

**DEPARTMENT OF HEALTH AND HUMAN SERVICES  
CENTERS FOR DISEASE CONTROL AND PREVENTION  
National Center for Environmental Health/  
Agency for Toxic Substances and Disease Registry**



**Board of Scientific Counselors Meeting  
May 17-18, 2007  
Atlanta, Georgia**

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**Record of the Proceedings**

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# TABLE OF CONTENTS

	<u>Page</u>
Attachment 1: List of Participants .....	A1-1
Attachment 2: Acronyms Used In This Report .....	A2-1
Executive Summary .....	-i-
Meeting Minutes .....	1
<b>May 17, 2007</b>	
Opening Session.....	1
Update by the NCEH/ATSDR Office of the Director .....	1
Panel Presentation on NCEH/ATSDR's Science and Public Health Activities .....	4
Health Department Subcommittee Report .....	13
Community/Tribal Subcommittee Report .....	14
Update on NCEH/ATSDR's Preparedness and Emergency Response Activities .....	15
Public Comment Period .....	17
Program Peer Review Subcommittee Report .....	17
Update on the CDC, NCEH and ATSDR Web Sites.....	23
Expert Panel Report on the Evaluation of OTA .....	25
<b>May 18, 2007</b>	
Overview of the National Acute Hazardous Substances Release Surveillance System .....	27
Update on the National Report on Human Exposure to Environmental Chemicals .....	30
Public Comment Period .....	33
Overview of CDC's Climate Change Initiatives.....	33
Overview of the OMB PART Review .....	37
BSC Business .....	38
Closing Session .....	41

## ATTACHMENT 1

### List of Participants

#### **BSC Members**

Dr. Patricia Nolan, Chair  
Mr. Donald Chen  
Dr. Gary Evans  
Dr. Janvier Gasana  
Mr. Scott Holmes  
Dr. Nancy Kim  
Dr. Ronald Laessig  
Dr. Geary Olsen  
Dr. Jonathan Patz  
Dr. Cynthia Warrick  
Dr. Daniel Wartenberg  
Dr. Paul Wax

#### **Designated Federal Official**

Dr. Thomas Sinks, Executive Secretary

#### **Ex-Officio Members**

Dr. Brenda Weiss (NIEHS)  
Dr. Hal Zenick (U.S. EPA)

#### **CDC/NCEH/ATSDR Representatives**

Dr. Howard Frumkin  
(NCEH/ATSDR Director)  
Mike Allred  
John Barr  
Mark Bashor  
Sharunda Buchanan  
Leslie Campbell  
William Cibulas  
Andrew Dannenberg  
Scott Deitchman  
Christopher DeRosa  
Bruce Fowler  
David Fowler  
Debra Gable  
Paul Garbe  
Richard Gelting  
Rick Gillig  
Petunia Gissendaner  
Olivia Harris

Marianne Hartin  
Lisa Hayes  
Arnetra Herbert  
Dan Holcomb  
Jim Holler  
Sandy Isaacs  
Nabil Issa  
Vikas Kapil  
Peter Kowalski  
Annie Latimer  
Shirley Little  
Sandra Malcom  
Michael McGeehin  
Joy McVey  
Susan Metcalf  
Susan Moore  
Moiz Mumtaz  
Jose Ordonez-Iriarte  
Maureen Orr  
James Pirkle  
Julie Racine-Parshall  
Susan Robinson  
Kenneth Rose  
Eric Sampson  
Edwin Shanley  
Anne Sowell  
Jana Telfer  
Rick Waxweiler  
Clement Welsh  
Lynn Wilder  
Sharon Williams-Fleetwood  
Mildred Williams-Johnson  
David Williamson  
Margo Younger

#### **Members of the Public**

Michael Kosnett (American College of  
Medical Toxicology)  
Megan Latshaw (Association of  
Public Health Laboratories)

## ATTACHMENT 2

### Acronyms Used In This Report

ACMT	— American College of Medical Toxicology
ALF	— Anthrax Lethal Factor
ASTHO	— Association of State and Territorial Health Officials
<i>B. anthracis</i>	— <i>Bacillus anthracis</i>
BSC	— Board of Scientific Counselors
C&D	— Construction and Demolition
CCEHIP	— Coordinating Center for Environmental Health and Injury Prevention
CDC	— Centers for Disease Control and Prevention
CO	— Carbon Monoxide
COTPER	— Coordinating Office of Terrorism Preparedness and Emergency Response
CSTE	— Council of State and Territorial Epidemiologists
CTS	— Community/Tribal Subcommittee
DOT	— Department of Transportation
EJ	— Environmental Justice
EPA	— U.S. Environmental Protection Agency
EPH	— Environmental Public Health
GIS	— Geographic Information Systems
HDS	— Health Department Subcommittee
HHS	— Department of Health and Human Services
HIA	— Health Impact Assessment
HSEES	— Hazardous Substances Emergency Events Surveillance
LEED	— Leadership in Energy and Environmental Design
LEED-ND	— LEED for Neighborhood Development
LPPB	— Lead Poisoning Prevention Branch
NACCHO	— National Association of County and City Health Officials
NCEH/ATSDR	— National Center for Environmental Health Agency for Toxic Substances and Disease Registry
NER	— National Exposure Report
NHANES	— National Health and Nutrition Examination Survey
OC	— Office of Communication
OMB	— Office of Management and Budget
OTA	— Office of Tribal Affairs
OTPER	— Office of Terrorism Preparedness and Emergency Response
PART	— Performance Assessment and Rating Tool
PBDE	— Polybrominated Diphenyl Ether
PER	— Preparedness and Emergency Response
PPRS	— Program Peer Review Subcommittee
PRT	— Peer Review Team
SSAs	— Site-Specific Activities
TCUs	— Tribal Colleges and Universities

## EXECUTIVE SUMMARY

The Department of Health and Human Services and the Centers for Disease Control and Prevention (CDC) National Center for Environmental Health/Agency for Toxic Substances and Disease Registry (NCEH/ATSDR) convened a meeting of the Board of Scientific Counselors (BSC) on May 17-18, 2007 in Atlanta, Georgia.

The Director of NCEH/ATSDR presented certificates and letters of appreciation to thank and formally acknowledge the outstanding service of seven BSC members whose terms would expire on June 2, 2007.

The Director of NCEH/ATSDR covered several topics in his update to the BSC: (1) NCEH/ATSDR's environmental health projects and activities to support CDC's healthy places and preparedness goals; (2) NCEH/ATSDR's initiatives to strengthen its excellence in science; (3) the NCEH and ATSDR budgets; and (4) and NCEH/ATSDR's leadership in greening CDC.

A panel of NCEH/ATSDR staff gave a series of presentations on CDC's recent science and public health activities:

- ATSDR's investigation of health effects from a coal-fired power plant in Alexandria, Virginia.
- NCEH's study to detect and quantify anthrax lethal factor in serum using a unique mass spectrometry method.
- CDC's response to carbon monoxide poisoning following a windstorm in Seattle, Washington.
- ATSDR's investigations of community health issues from construction and demolition debris landfills in Florida and Ohio.
- CDC's participation in the environmental investigation of *E. coli* in the spinach outbreak in Salinas Valley, California.
- NCEH's health and built environment activities.

The BSC made several suggestions for NCEH/ATSDR to consider in refining its scientific studies, community health investigations and other public health activities.

The chairs of the Community/Tribal Subcommittee, Health Department Subcommittee (HDS), and Program Peer Review Subcommittee (PPRS) reported on their respective activities and key discussion topics during conference calls and meetings over the past six months. Both the HDS and PPRS informed the BSC of the tremendous turnover in their respective memberships.

The PPRS presented its key findings and recommendations from the site-specific activities (SSAs) peer review that was held in March 2007 to assess ATSDR's program goals and objectives, accomplishments, quality of science, and public health impacts of SSAs.

The BSC members and NCEH/ATSDR senior management extensively discussed, asked questions and provided input on the peer review report and overall process. Several BSC members pointed out that ATSDR's SSAs are unique and serve as one of the best models of direct interaction between a federal agency and communities.

The BSC members and NCEH/ATSDR senior management provided the PPRS with several suggestions to assist in focusing, refining and clarifying the upcoming preparedness and emergency response peer review.

The NCEH/ATSDR Office of Terrorism Preparedness and Emergency Response presented an overview of its priorities, budget, and portfolio of 11 projects funded by the CDC Coordinating Office of Terrorism Preparedness and Emergency Response.

The NCEH/ATSDR Office of Communication described activities that were conducted to support the redesign of the CDC, NCEH and ATSDR web sites, such as user-centered research and data collection. A live demonstration was given during the BSC meeting to illustrate the improved designs of the NCEH and ATSDR web sites.

The ATSDR Office of Tribal Affairs (OTA) highlighted key findings and recommendations from an expert panel that was convened to evaluate OTA. OTA distributed a "Dear Tribal Leader" letter to 560 tribes, tribal health directors and tribal organizations throughout the country to confirm actions that would be taken in response to the expert panel's report. The placement of OTA will be elevated from an ATSDR division to the NCEH/ATSDR Office of the Director. An aggressive search will be launched to fill the position of the OTA Tribal Coordinator.

ATSDR described its completed activities, ongoing efforts and future plans to develop a national acute hazardous substances release surveillance system. The new vision will serve as an expansion and improvement of ATSDR's existing Hazardous Substances Emergency Events Surveillance (HSEES) System with 14 states. ATSDR noted that the BSC's previous recommendations to ATSDR based on the peer review of HSEES played a key role in the development of the new national surveillance system.

The BSC commended ATSDR on its vision for the new national acute hazardous substances release surveillance system. Several members made suggestions for ATSDR to consider in refining this initiative.

NCEH presented an update on several issues related to the National Report on Human Exposure to Environmental Chemicals (NER), including a fast-track publications process to more rapidly release results; delisting criteria to remove chemicals from the NER; meetings with industry to address the strong interest of these groups in NER data; and chemicals of special interest highlighted in the NER.

The BSC commended the NCEH Division of Laboratory Sciences for its outstanding science and solid relationships with federal partners, industry and other groups in communicating the NER results.

NCEH presented an overview of CDC's climate change initiatives. CDC is currently convening workshops and conducting other activities to take a leadership role and formulate a strong public health response to adverse health outcomes from climate change, including heat waves, air pollution, extreme weather events, and water-, food- and vector-borne diseases.

NCEH/ATSDR presented results of its Performance Assessment and Rating Tool (PART) review. Most of CDC's 20 programs that were reviewed were given "adequate" scores of 50-69. The highest PART score for a CDC program was 86. ATSDR received an "adequate" score of 66% in 2003 and a provisional "moderately effective" score of 84.3% in 2007. At this point, ATSDR has the highest PART score of all of CDC's programs. ATSDR described several actions that were taken to obtain a much higher PART score in 2007.

The BSC members provided NCEH/ATSDR with guidance on additional steps that could be taken to further increase its PART score in the future.

The BSC members and NCEH/ATSDR senior management reviewed and addressed several issues during a discussion of outstanding business items: (1) new chairs and members of the BSC and its subcommittees; (2) NCEH/ATSDR's formal response to feedback given during the December 2006 National Environmental Public Health Conference; (3) the need for NCEH/ATSDR to strengthen and formalize interactions with local and county health officials; and (4) continuation of the PPRS's preparedness and emergency response peer review.

The BSC's business items raised over the course of the meeting were noted for the record.

#### Consensus Recommendations

- *The BSC strongly recommended that CDC explore options to collect additional data from the National Health and Nutrition Examination Survey sample population while still protecting the confidentiality of subjects.*
- *The BSC **unanimously approved** the SSA peer review report. NCEH/ATSDR will present its formal response to the report during the next BSC meeting.*

#### Action Item

- *PowerPoint slides, briefing documents and other materials distributed during BSC meetings should be posted on the NCEH and ATSDR web sites rather than mailed to the BSC members. This approach will ensure that former BSC members and the broader environmental health community have access to these informative materials.*

### Agenda Items

- *Overview of the NCEH/ATSDR and EPA health disparities toolkits.*
- *Update on CDC's climate change initiatives.*
- *NCEH/ATSDR's formal response to the SSA peer review report.*
- *NCEH/ATSDR's formal response to the December 2006 National EPH Conference.*

The BSC Chair opened the floor for public comments at all times as noted on the published agenda.

The next BSC meeting will be held on either November 15-16 or November 29-30, 2007.



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NATIONAL CENTER FOR ENVIRONMENTAL HEALTH/  
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY**

**BOARD OF SCIENTIFIC COUNSELORS  
May 17-18, 2007  
Atlanta, Georgia**

**Minutes of the Meeting**

The Department of Health and Human Services (HHS) and the Centers for Disease Control and Prevention (CDC) National Center for Environmental Health/Agency for Toxic Substances and Disease Registry (NCEH/ATSDR) convened a meeting of the Board of Scientific Counselors (BSC). The proceedings were held on May 17-18, 2007 at CDC's Century Center offices in Atlanta, Georgia.

