis

**Physical Education and Sufficient Physical
Activity Levels Among High School
Students – United States, 2003
9:35 a.m.**

Authors: Eric A. Miller, D. Eaton, P. Huang

Background: The percentage of overweight adolescents has tripled since 1980 due, in part, to physical inactivity. School-based physical education (PE) classes might help students reach recommended activity levels. We investigated whether participation in high school PE is associated with engaging in sufficient physical activity.

Methods: We analyzed data from 15,214 U.S. high school students who participated in the 2003 Youth Risk Behavior Survey. Participation in PE was assessed by enrollment in PE (attending PE 1 day/ week), daily PE (attending PE 5 days/week), and being physically active in PE (active for >20 minutes during class). Sufficient physical activity was defined as vigorous activity for 20 minutes on 3 of the last 7 days or 30 minutes of moderate activity during 5 of the last 7 days. LMMMM ogistic regression models for each PE participation variable were used to calculate adjusted odds ratios (AOR) of sufficient physical activity, controlling for race, sex, grade, and sports team participation.

Results: Overall, 55.7% of students were enrolled in PE; of those enrolled, 51% attended PE daily, and 80.3% were active during PE. Only 66.6% of all students met sufficient physical activity levels. Compared with students not enrolled, enrollment in PE was significantly associated with sufficient physical activity (78.4% versus 54.6%; AOR=2.6; 95% confidence interval [CI]=2.2-3.1). Among only students enrolled in PE, daily PE (83.8% versus 72.8%; AOR=2.0; 95%CI=1.6-2.6) and being active in PE (85.5% versus 61.7%; AOR=2.5; 95%CI=2.1-3.1) were significantly associated with sufficient physical activity.

Conclusions: Students who participated in PE class were more likely to engage in sufficient physical activity. PE for high school students can play an important role in preventing obesity by increasing physical activity.

Key words: obesity, physical fitness, physical education and training, adolescent, student

Ecological Relationship between Physical Inactivity and Diabetes Across States — United States, 2003
9:55 a.m.

Authors: Sanjeeb Sapkota, S. Carlson, E. Gregg, B. Gerzoff, H. Kohl III

Background: Although the relationship between physical inactivity and diabetes has been established at the individual level, the magnitude of this association at the population level has not been documented. We conducted this study to determine the ecological association between diabetes mellitus and physical inactivity for the nation and to examine across states the magnitude of differences in diabetes prevalence associated with differences in the prevalence of physical inactivity.

Methods: We analyzed data from the 2003 Behavioral Risk Factor Surveillance System (n=257,659), a state-based random-digit dialed telephone survey of noninstitutionalized adults aged 18 years. For each state, we adjusted the prevalences of diabetes and physical inactivity for age and body mass index (BMI) category (<25, 25-29.99 and 30). Ecological associations between diabetes and inactivity were assessed by least squares regression.

Results: Nationally, the prevalence of physical inactivity was 24.3% (95% confidence interval [CI]=24.0-24.6) and the prevalence of diabetes was 7.4% (95% CI=7.2-7.6). The state-specific prevalence of physical inactivity was significantly (p < 0.05) associated with the corresponding prevalence of diabetes in the following three scenarios — unadjusted (r=0.71), after adjustment for age (r=0.69) and after adjustment for age and BMI (r=0.60). After accounting for age and BMI, a 10% decrease in the prevalence of inactivity was associated with a 1.8% decrease in the prevalence of diabetes.

Conclusion: A significant ecologic association exists between the prevalence of physical inactivity and the prevalence of diabetes nationally. The ecological model we developed suggests potential prevalence changes in diabetes for given changes in the prevalence of inactivity. Although further study is needed, such information may be useful for states as they set goals and plan strategies to prevent diabetes.

Key words: physical activity, diabetes mellitus, prevention and control

**Wednesday, April 13, 2005
Concurrent Session I1
Ravinia Ballroom
10:30 a.m. – 12:00 p.m.**

Wild Thing: Investigations Associated with Pets and Animals

Moderators: David Addiss and Patricia Griffin

Why is the Lake Killing our Dogs? Harmful Algal Blooms – Nebraska, 2004
10:35 a.m.

Authors: Zandra H. Duprey, P. Rao, W. Carmichael, T. Safranek, L. Backer, C. Rubin

Background: Algal blooms occur annually in various bodies of water around the world and are known as “harmful algal blooms” when they produce toxins capable of causing health effects in humans, other mammals, and fish. In May 2004, Nebraska health officials were alerted to three dogs dying shortly after swimming in a private residential recreational lake with an algal bloom. This animal sentinel event prompted health officials to close the lake and invite CDC to assist in an investigation of human health effects related to the bloom.

Methods: We performed a door-to-door survey of permanent lake residents to identify human or animal illness or death related to lake exposure. Water samples were analyzed for the presence of algae, toxins, and other toxicants using light microscopy and liquid chromatography mass spectrometry. Biological samples were collected from one dog.

Results: We interviewed 21 (91%) of 24 permanent lake residents. No significant illness or death was reported among 13 respondents who used the lake during the time of the bloom. Analysis of lake water confirmed the presence of *Anabaena spiroides* and high concentration of the cyanotoxin, microcystin-LR. Analysis of biologic specimens suggested microcystin-LR as the etiology of the dogs' deaths. Three additional dog deaths were discovered in other local lakes.

Conclusions: Microcystin levels measured in the dogs were consistent with levels known to cause human health effects. These sentinel events allowed for investigation and public health intervention of a potential human environmental hazard. After this investigation and based on CDC recommendations, Nebraska's departments of Environmental Quality and Health and Human Services have implemented a health advisory system for harmful algal blooms in both private and public lakes.

Key words: algal bloom, microcystin, sentinel surveillance, eutrophication

Outbreak of E. coli O157:H7 at a State Fair – North Carolina, 2004
10:55 a.m.

Authors: Brant B. Goode, C. O'Reilly, J. Dunn, K. Fullerton, S. Smith, M. Joyner, L. Durso, B. Jenkins, D. Griffin, J. Engel, M. Davies, S. Montgomery

Background: E. coli O157:H7 and other enterohemorrhagic E. coli (EHEC) infections cause hemorrhagic colitis and hemolytic uremic syndrome (HUS). An estimated 73,000 EHEC related infections and 61 deaths occur annually in the United States. Contaminated foods, beverages, water and livestock contact have caused outbreaks. In 2004, an E. coli O157:H7 outbreak occurred among North Carolina State Fair visitors.

Methods: We conducted a matched case-control study among fair visitors using randomly recruited controls who purchased tickets in advance. We defined cases as persons with culture-confirmed E. coli O157:H7 infection, HUS, or bloody diarrhea with illness onset after visiting the fair. Clinical specimens and environmental samples were tested by culture and pulsed-field gel electrophoresis (PFGE).

Results: Of 108 reported cases, we enrolled 45 confirmed or probable case-patients and 188 controls in the case-control study. Median case-patient age was 3.2 years (range: 1-61). Thirty-six case-patients (80%) reported visiting the same petting zoo (Odds Ratio [OR]:7.7, 95% Confidence Interval [CI]:3.5-17.0). Among visitors to this petting zoo, illness was associated with stepping in or touching manure (OR: 4.9, CI: 1.9-12.8), falling or sitting on the ground (OR: 3.4, CI: 1.3-8.6) or contact with sheep or goats' front legs (OR: 2.5, CI: 1.03-5.9). Hand hygiene upon exiting the petting zoo was not protective (OR: 1.7, CI: 0.5-5.8). Of 38 patient isolates, 33 (87%) had indistinguishable PFGE patterns. Environmental isolates from the petting zoo area were indistinguishable by PFGE from these 33 clinical isolates.

Conclusions: In this study, most illnesses were associated with animal or manure contact in a single petting zoo. Hand hygiene was not protective. Contact with animals and manure in petting zoos should be restricted to prevent EHEC infections.

Keywords: Escherichia coli O157:H7, EHEC, hemolytic uremic syndrome, petting zoo, zoonosis

Outbreak of Multidrug-Resistant Salmonella Typhimurium Infections Associated with Small Rodents Purchased at Retail Pet Stores — United States, December 2003–October 2004
11:15 a.m.

Authors: Stephen J. Swanson, C. Snider, K. Smith, D. Boxrud, J. Lockett, C. Braden

Background: An estimated 1.4 million Salmonella infections occur annually in the United States, leading to approximately 14,800 hospitalizations and 400 deaths. Most infections are thought to be foodborne, but animal contact is also an important source of salmonellosis. In September 2004, the Minnesota Department of Health confirmed multidrug-resistant Salmonella Typhimurium in seven dead hamsters from a Minnesota pet distributor; all isolates were indistinguishable by pulsed-field gel electrophoresis (PFGE) (Pattern A).

Methods: To identify human S. Typhimurium infections possibly related to hamsters, we reviewed the PulseNet National Salmonella Database. Case-patients whose isolates matched Pattern A by PFGE (indistinguishable or 1-band difference) were interviewed about rodent exposures. Available rodents from case-households and pet retailers were cultured for Salmonella.

Results: Twenty-seven matching human S. Typhimurium case-isolates were identified during December 2003–October 2004. Of 22 case-patients interviewed, 13 (59%) case-patients in 10 states identified exposure to rodents purchased from pet stores, and two (9%) were secondary to primary rodent-associated cases. Pet rodent exposures included hamsters (two cases), mice (three), rats (six), and both mice and rats (two). Among rodent-associated case-patients, the median age was 16 years (range: 0–43 years); six (40%) case-patients were hospitalized. S. Typhimurium Pattern A was cultured from a Minnesota case-patient's pet mouse and from seven Illinois pet store hamsters. Human and animal S. Typhimurium isolates were resistant to ampicillin, chloramphenicol, streptomycin, sulfizoxazole, and tetracycline.

Conclusions: This is the first documented salmonellosis outbreak associated with pet rodents. These pets represent an underrecognized source of Salmonella, including multidrug-resistant strains, for humans. Existing recommendations for preventing salmonellosis from other types of household pets (e.g., chicks, reptiles) may also be appropriate for preventing salmonellosis from pet rodents.

Key words: Salmonella Typhimurium, salmonellosis, zoonoses, hamster, rodents, drug resistance

**New War Against Raccoon Rabies—
Ohio, 2004**
11:35 a.m.

Authors: Mysheika LeMaile-Williams, K. Smith, S. O'Dee, M. Collart, B. Mattson

Background: Rabies is a viral disease transmitted by wild animals. Although rare among humans, the disease is often fatal. In 1997, raccoon strain rabies (RSR) spread into Ohio from Pennsylvania, with 62 animals from three northeast Ohio counties confirmed positive. To control the epizootic, the Ohio Department of Health (ODH) initiated an intervention by disbursing recombinant rabies vaccine along the northeast border. The 25-mile wide immune barrier was successful, and by 2003, only two raccoons tested positive. In July 2004, a barrier breach occurred, and RSR was identified 7 miles west of the barricade. We examined the extent of the epizootic and evaluated the usefulness of wild-animal surveillance.

Methods: Enhanced surveillance was instituted by collecting raccoons for testing. Data were collected for each specimen, including reason for submission. Active surveillance was conducted on raccoons that were suspect (i.e., dead, sick, or acting unusual) and raccoons collected for nuisance reasons. Passive surveillance was conducted on raccoons routinely tested after animal or human exposure. Testing was done by CDC and ODH laboratories by direct fluorescent antibodies (DFA). Odds ratios (OR) and 95% confidence intervals (CI) were calculated to examine the association between active and passive surveillance and rabies status.

Results: During 2004, a total of 1154 raccoons were tested and 44 (3.8%) tested positive. No cases occurred within the barrier. Animals collected by passive surveillance were more likely to be rabid than those obtained through active surveillance (OR=3.63, 95% CI = 1.48–8.60, <0.0008).

Conclusions: With RSR, passive surveillance appears to be more effective at providing prevalence of disease. ODH should prioritize raccoon collection by using passive surveillance to enhance detection of RSR.

Key Words: raccoons, rabies, oral rabies vaccine, surveillance

**Wednesday, April 13, 2005
Concurrent Session I2
Dunwoody Suites
10:30 a.m. – 12:00 p.m.**

Separate and Unequal: Health Disparity
Investigations
Moderator: Walter W. Williams

**Racial Disparities in the Incidence
of End-Stage Renal Disease
in Georgia — 2002**
10:35 a.m.

Authors: Karon Abe, K. Mertz, K. Powell, M. Wu, P. Cho

Background: In the US, end-stage renal disease (ESRD) incidence has steadily increased over the past 20 years, reaching > 80,000 new cases in 2002, with consistently higher incidence rates for blacks. The majority of newly diagnosed ESRD patients are reported to have hypertension or diabetes as the primary cause. Georgia has a large black population and has higher death rates due to kidney disease than the US. Therefore, we assessed racial disparities in ESRD and its contributing causes in Georgia.

Methods: We obtained information regarding persons with incident ESRD in Georgia from the United States Renal Data System. We calculated age-adjusted incidence rates using 2002 Census Bureau population estimates and the 2000 US standard population. We age-adjusted the prevalence of diabetes (2002) and hypertension (2001) in Georgia using self-reported data from the Behavioral Risk Factor Surveillance System.

Results: The rate among blacks was higher in Georgia (1076/1,000,000) than in the US (993/1,000,000), whereas the rate among whites was lower (247/1,000,000) than in the US (262/1,000,000). In Georgia, diabetes or hypertension was reported as the primary cause of ESRD among 79% of black and 72% of white patients. Although adult blacks in Georgia were 1.7 times (95% CI 1.4-2.0) more likely than whites to report having diabetes and 1.7 times (95% CI 1.4-2.0) more likely than whites to report having a history of hypertension, blacks were 4.3 times more likely to develop ESRD.

Conclusions: Racial disparities in the incidence of ESRD are not completely explained by the disparities in prevalence of diabetes and hypertension. Access to healthcare should be further explored. Patients with diabetes and hypertension should be educated about the importance of regular medical care.

Key words: blacks, end-stage renal disease, diabetes, hypertension

**Immunization Assessment in Four Women,
Infants, and Children Clinics - Colorado**
10:55 a.m.

Authors: Tista S. Ghosh, J. Patnaik, A. Bennett, L. Trefren, R. Vogt

Background: In the 2003 National Immunization Survey, Colorado had one of the poorest childhood vaccination rates in the United States. Low-income children, like those in Women, Infants, and Children (WIC) programs, were considered especially high-risk for under-vaccination. The Tri-County Health Department conducted a study of the WIC population in three metropolitan Denver counties to assess and improve vaccination rates and to identify barriers to vaccination.

Methods: A cross-sectional study was conducted in four WIC clinics. In three clinics, mothers of children aged 2 months - 5 years completed surveys for each eligible child on randomly selected days. At a fourth smaller clinic, eligible mothers were surveyed every day for 3 months. Demographic, insurance, and health-care information was obtained. Vaccination records were reviewed, and, in three clinics, non-up-to-date children were referred for vaccination and followed.

Results: A total of 1,571 children (1,232 mothers) were surveyed, with a mean clinic participation rate of 81.4%. At baseline, 63.7% - 74.2% of children were up-to-date with vaccinations in the four clinics. Of children whose mothers reported they were up-to-date, 22.0% - 31.1% were lacking vaccinations, mainly the diphtheria-tetanus-acellular-pertussis vaccine (DTaP). In three of the four clinics, the uninsured were significantly less likely to be up-to-date, when controlling for maternal age, race, education, and number of children. After vaccination referrals, clinic up-to-date rates increased 10.1% - 15.0%.

Conclusions: Baseline vaccination rates for this WIC population are substantially below the national target of 90%. Discrepancies between self-report and actual up-to-date status illustrate the need for improved vaccination education for WIC mothers, particularly regarding DTaP. Linking vaccination referrals with WIC services can increase vaccination rates, and future interventions should target the uninsured.

Keywords: vaccine, childhood vaccinations, WIC clinics, Colorado, immunization barriers

**Hepatitis A Before and After Universal
Childhood Vaccination Recommendations
— Oregon, 1996–2004**
11:15 a.m.

Authors: Sean Schafer, K. Hedberg, P. Cieslak

Background: In 1999, CDC recommended universal childhood hepatitis A (HAV) vaccination in Oregon and other states where incidence exceeded twice the U.S. rate. Historically, Hispanics (9% of Oregon's population, 47% born abroad) have had higher risk of infection. By May 2004, a total of 28% of Oregon children born in 2001 had received at least one vaccination. We compared HAV epidemiology in Oregon between the pre- (1996–1999) and the post-vaccine periods (2000–2004).

Methods: We reviewed reports of HAV cases that occurred in Oregon residents during 1996–2004 and calculated incidence by age and ethnicity before and after universal vaccination. Using geographic analysis, we linked non-Hispanic cases to census block groups and calculated incidence by proportion of Hispanic residents.

Results: Before universal vaccination, annual HAV incidence was 15.0/100,000; 9% of cases were Hispanic. Incidence was highest among persons aged 20–39 (26.9/100,000) and 5–9 (22.0/100,000) years. After universal vaccination, incidence declined to 2.7/100,000; 26% of cases were Hispanic. Incidence among non-Hispanics decreased 82% (14.5 to 2.2/100,000) and declined to 2.4/100,000 in all age groups. Among Hispanics, incidence declined 63% (21.3 to 7.9/100,000). Declines were least among Hispanics aged 19 years, whose combined incidence remained 24.9/100,000 after universal vaccination. Incidence among non-Hispanics living in heavily Hispanic areas was 2.5 times higher than among those living in areas with fewest Hispanics.

