

**NATIONAL CONVERSATION ON PUBLIC HEALTH AND CHEMICAL EXPOSURES
SCIENTIFIC UNDERSTANDING WORK GROUP**

**Meeting No. 5 Summary
In-person meeting
April 22–23, 2010**

Meeting Objectives:

- Present and discuss summaries of subgroup deliberations since the March 22 *National Conversation on Public Health and Chemical Exposures* Scientific Understanding Work Group (Scientific Understanding Work Group) conference call
- Determine and discuss key issues of interest to the full Scientific Understanding Work Group
- Focus and narrow topics for recommendations
- Clarify expectations for the next phase of work
- Determine work plans

I. Action Items

April 23: Welcome, Review of Day's Agenda	Who	Completed by
1. Send out sample Scientific Understanding Work Group recommendation to members	Kim DeFeo	May 10, 2010

April 23: Determine Next Steps	By Whom	By When
2. Send out proposed milestones and recommendation comparison matrix	Gail Bingham	May 6, 2010
3. Send out Doodle online scheduling system messages to schedule next calls	Gail Bingham	May 6, 2010
4. Schedule next subgroup calls	Subgroup leaders	As needed
5. Subgroup reports due to Kim	Subgroups	May 12–14, 2010

II. Agreements Reached

- The group agreed to a draft schedule of the next steps that Gail Bingham and Kevin Teichman proposed. Ms. Bingham agreed to send a final version to discuss with the group.

III. Meeting Summary

April 22, 2010

Welcome, Introductions, Meeting Goals, Outcomes, Ground Rules and Agenda Review

Dr. Teichman, Scientific Understanding Work Group chair, welcomed the group and commended everyone for the good work to date. He reminded the group that its main task is to develop 12 recommendations to send the *National Conversation on Public Health and Chemical Exposures* Leadership Council. He asked members to remember the scope of the work group's charge—recommendations should focus on improving the scientific understanding needed to better protect people from harmful chemical exposures. Dr. Teichman stressed that if the group feels recommendations are important, but do not fit under the group's purview, they can be shared with the appropriate work group (e.g., Policies and Practices, Education and Communication).

Abby Dilley, RESOLVE facilitator, reviewed the agenda and highlighted that the subgroups would have time to meet to work on their recommendations. She clarified that subgroups should focus on developing their recommendations and provide written background, context and references to Ms. DeFeo so subgroup efforts can be combined into a cohesive report. The format of the work group report template can be found on the project management site here: http://www.nationalconversation-projectsite.org/scientific_understanding/node/1764. Members of all work groups may comment on the report by providing feedback via the project management site.

In response to a member's question, Ms. Bingham, RESOLVE facilitator, shared that the Leadership Council is still seeking a co-chair. She also reported the creation of a Federal Coordination Team, comprised of Leadership Council members who represent federal agencies. The Federal Coordination Team aims to ensure that federal agencies have an opportunity to:

- (1) exchange ideas with one another about the process;
 - (2) provide input and feedback to the Leadership Council and its co-chairs;
 - (3) identify ways in which federal agencies can contribute to the success of the process;
- and
- (1) discuss recommendations that emerge and steps for considering both agency-specific and interagency actions, utilizing the decision making processes appropriate to each agency.

This team will meet regularly with Ms. Bingham, Henry Falk and Nse Witherspoon.

Subgroup Reports and Discussion

Frameworks Subgroup: Jeff Jacobs, leader of the *National Conversation on Public Health and Chemical Exposures* Scientific Understanding Work Group Frameworks Subgroup (Framework Subgroup), reported on this subgroup's progress. He shared that the focus on this subgroup has been cumulative risk, vulnerable subpopulations, and technical recommendations for improving risk assessment. Dr. Jacobs recognized that there is considerable overlap between the work of this subgroup and the work of the *National Conversation on Public Health and Chemical Exposures* Scientific Understanding Work Group Communities Subgroup. Dr. Jacobs also noted that many of the issues that these subgroups have under consideration might be more relevant to other work groups. He suggested that the two subgroups combine into one. Other members suggested that while certain issues, such as the precautionary principle, might relate to the

National Conversation on Public Health and Chemical Exposures Policies and Practices Work Group, the Scientific Understanding Work Group can look at what kinds of scientific information we need in order to be able to implement the precautionary principle.

