SRP Risk Communication Strategies to Reduce Exposures and Improve Health

June 21-22, 2021

Table of Contents

Opening Remarks

NIEHS Superfund Research Program (SRP) sponsored a workshop for SRP grantees, partners, and colleagues to discuss strategies and barriers to communicating potential health risks of environmental hazard exposures to the public. The two-day virtual workshop tailored for SRP grantees was free and open to anyone interested in attending. It included six different sessions, with 25 presentations from both SRP grantees and risk communication experts from related social science fields outside the SRP.

Sara Amolegbe, M.S.P.H., the workshop organizer, started the workshop with a brief orientation for all participants. The SRP Director, William A. Suk, Ph.D., welcomed participants with an introduction to the SRP program. He described the NIEHS SRP mission of providing practical science-based solutions to protect human health through competitively awarded grants and multi-project SRP centers consisting of research infrastructure and "cores" with different areas of expertise including research translation and community engagement. SRP research combines biomedical and environmental fields as grantees work with other agencies such as the EPA, members of tribal nations, and U.S. state agencies. Grantees also work with hundreds of communities through their Community Engagement Cores to develop strategies for effective risk communication to reduce exposure to hazardous substances and mitigate health risks for stakeholders. In his closing statement, Suk reminded participants that the workshop was an excellent platform to discuss how they have engaged communities and communicated health risks, lessons learned, challenges to overcome, and future steps.

NIEHS Director Rick Woychik, Ph.D., described the five leadership values at NIEHS: workforce diversity, innovation, collaboration, communication, and distributive leadership. He explained how risk communication fits squarely within theme two of the NIEHS Strategic Plan, which is "Promoting translation – Data to Knowledge to Action." He also spoke about the importance of developing effective communication strategies to mitigate health risks of environmental exposures.

Day two of the workshop began with a special talk by Dominic Balog-Way, Ph.D., from Cornell University on the evolving field of risk communication. His talk provided a selective overview on the current state and future of the field with a focus on the pragmatic function of risk communication and how to do it better. He discussed multiple aspects that are essential to effective risk communication such as messengers, message attributes, opportunities, challenges, and risk perception by audiences. He concluded his talk by acknowledging that there is no simple solution or approach when it comes to risk communication as it involves many multidimensional concepts.

Messages from sessions

The meeting was divided into six different sessions distributed over two days. Each session included four to six presentations followed by a 30-minute panel discussion where presenters answered questions posed by other participants.

This meeting report is broken down by session. For each session, this report provides a brief overview of each presentation, key messages from the session presenters, and noteworthy audience comments from the panel discussion.

Engaging Communities to Strengthen Environmental Health

The first session of day one was focused on risk communication to and engagement of diverse communities and included six 10-minute presentations followed by a community Q&A session. All presenters in the session discussed their work, experience, and lessons learned from engaging with communities.

Presentations in this session focused on the work of different SRP centers in assessment of risks caused by various air and water pollutants and communication of these risks to a wide variety of affected communities, from tribes in the Navajo nation to homeowners in New Hampshire. Despite the variation in their work, the experience of presenters was strikingly similar when it came to engaging with their respective audiences. All

> **"Our goals are to provide data we find for informed personal choice; so, we provide the information and then people can make a decision about how to respond."**
> **– Elisabeth Rose Middleton, Ph.D.**

presenters reported having to overcome skepticism and developing culturally appropriate strategies for successful risk communication. Once community members were engaged, all presenters reported an active participation and widening of the risk communication messaging to address community concerns as well.

The first talk of this session presented by Melissa Gonzales, Ph.D., described the University of New Mexico SRP Center's collaboration with tribal communities on Navajo Nation and Laguna Pueblo to reduce the health risks posed by legacy mining. She explained how the center partnered with cultural specialists and educators to develop risk communication messaging by respecting indigenous perspectives and using Navajo language. The center also worked with tribal artists to create artwork that clarified scientific concepts and aided in risk communication.

The second talk of the session was a joint presentation by Elisabeth Rose Middleton, Ph.D., from University of California, Davis SRP Center and Suzanne Fluharty, Ph.D., from the Yurok Tribe Environmental Program. They described the collaboration between both centers and the Yurok tribe to address concerns raised by tribal members about environmental exposures and related health risks. The centers collected and tested samples from suspected contaminated sites on tribal land and communicated their findings to the community with the goal of protecting traditional tribal practitioners. The presentation also emphasized that the community outreach activities were focused on providing information without any conclusive statements so tribal members could make their own informed decisions.

