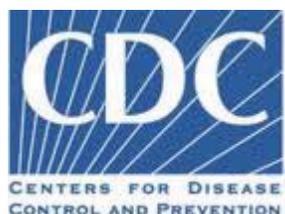


**DEPARTMENT OF HEALTH AND HUMAN SERVICES
CENTERS FOR DISEASE CONTROL AND PREVENTION
National Center for Environmental Health/
Agency for Toxic Substances and Disease Registry**



**Board of Scientific Counselors Meeting
May 27-28, 2010
Atlanta, Georgia**

Record of the Proceedings

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ATTACHMENT 1**List of Participants****BSC Members**

Dr. Timothy Ryan, Chair
 Dr. Darryl Barnett
 Dr. William Becker
 Dr. Anna Fan
 Dr. Arthur Frank
 Dr. Michelle Kegler
 Dr. Jonathan Patz
 Hon. Gerard Scannell
 Dr. Leonardo Trasande
 Dr. Cynthia Warrick

Kathleen Caldwell
 William Cibulas
 Carla Cuthbert
 Ingrid Dai
 Andrew Dannenberg
 Maxia Dong
 Gerard Dublin
 Betsy Dunaway
 Christopher Earl
 June Feng
 Natasha Friday
 Peggy Gallagher
 Maribel Gallegos
 Paul Garbe
 Justin Gerding
 Benjamin Gerhardtstein
 James Grainger
 Phil Green
 Olivia Harris
 Lindsey Horton
 Rudy Johnson
 Robert Jones
 Zlad Kazzi
 Niki Keiser
 Mary Kimberly
 Robert Kobelski
 Chris Kochtitzky
 Annie Latimer
 Fiona Lau
 Lauren Lewis
 Zheng Li
 Tina Lickliter
 Shirley Little
 George Luber
 Josephine Malilay
 Sandra Malcom
 Susan McClure
 Maureen McGuirk
 Theodore Meinhardt
 Charles Miller
 Deborah Millette
 Lavinia Mills-Herring
 Daphne Moffett
 Amy Mowbray
 Ed Murray

BSC Ex-Officio Members

Dr. Allen Dearry (National Institute for
 Environmental Health Sciences)
 Mr. John Decker (National Institute for
 Occupational Safety and Health)
 Dr. Bonnie Richter
 (U.S. Department of Energy)

Designated Federal Official

Dr. Paula Burgess,
 Acting Associate Director for Science,
 NCEH/ATSDR

CDC/NCEH/ATSDR Representatives

Dr. Henry Falk
 (NCEH/ATSDR Acting Director)
 Dr. Thomas Sinks
 (NCEH/ATSDR Deputy Director)
 Vivi Abrams
 Jaret Ames
 Kitty Armstrong
 David Ashley
 Kimberly Ayers
 Debbie Bankston
 Hannah Barks
 John Barr
 John Bernert
 Robert Blake
 Anne Boyer
 Dawn Brewer
 Sharunda Buchanan
 Tonia Burk
 Antonia Calafat

Whitney Neal
Gary Newnan
Jessica Ocariz
Grace Osborne
Radha Pennotti
Christine Pfeiffer
James Pirkle
Katrina Pollard
Theodosia Prater
Katie Pugh
Judith Qualters
Jamie Rayman
James Rifenburg
Lovisa Romanoff
Michael Rybak
John Sarisky
Rosemary Schleicher
April Sheppard
Dolly Sinha
Andreas Sjödin

Lin Tao
Jana Telfer
Lewis Underwood
Anne Venner
Hubert Vesper
Claudia Vousden
Clement Walsh
Langing Wang
Richard Wang
Robert Whitcomb
Pamela Wigington
David Williamson

Members of the Public

Tina Bahadori (American Chemistry
Council; Incoming BSC Member)
Yona Hackl (Battelle)
Thomas Newton (Iowa Department of Public
Health; Incoming BSC Member)

ATTACHMENT 2

Glossary of Acronyms

APRHB	Air Pollution and Respiratory Health Branch
BSC	Board of Scientific Counselors
CCP	Climate Change Program
CDC	Centers for Disease Control and Prevention
DLS	Division of Laboratory Sciences
DOE	Department of Energy
EEHS	Division of Emergency and Environmental Health Services
EHHE	Division of Environmental Hazards and Health Effects
EHSB	Environmental Health Services Branch
EHTB	Environmental Health Tracking Branch
EIS	Epidemic Intelligence Service
EISs	Environmental Impact Statements
EP	Emergency Preparedness
EPA	U.S. Environmental Protection Agency
EPH	Environmental Public Health
EPHRB	Environmental Public Health Readiness Branch
FDA	Food and Drug Administration
FTEs	Full-Time Equivalents
HCDI	Healthy Community Design Initiative
HHS	Department of Health and Human Services
HSB	Health Studies Branch
MOU	Memorandum of Understanding
NACP	National Asthma Control Program
NBP	National Biomonitoring Program
NBS	Newborn Screening Program
NCEH/ATSDR	National Center for Environmental Health/ Agency for Toxic Substances and Disease Registry
NEHA	National Environmental Health Association
NGOs	Non-Governmental Organizations
NHANES	National Health and Nutrition Examination Surveys
NPL	National Priorities List
PAHO	Pan American Health Organization
RSB	Radiation Studies Branch
SHS	Secondhand Smoke
Task Force	U.S. Task Force on Community Preventive Services
TSCA	Toxic Substances Control Act of 1976
VSP	Vessel Sanitation Program
WHO	World Health Organization

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 27-28, 2010 in Atlanta, Georgia.

The Acting Director of NCEH/ATSDR provided an update on several important developments that have occurred since the last BSC meeting in October 2009:

- Ongoing search processes to appoint a permanent Director of NCEH/ATSDR, Acting Associate Director for Science, and Director of the Division of Laboratory Sciences (DLS).
- Leadership positions that have been filled in CDC's new organizational structure.
- CDC's new or modified offices that are designed to meet the strategic priorities established by the Director of CDC.
- Alignment between NCEH's research projects and CDC's new strategic priorities.
- Increased interest by the Director of CDC in NCEH/ATSDR's environmental health portfolio.
- Challenges to leveraging new Congressional appropriations due to the large federal deficit and the current economic recession.
- NCEH's success in leveraging new federal dollars to formally establish its Climate Change Program and increase the budget for its Healthy Community Design Initiative by \$4 million.
- Recent activities and priority issues for NCEH and the ATSDR Office of the Director and divisions: Division of Health Assessment and Consultation, Division of Regional Operations, and Division of Health Studies.

DLS leadership provided an update to prepare the BSC for conducting the peer review. The update covered DLS's organizational structure, goals, budget, research projects and resources. The BSC members divided into four breakout groups to tour the DLS laboratories and provide advice and recommendations to DLS in response to five peer review questions:

1. Are the DLS programs taking reasonable and appropriate approaches to meeting their stated goals?
2. Are the DLS programs making substantive contributions to the detection, diagnosis, treatment and/or prevention of unsafe exposures or diseases in their respective areas of public health?
3. Are there important new directions for DLS to include in its future planning?
4. What barriers exist to DLS' projected growth, especially in biomonitoring and tobacco analysis, and what opportunities are there to overcome them?
5. Are there environmental chemicals, nutritional indicators, newborn conditions or diagnostics for which DLS has not yet developed biomonitoring methods that are a high public health priority?

BSC members in each breakout group presented their report-outs of the four DLS program areas that were evaluated during the peer review: National Biomonitoring Program; Tobacco Laboratory and smoking addiction research; Emergency Preparedness Laboratories (*i.e.*, chemical, biological and radiological threat agents), threats involving selected toxins (*i.e.*, botulism and anthrax) and pandemic influenza research; and the Newborn Screening Program and Nutrition Program.

The peer review report-outs by the BSC members showed common themes across the DLS program areas: (1) inadequate funding, laboratory space and staff; (2) the lack of incentives by leadership for NCEH and ATSDR staff to strengthen collaborations; and (3) the need for succession planning to assure long-term retention of highly-skilled laboratory experts in the DLS workforce rather than contractors.

The BSC **unanimously approved** the *Draft Report of the Board of Scientific Counselors: Peer Review of the Division of Emergency and Environmental Health Services, December 2009*. During its discussion of outstanding issues, the BSC made a number of comments to assure continuous quality improvement of the peer review process. The Chair confirmed that the BSC's suggestions to refine the process would be reflected in the next peer review.

The Director of the NCEH Division of Emergency and Environmental Health Services (EEHS) presented EEHS's formal response to the BSC's peer review that was conducted during the October 2009 meeting. The response addressed the BSC's two overarching recommendations to EEHS and the BSC's specific recommendations to the four individual programs that were evaluated in the peer review: Environmental Health Services Branch, Environmental Public Health Readiness Branch, Vessel Sanitation Program and Healthy Community Design Initiative.

The BSC thanked EEHS leadership and staff for their time and effort in providing a thoughtful, comprehensive and serious response to the peer review report.

The NCEH Division of Environmental Hazards and Health Effects (EHHE) presented a series of overviews to prepare the BSC for conducting the peer review during the next meeting. Presentations were made by leadership in the EHHE Office of the Director, Radiation Studies Branch, Air Pollution and Respiratory Health Branch, Climate Change Program, Environmental Health Tracking Branch, and Health Studies Branch.

The presentations covered the missions, goals, budgets, staffing, ongoing or completed research, and priority public health activities of the EEHE organizational units. During the peer review, the BSC would be charged with providing advice and guidance to EEHE in response to four questions:

1. Are the EEHE programs meeting their stated goals and objectives?
2. Are the EEHE programs and activities meeting the overall goals and objectives for NCEH and CDC?
3. What directions should EEHE undertake to plan its future growth? What potential barriers exist to EEHE's projected growth and what opportunities are there to overcome them?
4. What emerging environmental priorities should EEHE address for environmental public health?

The Chair informed the BSC of its deadlines to complete the draft report of the DLS peer review and review and submit comments on the May 2010 meeting minutes. The Chair called for public comment at all times noted on the agenda published for the May 27-28, 2010 BSC meeting.

The dates proposed for the next BSC meeting were October 21-22, October 28-29, November 11-12, November 18-19, or December 2-3, 2010. NCEH/ATSDR staff would poll the BSC members by e-mail to confirm the date of the next meeting.

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**BOARD OF SCIENTIFIC COUNSELORS
May 27-28, 2010
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 27-28, 2010 in Building 106 of CDC's Chamblee Campus in Atlanta, Georgia.

Opening Session

Dr. Timothy Ryan, Chair of the BSC, called the meeting to order at 8:43 a.m. on May 27, 2010 and welcomed the attendees to the proceedings. He asked the BSC members to review the agenda and recuse themselves from participating in discussions or voting on issues for which they had a real or perceived conflict of interest.