Conclusions: Although HAV vaccination rates among Oregon children remain low, incidence declined substantially for all groups except Hispanic children aged 19 years. Risk is higher for non-Hispanics in areas with more Hispanic residents. Achieving further HAV reductions might require alternative vaccination strategies among Hispanic immigrants and their neighbors.

Key Words: Hepatitis A/epidemiology, Hepatitis A Vaccines, Hispanic Americans, Oregon

**Just One More Visit: Achieving >90%
Vaccination Coverage and Reducing Racial
Disparities with One Catch-Up Visit –
United States, 2003**
11:35 a.m.

Authors: Tom T. Shimabukuro, E. Luman, R. Schieber, C. Winston

Background: Coverage for universally recommended vaccinations in young children falls short of the Healthy People 2010 target of >90%, and racial/ethnic and regional disparities in coverage exist. We projected the potential improvement in up-to-date (UTD) coverage achievable by simulating additional provider visits for catch-up vaccinations.

Methods: Data were obtained from the 2003 National Immunization Survey, a nationally representative random-digit-dial survey of households with children 19-35 months of age (n=14,909 children >24 months old). Projected UTD coverage was calculated using the 2003 universally recommended childhood and adolescent immunization schedule (4:3:1:3:3:1:4 series) by having non-UTD 24-month old children receive one or more simulated additional provider visits to receive missing vaccinations (maximum four vaccinations per visit). Computation of variances was conducted using SUDAAN 9.0.0. McNemar's test was used to test the significance of pre-post differences.

Results: Overall national UTD coverage increased from 35% to a projected 92% (p<0.001). Among children not UTD, 88% needed only one additional visit, of which 68% needed only a single vaccination. For non-Hispanic whites, coverage increased from 38% to 94%; for non-Hispanic blacks, from 29% to 90%; and for Hispanics, from 31% to 91% (p<0.001 for each pre-post comparison). Following one simulated additional visit, all states and the District of Columbia exceeded 87% projected coverage, and 40 exceeded 90% projected coverage. The Northeast had significantly higher coverage than the other regions at baseline, but not after one simulated additional visit.

Conclusion: One additional visit for non-UTD 24-month old children would likely result in >90% UTD coverage, regardless of race/ethnicity or region of residence. Strategies to promote such a catch-up vaccination visit should be developed.

Key words: vaccination, immunization, immunization schedule, child health services, racial/ethnic disparity

**Monday--Wednesday Poster Session
Meet the Authors
Ravinia Ballroom
12:30 p.m. - 1:30 p.m.**
Posters #15-30

**Poster Number 15
Leptospirosis: A Seroprevalence Survey
on American Samoa, 2004**

Authors: Kirk P. Winger, R. Novak, E. Pselio, T. Taylor, S. Pathak, M. Ari, S. Bragg, A. Niare, J. King, J. Tufa, T. Clark

Background: Leptospirosis is the most common bacterial zoonosis worldwide. In April 2003, the first laboratory-confirmed case of leptospirosis was diagnosed on American Samoa (AS). Since this initial report there have been five additional cases, including two deaths. We evaluated the prevalence of antibodies to leptospire on AS to measure the burden of disease and reservoirs of transmission.

Methods: Using a cluster sample design, we conducted a cross-sectional seroprevalence survey among adults on AS. Demographic, exposure data, and 5ml of blood were collected from each participant. We defined a seropositive result as an antibody titer 100 to one or more *Leptospira* serovars by microscopic agglutination testing. We also assessed environmental conditions and potential animal reservoirs for leptospire. Exposures associated with increased risk of seropositivity were determined by multivariable modeling.

Results: We enrolled 341 participants; 45% were male, 93% were Samoan. The median age was 40 years (range 18-86 years). Fifty-eight (17.0%, 95% CI=11.5-22.5) were seropositive. The majority reacted to serovars Bratislava (77.6%) and Icterohaemorrhagiae (15.5%) which are serovars commonly associated with rodents, dogs and pigs. These animals occur in large numbers on AS and contamination of surface water with their waste is common. Exposures associated with seropositivity included living in the village of Malaaloa (OR=3.0, 95% CI=1.1-7.7), contact with dogs (OR=2.1, 95% CI=1.1-4.0), and male gender (OR=2.1, 95% CI=1.1-3.9). Bathing in chlorinated municipal water rather than surface water was protective (OR=0.5, 95% CI=0.3-1.0).

Conclusions: We identified previously unrecognized endemic leptospirosis in AS. Laboratory and epidemiological data implicate dogs, pigs, rodents and contaminated streams as likely sources of transmission. We recommend improving nuisance animal control and animal waste management, and promoting public awareness of leptospirosis on AS.

Key words: leptospirosis, seroprevalence survey, seropositivity, animal reservoir

**Poster Number 16
Wound Infections: An Important
Cause of Vibrio Morbidity and Mortality –
United States, 1997-2003**

Authors: Amy M. Dechet, N. Koram, S. Jain, J. Painter

Background: *Vibrio* causes an estimated 8000 United States illnesses annually. Infection occurs through wound exposure to seawater or undercooked seafood consumption. Wound infections can lead to amputations and death, yet public awareness of *Vibrio* wound infections is limited and no prevention messages exist.

Methods: Data from disease reporting forms were extracted from the Cholera and Other *Vibrio* Illness Surveillance (COVIS) system from 1997 through 2003. *Vibrio* wound infection was defined as any *Vibrio* species isolated from a wound or from blood or another site with documented wound exposure. Individuals with infection from multiple *Vibrio* serotypes were excluded.

Results: Of the 2865 *Vibrio* illnesses, 630 (22%) were wound infections. Wound infections accounted for 317 (29%) hospitalizations and 61 (27%) deaths from *Vibrio* species. Among wound infections, *V. vulnificus* infections were the most common (34%) and caused 91% of deaths. At least 23 patients required amputations. Risk factors for death from *V. vulnificus* were alcoholism (OR = 13.3, 95% CI 5.7-30.7) or liver disease (OR = 39.0, 95% CI 14.6-103.9). Exposures reported by cases included seafood handling (66%), swimming (36%), boating or surfing (33%), and shore walking (20%). *V. vulnificus* wound infections were most frequently reported from the Gulf Coast states with 89% of deaths occurring from May through October. Other serotypes isolated included *V. alginolyticus* (30%), where 52 (27%) involved the ear in swimmers, and *V. parahemolyticus* (18%).

Conclusions: *Vibrio* wound infections, especially those from *V. vulnificus*, demonstrate high morbidity and mortality. Persons with alcoholism or liver disease should be advised of the risk associated with exposure to Gulf Coast seawater during warmer months if a wound is already present or is likely to occur.

Key words: *Vibrio* infections, *Vibrio vulnificus*, wounds, mortality, seawater, risk factors

**Poster Number 17
Adverse Drug Events Presenting to a
Nationally Representative Sample of
Hospital Emergency
Departments – United States, 2003**

Authors: Aaron B. Mendelsohn, D. Budnitz, K. Weidenbach, A. Trontell, P. Seligman

Background: Most surveillance for adverse drug events (ADEs) has been conducted at individual institutions among hospital inpatients or through passive systems, such as the Adverse Event Reporting System maintained by the Food and Drug Administration. Active surveillance of adverse drug events occurring in the outpatient setting is rarely performed.

Methods: We analyzed ADEs presenting to hospital emergency departments (EDs) using data from the National Electronic Injury Surveillance System-Cooperative Adverse Drug Event System (NEISS-CADES). NEISS-CADES includes 64 hospitals, representing all U.S. health care facilities with 24-hour EDs. An ADE was defined as an injury resulting from the outpatient use of a drug. Data were collected from 1 Aug 2003 - 31 December 2003. We describe the number of ADEs and the mechanisms (e.g., overdose, allergic reaction), drug, and associated outcomes (e.g., hospitalization).

Results: A total of 4,017 ADEs were reported during the study period. The median age of persons experiencing ADEs was 37 years (range: 1 month-103 years) and 60% were female. The most common drug classes associated with ADEs were CNS medications (23% of ADEs) and anti-infectives (19%). Unintentional overdoses were responsible for 41% of ADEs, followed by allergic reactions (32%) and side effects (23%). Of all ADEs, 14% resulted in a hospitalization.

Conclusions: NEISS-CADES is the first nationally representative, active surveillance system for ADEs in the outpatient setting and presenting to EDs. Analysis of NEISS-CADES will provide estimates of the national burden of these types of ADEs, the circumstances surrounding them, and aid in the design of interventions for reducing ADEs.

Key words: drugs, adverse events, emergency departments, active surveillance, national estimates

Poster Number 18
Eating Dinner with Family Associated with Decreased Risk for Delinquent Behaviors and Depression and Increased Likelihood of Fruit and Vegetable Intake

Authors: Jonathan H. Siekmann, L. Bensley, J. VanEenwyk

Background: Eating meals with family is associated with improved dietary quality and decreased risk for high-risk behavior among adolescents. However, whether eating meals with family is protective or a marker of overall quality of life or socioeconomic status (SES) is unclear. We examined associations between eating dinner with family and high-risk behaviors, depression, and eating fruit and vegetables.

Methods: We analyzed responses by 10th graders from the 2002 Healthy Youth Survey, a self-administered questionnaire given to middle and high school students in Washington State. Respondents who eat dinner with their family most of the time or always were compared to those who sometimes, rarely, or never eat dinner with their families, controlling for quality of life, sex, parents' college degree status, and routine dental exams within the past 2 years (a measure of SES).

Results: Eating dinner with family was associated with decreased risk for fighting (odds ratio [OR]=0.63; 95% confidence interval [CI]=0.47 – 0.84), smoking (OR=0.69; 95% CI =0.55 – 0.87), drinking alcohol (OR=0.66; 95% CI=0.51 – 0.86), and depression (OR = 0.78; 95% CI=0.62 – 0.99), and was associated with increased likelihood of eating fruit and vegetables >5 times daily (OR=1.54; 95% CI=1.11 – 2.15). All associations remained significant after controlling for quality of life, sex, parents' college degree status, and dental exams.

Conclusion: The decreased risk for high-risk behavior and depression and increased likelihood of eating fruit and vegetables >5 times daily suggest that eating dinner with family is an important factor for adolescents' well-being, independent of overall quality of life and socioeconomic factors. Studies to determine the causal nature of this association are needed.

Keywords: adolescent, family, eating, risk, behavior

Poster Number 19
Genotyping Identifies Ongoing Mycobacterium tuberculosis Transmission Associated with Delayed Diagnosis—Mississippi, 1996–2004

Authors: R. J. Asghar, T. Harrington, A. Laurie, L. Walker, R. Shohara, R. Pratt, J. Oeltmann, K. Ijaz, A. Rausa, K.M. McNeill, T. Navin

Background: Eliminating tuberculosis (TB) in the United States hinges on interrupting Mycobacterium tuberculosis transmission. Genotype clusters (patient isolates with matching M. tuberculosis genetic patterns) often represent recent transmission. Delayed diagnosis may result in increased transmission. During 1996–2004, at least 26 (38%) of 68 TB cases in County A had a matching genotype. We investigated this cluster to understand factors associated with transmission. **Methods:** We interviewed patients and reviewed medical and contact records of County A TB patients whose isolates had a matching M. tuberculosis genotype or (in the absence of genotype data) an epidemiologic link during 1996–2004. Delayed TB diagnosis was defined as diagnosis >60 days after symptom onset. Contacts received TB screening including a tuberculin skin test (TST).

Results: Thirty-three patients met the case definition. All were U.S.-born with median age 30 years (range 3–71). Thirty-two (97%) were black, 20 (61%) were male, and 25 (76%) lived within a 2-mile radius. Established risk factors for TB such as HIV co-infection (n=2) and injection drug-use (n=0) were infrequent or absent. Although 32 (97%) patients were symptomatic at diagnosis, diagnoses were delayed for 8 (28%) of 29 pulmonary cases. All homeless patients (n=3) were diagnosed without a delay. Positive TST result (128 [17%] of 738 screened contacts) was associated with exposure to patients with delayed diagnosis (odds ratio=2.9, 95% confidence interval=1.9–4.8).

Conclusions: Genotyping of TB isolates identified a cluster of ongoing M. tuberculosis transmission. Lack of some established risk factors may have contributed to delayed diagnoses and facilitated TB transmission. With the advent of universal genotyping in the United States in 2004, similar unsuspected chains of transmission may be uncovered.

Keyword: genotyping, TB cluster, tuberculosis, diagnosis, Mississippi, prevention and control

Poster Number 20
Assessing Risk for Latent Tuberculosis Infection: Validation of a Novel Risk Assessment Tool — Tennessee, 2004

Authors: Kevin P. Cain, K. Garman, K. Laserson, C. Wells, C. Haley

Background: Targeted testing and treatment for latent tuberculosis (TB) infection (LTBI) is an essential strategy for U.S. TB elimination. As part of a statewide targeted testing initiative (TTI), Tennessee developed a novel risk assessment tool (RAT) to identify persons at high risk for TB disease who would benefit from a tuberculin skin test (TST) and treatment of LTBI if present. The RAT identifies persons at increased risk for recent TB infection or increased risk for progression from infection to disease, two groups CDC defines as high-risk populations. We evaluated this tool to assess its utility for risk assessment.

Methods: We reviewed a cross section of Tennessee's TTI database, comparing risk assessment to TST result. We used CDC criteria to define a positive TST. We included all individuals assessed with the RAT during 3/1/2002 - 2/29/2004. We analyzed the data with Epi Info and SAS and calculated the sensitivity, specificity, predictive value positive (PVP), and predictive value negative (PVN) for the RAT in detecting individuals with a positive TST.

Results: Tennessee administered TSTs to 66,430 individuals as part of the TTI. Of 20,071 individuals assessed as being at low risk, 354 (1.8%) had a positive TST, while among 46,359 assessed as being at high risk, 6,662 (14.4%) had a positive TST. The sensitivity of the RAT was 95%; specificity, 33%; PVP, 14%; and PVN, 98%.

Conclusion: The risk assessment tool has a high sensitivity for identifying individuals who will have a positive TST. We conclude that this tool is valid and potentially useful in identifying individuals who may be at high risk for developing TB and who should be targeted for tuberculin skin testing.

Keywords: tuberculosis, epidemiology, tuberculin test, risk factors, mass screening, diagnosis

Poster Number 21
Nosocomial Mycobacterium tuberculosis Transmission in a Newborn Nursery and Maternity Ward -- New York City, 2003

Authors: Alyssa M. Finlay, K. Granville, C. Driver, C. Clark, F. Fitzpatrick, M. Purswani, B. Fazal, A. Burrowes, B. Heyman, D. Ruggiero, J. Jereb, M. Haddad

Background: In infants, Mycobacterium tuberculosis can progress rapidly to active disease, which is often severe. We investigated nosocomial contacts at a newborn nursery and maternity ward where exposure from a nurse with sputum smear-positive pulmonary TB disease had occurred. The nurse was foreign-born and had not adhered to treatment of latent TB infection (LTBI) upon immigration 11 years earlier.

Methods: We reviewed hospital records for all patients in the nursery and maternity ward who were potentially exposed during the nurse's infectious period. Women were notified of potential exposure, and they and their newborn infants were offered a tuberculin skin test (TST). Results were reviewed to evaluate the extent of transmission. Many women had baseline TST screening during the prenatal period.

Results: From 9/1/2003–11/29/2003, 613 infants and 900 women in the maternity ward were potentially exposed to the nurse; 225 (37%) infants and 216 (24%) women had been tested as of 10/1/04. No TB disease was found. TST results of 5 (2%) infants and 19 (8%) women changed from negative to positive (>5 mm). This finding was associated with cesarean delivery of infants (relative risk [RR]=11.8, 95% confidence interval [CI]=1.3–103.1) and foreign-born status among women (RR=5.9, CI=1.4–24.5).

Conclusions: Some M. tuberculosis transmission appears to have occurred in association with a specific nosocomial exposure, but fewer than half the exposed patients have been tested, despite extensive outreach. Post-cesarean infants may have required more nursing care, thus resulting in more exposure. Circumstances of this case support the need for effective LTBI testing and treatment programs for health-care workers to reduce such exposures.

Key Words: tuberculosis, transmission, tuberculin test, pediatrics, nosocomial

Poster Number 22
Investigation of an Increase in Tuberculosis Cases in Children Aged < 5 Years—Maricopa County, Arizona, 2002–2003

Authors: N. Sarita Shah, T. Harrington, M. Huber, C. Wellnitz, A. Sorensen, S. Fridrych, I. Gonzalez, K. Ijaz

Background: Childhood tuberculosis (TB) is a sentinel event usually indicating recent transmission from an infectious adult. Although TB case rates in the United States among children < 5 years old (2.8/100,000 in 2003) have been declining, Maricopa County reported an increase from 4.1/100,000 in 2002 to 9.0/100,000 in 2003, suggesting increased Mycobacterium tuberculosis transmission. We investigated factors associated with this increase.

Methods: We reviewed county TB clinic records of pediatric patients (age < 5) diagnosed 1/1/02 – 12/31/03 and their probable adult sources, interviewed parents of pediatric patients, and examined changes in TB clinic procedures.