The third talk was a joint presentation by Katy May, M.E.M., and Jamie DeWitt, Ph.D., from the North Carolina State University SRP Center. Their talk was focused on capacity development in communities exposed to environmental contaminants such as Per- and Polyfluoroalkyl Substances (PFAS). They

described how the center, with the help of their community partners, educated scientists and trainees to become effective communicators. They also highlighted the importance of honest and transparent communication with community members.

The fourth talk of this session presented by Laurie Rardin, M.E.S., focused on risk communication to communities by developing an online tool. The talk described the activities of the Dartmouth College SRP Center to communicate risks of arsenic contamination in water to private well users. The center conducted in-person outreach activities, developed a community action toolkit, and created a website to provide information to private well users. This talk also highlighted the importance of consistent messaging across different agencies and organization.

The fifth talk of this session was a joint presentation by Margaret Reams, Ph.D., and Jennifer Richmond-Bryant, Ph.D., from the Louisiana State University SRP Center. The presentation discussed the challenges of, and center activities to communicate health risks related to air pollution. The presenters described their collaboration with community partners to identify community concerns, sampling needs, and sampling locations. They also emphasized the importance of meeting the community where they are and translating research findings to community.

The last talk of this session presented by Galen Newman, Ph.D., was focused on assessing the impacts of green infrastructure interventions in underserved communities. He discussed how the Texas A&M University SRP Center worked with underserved communities in Houston to develop a masterplan to build green infrastructures by getting their input on community needs, infrastructure design, and site identification.

> **"It is really important that we as scientists never discount anybody's personal experience, personal health outcomes, or personal understanding about what is going on."**
> **– Jamie DeWitt, Ph.D.**

The panel discussion for this session reflected key points from presentations. Participants asked about challenges involved in designing risk communication strategies, data privacy of communities, designing exposure frameworks, and addressing uncertainties in questions raised by communities. Similar to their talks, presenters stressed the importance of working with all stakeholders, respecting their experiences, and designing messaging that addresses community needs and questions.

Key points from session

The following are some important points mentioned in the talks and panel discussion of this session:

- Respecting community language, perspectives, experiences, culture, and way of life.
- Capacity building by working with community leaders and collaborating with organizations that may have already been working with the community.
- Working with the community to identify and address their concerns clearly and honestly, even if there is uncertainty surrounding potential health risks from exposures.
- Honest and transparent communication, and reporting test results back to communities, is extremely important.

- Building trust and meeting community members where they are.
- Communicating results and letting people make their own decisions.
- Working with community partners to understand exposure pathways and develop cleanup standards.
- Preparing for all possible questions and scenarios when developing risk communication messaging.

Audience comments: Take-aways and suggestions from the session

- Partnering with local public health agencies to ensure that risk communication messages are consistent.
- Bringing together multiple partners and being honest that guidelines for acceptable exposure levels may not yet exist.
- Being honest about what you know and what you don't know.
- Listening without bias.
- Explaining your motivations.
- Making personal interactions and being available to listen. Listening builds a more trusting relationship than being a "know it all" scientist.
- Telling a personal story to humanize yourself.
- Making it clear that the research team cares about the community members and are here to support them by providing exposure measurements to try to substantiate their experiences.
- Asking community members about their concerns and what is important to them.

Advancing equity in risk communication

This session was focused on risk communication to minority communities and included three 15-minute presentations.

The first talk was a joint presentation by Monica Ramirez-Andreotta, Ph.D., Dorsey Kauffman, M.F.A., and Miriam Jones, from the University of Arizona. The presentation started with a discussion of the environmental justice framework developed to understand inequalities in protection. The speakers discussed their work with economically and racially diverse communities to ensure that research design and process reflect community interests. The speakers described how the University partnered with "promotoras" or community health workers. Promotoras served as knowledge brokers since they were indigenous to the community. One of the speakers, Miriam Jones, described her experience of becoming a promotora for the Project Harvest citizen science project at the University of Arizona.

