



Chemical Exposures: State Ideas for Safeguarding Health

Association of State and Territorial Health Officials

Final Report

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Acronyms

APHA – American Public Health Association
ASTHO – Association of State and Territorial Health Officials
ATSDR – Agency for Toxic Substances and Disease Registry
BPA – Bisphenol A
CAA – U.S. Clean Air Act
CARE - Community Action for a Renewed Environment
CDC – U.S. Centers for Disease Control and Prevention
CEHA – Community Environmental Health Assessment
CERCLA – U.S. Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)
CPSC – U.S. Consumer Product Safety Commission
CWA – U.S. Clean Water Act
ED – Emergency Department
EPA – U.S. Environmental Protection Agency
FDA – U.S. Food and Drug Administration
GIS – Geographic Information System
HIPAA – U.S. Health Insurance Portability and Accountability Act
ICS - Incident Command Structure
IRIS – Integrated Risk Information System
LRN - Laboratory Response Network
NACCHO – National Association of City and County Health Officials
NCEH – National Center for Environmental Health
NHANES – National Health and Nutrition Examination Survey
NOAA – U.S. National Oceanic and Atmospheric Administration
OSHA – U.S. Occupational Safety and Health Administration
PACE - Protocol for Assessing Community Excellence
PBDEs – Polybrominated Diphenylethers
RCRA – U.S. Resource Conservation and Recovery Act
REACH - Registration, Evaluation, Authorization, and Restriction of Chemicals
SEHD – State Environmental Health Director
TSCA – U.S. Toxic Substances Control Act
USDA – U.S. Department of Agriculture
USGS – U.S. Geological Survey
VOC – Volatile Organic Compound

Introduction to ASTHO

The Association of State and Territorial Health Officials (ASTHO) is a non-profit organization representing state and territorial (S/T) public health agencies of the United States. ASTHO's mission is to "transform public health within states and territories to help members dramatically improve health and wellness."ⁱ ASTHO's membership includes the chief health official from every state, territory, and the District of Columbia. ASTHO also supports the 120,000 public health professionals these agencies employ. ASTHO's portfolio includes a broad set of program areas, such as environmental health, infectious disease, immunization, injury prevention, preparedness, performance, chronic disease prevention, and maternal and child health. Within the Environmental Health Program, ASTHO staff cover five sub-portfolio areas, including the built and synthetic environment, food safety, the natural environment, environmental health surveillance, and safe water. As part of the built and synthetic environment portfolio, ASTHO Environmental Health Staff collaborate with S/T health agencies on issues related to chemical exposures, green chemistry, and chemical-related policy. It is within this portfolio area that ASTHO has been engaged in the National Conversation on Public Health and Chemical Exposures.

The National Conversation: Background

The Agency for Toxic Substances and Disease Registry (ATSDR) and the Center for Disease Control's National Center for Environmental Health (NCEH) launched the National Conversation on Public Health and Chemical Exposures in Washington D.C. on June 26, 2009. The project brings together federal, state, and local government agencies, professional organizations, tribal groups, community and nonprofit organizations, health professionals, business and industry, and members of the public to create a national action agenda.ⁱⁱ The vision of this initiative is to ensure that the U.S. use and manage chemicals in ways that are safe and healthy for all people.ⁱⁱⁱ Following the National Conversation kick-off meeting, the Leadership Council, and six workgroups were formed. The Leadership Council brings together key environmental and public health leaders to guide the project and will develop a final action agenda drawing on work group reports and ideas generated through other public involvement mechanisms.^{iv} The six workgroups are researching the primary subject areas and will provide recommendations on cross-cutting public health and chemical exposure issues. The six workgroup areas and their basic charges include:

1. **Monitoring** - Facilitating the collection, analysis and interpretation of information on chemicals, including their sources, uses, exposure, and associated health outcomes.
2. **Scientific Understanding** - Filling knowledge gaps on the health effects of chemicals.
3. **Policies and Practices** - Make recommendations for reducing harmful chemical exposures and adverse health outcomes, eliminating inequities, and spurring the development and use of safer alternatives.

