D BULLETIN D





Dear colleagues

It has been quite a busy time months since our first Bulletin came out! As you will read in this issue, DBD assisted in multiple outbreak investigations, including pertussis, Hib, meningococcal, disease and others. This has required intensive efforts and long working hours including many weekends by a large number of our staff from both the laboratory and epidemiology teams, but has resulted in the first class public health response and outbreak control this division is well known for.

Our staff continue to collaborate with our various partners at CDC and outside on many innovative projects both domestically, as in developing new software for managing molecular sequencing data, and globally, as in looking at the impact of better stoves respiratory infections. And when not one ACIP meeting goes by from DBD, highlighting the importance of all our activities on immunization policies and practices that help protect the lives of millions of people in the a new spring season, I know we will continue to come up with innovative approaches to better understand the diseases we deal with and how to prevent them even more effectively.

Rana

H(ib) i(s) b(ack) Minnesota, 2008

Photo: Jessica MacNeil and Jordan Theodore in the MDH laboratory.

Minnesota has seen an increase in Haemophilus influenzae type b (Hib) cases in children younger than 3 years of age.

In 2008, there were 5 confirmed cases of Hib, including one death. These 5 cases in 2008 are the greatest number of invasive Hib cases among children aged <5 years in MN since 1992, when 10 cases were reported, before routine use of Hib vaccine began. The children affected were either mostly unimmunized or partially immunized.

In response to the MN situation, MVPDB initiated enhanced surveillance to look for Hib disease in children across the country. To date, MVPDB has not identified any additional clusters of Hib disease outside of MN, but continues to work with states to follow up on any suspected cases and urges providers to report cases to their health departments. To increase public awareness and provide the most up-to-date and accurate information available to the general public, healthcare providers, and the media, CDC launched a variety of activities on Hib disease and

COMMUNICATIONS



Health Experts Urge Supermarket Pharmacies to "Get Smart" About Free Antibiotics RDB's Get Smart: Know When Antibiotics Work

campaign and the Infectious Diseases Society of America (IDSA) have issued joint letters urging supermarket pharmacies with freeantibiotics promotions to educate their customers on when antibiotics are the right prescription-and when they can do more harm than good. IDSA has issued two press releases that have generated interest from national media outlets. Lauri Hicks, medical director of the Get Smart campaign, has responded to media inquiries, including the New York Times and MSNBC (http://well.blogs.nytimes.com/2009/03/05/are-freeantibiotics-good-for-you/ and http://www.msnbc.msn.com/ id/29515330/). The Get Smart campaign is working with supermarket pharmacies that have offered to distribute CDC's educational materials as a result of these recent activities.

H(ib) i(s) b(ack)	P.1
Cover your Cough	P.2
Smart Soap?	P.2
Not Just Blowing Smoke	P.3
The Power of Partnerships	P.3

vaccine, including:

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- Partnering with the Minnesota Department of Health (MDH) to issue an MMWR and host a telebriefing with the media;
- Creating new web resources, including a CDC homepage web feature and a comprehensive website for healthcare providers and parents, which can be found at http://www.cdc.gov/vaccines/vpd-vac/hib/ providers-parents.htm;
- Issuing a letter to healthcare providers stressing the importance for all children in their practice to receive the 3 dose primary series with available Hibcontaining vaccine; and
- Releasing a Health Alert Network (HAN) Advisory, which goes out to over one million recipients – sent out on March 18 by CDC stressing similar messages to the earlier letter sent to healthcare providers.

Concerned that the increase in invasive Hib disease may be the result of increased Hib circulation among children in MN, MDH is conducting a survey of Hib carriage. The survey aims to estimate the point prevalence of Hib carriage among children <5 years of age in MN.

Using roughly a dozen pediatric clinics across the state, MDH staff are enrolling approximately 2,000 children in the study when they come to these clinics for well or sick child visits. In addition to obtaining a throat swab of the child and reviewing the child's immunization records, the child's caregiver is asked to complete a brief questionnaire. MDH is hopeful that this evaluation will help them understand reasons why some children are not vaccinated. MVPDB staff assisted with survey design and traveled to MN to help execute the study. We applaud the work of our laboratorians and epidemiologists who were on-site in MN over the course of a month. The media picked up this story throughout the country and featured it on NBC Nightly News (http://www.msnbc.msn.com/ id/3032619/#29245188), during which MVPDB's Jordan Theodore made an appearance while working on the carriage study.