**Opening Session**

Dr. Patricia Nolan, Chair of the BSC, called the meeting to order at 8:19 a.m. on May 17, 2007. She welcomed the attendees to the proceedings and opened the floor for introductions. The list of participants is appended to the minutes as Attachment 1.

Dr. Howard Frumkin, Director of NCEH/ATSDR, presented plaques to thank and formally acknowledge the outstanding service of the following BSC members whose terms would expire on June 2, 2007: Mr. Scott Holmes and Drs. Janvier Gasana, Nancy Kim, Ronald Laessig, Patricia Nolan, Geary Olsen and Daniel Wartenberg.

Dr. Frumkin noted that the outgoing BSC members made additional contributions to NCEH/ATSDR by providing their valuable time and expertise in either chairing or serving on the BSC's three subcommittees. NCEH/ATSDR staff presented Dr. Nolan with an additional token of appreciation for her tremendous leadership in chairing the BSC and overseeing the BSC's subcommittees. The participants applauded the service of the outgoing members.

**Update by the NCEH/ATSDR Office of the Director**

Dr. Frumkin covered three major areas in his update.

Topic 1. Dr. Frumkin reported that NCEH/ATSDR provides leadership and is extensively involved in several of CDC's healthy places goals, including healthy communities, healthy

travel and recreation, and healthy housing. NCEH/ATSDR's built environment initiative plays an important role in the healthy places goals.

NCEH/ATSDR is expanding the scope of the Lead Poisoning Prevention Branch (LPPB) to more strongly emphasize healthy housing. However, LPPB will maintain its core focus on reaching children who are at risk for elevated blood lead levels and achieving the *Healthy People 2010* objective of eliminating this public health problem in the United States.

For the new healthy housing initiative, NCEH/ATSDR is partnering with the Surgeon General's Office to prepare a "Surgeon General's Call to Action." This activity is being designed to broadly focus on low-income housing, outcomes of unhealthy housing, and benefits of healthy housing, such as injury prevention and clean air. The healthy housing call to action will be linked to healthy communities and will be launched over the next 6-12 months. NCEH/ATSDR expects the healthy housing initiative to serve as a major public/private effort among a number of federal partners and private-sector organizations to advance the goal of healthy housing for all Americans.

NCEH/ATSDR was asked to conduct research to support Kaiser Permanente's new \$20 billion effort to build green healthcare facilities over the next ten years. The research will focus on energy use patterns, waste stream minimization, and travel patterns of the healthcare workforce, patients and visitors. NCEH/ATSDR convened a team of experts from CDC and other federal agencies to systematically conduct research on the impact of green hospital construction. NCEH/ATSDR expects to deploy a staff member to Kaiser to serve as an official liaison to government researchers. NCEH/ATSDR will provide the BSC with periodic updates about its role in Kaiser's development of green healthcare facilities and also will solicit input from the BSC as more progress is made on this activity over time.

Dr. Frumkin pointed out that detailed overviews would be presented during the meeting on some of NCEH/ATSDR's activities to support CDC's healthy places goals, including research, technical assistance, publications and collaborations for the built environment initiative.

Topic 2. Dr. Frumkin reported that NCEH/ATSDR provides leadership for CDC's responses to natural disasters, chemical incidents, radiological events and other environmental emergencies. However, NCEH/ATSDR has been challenged in this effort because a national surveillance system has not been established to track and collect data on hazardous substances releases to better understand these events.

NCEH/ATSDR's current surveillance system only supports 14 states. Limited resources also have minimized NCEH/ATSDR's ability to correct flaws in data collection efforts for the surveillance system. However, NCEH/ATSDR is scaling-up its efforts to advance to a true national surveillance system of hazardous substances releases to facilitate the collection and analysis of more complete data and the dissemination of more solid data to stakeholders.

NCEH/ATSDR is conducting a number of activities to support the nation's stronger focus on climate change. NCEH/ATSDR most likely will become a leading voice for public health protection with respect to climate change. Dr. Frumkin pointed out that detailed overviews would be presented during the meeting on some of NCEH/ATSDR's activities to support CDC's preparedness goals, including responses to environmental events, the climate change initiative, and the surveillance system of hazardous substances releases.

Topic 3. Dr. Frumkin was pleased to announce that NCEH/ATSDR is making significant progress in strengthening its excellence in science. NCEH/ATSDR developed a modeling and forecasting initiative to serve all CDC centers, institutes and offices. After receiving funds in FY'06, NCEH/ATSDR defined the scope of this effort, convened a new modeling workgroup with representation by CDC and external experts, and held workshops. NCEH/ATSDR will expand the modeling and forecasting initiative to include issues beyond pandemic influenza that also play an important role in health, such as meteorology, the climate, demographics and economics.

NCEH/ATSDR recently released a job announcement to recruit a national modeling expert to oversee this effort. NCEH/ATSDR expects the initiative to lead to the development of a new "Center of Excellence on Modeling" that will inform both public health and environmental health issues. In response to a request by Dr. Hal Zenick, *ex-officio* representative for the U.S. Environmental Protection Agency (EPA), Dr. Frumkin confirmed that written materials on the modeling and forecasting initiative would be distributed to the BSC before the end of the meeting. He also mentioned that EPA serves on the new modeling workgroup. Dr. Frumkin asked the BSC members to encourage persons with appropriate expertise to apply for the position of the director of CDC's modeling program.

NCEH/ATSDR will continue to use its Environmental Public Health Tracking Program to collect and reconcile different sources of data on health and environmental factors. However, a new feature of the program will be the release of a national report to regularly update the country on the state of the environment and health. Both printed and electronic versions of the national reports will be released to the public in a user-friendly format.

Dr. Frumkin pointed out that detailed overviews would be presented during the meeting on some of NCEH/ATSDR's activities to strengthen its excellence in science, including the third National Exposure Report. Overall, he conveyed that NCEH/ATSDR has made major strides in its healthy places, preparedness and excellence in science activities despite budget cuts and the loss of personnel.

Dr. Frumkin described other developments that occurred in NCEH/ATSDR following the previous BSC meeting. The President's FY'08 budget request for ATSDR is nearly the same as the FY'07 budget. However, "stable" funding actually represents a 4% decrease each year due to salaries for a fixed workforce. ATSDR is responding to the stable funding

by decreasing external funds to grantees or not filling vacancies of staff who retire or take other positions.

The President's FY'08 budget request for NCEH is nearly the same as the FY'07 budget. Congress recently asked Dr. Julie Gerberding, Director of CDC, to provide her professional judgment on resources that CDC would need to function and operate. Her Congressional testimony was supported by budget estimates from NCEH and all of CDC's other major programs. However, Congressional action on Dr. Gerberding's testimony is uncertain at this point.

NCEH/ATSDR recently completed its Performance Assessment and Rating Tool (PART) review. The Office of Management and Budget (OMB) requires each federal agency to undergo this formal benchmarking process for evaluation of its performance and outcomes. ATSDR was extremely successful in the review. A detailed overview of the results of the PART review would be presented during the meeting.

NCEH/ATSDR will relocate its offices to an existing CDC campus over the summer. The new location in a green facility with "Leadership in Energy and Environmental Design" (LEED) certification is consistent with Dr. Gerberding's strong interest in greening CDC. NCEH/ATSDR is leading CDC's efforts in making the transition to an entire green agency. For example, NCEH/ATSDR is attempting to provide employees with a shuttle between the CDC campus and the nearest station of Atlanta's rapid transit system. NCEH/ATSDR will hold the next BSC meeting in its new building.

### Panel Presentation on NCEH/ATSDR's Science and Public Health Activities

A panel of NCEH/ATSDR staff made presentations on NCEH/ATSDR's recent science and public health activities.

**Dr. David Fowler** reported on ATSDR's investigation of Mirant Corporation's Potomac River Generating Station in Alexandria, Virginia. The coal-fired power plant was constructed from 1949-1957 based on regulations by the Federal Aviation Administration rather than "Best Engineering Practices." The construction resulted in a lower stack height. Compliance for emissions standards of the plant was grandfathered to ambient air standards until 2005. At that time, the Virginia Department of Environmental Quality asked Mirant to model its emissions in response to complaints from the surrounding community. Sulfur dioxide emissions were nearly one order of magnitude greater than established standards.

Mirant voluntarily closed the plant in 2005, but was subsequently ordered by the U.S. Department of Energy to restart the plant due to its role as a backup power source to the Capitol. Mirant is currently operating the plant under an administrative order with EPA.

Meteorology and modeling are used to predict the operation of the plant for the following day. The Alexandria Health Department asked ATSDR to review the modeling data and identify potential health effects to the community surrounding the plant.

ATSDR's investigation and one-hour modeling showed the following results. Modeling data suggested short-term exposure to vulnerable populations from a sulfur dioxide hazard. Modeling and monitoring data were inconsistent, contained several gaps and demonstrated a great deal of uncertainty. Previous studies showed an association between sulfur dioxide emissions from the plant and dust levels in homes. Dr. Fowler presented several photographs illustrating the proximity between the plant and the surrounding community.

ATSDR will take several actions to address these issues. Health education messages and materials will be delivered to the community through a public meeting and a site-specific page on ATSDR's web site. The Mirant web page will contain reports, documents and descriptions of ATSDR's activities. An exposure investigation will be conducted to fill data gaps. Monitors will be placed in certain locations at the plant.

Solid data will be collected on short-term high impacts and indoor/outdoor sulfur dioxide emission levels. Sub-hourly data will be gathered from Mirant to better characterize the level, frequency and duration of emissions from the plant. This information will be distributed to community members along with specific actions that can be taken to protect themselves against exposure to high emissions on particular days. After Mirant completes its model evaluation study in 2008, ATSDR will conduct a health consultation.

**Dr. John Barr** reported on NCEH's study to detect and quantify anthrax lethal factor (ALF) in serum using a unique mass spectrometry method. Cutaneous anthrax has a 20% death rate if untreated and gastrointestinal colonization anthrax has a 25%-60% death rate if untreated. Inhalational anthrax is usually fatal if untreated and is the most likely form to be weaponized. *Bacillus anthracis* (*B. anthracis*) causes anthrax. A specific biomarker of *B. anthracis* must be developed to detect and diagnose anthrax. The best and most specific biomarkers are three binary toxins produced by *B. anthracis*: lethal factor, protective antigen and edema factor.

NCEH focused on the lethal factor and lethal toxin binary toxins for purposes of its study. NCEH developed a unique mass spectrometry method to model sequences to which ALF cleaves and create a synthetic peptide similar to these sequences. The method allowed NCEH to amplify ALF by ~3-4 orders of magnitude and detect and analyze tiny amounts of toxin. NCEH took several actions to determine the specificity of the mass spectrometry method. ALF was purified from serum samples with a total extraction time of 65 minutes. Mouse monoclonal antibodies that bind to portions away from the catalytic center were developed. Detection of ALF with a two-hour incubation period required a maximum time of 3.5 hours.

NCEH used the mass spectrometry method in an analysis of serum samples from Rhesus Macaque monkeys that were given inhalational anthrax. The analysis showed that two days after inhalation of anthrax spores, the Macaque 1 group had lower levels of toxin; the Macaque 2 group had higher levels of toxin; and the Macaque 3 group had very high levels of toxin compared to the substrate. NCEH used the mass spectrometry method in another study with five Rhesus Macaque monkeys to identify the expected range of ALF in animals with anthrax and also to determine the earliest point in time that ALF could be detected. NCEH detected anthrax in three of the five monkeys one day after exposure and in all five monkeys two days after exposure.

NCEH also used the mass spectrometry method in 2006 to track a clinical case of anthrax involving a male 44 years of age who was a musician for an African dance troupe. The subject became infected while making a drum from animal skins that were purchased in Africa with high levels of *B. anthracis* spores. The subject was hospitalized, given aggressive antibiotic treatment and eventually recovered.

NCEH concluded that the mass spectrometry method for measurements of ALF has outstanding sensitivity and specificity as well as a solid range of more than five orders of magnitude. The method can produce the first result in two to three hours with high ALF levels and within 24 hours with low ALF levels. The method can process 200-300 samples per day and did not show any interference with antibiotics. The method is capable of detecting ALF levels in monkeys earlier than culture and in rabbits ~12 hours prior to the onset of fever. Based on the preparation of samples, the method has the ability to be used in the field. NCEH has filed a patent for the mass spectrometry method and hopes to use this technique in clinical settings to evaluate the effectiveness of therapy.

NCEH will conduct several activities in the future to refine the mass spectrometry method. A larger study will be conducted with 20 Rhesus Macaque monkeys. Collaborative efforts will be undertaken with the National Institutes of Health to use the rabbit model to develop therapies. Automation of sample preparation will be improved to increase production to 1,000 samples per day. The method will be refined to distinguish between lethal factor and protective antigen. Dr. Barr concluded his report by emphasizing that the ability of the mass spectrometry method in protecting against terrorism will benefit preparedness efforts, enhance public health activities, and contribute to safer and healthier persons in the general population.