4. **Chemical Emergencies** - Preventing, preparing for, responding to, and recovering from acute chemical incidents.
5. **Serving Communities** - Addressing local chemical exposure concerns to promote environmental justice and improve health.
6. **Education and Communication** - Ensuring a well-informed public and a competent network of health care providers.^v

ASTHO's Role in National Conversation

ASTHO has been involved in the National Conversation since its launch in June 2009. ASTHO nominated state environmental health staff for the six workgroups and 19 state employees were selected to officially participate. ASTHO convened a conference call with the 19 selected state health and environmental agency staff in January 2010 to discuss workgroup charges, areas of overlap, and mechanisms to solicit additional feedback from state health and environmental staff. Additionally, ASTHO coordinates its activities with other groups collaborating on this project, including APHA, NACCHO, and Resolve. As a partner, ASTHO was asked to solicit feedback from the state perspective, including that from both state health and environmental agencies. To accomplish this task, ASTHO developed a state needs assessment regarding the National Conversation and hosted a state forum with key state health and environmental personnel to discuss the National Conversation initiative and associated needs from the state perspective. (Note: While the territories were not able to participate in the state forum or needs assessment, they did review this final report and did not have differing opinions than those raised by the states.)

The state needs assessment provided an opportunity for the broader state environmental health community to provide valuable insight to the National Conversation and ensure that state views are sufficiently represented. The assessment contained 27 questions, both open-ended and multiple-choice, which covered ideas related to all six workgroup areas, state needs, and general feedback about the National Conversation. The needs assessment was distributed to State Environmental Health Directors in early February 2010 and was open for six weeks. The survey was opened by 56 people, but only 28 surveys were complete.

ASTHO also held a state forum to discuss the National Conversation initiative and relevant issues on March 16, 2010 in San Antonio, Texas. Invited participants included state health and environmental staff who applied for the official National Conversation workgroups but were not selected. ASTHO invited participants from all 10 HHS regions to gain a better understanding of the different needs of state health and environmental agencies concerning chemical reform. Forum participants discussed the six workgroup areas, results of the state needs assessment, and helped identify major priority issues for chemical reform. There were 12 participants in the state forum, representing Alaska, California, Connecticut, Georgia, New Hampshire, New York, Oregon, Texas, Utah, Virginia, Washington, and Wisconsin. The participants were mainly state toxicologists, but also held expertise in the areas of

preparedness, laboratory threats, children's health, or chemistry. There were 10 participants from state health agencies, and two participants from state environmental agencies.

Summary Results from the Needs Assessment and State Forum

The needs assessment and state forum focused on questions related to the six National Conversation workgroup areas in an attempt to better understand state needs on these topics. The following six sections of this report discuss the responses ASTHO received from state health and environmental agencies on their needs regarding monitoring, scientific understanding, chemical emergencies, policies and practices, education and communication, and serving communities.

Monitoring

Since monitoring is such a broad topic, this workgroup's discussions at the state forum were broken down into three main areas:

1. What data needs to be collected?
2. How is it/should it be collected?
3. How is the data used?

What data needs to be collected?

The largest need identified by the states is the lack of sufficient data for a large number of chemicals, resulting in many unknowns. Since many chemicals were grandfathered-in through TSCA, there are limited toxicity data or health effects associated with them. Without this data, it is difficult to predict risk, set acceptable exposure levels, and determine associations between exposure and adverse health outcomes. This was identified as a problem for states.

The second largest need for data revolves around chemical storage and transportation. State health agencies would like to know which chemicals are stored in their state, storage locations, and travel routes. This would also aid in identifying the high risk areas for chemical spills, thus highlighting areas that are at higher risk for chemical exposure within the state. Recognizing that knowledge of this information can pose a security risk, there would have to be adequate education on the proper uses and communication of this data with parties outside of the health agency.

The third largest need is for more biomonitoring data. Current biomonitoring programs only look for roughly 10% of chemicals, which leaves many ubiquitous chemicals untested. More clinical data will allow environmental health professionals to better understand the linkage between certain chemicals and adverse health outcomes, identify geographic areas where people have higher body burdens of chemicals, and provide the information needed for legislators to take action around a certain chemical. If data is not known, it is difficult to prove a chemical is harmful or restrict its use.

Other needs included:

- Understanding the public health outcomes of mixtures and multiple sources of exposure.
- Understanding the economic costs of adverse health outcomes due to chemicals.

- Information on fate and transport of chemicals, as well as their degradation products.
- Data on chemical releases by industrial facilities.
- Health outcome data directly and quantifiably linked to actual exposure data.
- More information on phthalates, BPA, PBDEs, and short-chain chlorinated paraffins.
- Better data on indoor air quality (e.g., VOCs, mold spore counts, etc.).
- Chemicals in consumer products.
- Toxicological studies for emerging contaminants.
- Testing for urinary metabolites of pesticides.

How should the data be collected?

