Coordinating Center for Infectious Diseases (CCID)
Board of Scientific Counselors (BSC) Meeting
Centers for Disease Control and Prevention (CDC)

May 6-7, 2008
Atlanta, Georgia

Centers for Disease Control and Prevention
Board of Scientific Counselors
Coordinating Center for Infectious Diseases
MEETING OF WORKING GROUPS
May 7, 2008

MINUTES OF MEETING

The Board of Scientific Counselors (BSC) of the Coordinating Center for Infectious Diseases (CCID) convened a meeting at the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia on May 6-7, 2008.

During the first day of the 2-day BSC meeting, Board members met in small groups that were organized according to the following four CCID National Centers: a) the National Center for Immunization and Respiratory Diseases (NCIRD), b) the National Center for Zoonotic, Vector-Borne, and Enteric Diseases (NCZVED), c) the National Center for HIV, Viral Hepatitis, STDs, and Tuberculosis (NCHHSTP), and d) the National Center for Preparedness, Detection, and Control of Infectious Diseases (NCPDCID). Each working group was charged with providing input regarding several specific center-related issues. Working group members were encouraged to share their ideas and assist in developing recommendations to be presented to BSC.

During the second day of the meeting, oral updates were given for a few topics, including the Center's facilities, budget, and goals process. This was followed by a presentation to Board members CDC's biosurveillance activity. Following these updates, the plenary session presented by CCID was a discussion of CCID top priorities. The day ended with representatives from the work groups summarizing the exchange of information that took place within their groups on the previous day, including recommendations.

INTRODUCTIONS AND WELCOME

On the second day of the CCID BSC meeting, CCID Director, Dr. Richard Whitley, acting chair, welcomed attendees (See Appendix I) and Board members, who then introduced themselves citing any possible conflicts of interest.

Dr. Cohen told members they would be provided with summaries from each of the four subcommittees and CCID welcomes feedback.

UPDATES

Facilities

Floy Brandt

Floy Brandt provided Board members with a CDC-wide facilities overview starting with the Roybal Campus. Slabs are currently being poured in the below grade levels of Building 23 for the vivarium, and the building will be up-to-grade, providing a plaza area, by end-of-summer 2008. The loading dock facilities are being expanded, but will remain operational for buildings 15, 17, and18. The loading dock should be fully available by January 2009 and will be the first completed phase for Building 23. The Building 23 laboratory tower will follow. Construction completion is slated for April 2010 with anticipated move-in thereafter. A relocation coordinator has been identified and will commence the planning process summer 2008.

Brandt indicated that the Roybal campus is intended to be a CCID campus. A model of Building 18 was presented providing scale and proportion relative to Building 23. Building 17, a parking deck, and Building 19 were identified. CDC has funding for design of a CCID non-lab 1,100-space 12 story office building (Building 24) to complement Building 21 on the first floor. Building 24 1) will have conference rooms; 2) will not have a basement, or cafeteria; and 3) will have a covered connecting walkway over the road to Building 16. Following the master plan drivers for the next decade, occupants from Buildings 1, 3, 6 on the Roybal campus and Division of Parasitic Disease (DPD) Chamblee non-lab staff will be relocated Building 24.

Fort Collins, CO: Fort Collins, Colorado Division of Vector-Borne Infectious Diseases (DVBID) laboratory building Phase 1A is occupied and fully operational and remaining site work should be completed August 2008. Project completion has been hampered by procurement and budget issues.

Plans are underway for a CDC and U.S. General Services Administration (GSA) joint 20-year lease-construct building plan with Colorado State University to build a replacement building for the current Fort Collins leased facility.

San Juan, PR: Brandt described plans for the San Juan, Puerto Rico campus, including the office, administrative, gymnasium, and laboratory buildings and insectory. Short-range project plans (less-than-one-year) include additional parking spaces and building an additional out-building for laboratory equipment and dry storage. Long-range (greater-than-one-year) plans consist of constructing a freezer storage building to make more efficient use of the laboratory building.

Anchorage, AK: A finalized project development study to expand the current facility will be considered by Health and Human Services (HHS) in June 2009. Because of the length of the approval process and Alaskan weather constraints, the project is not expected to commence until summer 2009. First new office space will be constructed,

employees will relocate to that office space, and then the previously existing office space will be reconfigured into expanded BSL2 and BSL3 laboratory space. During the renovation process, the laboratorians will work at the state laboratory.

Budget Update
Dr. Reggie Mebane

Reggie Mebane discussed CCID's budget activity with emphasis on the 2009 budget process and the expectation of an approximate $35 million reduction from the 2008 enacted level for the four CCID National Centers. Mebane reviewed the budget highlights with emphasis on $1.8 billion strictly associated with infectious diseases (CDC's total ceiling allocation is $5.2 billion including some funding streams not specific for infectious diseases [i.e., Terrorism Preparedness]). The Coordinating Center's administrative costs, which were $45 million in FY2005 are a proposed approximately $27 million. These decreases present operational and funding challenges for necessary programs like the Strategic Business Unit—part of the overall CCID consolidation initiative to run more effectively and efficiently.

Dr. Mebane provided the following 2009 President's budget highlights:

1) Immunization and Respiratory Diseases - an increase of $2.8 million for a total of $160 million has been allocated to the Influenza program which includes seasonal influenza, avian influenza, and pandemic influenza. The overall budget for Immunization is $526 million with a reduction of $991,000 primarily in administrative cost reduction.
2) Zoonotic, Vector-Borne and Enteric Diseases – the approximate $60 million FY2009 President's budget reflects a decrease of $7.2 million below the FY2008 enacted level. Within this center the following decreases from the FY2008 enacted level are:
   a) West Nile Virus (WNV) has an overall budget of approximately $19.3 million with a decrease of approximately $7 million;
   b) The overall All Other Food Safety budget line is approximately $22.4 million, reflecting a decrease of roughly $129,000;
   c) Chronic Fatigue Syndrome has an overall budget of approximately $4.7 million reflecting a decrease of roughly $22,000;
   d) Special Pathogens has an overall budget of approximately $3.7 million reflecting a slight decrease of approximately $17,000;
   e) Lyme Disease has an overall budget of $5.3 million reflecting a slight decrease of approximately $24,000; and
   f) Prion disease has an overall budget of $5.2 million reflecting a decrease of roughly $24,000.
3) HIV, Viral Hepatitis, STDs, and Tuberculosis was recognized as one of the largest budgets with approximately $1 billion, a decrease of roughly $2 million in the FY2009 President's budget, with details reported as follows:

a) The overall budget for domestic HIV/AIDS prevention is $691 million with an approximate $713,000 decrease;
b) The overall budget for the Viral Hepatitis program is $17.5 million with an approximate $78,000 decrease;
c) The overall budget for the STD program is $151.7 million with an approximate $678,000 decrease.
d) The overall budget for the TB program is $139.7 million with an approximate $624,000 decrease.

