

President's Council of Advisors on Science and Technology (PCAST)
FIRST MEETING
August 6-7, 2009
MINUTES

August 6, 2009

Keck Center of the National Academies, Room 100
500 5th Street, NW
Washington, DC

Members Present: John P. Holdren (Co-Chair), Eric Lander (Co-Chair), Harold Varmus (Co-Chair), Rosina Bierbaum, Christine Cassel, Christopher Chyba, S. James Gates Jr. , Shirley Ann Jackson, Richard C. Levin, Chad Mirkin, Mario Molina, Ernest J. Moniz, Craig Mundie, Ed Penhoet, William Press, Maxine Savitz, Barbara Schaal, Eric Schmidt, Daniel Schrag, David E. Shaw, Ahmed Zewail

Members Absent: None

Staff: Deborah Stine, Mary Maxon

Public Attendance: Approximately 100 observers attended.

The President's Council of Advisors on Science and Technology (PCAST) convened in open session at 10:15 am with Dr. Holdren, Dr. Lander, and Dr. Varmus presiding on Thursday, August 6, 2009.

Agenda Item 1: Welcome and Overview of PCAST

Dr. Holdren, Dr. Varmus, and Dr. Lander, PCAST Co-Chairs, opened the meeting and welcomed the participants at 10:15 am. Dr. Holdren noted that the PCAST meeting was also available live, and in the future archived, via video webcast. The archive of the video webcast is available at <http://www.ostp.gov/cs/pcast>.

Agenda Item 2: Health Care Reform: Health Information Technology

Eric Lander and Craig Mundie moderated this session. The following made presentations to PCAST:

- David Blumenthal, National Coordinator for Health Information Technology

Dr. Blumenthal discussed the challenges of realizing the aspiration of having electronic health records for all Americans by 2014, including adoption of health records, exchange and use of health information, and ensuring innovation in the information technology system. He also discussed a collaboration with the National Science Foundation to fund research on bioinformatics and on health systems or electronic health systems, including a program of supporting research centers in bioinformatics and health information technology.

- Aneesh Chopra, Associate Director and Chief Technology Officer, OSTP

Mr. Chopra discussed issues related to the adoption, exchange and use of health information, and a concern for a system that fosters innovation. Mr. Chopra also described his service on the Health Information Technology (HIT) Standards Committee, a body tasked to contribute to a set of open standards for adoption and exchange of HIT.

- John Glaser, Advisor to the Office of the National Coordinator for Health Information Technology, HHS

Dr. Glaser discussed the need for information at the point of care that contributes to intelligent decisions about patients' health care. Other issues discussed were some of the challenges of dealing with vast amounts of data at the provider and national levels, while ensuring privacy at the level of the individual patient. Dr. Glaser touched on secondary uses of data, comparative effectiveness research, the value of harnessing the power of communities, and the prospects of improved health care as a result of seeking information from around the world using HIT.

PCAST members commented and asked questions of the presenters. The discussion focused on issues such as the importance of the definition of "meaningful use" as it relates to the future of HIT and improved health outcomes, preservation of potential for innovation in HIT, challenges with interoperability of multiple systems, lessons learned from other countries in these areas, the 2011 timeline, the importance of exploratory research enabled by progress in HIT, and remote access to health care enabled by HIT. The Office of the National Coordinator for HIT offered that PCAST could help, and that additional conversations should ensue to help focus issues around the needs of the Office of the National Coordinator.

The co-chairs adjourned this portion of the Open Session at 12:00 Noon.

PCAST reconvened in Open Session at 2:00 pm.

Agenda Item 3: Public Comment Session

PCAST heard from members of the public in person, via the web, and through written comments read by a staff member during this session. The following individuals provided oral comments to PCAST: Joe Tanous, Craig Schiffries on behalf of the Geological Society of America, Dmitry Novik, William Waite on behalf of the Nation's Modeling and Simulation (M&S) Community-of-Practice (CoP), and Brenda Ekwurzel on behalf of the Union of Concerned Scientists. The following provided written comments to PCAST: David Wheeler, Charles Hesley, Semeon Rabinky, William Waite, and Dmitry Novik. Some of these comments were read aloud at the meeting. Additional public comments were provided through the White House Facebook webpage and read aloud at the meeting.