When asked how monitoring data should be collected, states strongly felt that chemical manufacturers should be involved in the process of collecting and reporting toxicity and health effects data on their products. Similar to the Registration, Evaluation, Authorization, and Restriction of chemicals (REACH) program in the European Union, chemicals should be “guilty until proven innocent.” Thus, before a chemical can be sold on the market, manufacturers should have to supply the data to prove that it is safe for use. Another recommendation is to create cooperative agreements with the European Union and Canada, who already have these programs in place, and allow the three governments to freely share their chemical data with one another. This data sharing is a good way to leverage resources and acquire data on a wider range of chemicals, without doing redundant testing. This tri-government partnership would essentially create a larger pool of data on chemicals.

Another way to improve data collection is to strengthen the reporting rules on chemical exposures, providing real-time, consistent data to state health agencies. This enhanced reporting would be applicable to state laboratories, poison control centers, and other medical providers, and allow state agencies to be more aware of what incidents have occurred within their jurisdictions. The reporting should include information on exposure location and demographics, so follow-up research can target a certain area or community and determine if there are other potentially-exposed individuals.

Other responses included:

- Enhanced groundwater/ private well sampling for naturally occurring metals.
- Tools to evaluate multiple exposure pathways and multiple chemical exposures.
- Inventory of chemical-use logs, sales inventory, emergency department visits related to chemical exposure, and environmental monitoring data.
- Utilizing health mapping of exposure data using GIS.

How should the data be used?

State agencies recognize a strong need for chemical data to be available to their staff. Toxicologists within state health and environmental agencies need access to all available data on chemicals, including proprietary data from chemical manufacturers and data withheld for security reasons. State representatives identified the need to work out a confidentiality system so that state employees have access to the data they need to do their job, without compromising the security of the data. This especially includes data storage and transportation information.

In an effort to strengthen their relationships with poison control centers and capitalize on this resource, state health agencies would like to create a new standard set of questions that are asked by poison control operators when they learn of an exposure. Since this infrastructure and communication system is already in place, adding additional questions to the call template will help state health agencies better track exposure information and protect public health. Weekly electronic reports of this information from poison control centers will help the health agencies keep up-to-date with what is happening in their state.

Scientific Understanding

State forum participants identified the top gaps in the scientific understanding of chemicals and the types of resources needed at the state level to bridge them. States would like to see the following needs addressed:

- Help explaining what health outcomes are linked to certain chemicals and at what levels.
- The need to understand distribution in vulnerable and susceptible populations.
- The need to understand and follow-up on acute exposures (large chemical spills or explosions).
- Better federal coordination and collaboration between government agencies.
- A list of endocrine disrupters.

The second part of the scientific understanding discussions and questions dealt with the types of resources needed at the state level to allow the state agency staff to do their jobs more effectively and achieve a greater understanding of chemical exposures. Resource needs identified included:

- The need for more consistent high-level guidance on risk assessment.
- Better guidance and interpretation of new research as it is developed, including research on emerging chemicals.
- Better understanding of the toxicological mechanisms and etiology of many chronic diseases.

Help explaining what health outcomes are linked to certain chemicals and at what levels

One of the biggest issues facing health assessment staff is determining if adverse health effects are linked with certain chemicals. An uncertain cause-and-effect relationship poses a significant problem for health agencies when they are working with the public because people want concrete answers. During an event, the public will want to know if a certain chemical is causing an illness so they know who is responsible for the medical costs, who should do the cleanup, and how to prevent the exposures from continuing.

In addition to more data, a better understanding of how individual chemicals and mixtures interact with humans and the environment is needed. Without knowledge of the health effects of some individual chemicals, scientists and toxicologists are limited in their ability to explain and predict synergistic effects. In addition, health professionals need a better understanding of the health effects of low-level doses of chemicals over a long-term exposure. Epidemiologists and other health professionals need to compare low-level doses to what people are routinely exposed to so they can adequately determine

appropriate levels that trigger an action. A national chemical exposure repository and better interpretation of this chemical exposure/ biomonitoring data is one way to address this issue. A national repository with more data may also help people better understand chemical toxicity. In addition, ensuring that the Integrated Risk Information System (IRIS) is continually managed and updated is essential in providing the needed support for chemical safety data.

The need to understand distribution in vulnerable and susceptible populations

Understanding how chemical exposures impact different people is very challenging. Some doses of chemicals may not adversely impact everyone in an exposed community, but may have huge health consequences for vulnerable sub-groups, such as pregnant women, children, and people with compromised immune systems. In addition, metabolic and genetic differences also impact health outcomes. There is need for a better understanding of how confounding factors impact vulnerability.