> **"It was very great being part of this project research. … It didn't matter what level of education we had or where we were coming from. … When we talked to members in our community, we also transferred information from scientists so that they (community members) could make the changes that might have been needed."**
> **– Miriam Jones, participant of citizen science centered Project Harvest.**

The second talk called attention to communication inequalities among social groups due to differences in their exposures, information processing, knowledge, and capacity to act. The presenter Andy Tan, Ph.D., spoke about his efforts in overcoming such communication inequalities by collaborating with LGBTQ individuals and organizations to develop and evaluate anti-tobacco health messaging among LGBTQ populations. His talk described the process of interviewing LGBTQ tobacco users to identify communication gaps and designing and pre-testing multiple messages to ensure accurate messaging. He highlighted the importance of listening to community members and learning from them.

The last talk of this session was presented by Julia Brody, Ph.D., from the Silent Spring Institute and Phil Brown, Ph.D., from the Northeastern University SRP Center. The presentation was a description and demonstration of a digital tool designed to report exposures in communities. The tool called "DERBI-Digital Exposure Report Back Interface" included background information, multiple graphs, and context for understanding results, and was tailored with participant input with the goal of engaging communities in personal exposure assessments. Smartphone reports were also added to the tool to improve access in low-income communities. The presenters described how having access to personal and community exposures empowered community members to make better personal choices and demand policy changes.

> **"Community based research comes from a tradition that recognizes knowledge is power and that community members have a right to know because they have a right to act to protect their health."**
> **– Julia Brody, Ph.D.**

The panel discussion generated potential collaboration opportunities for the report back tool "DERBI" and its uses in reporting exposures for different samples and contaminants. Participants also asked questions about designing questions for information gathering, incorporating bioavailability data while reporting contaminant level in samples, and bringing about policy changes. Panelists recommended doing detailed interviews with community partners to understand their experiences and enlisting their help in creating interventions. This session also included an interactive activity with participants using "Google Jamboard."

Key points from sessions

The following are some important points mentioned in the talks and panel discussion of this session:

- Interact with communities to identify problems and design studies.
- Collaborate with organizations already serving the community and people in the community to serve as knowledge brokers.
- Co-create interventions and ensure that community members are the experts.
- Empower communities by sharing knowledge in easily accessible ways.
- Humility and active listening are important while building trust with community partners.

Audience comments: Take-aways and suggestions from the session

- Use high-tech (apps, social media) but also high-touch (promotoras, trusted community members) approaches to engage and conduct outreach to diverse communities.

Designing your Message and Evaluating Impact

The last session of day one was focused on targeted messaging and evaluating impact of risk communication and included four 15-minute presentations. They also discussed principles of a successful risk communication campaign and reported that framing the messages and engaging with community helped in better dissemination of information.

The session began with a talk by Edward Maibach, Ph.D., who summarized the purpose of risk communication and shared messaging strategies for successful risk communication and bringing about subsequent behavioral changes among community members. He also stressed the importance of making

> **"To spread important ideas based on fact and evidence, there is no more reliable method than using simple clear messages repeated often by a variety of trusted voices."**
> **– Edward Maibach, Ph.D.**

risk communication a fun experience for the target audience. This talk resonated with all participants and was often quoted by other presenters during the remaining workshop.

The second talk, delivered by Matthew Seeger, Ph.D., was focused on risk communication strategies during public health emergencies. He first described the characteristics and conditions of a crisis and discussed the crisis communication framework developed by the Centers for Disease Control (CDC) to guide risk communication strategies. He underscored the importance of being "first, right, credible" during a crisis to reduce and contain harm. He also described the Crisis and Emergency Risk Communication (CERC) Lifecycle and the steps required during each stage of the lifecycle for effective risk communication.

> **"Evaluation of effects and effectiveness is essential so that you know what your return on investment is."**
> **– Kami Silk, Ph.D.**

The third talk of this session presented by Kami Silk, Ph.D., was focused on principles of risk communication to maximize impacts of messages. She discussed the characteristics of a risk communication campaign and different methods of evaluating impact of risk communication campaigns. She also described her experience in designing and implementing a breast cancer awareness campaign targeted towards mothers and daughters.