Results: We verified 11 pediatric TB patients in 2002 and 25 in 2003 (N=36): 31 (86%) were U.S.-born and 28 (78%) had a foreign-born parent. Epidemiologic characteristics did not differ by year. Of 24 children with identified sources, probable household transmission occurred for 23 (96%); a foreign-born relative from a TB-endemic country was the source in 20 (83%). Source demographic and clinical characteristics that may have affected M. tuberculosis transmission did not differ between years. In 2003, increased staffing (3 additional nurses), more frequent pediatric TB clinic days, and on-site gastric aspirates for TB diagnosis contributed to 19% more children being evaluated for TB. Additionally, the number of children with pulmonary TB completing 3 diagnostic smear examinations for acid-fast bacilli increased from 1/7 (14%) in 2002 to 17/24 (71%) in 2003 (p=0.012).

Conclusion: The increase in pediatric TB likely reflects improved clinic diagnostic capacity and may indicate a more accurate baseline rate for Maricopa County. Programmatic improvements in TB control and targeted outreach to high-risk immigrant populations may increase pediatric and adult source case detection and reduce M. tuberculosis transmission.

Keywords: epidemiology, Mycobacterium tuberculosis, tuberculosis, pediatrics, disease transmission, diagnostic services, Arizona

Poster Number 23
Age and Sex as Risk Factors for West Nile Virus Neuroinvasive Disease in Children

Authors: Lora B. Davis, E. Hayes, D. O'Leary, T. Smith, A Marfin, A. Hinckley, P. Collins, K. Kniss, G. Campbell

Background: West Nile virus (WNV) causes meningitis, encephalitis, flaccid paralysis, and self-limiting febrile illness. Since first detected in the United States in 1999, WNV has caused 6,854 cases of neuroinvasive disease in 46 states and the District of Columbia; representing the largest recognized epidemic of arboviral neuroinvasive disease in the western hemisphere. Intense surveillance for WNV neuroinvasive disease (WNND) began in 1999; WNND became nationally notifiable in 2002. Among adults, increasing age and male sex are risk factors for WNND, but the demographics and risk factors in children are poorly understood.

Methods: We analyzed all cases of WNND among children 18 years reported to CDC/ArboNET since 1999. Age- and gender-specific WNND incidences were calculated using U.S. 2000 census data. **Results:** During 1999–2004, 1,043 pediatric WNV disease cases were reported nationally; 610 (59%) were in males; 307 (29%) were WNND and 736 (71%) were West Nile fever or other syndromes. Among WNND cases, 145 (47%) were meningitis; 92 (30%) were encephalitis; and 70 (23%) were unspecified CNS disease; 2 (0.7%) were fatal. The average annual incidence of WNND in the pediatric population was 0.07 per 100,000, compared to 0.54 per 100,000 in adults. In children, incidence increased with age; incidence in children 15–18 years (0.13/100,000) was 2.6-fold greater than in children aged 0–4 years (0.05/100,000). Incidence in boys (0.08/100,000) was 60% higher than in girls (0.05/100,000).

Conclusions: Although the incidence of WNND is significantly lower in children than in adults, as in adults, the incidence in children increases with age and males appear to be at greater risk than females. Pediatric WNND-related mortality is rare.

Key words: West Nile virus, encephalitis, meningitis, child, infant

Poster Number 24
Rash in West Nile Virus Infection Associated with Improved Prognosis — Colorado, 2003

Authors: Dayna D. Ferguson, K. Gershman, S. Burnite, A. K. De, N. Haubert, J. Pape

Background: In 2003, Colorado had the largest documented state outbreak of West Nile virus (WNV). A higher proportion of patients (60%) reported rash than documented in recent WNV outbreaks (generally 19–33%). Surveillance data were analyzed to describe this finding and determine whether rash was associated with prognosis.

Methods: Case-patients were laboratory-confirmed (WNV IgM-positive) and identified through statewide surveillance. Patients were classified as having WNV fever (no central nervous system disease), meningitis (abnormal cerebrospinal fluid), and encephalitis (altered mental status). Patients or household members were interviewed by using a standard questionnaire.

Results: During 2003, a total of 2,595 (88.1%) of 2,947 WNV patients were interviewed; 1,329 (51.2%) were female and 2,161 (83.3%) were aged <65 years. Among interviewed patients, 2,002 (77.1%) had fever, 379 (14.6%) meningitis, and 214 (8.2%) encephalitis; 48 (1.8%) patients died (47 with encephalitis; one cause unknown). WNV fever patients reported rash more frequently (63.7%) than meningitis (54.6%) and encephalitis (35.5%) patients. Patients aged <65 years reported rash more frequently (66.9%) than patients aged >65 years (26.2%). Among encephalitis patients, only six (7.9%) of 76 patients with rash died, compared with 41 (29.7%) of 138 patients without rash. When age group and sex were adjusted for, odds of dying among encephalitis patients with rash were 0.29 times the odds of dying among encephalitis patients without rash (95% confidence interval=0.11–0.74).

Conclusions: In 2003 in Colorado, rash was commonly reported by WNV patients, particularly younger patients and patients with WNV fever. WNV encephalitis patients with rash had a better prognosis than patients without rash. These findings suggest that rash might be associated with a host factor that is protective against encephalitis and death.

Key words: West Nile virus, West Nile virus encephalitis, rash, death, prognosis

Poster Number 25
Assessment of Community Knowledge and Practices Following Outbreak Investigation and Control Efforts for Rocky Mountain Spotted Fever – Arizona, 2004

Authors: Elizabeth J. Melius, L. Demma, J. McQuiston, R. Holman, J. Cheek

Background: Rocky Mountain Spotted Fever (RMSF), caused by Rickettsia rickettsii, is a potentially fatal tickborne illness. From August, 2003 through September, 2004 a new focus of RMSF was found in a small community in Arizona. We conducted a survey to assess knowledge and practices of community residents following outbreak investigation and control efforts to determine intervention effectiveness.

Methods: Interviewers administered a standardized questionnaire to a convenience sample of 131 adult shoppers at community supermarkets 3 months after implementation of an ongoing community education campaign that included distribution of "Tick Kits" (gloves, forceps, information, and insect repellent) and a 3-month supply of Frontline™ canine tick preventive.

Results: Most respondents knew about RMSF (72%) and believed it could be fatal (83%). Most thought dogs (74%) and ticks (78%) were involved in transmitting RMSF to humans. Of respondents who received Frontline™ for their dogs, 41% (9/21) gave all required doses; 81% (17/20) gave at least one dose. Most (68%, 15/20) reported seeing fewer ticks on dogs, although only 36% (8/21) reported seeing fewer ticks around their homes. Only 46% (13/28) of homes on piers had skirting to prevent dogs from congregating underneath and increasing the likelihood of human exposure to ticks. Of respondents who had received tick kits, 68% (30/44) understood and 25% (11/44) used the kit; only 40% (17/44) searched their families for ticks.

Conclusions: Although few respondents had received the Tick Kits or Frontline™, most respondents were aware of RMSF risks and dangers and the role of ticks as vectors and dogs as potential reservoirs for the disease. Such awareness suggests that further public-health interventions to decrease RMSF risk would be well received in this community.

Key words: Rocky Mountain Spotted Fever, Tick-borne diseases, vector, Rickettsia infections, knowledge, practices.

Poster Number 26
Knowledge, Attitudes, and Behaviors
Regarding Lyme Disease Prevention:
Summary of Surveys Conducted in Seven
Communities in the Northeastern
United States

Authors: Larissa A. Minicucci, A. Postema, K. Griffith, R. Nelson, S. Soliva, F. Cantor, F. Sorhage, L. McHugh, K. Gerher, S. Marks, P. Mead

Background: Lyme disease (LD) is a tick-borne illness that can cause chronic disability. Nationwide, reported LD cases have increased from 9,123 in 1993 to 21,273 in 2003. A better understanding of attitudes and practices related to LD prevention is needed to develop more effective prevention strategies.

Methods: In conjunction with CDC, health departments in Connecticut, Massachusetts, New Jersey, and New York conducted independent surveys of residents in seven jurisdictions. Surveys were conducted between June and November 2002 by mail or telephone. Respondents were asked about their knowledge of LD, their use of personal protective measures, and their attitudes towards interventions to reduce tick exposure.

Results: Overall, 3,812 surveys were completed. Median age category of respondents was 40-49 years; 62% were female. Across surveys, 73-89% of respondents said they knew "a lot" or "some" about LD, and 42-79% reported that they "always" or "frequently" checked their body for ticks after being outdoors. Only 18-40% of respondents reported frequently or always using insect repellent, and 14-35% said they always or frequently tucked their pants into their socks. Although 34-49% said they approved of using pesticides on their property to kill ticks, only 21-38% reported doing so in the past. The most universally acceptable prevention measures were those related to personal and community property management such as removing brush and leaf litter in the yard (72-91% approved) and creating a gravel/woodchip barriers around play areas (47-82% approved).

Conclusions: Interventions requiring periodic activity targeting the environment (e.g., landscaping) may be more widely acceptable than personal measures requiring daily vigilance (e.g., repellent use). These findings should be used to prioritize messages within LD prevention campaigns.

Key Words: Lyme disease, prevention and control, community survey, ticks

Poster Number 27
Disparities in Testing for HIV by
Race/Ethnicity and Risk Status —
Los Angeles County, 2002

Authors: Elizabeth A. Baraban, P. Simon.

Background: Few population-based studies have examined patterns of human immunodeficiency virus (HIV) testing at the municipal or county level, where HIV prevention programs and treatment services are most often planned. This study examined factors associated with HIV testing among Los Angeles County residents.

Methods: Data were analyzed from a 2002 countywide, random-digit-dial telephone survey of 8,167 adults (>18 years old). Respondents were asked if they had been tested for HIV in the past 2 years. Adjusted odds ratios (AORs) and 95% confidence intervals (CIs) were calculated by using logistic regression to identify factors associated with HIV testing. Covariates included sex, education, race/ethnicity, age, marital status, income, health insurance, country of birth, language of interview, and HIV risk status. Persons at "high risk" were defined as men who have sex with men and heterosexuals who reported having two or more sexual partners and who did not always use a condom in the past 12 months.

Results: Overall, 30.7% of adults in the county were tested for HIV in the past 2 years. Among respondents at high risk, 52% were tested for HIV. Those at high risk were more likely to be tested than those at low risk (AOR=5.0, 95% CI=3.8-6.7). Blacks (AOR=2.6, 95% CI=2.1-3.2) and Latinos (AOR=1.7, 95% CI=1.4-2.0) were more likely to be tested than whites. However, among adults at high risk, Latinos (AOR=0.2, 95% CI=0.2-0.4) and blacks (AOR=0.4, 95% CI=0.2-0.6) were less likely to be tested than whites.

Conclusions: Enhanced efforts are needed to increase HIV testing among adults at high risk in the county, especially among Latinos and blacks at high risk.

Keywords: HIV, AIDS, high risk, testing, ethnicity, race

Poster Number 28
What Works in Public Health: The Evidence
Base for Preventing Disease,
Injury and Disability

Authors: Karen E. Giesecker, A. Mendelsohn, S. Saydah, J. Yuan, C. Curry, R. Ikeda, S. Thacker

Background: Public health prevention programs should be based on sound evidence. Information about risk factors and the magnitude of disease associated with these factors (attributable fraction [AF]) guides the development of intervention programs, whereas preventive fractions (PF) measure the impact of interventions. However, this information has never been described across multiple public health conditions.

Methods: To quantify the evidence base for 31 disease and injury conditions we systematically reviewed the literature for information about modifiable risk factors, AF, population-based interventions, and PF for each. Conditions were selected due to their high morbidity and/or mortality and importance to CDC's mission. We defined modifiable risk factors as those which could be changed by public health interventions. When AF or PF were not calculated by the authors, they were estimated from information provided in the articles using standard formulae.

Results: We reviewed 679 reports related to the 31 conditions and identified 194 modifiable risk factors. The attributable fraction was provided or could be estimated for 65 (34%) of the 194 risk factors. Additionally, 702 population-based interventions were identified for 28 (90%) of the 31 conditions and for 137 (71%) of the 194 risk factors. Preventive fractions could be estimated for 31 (4%) of the 702 interventions.

Conclusions: For this group of 31 conditions, much information exists about modifiable risk factors and population-based interventions overall. In contrast, relatively little data actually describing the magnitude of disease associated with these factors (AF) and the measurable impact (PF) of these interventions exist, which are both critical to rational public health planning. Enhanced efforts to measure and report AF and PF are needed to guide development of public health programs.

Key words: evidence-based public health, risk factors, attributable fraction, interventions, preventive fraction

Poster Number 29
Risk Factors for Death among Patients with
Plague – United States, 1960-2003

Authors: J. Erin Staples, D. Dennis and P. Mead

Background: Plague has reemerged as an important public health concern in the United States amidst fears that the causative agent, *Yersinia pestis*, could be intentionally released by terrorists. Although plague is frequently fatal, risk factors for death have not been well characterized.

Methods: We reviewed the medical histories of all confirmed human plague cases reported in the United States between 1960 and 2003. Analyzed variables included patient demographics, exposure history, laboratory findings, clinical course, and treatment. Multivariate analysis comparing fatal and nonfatal cases was performed to calculate odds ratios (OR) and 95% confidence intervals (CI).

Results: Records of 410 cases were reviewed, including 331 bubonic, 64 septicemic, and 10 pneumonic cases. Median age of patients was 24 years; 58% (239/410) were males, and 37% (116/314) were American Indians. The overall case-fatality rate was 15% (60/410) but varied by type of plague: bubonic 11% (36/331), septicemic 30% (19/64), pneumonic 40% (4/10). Mortality did not vary by age or race but was significantly higher for males at 18%, as compared with 10% for females (Chi-square=5.2, p=0.023). In multivariate analysis, five factors present at initial evaluation were associated with fatal outcome: bloody sputum (OR=42.9, CI=4.7-388), bacteria seen on peripheral blood smear (OR=11.9, CI=5.1-27.8), white blood cell count less than 20,000 (OR=7.5, CI 2.4-27.4), abnormal chest X-ray (OR=3.3, CI=1.6-7.1), and a delay of >72 hours between symptom onset and hospitalization (OR=2.2, CI=1.1-4.6).

Discussion: In addition to delayed treatment, several findings at clinical presentation are associated with an increased risk of death among patients with plague. These risk factors may be useful for guiding triage and clinical management of patients with plague, especially in a mass-casualty setting.

Keywords: Plague, *Yersinia pestis*, mortality, flea-borne disease

Poster Number 30
How Much Do Binge Drinkers Really Drink?

Authors: Ernest E. Sullivent, T. Naimi, R. Brewer, J. Miller, C. Okoro

Background: Binge drinking (consuming 5 drinks on one occasion) is responsible for over half of the 75,000 annual deaths due to excessive drinking in the United States. Although studies show a strong dose-response relationship between total drinks and adverse outcomes, there are no population-based studies assessing the number of drinks typically consumed by binge drinkers. Increased knowledge of this information could improve the design and evaluation of prevention programs.

Methods: We analyzed 2003 data from 13 states using the new Behavioral Risk Factor Surveillance System binge drinking module. Total drinks were calculated by summing the number of beer, wine, and liquor-containing drinks consumed during the most recent binge episode. A pairwise t-test was used to compare subpopulation proportions and mean number of drinks.

Results: Among 7,090 binge drinkers, the mean number of drinks per binge episode was 8.1; 70.4% of binge drinkers consumed 6 drinks, and 24.7% consumed 10 drinks. The mean number of drinks per binge was higher for men (8.5) than women (7.0) ($p < 0.01$) and was inversely related to age (10.0 for those aged 18-20 years vs. 7.0 for those aged >55 years; $p < 0.01$). The mean number of drinks was higher among Hispanics (9.1) than among blacks (8.3) and whites (7.8) ($p < 0.05$). Binge drinkers above median weight for this population consumed more drinks per binge episode (8.4) than those at or below median weight (7.9) ($p < 0.05$).

Conclusions: Most binge drinkers consume substantially more than 5 drinks per binge episode. These findings suggest that most binge drinkers achieve impairment-level blood alcohol concentrations. Aggressive interventions are needed to reduce both binge drinking and the number of drinks per binge episode, particularly in high-risk groups.

Key words: drinking behavior, alcohol drinking, alcohol abuse, health survey, Behavioral Risk Factor Surveillance System

Wednesday, April 13, 2005
Session J
Ravinia Ballroom
1:30 p.m. – 3:45 p.m.
Nowhere Man: Vulnerable Population Investigations
Moderator: Alyssa Easton

Incarcerating Hepatitis B: An Outbreak
Demonstrates the Importance of
Vaccination in Correctional Settings
1:35 p.m.

Authors: Rose A. Devasia, T. Jones, S. Halford, L. Sheeler, W. Schaffner

Background: In five counties in eastern Tennessee, the number of acute hepatitis B cases increased from 16 in 2002 to 42 in 2003. Hepatitis B is a vaccine-preventable viral liver disease that can lead to cirrhosis and hepatocellular carcinoma. We performed an epidemiologic investigation to characterize the outbreak and identify intervention strategies.

Methods: Case-patients were interviewed using a standardized questionnaire. Incarceration histories were confirmed by review of jail records. A point prevalence serosurvey for hepatitis B was performed at the largest county jail in the affected area; all inmates and staff were offered vaccination.