Dr. Ryan opened the floor for introductions and particularly recognized Dr. Paula Burgess, Acting Associate Director for Science of NCEH/ATSDR, who replaced Dr. Frederick Angulo as the Designated Federal Official for the BSC. The list of participants is appended to the minutes as Attachment 1.

Dr. Burgess asked two incoming BSC members who were attending the meeting as observers to introduce themselves. Dr. Tina Bahadori, Managing Director of the Long Range Research Initiative Program at the American Chemistry Council, and Mr. Thomas Newton, Director of the Iowa Department of Public Health, would begin serving their terms as BSC members at the next meeting. The participants joined Dr. Burgess in welcoming Dr. Bahadori and Mr. Newton to their first BSC meeting.

Dr. Henry Falk, Acting Director of NCEH/ATSDR, presented certificates of appreciation to four BSC members whose terms would expire on June 2, 2010: Drs. William Becker, Jonathan Patz, Leonardo Transande and Cynthia Warrick. The participants joined Dr. Falk in applauding the outstanding service, dedication and contributions of the outgoing BSC members to NCEH/ATSDR and the broader environmental health community.

NCEH/ATSDR Acting Director's Report

Dr. Falk covered the following areas in his update on recent developments in NCEH/ATSDR. CDC launched a search process to appoint a permanent Director of NCEH/ATSDR. In January 2010, Dr. Howard Frumkin, former Director of NCEH/ATSDR, accepted a new position as the Senior Advisor to the Director of CDC on Climate Change and Public Health. The position announcement for the Director of NCEH/ATSDR closed in April 2010 and CDC is currently interviewing candidates. Dr. Falk expected the position to be filled by the next BSC meeting.

Other changes in NCEH/ATSDR leadership include appointments for two key positions in the Office of the Director. Mr. Joe Henderson was named as the Senior Advisor to the Director and Ms. Sascha Chaney was named as the Chief of Staff. Dr. Paula Burgess is currently serving as the Acting Associate Director for Science, but a search process is underway to permanently fill this position.

A search process is underway to appoint a new Director of the Division of Laboratory Sciences (DLS). Dr. Eric Sampson, former Director of DLS, accepted a new position in the Food and Drug Administration (FDA) as a liaison to the Director of CDC. CDC is attempting to fill the position of the Director of NCEH/ATSDR first to ensure that the new director is engaged in the decision-making process to appoint the new Associate Director for Science and Director of DLS.

Dr. Falk emphasized that the two primary reasons for the current vacancies in NCEH/ATSDR's leadership are retirements by senior managers who have served in their positions for >25 years and exciting new positions offered to NCEH/ATSDR's talented staff. In addition to the current vacancies, Dr. Falk also was aware of important gaps in NCEH/ATSDR's leadership structure. For example, NCEH/ATSDR does not have positions for a Chief Medical Officer or an Associate Director for Global Environmental Health. He was confident that the new director would focus on and take steps to fill these gaps.

Dr. Falk presented an organizational chart to illustrate CDC's new structure. Dr. Thomas Frieden assumed his position as the 16th Director of CDC on June 8, 2009. Since that time, leadership positions have been filled for the Principal Deputy Director, Associate Director for Program, Associate Director for Science, Associate Director for Communication, and Associate Director for Policy.

The Coordinating Centers were removed from CDC's new organizational structure and replaced with new or modified offices that are designed to meet the strategic priorities Dr. Frieden established. CDC's new or modified organizational units include the Office of Public Health Preparedness and Response; Office for State, Tribal, Local and Territorial Support; Office of Surveillance, Epidemiology and Laboratory Services; Office of Noncommunicable Diseases, Injury and Environmental Health; Office of Infectious Disease; Center for Global Health; and Office of Surveillance, Epidemiology, Informatics, Laboratory Science and Career Development. The vast majority of CDC's leadership positions have been filled.

Dr. Falk conveyed that as the Director of CDC, Dr. Frieden has been most heavily engaged in and motivated by chronic diseases. His strongest interest is in reducing morbidity and mortality of diseases that cause the highest population burden (*i.e.*, tobacco use, obesity, physical inactivity, poor nutrition, cardiovascular disease, motor vehicle injuries and global health). At the agency level, three new organizational units will be particularly instrumental in improving CDC's public health impact both domestically and internationally: the Office for Policy, Center for Global Health, and Office for State, Tribal, Local and Territorial Support.

At the National Center level, a number of NCEH's research initiatives and projects are closely aligned with CDC's new strategic priorities. Several DLS laboratories are developing methods to reduce the burden of disease from obesity, poor nutrition and cardiovascular disease. The DLS Tobacco Laboratory will have a stronger and much broader public health impact as a result of the establishment of the new FDA Center for Tobacco Products in August 2009.

Studies and methods by the DLS Tobacco Laboratory will play a critical role in helping FDA to oversee implementation of the Family Smoking Prevention and Tobacco Control Act that President Obama signed into law in June 2009. The tobacco industry will be taxed \$750 million annually to fund the new FDA Center for Tobacco Products.

Although Dr. Frieden's background, history and current "winnable battles" are in the area of chronic diseases, he has been extremely supportive of NCEH/ATSDR's broader environmental health portfolio. Dr. Falk noted that Dr. Frieden has been intensely engaged in NCEH's research projects on air pollution, lead, healthy community design and the built environment. NCEH/ATSDR also has clearly defined and presented one- and four-year goals to Dr. Frieden on all of its programs.

In terms of resources, Dr. Falk announced that the federal budget would be challenging for CDC and all other agencies over the next few years. Large deficits will severely limit increases in Congressional appropriations to all federal agencies. For example, ATSDR is continuing operations with a 33% cut in its workforce and "level" funding that does not account for inflation or increases in staff salaries. To address the significant cuts in federal funding and utilize existing resources in the most cost-effective manner, CDC realigned its organizational structure and is currently reaching out to a broader group of partners and collaborators.

Despite the tremendous decrease in Congressional appropriations, CDC was successful in leveraging federal dollars to develop and implement NCEH's new Climate Change Program. Moreover, the FY2011 President's budget request calls for \$4 million to be set aside for the NCEH Healthy Community Design Initiative. Dr. Falk credited Dr. Frumkin's strong leadership and support in leveraging resources for these two activities.

Dr. Falk highlighted NCEH's recent activities since the previous BSC meeting. NCEH is heavily engaged in the federal response to the BP oil spill that occurred in April 2010 in the Gulf of Mexico. Staff was detailed to the CDC Emergency Operations Center to lead CDC's response. Collaborations were established with the U.S. Coast Guard, U.S. Environmental Protection

Agency (EPA) and other federal partners to rapidly disseminate up-to-date information to the public through fact sheets and a website.

Technical expertise is being provided to EPA and other federal agencies by reviewing air pollution, environmental and monitoring data from the oil spill. Collaborations were established with state health departments along the Gulf Coast to coordinate surveillance activities and collect data at the local level.

Telephone calls from Gulf Coast states to Poison Control Centers across the country are being monitored on a regular basis. Data from CDC's hospital-based surveillance system are being reviewed to track and monitor any emergency room visits related to the oil spill. NCEH is currently making efforts to leverage funds from EPA and the Coast Guard to support its oil spill-related activities.

NCEH deployed a team to Northwestern Nigeria to respond to a significant outbreak of childhood lead poisoning in a mining area that has led to several deaths. NCEH will represent CDC on the new President's Task Force on Environmental Health Risks to Children that was recently established.

NCEH recently gave Congressional testimony on the potential role of its National Biomonitoring Program in legislative changes to the EPA Toxic Substances Control Act of 1976 (TSCA). NCEH is continuing to provide testimony to a Congressional Subcommittee on lead-contaminated water in Washington, DC. Dr. Frieden has met with Congressional staffers to express his strong support of NCEH's response to the lead-contaminated water issue.

Similar to CDC at the agency level, NCEH also is increasing its global presence at the National Center level to improve public health. Community water systems are being redesigned to reduce the burden of disease from global water issues. Interventions for global air are being strengthened because indoor air pollution accounts for >1 million deaths annually among children in India, China and Africa. Unvented cooking stoves that use biomass fuel are the primary source of indoor particulates in these countries. CDC is using its binational agreement with India to particularly focus on global air issues.

Dr. Falk was aware that the current BSC meeting would have an "NCEH" focus (*i.e.*, the peer review of DLS; the response to the BSC's peer review by the NCEH Division of Emergency and Environmental Health Services; and presentations for the BSC to prepare for its upcoming peer review of the NCEH Division of Environmental Hazards and Health Effects). However, he pointed out that the BSC was given a detailed handout describing the current status of research and other activities at high-priority sites in each of the ATSDR divisions.

The ATSDR Division of Health Assessment and Consultation is involved in a complex data discovery process with the U.S. Marine Corps and U.S. Navy to address findings from its previous studies on the Camp Lejeune, North Carolina Marine Corps base. The cohort is several hundred thousand Marines who lived at Camp Lejeune and were exposed to drinking water contaminated with trichloroethylene, tetrachloroethylene and benzene.

The ATSDR Division of Regional Operations is conducting studies to determine potential health risks associated with hydraulic fracturing, particularly chemical contamination of drinking water wells, emission of volatile organics into air, and explosive hazards from the buildup of methane in drinking water wells. The ATSDR Division of Toxicology and Environmental Medicine is continuing to develop and release ToxProfiles for diverse audiences and provide support to Pediatric Environmental Health Specialty Units in each region in the country.

The ATSDR Division of Health Studies is completing a study on exposure to toluene diisocyanate in North Carolina; conducting an investigation on polycythemia vera in Pennsylvania; and initiating a biomonitoring program in the Great Lakes Region to support a larger EPA effort. The Division of Health Studies also is continuing its surveillance activities with the National Toxic Substances Incidents Program and the Amyotrophic Lateral Sclerosis Registry.

The ATSDR Office of the Director is continuing the “National Conversation on Public Health and Chemical Exposures” that was initiated by Dr. Frumkin. ATSDR is currently gathering input on six topic areas from expert workgroups for this initiative: monitoring, scientific understanding, policies and practices, chemical emergencies, community service, and education and communication. The workgroups will submit a draft report to the Leadership Council by August 2010 to assist in completing the “National Conversation Action Agenda” by January 2011.

ATSDR is expanding the innovative “Collegiate Leaders in Environmental Health Internship Program” that was initiated by Dr. Frumkin. Although 12 internships were awarded, the submission of high-quality applications by nearly 700 students was unprecedented. Students from prestigious universities across the country applied to the internship program, including Stanford, Cornell, Harvard, Columbia, Princeton, Emory and the University of North Carolina-Chapel Hill.