The last presenter of this session Kathleen Gray, Ph.D., discussed the importance of message framing in risk communication and impact assessment. She described how the University of North Carolina SRP Center developed risk communication strategies targeted towards fishermen by understanding their beliefs and risk perception. She pointed out the importance of research to identify barriers to risk communication. The most common barriers identified were overwhelming complexity, low perception of susceptibility, not trusting messengers, and missing cues to action. Her presentation stressed the

importance of active community participation and collaboration across disciplines for effective risk communication.

During the panel discussion, participants asked some tough, but important questions including lessons learned from risk communication during the COVID-19 crisis, and what to do to fight misinformation. Panelists responded by repeating messages they delivered during their presentations including warning people about misinformation campaigns, "fighting fire with fire," and filling information vacuum to prevent rumors from being circulated. Panelists also recommended building communication teams by collaborating with social scientists and communication experts to make messaging fun and spread it effectively.

Key points from session

The following are some important points mentioned in the talks and panel discussion of this session:

- Use audience research to determine which messages have most value.
- Ask trusted messengers to convey message and make it easy for them to do so.
- Make behavior change fun, offer/highlight benefits that target audience cares about, deliver immediate positive reinforcement for changing behavior.
- During crisis communication, be first, be right, be credible, express empathy, promote action, show respect for audience.
- Conduct research to identify barriers and components of solutions, audiences, channels to reach them and then develop a communication strategy.
- Use mixed methods research on belief and self-efficacy, knowledge to identify barriers to communication.
- Make information available in different ways to increase accessibility.

Audience comments: Take-aways and suggestions from the session

- Craft timely and effective messages for emergent health issues.
- Manage uncertainty, conflicting information, mis/disinformation, and changing recommendations as new evidence emerges.
- Building a communication team is important.
- Make sure you know your audience so you know what message and channel will work for them.
- Positive messages are shared more.
- Even when we do not have all the answers, we still have an obligation to communicate.

Exploring the Social Context of Risk Perception

The first session of day two discussed the social constructs involved in risk communication. This was a particularly thought-provoking session since it urged participants to consider assumptions and biases of their target audiences while designing risk communication strategies.

> **"Trust plays a central role in every risk communication context, and it is very important when knowledge of a hazard, activity, [or] technology is low."**
> **– Dominic Balog-Way, Ph.D.**

The session started with a talk by Anna Hoover, Ph.D., focused on how to navigate complex stakeholder spaces. She described the importance of first understanding the current situation and then deciding the path forward. She also emphasized the need for all stakeholders to trust each other.

The second talk by Joseph Hamm, Ph.D., focused on the role of trust in risk perception and communication. He discussed how trust was a key driver of risk communication effectiveness, how understanding risk was a technical task, and how it was essential to understand the vulnerability of the target audience while building trust. He emphasized the importance of technical competency and addressing audience vulnerability during risk communication efforts.

The last talk of the session presented by Haoran "Chris" Chu, Ph.D., was centered on the constructs of motivated reasoning and psychological distance. He described his work on how motivated reasoning shaped risk perception and demonstrated how people's perception of risk changes based on their psychological distance. He also underscored the importance of message tailoring based on existing views of the target audience.

> **"One important question to ask is what may influence peoples existing beliefs and attitudes and further shape their processing of risk information."**
> **– Haoran "Chris" Chu, Ph.D.**

The panel discussion presented challenging questions and answers including how to weigh exposure risks when multiple exposures are present and how to address issues caused by multiple messages from different sources. Panelists responded by emphasizing the need to understand why audiences do not like proposed solutions or might be prioritizing other risks. Messengers also need to be authoritative and trustworthy sources while disseminating information and understand stakeholder dynamics.

Key points from session

The following are some important points mentioned in the talks and panel discussion of this session:

- Understand stakeholder biases and perceptions.
- Identify that trust also brings a sense of vulnerability.
- Know where we are before deciding where we are going.
- Show technical competency and empathy to build trust.
- Reduce psychological distance to increase risk perception.
- Customize messages based on peoples existing views.
- Better understand audiences to design risk communication messaging.
- Actively engage audiences to understand what steps they are willing to take to move towards a lower risk environment.

Audience comments: Take-aways and suggestions from the session

- Risk perception is heavily influenced by sense of control.