Results: Of the 42 case-patients, 32 (76%) were female; 42 (100%) were white; and 26 (62%) had a history of incarceration. The median age was 39 years (range: 21-73). Of the 42 case-patients, 19 (45%) were contacted and interviewed; two (5%) were deceased; four (10%) refused; and 17 (40%) could not be contacted. Of the 19 case-patients interviewed, 15 (79%) admitted previous drug use; nine (47%) had a history of injection drug use. During the 6 months before diagnosis of acute hepatitis B, five (28%) had multiple (2 partners in 6 months) sexual partners. At the county jail, all 194 inmates were offered vaccination and testing for hepatitis B; 94 (48%) were vaccinated and 81 (42%) were tested. Serologic results revealed that 53 (65%) inmates were nonimmune, 14 (17%) with past infection; 8 (10%) previously immunized; 6 (7%) with acute infection and none with chronic infection.

Conclusions: Universal vaccination of inmates probably would have prevented a substantial proportion of the cases in this outbreak. CDC should develop effective methods to implement recommendations for vaccinating residents of correctional facilities.

Key words: hepatitis B, vaccine preventable, correctional facilities, injection drug use

Streptococcus Pneumoniae Serotype 12F
Outbreak in a Homeless Population –
California, 2004
1:55 p.m.

Authors: Ellen H. Lee, S. Hosea, E. Schulman, A. Bellomy, D. Jackson, N. Glass, D. Nguyen, J. Sekhar, A. Kimura, D. Feikin

Background: Streptococcus pneumoniae (Spn) is a leading cause of pneumonia and meningitis. In February 2004, responding to an outbreak in two homeless shelters, Santa Barbara County Health Department (SBCHD) officials administered pneumococcal polysaccharide vaccine (PPV-23) and levofloxacin to shelter residents and employees. We evaluated risk factors for Spn infection and impact of control measures.

Methods: A definite case was a shelter resident/employee with Spn isolated from a normally sterile site from January 14-February 23, 2004; a suspect case had meningitis, sepsis, or pneumonia without an isolate. SBCHD officials identified cases through contact with healthcare providers and laboratories. We reviewed case-patients' medical records, serotyped isolates, administered questionnaires to identify risk factors for infection, and obtained naso/oropharyngeal swabs to determine Spn carriage. Fisher's exact test was used to calculate p-values.

Results: Eight definite and one suspect case were identified. Seven (77.8%) case-patients were male, median age 52 (42-81 years). Seven isolates were serotype 12F. Among shelter residents/employees, 194 completed questionnaires. Risk of disease was elevated for those who were black (RR 5.1, 95% CI 1.1-22.4) or had a history of alcohol consumption (RR 4.8, 95% CI 1.0-23.0). Disease was less likely for those who received levofloxacin (0/67) than those who did not (8/127 [6.3%], $p = 0.05$), but not significantly different among vaccinated (3/107 [2.8%]) and unvaccinated persons (5/87 [5.7%], $p = 0.47$). Three (1.6%) of 188 persons tested carried Spn; one isolate was serotype 12F, and all were levofloxacin-susceptible.

Conclusion: Our findings illustrate Spn can still cause explosive outbreaks in crowded settings of susceptible hosts. Cases of invasive pneumococcal disease occurred after PPV-23 administration without concomitant antibiotic treatment, suggesting antibiotics might be an important adjunct to vaccination in this setting.

Key words: Streptococcus pneumoniae, disease outbreaks, homeless persons

Pertussis Outbreak at a Summer Camp for
HIV-Infected Children – Nebraska, 2004
2:15 p.m.

Authors: Anand A. Date, Tom J. Safranek, Dennis Leschinsky, Kathy Carter

Background: In August 2004, the Nebraska Health Department was notified of a suspected pertussis outbreak among attendees of a 7-day summer camp for HIV-infected children and children in families of HIV-infected persons. Whether HIV infection alters the risk for pertussis acquisition or severity is unknown. We investigated the outbreak to determine its extent, to identify risk factors for transmission, and to assess the effect of HIV on severity of illness.

Methods: Public health staff interviewed camp attendees and reviewed medical records. We defined a case-patient as a camp attendee who met the CDC pertussis outbreak case definition and developed cough <21 days after camp ended.

Results: Of 86 children (age range: 7-16 years) at the camp, 44 (51%) were girls, and 31 (36%) were HIV-positive. All attendees had received at least 4 doses of pertussis vaccine. Nineteen (22%) met the pertussis case definition; 15 were girls. The index case-patient was a girl with onset of cough on the first day of camp. Eight (50%) of 16 girls who shared a barracks-like bedroom with the index case-patient developed pertussis. Attack rate (29% versus 18% respectively) and severity of illness were similar for HIV-infected and non-HIV-infected attendees. Longer intervals between the last dose of pertussis vaccine and exposure at the camp (range: 2-10 years) did not increase the risk of being a case.

Conclusions: Transmission of pertussis was associated with prolonged exposure to the index case-patient in a barracks-like bedroom. HIV-infected children were not at increased risk of acquiring pertussis or of having more severe illness. Early isolation or exclusion of the index case-patient might have prevented this outbreak.

Keywords: Pertussis, HIV-infected children, summer camp, and outbreak.

Chronic Abdominal Pain, Schistosomiasis, and Strongyloidiasis among the Lost Boys and Girls of Sudan Refugee Group
2:35 p.m.

Authors: Drew L. Posey, B. Blackburn, M. Weinberg, E. Flagg, L. Ortega, M. Wilson, K. Won, K. Sanders-Lewis, W. Secor, J. Maguire, B. England, R. Jones, J. Stewart, J. Gibbon, G. Briggs, R. Woods, S. Santana, D. Campos-Outcalt, S. Maloney

Background: Schistosomiasis and strongyloidiasis are parasitic diseases that cause substantial morbidity and mortality in Africa. The U.S. resettles approximately 25,000 African refugees annually; 3,800 Lost Boys and Girls of Sudan arrived from 2000 through 2001. During 2004, CDC learned many Lost Boys and Girls were complaining of chronic abdominal pain (CAP), which may be caused by schistosomiasis and strongyloidiasis. To determine the prevalence and describe the characteristics of CAP and possible association with schistosomiasis and strongyloidiasis, we conducted an investigation during a national reunion of these refugees in August 2004.

Methods: A self-administered, written survey of CAP and associated physical and mental health symptoms and testing for schistosomiasis and strongyloidiasis (enzyme-immunoassays) were offered to all 800 reunion attendees. Data were analyzed to determine factors associated with CAP.

Results: Among 464 participants, 214 (46%) reported CAP. In crude analyses, CAP was associated with numerous physical and mental health symptoms. In multivariate analysis, CAP was associated with constipation (hazard ratio [HR] = 1.91, 95% confidence interval [CI]: 1.56, 2.34) and difficulty sleeping (HR=1.49, 95% CI: 1.20, 1.86). No discrete syndrome was identified. Among participants, 203 (44%) tested positive for schistosomiasis, 214 (46%) for strongyloidiasis. Neither disease was associated with CAP (schistosomiasis prevalence ratio [PR] =0.97, 95% CI: 0.80-1.19; strongyloidiasis PR=0.98, 95% CI: 0.80-1.19).

Conclusions: Lost Boys and Girls have a high prevalence of CAP, schistosomiasis, and strongyloidiasis. Schistosomiasis and strongyloidiasis were not associated with CAP. These refugees should be evaluated for other physical and psychiatric etiologies of CAP. To prevent future morbidity, these Sudanese refugees should receive presumptive treatment for schistosomiasis and strongyloidiasis. Presumptive therapy should also be considered for other African refugees from endemic areas.

Key words: Refugees, abdominal pain, schistosomiasis, strongyloidiasis

Elevated Blood Lead Levels in Refugee Children — New Hampshire, 2004
2:55 p.m.

Authors: Rachel N. Plotinsky, M. Dembiec, M.J. Brown, J. Kellenberg, J. Greenblatt, E.A. Talbot

Background: Refugee children are at risk for lead poisoning, perhaps related to malnutrition, pica, and environmental exposures. After the lead poisoning death of a Sudanese refugee child in Manchester, New Hampshire (NH) in 2000, the state adopted guidelines requiring blood lead level (BLL) screening for refugee children within 90 days of arrival and follow-up testing 3–6 months after initial screening for children aged <6 years. In follow-up testing, elevated BLLs (10 mcg/dL) were identified in 43 of 258 refugee children resettled in Manchester, NH in 2004. We investigated this outbreak to target immediate prevention strategies and to guide future research.

Methods: To define clinical, demographic, and epidemiologic characteristics of refugee children with elevated BLLs, we reviewed records from NH's Childhood Lead Prevention Program, immigration documents, and family interviews.

Results: The 43 affected children (mean age: 4.8 years; range: 11 months–13 years) were all born in Africa and came from 20 families. Of these, 38 (88%) had screening BLLs within 90 days of arrival in NH. At initial screening, 27/38 (71%) had BLLs <10mcg/dL (mean: 7.9 mcg/d; range 2–28). All 43 affected children had elevated BLLs in testing done 3–6 months after arrival in NH (mean: 20.2 mcg/dL; range: 10–72). Pre-existing severe malnutrition (height-for-age Z score <-2 or weight-for-height Z score <-2) was noted in 17/43 (39.5%). Of nine apartments in which environmental investigations were done, lead hazards were identified in eight.

Conclusions: Follow-up BLL testing of refugee children is important to identify lead exposure that occurs after resettlement. Identification of specific risk factors is urgently needed to guide state and national medical and environmental protocols for primary prevention.

Key words: refugee, lead poisoning, risk factor, screening, prevention

Health of Sheltered Homeless Persons — New York City, 2001–2003
3:15 p.m.

Authors: Benjamin W. Tsoi, B. Kerker, M. Schretzman, J. Bainbridge, W. Li, J. Kennedy, C. Driver, L. Torian, Y. Bennani, L.E. Thorpe

Background: Homeless persons have higher rates of morbidity and mortality than the general population. According to the 2004 New York City (NYC) homeless census, 84% of homeless persons reside in shelters run by the NYC Department of Homeless Services (DHS). To characterize health issues affecting sheltered homeless persons, NYCDHS and the NYC Department of Health and Mental Hygiene (DOHMH) conducted a series of cross-agency data linkage projects.

Methods: NYCDHS shelter residents during 2001–2003 were matched by name, date of birth, and social security number to the NYC Vital Statistics, tuberculosis, and HIV/AIDS registries and by address to the New York State hospital discharge database.

Results: During January 2001–March 2003, 55,734 single adults (0.4% of NYC residents) used DHS shelters. Most were aged <50 years (78%) and were Black (60%). The age-adjusted mortality rate among single homeless adults (2,903/100,000) was more than twice the general NYC adult population (1,043/100,000). Although only a small proportion of persons with tuberculosis or HIV/AIDS in NYC were homeless (3.6% and 2.6%, respectively), homeless adults had higher rates than the general public. The rate of new tuberculosis cases among homeless persons was 34/100,000, 2.5 times higher than the general population (13.6/100,000). HIV/AIDS prevalence among the homeless was 2.6%, compared with 1.1% citywide. Homeless persons accounted for 1.4% of NYC hospitalizations during 2001–2002. Although 9% of hospitalizations among non-homeless persons were due to drug use, alcohol use, or mental illness, these causes accounted for 64% of hospitalizations among the homeless.

Conclusion: Homeless adults are more likely to die, develop tuberculosis, have HIV/AIDS, and be hospitalized. Data from this study will guide outreach, prevention, and treatment programs in NYC.

Key words: homeless persons, New York City, mortality, tuberculosis, HIV infections

Wednesday, April 13, 2005
Session L: International Night
Dunwoody Suites
7:30 p.m. – 9:35 p.m.
Improving Public Health by Detecting and Responding to Health Threats
Moderator: Stephen B. Blount

Seroprevalence of O'Nyong nyong fever in Lamu Island – Kenya, October 2004
7:35 p.m.

Author: Sergon Kibet

Background: An outbreak of O' Nyong Nyong fever (ONN), a non-fatal, febrile illness, with severe arthralgias occurred in Lamu, Kenya (population 18,000), peaking in July, 2004. At least 1300 cases were documented. ONN is caused by an alphavirus transmitted by Anopheles mosquitoes. Worldwide, only two epidemics have been documented in Uganda with no reports of disease during the past 8 years. A seroprevalence study was conducted to define the magnitude of transmission in Lamu.

Methods: A cross-sectional, systematic survey was conducted. The first household was randomly selected and then every eighth household. Questionnaires were administered collecting information on demographics and illnesses of members of household. In each household, one resident was selected randomly for blood collection (survey participant). A case of ONN was defined as fever and joint pains within the past 4 months. Blood was collected for testing for IgM and IgG antibodies to ONN virus.

Results: 445 households were surveyed with a response rate of 96% (428/445). Of 1969 household members, 526 (27%) met the case definition. 304 serum blood specimens were collected (141 refusals). Mean age for the participants was 32 years (range 1–80 years). IgM antibodies to ONN were detected in 51 (18%) of 284 sera; IgG and virus neutralization results are pending. bed nets were used by 71% of participants; 23% of nets were insecticide-treated (ITN). Among IgM positive participants, 84% met the case definition compared with 40.7% of IgM negative participants.

Conclusions: Results of IgM antibody testing suggest that the outbreak was more widespread than appreciated. ITN use was low, despite acceptance of bednets. Aggressive promotion of ITN is indicated for prevention of ONN in this setting, with added benefit of preventing malaria, highly prevalent (30%) in Lamu. ITNs were distributed. Larviciding of mosquito breeding sites and health education was commenced.

Keywords: onyong onyong fever, onyong nyong virus

An Outbreak of Acute Febrile Respiratory Disease from Adenovirus in Schools of a Township – Eastern China, 2004
7:55 p.m.

Author: Zhijie An

Background: In China, threats of avian influenza, SARS, and other emerging respiratory pathogens increase the need for prompt investigation of outbreaks. In May 2004, We discovered an outbreak of acute febrile respiratory disease (AFRD) in students of a township. We investigated to identify the agent and mode of transmission, and recommend control measures.

Methods: We defined a case of AFRD as fever (38°E) and 1 respiratory symptom in any township student, April 1 -- June 15, 2004. We compared rates by school and exposure histories for 50 randomly-selected case-students and 58 unaffected control-students. We took pharyngeal swabs to detect agents by culture and PCR.

Results: 15% (832) of students from all 24 township schools (range of attack rates from 1.6% to 60%) developed AFRD. Seven agents including influenza and SARS were initially excluded by laboratory. 28% of case-students reported close contact with other case-students vs. 1.7% of control-students (OR=22;95%CI=3.6~481). 56% of case-students shared towel with family vs. 29% of control-students (OR=3.1;95%CI=1.4~6.8). 58% of case-students often washed their hands vs. 79% of control-students (OR=0.36;95%CI=0.15~0.84). Attack rates during an 11-day school closure done for outbreak control were 6.9% vs. 2.8% in the 11 days before closure and 3.9% in the 11 days after. 0.67% of 4743 students developed AFRD within 3 days after 3-day administration of prophylactic azithromycin vs. 0.96% of 312 untreated students (RR=0.70; 95%CI=0.22~2.28). Adenovirus PCR testing, available in June, detected adenovirus in 71% of 65 AFRD case-students.

Conclusions: Contact and poor personal hygiene sustained this adenovirus outbreak. Differentiation of adenovirus from other respiratory pathogens early during outbreaks is important to avoid unnecessary control measures (e.g. antibiotics) and rule-out potentially emerging infections.

Keywords: disease outbreaks, adenovirus infection, infection control, chemoprophylaxis

Immunization Coverage Cluster Survey – the Democratic Republic of Timor Leste – December 2004
8:15 p.m.

Author: Jonsson Jerker

Background: Early and complete childhood vaccination can reduce morbidity and mortality. Since the reported immunization coverage in Timor Leste continues to be low, the Ministry of Health (MoH), UNICEF and WHO agreed to conduct a coverage survey to evaluate the Expanded Programme on Immunization (EPI) and to assess reasons for non-vaccination.

Methods: A stratified survey was conducted using the WHO EPI cluster survey methodology. In each of the 13 districts in the country, 30 clusters with seven children aged 12 to 23 months and seven mothers who had given birth within the last 12 months were included. If an immunization card with dates was unavailable, history of vaccination was recorded. A questionnaire on reasons for non-vaccination was administered when applicable.

Results: The immunization card was available for 26% (95% CI=24-29) of 2662 interviewed children. Among those, 48% (95%CI=44-52) were fully immunized and 40% (95%CI=37-44) were so by 1 year of age. The BCG to measles drop-out rate was 40% (95% CI=35-46). The main reasons given for non-vaccination were distance from immunization site (32%) and unawareness of immunization (15%). Among 2657 interviewed women, immunization cards were available in 19% (95% CI=18-21), and of these 60% (95%CI=57-63) had received at least two doses of tetanus toxoid (TT) during their last pregnancy. Their main reasons for non-vaccination were also distance (39%) and unawareness (20%).

Conclusions: The immunization coverage and card retention were low in children and mothers alike. Recommended activities to increase coverage included outreach, follow-up of defaulters and health education campaigns to promote awareness and card retention.

Key words: immunization coverage, cluster survey, Expanded Programme of Immunization.

An Outbreak of Hepatitis E Caused by a Contaminated Water Supply – Baripada, Orissa, India, 2004
8:35 p.m.