The need to understand and follow-up on acute exposures (large chemical spills or explosions)

In addition to longer term, low-dose exposures, there are also larger acute exposures that need to be better understood. State agencies could benefit from a NHANES-type data collection system for chemical emergencies, large chemical spills, and/or explosions. At these types of exposure sites, there are many environmental samples taken, but little or no matching human data to complement the environmental data. State representatives identified a need for a validated method for sampling chemicals commonly found in humans at acute exposure sites. An expansion of CDC's Laboratory Response Network could be of great assistance. Information should be gathered, not only from members of the public known to have been exposed, but also the emergency responders at the site. States should develop a working relationship with the American College of Emergency Physicians so the two groups can share data.

Better federal coordination and collaboration between government agencies

States cited the need for better federal collaboration and coordination between government agencies to create a stronger, unified front. This is especially important for CDC, EPA, USDA, and USGS when dealing with chemical exposures. State representatives indicated the need for these agencies to work together to develop guidelines for chemical emergency preparation and response, and to clarify the distinct role each agency plays in the overall chemical safety system. States identified the need for additional opportunities to provide feedback to these federal agencies on their guidelines and opportunities to relay other chemical exposure recommendations. At the state level, state health agencies need to work more closely with their state regulatory agencies to ensure that they have more authority or influence when preparing for or responding to a chemical exposure incident.

A list of endocrine disruptors

It would be helpful to have a consensus list of chemicals considered to be endocrine disruptors. The European Union is working on one of these lists. This may present an opportunity to collaborate and share data and recommendations. Once these chemicals are identified, scientists need to better understand their potency, their potential threat to public health, and what their regulatory limits should

be. State forum participants recommended incorporating these chemicals into RCRA or CAA legislation as well.

The need for more consistent high-level guidance on risk assessment

State agencies need a central place to turn for advice on risk assessment. This repository should include epidemiology studies that tie environmental exposures to health effects. Due to tight budgets, most states solely rely on the large federally-funded epidemiology studies as a basis for their own assessments. State representatives identified a strong need for environmental epidemiology activities to be continually funded by federal agencies. States specifically identified a need for more population-based research data with biomarkers and exposure information. In cases where there are no federal studies or guidelines available, states indicated that it would be helpful to have a consortium of health agencies that allow colleagues from different states to discuss chemical exposure problems with one another and come to consensus on chemical risks. State representatives felt that this would be a useful way to leverage resources and make the best decisions with the information available.

Other resource needs included:

- Better guidance and interpretation of new research as it is developed, including research on emerging chemicals
- Better understanding of the toxicological mechanisms and etiology of many chronic diseases

Chemical Emergencies

The main focus of the chemical emergencies discussions and questions was training needs and coordination priorities. Training needs were identified for all levels of government and personnel, with a specific focus on local needs, since local agency staff are the people on the ground and most in-tune with their communities. The top identified training and coordination needs included:

1. Combined agency training that encourages coordination and response from all state and local agencies and groups involved in emergency response.
2. Training focused on chemical emergency preparedness.
3. Training on communication roles for state health agency staff during a chemical emergency.
4. Training for state agency staff on chemical storage in each state.
5. Coordination priorities for state health agencies.

Combined agency training that encourages coordination and response from all state and local agencies and groups involved in emergency response:

- Need for a federally-funded trainer to lead this training.
- Recipients for this training should include state and local health and environmental agencies, hospitals, first responders, local officials, local emergency response personnel, and the National Guard.

- Training on incident command structure (ICS), including basic and advanced training for all relevant personnel.
- Clarification of who is “in-charge” during a chemical emergency in each jurisdiction.
- Training on current surveillance programs.
- Coordination with the Laboratory Response Network (LRN).
- Responding to a chemical emergency versus a natural disaster.
- Use of NOAA forecasting tools.

Training focused on chemical emergency preparedness:

- Identifying causes of chemical emergencies.
- Training on selection of appropriate personal protective equipment (PPE)
- Details on chemical storage locations in each state and routes of transport.
- Exposure-specific training (chemical-specific and acute versus chronic exposure).
- Education on the limitations of field-tests during a chemical emergency.
- How to address responses that involve an unknown chemical.
- Understanding privacy issues related to chemical terrorism.
- Public health emergency training needs – evacuation, re-entry, follow-up.

Training on communication roles for state health agency staff during a chemical emergency:

- Communicating to other emergency personnel (including poison control).
- Communicating to law enforcement.
- Communicating to the community.
- Training on privacy issues and HIPAA compliance in relation to how health agencies respond to issues in schools.
- Training on rapid communication methods and routes.

