Risk Communication Practices to Address the Quandary of Pharmaceuticals, Endocrine Disruptors and Emerging Contaminants

Lisa Ragain
Aqua Vitae

April 27, 2011
Northeast Water Science Forum
Domestic water supplies should protect the health and promote the well-being of individuals and communities.

Overview

Introductions
Risk Communication
Discussion
Break
PPCPs and Emerging Contaminants
Exercise
Summary
Objectives

- Identify and discuss risk communication principles
- Relate principles to specific drinking water contaminants
- Describe of risk communication in the context of regulatory framework
- Apply risk communication framework to specific contaminants
What is Risk Communication?
Risk Communication is Not

• Crisis Communication
• Media Strategies
• Public Relations
• Brochures and other written products

These are tools that are a part of a comprehensive risk communication strategy.
What is Risk Communication?

- Risk Management
- Complex science
- Uncertainty
- Risks and Benefits
- Research and data
- Strategic
- Discourse
What is Risk Communication?

Evolved risk management
- NOT from communication or health communication

The context has changed
- How safe is “safe enough?” (late 1960’s)
- Natural, technological hazards (1970’s)
- Add-on to risk assessment (1980’s)
- Integrated into risk management processes (1990’s)
How do risk communication and risk management relate?
Risk Management

Paradigm

Adapted from CSA (1997)

Detail of Decision Points

Go Back

End

Next Step or Action
Risk Communication Principles

Perceptions and belief have equal status with data and facts

- Trust
- Audience specific
- Previous experience
- Messages
Foundations

- Built from data
  - Qualitative
  - Quantitative
- A component of risk management
- Reliant on dialogue and discourse
Role of Scientific Evidence

- Understanding of scientific process
  - Proving a negative
- Demonstrate the benefit of fluoridation
- Weight of the evidence
Risk Communication Perspective

What perceptions drive audience reaction?
- Involuntary risk
- Very familiar vs. “exotic”
- Understand some, not all aspects of a risk
- Trust
- Scare words: toxic, convulsive, sex hormone
Risk Communication Perspective

Perceptions are valid and must be addressed *equally* in relation to scientific data.
What does the public want to know?

- Is the drinking water safe for my family?
- What is the utility doing about it?
- Can I trust the experts?
- Where can I get information
- What are my options?
- **What can I do?**
Audience Considerations

• Staff
• Public officials
• Concerned customer
• Customers
• Advocates

Who can be persuaded, is there real discourse?
Drinking Water and Risk

- Involuntary risk
- Persistent and pervasive controversy
- Trust
  - Government and institutions
- Toxicity and sources
- Ethics
We Know that for drinking water and health...

Emerging and re-emerging contaminant issues

- Are complex
- Involve serious consequences for utilities
- Trigger public interest

Responding transparently to public concerns is very important

- Builds trust and credibility
“Tell” Model

Expert Information Source

Receiver
“Network” (Discourse) Model

Extensive group to group, person to person communication
Utilities and Public Health

• Drinking water is a part of public health
  – Unique role in communities
• Not health experts
• Public health *promotion*
• Regulatory framework vs. public health guidance
What should utilities say?

- Local issue, local decision
- Why/not is the drinking water fluoridated?
- Action related to research
- Change in guidance, what does it really mean?

Respond with public health and community partners
What should an agency say?

- Local issue, local decision
- Why/not
- Action related to research
- Change in guidance, what does it really mean?

Respond with public health and community partners
Example of Effective Practices

- Consistent communication
- Relates water to public health
- Local expert
- Personal
- Additional information and context provided
Risk Communication is

The set of strategies & approaches used to develop

An *interactive* process of exchange of information and opinion among various interested individuals, groups, and institutions about risk

Risk management decisions & actions flow from that exchange.