Dr. Falk hoped that future meetings would continue to be structured by providing the BSC with a detailed handout on the “non-focused” organizational unit. This approach would allow the BSC to use the peer review to provide advice and guidance to the “focused” unit during the meeting and review the detailed handout to provide input to the “non-focused” unit after the meeting.

The BSC was pleased that Dr. Frieden has become a stronger supporter of NCEH/ATSDR’s broader environmental public health (EPH) portfolio over the past year. Some BSC members noted that solid support from the highest levels of CDC would be critical in building on progress and expanding innovations in EPH issues, such as the built environment and urban planning.

The BSC members made one key suggestion for NCEH/ATSDR to consider in strengthening its activities in the current economic recession. Health impact assessments should be conducted to identify interventions that would result in cost-savings to the healthcare system. For example, an urban design could play a key role in reducing obesity-related conditions and diseases. This effort also should include an evaluation of the benefits of policy scenarios.

Update by the NCEH Division of Laboratory Sciences (DLS)

DLS leadership provided an update on DLS's organizational structure, goals, budget, resources and research initiatives to prepare the BSC for conducting the peer review.

Dr. Theodore Meinhardt, Acting Director of DLS, reported that a search process is underway to appoint a new DLS Director and positions for three Branch Chiefs are vacant at this time. However, the tremendous level of stability and depth within the Branches facilitated the identification of internal coordinators who are providing strong leadership to assure the continuation of DLS's science and business operations. Of DLS's 400 positions in the Office of the Director, six branches and 25 distinct laboratory groups, ~360 are filled at this time. DLS is a strong, energetic and diverse division with 108 PhDs, seven MDs, 40 full-time fellows and 12 summer research fellows.

Dr. Meinhardt described the goals of the four DLS program areas the BSC would cover during the peer review. The goal of the National Biomonitoring Program (NBP) is to provide laboratory science that improves not only the detection of human exposure, but also the diagnosis, detection, treatment and prevention of disease resulting from exposure to environmental chemicals. The goal of the Tobacco Laboratory is to provide laboratory science that reduces individual and population exposure to tobacco products.

The goals of DLS's research on chronic and infectious diseases, newborn screening (NBS) and nutrition are to (1) improve laboratory diagnosis and detection of nutrition-related disease, cardiovascular disease and diabetes; (2) provide laboratory support for influenza and selected infectious disease projects; and (3) assure early and accurate laboratory detection of treatable congenital disorders in newborns. The goal of the Chemical and Radiation Terrorism Laboratories is to provide effective laboratory support for the public health response to chemical and radiological threat agents and threats involving selected toxins.

Of DLS's 400 staff, the NBP accounts for 147 (or 37%), the Tobacco Laboratory accounts for 42 (or 11%), chronic/infectious diseases, nutrition and NBS account for 125 (or 31%), and terrorism activities account for 86 (or 21%). Of DLS's budget of \$76 million, the NBP accounts for ~\$26 million (or 34%), the Tobacco Laboratory accounts for ~\$7.6 million (or 10%), chronic/infectious diseases, nutrition and NBS account for \$21 million (or 28%), and terrorism activities account for ~\$21 million (or 28%).

DLS has had tremendous growth in three key areas over the past ten years. The DLS budget increased from \$10.5 million in 1999 to \$76 million in 2010. The DLS staff grew from 104 personnel in 1999 to 400 personnel in 2010. DLS's laboratory space increased from 60,000 square feet in 1999 to 143,000 square feet in 2010. The increase in the DLS budget from \$73.5 million in 2009 to \$76 million in 2010 was due to a one-time increase of 3% to conduct additional influenza-related activities. Over the next three years, however, DLS expects at least an increase of 6% (or \$3 million) for influenza-related activities. CDC and FDA are finalizing an interagency agreement that will provide additional funding to the DLS Tobacco Laboratory over multiple years.

Based on professional judgment, DLS's five-year forecast for its budget, staff and laboratory space includes an increase in its total budget from \$76 million to \$150 million; an increase in staff from 400 to 600 personnel; and an increase in laboratory space from 143,000 square feet to 240,000 square feet. However, Dr. Meinhardt described several factors that might impact DLS's ability to reach these aspirational goals.

DLS's average annual increase in personnel costs of 4% is projected to be ~\$952,000 in FY2011. DLS's average annual increase in maintenance agreements of 16% is projected to be \$1.2 million in FY2011. At this time, one DLS laboratory building is filled to capacity, while the other building is filled beyond capacity. Dr. Eric Sampson, former Director of DLS, previously projected that the new DLS laboratory building would be completed in 2014. However, at this time, the building is not likely to be completed until 2017.

Some DLS staff will be relocated to a refurbished building on the Chamblee Campus that has ~27,400 square feet of space. After adjusting for office space, other common space, freezers and sample logistics, the building yields ~11,600 square feet of usable laboratory space or ~42% of the building. The relocation will free up space in another building that predominantly will be used to expand DLS's tobacco activities, and to a limited extent, the nutritional biomarker activities.

Dr. Meinhardt concluded that DLS welcomes the BSC's input and findings from the peer review and is looking forward to the new director's insights and future directions.

Dr. James Pirkle, Deputy Director for Science of DLS, explained that DLS's organizational structure of 25 laboratories in one division has distinct advantages in terms of overhead costs, safety committees and construction of buildings. DLS is unique compared to other laboratories because the development of its measurements requires specialized expertise in several areas, such as trace elements, radionuclides, small molecules, peptides and proteins, lipids, nucleic acids and environmental toxicants.

Dr. Pirkle conveyed that DLS's laboratory research portfolio is based on three major sources. First, several activities are Congressionally mandated (*i.e.*, the NBP, Newborn Screening Program, Nutrition Program and Tobacco Laboratory). For example, CDC has received funding since 1959 to develop methods to measure cholesterol. DLS's biomarkers have served as the basis for all major epidemiological studies that have linked cholesterol to coronary heart disease. DLS is conducting laboratory research at this time to expand these biomarkers.

Second, CDC Directors instruct DLS to undertake new research initiatives. For example, DLS was given directives by former CDC Directors to contribute its analytic expertise to the areas of botulinum toxins and pandemic influenza. In terms of the current CDC Director, DLS leadership meets with Dr. Frieden on a monthly basis to provide updates on its tobacco research. DLS also provides Dr. Frieden with written reports each month to describe its progress in developing novel laboratory methods to measure trans fats and urinary sodium.

Third, internal CDC collaborators request DLS's laboratory expertise. For example, the Office of Infectious Disease asked DLS to develop methods to evaluate the incidence of AIDS and measure antiretroviral AIDS drugs both intracellularly and extracellularly.

Dr. Pirkle noted that DLS anticipates new funding from several sources. The interagency agreement between CDC and FDA will allow the Tobacco Laboratory to conduct new research on tobacco and smoking addiction. TSCA reform potentially could expand DLS's role in biomonitoring. DLS will receive \$4.5 million new dollars annually for three years (or a total of \$13.5 million) to strengthen its focus on pandemic influenza. DLS may receive more funding over the next few years to increase its capacity to measure radionuclides in urine.

Dr. Ryan pointed out that assignments for the BSC members to attend the peer review breakout groups were in the meeting binders. He reminded the BSC members to provide advice and recommendations to DLS in response to the five peer review questions:

1. Are the DLS programs taking reasonable and appropriate approaches to meeting their stated goals?
2. Are the DLS programs making substantive contributions to the detection, diagnosis, treatment and/or prevention of unsafe exposures or diseases in their respective areas of public health?
3. Are there important new directions for DLS to include in its future planning?
4. What barriers exist to DLS' projected growth, especially in biomonitoring and tobacco analysis, and what opportunities are there to overcome them?
5. Are there environmental chemicals, nutritional indicators, newborn conditions or diagnostics for which DLS has not yet developed biomonitoring methods that are a high public health priority?

Dr. Ryan recessed the meeting for the BSC members to tour the DLS laboratories and report to their respective breakout groups to conduct the peer review of the DLS programs.

Reports by the BSC Breakout Groups

National Biomonitoring Program (NBP). Drs. William Becker, Arthur Frank and Jonathan Patz attended the breakout group. Dr. Hal Zenick, the BSC *ex-officio* member for EPA, was absent. Dr. Tina Bahadori, an incoming BSC member, also attended the breakout group as an observer.

Dr. Frank noted that observations and recommendations by the BSC members reflect slight changes to some of the peer review questions. His summary of the breakout group's key findings on the NBP is outlined below.

1. Response to Questions 1 & 2: The BSC members found that the NBP has an extraordinary set of laboratories and staff with a clear vision of the operations and mission of DLS. The staff has an unwavering focus on several analytic principles that are applied to its research: accuracy, precision, sensitivity, specificity, high throughput of sampling, solid understanding of the limits of detection, and attention to and retention of the quality of methodologies over time. The NBP laboratories have permeated clinical medicine and serve as a world-class resource to the nation, state laboratories and international programs. The NBP has expertise that is rarely found elsewhere in the world and the hardworking staff has had long and distinguished careers at CDC. The NBP has an extraordinary number of partners in government, academia and the private sector both domestically and internationally. The BSC members concluded that with additional support, the NBP has the capacity to continue to conduct high-level science and serve as a tremendous resource to the world.
2. Response to Question 3: The BSC members found that the NBP recognizes new and emerging EPH problems and understands its limitations. The development of methods to measure nanoparticles is beyond NBP's normal scope, expertise and infrastructure, but the staff has knowledge of appropriate partners to undertake this research.
3. Response to Question 4: The BSC advised the NBP to engage in a long-term planning effort to address emerging EPH issues. The BSC members advised CDC to allocate resources to the NBP to delve into new areas. The BSC members were concerned that the NBP is frequently asked to contribute its expertise to new issues or problems with no additional funding. These requests leave little resources, staff, equipment and laboratory space to conduct new research initiatives. The large contracting workforce in one of the NBP units impacts the budget. The BSC members found that without long-term planning at this time, these requests potentially could become a serious problem as new demands are placed on DLS in the future (*i.e.*, the expanded tobacco research portfolio and additional biomonitoring to support TSCA reform). The BSC members emphasized the need for NCEH/DLS to strengthen its internal collaborations, particularly with ATSDR. Most notably, DLS should partner with ATSDR in developing a process to systematically and regularly review the National Priorities List (NPL) and make decisions on placing and removing chemicals from the NPL as new problems arise. The BSC members urged CDC to take extreme caution against efforts to politicize DLS leadership positions in the future.

Tobacco Laboratory and Smoking Addiction. Drs. Michelle Kegler, Bonnie Richter and Cynthia Warrick attended the breakout group. Dr. Kegler's summary of the breakout group's key findings on the Tobacco Laboratory and smoking addiction research is outlined below.