Training for state agency staff on chemical storage in each state:

- Enforcement of reporting guidelines.
- Community Right to Know Legislation (Tier 2 reporting).
- If information is available to the state health agency, who needs it and who should be eligible to receive it? Data privacy related to chemical terrorism.

Coordination priorities for state health agencies

When preparing for and responding to a public health emergency, there are many different groups that state health agencies need to work with to ensure that the response and recovery efforts are most efficient. Since local health agencies are better in touch with what is happening in their specific community and often the first to respond to an emergency, state agencies should first focus on better coordination and training with the local health agencies in order to be more effective. Once this training and relationship is well established, the state health agencies should then focus on bringing the state and local environmental agencies into the partnership and strengthen collaboration with them. This will help build the network of collaboration and communication needed to be effective. In cases where

environmental health staff are located in the environmental agencies already, the relationship between the health and environmental agencies should be strengthened.

Policies and Practices

The policies and practices discussions and questions revolved around five different areas:

1. Broad policies and legislation that will help prevent harmful exposure to chemicals and encourage safer chemical alternatives.
2. Specific policy needs for each prevention layer being addressed by the work group (primary, secondary, and tertiary).¹
3. Recommendations for TSCA Reform.
4. Regulatory needs.
5. Risk management.

Broad policies and legislation that, if addressed, will help prevent harmful exposure to chemicals and encourage the use of safer chemical alternatives:

- TSCA Reform.
- Mandatory housing of material safety data sheets (MSDS) at work establishments.
- Lead abatement standards (expand current policy).
- Fish consumption advisories (expand current policy).
- Outdoor wood boiler regulations.
- Safe chemicals policy in schools and public buildings.
- Radon-resistant construction guidelines for new homes.
- Mandatory consumer product labeling.
- Drinking water standards for organic compounds.
- Alternative energy use.
- BPA and PBDE legislation.
- Mandatory reporting and blood tests for pesticide exposures.

Specific policy needs for each prevention layer being addressed by the work group:

Primary

- Reform of current legislation to address more chemicals (TSCA, SDWA, CAA).
- Requirements for chemical manufacturers to provide toxicity and health effects data on their chemicals.
- Creation of a communication forum between physicians and health agencies with specific reporting requirements for adverse health outcomes linked with chemical exposures.
- Establishment of scientific health thresholds for chemicals.

¹ *Primary prevention* – Preventing harm by eliminating and/or reducing exposures to harmful chemicals and by spurring the development and use of safer and healthier chemical alternatives; *Secondary prevention* – Addressing harm by better producing, using, and managing of chemicals, and including greater use of safer chemical alternatives; *Tertiary prevention* – Addressing harm caused by historic practices, by protecting the health of at-risk populations and contaminated communities.

- Public policies, such as a tax or surcharge, that reflect the true risk of hazardous chemicals to the population.
- Financial incentives to switch to safer chemical alternatives.
- Tighter regulations and caps for industry and businesses on the quantity of chemicals they can release into the environment.
- Access to public water and sewer system data.
- Ban on chemicals deemed harmful.
- Programs to identify safer chemical alternatives with data to support their use.
- Development of laboratory test procedures to monitor exposure.

Secondary

- Financial, economic, and political incentives to use and manage safe chemical alternatives.
- Programs to provide public education on chemical safety.
- Mandatory industry cooperation.
- Programs to provide scientifically-based evaluations of the risks and benefits of chemical use and production.
- Full disclosure of chemicals in consumer products.
- Green chemistry certification.
- Clear definitions of green chemistry.
- Uniform approach to using the Toxics Use Reduction Act (TURA) methodology.
- Development of laboratory test procedures to monitor exposure to chemicals.
- Stricter control of imported products and products sold via the Internet (e.g., unregulated dietary supplements).

Tertiary

- Continuation of Superfund and other hazardous waste site remediation programs.....
- Funding to conduct population-based studies of communities impacted by historical contamination problems.
- Inclusion of health agencies in land redevelopment and zoning, including making recommendations based on risk assessments and Health Impact Assessments.
- Determination of best methods to determine historic exposure.
- Addressing legal concerns (e.g., who is responsible for medical bills if an exposure is linked to an adverse health effect, who will pay to clean up the exposed area, etc.).
- Quantifiable evidence that adverse health outcomes are attributed to exposed communities.
- Better risk communication to exposed communities.
- Better federal responsiveness and support for recommendations from state and local health and environmental agencies.
- Financial support from responsible parties to clean up and protect impacted communities.