4) Preparedness, Detection and Control of Infectious Diseases has an overall FY2009 budget of $27 million with the following specifications:
   a) Antimicrobial Resistance has an overall budget of $16.5 million with a decrease of $417,000;
   b) Patient Safety has an overall budget of $2.6 million with a decrease of roughly $67,000
   c) The majority of the decreases were reflected in the All Other Infectious Diseases line which had an overall budget of approximately $104 million with an approximate decrease of $27 million.

Mebane reported on CCID priority initiatives as detailed in the CCID Focus 2008 document in which 32 tactical and strategic core activity items were established relative to people, resources and finances, and service issues. Recruitment and reorganizing efforts have been underway to establish and stabilize CCID/Office of the Director (OD) executive personnel and within the first year of reorganization all national center leaders were in place. Another stated focus is partnership with the coordinating office of Global Health to synchronize global infectious disease efforts. A Program Integration Officer, Keith Williams, has been hired to integrate activities within CCID global programs and services and recruiting efforts are underway to hire an individual strictly focused on global activities. Two new centers, NCZVED and NCPDCID, were created from CCID's reorganization, utilizing existing centers' resources and funding, and require dedicated time and attention. Continued focus will be given to CDC's BioPHusion Unit to assist the director in utilizing intelligence information and to make critical decisions for the agency. In relation to resources and finances, goals execution continues to be a priority as well as Pan Flu task tracking and accountability. Internal controls are in place to effectively handle challenges relative to property and equipment. Jan Nicholson is leading an initiative for laboratory gold standards. STARLIMS, a laboratory automated information system, has been established to enable the exchange of laboratory data. Dr. Mitchell Cohen is tasked with leading the Immunization Safety initiative to ensure coordination and effective leadership.

BSC Discussion

- Matthew Boulton stated his continued surprise at the cuts to surveillance and programs for antimicrobial resistance. He cited an Emerging Infectious Disease Institute of Medicine (IOM) report that detailed a strategic plan where antimicrobial resistance was a high priority. He pointed out while antimicrobial resistance continues to grow as a public health concern; funding streams for research are decreasing.
- Mitchell Cohen commented on the challenges associated with competing government priorities and clarified that some of the stated reductions were Congressional rescissions. Antimicrobial resistance is a critical issue and received initial attention, but then other emerging challenges arouse and attention was deflected elsewhere.

Biosurveillance Systems Coordination
Dr. Dan Sosin

Dan Sosin defined biosurveillance as "timely visibility of high-impact acute human health-related events". At the national level there is concern regarding threats to health and security of the American public relative to terrorism, emerging infections, natural disasters, and technological disasters. Biosurveillance coordination is necessary because of fragmented and incomplete public health awareness resulting from workforce strain, system incompatibility, social and technological information-sharing barriers, and lack of common purpose and commitment. The time is right for Biosurveillance System Coordination because of national security needs, national mandates (HSPD-21, PAHPA), maturity of technological platforms and stakeholder expectations and readiness. This role is important for CDC, because 1) CDC is federally mandated to protect human health; 2) CDC has strong relationships to support information collection and sharing during events; 3) CDC has extensive experience and knowledge to interpret health data and to frame response options; and CDC has access to relevant health-related data. For fifteen years, CDC has been involved in integrated surveillance, but categorical funding has hampered capabilities and technology has evolved faster than the technical standards. National security threats have elevated nationwide needs for biosurveillance, so a common understanding of the problem and collaborative solutions to problems are necessary.

Biosurveillance coordination goals include: a) strengthening the capability of state and local government for early warning, rapid characterization, and overall situation awareness of public health events of national concern; b) improving information flows that are multi-directional, near real-time, and relevant; and c) improving the recognition and characterization of urgent health threats based on the integration of all relevant information. In late January, the CDC Director called for a Biosurveillance Coordination

Unit with the intent to develop a strategy and implementation plan for the nation's next-generation biosurveillance capability by strengthening public health practice, providing value to clinicians, and building upon current systems and resources. The strategic plan begins with the user to determine what information is needed and what the current capabilities are to detect and respond to an acute health event. Near-term, mid-term, and long-term opportunities for enhancement will be examined as well as how the plan can be implemented and evolved over time. The Biosurveillance Coordination Unit is attempting to develop a strategic plan that will serve as a forum for gathering input and identifying improvements through a number of key stakeholder groups including 1) U.S. Government Partners (Homeland Security Presidential Directive-21 Working Group); CDC Partners (Executive Leadership & Surveillance Experts); 3) State, Local, Tribal and Territorial Partners (State, Local Tribal & Territorial Working Group); and 4) Public and Private National and International Partners (National BioSurveillance Advisory Committee).

CDC collaborates with Department of Homeland Security (DHS) and the National Biosurveillance Integration System (NBIS) providing a human health component to support nationwide homeland security biosurveillance via liaison staff to the National Biosurveillance Integration Center, sharing collaborative technological tools, and coordinating across working groups.

The key strategies to Biosurveillance Systems Coordination include:

- Leveraging electronic health information – technology and standards that respect stewardship responsibilities, analytic capability, and research and development to evolve understanding (BioSense);
- Building international connectivity – expertise on the ground to train and strengthen capability to detect and respond (Global Disease Detection);
- Strengthening interpretation and reporting – better information products, workforce connectivity for hypothesis-driven inquiry, and evaluation of diverse information streams (BioPHusion).

In closing, Dr. Sosin reviewed guiding principles that include planning with a purpose in mind; engaging and empowering stakeholders to create solutions and centralized planning with decentralized execution. Another key guiding principle involves creating value through 1) timely, accurate, and relevant information products; 2) access to expert consultation; 3) ability to query systems and answer questions; and 4) managing expectations.

BSC Discussion

Dr. Sosin posed three questions in an effort to initiate discussion:

1) What can CDC do to strengthen the legitimacy of a CDC-led national planning effort?
2) What are the priority challenges that must be addressed in planning to be successful (e.g., privacy, performance measurement, workforce capacity, and visualization methods)
3) What conflicts between user wants and provider interests can be anticipated and how should they be resolved?