**Dr. Paul Garbe** reported on CDC's response to carbon monoxide (CO) poisoning following the "Hanukkah Eve" windstorm that occurred in Seattle, Washington. The cyclone approached the Pacific Coast on December 14, 2006 with wind gusts up to 70 mph and below-freezing temperatures for several days. Electricity was not available to 1.5 million residents. Effects from the storm directly or indirectly contributed to 15 deaths, including eight deaths from CO poisoning. Of 275 persons who were treated for severe CO poisoning, >50% did not speak English.

CDC took several actions from December 15-20, 2006 to assist the Seattle Poison Control Center and state and local health departments in Washington State in the CO response. CDC provided its package of CO poisoning prevention messages, web links and other materials to public information officers in five states. CDC translated and disseminated its CO prevention guidelines into seven languages.

Broadcast associations in two states provided local media outlets with CDC's audio and video public service announcements on CO poisoning prevention. CDC obtained a commitment from Home Depot Recovery Services to provide 3,000 CO detectors to areas where electricity had not been restored. CDC provided the Washington State Health Department with its case definitions and investigation questionnaires to assist in making CO poisoning a reportable condition in the state. At this time, seven states have made CO poisoning a reportable condition through either clinical recognition or laboratory data.

CDC conducts CO poisoning prevention activities in response to the morbidity and mortality from CO poisoning each year in the United States. CO poisoning accounts for 500 deaths and >15,000 emergency department visits each year. Annual CO poisonings in the United States are estimated to be at least 40,000.

CDC's CO poisoning prevention activities are targeted to two major areas. For "education and communications," CDC has served as the lead agency in developing non-emergency, emergency and recreational CO poisoning prevention messages since 2002. CDC will air a webcast in 2007 with tools for emergency department clinicians and emergency responders to recognize CO poisoning.

CDC has established partnerships with the Underwriters Laboratory, the Consumer Product Safety Commission, the Air Conditioners Contractors Association, and the National Public Health Information Council. CDC and its partners have achieved several important goals through these collaborative efforts. Prevention messages in plain English are developed and attached to new portable generators. Reminders are issued to the public about the importance of checking appliances and installing CO detectors. Both emergency and non-emergency messages are developed and disseminated to state health departments.

For "emergency and non-emergency surveillance," CDC developed a toolkit with emergency surveillance plans and other resources to evaluate communications related to CO poisoning following a power outage. CDC will collaborate with the American Association of Poison Control Centers to implement a rapid surveillance system through local poison control centers. CDC will partner with the Undersea and Hyperbaric Medicine Society to track the use of hyperbaric chambers in treating severe CO poisonings.

CDC recently submitted a proposal to the Behavioral Risk Factor Surveillance System with a request to expand the survey to include three core questions and one module on CO detectors and the use of portable generators. CDC will continue to collaborate with ten

states on the Surveillance Workgroup to develop indicators for health departments to measure the burden of CO poisoning.

CDC has established surveillance partnerships with several groups. Most notably, the Council of State and Territorial Epidemiologists (CSTE) will consider endorsing CDC's position statement to make CO a nationally notifiable disease during its meeting in June 2007. CDC and CSTE will continue to collaborate on the Carbon Monoxide Workgroup to focus on CO legislation and other policy issues. Dr. Garbe concluded his report by noting that strategic efforts by CDC and state health departments can decrease the burden of CO poisoning in the future because expertise is currently available to prevent this condition.

Two BSC members made several suggestions for CDC to consider in strengthening its CO poisoning prevention activities. Dr. Wax advised CDC not to focus the webcast on tools for emergency department clinicians to recognize CO poisoning. These providers have a wealth of knowledge and expertise in this area. Instead, the webcast should provide clinicians with strategies to improve epidemiology and make CO poisoning a reportable condition. Existing laboratory data could be compiled to support this effort. The webcast also should be targeted to non-emergency clinicians, such as family practitioners and other providers who do not routinely encounter CO poisoning.

Mr. Holmes urged CDC to disseminate its CO poisoning prevention materials to local health departments. He clarified that local staff rather than state personnel are responsible for responding to CO poisoning events. Local health departments also can serve as conduits in reaching building, safety and housing departments at the local level. Staff in these agencies plays a critical role in local efforts to improve under-reporting of low-level CO exposures in the home that do not require a hospital visit. Local health departments could assist CDC in developing a true population-based epidemiologic study of CO poisoning at the local level. CDC should collaborate with the National Association of County and City Health Officials (NACCHO) to broadly reach local health departments.

**Ms. Lynn Wilder** reported on ATSDR's investigations of community health issues from construction and demolition (C&D) debris landfills. EPA's estimates showed that 1,900 C&D landfills were active in 1994 and generated 136 million tons of waste in 1996. The Gulf Coast experienced a tremendous increase in the number and size of C&D landfills after the 2004 and 2005 hurricane seasons. C&D landfills cause adverse health impacts to nearby residents due to emissions from hydrogen sulfide, methane, and surface and underground fires.

ATSDR investigated community health issues at two C&D landfills in Warren, Ohio and Pensacola, Florida. Comprehensive community-based health studies on this issue are limited. Federal regulations have not been developed for siting, environmental monitoring, emission controls and closure of C&D landfills. Previous community-based studies on hydrogen sulfide exposure showed an association between low-level short-term exposures of ~30-100 ppb and exacerbation of respiratory problems, such as asthma, headache,



memory loss, and eye, nose and throat irritation. Limited data have been gathered on low-level chronic exposure of <30 ppb.

ATSDR identified several data gaps in hydrogen sulfide exposure. With the exception of asthmatics, other sensitive populations that also would have health impacts have not been identified to date. Data have not been gathered to determine whether short- or long-term peak exposures are associated with health effects. Exposure has been misclassified. Area rather than personal sampling strategies have been used to identify low concentrations.

ATSDR designed the health investigations to fill these data gaps. The Warren, Ohio study was a cross-sectional study with repeated measures. Data were gathered from ~100 participants through a respiratory health questionnaire. Participants were asked to maintain a daily diary for 30 days to record their symptoms, odors from the site, and the amount of time spent in the area each day. Participants who were identified with respiratory problems were given peak flow meters and instructed to wear personal monitoring badges for 24 hours/day for 30 days.

The Pensacola, Florida study was a cross-sectional study with 100 participants near the landfill and 100 participants further away from the landfill who lived in the same county and had a similar socioeconomic status. Similar to the Ohio site, the Florida participants also were asked to complete a respiratory health questionnaire, maintain daily diaries and wear personal badges. However, peak flow meters were not used at the Pensacola site because results from the Warren site were highly variable.

ATSDR encountered several challenges in conducting the studies. Participants reported non-specific health effects that were difficult to measure, such as headache and eye irritation. A clear distinction was not made between “short-term peak” and “chronic low-level” exposure. The participants were self-selected. The rate of participation decreased over the 30-day period because participants were required to conduct activities on a daily basis. Emissions from the landfills were not continuous and varied by season.

At the Ohio site, ATSDR found up to 90 ppb of hydrogen sulfide in the air. A weak association was seen among self-reported symptoms, reported odors, and information collected from personal monitoring badges. The number of asthmatics in the study was small. Hydrogen sulfide levels detected during the study were low because the landfill discontinued operations for 30 days while ATSDR conducted the study. At the Florida site, ATSDR found 240 ppb of hydrogen sulfide. The data analysis from this study is ongoing.

ATSDR’s investigations as well as activities by EPA and state partners resulted in several improvements at the sites. Ohio changed its regulations for C&D landfills. The Florida Department of Environmental Protection added requirements for air monitoring and emission control at the Pensacola landfill. Florida also is revisiting general regulations for all landfills in the state. ATSDR’s next steps will be to expand on lessons learned from the

studies by administering the respiratory health questionnaire to comparison communities and residents who live near other landfills in Florida.

Dr. Zenick offered to facilitate contact between ATSDR and EPA's Ecology Division near Pensacola, Florida. Damage to vegetation and other terrestrial and aquatic systems could be early signs of site-related impact of hydrogen sulfide and provide further data for the site assessment. Dr. Wax noticed that ATSDR found a weak association between self-reported symptoms and noxious odors at the Ohio site. He urged ATSDR to clearly distinguish between physical and psychological health effects of residents while expanding the C&D landfill investigations to other communities.

**Dr. Richard Gelting** reported on CDC's participation in the environmental investigation of *E. coli* in the spinach outbreak in Salinas Valley, California. The thorough environmental investigation on farms served as an excellent model of cross-agency collaboration between the Food and Drug Administration and the state of California. CDC coordinated the national epidemiologic investigation and provided expertise on water issues.

California manages its water supply by storing water in reservoirs to account for variation in seasonal precipitation and groundwater levels. Environmental samples that were positive for the outbreak strain of *E. coli* were taken from the San Benito River and feces from cows and wild pigs. Livestock have ready access to contaminated surface water from the San Benito River. Contaminated surface water can travel to groundwater and wells that pump 3,000 gallons of water per minute for 8-10 hours each day.

Data collected by the state of California showed that during the outbreak in August-September 2006, river water was not percolating into the ground at the beginning of the growing season and was percolating at the end of the growing season. These data suggested that irrigation water was contaminated and led to the *E. coli* outbreak. However, CDC acknowledges that public health effects from the gigantic constructed environment of the California waterscape are not well understood or studied. The waterscape also might have contributed to several recent *E. coli* outbreaks in California.

The environmental investigation of *E. coli* in the spinach outbreak was conducted with a systems approach and a strong team effort involving epidemiologic, laboratory and environmental expertise. For example, the epidemiologic analysis implicated spinach. The laboratory identified the strain of the outbreak in patients, bags of spinach from patients, and environmental samples from the field. The environmental assessment identified the reasons the agent was present in the environment and exposed the host.

Dr. Nolan pointed out that water management in arid parts of the world is an increasing environmental problem. The United States now receives more food from these areas. She advised CDC to explore the possibility of including and analyzing this issue in its global environmental agenda.

**Dr. Andrew Dannenberg** reported on NCEH's health and built environment activities. Health and community design are related to land use, automobile dependency and social processes. The built environment affects health in terms of obesity, cardiovascular disease, water quality and quantity, injuries, air pollution, asthma, climate change, mental health and social capital. NCEH's health and built environment activities are closely related to CDC's healthy places goals.

NCEH conducts ~40 health and built environment activities in four major areas. In the "science" category, NCEH is examining impacts of the built environment. A study is being conducted at two sites to determine changes in physical activity and other health outcomes among persons who move to communities that promote walking and other healthy behaviors.

NCEH analyzed existing data from the U.S. Department of Transportation (DOT) National Household Travel Survey to determine whether mass transit could be used as a mechanism to increase walking. The survey was administered in 2001 and included 3,312 transit users. The results showed that the median amount of time transit users spent in reaching or returning from the transit system was 19 minutes per day. Of all transit users, ~25% walked for at least 30 minutes each day.

NCEH is using geographic information systems (GIS) to examine health impacts. The "Safe Routes to School" project is designed to strengthen the infrastructure and disseminate education for children to ride bicycles to school. Preliminary findings suggest that repairs to sidewalks, bicycle paths and other areas in close proximity to schools would benefit the larger community. The national budget for this initiative for all states is collectively \$612 million.

In the "partnerships" category, two CDC centers are providing technical assistance to the Georgia DOT on the Safe Routes to School program. CDC will evaluate whether funding from the Georgia DOT to schools in the state plays a role in health outcomes. NCEH and EPA are providing funds and support to the American Planning Association on developing model zoning codes that promote health.

NCEH and EPA also are providing funds and support to the U.S. Green Building Council on the "LEED for Neighborhood Development" (LEED-ND) rating system. This project is designed to integrate the principles of smart growth, urbanism, public health, and green building to develop the first national standard for neighborhood design. The overarching outcome of the project will be to determine whether these principles can be applied to certify an entire community as LEED-ND. A draft LEED-ND system was developed and will be piloted in the field. NCEH and its partners hope that LEED-ND certification will result in economic value to building developers in promoting health, energy efficiency and other good standards.

In the “health impact assessment” (HIA) category, NCEH is analyzing the health consequences of building programs and policies. Several HIA projects are being conducted in response to a number of recommendations made during a workshop NCEH convened with experts to obtain guidance. The Atlanta Belt Line study was piloted to determine the health consequences of building a 22-mile transit loop around the city with trails and parks. NCEH expects to release results of the Atlanta Belt Line pilot study within the next few weeks. At this time, ~32 HIAs have been completed or are in progress in the United States. NCEH submitted a paper for publication on completed HIAs and the future direction of the field.