Communities Subgroup: Doris Cellarius, leader of the *National Conversation on Public Health and Chemical Exposures* Scientific Understanding Work Group Communities Subgroup, reported that this subgroup is focused on writing recommendations. The Communities Subgroup is considering topics related to communities needing to know more about chemicals that are used in their communities, community involvement in health studies and assessments, more funding opportunities to assist them in protecting their health (e.g., TAG grants), and increased access to local clinics. Members of the other subgroups shared ideas including considering training for community members on how to contribute scientific data, suggesting an ombudsman to advocate for community members and help them navigate government bureaucracy, and mandating agencies to involve communities.

Technologies Subgroup: Jean Harry, leader of the *National Conversation on Public Health and Chemical Exposures* Scientific Understanding Work Group Technologies Subgroup, reported that this subgroup has been focused on where technologies are taking us and how developing, improving, and validating new laboratory tools could significantly improve our ability to understand the hazards and risks chemicals pose. Dr. Harry is not quite sure how technologies might be helpful to implementing the precautionary principle and asked for help on this. The group also is looking at how to translate in-vitro to in-vivo results. Dr. Harry stressed that biologically relevant doses need to be taken into account in toxicity testing. She talked about the need to coordinate exposures with body burdens, perhaps by looking at genetic signatures coming out of people. She talked about lifecycle assessment and the need to look at chemicals not only in production, manufacturing, use and recycling but also at how they are metabolized. She suggested that more work needs to be done to ensure effective biomonitoring and noted that better understanding this could lead to enhanced remediation strategies. She discussed the need to develop ways to look at short-acting chemicals that may have adverse affects during critical windows of development.

The members discussed these ideas. One member suggested that when we consider exposure assessment we should also consider how to help people make decisions about how to protect themselves from exposures. For example, could we promote simple consumer-based testing that would allow people to understand their exposures and make decisions on how to protect themselves? Establishing environmentally controlled hospital units to get patients to a clean baseline, thus yielding data and perhaps treatment regimens, was also suggested. The idea of standardizing uncertainty values across agencies to reduce confusion to the public, especially policy makers, was also introduced.

Databases Subgroup: Mark Buczek, leader of the *National Conversation on Public Health and Chemical Exposures* Scientific Understanding Work Group Databases Subgroup, reported on this subgroup's progress. Mr. Buczek noted the overlap between the Databases Subgroup and the *National Conversation on Public Health and Chemical Exposures* Monitoring Work Group (Monitoring Work Group). The Monitoring Work Group started collecting a list of relevant databases, which the Databases Subgroup has expanded. The list can be found online here: http://www.nationalconversation-projectsite.org/scientific_understanding/node/1885. The Databases Subgroup's main recommendation will focus on the need to create a database where researchers and the public can easily access information from several databases at one time. This subgroup is looking at other database models, including the U.S. Environmental Protection Agency's HERO database. The idea of including a way to rate the quality of the

information that would be accessible through this database was brought up in a group discussion.

Individuals Subgroup: Claudia Miller, leader of the *National Conversation on Public Health and Chemical Exposures* Scientific Understanding Work Group Individuals Subgroup, reported on this subgroup's work. Dr. Miller noted that chemical loss of tolerance is a growing issue and that we need more research to better understand why people are developing intolerances that are not traditionally considered related (i.e., intolerances to foods, medications, and chemicals). The Individuals Subgroup is focusing on gene-environment interactions, research that targets chemically susceptible populations, developing relevant databases and a mold registry, research to identify and test approaches to reduce personal exposures, indoor air quality, and toxicant-induced loss of tolerance.

The question of how detailed subgroup recommendations should be arose. Ms. Bingham suggested that the more specific the action and the clearer the actors, the more helpful the recommendation will be. The members of some subgroups expressed concern over how to fund implementing their recommendations. Other members encouraged the group to think about innovative funding mechanisms, such as the tax that was implemented on the use of hazardous materials in Massachusetts.