1. Response to Question 1: The BSC members found that the Tobacco Laboratory's activities are linked to its stated goals and cited a number of examples to support this conclusion. Innovative new methods, analyses and markers of exposure have been developed to measure addictive and toxic substances in tobacco smoke. The Tobacco Laboratory is regarded as the premiere laboratory for tobacco-related analyses. The

Tobacco Laboratory is a tremendous asset to CDC due to its scientific contributions to support public health actions in tobacco control. The Tobacco Laboratory plays a major role in collecting and providing data needed by the tobacco community. The Tobacco Laboratory has strong linkages to public health agencies with responsibility for reducing exposures and smoking prevalence. The Tobacco Laboratory has a strong internal partnership with the CDC Office on Smoking and Health and will enhance its external relationship with FDA as funds began to flow between the two agencies. The Tobacco Laboratory is interested in strengthening its ability to support the World Health Organization (WHO) Framework Convention for Tobacco Control. The BSC members advised the Tobacco Laboratory to expand its target audience of researchers by packaging and disseminating research findings to other groups in the general public with an interest in these data.

2. Response to Question 2: The BSC members cited several examples in which the Tobacco Laboratory is making substantive contributions to public health. The Tobacco Laboratory developed a methodology to document reductions in secondhand smoke (SHS) exposure in the U.S. population and detect low levels of exposures in non-smokers. These data have been extremely important to the public health and tobacco control communities. The Tobacco Laboratory has an extensive portfolio of collaborative projects with academic universities and federal and state agencies. The Tobacco Laboratory developed new methods to analyze chemicals in different flavors that are added to cigarettes. The Tobacco Laboratory has the capacity to maintain pace with innovations in the tobacco industry and track chemicals related to these changes. FDA is currently using the Tobacco Laboratory's new analytic methods in its new regulatory role for tobacco control.
3. Response to Question 3: The BSC members were impressed by the flexibility of the Tobacco Laboratory in responding to actions and product development within the tobacco industry. The BSC members encouraged the Tobacco Laboratory to remain nimble in this area and continue to maintain pace with and advance beyond the tobacco industry. The Tobacco Laboratory should characterize patterns and triggers of smoking behavior and addiction and also should identify possible leverage points to support smoking cessation. The Tobacco Laboratory should continue to conduct innovative studies and provide data to support policies that deter or highlight actions by the tobacco industry. The Tobacco Laboratory's science is closely linked to health communications and public health actions. For example, CDC leadership will use the Tobacco Laboratory's new published paper to deliver public health messages. The Tobacco Laboratory should continue its efforts to develop the science of proteomics to identify short-term markers for long-term health effects. The Tobacco Laboratory should provide more training to build the capacity of state and international laboratories to replicate its research both nationally and internationally. This approach would decrease the dependence on the Tobacco Laboratory by the broader tobacco control community.
4. Response to Question 4: The BSC members found that the major barriers to the Tobacco Laboratory's projected growth are limited funding, staff and laboratory space. The lengthy process to hire new CDC employees is problematic. An efficient

mechanism has not been developed to engage external scientific expertise for particular research projects. NCEH's cross-clearance process between the Tobacco Laboratory and its internal collaborators in other CDC organizational units is lengthy. The vast majority of the Tobacco Laboratory budget is linked to the National Health and Nutrition Examination Survey (NHANES). New funding from other sources would allow the Tobacco Laboratory to more quickly undertake new research initiatives. The Tobacco Laboratory should create a new and more systematic process to make decisions on allocating discretionary funds for special studies. Input from sources other than the Leadership Team should be obtained in this process.

5. Response to Question 5: The BSC members were impressed by new biomonitoring methods developed by the Tobacco Laboratory, particularly the assessment of longer-term exposure to SHS. The BSC members advised the Tobacco Laboratory to develop a methodology to better understand combinations of chemical exposures. Most notably, nicotine receptors are a potential area that would be important to the field.

Emergency Preparedness Laboratories and Pandemic Influenza. Dr. Darryl Barnett, Dr. Timothy Ryan and Hon. Gerard Scannell attended the breakout group. Mr. Thomas Newton, an incoming BSC member, also attended the breakout group as an observer. Dr. Ryan's summary of the breakout group's key findings on the Emergency Preparedness (EP) Laboratories (*i.e.*, chemical, biological and radiological threat agents), threats involving selected toxins (*i.e.*, botulism and anthrax) and pandemic influenza research is outlined below.

The BSC members determined that the overarching goal of the EP Laboratories is to provide effective laboratory support for the public health response to radiological and chemical threat agents and threats involving selected toxins. The BSC members found that the EP Laboratories have developed an excellent rapid response to threats from chemical and radiological threat agents and threats from selected toxins. The Chemical Emergency Response Team can be deployed by jet with sampling kits and personal protective equipment to respond to an incident in one hour.

The BSC members agreed that the EP Laboratories have established solid coordination across the divisions, improved the volume of samples with new methods, and shortened the turnaround time to obtain results. The BSC members concluded that the outstanding *esprit de corps*, camaraderie and dedication among the EP Laboratory staff have facilitated collaboration and efficiency in several areas.

Findings by the BSC members in response to the five peer review questions are highlighted below.

1. Response to Question 1: The BSC members found that the EP Laboratories are taking reasonable and appropriate approaches to meet their stated goals. The activities are coordinated for other matrices. Patient samples taken in the field during an incident are adequately addressed through an upward communication method that includes the field location, local health department, state agency and CDC.

2. Response to Question 2: The BSC members were impressed by the contributions of the EP Laboratories to the detection, diagnosis, treatment and prevention of exposures. Mass spectrometry methods have been developed to enhance the detection and prevention of influenza through lower limits of detection and shorter time frames. A process has been created to train and provide state laboratory staff with hands-on experience at CDC and through web-based training.
3. Response to Question 3: The BSC members advised the EP Laboratories to focus on two key areas in its future planning efforts. Opportunities should be explored to apply laboratory technologies, techniques and research findings to other areas, such as adapting quantitative laboratory methods to address foodborne outbreaks or adapting radiological methods for the electric power industry. Plans should be developed to address workforce issues due to the demographics and age of current staff and existing vacancies. Expansion of the CDC Epidemic Intelligence Service (EIS) training program to include laboratorians would play an important role in workforce development.
4. Response to Question 4: The BSC members found that the three major barriers to the projected growth of the EP Laboratories are no funding to Radiation Analysis Centers, numerous staff vacancies at the present time, and limited physical capacity and laboratory facilities. The BSC members advised the EP Laboratories to make stronger efforts to more quickly fill their existing vacancies. The EP Laboratories should explore the possibility of replicating the fee-for-service structure of the CDC Vessel Sanitation Program in which coordination has been established between end-users and licensees.
5. Response to Question 5: The BSC members advised the EP Laboratories to make progress in developing isotope identification methods due to the growing list in this area. Additional resources and prioritization of this effort could enhance the rate of identifying ~3 isotopes per year.

In addition to responding to the five peer review questions, the BSC members also identified the top needs in three areas that the EP Laboratories should address.

Methods Development

- Ensure that allocations reflect the true intent of funding.
- Develop generic methods for emergency preparedness and response laboratory research.
- Expand resources for the development of reference materials.

Laboratory Response Network

- Create a new paradigm to assure reliable and consistent funding for state laboratories.
- Develop an “all-hazards” definition that is consistent and equal across chemical, biological and radiological threat agents.

Radiological Terrorism

- Strengthen internal capabilities and develop capacity with additional resources and facilities.

- Develop external transfer methods to support the new Laboratory Response Network-Radiological.

Newborn Screening Program and Nutrition Program. Drs. Allen Dearry, Anna Fan and Leonardo Trasande attended the breakout group. Dr. Dearry noted that the breakout group originally was charged with addressing selected chronic diseases (*i.e.*, chronic influenza). However, NCEH staff informed the BSC members that time constraints would not allow this issue to be addressed. As a result, the review of chronic diseases was removed from the breakout group's consideration. Dr. Dearry's summary of the breakout group's key findings on the Newborn Screening (NBS) Program and Nutrition Program is outlined below.

The BSC members were impressed by the world-class and dedicated scientists and technicians in the NBS and Nutrition Programs who design innovative methodological approaches, conduct basic discovery research to implement these methods, and communicate results to appropriate target audiences. The BSC members determined that the NBS and Nutrition Programs have established strong collaborations with external partners, particularly state health departments and professional societies.

The BSC members learned that the NBS and Nutrition Programs provide services at both national and international levels by developing methodologies, reference materials and standardization efforts to facilitate research on NBS and nutrition. The BSC members concluded that the development of an excellent set of training programs is one of the key strengths of the NBS and Nutrition Programs. Training is offered to fellows and post-doctoral fellows to strengthen methodological and analytical sciences of environmental health in the field.

Findings by the BSC members in response to the five peer review questions are highlighted below.

1. Response to Question 1: The BSC members determined that the NBS and Nutrition Programs are effectively meeting their stated goals.
2. Response to Question 2: The BSC members determined that the NBS and Nutrition Programs have made significant contributions to advance public health, particularly in secondary prevention and the development of new screening and detection methods.
3. Response to Question 3: The BSC members advised the NBS and Nutrition Programs to consider the development of cardiovascular disease and vitamin K biomarkers for nutrition and implementation of microfluidics technology for NBS as potential new directions in future planning efforts.
4. Response to Question 4: The BSC members found that inadequate laboratory space, limited staff, and dependence on "soft" internal or external dollars to conduct research were three of the major barriers to the projected growth of the NBS and Nutrition Programs. The BSC members learned that the NBS and Nutrition Programs comprise 50% of DLS's functional units (or three of its six branches), but only account for 25% of the DLS workforce and budget. Moreover, "soft" dollars are the primary source of

funding for the Lipid Reference Laboratory. The BSC members were concerned that input from external advisory committees is needed for the NBS Program to include additional activities, endpoints or disorders in its research. The NBS Program cannot make these decisions internally.

5. Response to Question 5: The BSC members advised the Nutrition Program to develop biomonitoring methods for dietary supplements because this area is a high public health priority with strong interest by FDA and other groups.

In addition to responding to the five peer review questions, the BSC members also made overarching recommendations for the NBS and Nutrition Programs to consider.

- Principles to guide and prioritize laboratory research and other activities in NBS and nutrition should be established based on public health needs.
- Processes for short- and long-term planning and communication within DLS and across CDC should be improved.
- A plan for succession training of staff in the NBS and Nutrition Programs should be developed to prepare for upcoming retirements.
- The possibility should be explored of collaborating with and leveraging resources from external entities (*i.e.*, academic institutions, other laboratories or industry) that can perform analyses or research and development in the areas of NBS and nutrition

At the conclusion of the BSC's peer review reports on the four DLS program areas, Dr. Ryan opened the floor for the entire BSC to provide additional comments or suggestions. The BSC made comments in two major areas during the discussion. First, the BSC was disappointed that construction of the new DLS laboratory building has been delayed from 2014 to 2017. Several members noted that reports by all four breakout groups emphasized the lack of DLS laboratory space at this time.