- How people feel about the risk is incredibly important. These feelings and perceptions are not always driven by data.
- Know your audience and have trusted communicators from the community.
- Be a humble and open-minded messenger. Seek to understand the complex factors that influence how your message may be received and barriers such as solution aversion.
- Be aware that each audience member has a unique context around the topic you are engaging in risk communication about.
- Information is powerful and necessary to inform communities
- Make sure everyone who may have a stake in the issue is at the table.
- Listen and build connections to gain trust.

Translating Research into Communication Tools

This session was focused on using different and innovative research-based risk communication tools to inform a diverse audience and included four 15-minute presentations.

The first talk presented by Joseph Wilson, M.H.S., and Maida Galvez, M.D., was focused on using a clinical translational tool "Prescriptions for Prevention" to educate families and provide them with resources to address environmental concerns such as mold, lead, and pests. The prescriptions cover over 20 topics and include action steps and resources for families. The speakers described how the prescriptions are used in conjunction with an environmental health screener in a clinical setting to advice families and guide them to appropriate resources.

The second talk presented a five-step process for using social media platforms to share science and communicate environmental risks. The speaker Carla Fisher, Ph.D., described her experience working on a project to create social media intervention in collaboration with mommy bloggers and targeted towards mothers and daughters to encourage adoption of lifestyle habits that reduce risk of breast cancer. She also emphasized the importance of ensuring that the messages are tailored towards users, easily shareable, and scientifically rigorous.

> **"When things are communicated on social media people view that information as urgent."**
> **– Carla Fisher, Ph.D.**

The third talk presented by Madeline Beal, M.P.H., discussed the "SALT framework" used by U.S. EPA to develop their risk communication strategies. The framework is built on Strategy, Action, Learning, and Tools. The speaker discussed the framework and factors that impact its implementation. She also highlighted the importance of knowing audiences, strengthening research connections, and identifying and addressing gaps in risk communication.

The last talk of the sessions presented by Jamie Rayman, M.P.H., was focused on communicating about Uranium with Navajo communities. She described the collaborative effort by multiple partners to identify community needs by listening to community experiences and questions and conducting open dialogue about Uranium. The project also partnered with community health representatives to refine messaging, create risk communication tools such as posters and factsheets, and distribute them to community members. The speaker emphasized the importance of presenting complex information in easily accessible formats to inform lay audiences.

> **"Working with and through the CHRs (community health representatives) built knowledge of uranium exposure and prevention within the health department and among individuals who are already experienced at interacting with Navajo people."**
> **– Jamie Rayman, M.P.H.**

Panelists were asked about the effectiveness of their interventions and how they are evaluating them. Participants also asked the challenges of making tools more actionable. Panelists discussed the need for research to identify effectiveness of interventions and the challenges of providing actionable intervention. They also stressed the importance of knowing the audiences' perspectives while designing risk communication.

Key points from session

The following are some important points mentioned in the talks and panel discussion of this session:

- Adapt translational tools for local context or situation.
- Ensure information presented is relatable by generating content with community partners and tailoring message.
- Identify, acknowledge, and address power imbalances.
- Listen to community experiences and questions.
- Coordinate messaging across multiple government agencies.
- Content should be evidence informed and scientifically rigorous.
- Words and images matter.
- Keep content complexity at middle school level.
- Collect reflections, incorporate insights, and set expectations.

Audience comments: Take-aways and suggestions from the session

- Think about what your audience needs and wants to know, not what you want to tell them.
- Communication approaches are most useful when they are consistent and extend reach but can be tailored in the local context.
- "Uncertainty" can mean something different to a researcher than to a community member.
- Practice humility.
- Translating the science to understandable messages that create interest but do not create excessive alarm can be challenging. We can explain the science but don't always have the answers on what they should do now.

Reaching Specific Populations

The last session of the workshop was focused on communication strategies to reach specific populations at the grass root level and included six 10-minute presentations. Similar to the first session on day one, the talks in this session discussed a varied audience. However, despite the differences in their target audiences, all presenters had similar experiences in their risk communication efforts. They reported facing skepticism and discussed strategies to build trust and rapport with the community. Almost all presenters mentioned working with community leaders, using surveys to get feedback from the community, meeting audiences where they are, and presenting information in easily accessible formats for successful risk communication.