Author: Susanta Kumar Swain

Background: Hepatitis E has never been reported in the state of Orissa. In January 2004, hospitals from Baripada city reported a cluster of acute hepatitis. Objective: Investigate the outbreak and formulate recommendations for prevention.

Methods: We defined a case as sudden onset of jaundice between 19 January and 1 March 2004 in a resident of Baripada and searched for cases door to door. We calculated the incidence using population denominators. For a case control study, all the reported cases were compared with population-based controls selected from the same neighborhoods. Serum samples were tested for IgM to hepatitis A virus, hepatitis B surface antigen (HBsAg), antibody to hepatitis C virus and hepatitis E virus (HEV).

Results: A total of 538 cases among which five deaths were reported between 19 January and 1 March 2004 (Attack rate: 40 / 1000 population, case-fatality: 0.9%). The attack rate was highest in three neighborhoods supplied by a common municipal water source pumped from a river. All 47 serum samples tested positive for anti HEV in ELISA and negative for other hepatitis viruses. Of 538 cases, 493 (91.6%) reported drinking water from the suspected source compared with 134 of the 538 controls (24.9%), unmatched odds ratio: 33, 95% confidence interval: 23-47. A strike among workers of the water treatment plant from 2 to 10 January led to the supply of untreated river water.

Conclusions: Failure to treat water supply because of a strike, led to the supply of untreated river water that caused a large outbreak of hepatitis E. The quality of drinking water provided to communities should be monitored and measures should be in place to ensure essential services during strikes at the water treatment plant.

Key words: Hepatitis E, Outbreak, Surface water.

Nosocomial Burkholderia cepacia Infections Associated with Exposure to Sublingual Probes — Texas, 2004
8:55 p.m.

Authors: Richard A Taylor, P Metcalf, K Newman, JD Siegel, M Richardson, A Srinivasan, M Arduino, B Jensen, J Noble-Wang, N Pascoe

Background: Burkholderia cepacia (formerly Pseudomonas cepacia, a gram-negative bacillus [GNB]) is associated with nosocomial infections among intensive care unit (ICU) and cystic fibrosis patients and with use of contaminated equipment and solutions. We investigated reports of positive cultures for B. cepacia, from respiratory samples of 13 pediatric ICU patients receiving mechanical ventilation at a Texas hospital during April–August 2004, to identify the source of these infections.

Methods: We reviewed hospital records of the 13 patients and collected environmental samples from the ICU's equipment, solutions, and medical devices. We compared patient and environmental B. cepacia isolates using pulsed-field gel electrophoresis (PFGE).

Results: The majority of patients were male (69%) and aged <1 month (62%). None had cystic fibrosis. B. cepacia was isolated from cultures obtained within a median of 5 days of admission to the ICU (range: 2 hours –15 days). Nine patients were treated for possible disease; the remaining four were considered colonized. Eleven (85%) of 13 patients had documented exposure to a single-use, sublingual probe approved by the U.S. Food and Drug Administration for noninvasive monitoring of tissue carbon dioxide levels. Cultures of the saline from unopened probe containers yielded B. cepacia and other GNB. B. cepacia isolates from nine patients and five unopened probe canisters from at least two lots were indistinguishable by PFGE analysis. No other samples yielded B. cepacia.

Conclusions: The source of this B. cepacia outbreak was a contaminated medical device. Following this investigation, the manufacturer issued a voluntary national recall of the contaminated probes and suspended manufacture of the probes pending further investigation to determine how contamination occurred.

Key Words: Nosocomial, Burkholderia cepacia, medical device

**A Large Outbreak of Water-Borne Paratyphoid Fever Attributed to a Contaminated Well in a Rural Junior High School – Guangxi Province, China
9:15 p.m.**

Authors: Ying Zhang, Re Fontaine, H. Mai

Background: On Dec. 3, 2004, the Chinese emergency surveillance system revealed 142 suspected paratyphoid fever (PTF) cases from a rural junior high school in Guangxi, China. To identify the mode of transmission and develop control measures, we investigated this outbreak.

Methods: We defined PTF case as onset of fever between November 19 and December 15, 2004, plus 1 of the following: headache, dry throat, nonproductive cough, or diarrhea in a student or employee of the school. We compared exposures to school water and food between 122 cases (fever \geq 38°C) and 201 controls chosen randomly from unaffected students. We evaluated the school water supply.

Results: From November 23 to December 12, 40% (404) of 1005 students, 60%(6) of 10 kitchen workers, and 1.4%(1) of 72 teachers developed PTF. 24 %(41) of 173 blood cultures yielded *Salmonella enterica* serovar paratyphi A. Unlike students and workers, teachers always boiled their drinking water. 94% of case-students drank water directly from the school taps compared with 65% of control-students (OR=8.6;95%CI:3.6-21). The OR increased 7-fold as tap water drinking increased from never to always (P<0.0001; χ^2 for trend). The school water system utilized a presumably dry well to store water. This well was <1m from open sewage drains. When emptied it filled spontaneously with 3m³ of subsurface water. One student had culture-confirmed PTF during a previous outbreak in her village represented the probable source of the organism.

Conclusions: This PTF outbreak resulted from contamination of the school water system; probably by subsurface seepage into a storage well. The school disconnected the storage well from the water system and began regular chlorination of tap water.

Key words: paratyphoid fever, outbreak, water-borne, *Salmonella enterica* serovar paratyphi A,

**Thursday, April 14, 2005
Session M
Ravinia Ballroom
8:30 a.m. – 10:15 a.m.**

Young Frankenstein: Mackel Award Finalists
Moderators: Beth Bell and Carol Rubin

**Case-Control Study of an Acute Aflatoxicosis Outbreak — Kenya, 2004
8:35 a.m.**

Authors: Eduardo Azziz-Baumgartner, K. Lindblade, K. Giesecker, H. Rogers, S. Kieszak, H. Njapau, R. Schleicher, L. McCoy, C. Pfeiffer, A. Misore, K. DeCock, C. Rubin, L. Slutsker, and the Aflatoxin Investigative Group

Background: During January-June 2004, Eastern Kenya experienced an aflatoxicosis outbreak with 317 cases and the most fatalities (125) ever documented. We conducted a case-control study to identify risk factors for contamination of implicated maize and (for the first time) quantitated biomarkers associated with acute aflatoxicosis.

Methods: We administered questionnaires concerning maize storage and consumption and obtained maize and blood samples from 40 case-patients with aflatoxicosis and 80 randomly selected controls. We analyzed maize for total aflatoxins and serum for aflatoxin B1-lysine adducts. We used regression and survival analyses to explore the relationship between maize consumption, aflatoxin levels, and case status.

Results: Homegrown maize from case-patients had more aflatoxins than homegrown maize from controls (geometric mean [GM] 354.53 ppb vs. 44.14 ppb, p=0.04) or commercial maize from case-patients. Storing damp maize and storing maize inside the home rather than in a granary were both associated with development of aflatoxicosis (odds ratio [OR] 3.5, 95% CI 1.2-10.3 and OR 12.0, 95% CI 1.5-95.7, respectively). For each milligram increase in maize aflatoxins there was a 0.5 pg/mg increase in the logarithm of serum adducts. Case-patients had higher serum aflatoxin B1-lysine adduct than did controls (GM 1.2 ng/mg vs. 0.15 ng/mg of albumin, p<0.0001). Serum adduct levels were associated with time from jaundice to death (adjusted hazard ratio =1.3, 95% CI 1.04-1.6).

Conclusion: Our findings confirm that contaminated homegrown maize was the source of aflatoxin exposure. In addition, we established clinically relevant serum adduct levels associated with morbidity and mortality from acute aflatoxicosis. We encourage adequate drying and

Keywords: aflatoxin B1, albumins, adducts, maize, serum, Kenya

**An Outbreak of Rocky Mountain Spotted Fever Associated with a Novel Tick Vector, *Rhipicephalus Sanguineus*, on an American Indian Reservation — Arizona, 2004
8:55 a.m.**

Authors: Linda J. Demma, M. Ereemeeva, W. Nicholson, M. Traeger, D. Blau, C. Paddock, M. Levin, G. Dasch, J. Cheek, D. Swerdlow, J. McQuiston.

Background: Rocky Mountain spotted fever (RMSF), caused by *Rickettsia rickettsii*, is a zoonotic tick-borne disease that may result in fatal illness. RMSF is rare in Arizona due to a climate unsupportive to the typical U.S. tick vectors, *Dermacentor* spp. During 2004, 13 cases of RMSF, including one death, were identified on an American Indian reservation in Arizona. We conducted environmental investigations and applied molecular tools to identify the source of the outbreak.

Methods: Partially engorged ticks were collected from patients' dogs, and flat (non-engorged) adult ticks were collected from the peridomestic environment around patient homes. Polymerase chain reaction, DNA sequence analysis, and culture isolation were used to confirm the presence of *R. rickettsii*. Results: All patients reported exposure to tick-infested dogs, and three (23%) of 13 patients described a prior tick bite. All collected ticks were identified as *Rhipicephalus sanguineus* (brown dog tick); no *Dermacentor* spp. ticks were found. *R. rickettsii* DNA was detected in flat ticks and in ticks found on dogs. Cultures of *R. rickettsii* were established from flat and partially engorged ticks.

Conclusions: The identification of *R. rickettsii* in *Rh. sanguineus* ticks collected from patient homes implicates this tick as a vector of RMSF, and provides the first evidence that this tick may be associated with RMSF in the United States. Transmission appears to be caused by high densities of *Rh. sanguineus* in peridomestic settings and by frequent dog-tick-human interactions. Ongoing preventive efforts include extensive tick control, community education, and physician awareness. The broad distribution of this common tick in the United States raises concerns over its potential to transmit *R. rickettsii* in similar settings

Key words: *Rickettsia*, Tick-borne diseases, Rocky Mountain spotted fever, vector, dogs

**Outbreak of *Burkholderia cepacia* Associated with the Use of Multi-Dose Albuterol for Nebulization Therapy-- Missouri, 2004
9:15 a.m.**

Authors: Concepcion F. Estivariz, L. Bhatti, R. Pati, F. Khan, B. Jensen, M. Arduino, D. Lipuma, D. Jernigan, A. Srinivasan.

Background: *Burkholderia cepacia* can contaminate medications and disinfectants and may cause pneumonia in critically ill or cystic fibrosis patients. In March 2004, we investigated a hospital outbreak of *B. cepacia* initially thought to be related to a recalled contaminated nasal spray.

Methods: We conducted a matched case-control study, collected environmental samples, and observed infection control practices. Case-patients had infection or colonization with *B. cepacia* and control-patients had sputum cultures not yielding *B. cepacia*, between October 2003 and March 2004. Isolates from patients and environmental samples were compared by pulsed-field gel electrophoresis (PFGE).

Results: We identified 18 case-patients with *B. cepacia* in sputum cultures. The median age was 62.5 (37-79) years; 15 case-patients were hospitalized in intensive care units (ICUs). Compared with matched control-patients, case-patients were more likely to be on mechanical ventilation (matched Odds Ratio [mOR]=9; 95% Confidence Interval [CI]=1.5-199); to have been hospitalized >6 days (mOR=undefined, P=.04); and to have received vancomycin within 7 days before sputum collection (mOR=9; 95% CI=1.5-199). *B. cepacia* was cultured from two opened (but not from unopened) multi-dose albuterol bottles, a nebulizer attached to the ventilator tubing, and several opened and unopened nasal spray bottles previously recalled for *B. cepacia* contamination. PFGE showed that strains from albuterol bottles and from patients were indistinguishable, but unrelated to the nasal spray strain. We detected improper aseptic techniques during respiratory therapy procedures and inadequate nebulizer cleaning between treatments.

Conclusion: Contamination of multi-dose albuterol and improper infection control procedures may have facilitated transmission of *B. cepacia* among ICU patients. Contaminated nasal spray was not the outbreak source. Adhering to infection control measures for respiratory therapy and changing to single-use albuterol terminated the outbreak.

Key words: *Burkholderia cepacia*, critically ill, respiratory therapy

Replacement Pneumococcal Disease: Increase in Non-Vaccine Type Disease in the Era of Widespread Pneumococcal Conjugate Vaccination—United States, 1998-2003
9:35 a.m.

Authors: Lauri A. Hicks, D. Jackson, B. Juni, D. Facklam, B. Flannery, C. Lexau, L. Harrison, A. Reingold, N. Bennett, M. Farley, A. Thomas, J. Hadler, A. Craig, T. Pilishivi, C. Whitney

Background: Streptococcus pneumoniae causes one million deaths worldwide annually. In 2000 a pneumococcal conjugate vaccine covering seven of 90 serotypes (PCV7) was introduced for children. Disease caused by PCV7 serotypes subsequently dropped among all age groups. Because of concern that non-vaccine type (NVT) disease may replace PCV7-type disease, we used laboratory-based surveillance to evaluate the effect of PCV7 use on incidence of NVT disease.

Methods: Invasive disease case-patients, defined as pneumococci isolated from a normally sterile body fluid, were identified in Oregon, California, Minnesota, Maryland, New York, Connecticut, and Georgia through CDC's Active Bacterial Core surveillance. Isolates were serotyped using the Quellung reaction. We calculated disease incidence using U.S. Census Bureau data. We used chi-square tests to compare rates of serotype-specific disease for two pre-vaccine years (1998-1999) to 2003.

Results: Between 1998 and 2003, 16,758 isolates were serotyped. Overall disease incidence dropped from 24.3 to 14.1 cases per 100,000 persons. Incidence of NVT disease for children <5 years rose from 12.2 to 17.8 cases per 100,000 persons ($p < 0.01$). The largest increases in children were observed for serotypes 3 (401%), 16F (616%), 19A (98%), 22F (204%), and 33F (203%; all $p < 0.05$). Incidence of NVT disease for adults >65 years rose from 26.7 to 30.7 cases per 100,000 persons ($p < 0.01$); 16F (240%), 22F (37%), and 33F (172%) increased significantly (all $p < 0.05$), while increases in 3 (31%) and 19A (35%) approached significance.

Conclusions: Although PCV7 has significantly reduced disease overall, we have confirmed that NVT disease is increasing. Ongoing surveillance is needed to monitor the increase in replacement disease relative to reduction in PCV7 disease to ensure that the vaccine targets the appropriate serotypes.

Key words: Streptococcus pneumoniae, pneumococcal conjugate vaccine, pneumococcal infections/epidemiology, pneumococcal vaccine

Rabies Virus Transmission by Solid Organ and Tissue Transplantation—Texas, 2004
9:55 a.m.

Authors: Anna M. Likos, A. Srinivasan, C. Rupprecht, M. Kuehnert, E. Burton, T. Ksiazek, C. Paddock, J. Guarner, W.J. Sheih, C. Goldsmith, C. Hanlon, D. Johnson, D. Swerdlow, J. Zoretic, J. Dillaha, M. Niezgod, L. Orciari, D. Cardo, J. LeDuc, M. Chamberland, D. Jernigan, S. Zaki, and the Rabies in Transplant Recipient Investigation Team.

Background: Rabies, a viral zoonosis, is generally fatal once symptoms appear. Over the past decade, no more than six cases per year have been reported in the United States. In June, 2004, three recipients of organs from a common donor at Hospital A in Texas developed unexplained encephalitis, prompting an investigation into the cause and source of the infections.

Methods: Clinical and epidemiologic data were collected from records and staff at Hospital A. Recent autopsy records were reviewed to detect other cases of unexplained encephalitis. A retrospective cohort study was conducted to assess potential healthcare-associated transmission. Charts of patients hospitalized on the same dates and units as the recipients of an organ from the common donor were evaluated for encephalitis if neurologic examination had been performed. Clinical specimens were tested using tissue culture, suckling mouse inoculation, serology, reverse transcriptase-polymerase chain reaction, histopathologic evaluation, immunohistochemical staining, and electron microscopy.

Results: Evidence of rabies virus infection was detected in three organ recipients and the donor. Autopsy record review identified a fourth transplant recipient with unexplained encephalitis; subsequent testing confirmed rabies virus as the etiology. Review of surgical procedures revealed that an arterial segment from the donor with rabies had been transplanted to this patient. All four recipients and the donor died from rabies. The retrospective cohort study of 25 patients found no healthcare transmission of rabies virus.

Conclusions: Four transplant recipients died from rabies following receipt of infected organs or vascular tissue from a common donor. Organs and tissues can transmit emerging or unusual pathogens; however, the etiology of some transplant-associated infections may be unrecognized. Improved post-transplant adverse-event surveillance and monitoring of tissue use is needed.

Key words: rabies, transplantation, transmission, encephalitis

Thursday, April 14, 2005
Session N
Ravinia Ballroom
10:30 a.m. – 12:00 p.m.

Mercy Mercy Me (The Ecology): Environmental Health Diseases
Moderator: Henry Falk

Lead Exposure Among Adults and Children Using a Volunteer-Operated Indoor Firing Range — Alaska, 2004
10:35 a.m.

Authors: Marc-Andre R. Chimonas

Background: Lead exposure can impair children's cognitive development and is toxic to adults. In January 2004, the Alaska Environmental Public Health Program (EPHP) investigated a volunteer-operated firing range, which is not regulated by the Occupational Safety and Health Administration, after elevated blood lead levels (BLL) were reported in two adult target-shooters. We investigated to determine if lead exposure occurred at the range and implement control measures.