Second, the BSC conveyed that its future peer review reports to NCEH/ATSDR should articulate common themes across programs. For example, BSC members in all four breakout groups identified inadequate funding, laboratory space and staff as major barriers to DLS's projected growth. Other common themes the BSC noted in the breakout groups were (1) the lack of incentives by leadership for NCEH and ATSDR staff to strengthen collaborations and (2) the need for succession planning to assure long-term retention of highly-skilled laboratory experts in the DLS workforce rather than contractors.

The BSC raised the possibility of Dr. Frieden, his Deputy Director or a high-level designee responding to overarching issues identified during the BSC's peer reviews at meetings or in written reports. The members pointed out that requests from an external advisory committee for CDC leadership to respond to NCEH/ATSDR's overarching issues might have more impact than requests from internal staff.

Drs. Falk, Meinhardt and Pirkle made several remarks in response to the BSC's concerns regarding the three-year delay in completing the new DLS laboratory building. Congress appropriated ~\$1.5 billion to build CDC's Headquarters and modernize the DLS laboratories and

other NCEH/ATSDR facilities on the Chamblee Campus. Moreover, the large government deficit and current economic recession have weakened the ability of CDC and other federal agencies to make a strong case for new federal dollars to support the construction of new buildings.

The Congressional requirement for federal laboratories to be housed on federal land also has played a role in delaying construction of the new DLS laboratory building. DLS hoped the construction of its new laboratory building would be expedited and completed in 2014 due to emerging issues related to tobacco and TSCA reform. Although the CDC Building and Facilities Group has placed DLS's limited laboratory space on its calendar, this decision-making process is on a ten-year cycle.

Despite these barriers, land on CDC's Chamblee Campus has been designated for the new DLS laboratory building. When DLS receives new dollars for tobacco research from FDA, new biomonitoring methods under TSCA reform, and additional laboratory studies from other sources, the BSC would be in a position to provide recommendations to CDC leadership on the need to allocate a portion of these resources to the construction of laboratory space.

In terms of common themes across program peer reviews, Dr. Falk raised the possibility of the BSC reviewing its recommendations and compiling a comprehensive list of overarching issues across the NCEH/ATSDR programs after all of the peer reviews have been completed. This approach would help the BSC to more quickly identify traditional institutional barriers and propose strategies for NCEH/ATSDR to overcome these challenges, particularly in the area of internal collaborations between NCEH and ATSDR. However, Dr. Falk clarified that different funding streams and Congressional mandates as well as the need for interagency agreements increase the difficulties in establishing strong collaborations between NCEH and ATSDR.

With no further discussion or business brought before the BSC, Dr. Ryan recessed the meeting at 5:23 p.m. on May 27, 2010.

Discussion of Outstanding BSC Issues

Dr. Ryan reconvened the BSC meeting at 8:31 a.m. on May 28, 2010. He entertained a motion for the BSC to approve the *Draft Report of the Board of Scientific Counselors: Peer Review of the Division of Emergency and Environmental Health Services, December 2009*.

The motion was properly placed on the floor by Dr. Trasande, seconded by Dr. Warrick, and unanimously approved by the BSC with no further discussion.

Dr. Ryan opened the floor for a discussion on outstanding BSC issues. He asked the members to particularly provide feedback to improve the peer review process. The BSC's comments on the peer review process are outlined below.

- The BSC members should have been given more time to conduct the DLS peer review, particularly in light of the laboratory tours. The BSC found the current process to be effective overall, but refinements will be needed in some areas based on the specific needs, complexity and time requirements of the division that will be reviewed.
- The BSC members were concerned that the shortened and accelerated peer review process might not allow the depth and breadth of some issues to be addressed.
- The current peer review process provides an opportunity for the BSC members to only meet with leadership of the reviewed program. This approach is “superficial” to some degree and does not allow staff to raise issues, problems or criticisms. Moreover, the process is designed for the BSC to only react to discussions with leadership and written materials distributed by NCEH/ATSDR. However, the BSC members who reviewed the NBP addressed this issue by asking leadership to leave the room for a more candid and open discussion with staff. BSC members in all breakout groups should consider this approach during future peer reviews.
- Some BSC members did not believe their breakout groups provided detailed or in-depth responses to the peer review questions. Consideration should be given to adding another day to meetings to allow the BSC to confirm that a solid and comprehensive peer review was conducted. This approach also would provide an opportunity for BSC members to speak with NCEH/ATSDR staff at all levels in private and obtain input on important organizational issues.
- The current peer review process does not allow the BSC to engage external experts. Outside expertise has played an important role in the quality of the peer reviews.
- The peer review of DLS on the previous day was the first review in which external writer/editors took notes and tape-recorded the breakout groups. This approach was extremely helpful and allowed the BSC members to focus on their discussions with the programs rather than concentrate on taking notes.
- Dissemination of focused peer review questions in advance of the peer review is an improvement over the previous process, but several process issues need to be clearly defined. For example, the BSC should be extensively involved in developing the peer review questions. The opportunity for BSC members to speak privately with staff during the breakout groups should be formalized on future peer review agendas.
- The BSC should develop a template to guide the process to ensure that the peer review is consistent across the individual breakout groups. The template should cover the following areas:
 - A checklist of cross-cutting issues the BSC members always should discuss with the reviewed program (*i.e.*, resources, staffing and budgets).
 - Flexibility in or strict adherence to answering the peer review questions.
 - The appropriate amount of time for tours.
 - A process for the BSC members to submit questions to and receive answers from NCEH/ATSDR in advance of the peer review.
 - An “open call” for staff to meet with the BSC members during the breakout groups at a designated time.
 - The ability of the BSC members to self-select their breakout groups to the extent possible.

Dr. Ryan confirmed that the BSC's suggestions to improve the peer review process would be reflected in the next peer review.

Public Comment Session

Dr. Tina Bahadori, Managing Director of the Long Range Research Initiative Program at the American Chemistry Council, is an incoming BSC member. She posed two key questions on the peer review process based on her attendance at the NBP breakout group on the previous day. Who are the sponsor, target audience and recipients of the BSC's peer reviews? Are the outcomes of the BSC's peer reviews actionable?

Dr. Ryan explained that NCEH/ATSDR is the sponsor of the BSC's peer reviews. The target audience includes leadership, staff, internal CDC collaborators, external partners and grantees of the reviewed program. The director of the reviewed program is responsible for responding to the BSC's findings and recommendations.

Based on Dr. Ryan's responses, Dr. Bahadori found the peer review process to be "self-fulfilling" to some degree because NCEH/ATSDR is the sponsor, designer and recipient of the BSC's peer reviews. Her position was that the process lacks transparency in the context of identifying underlying strengths and weaknesses of the reviewed program. She noted that the process is not designed for an entity beyond the director of the reviewed program to evaluate the quality of the BSC's peer review and NCEH/ATSDR's responses and assure appropriate actions were taken in due course.

Based on her observations, Dr. Bahadori believed that the BSC's peer review process has significantly improved over time, but NCEH/ATSDR's internal processes have not improved. She pointed out that the BSC members were not given an opportunity to aggressively cross-examine or challenge NCEH/ATSDR's responses to the lack of improvement in its processes. Her position was that this approach would have made the peer review of DLS more effective.

Dr. Ryan confirmed that a more detailed discussion on the peer review process would be placed on the next agenda for the new NCEH/ATSDR Director to directly address Dr. Bahadori's questions and comments.

NCEH Division of Emergency and Environmental Health Services (EEHS): Program Response to the BSC Peer Review

Dr. Sharunda Buchanan, Director of EEHS, presented EEHS's formal response to the BSC's program peer review that was conducted during the October 2009 meeting. She began by addressing the BSC's two overarching recommendations to EEHS.

1. *Recruit students for summer internships.* EEHS recruits college juniors and seniors to apply to the Collegiate Leaders in Environmental Health Internship Program. EEHS recruits junior environmental health officers to participate in the U.S. Public Health Service Commissioned Officer Student Training and Extern Program for a three- to six-month period. EEHS recruits students from accredited universities with environmental health majors to apply for internships in the intensive Summer Program for Environmental Health. EEHS recruits students from Emory and other universities in Atlanta to participate in the NCEH work-study program.
2. *Collaborate with the Pan American Health Organization (PAHO) to compile lessons learned and best practices in disaster preparedness from other countries.* EEHS uses its existing partnerships with PAHO and other organizations to compile and disseminate best practices and lessons learned and also to develop water safety plans.

Dr. Buchanan presented EEHS's responses to the BSC's specific recommendations on the four individual programs that were evaluated in the peer review.

Environmental Health Services Branch (EHSB)

- *Use the number of trainees as an output measure.* EHSB tracks the number of trainees in each of its programs in collaboration with partners. The National Environmental Health Association (NEHA) offers online training courses and provides EHSB with the number of trainees who complete these courses. EHSB tracks the number of accredited environmental health programs across the country.
- *Use capacity assessments to document chemical hazards expertise at state and local levels.* EHSB developed regional profiles at state and local levels in collaboration with multiple partners. EHSB established a process to document EPH standards and collaborated with partners to improve the accreditation process for EPH agencies.
- *Establish EPH standards for local and state health departments.* The EPH standards that EHSB developed are currently undergoing the Office of Management and Budget review and clearance process. EHSB hopes to implement its EPH standards in conjunction with the National Environmental Public Health Performance Standards to provide consistent and standardized practices to local and state health departments and the broader environmental health community.
- *Expand the CDC EIS Program to include environmental health practitioners.* EHSB has initiated discussions with CDC to change the eligibility criteria for the EIS Program to include environmental health practitioners.
- *Document individual health impacts at the local level.* EHSB uses the Environmental Health Services Network to translate EPH research findings into practice at the local level. EHSB has quantified the impact of its water safety interventions on systems, behaviors, morbidity and mortality in communities.

Environmental Public Health Readiness Branch (EPHRB)

- *Document the number of EPHRB's recommendations implemented by the U.S. Army.* EPHRB is currently compiling a database that will be completed in 2010 to track and rank recommendations according to the severity of hazards to communities and public health.