In the “education and training” category,” NCEH asked an urban planner to develop a paper to educate public health officials on the basic principles of urban planning. The paper was published and is now being used as an educational tool for public health students to advance the health and built environment field. NCEH and its partners convened two workshops to build HIA capacity. The workshops were designed to train 12 local planner-public health official pairs on using HIAs. Efforts are underway to develop pilot projects and training materials from this initiative.

NCEH is developing an interdisciplinary course on health and the built environment that will be taught at two academic institutions in Atlanta in the fall of 2007. Efforts are underway with another academic institution to create model curriculum on health and built environment issues based on six courses that are currently being taught around the country.

Two BSC members raised concerns about NCEH’s health and built environment initiative. Dr. Warrick urged NCEH to expand its partnerships because the projects appear to target affluent whites and exclude other groups, such as low-income populations, minorities, disabled persons and the elderly. Improvements in community design to promote health ultimately will result in unaffordable housing to low-income populations and the displacement of these residents. During the initial phase of planning health and built environment projects, Dr. Warrick advised NCEH to engage the Urban League, Habitat for Humanity, Small Business Development Centers, affordable housing agencies and other organizations that represent these populations.

Mr. Holmes was concerned that NCEH is not communicating with or collecting data from agencies with chemical exposure data. He strongly encouraged NCEH to broaden its health and built environment initiative by including chemical exposure risks to residential areas. For example, child care centers can be located in highway zoning areas that permit industrial uses with significant chemical exposures, such as warehouses, automobile repair shops and body shops.

In response to Dr. Warrick’s concerns, Dr. Dannenberg confirmed that NCEH is attempting to address the unintentional consequences of community design, particularly the displacement of low-income populations. Most notably, NCEH’s HIA activities routinely

focus on disparities related to equity, employment, housing, zoning and gentrification. NCEH's Healthy Places web site describes these problems and proposes solutions, including incentives for developers.

### **Health Department Subcommittee (HDS) Report**

Dr. Nancy Kim, Chair of the HDS, provided an update on HDS's recent activities. HDS established a regular schedule to hold 1.5-hour conference calls every five weeks. The HDS convened three conference calls since the December 2006 BSC meeting to discuss several issues.

In terms of bridging NCEH/ATSDR programs to better serve the needs of state and local health departments, the HDS reviewed a descriptive list of NCEH/ATSDR's extramural programs. The HDS will use this information to identify issues across NCEH/ATSDR that are of interest to state and local health departments and make recommendations for the BSC to consider.

In terms of identifying important issues to state and local health departments, the HDS members described their personal interests and reviewed feedback given by health departments during the Town Hall Forum in December 2006. The Association of State and Territorial Health Officials (ASTHO) also provided the HDS with its perspective on this topic.

The HDS was given a briefing on school siting issues and acknowledged the need to expand this area to broadly include the built environment. The ASTHO Environmental Health Policy Committee informed the HDS of its interest in gathering and using data on green and environmentally healthy facilities to improve health. The HDS determined that addressing the built environment could respond to its ongoing activities of bridging NCEH/ATSDR programs and identifying important issues to state and local health departments. The HDS plans to make recommendations on the built environment from the perspective of state and local health departments.

During its conference calls, the HDS also developed a document to formally report, track and follow-up on its recommendations. The HDS created a work plan to document its future activities. The work plan includes feedback provided by the Town Hall Forum participants.

Dr. Kim informed the BSC of several business items that should be addressed to ensure the continuity of the HDS. A new chair and members should be appointed because the terms for all but one of the current HDS members will expire in June 2007. The new HDS chair should serve in this role for at least two years. The process of complete turnover of the entire HDS membership should be reconsidered in the future because sufficient time will be needed for new members to become familiar with HDS's role, function, operation and activities.

The new HDS members should be appointed to serve as liaisons to the BSC's subcommittees, ASTHO and other partners. HDS's schedule of conference calls every five weeks and one annual face-to-face meeting should be maintained. Areas of expertise and interest of the individual members, cross-functional topics across NCEH/ATSDR programs, and HDS's tracking document and work plan should be used as criteria to identify future topics, make assignments and conduct activities. For example, HDS's focus on school siting issues could be expanded and incorporated into NCEH/ATSDR's healthy schools goals.

HDS's previous recommendations on the environmental public health (EPH) workforce should be updated. HDS members should be formally assigned to serve as leads for two topics. A handbook with HDS's charge, formal recommendations and previous meeting minutes should be developed and distributed to the incoming and all future HDS members. HDS will hold its next conference call on June 4, 2007.

Several BSC members and NCEH/ATSDR made suggestions for the HDS to consider in conducting its future activities.

- The HDS should include climate change in its work plan because state and local health departments have expressed a great deal of interest in this issue.
- The HDS should prioritize and clearly define the fundamental role of the work plan activities.
- The HDS should focus on a specific issue that compliments NCEH/ATSDR's mission while addressing the needs of state and local health departments.
- The HDS should engage federal staff on an ad hoc basis to gain more knowledge on outreach efforts to state and local health departments by agencies other than CDC.

### **Community/Tribal Subcommittee (CTS) Report**

Dr. Janvier Gasana, Chair of the CTS, highlighted key outcomes from the CTS's face-to-face meeting that was held on the previous day. NCEH/ATSDR provided the CTS with a live demonstration of its new environmental justice (EJ) web site and described next steps in this effort. Initially, the web site will be available on the CDC Intranet only. Changes will be made based on feedback from NCEH/ATSDR staff, the CTS and other partners. The revised web site will be broadly launched on the Internet.

The Coordinating Center for Environmental Health and Injury Prevention (CCEHIP) provided the CTS with an update on its health disparities activities. CCEHIP approved its new EJ policy in January 2007. CCEHIP will participate in the "Federal Collaborative on Health Disparities Research" Workgroup that was recently formed to facilitate research on

the built environment and three other priority areas. CCEHIP is developing a new health disparities assessment toolkit to provide programs with guidance on evaluating health disparities based on diverse criteria.

NCEH/ATSDR provided the CTS with overviews and updates on its communications and lead poisoning prevention activities; changes in the Office of Tribal Affairs (OTA); and the Third National Report on Human Exposure to Environmental Chemicals. Dr. Gasana limited his remarks because he pointed out that most of these presentations would be repeated to the BSC during the meeting. However, he informed the BSC that one of the CTS members noted a significant limitation of the National Exposure Report. American Indians/Alaska Natives and other small racial/ethnic populations are grouped in a collective “other” category. Specific data are not collected on these individual populations.

NCEH/ATSDR informed the CTS that an announcement was recently distributed to solicit internal candidates to serve on a 120-day detail to develop, coordinate and manage EJ activities. An opportunity would be available for the staff member to serve as NCEH/ATSDR’s new EJ Coordinator on a permanent basis following the detail. The EJ Coordinator would be charged with identifying strategies for programs to implement health disparities and EJ activities over the next year.

Dr. Gasana was pleased to report that the CTS provided NCEH/ATSDR with solid suggestions and extensive input on its ongoing activities. However, two members requested a status report on the CTS’s previous tribal recommendations that were approved by the BSC.

Dr. Zenick raised the possibility of coordinating NCEH/ATSDR’s new health disparities assessment toolkit, EPA’s “Community Action for Renewed Environments” program, and NCEH’s existing community-based initiatives. He suggested placing these projects on a future BSC agenda.

### **Update on NCEH/ATSDR’s Preparedness and Emergency Response Activities**

Dr. Mike Allred, of the NCEH/ATSDR Office of Terrorism Preparedness and Emergency Response (OTPER), described OTPER’s portfolio and priorities. OTPER is housed in the NCEH/ATSDR Office of the Director and is currently supported by ~20 staff with diverse skills. OTPER’s overarching goals are to upgrade preparedness and response capacity at CDC, state and local levels; participate in training and exercises; and collaborate with partners.

OTPER remains in a ready mode for terrorist attacks, natural disasters and technological events, but also conducts other activities during normal times. Collaborative efforts are undertaken with CDC’s Coordinating Office of Terrorism Preparedness and Emergency

Response (COTPER) in planning and preparedness activities. Strategic plans are developed and priorities are identified for preparedness and response. Linkages are provided between NCEH/ATSDR programs and external partners. Terrorism and emergency-related communications and publications are reviewed. OTPER represents CDC on federal, domestic and international preparedness planning and policy workgroups.

OTPER conducts the following activities during disasters. Requests for OTPER's assistance from the National Response Plan, other federal agencies, and state and local health departments are coordinated and evaluated. NCEH/ATSDR's subject matter experts who need to respond to requests are identified. Support is provided to CDC's Emergency Operations Center for chemical, radiological, technological and natural disasters. The recruitment and deployment of CDC staff are coordinated. Public communications about an event are prepared and reviewed. Lessons learned are obtained by participating in an after-action assessment. OTPER represents CDC on conference calls that are convened during responses.

COTPER allocates ~\$34 million to OTPER to conduct 11 projects in five broad activity areas. Three OTPER projects are funded under the "laboratory, biomonitoring and exposure assessment" activity area. Project 61 has a budget of ~\$16 million and is designed to upgrade and maintain CDC's laboratory capacity to respond to chemical and radiological terrorism. Project 2037 has a budget of \$2.4 million and is designed to enhance capacity in chemical terrorism by providing laboratory training, proficiency testing and exercises to state, local and territorial public health laboratories. Project 2150 has a budget of \$3 million and is designed to support CDC's mass spectrometry toxin laboratory by developing and validating methods for confirmation of toxins.

Two OTPER projects are funded under the "GIS and modeling" activity area. Project 63 has a budget of ~\$1.6 million and supports the Geographic Research, Analysis and Services GIS Program for planning, preparedness and emergency response activities. Project 4052 has a budget of ~\$1.1 million and is designed to provide CDC and its partners with modeling data on health dynamics in emergencies.

Three OTPER projects are funded under the "epidemiology and surveillance" activity area. Project 328 has a budget of \$1 million and supports the Hazardous Substances Emergency Events Surveillance System in 14 participating states. Project 330 has a budget of ~\$1.2 million and is designed to improve public health surveillance of chemical exposures and other potential health effects by providing nearly real-time data. Project 3307 has a budget of \$486,100 and is designed to improve coordination of federal, state and local public health morbidity surveillance after disasters.

Two OTPER projects are funded under the "toxicology, medical and health information" activity area. Project 2035 has a budget of ~\$3 million and is designed to enhance the ability of federal, state and local public health agencies to respond to nuclear or radiological terrorism events. Project 3942 has a budget of \$398,852 and is designed to support the



Automated Disaster and Emergency Planning Tool by building a technical assistance platform for states.

One OTPER project is funded under the “emergency response” activity area. Project 65 has a budget of ~\$3.75 million and is designed to improve OTPER’s response to EPH emergencies. Dr. Allred confirmed that OTPER will continue its partnerships with the American College of Medical Toxicology and the National Association of Environmental Health to build capacity in environmental medicine and health promotion. He pointed out that detailed descriptions of OTPER’s 11 funded projects were distributed to the BSC for review.

NCEH/ATSDR senior management provided additional details about OTPER in response to questions from the BSC members. OTPER will use pandemic influenza as a model to determine the effectiveness of collaborating with faith-based organizations to reach underserved communities and address health disparities and EJ issues during a disaster.

In terms of intramural funding, COTPER is now asking CDC programs to submit competitive applications for terrorism, preparedness and emergency response activities in FY’08. OTPER expects that its FY’08 allocation from COTPER will be stable. In terms of extramural funding, COTPER allocates \$1 billion to states for preparedness and response activities. OTPER will continue its close communications with COTPER to ensure that a fair amount of extramural funding is allocated to NCEH/ATSDR’s state grantees to address natural disasters, chemical incidents and radiological events. OTPER will continue to inform COTPER about the critical need to expand the scope of CDC’s preparedness and response activities beyond terrorism and infectious diseases to include natural disasters and chemical spills.

### **Public Comment Period**

Dr. Nolan opened the floor for public comments; no attendees responded.

### **Program Peer Review Subcommittee (PPRS) Report**

Dr. Daniel Wartenberg, Chair of the PPRS, explained that the PPRS would present its report in three parts.

Part 1. Dr. Wartenberg reviewed the PPRS’s process. The NCEH/ATSDR Office of Science provides the PPRS with a tremendous amount of support in planning and implementing the following peer review activities. An agenda for the site visit and a timeline for the overall peer review process are drafted. Persons with appropriate expertise in the subject matter for the review are identified and recruited to serve on a peer review team

(PRT), attend a site visit, and perform an independent technical review of NCEH/ATSDR's cross-functional activity.

The PPRS was originally charged with conducting peer reviews of NCEH/ATSDR's individual programs every five years. However, Dr. Frumkin asked the PPRS to modify its charge to evaluate NCEH/ATSDR's cross-cutting activities and performance as one of the nation's leading EPH agencies. Due to its more complex charge, the PPRS recognized the need for at least one PPRS member and one BSC member to serve on each PRT.