> "Listening is a major component. … Just because we have a priority as it relates to the academic side doesn't mean that those are necessarily aligned with the community."
> – Monica Baskin, Ph.D.

The first talk was focused on risk communication in communities that face multiple exposures. The presenter Monica Baskin, Ph.D., discussed risk communication strategies used while dealing with the impact of COVID-19. She described how the SRP center at the University of Alabama identified assets and resources already present in the community. They collaborated with a community advisory board to assess community needs and priorities. As part of risk communication, the center published a magazine for the community with information about center activities and stories of community members. The center also created and distributed educational material about the COVID-19 pandemic to address immediate needs of the community.

The second talk of this session presented by Paul Watson, Jr., M.S.H.S., described community engagement activities within communities of color. He used the phrase "breaking through the clay line" to refer to outreach activities targeted towards residents who were usually left out of the decision-making process and introduced the term "weavers" to describe individuals or organizations who use different paths to share knowledge and information in a community. He discussed the importance of engaging the next generation (children and youth) in community engagement activities. He also shared his experience of working with middle and high school students by teaching them about environmental justice issues and allowing them to become community weavers.

The third talk presented by Brandi Janssen, Ph.D., described challenges faced by the University of Iowa SRP Center while working with rural communities in the Midwest to address environmental concerns related to agricultural activities. She discussed the importance of building rapport and trust with the community by collaborating with different organizations and partnering with community leaders.

The fourth talk of the session was focused on challenges of risk communication for low-dose exposures with long-term consequences. The presenter Elizabeth Shapiro-Garza, Ph.D., discussed principles of social marketing and barriers to changing risk behavior. She described community based participatory research conducted by the Duke University SRP Center in collaboration with community partners to develop risk communication strategies for fish consumers on the Cape Fear River Basin. The talk discussed the social marketing campaign and development of mixed-media messaging to encourage fishermen to catch and consume only certain species of fish.

The fifth talk was jointly presented by BJ Cummings, M.A., from University of Washington SRP Center and Edwin Hernández Reto from Juntos Podemos Cuidar Nuestro Rio Duwamish. This talk was focused on risk communication strategy to promote salmon fishing among fishermen in the Duwamish River basin. The presenters described their collaborative work to develop educational videos in several languages and highlighted the importance of working with community partners for conducting events and developing messaging strategies.

The last talk of this session presented by Laurel Schaider, Ph.D., discussed the application of the previously described "DERBI" tool to communicate results of water sampling with private well owners. The talk described how the University of Rhode Island SRP Center addressed community questions using the DERBI tool. The center provided background information about PFAS contamination in well water. They also addressed community questions by building customized reports in the tool. The tool enabled presentation of information in different ways to suit target audience. It also provided information on actionable items for community members.

Panelists were asked if there was anything that they wished they knew before starting their work in community engagement and how they are engaging youth in their activities. Panelists responded by saying that they would have talked to leaders in the area to learn the history and previous community engagement activities and also remarked on the role that language barriers played during their activities. Panelists emphasized the importance of engaging children and youth in engagement activities as they bring in creativity to the messaging, parents are more likely to pay attention to children, and young people listen to their peers more than they listen to adults.

> **"Our community wants to know history of the contamination of the Duwamish River, regulation of safe fishing, and we are talking about control because the community is involved in recovering our Duwamish River."**
> **– Edwin Hernández Reto, Juntos Podemos Cuidar Nuestro Rio Duwamish**

Key points from session

- "Breaking through the clay line" – reach residents who are usually left out of decision-making process.
- Find the right partners to reach relevant populations, identify community "weavers."
- Implement community advisory board to identify community needs, and priorities.
- Assess the situation, don't be quick to act, and take a deep breath.
- Work with organizations/leaders already active within community.
- Engage next generation as they can help engage target populations using fun and creative ways.
- In immigrant and refugee groups, young people pick up language skills faster, so they carry a lot of communication weight. This makes them a good target population.
- Collect and evaluate feedback from community after engagement activities to identify best practices/ what works from audience perspective.

Audience comments: Take-aways and suggestions from the session

- Know your audience, enlist trusted community members/liaisons, transparency is key, humility is important.
- Understand the power relations within the community and with the institutions that impact and control their lives.
- Focus on the audience and how they might interpret and perceive risk.
- Risk and science communication must be bi-directional.