- *Conduct a risk assessment to compare incineration to alternative technologies and determine the best or most hazardous methods.* EPHRB collaborates with the National Research Council to investigate, review and publish the best methods for chemical weapons disposal.
- *Expand the Congressional mandate to broaden EPHRB's authority and oversight to address non-stockpiled chemical weapons.* EPHRB's Congressional mandate covers non-stockpiled chemical warfare materials, but EPHRB does not provide input or technical assistance until a plan exists to remediate buried materials.
- *Expand EPHRB's interpretation role to inform the public about the risks of new disposal technologies.* EPHRB informs the public about these risks through its updated website, participation on community advisory committees, and use of social media (*i.e.*, Facebook and Twitter).
- *Compare statistics between disposal facilities and other chemical management activities.* EPHRB collaborates with the Chemical Materials Agency to provide and evaluate these data on an annual basis. EPHRB collaborates with other organizations to standardize chemical management activities.
- *Broaden EPHRB's expertise beyond the disposal of stockpiled weapons.* EPHRB is partnering with the U.S. Department of State and Office of Cooperative Threat Reduction to apply its specialized expertise outside of the United States. Programs in other countries routinely ask EPHRB to provide safety oversight. EPHRB is evaluating data for chemical releases through crop production and food manufacturing.

Vessel Sanitation Program (VSP)

- *Conduct evaluations and implement an outcomes-based process to measure the impact of activities.* VSP is conducting a search at this time to identify relevant models of an outcomes-based process used by state and local programs. VSP conducts annual evaluations of standardization efforts during its inspections to document impact. VSP regularly updates its plan of operations.
- *Replace the current paper-based reporting system.* VSP is making efforts at this time to replace the remaining paper-based portions of its reporting system with a fully electronic reporting system over the next three years.
- *Fully communicate data to other CDC programs and foreign vessel programs.* VSP communicates data on cruise ship illnesses to the CDC Division of Global Migration and Quarantine. VSP uses its e-mail notification system to communicate data in real-time to state and local health departments on outbreaks. VSP provides technical expertise and has established strong relationships with all countries to address the data needs of foreign vessel programs and governments. VSP has provided technical assistance and training to the Egyptian Ministry of Health, WHO International Health Regulations, Brazilian National Health Vigilance Agency, Health Canada, and inspectors of Olympic Games in Athens, Greece and Sydney, Australia.
- *Bridge communication gaps with state and local health departments by providing a mechanism for real-time reporting of potential illnesses.* VSP routinely answers questions from states; develops and distributes post-inspection reports to address additional issues; provides rapid notification of outbreaks on its website; and participates in face-to-face meetings with health departments upon request.

- *Collect and analyze existing data as candidate markers of success.* VSP is making efforts to take a traditional “preventable pathogens” approach to evaluate its success based on the types of outbreaks that occur on land versus those on cruise ships. VSP also is attempting to document the number of its completed vessel inspections as an additional marker of success.
- *Fill the medical epidemiologist position.* VSP expects to fill this position by June 2010.
- *Develop an evidence-based approach to better demonstrate the long-term public health benefits of vessel inspections.* VSP collects data to document compliance or non-compliance with the *Operations Manual* standards. VSP conducts outbreak response activities to gather data to determine the ability of cruise ships to adhere to inspection control requirements. VSP is currently supporting international efforts to build the capacity of additional programs to perform comprehensive sanitation inspections each year. VSP is the only program with this capacity at this time.

Healthy Community Design Initiative (HCDI)

- *Formally evaluate the appropriateness of the “HCDI” name for communities and end-users.* EEHS administered a survey in 2008 and determined that “Healthy Places,” “Livable Communities” and “Healthy Community Design” were well received by end-users. If resources permit, however, HCDI will conduct focus groups to evaluate the appropriateness of its name in a more formal manner.
- *Apply intermediate or surrogate indicators to clearly define a “healthy community.”* HCDI has initiated an activity to develop quantitative and qualitative indicators to better define a healthy community. HCDI has identified a number of potential indicators to support this effort, such as park space per 1,000 residents, air pollution measures, age of housing, number of children with elevated blood lead levels, density of fast food and liquor stores per square mile, and accessibility to supermarkets. HCDI plans to integrate data on these indicators into data collected by the NCEH Environmental Health Tracking Branch. The Maryland Department of Health and Mental Hygiene will pilot the indicators selected by HCDI. HCDI is collaborating with the Oregon Environmental Health Tracking Program to track six measures that have been collected across the state. HCDI is collaborating with the CDC Healthy Homes Initiative to identify potential questions that could be used as environmental and built environment indicators.
- *Expand staff to include additional expertise in other areas.* HCDI is collaborating with federal partners to broaden its expertise beyond the health sector, particularly in the transportation, smart growth and housing fields. HCDI is partnering with multiple CDC programs in the areas of injury, physical activity, geographic information systems and public health law to grow its expertise.
- *Conduct a comprehensive inventory of existing databases and distribute these findings to state and local public health departments.* HCDI is currently analyzing existing surveillance databases to identify potential built environment indicators. Preliminary findings from this analysis show that these systems have inadequate built environment measures. HCDI will explore partnerships with jurisdictions that have Community Block Grants and existing momentum in environmental justice and food security.
- *Develop a broader and more diverse advocacy base.* HCDI is continuing to prioritize the development and enhancement of collaborations within and beyond the health sector. HCDI’s current partners represent diverse areas, such as planning, new urbanism, parks

and recreation, landscape architecture, school safety, agriculture and urban forestry, green building and transportation. HCDI regularly attends meetings of national organizations to ensure that health is a prominent issue in other sectors.

- *Convene a session during the 2010 Environmental Justice Conference.* HCDI was not placed on the agenda for the 2010 conference, but efforts are underway to hold an HCD session during the 2011 conference.
- *Incorporate the HCD curriculum into courses for undergraduate and graduate students at MPH and MS levels to provide training to future health department officials.* HCDI is attempting to leverage resources to target its curriculum to undergraduate students; develop additional web-based training courses for health, planning and local EPH officials; provide hands-on experience in HCD to undergraduate students; and offer continuing education credits more broadly. HCDI is seeking opportunities to partner with schools of public health and other academic professional societies to support these efforts.
- *Obtain federal funding to formally review environmental impact statements (EISs) to determine health impacts.* HCDI is aware of the need to take a public health approach in reviewing EISs and also is mindful of missed opportunities to routinely comment on EISs. However, HCDI provides input on EISs on a limited basis and has the necessary expertise at this time for more robust involvement in this area if additional resources become available in the future. HCDI developed a memorandum of understanding (MOU) with EPA to play a more official role in the review, evaluation and decision-making process of EISs.
- *Review transportation project EISs initially and expand this effort to review EISs of other projects in the future.* HCDI is aware of the need to prioritize its role in transportation-related EISs as resources become available. HCDI is particularly interested in providing comments on the proposed revised Corporate Average Fuel Economy Fuel Efficiency Standards. HCDI will use its MOU with EPA to support this effort.
- *Use and rank a multivariate index of healthy communities to measure success.* HCDI is exploring potential indicators and other measures of progress to include in the *Healthy People 2010* Initiative. The FY2011 President's budget request calls for \$4 million to be set aside for HCDI. HCDI hopes to use a portion of these new dollars to develop and distribute an HCD toolkit.
- *Closely collaborate with the NCEH Climate Change Program.* HCDI is a member of the CDC Climate Change Workgroup. HCDI offered dissertation stipends through the Association of Schools of Public Health to doctoral students who are completing their theses research on health, the built environment, or health in climate change.
- *Frame communications and messages to generate interest in HCD among communities with no first-hand experience or knowledge of this concept.* HCDI has developed a number of resources to raise public awareness of and interest in HCD, including fact sheets, DVDs, web-based videos and exhibit panels. HCDI conducted user insight testing to determine its potential target audiences and also collaborated with federal partners to obtain input on effective strategies to reach populations with and without knowledge of HCD.

Dr. Buchanan concluded that similar to other NCEH/ATSDR divisions, EEHS would need additional funds, staff and resources to fully implement all of the BSC's recommendations. Most

notably, the BSC pointed out that EEHS meets minimal requirements due to inadequate staff. Dr. Buchanan thanked the BSC for providing EEHS with insightful guidance during the peer review and a thorough report. She confirmed that the BSC's findings would play a key role in EEHS's strategic planning efforts in the future.

Dr. Buchanan invited the BSC members to participate in "EEHS University" in which external stakeholders accompany staff on investigations, cruise ship inspections, visits to chemical demilitarization sites or other activities in the field.

The BSC thanked Dr. Buchanan and the EEHS staff for their time and effort in providing a thoughtful, comprehensive and serious response to the peer review report. The BSC also thanked EEHS for providing its written response in advance of the meeting. However, some members asked for presentations of formal responses to be shorter in future meetings to allow the BSC more time to interact with the leadership and staff of the reviewed division.

The BSC members made two additional suggestions for EEHS to consider in improving its activities. First, VSP should explore the possibility of training personnel in the U.S. Merchant Marine Academy to decrease the burden on staff in traveling across the world to conduct an extensive number of cruise ship inspections.

Second, HCDI should not develop an HCD curriculum specifically for undergraduate students. Faculty could easily adapt and incorporate content from the existing HCD curriculum into courses for undergraduate students, such as housing codes and shelter or institutional environments. HCDI should partner with NEHA and the Association for Environmental Health Accredited Programs to widely disseminate the existing HCD curriculum to faculty and health organizations at local and large-city levels.

Overview of the NCEH Division of Environmental Hazards and Health Effects (EHHE)

EHHE leadership presented a series of overviews in preparation of the BSC's peer review of EHHE programs during the next meeting.

EHHE Office of the Director. Dr. Josephine Malilay is the Associate Director for Science of EHHE. She reported that EHHE is the oldest division in NCEH with a workforce of ~122 full-time equivalents (FTEs) and ~55 contractors. EHHE's mission is to conduct surveillance and investigations to increase knowledge between human health and the environment. EEHE uses this knowledge to develop national public programs and policies aimed at preventing disease.

Dr. Malilay presented an organizational chart to illustrate the EEHE Office of the Director, three Associate Directors for Science, Emergency Response and Policy, the Climate Change Program, and four branches. EEHE's FY2010 operating budget is nearly \$90 million with the Asthma Program and National EPH Tracking Program accounting for >50% of the budget. The expansion of the Tracking Program and the establishment of the Climate Change Program were the two primary reasons for the increase in EEHE's budget from FY2008 to FY2009.

The \$3.5 million decrease in EEHE's budget and the \$1 million increase for the Tracking Program from FY2009 to FY2010 are based on current planning levels. As a result, EEHE's FY2010 data reflect planning estimates. Funding for EEHE's other environmental activities include >\$2 million for radiation studies and ~\$100,000 for emergency response.

EEHE's most recent response activities at the national level focused on trailers deployed to the Gulf Coast by the Federal Emergency Management Agency, Chinese drywall and the BP oil spill in the Gulf of Mexico. However, EEHE received no additional funding to support its response to Chinese drywall and the oil spill.

