

# Communicating Environmental Risk Information With the Public

Ohio Chemistry Technology Council

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# *Today's Agenda...*

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- Risk Communication - Defined and Undefined
- History of Industrial Risk Communication Efforts
- Information as a “Cure” for Risk Communication Issues
- Physiological Basis for Risk Perception
- “Outrage Factors” and Their Impact on Risk Perception
- The “Source/Channel/Message/Receiver” Model for Risk Communication
- Ten Ways to Lose Trust and Credibility
- Seven Cardinal Rules for Risk Communication



# *Risk Communication is ....*

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Helping people understand the facts, in ways that are relevant to their own lives, feelings, and values, so they can put the risk in perspective and make more informed choices and decisions.



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# *Risk Communication is NOT...*

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Telling people only what you want them to know, in order to get them to behave “rationally”, that is, the way you want them to behave.



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# *Four Stages in the History of Risk Communication*

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- **Stonewall Stage: No communication**  
Ignore the public
- **Missionary Stage: One-way communication**  
Show the public why you're right and they're wrong
- **Dialogue Stage: Two-way communication**  
Learn from the public the ways in which they're right and you're wrong
- **Organizational Stage: Internal communication**  
Become the sort of organization that finds dialogue possible, even natural



# *Risk Communication Can Fail If ...*

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- It refuses to accept that this “irrational” behavior is how humans are programmed to protect themselves
- It doesn't take into account the psychological basis for people's perception of risk
- It's not done proactively, but only after a problem has arisen and people's opinions are already formed
- It's done as a monologue, not a dialogue
- It's done by people with a vested interest in the outcome



# Ranking Risks

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Nuclear Power

Handguns

Chemicals in the Environment

Terrorism

Being Underweight

Unsafe Sex

Iron Deficiency

Indoor Air Pollution

Unsafe Water

High Blood Pressure

Tobacco Use

Alcohol Use

High Cholesterol

Obesity

Floods

Hurricanes

Airplane Crashes

Motor Vehicle Accidents

Bacterial Infections

Being Underweight

Unsafe Sex

Iron Deficiency

Indoor Air Pollution

Unsafe Water

High Blood Pressure

Tobacco Use

Alcohol Use

High Cholesterol

Obesity



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# *The Myth About Misperceptions: A (somewhat hypothetical) Thought Experiment...*

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- A world renowned expert on pesticide risks has been examining the risk of “natural” carcinogens in food
- Research concludes that “...Broccoli is more carcinogenic than dioxin...”
- After several hours at a public meeting, the expert convinces the public that broccoli is indeed more carcinogenic than dioxin [The misperception has been corrected]
- Now a member of the audience asks: “Now that we know that broccoli is more carcinogenic than dioxin, which one do we want EPA to regulate?”



# *The Biological Basis of “Irrational” Risk Perception*

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- Only organisms that can recognize and respond to danger survive.
- We have a brain that is biologically constructed to fear first, and think second.



# *Survival is a Powerful Genetic Imperative*

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- We have developed to be able to recognize and respond to danger, very quickly, in order to protect ourselves.
- Using whatever tools we have, in order to survive, is absolutely rational behavior.



# *About Calculated vs. Perceived Risks...*

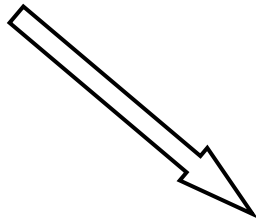
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Calculated Risk = Hazard x Exposure

# *About Calculated vs. Perceived Risks...*

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Calculated Risk = Hazard x Exposure



Perceived Risk = Calculated Risk x “Outrage”

Outrage: “Everything that is relevant to our perception of a risk except how likely it is to actually be harmful.”



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# *Outrage Factor #2*

## *Voluntary vs. Involuntary*

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Voluntary      vs.      Involuntary  
“Safer”                      “Riskier”

Example: The involuntary presence of chemicals in our bodies is viewed by many as an unacceptable risk. Yet, smoking is not considered to be a significant risk to most smokers.



# *Outrage Factor #3*

## *Time/Space Factors*

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Diffuse in Time  
And Space  
“Safer”

vs.

Focused in Time  
And Space  
“Riskier”

Example: Chemical production is perceived as risky because of the focused nature of facility incidents.



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# *Outrage Factor#4*

## *Control*

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Controlled by  
the Individual  
“Safer”

vs.

Controlled by  
the System  
“Riskier”

Example: Most (~85%) people believe that they are better than average drivers. So long as they are in control, the risks seem acceptable.





# *Outrage Factor #5*

## *Ease of Understanding*

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Easy to Understand  
“Safer”

vs.