Three different questionnaires the PPRS developed are distributed to and completed by NCEH/ATSDR's Office of the Director, programs and partners/customers prior to the site visit. The PRT prepares a report with its findings and recommendations based on outcomes from the site visit. The PPRS reviews the PRT's report and suggests revisions if necessary. The PPRS approves and presents the report to the BSC for formal approval. The final report is submitted to the Office of the Director for NCEH/ATSDR staff to respond to the peer review recommendations.

Following the BSC meeting in December 2006, the PPRS has held six conference calls and one face-to-face meeting. The PPRS discussed the possibility of revising its original timeline to conduct the remaining peer reviews due to the shift from individual program to functional reviews. Similar to the HDS, Dr. Wartenberg announced that the PPRS membership also is undergoing significant turnover. The terms for the PPRS chair, three members and one liaison representative to the HDS would expire in June 2007.

Part 2. Dr. Nolan informed the BSC that she chaired the PRT for the site-specific activities (SSAs) peer review. Five persons with extensive environmental expertise served on the PRT as members. Two persons who represented a state health department and an impacted site attended the site visit as a partner and customer, respectively.

The peer review was structured to determine whether four ATSDR divisions have achieved the purpose and intended outcomes of SSAs. Objective and science-based assessments of public health hazards from site-specific contaminants should be provided. Risks should be communicated to the public, state and local health departments, and other interested parties. Collaborative efforts should be undertaken with EPA.

Recommendations should be provided to limit risks to persons in communities and interested parties. The public should be educated on protective strategies. Research should be conducted when a hazard exists, but cannot be quantified. The NCEH/ATSDR Office of the Director, leaders of the four ATSDR divisions, and nine partners/customers completed questionnaires to assist the PRT in determining whether ATSDR met these goals.

The PRT held three conference calls prior to the site visit, including one with partners/customers. The PRT conducted the site visit on March 21-22, 2007 to assess ATSDR's

program goals and objectives, accomplishments, quality of science, and public health impacts of SSAs. The PRT drafted and reached consensus on its report of the SSA review. The PPRS formally approved the report during its meeting on the previous day. The PRT's final draft of the SSA peer review report was distributed to the BSC for review, comment and formal approval.

Dr. Nolan summarized the PRT's key findings. ATSDR's SSAs have made a positive contribution to the health of communities and the public health infrastructure. Despite many resource constraints, SSAs are robust. To effectively meet community needs, however, SSAs need a significant amount of attention to the continuing demand for health assessments, technical guidance, protection of scientific skills and resources at sites.

ATSDR's health risk assessments, communication and management are important basic public health activities. ATSDR's relationships with EPA, state and local departments, communities, and tribal members and governments are critical to implementing SSAs. Streamlining processes, meeting public expectations, and shortening timelines to produce documents and complete studies are vitally important to SSAs as well. ATSDR's scientific evidence for decision-making has gaps, but is solid overall. Decreased resources have limited ATSDR's capacity to conduct SSAs.

Dr. Nolan highlighted the PRT's key recommendations.

- ATSDR should increase strategic planning of SSAs from a functional perspective to clarify goals and priorities across the four divisions.
- ATSDR should balance rapid responses and quick document production with public health needs to obtain a better understanding of activities at sites.
- ATSDR should define the needs of communities and partners for public health assessments and share lessons learned. In this effort, ATSDR should continue to educate and inform the public about the limitations, end-products and expectations of SSAs.
- ATSDR should develop a mechanism to share reports, experiences, lessons learned and other data across sites.
- ATSDR should place stronger emphasis on building relationships, particularly with EPA staff at regions and sites to better address science issues.
- ATSDR should ensure that support is available in the future for cooperative agreements due to ongoing exposure at sites, continued submission of petitions and chemical spills.
- ATSDR should obtain more science benefits from SSAs by pursuing additional research and improving surveillance. This approach will facilitate the publication SSA data in the scientific peer-reviewed literature and also will build a constituency to fill gaps in the knowledge base.
- ATSDR should make a commitment to conduct high-quality applied research.
- ATSDR should provide support for mentoring and succession planning to sustain scientific and technical expertise of staff.

- ATSDR should make data analysis and sharing of information from SSAs a high priority.
- ATSDR should expand education programs for health professionals to increase knowledge of SSAs and toxic exposures at sites.
- ATSDR should sustain linkages to the medical community.
- ATSDR should continue to respond to recommendations from previous peer reviews that also had site-specific components.
- ATSDR should collaborate with EPA, the National Institute for Environmental Health Sciences, and the National Institute for Occupational Safety and Health in taking a more explicit and vigorous approach to influence the overall science agenda. ATSDR should use these partnerships to leverage external support for health studies, toxicological profiles and other SSA-related research.

Dr. Nolan concluded her report by thanking Ms. Athena Gemella, of the NCEH/ATSDR Office of Science, for her outstanding efforts in compiling data from the questionnaires and providing other support to the PRT for the SSA review.

Several BSC members pointed out that ATSDR's SSAs are unique and serve as one of the best models of direct interaction between a federal agency and communities. The members made a number of comments and suggestions on the SSA peer review report and process.

Dr. Wax expressed concern that all of the partners/customers in the SSA review were "experts" and no input was obtained from affected community members at sites. He pointed out that the affected community is the primary stakeholder of ATSDR's SSAs. Dr. Kim advised ATSDR to require its state grantees to exhibit posters during partners' meetings. This approach could assist in responding to the PRT's recommendation to share SSA data and lessons learned across sites. In response to Dr. Kim's suggestion, Dr. Frumkin confirmed that ATSDR would share the final approved version of the SSA peer review report with its state partners.

Several BSC members supported the PRT's recommendation for ATSDR to expand the scope and definition of "sites." Dr. Zenick encouraged ATSDR to share lessons learned with EPA in responding to this recommendation. Dr. Sinks asked the PRT to provide explicit guidance and examples to ATSDR on appropriate and inappropriate types of sites to include in the broader scope and definition. Mr. Holmes advised ATSDR to appoint a site ombudsman or community liaison while conducting SSAs to build linkages to and relationships with local agencies and resources. This approach would minimize the risk of ATSDR making promises at sites that could not be kept in its role as a federal agency.

Dr. Sinks noted that the PRT's report excluded responses from the Office of the Director questionnaire. Dr. Nolan clarified that the report specifically quoted senior management's description of the goals and priorities of SSAs. The senior management definition was compared to the program perspective of the goals and priorities. In response to Mr.

Holmes' comment, Dr. Nolan planned to re-review the report to more clearly state that local agencies are involved in ATSDR's SSAs at the site level.

Dr. Frumkin thanked the PPRS members and external reviewers for contributing their valuable time and making the commitment to undertake this tremendous effort. He announced that ATSDR would present its formal response to the SSA peer review report during the next BSC meeting. In the interim, he asked Dr. Nolan to provide additional details about the SSA review by responding to the following questions:

1. What was the PRT's experience and perspective on the overall process of the first cross-cutting review?
2. Did the PRT endorse ATSDR's current model of conducting SSAs at the local level in its role as a federal agency? Should health departments play a leading role in SSAs with ATSDR serving as a consultant?
3. Should ATSDR maintain its traditional focus on hazardous waste sites only or expand its scope to include other pathways of encountering chemicals?
4. What was the internal performance of the four ATSDR divisions that conduct SSAs in the context of harmonization, fragmentation, redundancy or excess bureaucracy?
5. What was ATSDR's performance in the context of addressing health disparities and EJ issues in communities?

Dr. Nolan's responses to Dr. Frumkin's questions are outlined below.

1. The PRT found the case study approach to be helpful for the SSA review. However, more than one case study should be presented to fairly evaluate a functional activity across different programs. The PRT also recognized the need to obtain feedback from a broader range of customers when additional cross-cutting reviews are conducted in the future.
2. The PRT found ATSDR's current model of conducting SSAs to be acceptable. ATSDR should not take a "hands-off" approach or serve as a distant consultant to state and local health departments. ATSDR's role as a federal agency provides communities with national consistency and an opportunity to include site-specific data in a national registry. State and local health departments also need ATSDR's guidance and technical expertise, particularly at sites with resource, political or other types of barriers to conducting SSAs at the local level.
3. The PRT expressed strong support for ATSDR expanding its scope beyond traditional sites to include chemical spills and other types of encounters. However, the PRT noted that ATSDR would need to take caution in this effort due to limited resources and its statutory mandate to respond to Superfund sites.
4. The PRT found that ATSDR's goals, objectives and priorities for SSAs are unclear in some cases. For example, the four divisions might conduct

overlapping activities at a dynamic site with new issues. However, the divisions might not obtain sufficient or rapid support to address issues at a less compelling site.

5. The PRT found that the ATSDR divisions agree on the importance of health disparities and EJ and attempt to address these concerns in communities. However, actual attention to these issues at sites by ATSDR and its partners is unclear. To date, ATSDR has not fully institutionalized the concepts of health disparities and EJ issues while conducting SSAs.

Dr. Nolan encouraged the BSC members to submit comments to her on the report over the next week. However, she clarified that major changes would need to be approved by the PRT or placed in an appendix.

Dr. Nolan entertained a motion for the BSC to approve the SSA peer review report. A motion was properly placed on the floor by Mr. Chen, seconded by Dr. Kim, and **unanimously approved** by the BSC.

Part 3. Dr. Wartenberg provided an update on the upcoming preparedness and emergency preparedness (PER) peer review. The PER review will be the PPRS's largest and most challenging effort to date due to the involvement of seven different programs and a broad range of partners/customers. In an effort to provide a framework for the complex review, the PPRS drafted a charge to the PRT and made revisions based on feedback from Drs. Frumkin and Sinks. The charge for the PER review was distributed to the BSC.

The PPRS will instruct the PRT to use a number of criteria to evaluate NCEH/ATSDR's capacity to respond to an event: OTPER's 11 funded projects; NCEH/ATSDR's interaction and coordination with other parts of CDC and other agencies; and NCEH/ATSDR's ability to address health disparities and EJ issues during a response. At this time, the PPRS has determined categories of expertise for the PRT, identified potential partners/customers to provide additional feedback on NCEH/ATSDR's PER activities, and drafted an agenda for the site visit. However, the typical two-day site visit might need to be expanded due to the complexity of the PER review.

Dr. Wartenberg reminded the BSC that the PPRS has only conducted one functional review to date. As a result, he asked the BSC to provide input on all aspects of the PER review.

The BSC members made several suggestions for the PPRS to consider in its ongoing efforts to focus and refine the PER review.

- The National Oceanic and Atmospheric Administration and the Federal Emergency Management Agency should be included as additional partners.
- A local perspective should be represented in the PER review. Local agencies are given federal preparedness dollars and are responsible for responding to

events. NACCHO should be included as an additional partner or a local health department representative should serve on the PRT.

- The charge should be revised for the PRT to evaluate whether “NCEH/ATSDR is making the best use of its current resources.”
- A representative from the nuclear power, chemical or other parts of industry that are parallel to emergency preparedness should be involved in the PER review as a PRT member, partner or customer.

NCEH/ATSDR senior management made several remarks to assist the PPRS in focusing the PER review. Dr. Scott Deitchman, Director of OTPER, confirmed that the PER review would be helpful to OTPER. However, he advised the PPRS to consider external realities as additional criteria to evaluate NCEH/ATSDR’s capacity to respond to an event. For example, COTPER establishes priorities for OTPER. The Department of Homeland Security’s promulgation of 15 disaster scenarios will play a key role in NCEH/ATSDR’s efforts to establish target goals for national preparedness.

Dr. Sinks asked the PPRS to determine the appropriateness of and gaps in OTPER’s 11 funded projects in the context of NCEH/ATSDR’s cross-functional PER activities. NCEH/ATSDR will use the PPRS’s guidance during the FY’09 competitive application cycle for COTPER funding.

Dr. Sinks encouraged the PPRS to reconsider some areas of expertise that do not play a significant role in NCEH/ATSDR’s PER activities, such as first responders, microbiology and international public health agencies. For example, NCEH/ATSDR does not serve as first responders during an event and would not need input from this group.

### Update on the CDC, NCEH and ATSDR Web Sites

**Ms. Jana Telfer**, of the NCEH/ATSDR Office of Communication (OC), reported that the NCEH and ATSDR web sites were developed nearly 10 years ago. Since that time, >17,000 pages have been created and posted on the web sites. Five full- and part-time staff members maintain the volume of the web sites and ~200 subject matter experts and health communications specialists contribute content to the web sites.

The traditional approach of NCEH and ATSDR was for individual divisions, programs and staff to develop and maintain different web sites. However, the lack of central administration of these separate sites resulted in inconsistent content, site organization, page design, navigation tools and user experiences. For example, ATSDR’s four divisions previously had four different descriptions of asbestos on the web sites. NCEH/ATSDR’s information rarely appeared in the first page of search engine results.