Adapted by Dr. Rebecca Parkin from NRC, 1989
Risk Perception Drives Risk Communication

Risk Perception

- Shapes judgments, preferences, & decisions
- Is influenced by personal, social and cultural factors

Central Questions

- How do people *think* and *feel* about the risk?
- *Why* do they view the risk that way?
To understand in risk perception…

Public Concern ≠ Scientific Concern

Public concern is valid, real and must be addressed

via risk communication
Risk Perception Parameters

Extent to which the hazard is feared
DREAD

Extent to which the hazard is know or unknown
KNOWLEDGE

Number of people exposed
Public Health Significance

least important of the three
Understanding risk perceptions

Questions to answer:

- What do they want to know?
- How do they want to know it?
- When do they want to know it?
## Attributes of public concern

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Definition</th>
<th>Scoring Range</th>
<th>Example</th>
<th>Rationale</th>
</tr>
</thead>
</table>
| Proximity | Place – Closeness to the utility customers | 0 = No mention  
1 = Local  
2 = State  
3 = Region  
4 = Country | Des Moines  
Iowa  
Midwest  
U.S. | The closer the media is to the consumer, the more public concern it can be assumed to have within a community. |
| Frequency | Time – The number of media items mentioning a specific contaminant | Number of articles per 36-month period (e.g., 2001-2004) | 19 media items featured coliform bacteria during the period reviewed | The more recent, and the more a community hears about a contaminant, the more likely they are to have elevated levels of concern. |
| Concern | Dread – The words that represent different levels of concern | 0 = No mention  
1 = Neutral  
2 = Concern  
3 = Dread | “Hydration”  
“Unknown effect”  
“Cancer” or “Toxic” | Certain words can create a perception of dread. This scale used different levels to reflect public concern. |
| Population | Person – Specific communities | 0 = No mention  
1 = Not specified  
2 = Personal  
3 = Concern  
4 = Dread | No population mentioned  
Private well or specific neighborhood  
Elderly  
Children, pregnant women | Specific groups affected by a contaminant may cause a greater level of public concern. Additionally, if people think an issue is more likely to affect them, they also demonstrate a higher level of concern. |
Dread Characteristics

- Not controllable
- High dread
- Catastrophic globally
- Fatal consequences
- Not equitable
- Population affected
- High risk to future generations
- Not easily reduced
- Risk is increasing
- Involuntary exposure
Drinking Water Dread Characteristics

Not controllable AND Involuntary exposure

High dread
  Poison
  Toxin

Interpretation
  Difference between exposure and toxicity

Health Effects
  Cancer

Population At Risk
  Children
  Pregnant women

October 2005
Secrecy shrouds water test results

By Martha Mendoza/AP National Writer

Article Launched: 03/11/2008 06:16:16 AM PDT
Organizational Characteristics

- Risk Management
- Select priorities and develop in steps
- Regular business practice
- Exercise and training
- Build collaborations over time
- Establish and support dialogue
Risk Communication for Emerging Contaminants 2776

• Recognition of emerging issues as a communication challenge

• Need for
  – Risk perception data on drinking water and trust in utilities
  – Role of the web
  – Links between scientific and perception data
Perception Challenges

If water was safe yesterday,

Why isn’t it safe today?

Was water really safe yesterday?

How safe is safe enough?
Risk Perception Applied

People tend to
Simplify risk information
  I was told to boil my water once. Should I always boil my water?
Find it difficult to change their minds
  Regaining credibility and trust
Remember what they see
  Strong visuals, positive or negative
Disagree more about what risk is and how extensive
I. Scientific and public concern
II. Scientific concern, no public concern
III. Public concern, no scientific concern
IV. No scientific or public concern

Public Concern

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>I arsenic</td>
<td>II antimony</td>
</tr>
<tr>
<td>III MTBE</td>
<td>IV vanillin</td>
</tr>
</tbody>
</table>
Understanding risk perceptions

Identify audiences through…

- Community - General
- Susceptible populations - contaminant specific
- Partners
- Demographics
- Community presence
Barriers to Risk Communication

- Resources
  - Personnel
  - Time
  - Monetary
- Mutual understanding
- Communication
- Professional and agency relationships
- Roles and responsibilities
Internal Process

- Commitment to risk communication
- Develop process
- Strategic process rather than reactive measures
- Identify specific areas and tasks
- Look full range of employees
Academia to Practice

- Remove intimidation
- Focus on application in the field
- Demonstrate applications
- Revise based on field experience
2776 Findings

- “Emerging” linked with inevitable
- Storm water and wastewater negatively affected drinking water perceptions
- Frequency and population attributes had strongest affect on classification
- Risk Communication needs to be a strategic priority within a utility
Pharmaceuticals
Why?