- Marci Layton commended the biosurveillance effort in engaging state, local, and other key partners suggesting the most difficult component to manage will be to ascertain the authenticity of gathered data. She questioned whether epidemiological laboratory investigation will be included in the characterization of data and the management of those expectations. Dr. Sosin emphasized the importance of protectively sharing collective data through various forums of information (i.e., situational reports) to promote trust in the public health system.
- Richard Whitley remarked that communication is the fundamental component for success for biosurvelliance as with clinical trials.
- Barry Beaty inquired about possible partnerships with the Gates Foundation and the Google Foundation. Dr. Sosin commented on intentions for outreach to foundations and the private sector through the Advisory Committee to the Director (ACD) subcommittee representation and individual consultation with groups actively engaged in biosurveillance efforts. Barry Beaty commented on the limitations relative to the amount and value of information stating the decision support system should be designed with the front line stakeholders in mind while considering how the data will be utilized by governmental agencies relative to policy decisions. Barry Beaty also emphasized the relevance of interventionists, specifically those involved with vector borne diseases, in the Biosurveillance Coordination Unit.
- James Hadler stated the importance of continually strengthening legitimacy with state and local partners by emphasizing CDC cooperation and trust with DHS to implement efforts around human health. He also stressed the importance of simultaneous information prioritization and dissemination management.
- Gail Bolan commented on strengthening legitimacy relative to the high level of effort and funding focused on hypothetical situations, which she said can divert resource investment from the public health frontline. She questioned whether there has ever been a surveillance system that detected an emerging problem before it was detected by public health and suggested surveillance resources be better served in monitoring and mobilization after a threat has been detected in the field. Dr. Sosin acknowledged that the model should reflect that CDC does not detect, but rather detection takes place at the local level and CDC's role is to facilitate effective response, appropriate investigation and characterization, and guidance. Rima Khabbaz stressed the

importance of data interpretation. Marci Layton reported in nearly 10 years, New York City's surveillance system has not detected significant emerging problems that weren't already reported by a provider. She recognized the advantage of providing situational awareness, specifically for seasonal outbreaks, but she indicated no surprise that some larger outbreaks were not detected by the surveillance system.

- Marci Layton also expressed concern on the large scope of the biosurveillance project. Strengthening legitimacy may require setting up a simple system and building upon that system to demonstrate its effectiveness—then, she suggested building upon that system in incremental phases.
- Matthew Boulton inquired about BioPHusion workforce connectivity and Dr. Sosin mentioned connecting public health and facilitating information exchange more effectively through social networks, specifically international forums.
- Jesse Goodman added the necessity of maintaining practicality and building upon and transitioning and examining the existing inventory. He supported Marci Layton's suggestion of launching a few pilot areas that bring the different information streams together that can then be subsequently built upon. He also inquired whether the CDC health informatics groups are connected. Dr. Sosin stated that these initiatives are connected at a high level, but efforts are taking place to improve communication at more practical levels.
- Jim Hadler recommended considering real-life multi-jurisdiction information coordination efforts when developing the system. Dr. Sosin emphasized the difference between coordination and operational responsibilities to assure appropriate standardization relative to varying events.

Strategic Directions for CCID
Blake Caldwell

Blake Caldwell reported on CCID's FY2009 CDC Infectious Disease priorities. The purpose for presenting this to the BSC was to obtain input, stimulate potential collaborations, and ultimately increase health impact. These priorities are framed by the four over-arching health protection goals:

1) Healthy People in Every Stage of Life
   a) Implement new vaccines and new vaccine recommendations, both domestically and globally;
   b) Improve the health of populations, disproportionately affected by HIV/AIDS, viral hepatitis, STDs, and TB, and ultimately to help eliminate health disparities;
   c) Eliminate acute hepatitis B virus transmission in the United States.

2) Healthy People in Healthy Places
   a) Expand disease prevention and control strategies through an ecologic approach to infectious diseases,
   b) Improve the quality and safety of the healthcare system.
3) People Prepared for Emerging Threats
   a) Expand capacity in pathogen discovery and improve infectious disease health monitoring, detection, preparedness, and response to outbreaks;
   b) Improve laboratory quality, management and systems;
   c) Strengthen domestic and global preparedness for pandemic and seasonal influenza.
4) Healthy People in a Healthy World
   a) Increase global capacity for preventing and controlling infectious diseases,
   b) Reduce worldwide deaths from pneumonia and other severe respiratory and vaccine-preventable diseases.

Caldwell posed the following questions to stimulate discussion:
1) Are these the right 10 priorities?
2) How should these priorities be framed to secure broader support?
3) Are you aware of other work in these areas, and can you suggest how we can (collectively) leverage that work?

BSC Discussion

- Mitchell Cohen commented on questions from partners regarding emerging infectious diseases and microbial threats and their effect on priorities relative to goal setting and cross-agency connectivity. The agency recognized the importance of both horizontal and vertical planning. Cohen requested the Board's recommendations on the scope and specificity of the 10 priorities as well as overall strategy.
- Carole Heilman cautioned CCID on limiting the priorities to FY2009 and suggested setting a broader strategic framework where specific FY2009 goals are listed, but not limiting goal accomplishments to FY2009. Heilman also recommended extreme caution in word-use to reduce the potential for misinterpretation. As an example, she suggested instead of using the word "eliminate" in terms of hepatitis B, that the phrase "accelerate the elimination" may be better utilized. Citing page 5, paragraph 2, item #3, Heilman pointed out CCID's inability to be involved in "the improvement of medical product safety." Since that is an industry activity, she suggested replacing that verbiage with "CCID can improve the strategies upon which medical products are used." Heilman cited the middle of page 6, where the statement reads "CDC is the only organization that can do the following." She cautioned that public health may take

exception to these types of statements and CDC should recognize this type of potential offensiveness when reaching out to partners. She also cited on page 7 under Flu Activity, a statement beginning with "It ensures that CDC can develop…" and stated it is necessary to clarify CDC's involvement as "development of interventions" or "the strategies for utilizing the interventions."

- Edward Hook suggested CDC convey a more "catalytic" role, specifically in regards to the title. He also emphasized the unique role of CDC as the world's source of infectious disease information and suggested working towards being "the definitive source science-based rigorously—vetted information regarding infectious diseases" in a manner which is independent of influence.
- Marci Layton cautioned about some goals being too vague to be able to determine progress, while recognizing that getting too specific can be detrimental. She recommended developing short and long term measures of success with an action plan and to that end, reprioritizing objectives. Though antibiotic resistance is listed under Patient Healthcare Safety, Layton suggested it as a larger issue meriting more emphasis. She also suggested prioritizing at the Center level, marketing infectious disease information both directly and indirectly, so information is more clearly defined, communicated, and attainable.
- In response to Ralph Diclemente's question relative to the specific or strategic structure of the priorities, Caldwell remarked that she understood the importance to clarify the strategic nature of the plan as priorities of focus, not specifically to be attained by year end 2009.
- Gail Bolan recommended reframing the title to "Strategic Plan for FY2009" and providing a long-range list of Healthy People objectives. It would be helpful to have a long-range priority list in harmonizing public health. Cohen informed the Board that CCID has been engaging with key partners on our priorities. CCID staff visited 8 of the 10 key partners in an April 2008 Washington DC planning trip. The partners were provided the CCID priority document for review and comment, but this information has not yet been assembled.
- Cohen requested the Board comment on how these priorities should be framed, whether to have a more over-arching or more specific focus, in order to secure broader support. Samuel Katz suggested considering the global impact when prioritizing. He added the suggestion to change the word "maintaining" to "restoring" when referring to public trust in immunization in relation to what he called the "serious erosion of public trust." He inquired about CCID's responsibility in this regard and also the mechanisms that will be employed to restore public trust.
- Anne Schuchat reported tremendous global vaccine collaborations and activities with World Health Organization (WHO) and Global Alliance for Vaccine and Immunization (GAVI) and other partnerships in implementing new and under-

utilized vaccines and new immunization recommendations. CDC has ongoing collaborations and traditional ongoing partnerships relative to the measles initiative and polio eradication efforts. Schuchat expressed her satisfaction that "implementing new and under-utilized vaccines and new recommendations" is included in the top 10 priorities. Cohen stated CCID is working very closely with agencies to restore public trust through improved communication, engagement, and research.