EEHE conducts a range of activities in multiple areas, including epidemiologic-environmental investigations, exposure assessments, emergency preparedness and response to chemical and radiological exposures, natural disasters and technological incidents, surveillance, and program evaluations.

Dr. Malilay concluded that during the upcoming peer review, the BSC would be charged with providing advice and guidance to EEHE in response to four questions:

1. Are the EEHE programs meeting their stated goals and objectives?
2. Are the EEHE programs and activities meeting the overall goals and objectives for NCEH and CDC?
3. What directions should EEHE undertake to plan its future growth? What potential barriers exist to EEHE's projected growth and what opportunities are there to overcome them?
4. What emerging environmental priorities should EEHE address for environmental public health?

Radiation Studies Branch (RSB): Dr. Charles Miller is the Chief of RSB. He reported that RSB's mission is to promote public health protection from environmental radiation exposures through science and education. RSB's vision is "people protected from radiation-related health threats." RSB's organizational structure includes three teams: the Program Support Team, Radiological Assessment Team, and Education and Communications Team.

RSB conducts activities in two major categories. For "non-emergency" activities, RSB analyzed radiation releases from nuclear weapons production sites in the 1940s-1960s in partnership with the Department of Energy (DOE). RSB studied the health impacts of nasopharyngeal radium irradiation treatments among children and military personnel in the 1940s-1950s. RSB provides technical expertise and support to EPA to study radon from environmental sources. RSB analyzes environmental radiation exposures that occur in other countries. RSB studies medical exposures to radiation from diagnostic and treatment procedures.

For “emergency preparedness and response” activities, RSB serves on the Federal Radiological Preparedness Coordinating Committee to prepare guidance for the federal Environment, Food and Health Advisory Team. RSB serves on a number of HHS committees to assess Strategic National Stockpile pharmaceuticals and supplies needed for a radiation emergency. RSB develops planning guidance for public health officials at state, local, territorial and tribal levels.

RSB creates training and educational materials for public health practitioners, clinicians and emergency responders. RSB prepares educational materials and messages for the public on radiological emergencies and protective actions. RSB develops surveillance systems for radiological emergencies.

Dr. Miller highlighted RSB’s notable accomplishments in 2009. RSB completed the draft final report on the Los Alamos Historical Document Retrieval and Assessment Project and is finalizing the report in collaboration with community groups. Los Alamos is RSB’s last DOE project. RSB established an alliance of traditional and non-traditional partners to build capacity and coordination for a radiological emergency.

RSB collaborated with DLS and EHHE Health Studies Branch to build laboratory and epidemiologic response capacity in a radiological emergency. RSB developed tools, guidance and training materials for state and local health officials on population monitoring following a radiological emergency.

Dr. Miller described the three major priorities RSB has established for 2010. First, RSB is building capacity at state and local levels to conduct population monitoring in a radiological emergency event. RSB is partnering with states to identify and enroll volunteers in the Medical Reserve Corps to support this effort. Second, RSB and its federal partners are collaborating with the National Academy of Sciences to conduct a study on tracking radiation doses from medical diagnostic procedures.

Third, RSB will convene the “National Conference on Radiological and Nuclear Emergency Preparedness” in 2011. Federal, state and local officials will be invited to the conference to share information on current activities, future plans and existing gaps in radiological and nuclear emergency preparedness. RSB submits proposals each year to the CDC Office of Public Health Preparedness and Response to compete for funding for radiologic preparedness, but no specific line item exists for RSB to conduct these activities.

Dr. Miller concluded that RSB is aware of three key challenges to achieving its 2010 priorities. Preparedness by state and local health departments for population monitoring in a radiological emergency is lacking. Capacity for epidemiologic support to state and local officials in a radiological emergency is extremely limited. Internal capacity within RSB for emergency preparedness and non-emergency radiation public health programs is lacking as well.

Air Pollution and Respiratory Health Branch (APRHB). Dr. Paul Garbe is the Chief of APRHB. He reported that APRHB’s staff includes 30 FTEs and ~15 contractors, fellows or university researchers. APRHB’s organizational structure includes six teams: the Air Pollution

Team, Asthma Epidemiology Team, Asthma Program Team, Communications Team, Evaluation and Community Intervention Team, and Surveillance Team.

In addition to states, APRHB also maintains partnerships with federal agencies and non-governmental organizations (NGOs) with an interest in asthma control. APRHB will represent CDC on the new President's Task Force on Environmental Health Risks to Children that was recently established. Asthma disparities will be one of four priority areas addressed by the Task Force.

A Congressional appropriation to support the National Asthma Control Program (NACP) is the major source of APRHB's funding. NACP's goal is to reduce the burden of asthma on persons, families and communities throughout the United States. NACP activities are focused at both national and state levels in six key areas: surveillance, disparities, research, interventions, evaluation and communication. Partnerships (or cooperative agreement funds to states) account for 69% of the NACP budget, interventions account for 18%, and surveillance accounts for 13%.

The 36 NACP grantees represent 34 states, the District of Columbia and Puerto Rico. "Core" grantees are funded to establish and maintain an asthma surveillance system with local data; develop a statewide asthma plan; build coalitions and partnerships with asthma control stakeholders at the state level; and use the surveillance system to identify target audiences and implement interventions tailored to the specific needs of the local population. "Core plus expanded" grantees are funded to conduct the core activities in addition to special projects, such as the development and evaluation of focused surveillance systems, assessments of disparities, or implementation and evaluation of targeted interventions.

Dr. Garbe highlighted APRHB's key activities. APRHB maintains and publishes national asthma surveillance data on asthma prevalence, mortality, hospitalizations, outpatient visits, emergency department visits and physician office visits. APRHB incorporates the "Asthma Call-Back Survey" into the Behavioral Risk Factor Surveillance System to obtain data on asthma symptoms and episodes; utilization, knowledge of asthma management and quality of care; modifications to the environment; asthma medications; and demographics. The call-back survey is administered to 41 states at this time and includes detailed questions for both children and adults.

APRHB recently completed the "Controlling Asthma in American Cities" demonstration project in seven inner-city communities to demonstrate the impact of a public health approach on asthma control. Existing tools, interventions and culturally-tailored asthma action plans and activities were used in the target communities to demonstrate a reduction in the burden of asthma among at-risk children.

Findings of the demonstration project will be published in a supplement to the *Journal of Urban Health* by the end of December 2010. The supplement will describe policy, community and institutional changes and also will strengthen the knowledge base on complex community interventions.

Preliminary data show that among children, the interventions resulted in improvements in asthma medication use, reductions in asthma symptoms and missed school days, and increased access to medical care. Improvements also were observed at the institutional level, such as enhanced communications and services in the target communities among health plans, healthcare providers, social service agencies, pharmacies, schools and families.

APRHB collaborated with the U.S. Task Force on Community Preventive Services (Task Force) to conduct a comprehensive evaluation and systematic review of indoor home environmental interventions for asthma management and identify effective practices. The Task Force used APRHB data to recommend multi-trigger and multi-component home-based interventions with an environmental focus as an effective strategy to reduce asthma morbidity in children. The entire review is available at www.thecommunityguide.org. APRHB also conducts a “review of reviews” to identify and publish other effective practices and interventions more quickly.

APRHB has asked its state grantees to incorporate an evaluation component into their activities. To support this effort, APRHB assigned evaluation technical advisors to each funded state and developed and released the *Learning and Growing through Evaluation: State Asthma Program Evaluation Guide* as an additional resource at www.cdc.gov/asthma/program_eval/guide.htm. APRHB is currently developing similar evaluation guidance for the partnership, surveillance and intervention components.

APRHB’s research priorities include an investigation of the determinants of asthma incidence and prevalence, particularly in the context of health equity; an evaluation of the effectiveness of interventions; and an assessment of the natural history and medical management of asthma with a focus on environmental factors. APRHB uses these research findings to inform and evaluate policy development.

APRHB is collaborating with EPA to use state-level data to evaluate the impact of air pollution regulations and also to develop and tailor public health messages on air pollution to address local needs. APRHB will engage its state asthma control programs in this effort. APRHB is collaborating with states, academia and federal agencies to conduct research on air pollution and asthma. These studies focus on:

- The impact of wildfire smoke exposure on chronic respiratory and cardiovascular disease (California).
- The impact of volcanic exposures on asthma (Hawaii).
- The development and dissemination of guidance on physical activity in the context of outdoor air quality (workshop of national experts).
- The impact of in-vehicle exposures on commuters with asthma (Emory University and Georgia Institute of Technology).

APRHB provides national leadership and support to state and local health departments in responding to carbon monoxide poisoning, but this activity is unfunded. APRHB characterizes public knowledge, attitudes and practices regarding carbon monoxide poisoning to improve the development of appropriate health communication messages.

Climate Change Program (CCP). Dr. George Luber is the Associate Director for Climate Change. He reported that CCP was formally constituted as a program in March 2009 with a Congressional appropriation of \$7.5 million and a staff of ten FTEs. CCP provides leadership in four important efforts: (1) identify health impacts of climate change and the populations most vulnerable to these impacts; (2) design programs to assist the public health community in anticipating future trends; (3) assure the availability of systems to detect and respond to emerging health threats; and (4) take actions to assure health risks can be managed now and in the future.

CCP fills three critical roles. CCP analyzes and translates the latest findings in climate science to its public health partners. CCP applies these findings to develop decision support tools (*i.e.*, vulnerability maps, surveillance tools and adaptation planning) to aid in the public health response at state and local levels. CCP provides leadership within and outside CDC to ensure that public health concerns are represented in climate change adaptation and mitigation strategies and also to create linkages between efforts in public health and other sectors.

Dr. Luber announced that CCP held a climate change meeting in January 2007 with a diverse group of partners and stakeholders. CCP used the recommendations from the meeting to identify 11 priority actions for climate change, guide the public health approach on climate change, and inform the development of the CDC Climate Change Policy. Dr. Luber described CCP's ongoing projects and activities to address five of the 11 priority actions.

1. *Track data on environmental conditions, disease risks and disease occurrence related to climate change.* CCP is collaborating with federal partners both within and outside CDC to enhance and expand existing national disease surveillance systems; integrate infectious and environmental disease information systems; and incorporate climate, meteorologic and environmental monitoring data.
2. *Enhance the science base to better understand the relationship between climate change and health outcomes.* CCP released a funding opportunity announcement, "Climate Change: Environmental Impact on Human Health." CCP awarded seven grants totaling \$2.1 million per year for three years to conduct this extramural research. One of the extramural research projects is quantifying the impact of climate change on heat-related threats to public health resulting from a greater incidence of excessively hot days and an intensification of air pollution within cities. CCP awarded 17 intramural research projects totaling nearly \$3 million to CDC investigators to increase CDC's climate change capacity. One of the intramural research projects is analyzing the public health effects of decentralized water reuse as a non-potable water supply and assessing the potential benefits and limitations of this approach. CCP completed an interagency activity to identify research priorities and determine gaps in knowledge of climate change and human health consequences in 11 categories. This research was published in April 2010 as a supplement to *Environmental Health Perspectives*.
3. *Identify locations and population groups at greatest risk for health waves and other specific health threats.* CCP traditionally conducts epidemiologic investigations and vulnerability mapping to support this effort, but novel methodologies are being explored

at this time. CCP is funding a pilot project in Austin, Texas to develop and disseminate guidance on assessing vulnerability to extreme heat and flooding at the local level.