Clinician Outreach and Communication Activity (COCA) On March 3, Lauri Hicks (RDB) presented

"Investigating Respiratory Disease Outbreaks: An integrated approach to investigations, specimen collection, and pathogen identification." Webinar participants learned about the clinical and public health challenges associated with investigating respiratory disease outbreaks, CDC's approach to supporting respiratory outbreak investigations, the Unexplained Respiratory Disease Outbreak website, and new diagnostics that will be useful for investigating outbreaks. For more information, visit http://www.bt.cdc.gov/coca/.

COVER YOUR COUGH!

The pertussis team of MVPDB has provided consultation and/or laboratory support for a number of pertussis outbreaks in addition to two EPI-AIDs.

PI-AID 2009-010: Pertussis outbreak in a school Omaha, Nebraska, 2008 - In September 2008, one case of pertussis was identified in a kindergarten student in a school (preschool-eighth grade) of approximately 600 students. As of November 7, there had been a total of 17 confirmed/probable or suspect cases linked in this school-based outbreak. On November 12, the Nebraska Department of Health and Human Services requested an EPI-AID from MVPDB. Henry Wu, Cynthia Thomas, and Jennifer Liang departed for Omaha, NE to assist state and local health officials with the investigation. They were also joined by Prevention Effectiveness Fellow Dr. Garrett Asay and Epidemiology Elective student Phillip Bonner.

The objectives of this investigation were to assist with characterizing the outbreak, evaluate the effectiveness of prevention and control recommendations made by the Douglas County Health Department (DCHD), and collect data to evaluate the cost effectiveness in responding to this school-based outbreak. Twenty-six pertussis cases associated with the school were identified. There were cases in all grades in the school except first and seventh grades. The highest number of cases (8 cases) was found in the fifth grade. The school has a highly vaccinated population, with 95.8% of the students in kindergarten through eighth grade receiving 5 doses of DTaP. A web-based survey of parents and staff was conducted using SurveyMonkey to collect data to evaluate which of DCHD's prevention recommendations may have made the most impact in controlling the outbreak. A detailed analysis of available seating assignment data was undertaken to define a more complete chain of transmission within the school. Further analysis is underway and results will be presented at the EIS Conference.

PI-AID 2009-029: School-based pertussis outbreak in Cobb County, Georgia, 2009 -Between October 21, 2008 and January 30, 2009 Cobb County reported 15 cases of pertussis from three elementary schools. Specimens from 14 (8-10 years of age) cases showed amplification of pertussis DNA by PCR. Because the clinical accuracy of a single-target PCR is unknown, culture confirmation of an outbreak is valuable. Culture had not been done for the 15 cases. The Georgia Department of Human Resources, Division of Public Health (GDPH) requested an EPI-AID to investigate the outbreak, provide laboratory confirmation, and develop strategies for outbreak control. The investigation was led by Surbhi Modi (NCHHSTP/GAP EISO). Stan Wei, Stacey Martin, Jennifer Liang, Melissa Mascaro (Epi Elective student),



and Christine Mitchell (Emory work study student) also participated in the investigation. Laboratory support and diagnostic testing (culture, PCR and serology) were conducted by members of the Pertussis and Diphtheria Laboratory Team. A fourth school with two PCR-identified cases was included in the investigation. In collaboration with GDPH and Cobb and Douglas Public Health, MVPDB offered pertussis testing at the four schools. Suspect cases, if eligible, were also enrolled in the CDC's Pertussis Diagnostics Clinical Validation Study. A total of 109 persons were tested. Results from testing showed no active transmission at three of the four schools. In the fourth school, with several cases positive by serology, PCR and culture, prevention and control measures were implemented, including a cough exclusion policy.

Washing Your Hands: Measuring Factors Associated with Respiratory Disease Prevention through Technology

There is evidence that handwashing with soap can reduce respiratory disease incidence overall, but its role for prevention of clinicallyconfirmed disease is uncertain in resource-poor countries like Bangladesh.

RDB and CDC's Influenza Division have partnered with the International Centre for Diarrhoeal Disease Research, Bangladesh and the University of Buffalo's School of Public Health and Health Professions on a case-control study to measure the associations between handwashing with soap and influenza and radiologicallyconfirmed pneumonia among young children living in an urban area of the capital city, Dhaka, Bangladesh.

The study relies on a community-based surveillance system that tracks influenza and pneumonia in a defined population and provides medical care for households that participate in surveillance. Handwashing behavior will be measured (in case and control households) using strategies designed to accurately record handwashing events and other pertinent data. Field research assistants will begin household visits by administering a questionnaire on demographics and illness histories, knowledge of acute respiratory infections, handwashing knowledge, and socioeconomic status. Next, the research assistants will conduct a series of observations in the home, recording water availability, sanitation facilities, and handwashing behaviors.