Hard to Understand  
“Riskier”

Example: Genetically modified foods and nanotechnologies are perceived as riskier than living downstream of a dam or underneath an electric line.



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# *Outrage Factor #6*

## *Dread*

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Not Dreaded  
“Safer”

vs.

Dreaded  
“Riskier”

Example: Many people would be more concerned by a false claim of carcinogenicity of a material than by a true claim on its non-carcinogenic effects.



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# *Risk Perception (Outrage) Factors*

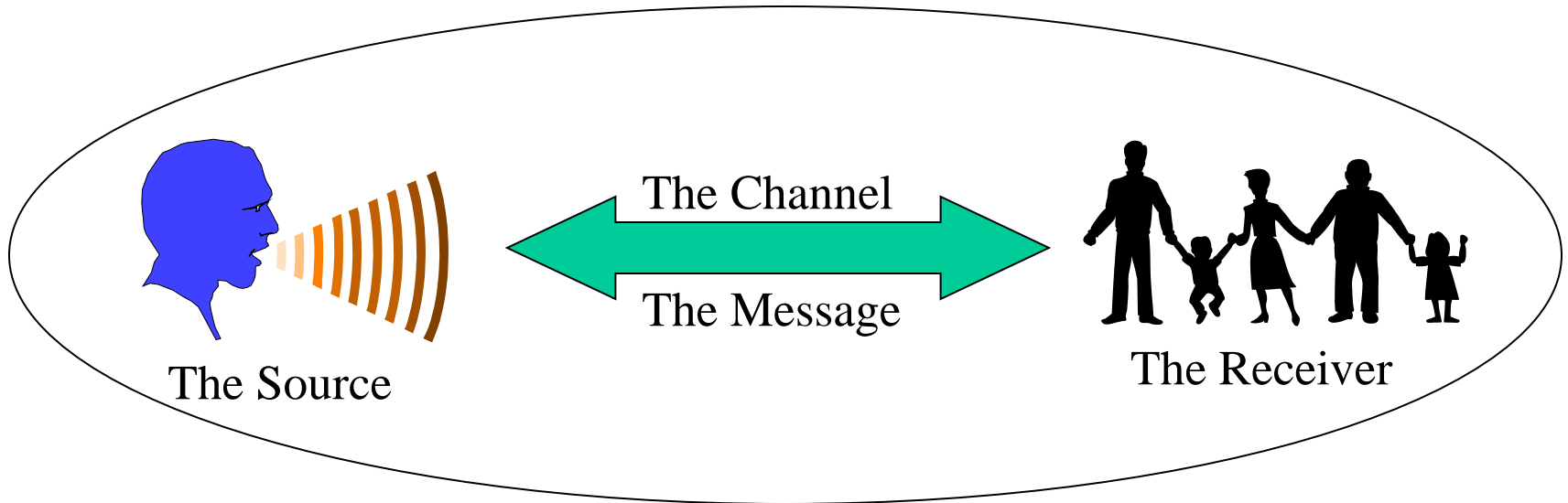
## *Some General Rules...*

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- For any given risk, there are usually several perception factors involved.
- Risk perception factors tend to be universal across cultures, ages and genders.
- How we perceive risk is based on our life experiences and our learned values.
- Understanding the risk perception factors relevant to a given situation is key to effective risk communication



# *“Source/Channel/Message/Receiver” Model in Risk Communication...*



- Useful in dissecting the process
- Useful in identifying pitfalls to successful communications
- Useful in developing strategies to managing communications

# *Source Issues:*

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- Lack of trust and credibility
- Disagreement among scientific experts



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# *Source Issues:*

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- Lack of trust and credibility
- Disagreement among scientific experts
- Failure to disclose the limitations of decision-making tools and resulting uncertainties
- Limited understanding of the interests, concerns, priorities and preferences of individuals and citizen groups
- Use of bureaucratic, legalistic and technical language



# *Channel Issues:*

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- Selective and biased media reporting
- Premature disclosure of scientific information
- Oversimplifications, distortions and inaccuracies in interpreting technical information





# *Message Issues:*

- Deficiencies in scientific understanding which result in large uncertainties in risk estimates
- Highly technical and often unintelligible analyses



# *Message Issues:*

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- Deficiencies in scientific understanding which result in large uncertainties in risk estimates
- Highly technical and often unintelligible analyses
- The sheer amount or complexity of the information



# *Receiver Issues:*

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- Inaccurate perceptions of risk levels
- Lack of interest in technical complexities
- Strong beliefs and opinions that are resistant to change
- Exaggerated expectations about the effectiveness of regulatory actions
- Desire and/or demand for scientific certainty
- A reluctance to make trade-offs between risk, costs and benefits
- Difficulties/reluctance in understanding/accepting probabilistic information



# *Ten Ways to Lose Trust and Credibility*

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- Don't involve people in decisions.
- Hold on to information.
- Ignore people's feelings.
- Don't follow up.
- If you make a mistake, deny it.
- If you don't know the answers, fake it.
- Don't speak plain English.
- Be a bureaucrat.
- Delay talking to other organizations.
- Send your introverted scientists.