Recommendations for TSCA Reform:

- Better data on all chemicals (new and old).
 - Acute and chronic exposures.
 - Range of toxicity tests on all chemicals (chemical, reproductive, aquatic, neurotoxicity, etc.).
 - Data needs to be available to state health agencies, not proprietary (“No chemical left behind”).
 - Inclusion of tests for pesticides.
 - Data on chemical alternatives and their health consequences.
- Better protective safety data (predictive).
 - Include information on water solubility, fat solubility, environmental fate and transport, and physical and chemical characteristics.
 - Businesses need to provide this information and prove its safety before a chemical is manufactured and sold.
- Change in the way chemicals are regulated and released.
 - Follow European Union model and get away from guilty/innocence model (no data, no market).
 - Create uniformity at federal level that is similar to European Union/Canada model.
- Better outreach from the Consumer Product Safety Commission (CPSC).
 - CPSC needs to be both proactive and reactive- preventative outreach is needed for consumer products.
 - Chemicals in consumer products need to be better regulated.
- Involve FDA and OSHA in reforming TSCA.

Regulatory needs:

- Incorporating new or emerging issues into current legislation.

The nation needs stronger mechanisms to regulate chemicals that are new or emerging since RCRA, CWA, CERCLA, and/or CAA. States suggest incorporating regulatory limits for chemicals considered endocrine disruptors, PBDEs, and BPA into the existing regulatory framework. There is a need to match evolving science with this existing framework. New toxicology data needs to be incorporated into old legislation so it can be used to better inform public health decisions.

- More responsive numeric regulatory guidelines.

Since the regulation process is time consuming and politicized, the federal government (e.g., ATSDR and EPA) needs to ensure that guidelines are up-to-date with the new science. One way to do this is to make sure the Integrated Risk Information System (IRIS) is well-maintained and continually updated with the latest numbers. In addition, publicizing how the measures were derived for this database will help create better transparency.

- Allow states to be more stringent than federal standards.

States should be allowed to be more stringent than the federal government with regard to chemicals manufactured or sold in their state. The federal government's regulation or lack of regulation of a certain chemical should not prevent a state from creating a stricter standard if it is based on available science. Some states have already done this with BPA and PBDE bans. State governments should be allowed to respond to their communities with legislation on topics important to them.

Risk management

Risk management was identified as a gap in the National Conversation structure that should be addressed. The needs identified for risk management are:

- More guidance on risk management in general.
- Need for a federal training program or textbook on risk management.
 - Risk assessment versus risk management (Should there be a combined approach?).
- Need for better structure for risk management.
 - Confusion results from multiple agency involvement.
 - Different agencies have different responsibilities, and these need to be outlined and clarified.
 - Issues with collaboration.
- Risk-benefit analysis.
 - Conducting risk-benefit analyses for emerging chemicals.
 - Although you can assess the risk of breast-feeding after being exposed to flame retardants, how can you tell mothers not to breast feed with all of its great benefits? Or with BPA?

Education and Communication

The education and communication discussions at the state forum revolved around the capacity needs of state agencies to more effectively communicate to the public, as well as the larger education needs to create an informed public. The lists below describe:

1. Goals of communication with the community.
2. Methods and mechanisms for communication.
3. Resources needed for effective communication.
4. Environmental health educational needs.

Goals for communicating with communities:

- Change behaviors.
- Help the public understand and abide by public health advisories and messages.
- Help people feel safe in their environment.
- Allow citizens to have the appropriate information to prioritize relative risk and conduct their own risk management.
- Help people make informed decisions.
- Demonstrate that government takes action when problems occur.
- Educate the public on the differences they can make through their personal consumer decisions.

- Help people to be informed so they support improved standards.
- Help government to assess when communication is effective.

Methods and mechanisms for communication:

- Aid communities in starting citizen action groups.
- Assess communication efforts and evaluate their effectiveness.
- Utilize CARE (Community Action for a Renewed Environment) and PACE (Protocol for Assessing Community Excellence) grants.
- Utilize Community Environmental Health Assessments (CEHA).
- Work with CDC's Community Tool Box.
- Opt-in to social media (e.g., blogs, Facebook, Twitter).
- Create community conversation toolkits.
- Hold public availability or drop-in sessions.
- Create and actively disseminate a repository of community toolkits.