- Low levels, detected through better technology
- No documented human health effects
- Modern water treatment has improved public health
- Competing concerns of infrastructure, known health effects, new regulations
“Drinking water is personal. It is what we use to bathe, prepare food and make formula to feed our babies. It touches every aspect of our lives.

What we do as water professionals is intimately related to the health and well-being of our friends - our families - our communities.”
Risk Management Quandary

Sampling, Monitoring and Regulation of Emerging Contaminants

Northeast Water Science Forum
Regulation

• Regulation is a form of risk management
• Public may or may not care
• Public officials
What Are the Challenges?

- Rules
  - LCR
  - DBP
  - TCR

- Monitoring Precision and Accuracy
  - Perchlorate
  - Pharmaceuticals
  - Endocrine Disruptors
  - Microbes

- Simultaneous Compliance -
  - complex and technical

- Public Awareness and Concern

- Undefined Health Effects

- Limited Resources

October 2005
Few guidelines, treatments for contaminated water

PHILADELPHIA, Pennsylvania (AP) – Just a century ago, this historic city notched by the Delaware and Schuylkill treated these rivers as public sewers, but few cared until the waters ran black with stinking filth that spread cholera and typhoid. Today, municipal drinking water is cleansed of germs — but not drugs.

Traces of 56 human and veterinary pharmaceuticals or their byproducts — like the active ingredients in medicines for pain, infection, high cholesterol, asthma, epilepsy, mental illness and heart problems — have been detected in Philadelphia’s drinking water. Starting their winding journey in medicine cabinets and feed bins, they are what’s left of drugs excreted or discarded from homes and washed from farms upriver.

Is Philadelphia worried? Not so far. Tens of millions of Americans here and elsewhere drink water that has tested positive for minute concentrations of pharmaceuticals, and they don’t even realize it, The Associated Press learned during a five-month investigation.

Though U.S. waterways coast to coast are
Monitoring and Sampling

- If it isn’t dangerous, why are you testing for it?
- Why are you monitoring or sampling?
- What will you do with the results?
- Plan communications and information exchange
- Technical Assistance
Endocrine Disruptors, Pharmaceuticals, and Personal Care Products

Applying Risk Communication in...
Common PPCP Themes

- Toxicity
- Forced Medication
- Negative Health Effects
- Government intrusion
- Individual actions
Contradictions of EDCs and PPCPS

Medical
• Health benefits
• Familiar
• Control
• Individual health
• Regulation

Water
• Health threat
• Familiar
• Population health
• No regulation
AP Article Overview

- Developed as new “Investigative” initiative in AP
- National scope, utilities in all states queried
- Appearance of “scientific” review of data
- Highly promoted with AP subscribers
Pharmaceuticals, EDCs and…

How Did We Get Here Again?
AP Investigation Method

- Review of hundreds of scientific reports, analyzed federal drinking water databases,
- Site visits at study sites and treatment plants
- Interviewed 230+ officials, academics and scientists
- Surveyed 50 largest US cities, other major water providers and smaller community water systems

PNW AWWA 2009
AP Probe Finds Drugs in Drinking Water

By JEFF DONN, MARTHA MENDOZA and JUSTIN PRITCHARD
The Associated Press
Monday, March 10, 2008; 9:17 AM

A vast array of pharmaceuticals -- including antibiotics, anticonvulsants, mood stabilizers and sex hormones -- have been found in the drinking water supplies of at least 41 million Americans, an Associated Press investigation shows.

Duane Moser, an assistant research professor with Desert Research Institute, collects water samples from the Las Vegas Wash in Henderson, Nev., Thursday, Oct. 18, 2007. (Jae C. Hong - AP)
New tests detect pharmaceuticals in more water

At least 46 million Americans are supplied water that has tested positive for trace concentrations of pharmaceuticals, up from 41 million in March. The original Associated Press reports prompted many more communities to test their water.