- Joshua Metlay spoke about challenges with zero-sum budgets with regard to competing priorities and recognized the difficulty of planning strategically without measurable and definable goals, which assist in valuing the quality of priorities. Cohen recognized budgetary and economical challenges and emphasized creative opportunities of leveraging resources as with recent flu vaccine funding increases.
- Matthew Boulton recommended launching conceptual models that provide a quantifiable and systematic approach to improve capacity building relative to activities and processes that result in infrastructure outputs (i.e., adequate infectious disease surveillance), which in turn impact health outcomes.
- Carole Heilman stated that the collaborative priorities, as currently written, benefit only CDC and ways in which partners could also benefit should be considered.
- Jesse Goodman suggested focusing on desired outcomes and then determine the steps to achieve those outcomes, maintaining a consistent level of specificity across the plan.
- Gail Bolan commended focus on prioritization and suggested the Board be provided the criteria used in determining priorities for contextual purposes and response.
- James Hadler questioned where Global TB fit into the priorities and Caldwell clarified the way in which priorities were determined. Each Center was granted two over-arching priorities and with the exception of Hepatitis B, disease-specific information was not included. Caldwell welcomed the Board's input as to whether another approach could have been more effective.
- Anne Schuchat commented that not having drug resistance included in emerging infectious disease threats is a missed opportunity. She also stated all antimicrobial resistance issues are cross-cutting and should be included somewhere in the priorities.
- Lonnie King spoke about the strategic paradox relative to the further one looks into the future the more uncertain outcomes become, especially in preparing the public health workforce for improving current activities while preparing for future priorities. King stressed that antimicrobial resistance should be included in the priorities.

- Marci Layton questioned the process and whether there was a meeting of the centers to look at cross-cutting common issues to prioritize at the center-level.
- Ralph Diclemente stressed the importance of prioritizing the elimination of health disparities and Caldwell recognized that based on this feedback and others, the priorities should be amended to reflect this as a main focus.
- Gail Bolan suggested it would be helpful to be able to map out the priorities by center, because partners look to CDC for global focus and prioritization which helps to determine local planning efforts. She suggested CCID glean information by grant requests provided by partners and public health officials.
- Caldwell described the process of how the priorities draft would be presented to executive level key partners and then the Board will have opportunity to review and make recommendations. Then, the revised document will be presented to the entire membership for comment.
- Matthew Boulton suggested quantifiable sentinel measures of organizational capacity performance as is part of the local level public health accreditation process in order to measure success in each of the significant areas.
- Barry Beaty inquired whether the Board will review priorities on an annual basis and Cohen stated that once a more comprehensive infectious disease focused plan is developed, high priority performance areas could be reviewed annually.
- Barry Beaty stated his surprise at how little credit CDC receives for its contribution relative to African malaria and he recommended CCID get involved in the visionary cross-cutting effort of pesticide resistance.
- On Healthy People in Every Stage of Life, Michal Fleenor suggested a) reframing #1 to read "to optimize the acceptance health impact of current new vaccines;" b) to optimize NACCHO support, he suggested making the existing #3 verbiage a subset of #1; and c) substituting "reduce the human impact of drug-resistant organisms" as #3.
- Gail Bolen stated that under People Prepared for Emerging Threats, the "provider" should be included in #2.
- One Board member asked for clarification regarding People Prepared for Emerging Threats on whether "improving laboratory quality" included clinical or diagnostic laboratory community, which public health depends on for information. Caldwell affirmed.
- As an HICPAC representative, Nalini Singh suggested establishing synergy between the budget and Healthy People in Healthy Places healthcare system priorities, citing mandatory public health infectious disease reporting requirements.

SUMMARIES AND RECOMMENDATIONS FROM WORKING GROUP MEETINGS AND FULL BOARD DISCUSSIONS

During the first day of the BSC meeting, Board members convened in one of four working groups representing each of CCID's National Centers. (For a list of working group participants, see Appendix II.) Center leaders provided BSC members with updates about center-related activities; Board members were then asked to provide input regarding center-specific topics and to make recommendations to help guide future activities.

Each working group assigned a spokesperson to summarize group discussions and relay the working group's recommendations. Spokespersons addressed the larger Board during the second day of the BSC meeting; following each presentation, meeting participants were given the opportunity to engage in discussion.

NCIRD Working Group Observations and Recommendations

Dele Davis

Anne Schuchet had updated the working group on current NCIRD activities and initiatives and Dele Davis provided the Board with a report on the working group's discussions regarding areas of importance and/or reinforcement for the following activities:

Norovirus Program: Close Gaps

1) Continue studies to identify disease burden and understanding of disease natural history
   a) Specifically, more information is needed on determining particularly at-risk people for Norovirus
   b) Examine lessons that could be learned from prior rotavirus surveillance studies
   c) Include economic burden considerations
   d) Consider new partnerships
2) Studies of understanding transmission should be performed and applied to finding appropriate interventions
   a) Are there high transmitters critical to moving disease into community?
3) Prevention Issues relative to immunization are premature
   a) First understand why patients develop a second infection
   b) Integrate knowledge of epidemiology with host immune responses
4) Integrate the various government resources directed toward understanding source of Norovirus infection (i.e., United States Department of Agriculture [USDA], DoD)
5) Work with partners to develop a diarrheal disease diagnostic platform rather than many single platforms
   a) Understand platform options as more is learned about prevailing organisms