Resources needed for effective communication:

- Assessment assistance/guidance.
- Communication specialists and health educators that are well-versed in environmental health.
- Continuation and expansion of ATSDR Cooperative Agreement funds for state and local health agencies.
- Repository of assessment tools available and an evaluation of their usefulness (e.g., PACE-EH, CARE).
- Strengthen ties between health educators and health assessors.
- Site-specific and generic education modules.
- Professional facilitators (similar to EPA's CPRC program).
- Encyclopedia of FAQs about chemical exposures.
- Opportunities for communication and professional development activities that focus on translating scientific issues into understandable information for the public.
- More public health toxicologists.
- Greater travel budgets to reach out to the community.
- Biomonitoring data at the local level.
- Mechanisms to effectively communicate biomonitoring data.
- Environmental health curriculums for schools.

Environmental health educational needs

One of the larger needs identified by state agencies was the need to develop and implement a better environmental health curriculum in schools. The first need is to scan what environmental health programs are already available, and use this information to create a repository of current environmental health lessons and curricula for grade schools. States also recommend that the Department of Education incorporate environmental health topics into their standards for science classes. This requirement will help fulfill the incentive needed for teachers to lecture on environmental health topics. In addition, better education is needed within state agencies and other professional groups. For example, chemists

should take toxicology classes and health care providers should take environmental health classes. All fields need to work together to promote environmental health.

Serving Communities

The serving communities discussions dealt with the most effective ways to involve the public in governmental decision-making and how to build trust between state agencies and the public. The following questions and needs arose from these discussions:

1. How do you communicate to the public when you cannot answer their questions or your findings do not support the community hypothesis?
2. Since federal agencies are most removed from the communities, how can the state/local health agencies educate them on the community needs or help them better engage with the community?
3. ATSDR should develop an educational and/or training program for environmental health issues.
4. Follow-up after spills is an opportunity for community education.
5. What are some effective ways to involve the public?

How do you communicate to the public when you cannot answer their questions or your findings do not support the community hypothesis?

- Build trust with communities – takes time and requires face-to-face meetings.
- Keep open communication.
- Recognize some issues are outside of the state health agency realm.
- State health agencies need an exit strategy for long-term sites.
- How do you communicate “I don’t know” to the public?

Since federal agencies are most removed from the communities, how can the state/local health agencies educate them on the community needs or help them better engage with the community?

- Promote upward communication (local → state → federal) since locals are most in-tune with community needs.
- Need ATSDR to create a policy statement to explain their limitations.
 - Explain that a direct causal-effect rarely exists.
 - Cannot always prove a significant association.
- Better frame the role of the federal government and health agencies.
 - What is possible in a health agency investigation or community assessment?
 - Explain the difference between acute versus chronic exposures and the inability to definitely say there is a causal relationship with chronic exposures.
- Guidance on how to answer questions about government’s ability to provide proof.

ATSDR should develop an educational and/or training program for environmental health issues:

- Create an environmental health curriculum for schools (all grade levels).
- Help children understand the environment around them.
- Promote better training in science, chemistry, green chemistry, and then environmental health.
- Identify, expand, and promote use of current environmental health curricula.
 - e.g., Beyond Benign

Follow-up after spills is an opportunity for community education:

- Involve community members in post-incident advisory groups provides a very different and helpful perspective.
- Hold hot washes with first responders, public health, and impacted community.
- Door-to-door surveys can help collect information from community members.
 - Use state agencies as technical advisors prior to a large study.

What are some effective ways to involve the public?

- Create community task forces.
- Involve key stakeholders early in decision-making processes.
- Conduct public meetings and targeted meetings with community leaders.
- Establish citizen action groups (e.g., EPA's TAP program).
- Community-based participatory research.
- Education through schools.

Overall State Priorities and Recommendations

Based on the results of the needs assessment and state forum, the following section outlines the highest priorities identified by the state health and environmental agencies for improving their ability to protect the public from harmful chemical exposures, as well as recommendations to the federal government for an improved chemical safety system.

Biggest Priorities for State Health and Environmental Agencies

1. Better scientific understanding.
2. Increased funding for biomonitoring and tracking.
3. Integration of life-cycle principles.
4. Increased resources for communication and outreach to the public.
5. Update legislation to reflect scientific understanding of chemicals.

Better scientific understanding

All respondents identified a need for more research and better understanding of the health effects of chemical exposures. Major data gaps include, but are not limited to, understanding the health impacts of exposure to chemical mixtures, understanding the health impacts of low-level chemical doses, impacts of long-term exposure, and exposure to chemicals commonly found in consumer products.

Increased funding for biomonitoring and tracking

States recognize the importance and need for biomonitoring data to better understand the health effects of chemical exposures. Thus, many state health and environmental agencies are interested in starting or expanding biomonitoring programs in their own state, with the hope of expanding biomonitoring programs to all states in the future. The data gathered from state biomonitoring programs could help individual states set legislative and preventive priorities.