Agenda Item 4: Health Care Reform: Comparative Effectiveness Research (CER)

Harold Varmus and Christine Cassel moderated this session. Dr. Cassel provided an overview of an Institute of Medicine report on Comparative Effectiveness Research. The following made presentations to PCAST:

- Elizabeth G. Nabel, Director, National Heart, Lung, and Blood Institute, National Institutes of Health

Dr. Nabel's presentation included an introduction to CER, the history of CER and the National Institutes of Health (NIH), and included three examples of comparative NIH-sponsored comparative studies that demonstrated the value of CER. Clinicaltrials.gov, a registry of all current publicly and privately funded clinical trials, was mentioned as an important information resource. The Drug Effectiveness Review Project was also offered as a valuable resource for treatment comparison data. PCAST was urged to undertake a study of recommendations relating to CER. Dr. Nabel proposed that PCAST help determine the best structure for CER decision-making, citing public-private partnership, a health board, or a specific agency as possible examples.

- Carolyn Clancy, Director, Agency for Healthcare Research and Quality (ARHQ)

Dr. Clancy provided background information about ARHQ, which is focused on the health care system itself (providing research relevant to Medicare, Medicaid and SCHIP), rather than research for health care, or population health interventions. It was stated that the American Recovery and Reinvestment Act approved \$1.1 billion for CER. Dr. Clancy described a very large initiative called Choice, comprised of ten very large projects focused in real world settings, practical trials or studies that will include a large proportion of populations underrepresented in clinical studies. Dr. Clancy described the value of randomized trials, the primary clinical tool for the previous 60 years that is used to demonstrate if a treatment works, and explanatory trials that elucidate pathophysiologic mechanisms of treatments.

PCAST members commented and asked questions of the presenters. Questions focused on the role of the patient in decision-making, workforce leveraging, integration of new medical findings, new clinical trials for safety and efficacy vs. after-market outcomes marketing trials, genetic differences and CER, and the role of CER in providing evidence for treatments that could contribute to lowering health care costs.

Agenda Item 5: Energy and Environment

John Holdren and Daniel Schrag moderated this session. The following made presentations to PCAST:

- Shere Abbott, Associate Director of Environment, OSTP

Ms. Abbott focused her presentation on issues related to energy, climate and sustainability. As described by Ms. Abbott, climate change, which is due to CO₂ emissions and other heat-trapping pollutants from human activities, will require adaptation, due to the long residence time of CO₂ in the atmosphere, will also require energy technology transformations. She indicated that a goal is to transform the national economy to a low carbon economy, but also to transform the global economy to a low carbon economy through energy technology transformations and other means. In addition, the National Research Council has recommended research toward a better understanding of climate variability and change, and research in understanding the effects of climate change on ecosystem services, on water resources, on natural resources utilization, and on human health. Ms. Abbott described the challenges of the Earth observation systems and data systems that currently exist, and said that addressing these challenges may lead to important decisions that society needs to make to adapt to changes ahead.

- Robert Sussman, Senior Policy Counsel, Environmental Protection Agency (EPA)

Mr. Sussman indicated that EPA's focus is primarily on achieving environmental progress by setting standards and enforcing standards using the tools of regulation to change behavior in the private sector and in the public sector. EPA has identified five science and technology areas that it believes are important in general, and important for PCAST's consideration. The first is a cap and trade program, the next is carbon capture and storage, the third is adaptation, the fourth is energy efficiency, and the last is advanced vehicle technologies.