   b) Integrate with epidemiological studies
6) Disinfectants work should continue to be high priority
7) Take advantage of opportunity to work worldwide to understand the global impact of Noroviruses on diarrheal diseases
8) Influenza and MRSA as top priority
   a) Needed for real impact on public health
   b) Studies that rely on "passive" testing that could result in biased estimates (i.e., Unlike ABC program)
   c) Is this an emerging complication on influenza versus emerging problem with community-associated MRSA?
   d) Conduct surveillance for MRSA in communities to get a more representative sense of MRSA burden prior to influenza
   e) Community study during influenza outbreak to obtain differential risk of influenza admissions with or without MRSA colonization
      i) Risk factors for hospitalization (i.e., vaccination)
      ii) Follow adults and children; family units
   f) Could integrate with ongoing surveillance studies on the impact of universal childhood immunization
   g) Could Vaccine Safety Datalink (VSD) be used for vaccine coverage information to link with epidemiological studies?
   h) Integrate perspectives across diseases (e.g., influenza and Streptococcus pneumonia)
   i) Investigate all ages even though deaths among children are prominent concern
   j) Understand meaning/clinical importance of Streptococcus aureus in children with influenza
      i) Don't be pulled away from focus on influenza, unless it is important
      ii) Understand host response
9) Vaccine Analytic Unit (VAU)
   a) Define the value of the VAU to civilian health such as safety of adolescent vaccines and safety of vaccines for biological threats, etc.
   b) Is it able to pick up expected events (i.e., positive control)?
   c) How can the VAU be linked to the VA database or others?
   d) Retain infrastructure/capacity at CDC for analyzing the DMSS data.
   e) Integrate CDC's vaccine safety analytic groups with other federal agencies to review vaccine safety and benefit from focus.
      i) Is this an integral part of the national vaccine safety research system, outside of the needs of DoD? Can it be integrated?
10) Respiratory Disease Activities
   a) Broaden the policy and science platform (i.e., create a flexible infrastructure, possibly syndromic, rather than a single pathogen-based infrastructure)

b) Consolidate ABCs: critically important
c) Ensure surveillance follow-up on outcomes of ACIP recommendations
d) Explore the links between infectious respiratory illnesses with chronic illnesses (i.e., asthma) and at-risk populations
    i) NCIRD's focus should be combining detailed epidemiological with long-term outcomes
    ii) Relate to the cost burden of these diseases

11) Non-pharmaceutical interventions: from efficacy to behavioral and structural interventions

BSC Discussion

- James Hadler questioned the term "consolidate" in reference to ABCs and it was clarified that the working group emphasized the importance of the activity and reinforcing it not be considered an at-risk program.
- Anne Schuchet thanked the panel for their help in prioritizing and reminding the center to reach out across CDC and other agencies to collaborate and communicate.
- Rima Khabbaz announced a major national MRSA initiative that will be launched summer 2008 with the CDC Foundation and targeted to reach the general public, hard-to-reach populations, and the healthcare community.
- Joshua Metlay emphasized the necessity to create an infrastructure that prioritizes and effectively communicates and ensures vaccine knowledge and safety. He stated the VAU is a tremendous resource, but there are a number of other data resources that should be accessed to ensure safety in vaccine supply.

National Center for HIV/AIDS, Viral Hepatitis, STD and TB Prevention (NCHHSTP)
Ralph DiClemente

NCHHSTP's over-arching issue is Program Collaboration and Service Integration (PCSI) within the Center and across different divisions. The operating definition of PCSI is a mechanism of organizing and blending interrelated health issues, separate activities, and services in order to maximize public health impact through new and established linkages between programs to facilitate the delivery of services. PCSI is focused on improving collaboration between programs in order to enhance integrated service delivery at the client level, or point of service delivery. Identifying PCSI research priorities and methodologies, determining critical research collaborations, developing appropriate research questions and a corresponding research agenda, are the key priorities and desired outcome of the workgroup discussion for each division. Each NCHHSTP division presented discussion questions to the BSC working group for deliberation, but in

the interest of integration, the working group focused its deliberations away from division-specific questions and focused solely on what the working group considered the cross-cutting questions. Recommendations in three categories resulted:

1) Evaluation of effectiveness of integration,
2) Operational research relating to integration,
3) Integrated health communications (rather than disease-targeted integration)

The working group asked the question "Is integration better for disease prevention than siloed preventive care with respect to disease prevention and number and percentages of age of persons at risk screened and vaccinated and routed to care?" The working group recommended CDC should design and carry out several proof of concept trials comparing two similar communities; one with status quo service provision and one with model integration efforts. Models should be flexible taking into account local conditions and including epidemiology. Trials should be funded in equal proportion by each division with a stake in integration being examined and performed in communities with high burdens of relevant conditions and disparities. Outcomes should include change in number of new infections identified and treated, increase in persons screened, vaccinated and treated, cost with the ultimate goal of disease reduction or enhance prevention.

The working group recommended that before developing a new model, an examination of the existing models should take place. To measure current efforts at service and data collection integration for a) TB and HIV, and b) HIV, HCV and STI screening along with HBV and HAV prevention, CDC should conduct a survey of local and state health departments before encouraging further integration.

Recommendations for integration were initially made over 10 years ago, but the working group expressed appreciation that integration is clearly a present priority. Many local and state health departments have strong leadership, independent initiative, and have attempted integration and there are many lessons to be learned in this regard. Surveys should be carefully designed to both qualitatively and quantitatively measure integration of service and data activities that CDC and local and state health departments feel are important. This is an opportunity to identify best practices to complete further observational study.

In regards to operational research and integration, CDC's primary role in evaluating rapid point-of-service screening tests before FDA approval should be to develop models to determine what test characteristics would make them of public health value in the United States and in selected international settings. Sensitivity, specificity, prevalence, and cost should be considered. For tests with characteristics that qualify as public health value, CDC should do whatever is necessary to bring them to approval and to appropriately widespread use. This may include helping with technical development, evaluation of test performance characteristics in practice, reagent quality control, and

development of guidelines for use in practice. CDC should avoid pitfalls of being a competitive developer, but may need to take a safety net development role.

Before a mix of integrated screening services is defined, CDC needs to determine the prevalence of co-infection in the targeted populations with a view to defining thresholds for when integration may be effective. CDC should assure the necessary co-morbidity studies are done so that any subsequent recommendations are supported by data. CDC should perform modeling to inform guidance to local and state health departments for thresholds of co-infection that might make integration desirable. CDC should provide guidance to local and state health departments to design integrated data methods and system and epidemiology studies to inform and help evaluate integration efforts at the local level.

The working group's core integrated health communications recommendation focused on the need for a coordinated center and perhaps agency-wide approach for health communication that involves at least all divisions and Center's Disparities Working Group and the National Center for Health Marketing. The specific recommendations for integration included a) choosing target populations for marketing integrated messages strategically (e.g., adolescents, men who have sex with men [MSM], African Americans), b) making a conceptual map of the message landscape—assess educational priorities for targeted group for each CDC division, c) designing and evaluating integrated health and service-based (not siloed) communications within populations as the subject, d) testing and evaluating integrated health messages in a few selected communities before rolling out nationally, and e) behavioral and health outcomes targeted evaluation.

A literature review should be completed of unintended consequences of health communications to enable a better understanding of potential pitfalls relative to various types of communication efforts. All health communication initiatives, including the CDC Hotline, should be evaluated for cost-effectiveness.