* In Virginia Beach, pharmaceuticals were found in source water but not in treated drinking water.
AP Article Analysis

• Pressured utilities for data
• Knew story had elements of “outrage”
• Promoted concerns rather than solutions
AP Article Analysis
Limitations

Did not explain or acknowledge:

- Why some utilities testing for unregulated contaminants
  - Why other utilities do not
- The differences in data collection from utility to utility
- Competing priorities
AP Article Analysis

Opportunities

• Sparked awareness of drinking water quality
• Initiated important policy and risk discussions
• Created a public awareness of the link between source water, drinking water and wastewater
AP Article Analysis
Effects

- Decisively created the biggest drinking water story of the year
- Set a precedent for future stories
- Underscored the need for stronger risk communication strategies and relationships with public health, health care providers, and other organizations
Immediate Reactions

- Large volume of public comments relative to other drinking water stories
- Health department inquiries
- Utilities surveyed received few calls
Greater Bangor

Bangor area water safe, district says
By Meg Haskell
Tuesday, March 11, 2008 - Bangor Daily News

BANGOR, Maine — In response to a national survey that includes Bangor on a list of small cities that do not test their public drinking water for the presence of pharmaceuticals, the water district’s top official said Monday that consumers here have little to fear.

Kathy Moriarty, general manager of the Bangor Water District, said the city’s water source, Floods Pond in Otis, is so well-protected that it’s next to impossible for it to contain even minute traces of pharmaceuticals. Nonetheless, she said, she has already sent away to a California laboratory for a specialized testing kit and hopes to be able to demonstrate conclusively the lack of pharmaceutical contamination in Floods Pond.

"The risk is incredibly low," Moriarty said in a telephone interview. "I can’t imagine a water supply that’s better protected against this problem." The water district owns the entire perimeter of the 635-acre lake. It also owns 99 percent of the watershed that feeds the lake, Moriarty said, including more than 5,600 acres surrounding the lake.
DES suggests testing your well water for known health risks

By TOM BURACK

An alarm was recently sounded by the media alerting us to the potential dangers related to trace amounts of pharmaceuticals and personal-care products in drinking water.

While this announcement is certainly a reason for concern, it isn't a reason for panic, nor does it represent breaking news to the staff at the New Hampshire Department of Environmental Services.

The attention this announcement provides is a great reminder that we should all be concerned about the quality of our drinking water, especially if the water is provided by a private well.
National Media

- Did not print full series of AP articles
- Did not interview utility/water experts, but academics or public officials.
- Published follow-up articles with details
- Often added links, multi-media and other information to put risk into perspective
State and Local Media

• Spoke directly with local utility
• Used local “experts”
• OpEds and letters:
  – Used the term “wake-up call”
  – Supported source water protection and infrastructure improvement
  – Noted bottled water is not an answer
Continued Coverage

- Sporadic reports as utilities and states release test results
- Hearings reported prior, but results are not widely covered after
Legislative Reactions

- Congress - Senate hearing, bills in both houses
- New York City, Philadelphia City Council Hearings
- New Jersey, Massachusetts Legislative Hearing
- Texas State Attorney General request
- Illinois - State mandated sampling
Public Comments

I don't understand how utilities claim that their water is safe when clearly not enough testing is done in this aspect.
What Worked

• Proactive strategy
• Open about uncertainty and results
• Trust within the community
• Consistent Messages
What Did Not

“revealing the name (of the pharmaceutical) in the post-9/11 world could cause a terrorist to intentionally release more of the drug, causing harm to residents”
What Did Not

• “The public won’t understand”
• Citing regulations
• “The water is absolutely safe”
• Reactive testing
Standard Response

“For reference, a part per billion is equivalent to one drop in an Olympic-sized swimming pool, and a part per trillion is equivalent to one drop in 1000 Olympic-size swimming pools.”

Better Response

All the results are in the parts per trillion range -- the equivalent of grains of sand in an Olympic-sized swimming pool --
Less than one in a billion

It doesn’t take much hexavalent chromium in the water to create a long-term health risk, new research shows. But you might not realize it’s a problem if you rely on the consumer confidence reports mailed each year by your local water provider. Those reports typically mention only total chromium levels — including “hex chrome” and another kind that is beneficial.

Mandatory drinking water standards for chromium, and the new public health “goal”

- Federal government’s mandatory standard for total chromium: 100 parts per billion (ppb)
- State’s mandatory standard for total chromium: 50 ppb
- New proposed public health goal for hexavalent chromium (a part of total chromium): 0.02 ppb
- Stockton last tested for hexavalent chromium in 2001-02, and found it in concentrations ranging from 4 to 6 ppb

One part per billion is roughly equivalent to one drop of ink in one of the largest trucks used to haul gasoline.