- Steven Chu, Secretary of Energy

Dr. Chu highlighted the importance of understanding the successes of STEM education as they relate to their ability to be adopted broadly. He also highlighted the power of Wall Street analysts to influence decisions by companies to pursue or abandon long term research. Dr. Chu requested that PCAST review applied research areas at the Department of Energy, and made the point that rigorous scientific analysis of carbon offsets and the national weapons labs are worth PCAST's consideration.

PCAST members commented and asked questions of the presenters. Of the first two speakers, questions focused on end-use efficiency, scale and infrastructure, scope, nature, and distribution of adaptation research, carbon capture and sequestration regulations, the pace of rulemaking for CO₂ emissions, vertical agriculture, and energy delivery system innovation. Of the third speaker, questions focused on the need for new ideas in energy and environment and how to foster them, the intersection of national needs with business markets, the value of mission-driven research vs. curiosity-driven research, and the forcing function of computing and supercomputing in energy research.

The co-chairs adjourned this portion of the Open Session at 6:00 pm.



August 7, 2009
White House Conference Center
726 Jackson Place
Truman Room
Washington, DC

PCAST reconvened its open session at 10:00 am.

Agenda Item 6: PCAST, OSTP, and the Obama Administration's Science and Technology Agenda

John Holdren discussed science and technology activities in the Administration.

Dr. Holdren highlighted the President's commitment to science and technology, referencing the President's inclusion of science and technology in his campaign, his inauguration speech, his speech to the Joint Session of Congress at the start of his administration, at the National Academy of Sciences annual meeting at the end of April, and in the speech he gave in Cairo. Also highlighted as commitments to science and technology were the appointments the President has made, including a Nobel Laureate in physics heading the Department of Energy, and one of the world's leading marine biologists heading the National Oceanographic and Atmospheric Administration; a total of perhaps a dozen members of the National Academy of Sciences, the National Academy of Engineering, and the Institute of Medicine have high government positions in this Administration. The American Recovery and Reinvestment Act of 2009 was cited as the largest boost in investment for research in the history of the country. Also mentioned were details of the structures of OSTP, PCAST and National Science and Technology Council, and the importance of the relationship of science and technology to economic recovery and growth.

Agenda Item 7: Healthcare and Life Sciences Subcommittee Report

Harold Varmus and Eric Lander described the activities of PCAST's H1N1 Working Group, which they co-chaired. They then provided an overview of both the working group report and PCAST's Executive Report on H1N1. Specifically, features of the report discussed included: the value of scenario planning, the importance of reviewing surveillance systems, and appropriate responses in the areas of vaccines, antivirals, and appropriate medical capacities. Barriers were discussed, such as legal, social, and financial, as was the importance of communications in the course of a response to the H1N1 epidemic. Finally, there was also some discussion about future preparedness kinds of activity that might be valuable to undertake in the future. Dr. Varmus stressed that the Working Group was impressed with

the government's response to the H1N1 situation, stating that it was perhaps the best response ever to an epidemic event.

PCAST then discussed the report and asked questions of the co-chairs. Questions focused on whether or not the virus is expected to mutate, cross-governmental responses to the epidemic, interactions of nongovernment organizations during the response, whether extreme scenarios had been envisioned, timing of vaccination efforts, and the value of lessons from the H1N1 Working Group's efforts.

PCAST unanimously APPROVED the *Report to the President on U.S. Preparations for 2009-H1N1 Influenza* subject to final editorial changes by the co-chairs.

Barbara Schaal described possible PCAST activities in the area of food and agriculture. The following were mentioned: sustainable agricultural practices with lower environmental impact, food quality, food safety, and the tradeoff between producing food and producing biofuels. Dr Schaal described the National Institute for Food and Agriculture, an authorized but not yet funded agency that will be part of the U.S. Department of Agriculture focused on basic research of some of the above issues. Questions focused on global agricultural productivity projections and trade implications, a broader group of crops for future consideration in light of multiple stressors such as temperature, drought, flood frequency, and pollutants, collaborations with the DOE given agriculture and biofuels, and molecular biology and genetic engineering of crops.