Integration of life-cycle principles

The historical legacy of chemical contamination in communities across America necessitates a progressive assessment of chemicals that involves not only a human health assessment, but a life-cycle assessment as well. Life-cycle assessments will help states prepare and ensure that proper environmental controls are in place to eliminate chemical exposures as compounds migrate through the environment. Additionally, states would like to see a greater investment in green chemistry initiatives and integration of data-supported safer chemical alternatives.

Increased resources for communication and outreach to the public

With continuing state budget cuts, state health and environmental agencies are limited in staff and resources to ensure effective communication with the public. Due to inadequate funding, some state environmental health departments are currently unable to hire and retain trained health communication professionals. This greatly diminishes their capability to effectively communicate with

the public. Additionally, travel restrictions on state employees make it very difficult for environmental health staff to perform health outreach even within their own state.

Update legislation to reflect current scientific understanding of chemicals

Despite great advances in science, federal legislation, such as the Toxic Substances Control Act (TSCA), has not been adequately updated to reflect current scientific understanding. States feel that TSCA needs to be reformed in a way that places the burden of proof on industry to demonstrate that their products are safe, as opposed to leaving it up to the federal government to prove that they are unsafe. A majority of states who responded to the ASTHO State Needs Assessment believe that a list of high concern and priority chemicals should also be included in the legislation. In addition, regulations should be flexible enough to change accordingly as new chemical safety and scientific information becomes available.

Overall Recommendations

1. Utilize existing federal databases to advance scientific understanding of chemicals.
2. Improve the communication infrastructure.
3. Fund all states to collect biomonitoring data.
4. Improve training and coordination on all levels of government.
5. Place the burden of proof of safety on industry.

Utilize existing federal databases to advance scientific understanding of chemicals

Utilizing and enhancing what data repositories are already available is the best way to leverage resources and share information. Participants at the state forum referenced the Environmental Protection Agency's (EPA) Integrated Risk Information System (IRIS) as a useful tool for information on chemical exposures, but recommended that the database be updated with increased frequency as more scientific research becomes available. States also suggested that the Agency for Toxic Substances and Disease Registry (ATSDR) expand their existing toxicological profiles and provide toxicity information on emerging chemicals.

Improve the communication infrastructure

States need consistent and adequate resources to hire and retain professional environmental health educators and risk communicators. In order to effectively communicate with the public, state health agencies need health materials at all reading levels and in different languages to accommodate a diverse population. During the state forum, participants suggested that CDC establish a type of "federal health educator SWAT team," similar to the CDC Epidemic Intelligence Service. The team would consist of trained health educators and risk communicators that could travel and serve as an on-site resource for state and local health agencies during community assessments and disease outbreak investigations. This team or task force would provide community outreach and risk communication assistance for states that lack health communication staff.

Fund all states to collect biomonitoring data

State health and environmental agencies would like to see biomonitoring funding expanded to all 50 states. Some states feel that they are consistently at a loss if they have no baseline program already in place, so they are not eligible for continuation funding. Every state has chemical exposures and health priorities, so no one should be left out of this monitoring network. Ubiquitous biomonitoring efforts would allow each state to determine what chemicals pose the highest risk to their residents and base preventive measures on those priorities. Additionally, biomonitoring and other clinical data could help the federal and state governments set action and reference levels for chemicals contributing to high body burdens.

Improve training and coordination on all levels of government

In the needs assessment, 41% of respondents identified “lack of understanding about the overall ‘system’” as the primary gap in coordination among key emergency preparedness and response personnel. Individual and joint-agency training is required on all levels of government to ensure a well-coordinated and prepared response network is in place in case of an emergency. States reported the need to enhance the Incident Command System (ICS) structure in all states so that they can be better equipped to handle and respond to chemical emergencies. Both basic and advanced ICS training is needed to achieve the best coordination.

Place burden of proof of safety on industry

Federal and state governments do not have the adequate resources needed to prove a chemical is unsafe once it is already on the market. State health and environmental agencies believe that it should be the responsibility of chemical manufacturers to prove a product’s safety before it is approved for commercial use. States cite the European Union’s Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH) program as a model that could be achieved through TSCA reform. States also reported having a need for better disclosure and understanding of the chemicals being used at industrial facilities, chemical transportation routes, and chemical storage locations to ensure an effective preparedness and response strategy in the event of an emergency. Additionally, states feel that proprietary and secure chemical data should not be withheld from federal and state governments, recognizing that there should still be a security plan in place for using this information to reduce the risk of security breaches and chemical terrorism.

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