Methods: EPHP administered questionnaires to ascertain range use and other possible lead exposure sources, interviewed range officers about facility operation and maintenance, drew blood samples to assess BLL, and collected lead dust samples using the Environmental Protection Agency's (EPA) protocol. Multivariate regression models were constructed to correlate range activities with BLL, adjusting for non-range lead exposures.

Results: EPHP interviewed and tested 46 persons affiliated with the range: 21 children aged 7–17 years and 25 adults. Median BLL was 9.0 $\mu\text{g/dL}$ (range: 1–25 $\mu\text{g/dL}$) overall and 8.0 $\mu\text{g/dL}$ (range: 1–14 $\mu\text{g/dL}$) for children. Eight children (40%) had BLL 10 $\mu\text{g/dL}$, CDC's level of concern. In regression models, range use frequency ($\lambda = 0.20 \mu\text{g/dL/range visit}$; $p < 0.001$) and range officer duty ($\lambda = 3.72 \mu\text{g/dL}$ for officers; $p = 0.010$) were associated with BLL. Lead content of 16 dust samples was 1,700–27,000 $\mu\text{g/ft}^2$ (EPA acceptable level <100 $\mu\text{g/ft}^2$). The range had no written maintenance protocol or record of ventilation system certifications. Adults and children swept the firing lanes after each shooting session.

Conclusions: Lead exposure occurred at the firing range. EPHP recommended the range certify its ventilation system, regularly wet-mop with a lead-chelating agent, and prohibit children from cleaning. This investigation underscores the importance of implementing lead exposure programs at volunteer-operated firing ranges.

Keywords: lead; exposure, environmental; volunteer workers; guns; recreation

Outbreak of Thyrotoxicosis—Uruguay, 2003-2004
10:55 a.m.

Authors: Elizabeth J. Conrey, C. Lindner, C. Estivariz, J. Welsh, D. Freedman, M. Pereira, L. Kettel-Khan, L. Grummer-Strawn.

Background: Thyrotoxicosis is characterized by thyroid hormone elevation from endogenous or exogenous sources. Symptoms include unintentional weight loss and, in severe cases, atrial fibrillation requiring hospitalization. Few outbreaks are documented. In early 2004, physicians in Minas, Uruguay, noted a sharp increase in thyrotoxicosis patients, especially within one neighborhood, and multiple cases within families.

Methods: We initiated case surveillance, environmental inspection, and a case-control study. Cases were symptomatic city residents with documented elevated free T3 or T4 with thyroid stimulating hormone (TSH) <0.49 $\mu\text{IU/mL}$, or only TSH <0.1. Controls were frequency matched by age and neighborhood. Cases, controls, and their primary food preparers were interviewed with a standard questionnaire. Odds ratios adjusted for age and sex (AOR) were calculated by using logistic regression in SUDAAN to account for clustering within neighborhoods and families.

Results: We identified 59 case patients aged 9-74 years (median=39). Of those, 48% were women and 71% resided within one neighborhood. Of the 56 case patients interviewed, 98% consumed ground beef more than once a week versus 81% of 112 controls (AOR=13.4, 95% confidence interval [CI]=1.7-104.0); and 96% of case patients and 88% of controls consumed chicken (AOR=4.9, CI=1.1-20.9). Ninety-three percent of case patients and 46% of controls purchased ground beef from butcher A or B (AOR=17.2, CI=4.4-67.2). Environmental investigation revealed that a beef supplier to these two butchers was selling meat cuts that contain thyroid gland.

Conclusions: The most likely cause of this outbreak was ground beef contaminated with thyroid gland, as documented in prior outbreaks. Thyroid gland consumption may be an underreported source of thyrotoxicosis. Tight regulation and oversight of slaughter, sales, and processing are imperative for prevention of future outbreaks.

Key words: thyrotoxicosis, thyroid gland, food contamination, hyperthyroidism, disease outbreak

Residential Exposures to Hydrogen Sulfide and Respiratory Outcomes — Warren, Ohio, 2004
11:15 a.m.

Authors: Preethi Lakshmi Rao, L. Wilder, D. Middleton, M. Lewin, A. Henderson

Background: Hydrogen sulfide (H₂S) is the second leading cause of toxin-related death in U.S. workplaces; low exposures cause respiratory effects. In 2004, residents near a Warren landfill complained of H₂S-associated respiratory effects, fatigue, nausea, headache, and eye irritation.

Methods: We recruited 107 people who lived near, worked at, or attended a school within 1 mile of the landfill. During the 4-week study all participants recorded odors smelled (rotten eggs, garbage, sewage and smoke) and symptoms in a daily diary; 66 (62%) wore H₂S-measuring badges and 50 (47%) used an electronic peak-flow meter to measure respiratory function. Ambient H₂S levels near the landfill were monitored. The Ohio Environmental Protection Agency provided sulfur dioxide, ozone and particulate matter data. We used mixed-model regression to model percent predicted forced expiratory volume (FEV₁), and generalized estimating equations to model the daily self-reported symptoms.

Results: Ambient H₂S levels were 0.94 (range 0-16) parts per billion (ppb); 3-fold higher than in other U.S. cities (0.11–0.33 ppb). Changes in FEV₁ were significantly associated with exposure to particulate matter, smoking, and asthma, but not with H₂S levels. The odds of self-reported lower respiratory symptoms (LRS) increased for odors of rotten eggs (OR=1.42 [95% confidence interval: 1.17–1.72]), smoke (OR=1.37 [1.05–1.79]), garbage (OR=1.40 [1.01–1.94]), and sewage (OR=1.55 [1.21–1.99]). The odds of self-reported LRS increased with each additional odor reported (OR=1.41 [1.23–1.62]) and time spent each additional hour spent near the landfill (OR 1.05 [1.03–1.07]).

Conclusions: Residents near the landfill were exposed to H₂S levels higher than U.S. levels. Air quality (odors and particulate matter) affected self-reported lower respiratory symptoms and was associated with decreases in lung function.

Identifying Housing that Poisons: A Critical Step in Eliminating Childhood Lead Poisoning — Chicago, 1997–2003
11:35 a.m.

Authors: Nimia L. Reyes, L. Wong, G. Curtis, P. MacRoy, P. Meyer, A. Evens, M.J. Brown

Background: Childhood lead poisoning symptoms range from subtle neurodevelopmental problems to death. The most common source of lead exposure for U.S. children is deteriorated leaded paint in housing built before 1950. In 2001, Chicago—where 52.3% of housing was built before 1950—reported more children with confirmed elevated blood lead levels (BLLs [10 µg/dL]) than any other U.S. city. We conducted a study to identify Chicago housing where multiple children aged <6 years who had confirmed elevated BLLs had lived.

Methods: We analyzed 1997-2003 Chicago childhood lead poisoning surveillance data for children aged <6 years, using geographic information systems and SAS. Each child's address at first confirmed elevated BLL was geocoded and linked to the Chicago Building Footprint file to determine the number of children with elevated BLLs associated with each building. Buildings with 10 children with elevated BLLs were identified. Addresses of these buildings were linked to environmental inspection data to determine whether inspected buildings had lead hazards.

Results: Preliminary results showed that of a total of 55,876 children with elevated BLLs, 53,826 (96.3%) were linked to 36,546 validated and geocoded addresses. We successfully matched 33,235 (90.9%) of these addresses to 30,742 buildings. Of these, 124 buildings had 10 children with elevated BLLs; of 123 buildings with inspection data, 69 (56.6%) had documented lead hazards. These 69 buildings were associated with 1148 children with elevated BLLs from 1997-2003.

Conclusions: This approach of identifying buildings associated with multiple children with elevated BLLs can guide targeting of high-risk buildings for remediation and legal interventions to prevent more children from being poisoned at the same building. Further investigation of these buildings is ongoing

Key words: child, lead poisoning, Geographic Information Systems, Chicago

Thursday, April 14, 2005
Session O
Ravinia Ballroom
1:30 p.m. – 3:15 p.m.

Every Breath You Take: Tuberculosis Investigations
Moderator: Ken Castro

Tuberculosis Outbreak among Young Marijuana Hotboxers—Seattle, Washington, 2004
1:35 p.m.

Authors: John E. Oeltmann, E. Oren, M. Narita, L. Lake, T. Harrington, K. Ijaz, L. Diem, M. Haddad

Background: Although U.S. tuberculosis (TB) rates are declining, certain populations continue to challenge TB control. From February to October 2004, TB was diagnosed in 11 Seattle residents involved with illicit drug-related activities. We investigated Mycobacterium tuberculosis transmission and recommended control measures.

Methods: M. tuberculosis isolates were genotyped. Times, places, and behaviors relevant to transmission were determined from medical records, patient reports, and field observations. Contacts were classified as friends or others. Contacts received screening for M. tuberculosis infection with a tuberculin skin test (TST). Friends included members of a close-knit network of delinquent young adults.

Results: Seven isolates had matching genotypes; results for four others are pending. Patients' median age was 22 years (range: 18–41). Patients had findings indicating infectiousness: all were diagnosed with pulmonary TB, seven (64%) had cavitary disease, and eight (73%) had positive sputum smear examinations for acid-fast bacilli. Each was unemployed, had been incarcerated, and used marijuana. All patients reported "hotboxing" (smoking marijuana inside a closed car to recycle exhaled smoke) with friends. Fifty-five (48%) of 114 contacts were considered friends. Twenty-nine (54%) friends reported or were seen hotboxing. Fourteen (64%) of 22 screened friends had a positive TST result. Risk of a positive TST result was 2.8 times greater among friends than among others (95% confidence interval = 1.3–6.0).

Conclusions: Numerous contagious patients within a close-knit group of friends led to intense M. tuberculosis transmission. Hotboxing may have contributed to transmission by inducing cough in an enclosed environment. Control efforts were directed toward detecting and screening friends.

Key words: tuberculosis, marijuana, hotboxing, transmission, Seattle

Time in the United States as a Method of Assessing Risk for Tuberculosis Disease among Foreign-Born Persons — Tennessee, 2004
1:55 p.m.

Authors: Kevin P. Cain, K. Garman, K. Laserson, C. Wells, C. Haley

Background: Over half of reported U.S. tuberculosis (TB) cases are among foreign-born persons. However, CDC guidelines categorize only recent immigrants (those who have been in the United States 5 years) as being at high risk, and only for those immigrants do CDC guidelines recommend tuberculin testing and treatment of latent TB infection. Tennessee's statewide targeted tuberculin testing initiative considers all foreign-born to be at high risk and targets all for testing and treatment. We investigated whether persons residing here > 5 years are at high risk in Tennessee.

Methods: We analyzed all cases reported to Tennessee's TB Information Management System to determine the number reported among foreign-born persons in Tennessee from January 1, 1999, to August 31, 2004, stratified by length of U.S. residence. We estimated case rates using census data.

Results: During the study period, 273 TB cases were reported among foreign-born Tennessee residents. Of these, 95 (35%) reported U.S. residence > 5 years prior to diagnosis. Based on census data, there are approximately 130,000 foreign-born persons in Tennessee who have been in the United States > 5 years. Thus, the estimated case rate for this group is 14/100,000.

Conclusions: In Tennessee, the rate of TB disease among foreign-born persons residing in the United States > 5 years is over five times that of U.S.-born persons (2.7/100,000) and is similar to estimated rates among other groups considered at high risk. These data support Tennessee's decision to consider all foreign-born persons to be at high risk and suggest a need for research at the national level to determine whether time in the United States should continue to be used for risk assessment.

Keywords: tuberculosis, foreign-born, epidemiology, tuberculin test, risk factors, mass screening

Clinical Outcomes of Multidrug-Resistant Tuberculosis Patients Treated Under the WHO DOTS-Plus strategy – Estonia, 2001-2002
2:15 p.m.

Authors: Alyssa M. Finlay, T. Holtz, K. Kliiman, M. Danilovits, K. Laserson, C. Wells, K. Vink, V. Hollo

Background: In 2000, 12% of newly diagnosed tuberculosis (TB) patients in Estonia had multidrug-resistant TB (MDR TB; TB resistant to at least isoniazid and rifampin), one of the world's highest percentages. We assessed treatment outcomes for the first cohort of MDR TB patients treated in Estonia under the strategy recommended by the World Health Organization (WHO) for managing MDR TB patients, Directly Observed Treatment, Short-course with drug susceptibility testing (DOTS-Plus).

Methods: We performed record reviews of all Estonian patients who started MDR TB treatment between 8/1/2001-1/31/2002. Treatment outcomes were assessed using established international definitions.

Results: Preliminary results show that of 87 registered patients, 43 (49%) were new patients without prior TB treatment, and 44 (51%) had previously been treated. Median age was 44 years (range 19-79), 69 (79%) were men, and 8 (9%) were prisoners. Patients' isolates were resistant to a median of 5 drugs (range 2-9) at treatment initiation. Five patients who died without MDR TB treatment were excluded from the cohort analysis; the remaining 82 began individualized treatment based on drug susceptibility results and including at least 3 drugs effective against the patients' isolates. Of 75 patients for whom outcomes are available, 39 (52%) were cured or completed treatment, 13 (17%) died, 14 (19%) interrupted treatment, and 9 (12%) failed treatment. Patients were treated for a median of 413 days (range 3-1270).

Conclusions: With high drug resistance in Estonia, only half of MDR TB patients were treated successfully. This is less than the 65-70% treatment success rate of other DOTS-Plus programs. Future efforts to improve outcomes will require enhanced strategies to address treatment interruption and failure.

Key Words: Tuberculosis, drug resistance, treatment, outcome

Tuberculosis Outbreak in a Low-Incidence State—Allen County, Indiana, 2001–2004
2:35 p.m.

Authors: Kathrine Tan, D. McMahan, D. Tuckey, P. Britton, K. Ijaz, I. González

Background: Breakdown in tuberculosis (TB) control can contribute to outbreaks in low-incidence states (TB case rates <3.5/100,000 population). During 2000–2003, Allen County, Indiana, annual TB case rates increased from 2.9 to 4.7. We investigated this increase and recommended interventions.

Methods: We abstracted medical records and interviewed patients, tested contacts for latent TB infection (LTBI) using tuberculin skin tests (TST), and treated those infected. Mycobacterium tuberculosis isolates from 1/1999–6/2004 were genotyped by U.S. standard methods. Outbreak-related patients had matching genotypes. TB diagnosis made 2 months from symptom onset was delayed.

Results: From 1/2001–6/2004, we found 25 outbreak-related cases; 19 (76%) had pulmonary TB and 10 (40%) had delayed diagnosis. Median age was 27 years (range: 6 months–51years), 96% were non-Hispanic black, all were U.S. born, and 56% were female. All 16 patients tested for HIV were uninfected. Of 1,107 contacts, 46 (4%) had a prior positive TST result; 752 (68%) received TSTs, of whom, 130 (17%) had positive results (induration 5 mm). Of the 130, 60 (46%) were contacts to patients with delayed diagnosis. Of the 130 with positive TST, LTBI treatment was indicated in 113 (87%), contraindicated in 2 (2%), and 15 (12%) had TB disease. Of the 113 LTBI treatment candidates, 50 (44%) refused treatment, 51 (45%) completed treatment, and 12 (11%) defaulted. Of these 12, 3 (25%) developed TB disease and were suspected sources of infection for 16 outbreak-related TB disease cases.

Conclusions: Data from this outbreak revealed TB control lapses such as delayed TB diagnosis and incomplete LTBI treatment. Low-incidence states still face TB control challenges and require resources and capacity for rapid outbreak response.

Tuberculosis Contact Identification – Louisiana, 2004
2:55 p.m.

Authors: Peter J.E. Vranken, Ch. Degraw, R. Oliveri, R. Ratard

Background: Tuberculosis (TB) remains an important cause of disability and death in Louisiana. In February 2004, a 13-year-old child had active TB disease diagnosed. Restriction fragment length polymorphism (RFLP) finger printing of the child's isolate matched several other Louisiana isolates. We investigated why TB control failed.

Methods: We searched the Louisiana RFLP database, which holds all active TB cases since 1999, for patterns matching that of the child. We reviewed records and interviewed cases to identify social interactions and to evaluate contact investigation and treatment of latent TB infection (LTBI).

Results: A cluster of six TB cases was identified. All were linked through their social interactions. The child's grandmother was the first to have active TB disease diagnosed in November 1998. She is considered the initial case in this cluster and the source of infection for her son and grandchild. Her son, never identified and investigated for LTBI, had active TB in July 1999. The grandchild was investigated as a household contact, treated for LTBI, but had active TB nonetheless. The remaining three cases had active TB disease after February 2004 and were probably infected by the child. One was her step-grandmother who already had active TB at the time of contact investigation. The other two were never identified as contacts. They acquired infection after very short periods of exposure – 4 hours as a substitute teacher and 3 2-hour sessions as a hairdresser. Both were infected with the human immunodeficiency virus.

Conclusions: Contact investigations are often not fully exhaustive. Even a very comprehensive contact investigation might not identify casual contacts. This limits the ability of LTBI investigations and treatment to control TB transmission.

Key words: tuberculosis, contact investigation, latent tuberculosis infection, tuberculosis control

Thursday, April 14, 2005
Session P
Ravinia Ballroom
3:30 p.m. – 5:00 p.m.

General Hospital: Nosocomial Infections
Moderator: Michele Pearson

Outbreak of Burkholderia cepacia Pseudobacteremia Associated with Nonsterile Practices of Phlebotomists – Chicago, 2004
3:35 p.m.