State grantees provided input to the process of updating the NCEH and ATSDR web sites during the annual partners' meeting in 2004. The grantees routinely obtained information from sources other than NCEH/ATSDR due to their extreme frustration in navigating the sites. NCEH/ATSDR initiated user-centered research to support the redesign of the web sites and began collecting consistent baseline data on use of the web sites in FY'06.

**Ms. Marianne Hartin**, of OC, highlighted key features of the redesigned web sites and summarized outcomes from the user-centered research. NCEH's web site was previously organized by program, while ATSDR's web site was previously structured by concepts established by the web designer. The web sites were redesigned based on feedback from user-centered research, user priorities, improved access, and more consistent branding and navigational experiences across both sites. OC also redesigned the web sites based on its assumption that visitors relate to environmental health from both alphabetical and geographical perspectives.

OC redesigned the web sites in a two-phased approach from January-September 2005. A workshop was held for CDC to present a review of the literature and data that were previously collected. Various workgroups were formed to review the functional and user requirements of the web sites. The user and functional requirements were finalized and the existing web sites were evaluated on the bases of content, the most popular sites visited and other criteria. Prototypes of the home page designs were developed, tested at external conferences, and revised in response to feedback. The new template was applied to the home pages. Quality assurance of the prototype was performed and the template was launched.

Ms. Hartin presented slides to illustrate the improved design of the NCEH and ATSDR web sites. The banners and footers connect to and are consistent with the CDC web site. The left and right navigation panels provide contextual links to additional content. Spotlights with new images enhance and freshen the home pages and increase visibility of the content. The redesigned web sites also contain cascading style sheets and standard style guides. CDC selected the NCEH/ATSDR template as a model to be considered for the redesign of its agency-wide web site.

OC contracted an outside company to conduct user-centered research from September 2005-September 2006 to evaluate user-friendliness of the web sites; identify usability issues among diverse audiences, improve accessibility of information; and strengthen user experience. During the research phase, parameters were established for the project and a protocol was developed. Interviews were conducted with 32 diverse stakeholders and approval was obtained from an Institutional Review Board to collect information on the protocol. Qualitative and quantitative user assessments were performed and the web sites were modified based on these findings.

OC took several actions to respond to feedback provided during the user-centered research. For the "credibility" recommendations, the ATSDR brand was incorporated into



the CDC brand to highlight credibility and create a family of sites. A description of ATSDR was added to the home page.

For the “content” recommendations, simple summaries were created with links to more detailed information. Scientific and common language was used in articles. Audience-based sections were included in navigational tools to direct users to the most appropriate content. A mapping application was added. For the “A-Z Index” recommendations, scientific and common language was used. Information was organized by topic home pages or chemicals. Ms. Hartin showed video clips of persons who participated in the user-centered research.

**Ms. Telfer** highlighted key features of CDC’s redesigned web site since its debut in 1994. CDC’s web site has one of the highest American Customer Satisfaction Index scores of all government web sites. However, CDC recognized the need to redesign its web site because individual programs traditionally have developed, maintained and administered separate sites. CDC redesigned its web site based on four guiding principles: research-based, user-centered targeted to primary and secondary audiences, performance-driven and collaboration-rich.

CDC made several changes to its web site based on research findings. Data and statistics are highlighted in specific sections. The A-Z Index is easier to read and use, more prominently displayed, and integrated with search functions. Information is clearly grouped by topic, such as “environmental health.” In the future, links will be provided on each substance-specific home page that will direct users to WebMaps with locations of substances throughout the country. Users would then be able to access other sites to obtain more information on a particular substance.

CDC’s redesigned web site resulted in a number of improvements. The ability of users to perform the same search tasks was enhanced by 22%. Users required 41% fewer clicks or page views to reach desired information. User satisfaction improved 70%. Ms. Telfer concluded the update with a live demonstration of two new products of the NCEH and ATSDR web sites: the “Toxic Substances Portal” and “Environmental Health WebMaps.”

### **Expert Panel Report on the Evaluation of OTA**

Ms. Leslie Campbell, of OTA, reported that OTA was established in 1999 to respond to requests from tribes for ATSDR’s assistance. OTA conducts several activities to fulfill its mission. A central conduit is provided for tribes to access ATSDR’s programs and services. Assistance is given to ATSDR in responding to various Presidential Executive Orders and federal mandates related to tribes. American Indian/Alaska Native policies are developed in collaboration with tribes for use by ATSDR, such as the CDC/ATSDR Tribal Consultation

Policy. ATSDR's tribal programs and projects are coordinated to meet tribal-specific public health needs.

External tribal programs are funded through cooperative agreements to build EPH capacity throughout Indian Country. Capacity-building programs are implemented to allocate resources, provide technical assistance, and improve tribal capacity to address EPH issues. Programs and curricula are developed for use by Tribal Colleges and Universities (TCUs). Partnerships are established with organizations to conduct research to reduce and prevent environmental exposures.

Tribal consultations are conducted to provide direct assistance to tribes, tribal organizations and governments, including exposure investigations and EPH evaluations on chemical- and exposure pathway-specific issues. ATSDR staff is trained in appropriately interacting with tribal nations, recognizing cultural issues, and observing the sovereignty of the government-to-government relationship and other legal aspects related to tribes. OTA takes these actions to build trust and ensure that ATSDR's products are widely accepted in Indian Country. To date, OTA has collaborated with >175 tribes throughout the country on various types of projects.

Ms. Campbell reported that OTA had not been evaluated since its establishment in 1999. To address this need, OTA convened an expert panel with tribal experts who had knowledge of the environment, public health and ATSDR. The expert panel was charged with assessing OTA's past accomplishments and recommending critical actions to guide OTA in strengthening tribal projects and programs. The expert panel used the following criteria to conduct the evaluation: OTA's previous achievements that have benefited tribes; EPH needs of tribes throughout the country; and strategies for OTA to have the greatest value to tribes in the future.

Ms. Campbell's summary of the expert panel's key findings is outlined as follows. ATSDR has been successful in maintaining a functional Indian Desk. ATSDR has provided training and education that have benefited tribes, such as the clinician's environmental health training course, curricula for TCUs, and the provision of ATSDR's existing public health assessment course to tribal leaders in Alaska. ATSDR has developed and maintained an informative web site on OTA. ATSDR's cooperative agreements with TCUs have increased the development of environmental health curricula. ATSDR has provided site-specific technical consultations to tribal entities. However, the expert panel determined that OTA is too small to provide adequate services.

Ms. Campbell highlighted the expert panel's key recommendations. A systematic review or survey should be administered at the national level to identify tribal and regional variations and also to determine tribal EPH needs. The expert panel pointed out that no national assessment of tribal EPH needs is available at this time. Tribal-specific models of environmental exposures should be created. Existing data on environmental diseases

should be compiled and interpreted. Training and education to build tribal capacity should be continued and expanded.

The placement of OTA should be elevated from an ATSDR division to the NCEH/ATSDR Office of the Director to increase its visibility. Collaborative efforts should be undertaken with the National Indian Health Board and other tribal organizations to build more partnerships and identify advocates. A strategic plan should be developed to guide OTA's growth over time. A travel budget should be included in OTA's line item to support face-to-face meetings between staff and tribes. Consideration should be given to hiring and maintaining OTA staff outside of Atlanta. Research should be designed, conducted and targeted to tribal populations. Evaluations of OTA should be performed periodically.

Ms. Campbell announced that in response to the expert panel's report, OTA distributed a "Dear Tribal Leader" letter to ~560 tribes, all health directors of tribes throughout the country, and tribal organizations. Under Dr. Frumkin's signature, the letter made several commitments. The placement of OTA will be elevated to the NCEH/ATSDR Office of the Director. OTA staff will report directly to the NCEH/ATSDR Director and Deputy Director. An aggressive search will be launched to fill the position of the OTA Tribal Coordinator with special emphasis on advertising the position and recruiting in Indian Country. An announcement for the position is currently being developed.

OTA's next steps will be to develop a strategic plan for growth, enhance existing partnerships and collaborations with tribal organizations, and expand tribal knowledge about OTA. Ms. Campbell pointed out that the expert panel's report was distributed to the BSC for review.

With no further discussion or business brought before the BSC, Dr. Nolan recessed the meeting at 4:53 p.m. on May 17, 2007.

### **Overview of the National Acute Hazardous Substances Release Surveillance System**

Dr. Nolan reconvened the BSC meeting at 8:13 a.m. on May 18, 2007 and yielded the floor to the first presenter.

Dr. David Williamson, of NCEH/ATSDR, explained that the Hazardous Substances Emergency Events Surveillance (HSEES) System is a web-based surveillance system to capture public health consequences associated with acute hazardous substances releases. For purposes of HSEES, "hazardous" is defined as an event that might reasonably be expected to cause adverse human health outcomes.

ATSDR developed HSEES in 1990 to achieve several objectives. Data are collected on acute releases to determine public health impact. Data are analyzed to identify factors related to public health impacts from events. Data are used to identify and promote activities to decrease public health impacts. HSEES maintains data submitted by 14 state health departments that represented ~42% of the national estimated population in 2006. States have a target goal to enter data into HSEES within 48 hours after knowledge of an event.

Eligibility criteria to list an event in HSEES include sudden, uncontrolled, illegal or threatened releases of at least one hazardous substance. Petroleum-only releases are excluded from HSEES due to Superfund authorizing legislation. States use a number of sources to report data to HSEES, including release sources, environmental agencies, the National Response Center, media, hospitals, DOT, poison control centers, police and fire departments, and HAZMAT agencies.

Dr. Williamson summarized key findings from HSEES data that were collected from 1993-2005. The 14 participating states have reported ~5,500-6,500 fixed facility events and ~2,000 transportation events to HSEES each year since 2000. Carbon monoxide was the most frequently reported release in 2005. The number of victims reported to HSEES increased from ~2,000 in 1993 to ~3,000 in 2005. Employees, the general public, responders and students accounted for the top four groups of victims reported to HSEES in 2005.

For purposes of HSEES, "victims" are defined as deaths associated with an event or persons who present to emergency responders, physicians and emergency rooms within 48 hours following an event. However, victims are categorized in HSEES based on level of severity, such as treated at the scene, presented to private physician, admitted or not admitted to a hospital, or died. Asymptomatic persons are not classified as victims in HSEES.

Respiratory irritation, headache, dizziness/central nervous system effects, gastrointestinal problems and eye irritation accounted for the top five adverse events reported to HSEES in 2005. Manufacturing, transportation, wholesale trade and utilities accounted for the top four industries involved in events in 2005.

HSEES data are used for several purposes, including web site content, prevention outreach activities, public use data sets, interagency collaborations, emergency response planning and preparedness, presentations, training, annual reports, fact sheets, publications, linkages to state web sites and materials, and justification for federal, state and local legislation. At the state level, states use HSEES data to develop prevention plans, measure public health impact and provide statewide alerts. However, ATSDR acknowledges the limitations of HSEES, such as the exclusion of petroleum-only events, limited partnerships with industry and non-participating states, a small coverage area of only 14 states, and minimal resources.

Dr. Williamson reminded the BSC of its key recommendations to ATSDR based on the peer review of HSEES. A strategic plan and evaluation criteria metrics should be developed. A public use database should be promoted. Partnerships with other groups and collaborations among the HSEES member states should be expanded. Nationally applicable lessons should be elicited and information should be disseminated at the national level. Efforts should be made to include petroleum-only releases in HSEES. Epidemiologic use of data should be enhanced with statistics and GIS.

Dr. Williamson noted that the BSC's recommendations played a key role in ATSDR developing a new vision for a national acute hazardous substances release surveillance initiative. The new surveillance system is being designed as an integrated and comprehensive national system to encompass the universe of hazardous substances releases in the United States. The new national surveillance system will be supported by four core activities.

For "data collection," ATSDR will increase the coverage area, identify core variables, standardize the data collection format, increase the procurement and integration of data, protect sensitive data, and minimize reporting burden. For "data analysis," ATSDR will perform epidemiologic investigations, link core elements to GIS, identify vulnerabilities in manufacturing and transport, and use best practices to develop case studies.

For "products," ATSDR will develop and provide web sites, national alert reports, newsletters to states, conferences, training opportunities, and a joint research program with partners and stakeholders. For "expanded partnerships," ATSDR will enhance collaborations with state health and environmental departments; CSTE; environmental, labor and industry advocacy groups; preparedness and response organizations; poison control centers; the chemical industry; research institutes; federal agencies; and international organizations.

Dr. Williamson summarized ATSDR's completed activities and future plans for the new national surveillance system. A strategic plan was developed, vetted by the participating states, and is currently undergoing internal review. A national vision document was drafted and is being distributed to partners and stakeholders for review and input. Introductory and planning meetings are currently being held with stakeholders to discuss the new surveillance system and prepare for a national conference in the future. A business plan will be drafted for the new surveillance system.