4. *Enhance climate change capacity at state and local health departments.* CCP awarded funding to 11 state/local health departments in FY2009 and expects to award funding to 10-12 health departments in FY2010. The grantees will conduct a comprehensive needs assessment to evaluate the ability of state/local health agencies to address the public health consequences of climate change. The grantees will use findings from the needs assessments to describe existing knowledge and gaps in climate change capacity. The grantees will create a strategic plan to address these gaps. The grantees will develop an evaluation plan to assess the effectiveness of the needs assessments in addressing climate change.
5. *Promote workforce development by ensuring training of a new generation of public health professionals to respond to health threats posed by climate change.* CCP funded three dissertation awards through the Association of Schools of Public Health to encourage research on the interface between climate change and health. CCP funded two one-year post-doctoral positions at the National Center for Atmospheric Research to strengthen knowledge on climate modeling, climate science and the integration of climate models into downscaled approaches. CCP is sponsoring a series of webinars with the American Public Health Association to provide education on climate change and health. The webinars are accredited for public health agencies to offer continuing education units to staff members who complete the course.

Environmental Health Tracking Branch (EHTB). Dr. Judith Qualters is the Chief of EHTB. She reported that EHTB is responsible for the National Environmental Public Health Tracking Program. The five major goals of the Tracking Program are to (1) build a sustainable National EPH Tracking Network; (2) enhance the EPH workforce and infrastructure; (3) disseminate information to guide policy, practice and other actions to improve the nation's health; (4) advance EPH science and research; and (5) foster collaborations among environmental and health programs.

The EHTB staff of 27 FTEs is organized into three teams: the Informatics Team, Science Development Team, and Program Services Team. EHTB conducts its activities through strong collaborations with federal and state partners. EHTB regularly obtains input on tracking from its three standing workgroups: the Standards and Network Development Workgroup, Content Workgroup, and Program Marketing and Outreach Workgroup.

EHTB's budget has increased from \$17.5 million in 2002 to \$33.1 million in 2010. EHTB is currently funding 23 states and New York City to develop tracking networks as components of the National Tracking Network. All states are required to maintain the core data set and measures that are in the National Tracking Network. However, EHTB provides flexibility for states to use cooperative agreement funds to track priority issues at the local level.

EHTB only funds 24 state/large-city grantees, but tracking data also are collected nationwide in collaboration with partners. For example, air monitoring data for ozone and particulate matter

are obtained from EPA. EHTB also funds NGOs to assist the program in outreach and universities to conduct research that can be translated into actual practice. In the upcoming funding cycle, EHTB's academic partners will be asked to develop statistical methods for use by state and local health departments; conduct exposure assessments to facilitate the use of hazard data to determine potential exposures; and perform research on linkages between air pollution/cardiovascular disease and water/other health effects.

Over the past year, EHTB's academic partners have collaborated with state health agencies to implement various projects, such as the linkage between air pollutants and various health outcomes, an analysis of heat-related mortality, and development of a vulnerability index. The collaborative projects between EHTB's academic partners and state grantees were designed to build tracking capacity at state and local levels.

Dr. Qualters explained that the Tracking Network is a web-based information system at national, state and local levels to serve the public, EPH agencies, healthcare providers and researchers. The Tracking Network can be used to obtain health data, environmental data and information on specific geographic locations.

Health data in the Tracking Network cover asthma, myocardial infarction and carbon monoxide poisoning hospitalizations, carbon monoxide emergency department visits and mortality, childhood lead poisoning and testing, cancer, birth defects, and other reproductive outcomes such as low birth weight. Environmental data in the Tracking Network cover air, the age of housing, community drinking water, and U.S. Geological Survey groundwater. EHTB obtains hospitalization, emergency department, and water data directly from state tracking programs in 16 states and New York City.

In turn, state and NYC tracking programs partner with other programs in the state to gain access to and make available data on their state networks and the national network. For example, water data are obtained by tracking grantees from their state environmental agencies and hospitalization and emergency department data are obtained from state hospital organizations or other state agencies. State health data reported to EHTB are aggregated at the county level.

In addition to direct reporting from tracking grantees, some state-level data are obtained from other federal programs. For example, cancer data are obtained from cancer registries through CDC's National Program of Cancer Registries and the National Cancer Institute's Surveillance Epidemiology and End Results Program. EHTB obtains regular pre-processed air monitoring data and data on daily surface concentrations for ozone and particulate matter that have been modeled across the United States directly from EPA.

EHTB launched the initial version of the National Tracking Network in 2009 with limited data on hospitalizations, carbon monoxide emergency department visits, housing and childhood lead poisoning, water and air. However, the Program continues to enhance the content and functionality of the Network. Since its launch, data on reproductive health, cancer, birth defects and modeled air have been added.

EHTB will further expand the Tracking Network in the future by adding data on population characteristics, such as demographics, poverty indices, education levels, and insurance coverage; APRHB's Asthma Call-Back Survey; climate change; pesticides; remote sensing, air pollution health impact metrics and tools; and linked health and environmental data sets.

Dr. Qualters clarified that the benefits of tracking extend far beyond data collection and maintenance. Tracking translates research into practice and facilitates the development and dissemination of public health messages. Tracking serves as a technical resource to state and local health practitioners to identify disease clusters and determine health impact. Tracking provides "how-to" guides and statistical tools to improve the ability of state and local health officials in responding to EPH issues.

The Tracking Network and Program have been innovative activities at CDC. The Tracking Network was the first data system developed at CDC with both public and secure portals. The Tracking Network has provided public access to state hospitalization data at the county level. The communication and outreach activities for the Tracking Network reflect NCEH's most extensive use of social media (*i.e.*, Twitter, YouTube and Facebook). Overall, EHTB's ultimate measures of success are to translate data into public health action and address policy issues.

Health Studies Branch (HSB). Dr. Lauren Lewis is the Chief of HSB. She reported that the HSB workforce includes ~30 FTEs, contractors, medical toxicology fellows and EIS Officers. The HSB staff has diverse skill sets in the areas of epidemiology, toxicology, medicine, chemistry, environmental health, behavioral sciences and statistics. HSB's Preparedness and Response Team houses the Disaster Preparedness and Response Program and the Toxicology Program, while the Applied Epidemiology Team houses the Clean Water for Health Program.

Dr. Lewis highlighted HSB's key activities in its three major focus areas.

- HSB investigates and understands the impact of environmental exposures on human health by:
 - Investigating non-infectious outbreaks domestically and internationally.
 - Conducting environmental epidemiologic research.
 - Conducting national surveillance of toxic exposures in real-time in collaboration with the American Association of Poison Centers.
 - Providing EPH training to medical toxicologists, epidemiologists and EIS Fellows. HSB's research agenda is based on periodic reviews of significant or emerging EPH issues.
- HSB prepares for, responds to, provides leadership in, and serves as a subject matter expert of natural, chemical and radiologic disasters by:
 - Collaborating with several partners to develop and provide public health response tools and training to federal and state agencies. These resources include shelter surveillance tools, disaster morbidity and mortality surveillance tools, and the rapid community needs assessment toolkit. HSB staff is deployed to the field to provide direct assistance to state and local governments during disasters. HSB plays a leadership role in the CDC Emergency Operations Center during disasters.

- HSB leads and implements the Clean Water for Health Program by:
 - Creating the National Well Data Resource to collect and maintain data on private wells, inform public health decision-making, and guide interventions and policies related to private wells.
 - Addressing drinking water issues among vulnerable populations, such as American Indians/Alaska Native communities and the Navajo Nation.
 - Investigating chemical waterborne exposures to arsenic, nitrates, uranium and other contaminants.

Dr. Lewis concluded that HSB's future directions and priorities will focus on reorganizing the Clean Water for Health Program; providing generic disaster preparedness and response expertise to RSB to build capacity in radiologic disasters; and leveraging funds to continue to serve as a leader in disaster response within and outside of CDC.

The BSC thanked EEHE for providing a comprehensive overview of its programs, research and public health activities in preparation of the upcoming peer review. Dr. Becker is an outgoing BSC member who would not participate in the EEHE peer review. During the upcoming peer review, he asked the BSC to be mindful that RSB does not receive funding from the CDC Office of Public Health Preparedness and Response (formerly the Coordinating Office for Terrorism Preparedness and Emergency Preparedness).

Dr. Ryan asked EEHE staff to include specific information in the packet of materials that would be distributed to the BSC for the peer review prior to the next meeting, such as organizational charts for all four branches and the Climate Change Program, metrics to assist the BSC in answering the four peer review questions, and the EEHE Strategic Plan. Dr. Ryan also asked the BSC members to send him e-mail messages with new or modified questions to address during the peer review in addition to the four questions proposed by EEHE.

Closing Session

Dr. Ryan reported that the deadline for the BSC to complete its draft report of the DLS peer review would be August 1, 2010. The BSC members would be given a deadline of early September 2010 to review and submit comments on the draft DLS peer review report. These deadlines would provide DLS with sufficient time to review the BSC's draft report and prepare its formal response for presentation at the next meeting.

Dr. Ryan emphasized that as the Chair, he would sign the final BSC minutes for the May 2010 meeting by September 1, 2010. As a result, he asked the BSC members to review and submit comments on the draft minutes as soon as possible after receipt.

The dates proposed for the next BSC meeting were October 21-22, October 28-29, November 11-12, November 18-19, or December 2-3, 2010. NCEH/ATSDR staff would poll the BSC members by e-mail to confirm the date of the next meeting.

The BSC commended Drs. Falk and Burgess for their outstanding leadership of NCEH/ATSDR. The BSC applauded the Office of Science staff (Ms. Dolly Sinha, Activity Lead; Ms. Sandra Malcom, Executive Coordinator for the BSC; and Ms. Shirley Little) for providing excellent administrative support and making logistical arrangements for the BSC meeting. Dr. Ryan thanked the outgoing, current and incoming BSC members for their diligent and tireless efforts in conducting high-quality peer reviews of the NCEH/ATSDR divisions.

With no further discussion or business brought before the BSC, Dr. Ryan adjourned the meeting at 12:28 p.m. on May 28, 2010.

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

Date

Timothy J. Ryan, PhD
Chair, Board of Scientific Counselors