Authors: Lyn James, A. Siston, J. Watson, R. Jones, G. Schneider, S. Monahan, J. Price, S. Mohapatra, S. Gerber

Background: Burkholderia cepacia is a nosocomial pathogen frequently implicated in hospital epidemics. Outbreaks have been associated with contaminated equipment and solutions, and with poor infection-control practices. On September 19, 2004, the Chicago Department of Public Health was notified of an increased number of positive blood culture reports for B. cepacia in a local hospital. We investigated to determine the source and to prevent further cases.

Methods: A case-patient was any patient with >1 B. cepacia-positive blood culture report. We reviewed patient charts, interviewed phlebotomists and nurses, inspected medical supply rooms, and collected environmental samples. We analyzed culture reports for August 2004 to determine the distribution of blood specimen collections between phlebotomists and nurses.

Results: During January 1, 2004–September 18, 2004, a total of 29 B. cepacia-positive blood culture reports, among 22 case-patients, were identified. Twenty (91%) of 22 had no clinical signs of sepsis (systolic blood pressure <90 mm Hg), and none had B. cepacia on subsequent cultures. All case-patients were in medical wards and had blood collected by phlebotomists. Among all cultures collected in August 2004 in medical wards, 12 (6%) of 214 collected by phlebotomists were positive for B. cepacia, compared with none of 327 collected by nurses (Relative Risk undefined, p<0.0001). Phlebotomist practices included collection of blood in nonsterile tubes before transferring to culture bottles. The phlebotomists' supply room had a toilet, visible dirt, and plants; environmental cultures were negative for B. cepacia. The room was closed and the phlebotomists retrained. No further cases have been reported.

Conclusion: B. cepacia pseudobacteremia can indicate nonsterile blood specimen collection and breaches in established hospital practices. To prevent specimen contamination, adherence to recognized infection-control guidelines is essential.

Key words: Burkholderia cepacia, outbreaks, blood specimen collection, infection control

Transmission of Hepatitis C Virus at a Pain Remediation Clinic — San Diego, California 2003
3:55 p.m.

Authors: Mark C. Janowski, R. Gunn, M. Ginsberg, J. Rosenberg, M. Alter, I. Williams

Background: Hepatitis C Virus (HCV) is a common bloodborne pathogen that has been associated with contaminated multiple-dose vials of medication in nosocomial outbreaks. We investigated a patient with acute hepatitis C who received procedures at a pain clinic during March–April, 2003.

Methods: Medical record review identified clinic attendees with previous diagnoses of HCV infection (possible source patients) and an at-risk cohort exposed to these patients. HCV screening, genotype determination, and NS5B sequence analysis were performed to identify new patients and determine relatedness between infections.

Results: Four possible source and 52 at-risk patients were identified. Among the 52 at-risk patients, 35 (67%) were tested and 4 (11%) received new diagnoses of HCV infection. Risk factors for newly diagnosed HCV were undergoing a procedure in operating room #2 on April 3 (57% [4/7] vs. 0% [0/28], Relative Risk (RR)=•, $p < 0.001$) and receiving 1cc of lidocaine from a multiple-dose vial on that day (100% [4/4] vs. 0% [0/3], $RR = \bullet$, $p = 0.03$). A source patient and two patients with new diagnoses of HCV infection had the same genotype (1b) and >95% sequence homology among the NS5B portion of their viral genomes; no viral RNA was present in the remaining two newly diagnosed patients.

Conclusions: This nosocomial outbreak of HCV infection most likely resulted from a single, 1-day contamination of a multiple-dose vial of lidocaine from a source patient with transmission to four susceptible patients. This study adds to a growing body of evidence suggesting that multiple-dose vial use should be restricted to single patients or centralized medication rooms and demonstrates the value of investigating single cases of acute hepatitis C in settings where nosocomial transmission has been reported previously.

Key Words: hepatitis C virus, nosocomial transmission, pain clinics, lidocaine

A Hospital Outbreak of Diarrhea Reveals Emergence of an Epidemic Strain of Clostridium Difficile - Maine, 2003
4:15 p.m.

Authors: Sophia V. Kazakova, G. Killgore, K. Ware, B. Baughman, O. Bilukha, A. Paradis, S. Sears, A. Thompson, B. Jensen, L. Wiggs, J. Bessette, J. Martin, J. Clukey, K. Gensheimer, L.C. McDonald

Background: According to national hospital discharge data, rates of Clostridium difficile-associated diarrhea (CDAD) have abruptly increased 61% since 2000. To explain the increase and to determine risk factors, we investigated a hospital outbreak of CDAD in Maine and compared isolates causing outbreaks in other states and Canada.

Methods: A CDAD case was defined as diarrhea and a positive C. difficile toxin test in a Hospital A patient during May–December 2003. Cases were compared by where CDAD was acquired—Hospital A or an affiliated nursing home (NH). Risk factors were examined in a matched case-control study. C. difficile isolates were compared with isolates from separate CDAD outbreaks in 9 states and Canada by antimicrobial susceptibility, pulsed-field gel electrophoresis (PFGE), and PCR for toxinotyping and virulence factors (binary toxin and deletion of tcdC, a toxin suppressor gene).

Results: We identified 46 cases acquired at Hospital A and 16 at the NH. Independent factors associated with CDAD ($P < 0.05$) were receipt of fluoroquinolones (Matched Odds Ratio [MOR] 4.8) and gastric acid suppressors (MOR 5.4). Analysis of isolates from patients, environment, and healthy carriers confirmed acquisition of two distinct strains at the two facilities: 1) toxinotype 0 at NH and 2) toxinotype III (T-III) at Hospital A. The hospital (T-III) strain was indistinguishable by PFGE from isolates causing recent hospital outbreaks in the US and Canada, possessed binary toxin, had tcdC deletion, and was resistant to fluoroquinolones.

Conclusions: Our investigation revealed an emerging novel strain of CDAD as a cause of geographically dispersed outbreaks. Reduced fluoroquinolone use may be needed to prevent epidemics with this emerging strain. Limiting gastric acid suppression may be another important infection control strategy.

Key words: Clostridium difficile; enterocolitis, pseudomembranous; diarrhea; bacterial toxins

Pseudomonas Aeruginosa Outbreak in a Neonatal Intensive Care Unit — Illinois, 2004
4:35 p.m.

Authors: Kathleen A. Ritger, L. Graham, S. Borchardt, R. Griffith, J. Conway, K. Holmes, M. Dworkin

Background: Mortality during outbreaks of Pseudomonas aeruginosa in neonatal intensive care units (NICUs) can reach 35%. Standard guidelines for control include increased attention to hand hygiene, gloving, and elimination of potentially contaminated reservoirs. Collection and testing of environmental specimens ideally is guided by findings of the epidemiologic investigation. We investigated an outbreak of P. aeruginosa infection and colonization in a NICU to identify preventable risk factors.

Methods: Patients were NICU infants with culture-positive P. aeruginosa during July 10–August 23, 2004. Controls were selected from the NICU census from the date of the corresponding patient's first P. aeruginosa culture. Information about potential risk factors, such as invasive procedures, was collected by medical record review. Swabs from respiratory equipment, faucets, lotions, and patient care items were cultured. P. aeruginosa isolates were typed using pulsed-field gel electrophoresis (PFGE).

Results: Sixteen cases were identified, comprising two fatal infection, nine nonfatal infection, and five nonfatal colonization cases. Intubation (gestational age-adjusted odds ratio [AOR]=11.1, 95% confidence interval [CI]=1.3–99.1) and umbilical vessel catheterization (AOR=11.3, 95% CI=1.2–104.6) were associated with infection. Eighty-six environmental cultures identified one faucet aerator positive for P. aeruginosa. PFGE typing identified an outbreak pattern among 13 patients, a unique pattern for the index patient and faucet aerator, and a third pattern for one patient. Improved hand hygiene and cohorting of patients and nursing care succeeded in controlling this outbreak.

Conclusions: Although analytic studies can help identify a source of an outbreak, strict adherence to standard precautions for hospital infection control might be sufficient for outbreak control. Extensive environmental culturing did not yield useful information for enactment of control measures. Epidemiologic findings should guide environmental testing during P. aeruginosa outbreaks.

Key Words: Pseudomonas aeruginosa, intensive care units, infant, cross infection, disease outbreak, public health practice

Friday, April 15, 2005
Session Q

Ravinia Ballroom
8:30 a.m. – 10:00 a.m.

He Sees You When You're Sleeping:
Surveillance Presentations
Moderator: Denise Koo

Outbreak of Invasive Pneumococcal Disease Detected by Surveillance—Rural Alaska, 2003-04
8:35 a.m.

Authors: Laura L. Hammitt, K. Rudolph, J. Butler, R. Singleton, B. Beall, C. Whitney, D. Hurlburt, T. Hennessy

Background: Streptococcus pneumoniae remains a major cause of morbidity and mortality despite the availability of vaccines. Surveillance revealed an increase in invasive pneumococcal disease (IPD) in a region of rural Alaska, Region A, during 2003–04. The cases underscore the preventability of IPD and the importance of capitalizing on opportunities for vaccination.

Methods: Cases of IPD were detected through statewide laboratory-based surveillance. CDC/AIP confirmed each isolates' identity, serotype, and antimicrobial susceptibility. Nasopharyngeal (NP) swabs were collected on Region A residents through an ongoing community study of pneumococcal carriage. Pulsed-field gel electrophoresis (PFGE) and multilocus sequence typing (MLST) were performed on a subset of isolates. MLST results were compared with the Pneumococcal MLST Database.

Results: From January 2003 – March 2004, Region A reported 14 cases of IPD, compared to a mean 2.8/year for 1986–2002. Eight (65%) of 11 of adult patients had indications for, but had not received, pneumococcal vaccination. Nine (64%) cases were 12F, a serotype in the 23-valent vaccine. 12F isolates were indistinguishable from each other by PFGE, but were unique compared to a sample of invasive 12F isolates (n=40) collected throughout Alaska since 1986. NP carriage of 12F was identified in 46/1843 Region A residents in 2003 (compared to 0/1825 in 2002). Carried 12F isolates were identical to the outbreak strain on PFGE. MLST results indicated that the outbreak 12F clone is not related to any known pneumococcal clone.

Conclusions: Surveillance detected an IPD outbreak due to a previously unrecognized 12F clone. Carriage of the new clone was detected in Region A concomitant with the outbreak. The largely preventable nature of this outbreak prompted Region A providers to implement standing orders for pneumococcal vaccination.

Key words: Streptococcus pneumoniae, pneumococcal infection, multilocus sequence typing

Evaluation of Surveillance for Reportable Neisseria Meningitidis Invasive Disease — Iowa, 2002–2003
8:55 a.m.

Authors: L. Flamigni, P. Quinlisk, A. Buckler, B. Jacobsen

Background: Each year, 2,400–3,000 cases of Neisseria meningitidis invasive disease (NMID) are reported in the United States. One goal of the NMID surveillance system is to prevent secondary cases. We evaluated the 2002–2003 surveillance system for NMID in Iowa to determine completeness of reporting and the effectiveness of prevention.

Methods: We assessed system attributes (acceptability, simplicity, timeliness, and flexibility) using CDC's current guidelines for evaluating surveillance systems. We reviewed report forms for data completeness, time of prophylaxis, and prevention effectiveness. Using Iowa reporting forms, the number of persons exposed to NMID was determined. The number of prevented cases was calculated using national estimates. Sensitivity was calculated using hospital discharge data and death certificates as the standard. Health-care workers were surveyed to determine the acceptability and simplicity of the system.

Results: The system is flexible; this was demonstrated by its ability to capture newly reportable West Nile Virus cases. The reporting rate of NMID was 100%, indicating high acceptability.

Using the standard, 56 cases were identified which is consistent with the 56 cases reported. Of these reports, 49 (87%) were complete enough for follow-up and 7 (12%) were incomplete. Almost all cases (53/56, 95%) were reported 0–1 days following hospitalization, and antibiotic prophylaxis was initiated in 100% of exposed persons. The health-care worker's survey indicated that 91% perceived the system as simple. We estimate that 420 persons are exposed annually in Iowa; therefore, up to nine cases and one death were prevented each year.

Conclusions: Through rapid and complete reporting of index cases of NMID, public health intervention prevents an estimated nine cases and one death per year.

Keywords: Neisseria meningitidis, surveillance, prevention, Iowa, communicable diseases.

Assessment of Post-Tropical Storm Jeanne Disease Surveillance – Gonaives, Haiti, 2004
9:15 a.m.

Authors: Seema Jain, R. Colindres, A. Bowen, W. Pierre, K. Saint Vil, Y. Bernard, G. Lerebours, M. Beatty, E. Mintz

Background: Tropical Storm Jeanne struck Haiti on September 18, 2004, severely damaging 7,000 homes and killing nearly 2,800 people. Flood waters inundated the city of Gonaives, rendering the hospital inoperable and increasing the risk of acute epidemics, injuries, psychological and untreated chronic disease. Epidemiologic surveillance following natural disasters is essential for monitoring the health of the affected population, detecting epidemics, informing decisions about resource allocation, and evaluating public health interventions.

Methods: On September 25, the Ministry of Public Health and Population (MSPP), the Pan American Health Organization and CDC established emergency syndromic surveillance in outpatient and inpatient facilities serving the affected area. In mid-November, we evaluated this surveillance system and compared the first 7 weeks of data with surveillance records from specific clinics.

Results: Over 90,000 reports were made from 12 surveillance sites during the 7 weeks following the hurricane. The most common syndromes were fever with cough (12,208; 14%), cutaneous problems (11,119; 12%), injuries (3,843; 4%), and fever with diarrhea (3,794; 4%). Overall, 21% of reports were from children <5 years old. Reports for all conditions peaked in the first week (21,744 reports) and declined thereafter, except for peaks in injuries and psychological problems during week six. Clinic-specific surveillance corroborated that no epidemics occurred in the hurricane-affected area; however, case-definitions were non-specific, data analysis and reporting were not timely, and mortality data were not collected. The emergency surveillance system was modified to address these concerns.

Conclusions: The emergency surveillance system provided valuable reassurance to MSPP and other agencies that no epidemics occurred in the aftermath of the storm. Improvements in specificity, information flow, and mortality surveillance will increase the utility of the system.

Key words: hurricane, disaster epidemiology, emergency surveillance, natural disasters, population surveillance

Reporting of Nosocomial Outbreaks of Acute Gastroenteritis — State of Georgia, 2002–2004
9:35 a.m.

Authors: Eileen W. Lau, C. Burnett, P. Blake, R. Turcios, J. Bresee, C. McDonald, M-A. Widdowson

Background: Acute gastroenteritis (AGE) outbreaks, often caused by norovirus, are frequently reported in healthcare facilities in other countries and are a substantial economic burden. In contrast, few such outbreaks are reported in the United States. It is not known whether this is due to a truly lower frequency of outbreaks or to under-reporting.

Methods: Hospital infection-control practitioners in Georgia were sent a questionnaire to gather data on the frequency and features of AGE outbreaks that occurred from January 1, 2002, through June 30, 2004. To determine if under-reporting exists, survey data were compared with reports made to the Georgia Department of Health (GADOH) during the same time.

Results: Of 163 hospitals surveyed, 55 (34%) responded. Of these, 10 outbreaks were reported from seven (12.7%) hospitals. Illnesses lasted a mean of 4 days in 90% of outbreaks. Predominant symptoms were diarrhea, fever, and vomiting (100%, 80%, and 60% of outbreaks, respectively). Most outbreaks occurred from October to March, and 70% continued for >15 days. Of the 10 outbreaks, four affected >10 patients and two affected >40 staff members. Outbreaks resulted in staff absenteeism (50%), case-patient relocation (40%), discharge delays (80%), and one ward closure. Etiology was confirmed in eight outbreaks: four were attributed to Clostridium difficile, one to norovirus, and three to rotavirus. No association was found between hospital characteristics and outbreak occurrence. None of the outbreaks identified from our survey had been reported to GADOH.

Conclusions: Nosocomial outbreaks of AGE are under-reported to Georgia authorities. The predominant cause of these outbreaks may not be norovirus as in other countries. Larger, national studies are required to assess the true incidence and etiology of nosocomial AGE outbreaks.

Key words: hospital, disease outbreaks, epidemic gastroenteritis, norovirus

Friday, April 15, 2005
Session S
Ravinia Ballroom
1:30 p.m. – 3:15 p.m.
Pièce de Résistance: Antimicrobial Resistance and Practice Patterns
Moderator: Jo Hofmann

Impact of Multidrug-Resistant Acinetobacter Infections on Mortality and Length of Hospitalization – Maryland, 2002–2004
1:35 p.m.

Authors: Rebecca H. Sunenshine, M. Wright, L. Maragakis, S. Kazakova, H. Standiford, T. Perl, A. Harris, J. Hebden, S. Cosgrove, D. Blythe, A. Anderson, J. Carnell, D. Jernigan, A. Srinivasan

Background: Acinetobacter that are resistant to all commonly prescribed antimicrobials, are an emerging cause of healthcare-acquired infections. To study the impact of multidrug-resistant (MDR) Acinetobacter infections, we compared three patient groups in a retrospective cohort study in two Baltimore hospitals.