Use of technology is also an important part of the study. Soap use events will be detected using bars of soap with a motion sensor (accelerometer) and an embedded data logging device. The soaps are designed to closely resemble actual soaps that are available locally (see photo). The study will examine associations between these behavioral factors and the rates of respiratory diseases. The project is starting data collection in late March and will continue until December 2009.

Save the Date!

April 25, 2009 is World Meningitis Day, which seeks to raise awareness about meningitis and the importance of being vaccinated.

World Meningitis Day is organized by The Confederation of Meningitis Organisations (CoMO), which was formed in 2004 and whose members include organizations and individuals in 19 countries across Europe, North and South America, Australia, the Philippines and Africa.

n addition to encouraging participation in local events, CoMO invites all to log on to their website (www. comoonline.org) during April and join hands against meningitis in a global virtual community.

You can also join the cause on Facebook at http://apps. facebook.com/causes/241368/26048769?m=6d54c0aa.



Photo: Can you tell which of these bars is the soap with the motion sensor? (answer on back)





Not Just Blowing Smoke:

Simple and Innovative Stoves Can Reduce Indoor Air Pollution and Respiratory Disease in Children in Rural Western Kenya

Approximately 2 million deaths in children less than five years of age worldwide are caused by pneumonia, and up to one-third of these are attributed to indoor smoke released from solid fuels used during cooking.

n July 2008, RDB partnered with the Enteric Diseases Epidemiology Branch at CDC, the Nyando Integrated Child Health and Education Project, and the Kenyan NGO Safe Water and AIDS Project to initiate a project in 10 villages in rural Western Kenya to promote the use of efficient and low cost clean-burning stoves (*Jiko Kisasa* stoves). In this area in Kenya, nearly a quarter of children less than 3 years of age have an acute respiratory infection each year. The goal of the project is to reduce the risk of respiratory infections by motivating the use of innovative stoves for improvement of indoor air quality.

The project does not just promote the use of *Jiko Kisasa* stoves, it also creates income generating activities for HIV self-help groups, such as those women who have been widowed by HIV or who take care of HIV orphans, by acting as stove vendors.

n addition to monitoring respiratory disease, particulate monitors are being used to monitor indoor air quality in

The Power of Partnerships



eveloping and maintaining a bioinformatics infrastructure with the capacity to keep pace with the rapid generation of genomic data is one of the major challenges currently facing CDC. In order to improve CDC's bioinformatics capabilities, Dr. Leonard Mayer of the Meningitis Laboratory began a partnership with the Georgia Institute of Technology, working with Dr. I. King Jordan's Laboratory. In a collaborative process, they developed software systems to improve (1) assembly and analysis of data from genomic sequencing and (2) analysis of molecular typing sequence data. Knowledge of the gene content and structure of Neisseria meningitidis genomes and the population biology of circulating strains of N. meningitidis is vital to understanding the pathology, population dynamics of carriage, and identification of virulence factors or potential vaccine candidate genes of this important human pathogen.

Dr. Jordan's Computational Genomics class created software adapted from existing open source freeware to assemble the hundreds of thousands of sequences generated during a sequencing run, perform gene prediction, annotate the genome, and create an online genomic browser allowing the user to analyze the genomic

a sample of households. Initial data suggest that smoke levels in houses with newer innovative stoves are half of what was produced by cooking over traditional open fire pits. The burning of solid fuels indoors releases significant amounts of particulate matter, carbon monoxide, and other pollutants and greenhouse gases, which may contribute to global climate change.

There are 548 households in 11 villages, and previous estimates note that 21% of the households in this area already had a *Jiko Kisasa* stove. By the end of 2008, 276 stoves had been sold as part of this project, which equates to almost half (48%) of the homes. The pilot phase of the stove project is concluding in April and it will expand to at least an additional 50 villages in 2009.



data and compare data between multiple genomes. Dr. Jordan's students wrote thousands of lines of code and created an automated pipeline taking sequence data through assembly to analysis using sequencing files from four *N. meningitidis* genomes that had been generated at CDC. This software suite has so stream-lined the assembly and analysis process that using it can save CDC an estimated \$50,000-100,000 per genome project. These resources can be found at http://compgenomics.biology.gatech.edu and http://gbrowse.biology.gatech.edu/.

Working closely with the Meningitis Laboratory, one of Dr. Jordan's Program in Bioinformatics PhD students designed and developed software to analyze molecular typing data. The Meningococcus Genome Informatics Platform (MGIP) is a suite of computational tools for the analysis of several different molecular typing assays, which are vital to molecular epidemiology. These include outbreak investigation and the population biology of *N. meningitidis*. MGIP represents a substantial advance over the widelyused existing software. This system is now being used by scientists in North America, Europe, and Africa and is poised to become the new gold standard for analysis of molecular typing data for *N. meningitidis*. This resource can be found at http://mgip.biology.gatech.edu. Additional microorganism subtyping systems can easily be added in the future.