Christine Cassel discussed possible PCAST activities on CER, HIT, and cancer research. Specifically, Dr. Cassel mentioned a role for PCAST in making recommendations focused to create a lasting infrastructure with patient-centered inputs and patient availability of data. Discussion addressed the value of developing a dynamic HIT system that can power CER studies while allowing innovation to ensue. She also discussed the potential benefits of bringing together HIT, CER and cancer research specifically.

Agenda Item 8: General PCAST Study Strategy and PCAST Subcommittee Reports

Each subcommittee then described possible activities PCAST might undertake. James Gates, Rosina Bierbaum, and Ahmed Zewail provided the report of the Science, Technology, Engineering, and Mathematics (STEM) Education Subcommittee. Dr. Gates mentioned a potential study to increase the number of K-12 teachers with expertise in science, engineering, mathematics and technology in general, a study focused on curriculum goals, and other topics were mentioned such as national standards, the role of IT in STEM education and the potential for IT-based classrooms, and the role of community colleges in STEM education.

Daniel Schrag, Ernest Moniz, and Rosina Bierbaum provided the Energy and Environment subcommittee report. Topics under consideration included cap and trade related prospects such as carbon offsets and carbon capture and storage. The need for climate observations and long term monitoring was mentioned, as was the need for innovation in energy. The National Academy study, *America's Climate Choices*, was described as potentially useful in focusing relevant questions for further discussion.

Shirley Jackson, Eric Schmidt, and Chad Mirkin provided the Innovation and Technology Subcommittee Report. Opportunities at the intersection of advanced manufacturing and advanced computing and communications, but with specific foci in health care and in energy, were mentioned. Another possible area for PCAST's consideration is how to ensure that super scale data facilities are available to the research community, a problem that will require advances into networking and its deployment, as well as optimization of investments of new money in these areas.

Rick Levin provided the Economic Development Subcommittee Report. Topics under consideration include a study of policy objectives and the instruments available to achieve them, a study focused on the opportunities for new kinds of fundamental infrastructure investments that would enable the emergence of new industries, and a study designed to look at how to enable the growth of new industries either by big infrastructure investments or by developing standards.

William Press and Christopher Chyba provided the International Security Subcommittee Report. Topics included understanding space debris and how it will affect not only the United States but the other spacefaring nations to use space for commercial and peaceful purposes, and a survey of the national portfolio of S&T activities in support of homeland security.

Harold Varmus described a possible International Science and Technology activity in the report for the Interdisciplinary Aspects of Science and Technology Subcommittee Report. A topic discussed was the role of science and technology in foreign affairs through State Department activities in embassies and through exchanges of personnel and other activities to enhance our reputation abroad.

Eric Lander indicated that PCAST was interested in hearing from the members of the public regarding their thoughts on what PCAST studies should have the highest priorities.

Dr. Holdren, Dr. Lander, and Dr. Varmus adjourned the meeting at 1:00 pm.

Respectfully Submitted:



Deborah D. Stine
Executive Director
President's Council of Advisors on Science and Technology



Mary E. Maxon
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President's Council of Advisors on Science and Technology

Approved:



John P. Holdren
President's Council of Advisors on Science and Technology



Eric Lander
Co-Chair
President's Council of Advisors on Science and Technology



Harold Varmus
Co-Chair
President's Council of Advisors on Science and Technology

Attachments:

Appendix A: Christine Cassel, PCAST Member, "Institute of Medicine Initial National Priorities for Comparative Effectiveness Research," Powerpoint presentation.

Appendix B: Carolyn M. Clancy, Agency for Healthcare Research and Quality, "Comparative Effectiveness Research: Informing Health Care Decision Makers," Powerpoint presentation.

Appendix C: Elizabeth Nabel, National Institutes of Health, "Comparative Effectiveness Research: National Institutes of Health," Powerpoint presentation.

Appendix D: Written Comments Received from David Wheeler, Charles Hesley, Semeon Rabinky, William Waite, and Dmitry Novik.