Identification and Discussion of Cross-Cutting Issues

Issues that are cross-cutting between the work groups were discussed. Dr. Teichman stressed that the final work group recommendations will be coming from the group as a whole; so it does not matter which subgroup takes up certain issues for consideration as long as issues are not lost. A member asked how the group will prioritize its recommendations. The group was reminded that it had developed criteria by which to evaluate its recommendations, and it was suggested the group use those after we get a full list of possible recommendations.

It was decided that the Frameworks Subgroup will address the issue of critical windows of development. Product labeling and disclosure were discussed. It was agreed that scientific questions related to this would be discussed by the Scientific Understanding Work Group and issues more related to the Policies and Practices or Education and Communication work groups, would be referred to them. A Scientific Understanding Work Group member stressed the importance of increasing the scientific understanding of the cumulative effects of multiple, low-level exposures over time. The Frameworks Subgroup is addressing this issue. Stephen Lester agreed to help frame this issue in the subgroup report.

Discussion of Input from the Web Dialogue, NACCHO, ASTHO Meetings

Kim DeFeo, a NCEH/ATSDR staff member, presented a report on input that was received on the *National Conversation on Public Health and Chemical Exposures (National Conversation)*. The input was gathered from web dialogues and meetings held by the National Association of County and City Health Officials (NACCHO) and the Association of State and Territorial Health Officials (ASTHO). Ms. DeFeo encouraged Scientific Understanding Work Group members to think about whether this input helps them prioritize their recommendations or identify any gaps in issues the subgroups have been considering. She encouraged each work group member to read the reports in full.

Ms. DeFeo explained that ASTHO sent a survey out to environmental health directors and held a state forum to get feedback on the *National Conversation* and the six work group topic areas. NACCHO hosted two forums to generate input from local health directors on the topics of the six work groups, including what gaps in information exist at the local level. Three hundred twenty-

eight people participated in the web dialogues and shared their thoughts on the *National Conversation* process and ideas for consideration by the work groups and Leadership Council.

Some common themes from these three sources include:

- The need for more exposure data and links to health outcomes
- The need for exposure information on newer concerns: endocrine disruptors, pharmaceuticals, bio-solids, recycled water, mold, composting waste, nanotechnology and “green” chemicals
- The need for more information on the effects of multiple and low-dose exposures
- The need to understand more about how timing of exposures can affect development
- The need to study health outcomes other than cancer and reproductive effects
- The need for companies to share proprietary information so that we know what we are exposed to
- The need for more information on connections between chemical exposures and chronic diseases
- The need to understand how chemicals effect vulnerable populations
- The need for honest, independent research free of conflicts of interest
- The need to move research results into action
- The need to move beyond Risk Assessment
- The need to implement the precautionary principle

Several recommendations came out of these public input mechanisms including:

- Develop clear action levels and guidance on what is safe;
- Research the impacts of cumulative exposures;
- Develop a database to collect information on those who have been injured by chemicals;
- Develop a national clearinghouse of information to give the public easy access to existing data; and
- Implement the precautionary principle.

Subgroup Meetings

The members of the subgroups spent the rest of the day meeting in their subgroups to flesh out their reports and develop their recommendations.

Public Comment

No members of the public were present to give public comment.

Additional Work Time

Ms. DeFeo reviewed how to use the project management site. While subgroups may coordinate their work however they wish, it will be especially important to use the project management site when the group begins to edit its work group report.

April 23, 2010

Welcome, Review of Day’s Agenda

Dr. Teichman convened the meeting and announced, due to Ms. Dilley’s work commitments, Ms. Bingham would facilitate the Scientific Understanding Work Group. He thanked Ms. Dilley for her hard work and welcomed Ms. Bingham to the team. Ms. Dilley then reviewed the day’s agenda and the subgroups reconvened to discuss their recommendations for presenting to the group.

Reports from Subgroups

Below are the draft recommendations that each subgroup presented to the work group.