The stakeholder meetings are designed to identify, review and discuss ongoing data collection activities, gaps, needs, partnering opportunities, additional stakeholders, challenges, and the feasibility of the new national surveillance system. A roundtable will be convened with two key partners in the summer of 2007 and the national conference for the new surveillance system will be held in the near future. A detailed implementation plan will

be developed following the national conference. Dr. Williamson encouraged the BSC to provide feedback on the new surveillance system.

The BSC commended ATSDR on its vision for the new national acute hazardous substances release surveillance system. A number of members noted that national data on events would be extremely beneficial to a variety of partners and stakeholders. The BSC was also pleased that its peer review of HSEES played a key role in the development of the new national surveillance system.

Several BSC members made suggestions for ATSDR to consider in refining the new national surveillance system.

- ATSDR should take caution in using “victim” in HSEES because this word is typically associated with deaths or serious health consequences. However, impacts following a release often involve minor medical or psychological outcomes or asymptomatic persons with an interest in receiving medical follow-up. ATSDR should design its new national surveillance system with appropriate and solid data collected from epidemiologic investigations and the bedside.
- ATSDR should create a national map of repositories to identify river basins, storage facilities and other sources of releases in areas outside of the 14 participating states.
- ATSDR should clarify the goals of the new national surveillance system. For example, the “data collection” goal might cause the public to believe that ATSDR is designing the national surveillance system to gather information for public health purposes only. The primary purpose of the national surveillance system to reduce the frequency and severity of releases in communities should be explicitly stated. This approach will facilitate ATSDR’s development and dissemination of solid products to stakeholders and partners.
- ATSDR should clearly define and explain the importance and usefulness of the new surveillance system to first responders, the chemical industry and other groups to increase participation among and endorsement by new partners and stakeholders.
- ATSDR should design the new surveillance system to play a critical role in preparedness and emergency response activities.

### **Update on the National Report on Human Exposure to Environmental Chemicals**

Dr. James Pirkle, of NCEH/ATSDR, explained that the essential steps to prevent disease from a public health perspective are to detect exposure or disease, assess health risk, develop and apply interventions, and assure the effectiveness of interventions.

Environmental and genetic causes must be addressed to prevent disease and injury. Environmental causes include four categories: infectious agents, chemicals, radiation and the physical environment.

The major criteria to establish priorities for chemicals are the seriousness of known or potential health effects; the cost and feasibility of interventions; disproportionate exposure to underserved populations; and the number of persons exposed in both the U.S. population and special populations. The National Exposure Report (NER) fills one of these gaps by evaluating exposure in the U.S. population.

The NER is a nationally representative sample of ~2,400 persons in each two-year cycle. The third NER was published in 2005 with 148 chemicals and the fourth NER will be published with 275 chemicals. The 2003-2004 NER represented >660,000 measurements. The NER has several public health uses. Chemicals that actually enter the human body are measured and at-risk populations are identified. Data to identify unusual exposures are referenced. The effectiveness of public health efforts is evaluated. Exposure trends are tracked.

Dr. Pirkle described several examples in which NER data were applied in the field. Unusual levels of exposure were analyzed in 370 firefighters who responded to the World Trade Center disaster. Blood and urine samples were collected from firefighters while fires were still burning and 110 fire-related chemicals were tested. NER data showed that most of the 110 chemicals measured were well within the 95<sup>th</sup> percentile of the U.S. population. Based on the third NER, however, 7% of exposed firefighters had 1-hydroxy pyrene levels above the 95<sup>th</sup> percentile and 16.5% had antimony levels above the 95<sup>th</sup> percentile.

Exposure to depleted uranium was analyzed in ~120 U.S. soldiers returning from Iraq, including exposure from shrapnel and battle explosions. The third NER showed that the 95<sup>th</sup> percentile for uranium in urine of adults was 0.045 µg/L. All uranium levels measured in soldiers to date have been below the 95<sup>th</sup> percentile.

Blood mercury levels in women of childbearing age were measured from 1999-2002. The EPA reference dose for blood mercury is 5.8 µg/L. The third NER showed that the 95<sup>th</sup> percentile for blood mercury levels in women 16-49 years of age was 7.1 µg/L. These data showed that 7.8% of women of childbearing age in the United States exceeded the EPA reference dose.

Dr. Pirkle announced that CDC has developed another method to more rapidly report NER results. Increases in the number of chemicals and the size of the NER have resulted in the completion of some findings before others. To avoid delays in releasing data until the full NER is finalized, CDC initiated a fast-track process to distribute manuscripts for publication within two months of completing an analysis of a chemical or chemical group. The NER web site now serves as a one-stop source for all fast-track publications and the entire version of the latest NER with results for all environmental chemicals measured.

Dr. Pirkle reported that CDC convened an expert panel to assist in responding to a request to develop criteria to remove chemicals from the NER. CDC and the expert panel determined that chemicals should be removed from the NER based on one of three circumstances: the availability of a better chemical marker, low detection rates of the chemical, or no changes or a downward trend of the chemical.

CDC identified several exceptions to the delisting criteria: (1) an established biomonitoring health threshold of the chemical; (2) a federal standard to regulate levels of the chemical in the environment; (3) a long half-life of the chemical; and (4) recent changes in exposure sources of the chemical. CDC is in the process of obtaining OMB approval and submitting the exact wording of the delisting criteria to the *Federal Register* for public comment.

Dr. Pirkle noted that CDC recently met with the American Chemical Council and CropLife to discuss the NER results and publications. CDC is aware of industry's strong interest in the NER data, the interpretation of these findings, and excerpts from the NER that can be quoted. CDC will continue to meet with industry on an ongoing basis to clearly communicate the NER results.

Dr. Pirkle described chemicals of special interest in the NER. Perchlorate has widespread exposure in the United States. The level of this chemical is 70%-80% higher in children than adults and adolescents. Common levels of perchlorate in the population are associated with small- to medium-size changes in thyroid hormone levels in ~43 million or 36% of women in the United States. A decrease was seen in thyroxin and an increase was seen in thyroid-stimulating hormone.

Urinary arsenic measurements identified and distinguished between forms of arsenic from food and water. CDC expects to release new data from the urinary arsenic analyses for the entire U.S. population within the next six months. Perfluorinated compounds and polybrominated diphenyl ether (PBDE) are special interest chemical groups. CDC expects to release NER data on these chemicals before industry makes major changes in manufacturing processes. Differences in the population as a result of these manufacturing changes will be evaluated in the future. A publication on perfluorinated compounds is now available on the NER web site and a new publication on PBDE is expected to be released over the next six months. Dr. Pirkle encouraged the BSC to review the NER at [www.cdc.gov/exposurereport](http://www.cdc.gov/exposurereport).

Dr. Zenick remarked that the NCEH Division of Laboratory Sciences is outstanding from a scientific perspective and also is the most cooperative and accommodating of all of EPA's federal partners. He raised the possibility of convening a workshop with experts to initiate the process of listing potential emerging exposures in the NER, particularly biofuels and the increase in metals from nanotechnology. Dr. Pirkle clarified that CDC has a formal nominations process and specific criteria to list chemicals in the NER. However, he was in



favor of Dr. Zenick's suggestion to convene a workshop to begin discussions on listing potential emerging exposures in the NER.

In response to Dr. Olsen's comment, Dr. Pirkle described biomonitoring efforts at the state level. CDC is providing California with laboratory expertise and other technical assistance to support its new state-based biomonitoring program to measure selected agents. CDC is also assisting New York City in undertaking a similar effort to target chemicals of interest at the local level. Dr. Pirkle emphasized that the lack of federal funding continues to serve as a major barrier to the development and implementation of state-based biomonitoring programs.

In response to Dr. Gasana's question, Dr. Pirkle confirmed that CDC collaborates with academic institutions and researchers throughout the country on epidemiological studies. He would contact Dr. Gasana to discuss the possibility of CDC using its new analytical technique to measure, track and distinguish between ethyl and methyl mercury at sites in Florida.

### **Public Comment Period**

Dr. Michael Kosnett, of the University of Colorado Health Sciences Center, made comments on behalf of the American College of Medical Toxicology (ACMT). Due to the extraordinary value of the NER, he emphasized the critical need to collect additional information from subjects with higher exposure levels. He noted that ACMT would be extremely interested in partnering with CDC to interview highly-exposed subjects and apply the data in a large national study. He also pointed out that ACMT is trained in obtaining informed consent and protecting the confidentiality of subjects.

Dr. Pirkle agreed that this effort is feasible. For example, ACMT's contact information could be distributed to subjects during the data collection process of the National Health and Nutrition Examination Survey (NHANES). Subjects with an interest in medical follow-up beyond their personal physicians could contact ACMT separate and apart from NHANES. Dr. Pirkle offered to discuss potential options with Dr. Kosnett in more detail.

Dr. Nolan asked for the record to reflect the BSC's strong recommendation for CDC to explore options to collect additional data from the NHANES sample population while still protecting the confidentiality of subjects.

### **Overview of CDC's Climate Change Initiatives**

Dr. Michael McGeehin, of NCEH/ATSDR, described CDC's public health response to climate change and human health. Dr. Gerberding testified before a Congressional

appropriations committee in March 2007 and confirmed that CDC has taken initial steps to address climate change and its health consequences. CDC is aware that climate change primarily impacts health through weather and a changed ecology. Adverse health outcomes from climate change include morbidity and mortality from heat waves; respiratory effects from air pollution; water-, food- and vector-borne diseases; and injury or illness from extreme weather events.

Climate change also impacts infectious diseases at both domestic and global levels, including vector- and water-borne disease, agriculture production, migration of animals, changes in ecosystems for wildlife and animals, the built environment, the human-animal interface, ecologies, a new research portfolio, and evidence-based public health impact. CDC and other parts of the public health community must be in a position to address and provide leadership to climate change and its health consequences. Dr. McGeehin's summary of public health effects from climate change is outlined below.

For "heat waves," two models were developed that illustrated changes in heat indices for the 21<sup>st</sup> century. The models predicted that the temperature would increase 2 to 5 degrees Celsius on an afternoon in July over the next 50 years. Moreover, scientists have stated with confidence that the duration, intensity and geographic range of heat waves will dramatically increase and impact the United States and other parts of the world.

The health effects of heat include fainting, heat cramps, stroke and exhaustion. Heat waves are the cause of >200 deaths each year because nearly all body systems are affected. Heat waves have been responsible for the deaths of 725 persons in Chicago in five days and 35,000 persons in Europe in <2 weeks. In average annual temperatures, heat waves may double in number with a rise of 2°F.

Without an adaptation of current approaches or more effective interventions, all states and local jurisdictions have predicted an increase in the number of deaths from heat waves. To address health effects from heat waves, multiple agencies should jointly develop a comprehensive strategy that includes heat emergency response plans, focused interventions for at-risk persons, air conditioning use, and physiologic and behavioral changes.

For "waterborne diseases," climate change affects animals, humans, microbial pathogens, and other aspects of the water environment and waterborne zoonosis. Heavy precipitation events and droughts will have significant public health implications. Moreover, the infrastructure of combined wastewater, storm water and sewage systems are poor at this time. Heavy precipitation events cause flooding and also impact sewage, water treatment and water distribution systems. The weak combined water system in the United States is extremely susceptible to waterborne disease outbreaks and public health disasters.

For "food-borne diseases," >21 billion food animals were produced in 2006 to help feed a population of >6 billion persons. This production resulted in trillions of pounds of products

distributed worldwide. Projections toward 2020 indicate that the demand for animal protein will increase by 50%, particularly in developing countries. Contaminated food and water cause >2 million deaths worldwide from diarrhea each year. In the United States alone, ~76 million persons who experience food-borne illnesses each year account for ~325,000 hospitalizations and ~5,000 deaths.

For “vector-borne diseases,” Texas reported 64 cases of Dengue fever from 1980-1999, while Mexico Border states reported 62,514 cases in the same time period. In an effort to determine the cause for the tremendous disparity of Dengue fever between the United States and Mexico Border states, CDC administered a survey in 1999 to 622 households in Nuevo Laredo, Mexico and Laredo, Texas. CDC also took blood samples from 516 residents on both sides of the border.

The survey showed that residents in Mexico were more affected by Dengue fever, but homes on the U.S. side of the border were more impacted by mosquito larvae. CDC found that this result was due to better standards of living and housing characteristics in the United States, such as central and room air conditioning, evaporative coolers, more intact screens, fewer number of occupants and better access to health care.

A published study in 2001 showed that climate is one determinant of vector-borne disease incidence. Most notably, air pollution damages lung tissue, exacerbates respiratory disease, reduces lung function, and aggravates cardiovascular disease. Data collected on maximum daily ozone concentrations versus maximum daily temperatures in Atlanta and New York showed that sunlight, temperature and other aspects of the weather accounted for variability in the ozone between the two cities.