Methods: We reviewed records of patients identified from January 2002 to August 2004 infected with MDR Acinetobacter (resistant to all or all but one commonly prescribed antimicrobial classes) (n=96), patients infected with non-MDR Acinetobacter (susceptible to 3 drug classes, "susceptibles") (n=90), and patients without Acinetobacter infection (references) (n=89). We used multivariable logistic regression to examine the effect of MDR Acinetobacter infection on length of stay (LOS) and mortality, controlling for severity of illness (modified APACHE III) and comorbidities (Charlson Index).

Results: Groups were similar in age and gender. Mortality of MDR Acinetobacter, susceptibles, and references was 27.1%, 16.7%, and 12.4%, respectively. Mean LOS after infection (equivalent day for references) was 27, 20, and 19 days, respectively. Mean number of intensive care unit (ICU) days after infection was 14 for MDR Acinetobacter and 7 for susceptibles and references. Controlling for severity of illness and comorbidities and comparing to references, MDR Acinetobacter patients were more likely to have greater than the mean LOS in a hospital (OR 2.4, p<.01) and ICU (OR 2.73, p=.02). Mortality rates did not differ significantly in controlled analysis.

Conclusions: This is the first study to examine outcomes of MDR Acinetobacter infections while controlling for severity of illness and comorbidities, which contribute substantially to mortality and LOS. MDR Acinetobacter infection was independently associated with significant increase in hospital and ICU stay. Improved detection, prevention, and treatment strategies for MDR Acinetobacter are needed.

Key words: Acinetobacter; Acinetobacter infections; drug resistance, bacterial; Gram-negative bacterial infections

Recurrent Nosocomially Acquired, Community-Associated, Methicillin-Resistant Staphylococcus Aureus Infections in a Well-Baby Nursery — Los Angeles County, 2003–2004
1:55 p.m.

Authors: Dao M. Nguyen, L. Mascola, E. Bancroft

Background: Community-Associated Methicillin-Resistant Staphylococcus aureus (MRSA) is an increasing cause of skin or soft tissue infection (SSTI) in children. In 2003–2004, pediatricians reported clusters of male infants with MRSA SSTIs. All were discharged from the same well-baby nursery (Nursery A) in Los Angeles County. We investigated to determine risk factors and make infection control recommendations.

Methods: We defined case-infants as newborns discharged from Nursery A during November–December 2003 (Outbreak-1) and May–June 2004 (Outbreak-2) with onset of MRSA SSTIs within 21 days of discharge. Active surveillance included discharge nasal cultures of all newborns obtained during January 28–February 29. Site inspections were conducted. Data were collected from chart abstractions by using a standard form. A case-control study included randomly selected, asymptomatic male infants admitted in Nursery A during the outbreak periods as controls. MRSA isolates were characterized by pulsed-field gel electrophoresis (PFGE).

Results: Six case-infants were identified in Outbreak-1 and five in Outbreak-2. All were full-term males with pustular-vesicular lesions in the groin, with mean onset at 4.4 days post-discharge. Among 135 newborns cultured, one (0.7%) had a positive MRSA nasal culture. Site inspection in Outbreak-2 revealed improper circumcision practices, including uncovered equipment, reuse of lidocaine vials, and poor hand hygiene. Compared with controls (n = 22), case-infants (n = 5) in Outbreak-2 were more likely to have been circumcised in Nursery A (Odds Ratio = undefined, 95% Confidence Interval = 1.73–undefined). All seven available isolates were indistinguishable on PFGE to a community-associated MRSA strain (USA300).

Conclusions: Improper circumcision practices might predispose newborns to MRSA SSTIs. Improving circumcision practices and hand hygiene might decrease nosocomial transmission of community-associated MRSA infections among newborns.

Keywords: Methicillin resistance, Staphylococcus aureus, circumcision, outbreak, Newborns

Patient Satisfaction and Antibiotic Use for Acute Upper Respiratory Tract Infections — Wisconsin, 1999-2003
2:15 p.m.

Authors: Alexandra P. Newman, B. Kieke, J. Davis, R. Besser, E. Belongia

Background: An estimated 20%-50% of outpatient antibiotic use is unnecessary and contributes to the emergence of drug-resistant bacteria. Reduced patient satisfaction has been identified as a barrier to judicious antibiotic use. We analyzed outpatient survey data to determine whether receipt of an antibiotic is a predictor of patient satisfaction following an initial visit for acute respiratory tract infection (ARTI).

Methods: A regional multispecialty health-care organization mailed routine satisfaction surveys to a random sample of patients (or parents of patients aged <18 years) seen weekly during 1999-2003. Overall satisfaction with the visit was rated on a five-point scale (poor to excellent). Visits were linked to pharmacy claims and analyzed for patients with incident ARTI. The relationship between antibiotic receipt and an "excellent" satisfaction rating was assessed in a multivariable model controlling for physician clustering, specialty, diagnosis type (bacterial or viral), patient age, sex, and other potential confounders.

Results: Of 4,727 surveys sent, 1,470 (31.1%) were returned, representing 500 adults and 918 patients aged <18 years. Eighty-one percent of adults and 86% of parents rated their satisfaction as "very good" or "excellent." Among adults, 222 (44.4%) rated their satisfaction as "excellent" and 222 (44.4%) received antibiotics. No significant association was found between antibiotic receipt and patient satisfaction in the multivariable model (p=0.078). For patients aged <18 years, 408 (44.4%) received antibiotics, and 457 (49.8%) parents rated their experience as "excellent;" no significant association was found between antibiotic receipt and overall satisfaction (p=0.71).

Conclusions: Patient satisfaction was not related to antibiotic receipt in this multispecialty practice. Clinician education activities on judicious antibiotic use should include the message that antibiotic use is not an important determinant of patient satisfaction.

Key Words: antibiotic, patient satisfaction, respiratory tract infection, antimicrobial drug resistance

Surveillance of Antimicrobial Susceptibility of Invasive Streptococcus pneumoniae — Chicago, Illinois
2:35 p.m.

Authors: Lyn James, J. Watson, R. Jones, J. Antonelli, J. Schermond, P. Diaz, W. Paul, S. Gerber

Background: The prevalence of drug-resistant invasive Streptococcus pneumoniae varies geographically and can affect patient-care decisions. A surveillance system based on passive-case reporting was implemented in Chicago in 2001 to monitor antimicrobial susceptibility of invasive S. pneumoniae. We evaluated this system to determine the representativeness of the data collected.

Methods: We visited nine Chicago hospitals with in-house antimicrobial testing and interviewed hospital personnel and reviewed hospitals' invasive S. pneumoniae culture and susceptibility results for 2003. These data were compared with data passively reported to Chicago Department of Public Health (CDPH) during this same period.

Results: The nine hospitals represent 51% of available hospital beds in Chicago and accounted for 58% of overall invasive S. pneumoniae reports to CDPH in 2003. Methods for detecting antimicrobial susceptibility patterns were different for all hospitals surveyed. Of 151 records retrieved from hospitals, 76 (50%) were captured by the passive reporting system. The capture rate appeared lower for susceptible isolates (46% and 49% for penicillin and ceftriaxone susceptible isolates, respectively) and higher for nonsusceptible isolates (100% for penicillin and ceftriaxone resistant isolates). On the basis of records retrieved from the hospitals, the percentage of isolates that were susceptible, intermediate, and resistant to penicillin were 76%, 19% and 5%, respectively, compared with 70%, 21% and 9%, respectively, for passive reporting.

Conclusions: Passive reporting of S. pneumoniae antimicrobial susceptibilities occurred in 50% of cases and might be biased toward the reporting of nonsusceptible isolates, thereby limiting the representativeness of the system. Options for creating a more representative system to monitor S. pneumoniae susceptibility include active surveillance, sentinel surveillance, improved education to enhance passive reporting, or collection of hospital antibiograms.

Key words: Streptococcus pneumoniae, epidemiology, drug resistance, bias, Chicago

Prevention of Neonatal Candidemia: Description of Current Antifungal Prophylaxis Practices of Neonatologists—United States, 2004
2:55 p.m.

Authors: Lauren A. Burwell, D. Kaufman, J. Tuboku-Metzger, B. Stoll, S. Fridkin

Background: The yeast Candida is the third leading cause of late-onset sepsis in very low birth weight infants (VLBW, <1500g) and is associated with mortality as high as 44%. Although one clinical trial showed administration of prophylactic fluconazole, an antifungal agent, can prevent candidemia in high-risk infants, the extent of antifungal prophylaxis (AP) use is unknown. We performed a survey to describe current practices of AP.

Methods: We surveyed a 20% random sample of the 2,354 members of the Perinatal Section of the American Academy of Pediatrics. We collected information on prophylactic agent use, criteria, and rationale for use. Respondents who reported no use of AP were compared by Chi squared analysis to those who used AP.

Results: 219 (47%) of 469 responded; 216 cared for VLBW infants. Of these 216 respondents, 73 (34%) reported using any type of AP; antifungal agents used included fluconazole (66%), oral nystatin (59%), and amphotericin B (21%). Birth weight or gestational age was often (57, 78%) cited as a criterion to start AP, but 42 (58%) based the decision to start AP on additional criteria. Furthermore, there was no consistent set of criteria used to initiate AP. When asked about specific rationale, those who did not use AP were more likely to have concerns about emerging antifungal resistance caused by AP use (80% vs. 48%, P<0.01) or more likely to request clarification of specific criteria for appropriate AP use (77% vs. 52%, P<0.01) compared to those who used AP.

Conclusions: Only one-third of the responding clinicians use AP. Further studies should address concerns of resistance and determine specific criteria to identify high-risk infants who may benefit from AP.

Key words: Candida, intensive care, neonatal, antifungal agents, fluconazole

Abbreviations

Food and Drug Administration	FDA
National Center on Birth Defects and Developmental Disabilities.....	NCBDDD
National Center for Chronic Disease Prevention and Health Promotion.....	NCCDPHP
National Center for Environmental Health/Agency for Toxic Substances and Disease Registry	NCEH-ATSDR
National Center for Health Statistics	NCHS
National Center for HIV, STD, and TB Prevention	NCHSTP
National Center for Infectious Diseases	NCID
National Center for Injury Prevention and Control	NCIPC
National Immunization Program	NIP
National Institute for Occupational Safety and Health	NIOSH
Office of Genomics and Disease Prevention	OGDP
Office of Global Health	OGH
Office of Workforce and Career Development.....	OWCD

Presenting EIS Officers by Center/Institute/Office

FDA Aaron Mendelsohn	Fatu Forna Michael Greenberg Zsakeba Henderson	Laura Podewils Drew Posey J. Staples Rebecca Sunenshine Michael Thigpen Kirk Winger	Anand Date Rose Devasia Darline El Reda Dayna Ferguson Luca Flamigni Kate Gaynor Tista Ghosh Brant Goode Lyn James Mark Janowski Neely Kazerouni-Frederick Mysheika LeMaile-Williams Elizabeth Melius Eric Miller Alexandra Newman Dao Nguyen Rachel Plotinsky Kathleen Ritger Sara Russell Sukhminder Sandhu Sean Schafer Eric Sergienko Carrie Shuler Jonathan Siekmann Julie Sinclair Austin Sumner Stephen Swanson Esther Tan Richard Taylor Benjamin Tsoi Peter Vranken
NCBDDD Kathleen Raleigh	Andrea Kim John Oeltmann Nicole Seguy N. Shah Kathrine Tan Allan Taylor	NCIPC Victor Balaban	
NCCDPHP Elizabeth Conrey Karen Lee Sanjeeb Sapkota Andrea Sharma Ernest Sullivent Edward Weiss	NCID Stephen Benoit Brian Blackburn Jennifer Brown Deron Burton Lauren Burwell Michelle Chang Lora Davis Amy Dehet Linda Demma Amy DuBois Concepcion Estivariz Thea Fischer Sundeep Gupta Laura Hammitt Lauri Hicks Natasha Hochberg Seema Jain Sophia Kazakova Natalie Keeler Eileen Lau Ellen Lee Ann Likos Larissa Minicucci Rosalyn O'Loughlin Ciara O'Reilly Christina Phares	NIP Angela Calugar Amanda Cohn Alison Rue Miriam Sabin Tom Shimabukuro	
NCEH/ATSDR Eduardo Azziz-Baumgartner Tesfaye Bayleyegn Dawn Burmeister Zandra Duprey Michael King Ondrej Mach Preethi Rao Nimia Reyes Tami Zalewski		NIOSH Vinicius Antao Rebecca Noe	
NCHS Allison Hedley Asel Ryskulova Sharon Saydah Carolyn Tabak		OGDP Susan Hariri Shauna Lyn	
NCHSTP Linda Ahdieh-Grant Rana Jawad Asghar Kevin Cain Chineta Eure Alyssa Finlay		OWCD Karon Abe Elizabeth Baraban Elizabeth Begier Amanda Castel Brett Cauthen Daniel Chertow Marc-Andre Chimonas Fatima Coronado	

A Karon Abe 13, 68 Linda Ahdieh-Grant10, 50 Vinicius C. Antao8, 36 Rana Jawad Asghar14, 72 Eduardo Azziz-Baumgartner17, 84	B Victor Balaban 11, 57 Elizabeth A. Baraban 14, 76 Tesfaye M. Bayleyegn 11, 56 Elizabeth M. Begier 11, 53 Stephen R. Benoit12, 58 Brian G. Blackburn 9, 42 Jennifer A. Brown12, 59 Dawn H. Burmeister 9, 40 Deron C. Burton10, 46 Lauren A. Burwell 20, 97	C Kevin P. Cain 14, 17, 73, 89 Angela Calugar 12, 61 Amanda D. Castel10, 47 Brett B. Cauthen 12, 64 Michelle A. Chang 10, 47 Daniel S. Chertow8, 35 Marc-Andre R. Chimonas17, 87 Amanda C. Cohn12, 59 Elizabeth J. Conrey17, 87 Fatima Coronado 8, 37	D Anand Date15, 79 Lora B. Davis 14, 74 Amy M. Dechet 9, 14, 38, 71 Linda J. Demma17, 75, 85 Rose A. Devasia15, 78 Amy E. DuBois9, 38 Zandra H. Duprey13, 66	E Darline K. El Reda11, 55 Concepcion F. Estivariz17, 58, 85, 87 Chineta R. Eure11, 55	F Dayna D. Ferguson14, 75 Alyssa M. Finlay14, 17, 73, 90 Thea K. Fischer12, 60 Luca Flamigni19, 94 Fatu M. Forna10, 51
--	--	--	--	--	--

G Kate Gaynor9, 45 Tista S. Ghosh13, 69 Karen E. Giesecker14, 77, 84 Brant B. Goode 13, 67 Michael E. Greenberg 10, 50 Sundeep K. Gupta 8, 34	H Laura L. Hammitt19, 93 Susan Hariri 13, 64 Allison A. Hedley 8, 33 Zsakeba T. Henderson 11, 56 Lauri A. Hicks9, 17, 44, 86 Natasha S. Hochberg9, 43	J Seema Jain 19, 71, 94 Lyn James18, 20, 91, 97 Mark C. Janowski 18, 50, 92	K Sophia V. Kazakova18, 92, 95 Neely Kazerouni-Frederick11, 58 Natalie M. Keeler11, 52 Andrea A. Kim 12, 62 Michael E. King 11, 54	L Eileen W. Lau 19, 95 Ellen H. Lee 15, 40, 60, 79 Karen K. Lee12, 62 Mysheika LeMaile-Williams 13, 68 Anna M. Likos 17, 86 Shauna Lyn9, 41, 48	M Ondrej Mach8, 34 Elizabeth J. Melius 14, 75 Aaron B. Mendelsohn 14, 71, 77 Eric A. Miller 13, 65 Larissa A. Minicucci14, 76	N Alexandra P. Newman 20, 96 Dao M. Nguyen.....19, 79, 96 Rebecca S. Noe8, 35	O John E. Oeltmann 17, 89 Rosalyn E. O'Loughlin9, 43 Ciara E. O'Reilly10, 46, 67
--	--	---	--	--	---	---	--

P Christina R. Phares 11, 53 Rachel N. Plotinsky15, 80 Laura J. Podewils10, 48 Drew L. Posey15, 42, 80	R Kathleen G. Raleigh 11, 54 Preethi L. Rao17, 66, 88 Nimia L. Reyes17, 88 Kathleen A. Ritger 18, 93 Alison M. Rue10, 48 Sara J. Russell 11, 57 Asel A. Ryskulova 9, 41	S Miriam Sabin 10, 51 Sukhminder K. Sandhu9, 39 Sanjeeb Sapkota13, 66 Sharon H. Saydah9, 42, 77 Sean P. Schafer 13, 69 Nicole Seguy10, 49 Eric M. Sergienko9, 45 N. Sarita Shah14, 74 Andrea J. Sharma 12, 63 Tom T. Shimabukuro 13, 70 Carrie M. Shuler9, 39 Jonathan H. Siekmann14, 72 Julie R. Sinclair 10, 52 J. Erin Staples14, 38, 77 Ernest E. Sullivent14, 78 Austin D. Sumner8, 37 Rebecca H. Sunenshine 19, 95 Stephen J. Swanson 13, 67	T Carolyn J. Tabak 13, 65 Esther T. Tan 9, 35, 44 Kathrine Tan 18, 90 Allan W. Taylor 8, 33 Richard Taylor 16, 83 Michael C. Thigpen 10, 49, 53 Benjamin W. Tsoi 9, 15, 40, 81	V Peter J.E. Vranken8, 18, 36, 91	W Edward C. Weiss12, 63 Kirk P. Winger13, 70	Z Tami Zalewski12, 61
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