Databases Subgroup

- Improve knowledge of existing databases and increase the accessibility of the information across multiple databases by:
 - a) Establishing a National Data Management Advisory Committee (short-term). This committee would include representatives from the major government agencies, the public health field, medical professionals, and chemical industry, industries that depend on chemicals, academia, non-governmental organizations and the general public. The committee would need to be independently funded and be given access to all relevant sources of data across the various agencies. This committee would facilitate the collection of the data registry and would assess the relative quality of the information. It would deal with issues of confidential or non-public information. It would look for relationships between data currently held separately to facilitate understanding how chemical hazard, exposure, bioaccumulation, human health and disease information are interrelated.
 - b) Creating a National Registry of significant databases (medium-term). There is a need to understand what information currently exists in the various databases maintained by various federal and state agencies and other sources. The Databases Subgroup has started to compile a list and has accumulated more than 100 such databases. As part of this effort, it will need to be determined how many of these data are unique and how many are repetition from another source. This effort should expand beyond the borders of the United States to include the European Union, Canada, and Asian sources. The registry would be made available to the public, however decisions on the treatment of confidential and non-public information will need to be taken.
 - c) Creating a knowledge-based search engine to access data across multiple agency databases (long-term). As an aspirational goal the group would like to develop search engine capabilities to access multiple data sources across federal, state and potentially international sources. The intent would be to develop a knowledge-based system, rather than an information-based one, capable of asking more detailed questions that would allow a user to limit responses to those that contain relevant data. For example, asking for information on a specific item such as brominated flame retardants would yield thousands of data; however, phrasing the question to address a specific health concern in a specific situation would give only meaningful data.

This effort will require a focus on identifying interrelationships of data between chemical hazards and exposure to human and public health data. There will be no shortage of issues to be addressed, such as data quality, data gaps, responsibility of the information provider, etc. The effort will require significant resources and should be directed by the Advisory Committee.

Frameworks Subgroup

- Improve utility of Risk Assessment
 - Stakeholder engagement
 - Design of Risk Assessment (part of overall approach and not paradigm), improve scoping, and study design

- Improve technical analysis
 - Define and better describe uncertainty, “margin of safety,” and dose-response analysis
 - Selection and use of defaults
 - Unified approach to dose-response
 - Vulnerable subpopulations, such as children, elderly, immune-compromised, and women
- Develop approach for Cumulative Exposure Assessments
- Developing Scientific Criteria for using precautionary approach
- Suggest Criteria for Alternatives Assessment
- Scientific Criteria underpinning need for TSCA reform
 - Require full reporting and disclosure for all chemicals
 - Prioritize chemicals of concern
 - Establish protective safety standards that are based on all available analyses, including scientific risk assessments and alternative assessments

Technologies Subgroup

- Foster integration of a systems biology approach into 21st century risk assessment. For the short term, apply a systems biology approach to NIEHS research program on bisphenol-A. Systems biology is generally considered to be the integrative study of the behavior of all linked components making up the entity being studied and is complementary to the reductionist approach of breaking the system into its component parts. A systems biology approach for holistic study of environmental disease and risk assessment spans multiple levels of biological organization between molecules, cells, tissues, individuals and populations. Real-world exposure information is required to translate molecular insights into risk assessment for individuals and populations.
- Support research to explore the usefulness of environmental forensics to assess the historical levels of exposure and the potential to identify relative contributions of natural and anthropogenic sources of environmental exposures.
- Refine the uncertainty factors:
 - Determine if they sufficiently cover the range of human response to toxicants
 - Epidemiological studies to evaluate a range of response to toxicants influenced by non-chemical stressors, age, body weight, genetic factors, and others
 - SNP data to capture the range of metabolic activity
 - Use new and existing experimental models for empirical dose response studies
- Improve in-vitro and in-silico screening programs:
 - To Incorporate PBPK models
 - To include endogenous biotransformation data relevant to human exposure
 - To provide dose information relevant to in-vivo studies
 - To provide relevant information for human studies