For “air pollution,” climate change might increase natural emissions of hydrocarbons, particulate matter emissions, ozone concentrations, and deposition of acidic materials. For “extreme weather events,” climate change might alter the frequency, timing, intensity and duration of events. Blizzards, droughts, floods, tornadoes and hurricanes are well characterized as extreme weather events, but the relationship between climate change and extreme weather is not well understood. Improved warning systems, emergency response plans, flood plain management and stricter building codes are needed to respond to extreme weather events.

Dr. McGeehin pointed out that although climate change primarily affects the elderly, poor persons, urban residents and other vulnerable populations, deaths from climate change are still preventable. However, the public health impact of climate change remains largely unaddressed despite anticipated adverse health effects and the existing breadth of organizations and sectors with climate change initiatives.

Dr. McGeehin emphasized the need for the public health community to provide leadership on climate change. CDC convened a workshop in January 2007 to begin framing its response to climate change based on ten essential public health functions: monitor health;

diagnose and investigate; inform, educate and empower; mobilize community partnerships; develop policies; enforce laws; link to and provide care; assure a competent workforce; conduct evaluations; and perform research.

CDC identified several activities for the public health community to conduct to take a leadership role in response to health consequences of climate change. Diseases and trends related to climate change should be tracked. Infectious water-, food- and vector-borne disease outbreaks should be investigated.

A credible resource should be provided on health consequences of climate change. Partnerships should be established with the private sector, civic groups, non-governmental organizations, the faith-based community and other groups. Heat wave and severe storm response plans should be developed to reduce deaths. The ability and preparedness of a diverse public health workforce to respond to climate change should be assured. Studies should be conducted to predict links between climate change and health.

CDC has taken several steps to support its leadership role in the public health response to climate change. CDC identified its research capacity to model health dynamics and formed a Climate Change Workgroup. Efforts are underway to integrate CDC's ongoing climate change research and impacts from the built environment.

CDC will convene climate change workshops in 2007 to determine the role of the U.S. public health community in this national effort. CDC will hold additional workshops in the future to address water, health marketing and heat issues. CDC will establish partnerships and international collaborations to better address climate change. CDC will develop a climate change policy.

Dr. McGeehin concluded his overview by summarizing the rationale for CDC's public health response to climate change and human health. Climate change is both a mainstream and a public health issue. CDC is uniquely poised to make contributions to address this issue. The public health cost of not taking action in response to climate change is high. Effective and science-based activities and messages are available for the public health community to conduct and deliver. Dr. McGeehin noted that he welcomed the BSC's recommendations and expert opinion on strategies for CDC to advance its climate change initiatives.

Dr. Frumkin added that CDC will design its climate change initiatives to highlight co-benefits from environmental, social and economic interventions. This approach can advance public health in a number of areas, such as improving physical activity, preventing injuries, minimizing heat islands, and decreasing carbon monoxide emissions. The positive benefits of climate change also include a healthier population, improved quality of life and a stronger economy.

Dr. Frumkin conveyed that CDC plans to discuss the co-benefits of climate change with staff, external partners and the public in an effort to promote this approach. However, he

emphasized that CDC recognizes the need to train staff in properly discussing climate change with a strong evidence basis due to the controversy associated with this issue.

## Overview of the OMB PART Review

Mr. Kenneth Rose, of NCEH/ATSDR, explained that OMB developed PART as a systematic method to assess the performance of federal agency programs and evaluate strategies programs use to achieve goals. PART is central to the Administration's budget and performance integration initiative due to its key role in sustaining a focus on results. The purpose of PART is to improve program performance, link performance to budget decisions, and provide a basis for making recommendations to improve results. PART results for all federal agencies are available to the public at [www.expectmore.gov](http://www.expectmore.gov).

To earn a high PART rating, a program must use performance data to manage activities, justify resource requests based on the performance the program expects to achieve, and continually improve efficiency. PART is designed with 28 questions categorized into four sections.

Section I, "Program Purpose and Design," assesses whether the program's purpose and design are clear and sound. Section II, "Strategic Planning," assesses whether the program has valid long-term and annual measures and budgets. Section III, "Program Management," assesses the management of the program, including its financial oversight and program improvement efforts. Section IV, "Program Results and Accountability," rates the program's progress toward achieving its long-term performance goals and realizing efficiencies.

Each section is weighted differently to derive an overall PART score. Section I accounts for 20%; Section II accounts for 10%; Section III accounts for 20%; and Section IV accounts for 50%. The PART scores are 85-100 for "effective;" 70-84 for "moderately effective;" 50-69 for "adequate;" 0-49 for "ineffective;" and N/A for "results not demonstrated."

OMB completed its first five-year cycle of reviewing all federal programs. Most of CDC's 20 programs that were reviewed were given an adequate score of 50-69. The highest PART score for a CDC program was 86. ATSDR received an adequate score of 66% in 2003 and a provisional moderately effective score of 84.3% in 2007. At this point, ATSDR has the highest PART score of all of CDC's programs.

ATSDR recognizes that its diligent efforts in responding to OMB's recommendations in 2003 resulted in a much higher PART score in 2007. ATSDR conducted the following activities in this regard. The administrative consolidation with NCEH was completed. Baseline and targets for new long-term measures were established. Actions were taken in response to the BSC's peer reviews of programs. The budget justification and performance plan were

merged. Additional evidence was provided to OMB on ATSDR's performance-based budget decisions.

Goals and measures were revised to improve public understanding of ATSDR's activities. A new efficiency measure was implemented to improve the speed by which public health findings and recommendations are delivered to the public. An efficiency measure was instituted to track progress across all divisions. The cost of meeting targets was clearly defined by fiscal year for each PART measure in performance and budget reports. Follow-up actions in response to the BSC's peer reviews will be continued.

NCEH/ATSDR integrates recommendations from the BSC's peer reviews into its internal performance management system. These data can be reported to PART over time. NCEH/ATSDR has dedicated resources on an ongoing basis for staff to respond to the PART review. NCEH/ATSDR produces both mid-year and end-of-year reports to describe progress in meeting targets for the PART review.

Dr. Kim advised ATSDR to give states clear guidance on the appropriate time frame for states to respond to petitions for ATSDR's public health assessments. The timeliness of states in conducting this activity would assist ATSDR in improving its "Program Results and Accountability" PART score.

Dr. Nolan urged NCEH/ATSDR to better coordinate the PART review and the BSC's external peer reviews. For example, different data should not be collected and different measures should not be used in these two reviews. A coordinated approach would improve NCEH/ATSDR's efficiency by minimizing duplication and redundancy. Dr. Frumkin agreed that environmental health goals should be better aligned across NCEH, ATSDR and CDC.

### **BSC Business**

Dr. Frumkin announced that Dr. Ducatman has agreed to serve as the new BSC Chair. NCEH/ATSDR provided HHS with the names of potential candidates for new BSC members. The names cannot be released at this point because HHS has not officially approved the candidates.

Dr. Mark Bashor, of NCEH/ATSDR, gave brief descriptions on the backgrounds and areas of expertise of the principal candidates. The BSC will be informed about the new members after the selection process is complete. NCEH/ATSDR hopes that HHS will approve its list of candidates by mid-June 2007 with no changes.

In terms of the BSC subcommittees, Dr. Bashor explained that each group will discuss its individual chair and membership. NCEH/ATSDR will attempt to convene conference calls before the next meeting to assign the new BSC members to subcommittees. Dr. Nolan

added that BSC members whose terms have expired should continue to serve on their respective subcommittees to ensure the continuity of these groups.

Dr. Sinks presented a slide to demonstrate the enormous amount of expertise in person-years that would be lost when the terms of eight BSC members expire in June 2007. As a result, he emphasized the critical need for NCEH/ATSDR to orient the new BSC members before the November 2007 meeting.

Dr. Sinks raised the possibility of each NCEH/ATSDR division director developing a presentation on each program, including its purpose, budget and specific activities. The presentations could be posted on the NCEH and ATSDR web sites or copied on a CD-ROM and distributed to the new BSC members prior to attending their first meeting. Dr. Sinks proposed that another option to orient the new BSC members would be to extend the November 2007 meeting with an additional day for the division directors to make these presentations.

Dr. Nolan opened the floor for the BSC to revisit outstanding issues. She led the discussion by asking NCEH/ATSDR to describe its follow-up actions in response to the BSC's recommendations on the national EPH conference. She was particularly interested in the process NCEH/ATSDR planned to use in adopting EPA's model for conferences in which large science forums are held biennially and conferences are held in intervening years on specific topics.

Dr. Nolan pointed out that NCEH/ATSDR should consider holding the next national conference in 2009 because discussions on the FY'09 budget are underway. She urged NCEH/ATSDR to develop a regular schedule of convening a large conference every three years because this cycle would allow a sufficient amount of time for new changes in the EPH field and personnel.

Dr. Nolan acknowledged that individual NCEH/ATSDR programs collaborate with NACCHO, but a formal mechanism has not been established for broader and regular interactions with NACCHO across NCEH/ATSDR. She emphasized the need for NCEH/ATSDR to obtain input from local health officials. This collaboration also could assist NACCHO in developing a strong environmental health component. Dr. Nolan advised NCEH/ATSDR to attend NACCHO's annual meetings as an initial step in creating formal linkages between the two groups. Dr. Kim added that NCEH/ATSDR should use its EPH Tracking Program as an opportunity to build relationships with county health officials.

Dr. Nolan asked for a status report on NCEH/ATSDR's formal response to input given during the national EPH conference in December 2006. She recalled that NCEH/ATSDR planned to develop and distribute a written summary of key outcomes and next steps. She strongly encouraged NCEH/ATSDR to present its response to the national conference during the November 2007 BSC meeting. NCEH/ATSDR should particularly respond to

recommendations that were made to sustain the momentum and energy of the EPH workforce.

Dr. Laessig expressed concern about the continuation of the PER review because the terms of the PPRS chair and several members will soon expire. He asked NCEH/ATSDR to describe actions that would be taken to ensure the continued progress and momentum of the PER review.

Drs. Frumkin and Sinks made several remarks in response to the BSC's comments and questions on outstanding issues. In terms of a conference schedule, NCEH/ATSDR has held and will continue to convene program-specific workshops, meetings and retreats on an ongoing basis. NCEH/ATSDR plans to formally adopt this strategy.

At this time, funding has not been allocated and a date has not been selected to hold the next national EPH conference. NCEH/ATSDR does not expect to convene a large conference in either 2007 or 2008, but discussions will be initiated in the near future on potential dates for the next conference. However, NCEH/ATSDR acknowledges the need to develop a regular cycle to convene national EPH conferences.

In terms of NCEH/ATSDR's formal response to the national EPH conference in December 2006, evaluation data have been analyzed. However, the overall conference follow-up has not been completed at this time.

In terms of the PER review, NCEH/ATSDR does not plan to delay this activity. The outgoing PPRS members will be asked to serve as expert consultants for the PER review to retain institutional memory and ensure continued progress. The next steps will be for NCEH/ATSDR and the PPRS to clearly define and limit the scope of the PER review to a realistic and reasonable level. Efforts will be made to complete the PER review in October 2007, but this timeline might need to be changed if response staff are deployed during hurricane season.

The BSC's business items raised over the course of the meeting are outlined below for the record.

#### Consensus Recommendations

- *The BSC strongly recommended that CDC explore options to collect additional data from the NHANES sample population while still protecting the confidentiality of subjects.*
- *The BSC **unanimously approved** the SSA peer review report.*



Action Item

- *PowerPoint slides, briefing documents and other materials distributed during BSC meetings should be posted on the NCEH and ATSDR web sites rather than mailed to the BSC members. This approach will ensure that former BSC members and the broader environmental health community have access to these informative materials.*

Agenda Items

- *Overview of the NCEH/ATSDR and EPA health disparities toolkits.*
- *Update on CDC's climate change initiatives.*
- *NCEH/ATSDR's formal response to the SSA peer review report*
- *NCEH/ATSDR's formal response to the December 2006 national EPH conference.*

**Closing Session**

Drs. Frumkin and Sinks thanked the BSC members for assisting NCEH/ATSDR in fulfilling its mission to provide credible EPH services to the nation. They reiterated their gratitude to the outgoing BSC members for their tremendous contributions to NCEH/ATSDR.

The BSC applauded Ms. Sandra Malcom, the BSC Committee Management Specialist, and other NCEH/ATSDR Office of Science staff for their outstanding efforts in organizing the BSC meetings, compiling meeting materials, and making other logistical arrangements.

The next BSC meeting will be held on either November 15-16 or November 29-30, 2007. NCEH/ATSDR will poll the members by e-mail to confirm the date.

With no further discussion or business brought before the BSC, Dr. Nolan adjourned the meeting at 12:02 p.m. on May 18, 2007.

I hereby certify that to the best of my knowledge, the foregoing Minutes of the proceedings are accurate and complete.

\_\_\_\_\_  
Date

\_\_\_\_\_  
Patricia Nolan, M.D., M.P.H.  
Chair, Board of Scientific Counselors