BSC Discussion

- Matthew Boulton commented on the effectiveness of integration and the importance of assessing existing literature on this area citing the Maternal Support Services and Infant Support Services programs, intended to be integrated wrap-around services for pre and post natal care. The programs provided ample validated outcome measures for that integrated public health program. Ultimately, it was defunded nationally despite the fact it appeared to have been effective.
- Samuel Katz questioned whether President's Emergency Plan for AIDS Relief (PEPFAR) funds could be utilized for research and Hazel Dean confirmed that they could not. Gail Bolan clarified PEPFAR was considered for areas of rapid testing and evaluation.

- Anne Schuchet questioned the proportion of service delivery for STD, TB, hepatitis, and HIV in the private sector where it's already integrated. Gail Bolan reported that specific to California, 80% of STDs are seen in the private sector and she also recognized the role of STD and HIV prevention. She stated concern for the number of HIV care providers who do little or no risk assessment and STD testing. She emphasized some TB clinics don't perform HIV testing and there are HIV care centers that don't screen for TB which reflects that despite CDC recommendations, much improvement is necessary. James Hadler reinforced Schuchet's sentiments stating that unlike pediatrics, adult healthcare is usually handled by primary care providers without collaboration or communication with specialty care.
- Hazel Dean thanked the working group and emphasized the following leadership priorities: 1) program collaboration and service integration, 2) health disparities, and 3) global synergies. The center has systematically honed in on these three areas to have the greatest possible public impact.

National Center for Preparedness, Detection, and Control of Infectious Diseases (NCPDCID)
Marci Layton

The working group's discussion focused on the following surveillance systems: a) National Healthcare Safety Network (NHSN), b) Epi and Lab Capacity grant program, c) GeoSentinel, and d) Early Aberration Reporting System.

Layton briefly reviewed the NHSN structure with patient safety, healthcare personnel safety, and research and development components with specific attention to patient safety. Questions posed to the working group in this regard were: 1) Are there any gaps in the healthcare associated infections monitored through the NHSN patient safety component? 2) What priorities should be set to fill any gaps or enhance existing coverage? 3) What strategies and steps can be recommended to achieve new objectives?

The primary gap in surveillance coverage appeared to be that most of the NHSN surveillance is hospital-based and with the trend towards healthcare moving outside of the hospital setting to ambulatory/outpatient and private facilities, it is challenging to capture data, because a) many of these sites are not mandated to report healthcare associated infections (HAI), b) do not have designated staff to monitor and report, c) nor the infrastructure or incentive to participate in CDC's voluntary network. Long term care facilities will probably be addressed as the system expands, but will have challenges due to lack of infection control expertise or infrastructure like hospitals. It was recognized that the healthcare safety worker module didn't capture laboratory acquired infections among laboratory workers. As the system expands, especially with the number of states mandating HAI reporting, the number of sites are increasing which will place strain on

CDC's NHSN infrastructure and requiring focus on data quality assurance. Automated electronic HAI reporting should be integrated with other existing electronic lab and health record reporting systems like RHIOs.

Layton briefly described the Epi and Lab Capacity Program conveying the program's goal as strengthening epidemiology and laboratory capacity in six local and 50 state public health agencies to monitor known infectious diseases, detect new and emerging infectious disease threats, and identify and respond to infectious disease outbreaks. Components of the program include: a) core epidemiology and laboratory capacity, b) NEDSS, Influenza, antimicrobial resistance, border infectious disease surveillance, west nile virus, foodborne, lyme disease, and prion disease.

Discussions took place around the January 2008 ELC external review recommendations consisting of: 1) better defining core epi and lab capacities, 2) reviewing ELC purpose, scope, and direction, 3) defining ELC in relation to other CDC cooperative agreements (PHEP), and 4) strengthening integration of epidemiology and laboratory activities. The working group was asked to review NCPDCID's response to the ELC external review recommendations; ELC Draft Vision, which states: ELC provides leadership, support, and an integrated approach for strengthening states' core infectious disease capacities to improve surveillance and other services leading to a stronger national public health system. The working group was asked how NCPDCID should prioritize and respond to recommendations from ELC external review; thoughts on new vision, how the vision fits into other CDC surveillance efforts and suggested steps in the response plan. Comments on the vision statement included explicitly incorporating "laboratory and epidemiology capacities" in statement rather than generic "infectious disease capacities" and to more clearly define "other services," so as to not only be surveillance focused, but include areas of epidemiology response, education, and prevention. Working group comments generally supported ELC review recommendations. More specifically, ELC fills critical but difficult-to-define gaps in emerging infectious disease (EID) capacity calling for an increased level of "market" importance of ELC to ensure continued funding starting with a systematic assessment of accomplishments to show impact. The working group recognized the need for more well-defined local and national core ID epidemiology and lab capacities with collaborative partners. A well-defined focus should on what makes ELC unique compared to PHEP should be conveyed. The working group suggested having regular ELC meetings with grantees to discuss ELC activities and direction to ensure both epidemiology and lab representation.

GeoSentinel was briefly described as a provider-based surveillance of international travelers and migrants with 41 travel/tropical medicine clinics globally and 173 network members on all six continents. Discussions about the GEoSentinel program focused on: 1) geographic expansion; 2) lab components; 3) incorporating other healthcare sites where travelers are seen, specifically ERs and primary care facilities; 4)

opportunities for integration or cross fertilization with other surveillance systems, and 5) whether nontraditional partnerships should be initiated (e.g., private foundations, corporate sponsors). The working group recommendations included:

1) Targeting expansion to address current gaps in coverage (i.e., geographically, visiting friends and relatives [VFR]);
2) Improve linkages with state/local public health;
   a) alerts to remind GeoSentinel sites to report and/or notify state/local public health of notifiable disease,
   b) use EpiX for sharing key/new findings,
   c) collaborate on surveillance for less exotic diseases (e.g., measles),
   d) coordinate arrangements for reference lab testing at CDC or state public health labs,
3) Explore options for sharing summary data with key clinical and public health partners via data queries;
4) Coordinate with corporate partners both as surveillance sites and for funding opportunities.

Layton provided a brief description of Early Aberration Reporting System (EARS), a tool to assist local and state public health with early detection of possible outbreaks including bioterrorism. EARS is used for monitoring ongoing surveillance systems both for nationally notifiable diseases and syndromic surveillance data from various sources (i.e., emergency department chief complaint). EARS has been used for special event surveillance as in the democratic national convention and the 2004 summer Olympics in Athens, Greece. EARS users can define syndromes of interest and the reporting system is currently in the process of obtaining CDC certification for receiving data (i.e., summarized and aggregate syndromic data), which: 1) will start with influenza-like illness syndrome via CDC Sentinel Provider System, and 2) have the ability for each locale to decide whether or not to transmit data to CDC with a user on-or-off option. The following questions were posed to the working group regarding EARS: 1) How might EARS contribute to surveillance during an event? 2) To what level and granularity should information from EARS users be collected at the federal level during an event?