Vaccine News

Omnibus Autism Proceeding

Three rulings related to autism and vaccine injury compensation cases were issued on February 12, 2009 by the Special Masters of the U.S. Court of Federal Claims. The rulings were part of the Omnibus Autism Proceeding created by the National Vaccine Injury Compensation Program to handle the large volume of claims that vaccines induce autism. In order to ensure that the over 4,900 cases were dealt with in a timely manner, the U.S. Court of Federal Claims divided the claims into three different theories:

- Theory 1: MMR in combination with thimerosalcontaining vaccines can cause autism
- Theory 2: Thimerosal-containing vaccines alone can

cause autism

Theory 3: The MMR vaccine
 alone can cause autism

In three separate rulings issued on February 12, 2009, each of the Special Masters ruled that the measles-mumpsrubella vaccine, whether administered alone or in conjunction with thimerosalcontaining vaccines, were not causal factors in the development of autism or autism spectrum disorders. The specific rulings can be found at: http:// www.uscfc.uscourts.gov/node/5026.

Reduced Dosage and Intramuscular Administration Approved for Anthrax Vaccine

Emergent BioSolutions Inc. and CDC announced on December 16, 2008 that the FDA approved Emergent's supplemental Biologics License Application (sBLA) for Anthrax Vaccine Adsorbed (BioThrax®), the only FDAlicensed vaccine to prevent disease caused by Bacillus anthracis. The clinical trial that led to the change was initiated and sponsored by CDC. The supplement provides for a change in the route of administration and a reduction in the total number of vaccinations. Vaccinees are expected to benefit directly from these improvements due to fewer local reactions and the reduced number of required injections. More information: Marano N, Plikaytis BD, Martin SW, et al. Effects of a reduced dose schedule and intramuscular administration of anthrax vaccine adsorbed on immunogenicity and safety at 7 months: a randomized trial. JAMA. 2008;300:1532-43.

ACIP: Updates from February 25-26 Meeting

Speaking on behalf of the Anthrax Work Group, Jennifer Wright (MVPDB) proposed a draft recommendation for route/schedule of Anthrax Vaccine Absorbed (AVA). The recommendation for pre-event use of AVA stated: (1) ACIP recommends 5 intramuscular doses administered at day 0, week 4, months 6, 12, and 18, followed by annual boosters; (2) Subcutaneous administration is allowable only when medically indicated, such as in persons with coagulation disorders. ACIP members voted to approve this recommendation.

DBD also participated in ACIP during the following sessions:

- Update: Pertussis Vaccines Work Group
- Pneumococcal Vaccines: Use of PPSV23 for prevention of pneumococcal pneumonia during an influenza pandemic
- Pediatric Haemophilus influenzae
 b Cases in Minnesota, 2008-2009
- Meningococcal Vaccine: Update

 Meningococcal Work Group and Meningococcal conjugate vaccine post-licensure safety update – Vaccine Adverse Event Reporting System (VAERS)

MEETINGS:



The annual Active Bacterial Core surveillance (ABCs) Steering Committee Meeting was held in Atlanta on January 27-28. The ABCs Steering Committee meeting is the primary forum in which ABCs Principal Investigators and CDC collaborators gather to review ongoing projects and recent study results, debate potential solutions to current challenges. and discuss future directions and potential new projects for ABCs. Meeting attendees included ABCs Principal Investigators and Surveillance Officers from all 10 **Emerging Infections Program (EIP)** sites, and CDC ABCs staff from RDB, MVPDB, and DHQP. CDC Influenza Division staff and their EIP counterparts met January 28. Highlights from this year's

28. Fighlights from this year's meeting included evaluation of resistant *Neisseria meningitidis* infections, *Haemophilus influenzae* type b infections among vaccinated children, preparations for evaluation of an upcoming 13-valent pneumococcal conjugate vaccine, trends among MRSA infections, results from influenza vaccine effectiveness studies, and new statistical methods for analysis of ABCs data.

The Immunosenescence and Vaccination in the Aged Meeting was held February 4-5 in Atlanta. The meeting was coordinated by CDC, Emory Center for Human Immunology, Emory Vaccine and Treatment Evaluation Unit, and the Infectious Diseases Division at Emory University. Scholars presented on the epidemiology of vaccine preventable diseases (VPDs); the basic science in the area of immunosenescence and how it impacts vaccine effectiveness; and effective strategies and applications of basic science that will improve the immune status of and protect against VPDs. Collaborations to address basic, applied and public health gaps in understanding and approaches to immunosenescence were key issues discussed during the meeting.