# *Seven Cardinal Rules of Risk Communication*

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- Accept and involve the public as a legitimate partner.
- Plan carefully and evaluate your audience.
- Listen to your audience.
- Be honest, frank and open.
- Coordinate and collaborate with other credible sources.
- Be cognizant of social media, but meet the needs of the traditional media also.
- Speak clearly and with compassion.



# *Case Study...*



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# *Risk Communication Case Study: Sierra-Crete*

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- DuPont manufactured Sierra-Crete at its Oakley, CA facility between 1988 and 1997
- Sierra-Crete is a mixture of roughly equal parts water, cement and mineral processing by-product
- The product was sold to contractors as an artificial aggregate sub-base for roads, sidewalks and parking lots
- Early in 2002, trace levels of dioxins were identified in Sierra-Crete
- DuPont immediately initiated a comprehensive study to determine whether this situation posed any risks to residents or contractors



# *Results of the Initial Risk Evaluation...*

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- Dioxin levels in the Sierra-Crete were less than USEPA and California DTSC levels for residential soils
- Sierra-Crete is not the only source of dioxin on the roadways
- Lifetime aggregate cancer risks were less than 1:1,000,000 for residents and contractors
- Foreseeable dioxin exposures represented about 1-2% of a person's typical background dioxin exposures





# *Elements of the Communications Plan...*

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- Situation Analysis
- Key Objectives and Definition of Success
- Audience Identification
- Key Message Identification (by audience)
- Stand-By Statements and Q&A
- Execution and Monitoring Plan



# *Initial Execution Plan...*

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- Meet with municipal officials from the primarily affected community
- Share results of the risk evaluation with the officials
- Ask them to review the document and comment on it
- Ask them to participate in a joint press event announcing the results



# *Reaction of the Municipality...*

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- Felt the need to immediately share the information
  - ✓ Requested the posting of an informational web site within 8 hours
  - ✓ Requested a joint briefing for all affected townships the next morning
  - ✓ Requested a joint press conference within 24 hours
- Felt the need to independently verify DuPont's initial results
  - ✓ Engaged the County Health Department Director to chair an independent task force to evaluate the safety of the situation
  - ✓ Assigned the County Ombudsman to monitor the process
  - ✓ Mandated a process that would ensure transparency to all stakeholders



# *Community Engagement Process...*

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- County Health Department organized routine public meetings to communicate the progress of its independent evaluation
- DuPont was charged with implementing a community outreach program to ensure that all potentially affected residents were kept informed
  - ✓ Press releases
  - ✓ Newsletters
  - ✓ Door hangers
  - ✓ Public meetings
  - ✓ Web sites



# *Outcome...*

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- Health Department independently verified DuPont's initial findings of negligible risk
- Some limited remediation was conducted at two school locations to comply with additional regulatory requirements
- Ultimately, the situation resolved itself



# *Potential Outrage Factors Present in this Situation*

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## *Outrage Factor:*

- ✓ Dread (Dioxin)
- ✓ Trust (Messenger)
- ✓ Control (Residents)
- ✓ Children's Risks (Schools)

## *Approach:*

- ✓ Provide an easily understandable context for the potential exposures
- ✓ Let an independent local public health official carry the messages
- ✓ Provide frequent and convenient opportunities for public involvement
- ✓ Proactively address all issues at the schools



# *Postscript...*

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- Good science is essential, but it only goes so far whenever emotive issues are involved
- When the going gets tough, get help (independent spokespersons, public affairs support contractors, etc.)
- You can't overstate the importance of honesty, openness and maintaining good relationships
- Ultimately, a proactive and transparent approach to communicating risks that addresses the relevant outrage factors head-on will have the best chance of meeting the needs of all stakeholders



# *To Summarize...*

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- The way we perceive risk is dictated by:
  - Our physiology; and,
  - Mediated by a series of outrage factors that are shaped by our value systems and beliefs.
- Many of the chemical risk issues that we have to deal with are amplified by these factors.
- There is a system for communicating risk information that has application in many settings.