The working group reached a consensus that EARS was a model approach of developing a tool primarily for state and local public health ownership and data use. There are an increasing number of sites using EARS and ease-of-use will facilitate increased use for event specific surveillance. The working group expressed the following concerns relative to plans for reporting data to CDC:

1) Should be discussed with CSTE for input;
2) CDC should clearly articulate gap in ILI that will be addressed by this approach (e.g., BioSense and International Society for Disease Surveillance (ISDS) distribute system;

3) Granularity of shared data should depend on type of event and disease and geographic area impacted and specific needs of CDC and states.

The working group discussed cross-cutting issues around marketing surveillance and the following questions were posed:

1) How can we better market the successes of the surveillance system?
2) How do we better articulate the status of public health surveillance? What works and what doesn't?
3) How do we better manage expectations?

The working group realized answers to these questions differed depending on the target and recommended separate marketing strategies be developed for different audiences. A Systematic inventory of "success stories" were recommended as well as improving use of CDC website for providing access to and summarizing surveillance data. It was also recommended a marketing approach should be addressed at the CCID level for all ID surveillance systems supported by CDC as well as implementing an integrated approach for other surveillance issues.

BSC Discussion

- Carole Heilman asked whether CDC considered spending effort and time in developing common tools or data sets that can be distributed by the Internet and utilized widely and would thus provide more and broader informational input or is a more siloed approach appropriate. Marci Layton recognized the difficulty of integrating community or demographic information, citing the *MMWR* as the only collated CDC information, which is provided only at state level and pertains only to the notifiable diseases.
- Rima Khabbaz directed members' attention to the distributed booklet with the summary of 52 surveillance systems that were developed during different times for different purposes. She spoke about challenges in light of streamlining these systems, determining gap-value, better articulating marketing surveillance initiatives. Gail Bolan emphasized these surveillance integration challenges are not unique to CCID, but the coordinating center as a whole, taking into consideration geo-coding capabilities, reporting synergies, and workforce capacities. Bolan suggested a more Center-focused approach at looking at these issues, so all ID surveillance systems are considering the issues and building capacity.
- Marci Layton emphasized the working group recognized NCPDCID lost the most in funding and realized the impact that may have on recommendations.
- Matthew Boulton stressed the importance of incorporating ongoing surveillance system formal evaluation with commonly accepted variables: 1) sensitivity, 2) positive predictive value, 3) representativeness, and 4) timeliness.

- Elisa Passiment commented on the importance of data input from clinical/medical laboratories and private laboratories. Occurrences are missed due to confusion from laboratories on what to report or who should be the recipient of the data reporting. In regard to marketing to consumers, a single well-organized portal would increase and improve information communication. Clinical laboratories would welcome the alerts similar to those sent to public health laboratories. Passiment stated a critical missing communication link in the presented programs is the omission of clinical or medical laboratories in identified partners.
- Patricia Samsel stated it was suggested that organizations (e.g., APHL) can provide input on the issue of defining core capacities for national public health laboratories. A suggestion was made for periodic review of surveillance systems. In light of the over fifty surveillance systems, it's very difficult to single out four and assess cross-cutting issues, duplication, and gaps without the ability to compare those not considered.
- Rima Khabbaz informed the Board CCID had a peer preview of the ELC surveillance system and reminded members working group discussions at the last meeting focused on laboratory capacity and stressed the need to address integration and public health laboratory capacity, specifically, measures to be taken at each state, federal, and local levels.
- Mitchell Cohen suggested initiating NACHO contacts when considering core capacities for epidemiology laboratory activities.
- Matthew Boulton emphasized activity around developing a conceptual model for capacity co-convened by CSTE and CDC's office of workforce and career development. APHL, ASTO, and NACHO have been involved on a national expert panel for model development and as external product reviewers. CDC and public health laboratories are considering workforce capacity, but utilizing different metrics and there is interest in coordinating and integrating activities and making this a national quantifiable focus.

National Center for Zoonotic, Vector-Borne, and Enteric Diseases (NCZVED)
Barry Beatty

Barry Beatty summarized the work group's deliberations focusing on the role of NCZVED and its role in the global health arena, specifically in the context of its new emphasis on the ecology of infectious diseases. The NCZVED global activities were reviewed and new programs were described, and the directors presented global health strategy and objectives. These programs serve as excellent models and platforms for the center to perpetuate its global agenda and partner with other agencies to leverage resources and activities to address global response and research needs.

The working group was committed to the focus of NCZVED on the ecology of diseases; it is a well-conceived conceptual framework to address global health addressing ecological, economic, and environmental issues. By incorporating this with modern computational biology, there are opportunities for quantitative, temporal, spacial host-factor analysis for prediction and risk assessment of emerging diseases.

The working group was charged with assessing a number of issues relative to focus, resource allocation, global activity location, and partnerships. It was stressed CDC/NCZVED has an unparalleled opportunity to partner in efforts involving the ecology of infectious diseases, obtain goals in addressing global issues, and catalyze related progress. Mutually-beneficial partnerships could enhance CDC and the working group suggested establishing strong interactions with stakeholders and veterinary medicine and veterinary health, foundations, NGOs, and other agencies in critical need of CDC expertise and facilities. Academic organizations are particularly attractive in terms of research partnerships and external grant programs and would be mutually-beneficial to CDC for strategically leveraging CDC resources and expertise and enhancing and strengthening CDC advocacy.

One action the working group suggested would reinforce the CDC role in the context of global health would be the restoration of the WHO collaborating reference centers in infectious diseases. This would provide a clear indicator to global health partners of CDC's recognition of its critical role in reference center activities and desire to be a true partner in these efforts. The working group agreed the fiscal needs to rejuvenate the reference centers are modest and the bio-political rewards are enormous. The working group views this restoration as a critical activity and it is noteworthy that the division director supported this action.

It was stressed that resource allocation should be more strategic and not only response driven while recognizing much of the budget is program orientated. There was a clear consensus that future portfolios need to be based on improved criteria, algorithms, outcome-based metrics, and risk-based assessment and not determined intuitively. Strategic planning needs to be emphasized, including development of decisional algorithms for focus of global efforts with consideration to disease magnitude, severity, premature mortality, overall morbidity, economic costs, funding availability, political pressure, public attention.

USDA's avian influenza surveillance program may provide a useful model for moving the NCZVED program forward, including stakeholder expectations, program efficacy and other important components. The overall approach provides a decision framework and quantitative analysis of outcomes for program evaluation and implementation. The working group recommended approaching capacity building in a more quantifiable fashion and urges NCZVED to examine existing capacity models which address areas of organizational structure, process outputs, and health outcomes in its decision process in the global sphere. The CSTE logic model of Epidemiologic

Catchment Area Study (ECA) could be utilized by NCZVED to develop its workforce training portfolio. The resulting capacity/assessment index would focus resource efforts where most needed and beneficial.