0.02 part per billion is roughly equivalent to two hundredths of that same drop of ink.

Sources: California’s Office of Environmental Health Hazard Assessment; Environmental Working Group

RICK HUDOCK / The Record
Public Comment Summary

• Concern, not panic
• Questions what to do
• Questions bottled water
• Outrage greater when utility had long standing water quality or public trust issues
• Question drug disposal/return problems and actions
Strategies and Tools

Risk Communication in Practice

Northeast Water Science Forum
Drinking Water Communication Practice

**Preparation**
- Regular communications
- Partnerships and network
- Event or contaminant
  - Media, regulation

**Response**
- Specific communication
- Audiences

**Assessment**
- What else
- Enough
- Next time
Northeast Water Science Forum

Risk Communication Strategy → Response → Recovery
Evaluation

= Media Event Concern unknown
How should water professionals respond?

- Consistent communications from CCR, to customer tips to education
- Previous issues affect reactions
- Introducing or continuing fluoride?
- Preparation, evaluation of other efforts, institutional history

Know your community
Understanding Audiences

- “Publics”
- Boards
- Regulators
- Elected Officials
- Media
Exercise

• AP is releasing another series in conjunction with USGS and EPA data release

• Use the given tool to craft a message
What is a message?
The information an audience most needs to know
Message Considerations

- Who you are
- What action individuals should take
- What occurred and description
- Where it occurred
- When it occurred

- Expected duration
- Why it happened
- Who is affected
- Basic information about the water system
- Current actions
- Where to get more information

Northeast Water Science Forum
**PURPOSE**
Advisories need to be a clear, consistent message. The Single Overriding Communication Objective (SOCO) Worksheet is a tool to create a specific message.

**DIRECTIONS**
Work with water system staff and partners to complete the SOCO Worksheet. Use the best available information. First, think about the reason for the advisory and the actions needed. Next, answer each question. Use the results to develop all communication. As the situation changes, use this worksheet to update the message.

---

**Key Message: Provides Meaning and Context**
In one brief paragraph, state the key point or objective you want to communicate.

---

**Key Facts**
What are the three most important facts you need an individual to understand about the Drinking Water Advisory?

---

**Target Audience**
Who is the main audience or population segment you would like this message to reach? Who is the secondary audience?

Primary Audience: ________________________________
Secondary Audience: ________________________________
Tertiary Audience: ________________________________
What does the public want to know?

• Is the drinking water safe for my family?
• What is the utility doing about it?
• Can I trust the experts?
• Where can I get information
• What are my options?
• **What can I do?**
Contamination suspected/found in tap water. Take action before drinking or cooking.

Boil water for drinking and cooking.
- Fill pot with cold water. Heat until bubbles come from the bottom of the pot to the top.
- Once the water reaches a rolling boil, let it boil for one minute.
- Let the water cool and store it in a clean container with a cover.

Routine tests confirm the presence of E. coli bacteria in the water.
- Your risk of illness from drinking the water is low.
- Everytown Water is increasing the disinfectant levels and flushing the distribution system to eliminate the problem.
- Testing will continue until the problem is resolved. You will be informed of progress.

If you cannot boil water, disinfect it.
- Add 8 drops (1/8 teaspoon) of unscented household bleach per gallon of water.
- Allow the water to stand for 30 minutes. If the water is cloudy, repeat the procedure.
- Store disinfected water in a clean container with a cover.
Planning and Collaboration

Primacy Agency

Public Health Agencies
- Susceptible populations
- Translation
- Community organizations
- Health care providers
- Hospitals and clinics
- Food service
- Health expertise

Water Systems
- Consecutive systems
- Regional groups
- Alternative water

Local Government
- City or County Councils
- Public Works

Academics

Community Based Organizations
What next?

- Recognize there will be another event
- Concern of the may not be expected or understood
- Proactive, strategic approach essential
- Develop relationships to build trust
- Identify both opportunities and challenges
Tools for Collaboration

• Tools follow key points in collaboration process
  – Authorities
  – Roles and responsibilities

• Documentation of existing components to identify needs to expand or build collaboration

• Focused on public health and health care providers - foundation for any effort

• Evaluation
Final Thoughts

Special thanks to PWD, GWU, the Water and Health Work Group and numerous other utility and public health colleagues

PNW AWWA 2009