ANSWER: The soap with the motion detector is in her left hand.

(MEETINGS CONT'D)

The 2009 PneumoADIP and Hib Initiative Surveillance Networks Investigators Meeting: Evaluations, Innovations and Transitions was held March 4-6 in Johannesburg, South Africa. Several DBD representatives attended and/or presented at this meeting. The objectives were to assess Hib and Spn vaccine impact evaluation methodologies; discuss clinical, lab and epidemiologic innovations that improve surveillance quality; and discuss PneumoADIP, Hib Initiative and WHO surveillance transitions.

DBD staff are presenting at many spring meetings, including the:

- 43rd National Immunization Conference, Dallas, TX, March 30-April 2
- 58th Annual Epidemic Intelligence Service (EIS) Conference, Atlanta, GA, April 20-24

2009 EPI-AIDs

- Increased incidence of Haemophilus influenzae type b, MN
- School-based cluster of suspected pertussis cases, GA
- Streptococcus pneumoniae meningitis, MO

Did You Know?

- During January and February, DBD helped develop three features for the CDC.gov homepage – two are available in Spanish. Topics include pertussis, Hib disease, and prenatal infections. Go to the DBD website (http://www.cdc.gov/ncird/DBD.html) and click on e-tools.
- CDC, EPA, and the National Weather Service are among the relatively few government agencies and offices that have dedicated mobile websites: http://m.cdc.gov/.
- CDC has a Twitter site: http://twitter.com/CDC_ eHealth.
- MVPDB is working on a Meningitis CDC-TV production. Visit http://www.cdc.gov/CDCTV/ for more information.

Featured Publications:

Centers for Disease Control and Prevention. *Invasive Haemophilus influenzae type b disease in five young children* --- *Minnesota, 2008.* MMWR 2009:58 (Early Release);1-3.

Centers for Disease Control and Prevention. *Trends in perinatal Group B Streptococcal disease -- United States, 2000-2006.* MMWR 2009:58(05);109-12.

Grant GB, Campbell H, Dowell SF, Graham SM, Klugman KP, Mulholland EK, Steinhoff M, Weber MW, Qazi S. *Recommendations for treatment of childhood non-severe pneumonia.* Lancet. 2009;9:185-96.

Hsu HE, Shutt KA, Moore MR, Beall BW, Bennett NM, Craig AS, Farley MM, Jorgensen JH, Lexau CA, Petit S, Reingold A, Schaffner W, Thomas A, Whitney CG, Harrison LH. *Effect of pneumococcal conjugate vaccine on pneumococcal meningitis.* N Engl J Med. 2009;360:244-56.

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Wu HM, Harcourt BH, Hatcher CP, Wei SC, Novak RT, Wang X, Juni BA, Glennen A, Boxrud DJ, Rainbow J, Schmink S, Mair RD, Theodore MJ, Sander MA, Miller TK, Kruger K, Cohn AC, Clark TA, Messonnier NE, Mayer LW, Lynfield R. *Emergence of ciprofloxacin-resistant Neisseria meningitidis in North America.* N Engl J Med. 2009;360:886-92.

A **Supplement to Clinical Infectious Diseases** (Volume 48, Supplement 2) was published March 1, 2009. It includes 21 articles on the topic of coordinated surveillance and detection of pneumococcal and *Haemophilus influenzae* Type b (Hib) disease in developing countries.

AWARDS

The paper, Legionella reduction after conversion to monochloramine for residual disinfection, has been selected for the 2009 AWWA Water Quality & Technology Division Best Paper Award. Authors: June M. Weintraub, Brendan Flannery, Duc J. Vugia, Lisa B. Gelling, James J. Salerno, Michael J. Conroy, Valerie A. Stevens, Charles E. Rose, Richard E. Besser, Barry S. Fields, and Matthew R. Moore.

Laboratorians in DBD were presented with three **CDC Director's Innovation Awards: Innovator Showcase** on March 30. The CDC Director's Innovation Awards recognize the many extraordinary members of the CDC community who use innovation to advance CDC's mission to create the knowledge, tools, and networks that people and communities need to protect their health. DBD laboratorians were recognized for "Novel, Rapid Diagnostic Technology for Quantification of Anthrax Lethal Factor," "A novel Streptococcus pneumoniae Common Protein Vaccine Component," and "New Technologies for Respiratory Delivery of Vaccines." Visit the Innovator's Showcase at http://innovationawards.cdc.gov/Showcase/ to learn more about this year's winners.