Broad-based activities were addressed and the working group strongly supported the plan to focus strategically on selected areas for comprehensive in-depth ecology of disease research centers and investigations such as that being developed in Uganda. This will provide new opportunities for multi-disciplinary research in areas noted as hot spots for disease emergence and will break down silos within CDC as well as provide additional opportunities for partnering with non-CDC agencies and groups. Such sites can also serve as an unparalleled training venue for a new generation of tropical disease researchers and public health veterinarians, thereby significantly helping to address national and international needs. One added advantage of the comprehensive ecology disease centers is the downstream ability for medi-analysis of different studies and projects, thereby potentially providing insights to hidden patterns and detriments of disease ecology. The working group also supported the need for different divisions and branches to have a portfolio of smaller projects that are more specifically focused.

The following miscellaneous comments from the working group were reported by Beatty:

- Discussion of decision support systems took place for disease management to assess achievements and outcomes in global health initiatives. The implementation of robust decision support systems in global efforts would provide for systematic collection of data, facilitate analysis, and reporting of information both in retrospective and prospective studies.
- Much discussion took place on potential impediments to the NCZVED global research, specifically issues involving shipment of pathogens, samples, tissues, and vectors which has become increasingly difficult due to regulatory and customs issues. Beatty commented on the potential downstream needs and overseas infrastructure and capacity to perhaps complete much of the work historically completed in US sites. The WHO Regional Measles Laboratory at Uganda Virus Research Institute (UVRI) could emerge as such a facility.
- The working group was strongly supportive of the DPD proposal to consider eradication of neglected tropical diseases, agreeing it is attainable and would resonate with stakeholders, potential funders, and partners.
- John Bennet charged Beatty to bring up the topic of mycotic diseases and the lack of a programmatic fit and less collaborative opportunity. The group discussed where mycotic diseases may be more appropriately located, but no conclusions were reached. The majority of members agreed it was a logical fit, but Bennet requested the issue be raised to the Board to make sure the program is monitored for progress.

BSC Discussion

- Matthew Boulton stated with regard to decisional algorithms, it would be helpful at the coordinating center and individual centers to have resource allocation or emphasized diseases. Boulton questioned how variables (e.g., premature mortality, morbidity, and severity) should be prioritized and weighted relative to low incidence. He questioned how categorical funding availability, public pressure, and political advocacy impacted prioritizing decisions both individually by overall collaborating centers.
- Mitchell Cohen recognized the challenge of prioritizing, more specifically within categories, and allowing greater flexibility would allow increased ability to effectively prioritize.
- Carole Heilman pointed out the areas of interest Beatty mentioned were not large funding activities for CDC and Rima Khabbaz recognized global health as a cross cutting theme and priority for the CCID where there are opportunities to leverage resources.
- Jesse Goodman emphasized the importance of considering the priorities of those in other parts of the world, not just CDC, and Rima Khabbaz mentioned the need to build infrastructure and capacity throughout the world. She reported activities are underway via WHO for building capacity through the international health regulation.
- Lonnie King emphasized relative to NCZVED cross-cutting food and vector borne and zoonotic disease issues there are opportunities to increase interdisciplinary focus, consider international research, and development centers and devise new strategies and intervention and prevention.

APPENDIX I
Board of Scientific Counselors
Members, Representatives
And Guests

Rex Astles, NCPDCID
Cynthia Baur, NCHM/CDC
Barry Beaty
Elisa Beltrami, NCPDCID
John Bennett
Carolyn Black, NCPDCID
Gail Bolan
Aaron Borrelli, CCID/OD
Matthew Boulton
C.B. Bridges, NCIRD
Clive Brown, CDC/CDGMQ
James Buehler
Brent Burkholder, NCIRD
Sal Butera
Blake Caldwell, CCID
Roberta Carey, NCPDCID
Terence Chorba, NCHHSTP
Michael Cohen, CCID
Joanne Cono, CCID
Dele Davies
Hazel Dean, CDC
Ralph DiClemente
Sam Dooley, NCHHSTP/DHAP
Stephanie Dopson
Peter Drotman, CDC
Barbara J. Ellis, CDC/COTPER
David Elswick, CCID/NCPDCID
Michael Fleenor
Kim Gadsden Knowles, CDC/COTPER
John Gittleman
Bruce Gellin,
Jesse Goodman
James Hadler
Jeff Hageman, NCPDCID/DHEP
Rana Hajjeh, CCID/NCIRD
Carole Heilman, NIAID/NIH
James Heffelfinger, NCHHSTP/DHAP
Edward Hook
Duane Hospenthal
Devery Howerton, CDC/DLS
Rosemary Humes, APHL
Samuel Katz
Lonnie King
Philip LaBuer
Marci Layton
Alberto Lifshitz
Susanne Lisla, NCHHSTD
Debbie Mathis, CCID/OD
Suzanne Marks
Eric Mast
Leslie McDonald, NCPDCID/DLS
Mary McCauley, NCIRD
Eric Mast, GID/NCIRD
Michael Melneck,NCHHSTP
Joshua Metlay
Robin Moszeley,NCPDCID
Roger Nasci, ZOED
Jan Nicholson, CCID
Elissa Passiment
Ted Pestorius, NCPDCID/OD
Bob Pinner
Anne Pollack, NCPDCID
Kristin Pope, NCIRD
Conrad Quinn, CDC/NCIRD
Lisa Rotz, NCPDCID
Jeanne Santoli, NCIRD
David Scharf, CCID/OD
Aaron Scott
Salmaan Semaan, NCHETP
Nalini Singh
Vishnu Sneller, CDC
Patricia Somsel
Ronald Stall
Linda Valleroy, NCHHSTP

APPENDIX I (Continued)
Board of Scientific Counselors
Members and Representatives

Chris Van Beneden, CDC/NCIRD
Melinda Wharton, NCIRD
Richard Whitley
Cyndy Whitney,CDC/NCIRD
Sarah Wiley, NCZVED
Jennifer Wright, CDC/NCIRD

Appendix II.
Coordinating Center for Infectious Diseases (CCID)
Board of Scientific Counselors (BSC)
Working Group Members

National Center for Immunization and Respiratory Diseases (NCIRD)
Dr. Anne Schuchet, Director
Dele Davies
Carol Heilman
Duane Hospenthal
Samuel Katz
Joshua Metlay
Richard Whitley

National Center for HIV, Viral Hepatitis, STDs, and Tuberculosis (NCHHSTP)
Dr. Kevin Fenton, Director
Gail Bolan
Ralph DiClemente
James Hadler
Ronald Stall
Michael Fleenor
Edward Hook
Albert Lifshitz

National Center for Zoonotic, Vector-borne, and Enteric Diseases (NCZVED)
Dr. Lonnie King, Director
Barry Beaty
John Bennett
Matthew Boulton
John Gittleman
Aaron Jones

National Center for Preparedness, Detection, and Control of Infectious Diseases (NCPDCID)
Dr. Rima Khabbaz, Director
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