Individuals Subgroup

- Characterize the nature of and determine the prevalence of chemical intolerance and chronic disease in selected exposed populations and patient groups (including the use of the QEESI).
- Examine gene-environment (GxE) interactions in complex diseases and chemical and mold exposed groups by establishing a private-public consortium to integrate existing databases and biorepositories and promote GxE studies that piggyback on existing genetic or environmental initiatives when possible.
- Facilitate research, diagnosis, and treatment of chemically exposed patients using environmentally controlled medical units (EMUs)
 - 1) Trained doctors in EMUs use
 - 2) Facilities funded by insurance companies
- Establish interagency research on toxicant-induced loss of tolerance (TILT) using clinical, epidemiological, and animal studies
- Better determine the degree of sensitivity to the levels of chemical exposures in the general population to validate margin of safeties used in the development of comparison values (e.g. reference dose, minimum risk level)

Communities Subgroup

- Research and identify solutions to the obstacles preventing states from adopting and implementing the Massachusetts Toxic Use Reduction model.
- Identify and evaluate the effectiveness of the scientific methods currently used to respond to questions about increased community health problems.
- Social science research is needed to determine how to fully and effectively incorporate public involvement into the development of the type, design, methods, scope, and data in the study of their community.
- Vulnerability characteristics of communities need to be identified and defined in both structure (e.g., socio-economic factors, current and past exposure conditions, proximity to pollution sources, economic trends, environmental degradation) and function (e.g., social organization, capacity to address impacts, public health issues).
- Ethnic communities, such as Native Americans and Hispanics, require site or community specific exposure factors to be included in health and risk assessments that determine the effects from contaminants.
- Evaluate the effectiveness of health assistance provided to communities evaluated under Superfund or other programs addressing contaminated communities.

Analysis of Work Group Progress

Dr. Teichman shared that he was pleased that the group is making good progress on honing the recommendations and determining priorities.

Determine Next Steps

Ms. Bingham presented a draft work plan for accomplishing the work group's goals. She shared a draft timeline and a draft comparison matrix for the group to use to help prioritize its recommendations. Ms. Bingham told the group she would e-mail this information to everyone for consideration after the work group meeting. The group was asked to submit subgroup reports (ideally in the format of the work group report template) to Ms. DeFeo between May 12–14. These will then be compiled for group discussion so that the group can prioritize recommendations using the proposed comparison matrix.

Wrap Up and Adjourn

Dr. Teichman thanked everyone for their hard work and for the progress the group has made. Ms. Bingham promised she would send out requests shortly in order to set the dates for the upcoming meetings.

IV. Participation

Members Present

George Alexeeff, Cal EPA
Cherri Baysinger, MO Department of Health and Senior Services
Nancy Beck, Physicians Committee for Responsible Medicine
Mark Buczek, Supresta – retired
Doris Cellarius
Bob Hamilton, Amway Corporation
Susan Hanson, Shoshone-Bannock Tribe
Jean Harry, NIEHS
Rebecca Head, Monroe County (MI) Health Department
Wade Hill, Alliance of Nurses for Healthy Environments
Jeff Jacobs, American College of Occupational and Environmental Medicine
Kristi Jacobs, FDA
Stephen Lester, Center for Health, Environment and Justice
Fred Miller, NIEHS
Claudia Miller, UT Health Science Center at San Antonio
Frank Mirer, Hunter Urban Public Health Program
Lisa Nagy, The Preventive and Environmental Health Alliance
Melissa Perry, Harvard University
Stu Schmitz, Iowa Department of Public Health
Rich Sedlak, The Soap and Detergent Association
Margaret Shield, Local Hazardous Waste Management Program, King County (WA)
Russ White, American Petroleum Institute

Regrets

Frank Bove, ATSDR
Jeff Fisher, College of Public Health, University of Georgia
Jim Klaunig, Indiana University Center for Environmental Health
Deirdre Murphy, EPA
Rick Niemeier, NIOSH

Facilitation and Staff Team Members Present

Gail Bingham, RESOLVE
Adam Brush, NCEH/ATSDR

Final Document

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Abby Dilley, RESOLVE
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Kevin Teichman, EPA