Risk Communication in Mass Poisoning Situations: Messaging

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Conflict of Interest and Disclaimer

• Dr. McKay is Vice President of the American College of Medical Toxicology (ACMT), a physician organization of medical toxicologists.
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Overview

• What is crisis risk communication?
• Crisis risk communication in a chemical event
  Developing key messages
  Developing key supporting statements
Seeking help (input and output)
Definition of Risk

• Dictionary definition
  – Possibility of loss or injury: peril
  – Someone/thing that creates or suggests a hazard

• Mathematical definition
  – Risk = Frequency x Consequence

• Security definition
  – Risk = Threat x Vulnerability x Consequence

• Public/Media definition
  – Risk = unacceptable
  – Risk = Hazard x Outrage  (Peter Sandman)
<table>
<thead>
<tr>
<th>More Acceptable</th>
<th>Less Acceptable</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Natural “cause”</td>
<td>• Man-made “cause”</td>
</tr>
<tr>
<td>• Associated with a trusted source</td>
<td>• Not associated with a trusted source</td>
</tr>
<tr>
<td>• Familiar</td>
<td>• Exotic</td>
</tr>
<tr>
<td>• Voluntary</td>
<td>• Involuntary</td>
</tr>
<tr>
<td>• Potentially beneficial</td>
<td>• Limited or absent benefit</td>
</tr>
<tr>
<td>• Statistical (low harm likelihood)</td>
<td>• Catastrophic (high harm likelihood)</td>
</tr>
<tr>
<td>• Fairly distributed or shared by all</td>
<td>• Unfairly distributed (injustice)</td>
</tr>
<tr>
<td>• Affects adults</td>
<td>• Affects children</td>
</tr>
</tbody>
</table>
Degree of Outrage

“Unfamiliarity” factor

Involuntary nature of exposure

Severity of Effect
### Spectrum of Scenario & Response

<table>
<thead>
<tr>
<th>EVENT OR SETTING</th>
<th>APPROPRIATE RESPONSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low risk – Low outrage</td>
<td>Informational (or none)</td>
</tr>
<tr>
<td>Low risk – High outrage</td>
<td>Outrage Management</td>
</tr>
<tr>
<td>High risk – Low outrage</td>
<td>Advocacy</td>
</tr>
<tr>
<td>High risk – High outrage</td>
<td>Crisis Communication/Action</td>
</tr>
</tbody>
</table>

The Peter M. Sandman Risk Communication Website. [http://www.psandman.com/](http://www.psandman.com/)
High-Stress or Crisis Risk Communication

• Science-based approach to successful communication in situations defined by:
  – High concern or high stress
  – Emotionally charged nature
  – Controversy
Where Does It Fit In Response to a Chemical Event?

• Risk Communication is the final component of a risk characterization

• Risk Characterization
  – Risk Assessment
    • Hazard Identification
    • Exposure Pathway
    • Modifying Factors
    • Toxicity Assessment
  – Risk Communication
Memory and Stress

• People retain an average of **7** bits (range 5-9) of information in **low-medium stress situations**

• People retain an average of **3** bits of information (range 1-5) in **medium to high stress situations**
Risk Communication Bottom Line

• “Here is the situation.”
  – You are (not) in danger (now, ever)
  – Your children are (not) in danger (now, ever)

• “You do (not) need to do something.”
  – Your options include the following…
• Mortality from lung cancer has shown downwards trends over the last decade or so, related largely to impacts of smoking cessation efforts from their highest levels seen following World War II. The increase in the proportion of woman smokers and the long latency period of lung cancer is also likely responsible for the continued increase seen in this population through the 1990s, only more recently beginning to fall.
Risk of Lung Cancer: Visual

**Age-Adjusted Rates**
*By Data Type*
Lung and Bronchus, All Ages, Black, Male
1975–2013

**Men**
- 125 of 100,000
- Risk per 100,000
- Year of Diagnosis/Death

**Women**
- 40 of 100,000
- Risk per 100,000
- Year of Diagnosis/Death

Cancer sites include invasive cases only unless otherwise noted.
Factors That Impact Risk Communication

- Nature of previous encounters with healthcare field
- Lack of prior patient-healthcare worker relationship
- Incomplete or inadequate response to questions
- The provision of information contrary to "popular understanding" or media representation
- Loss of credibility
- Lack of appreciation of individual or cultural differences in perception of risk or applicability of data
- Incomplete or limited comprehension of scientific or statistical principles
• Every good (conspiracy) story needs a:
  – Victim
  – Villian
  – Vindicator
Consequences of Poor Risk Communication

• Promotes distrust
• Decreases compliance with recommended measures
• Increases duration, complexity and cost of response efforts, necessitating more elaborate means
• Results in use of limited resources in a less productive and inappropriate way
Real World Dangers of Poor Risk Communication

- Unfounded and misinterpreted concerns about thimerosal-containing vaccines
- Abrupt decline in Hepatitis B vaccination of neonates
- No mercury poisoning avoided but infants died of Hepatitis B

**FIGURE 2. Number of children who received first dose of Hepatitis B vaccine ≤5 days after birth — United States, 1999–2000**

- **Number of Children**
- **Issuance of Joint Statement Regarding Thimerosal as a Vaccine Preservative**
Risk-Based Communication

http://www.biomonitoringinfo.org/new/20051128.html#B
Risk Communication is Science…and Art

• Communication in a crisis is affected by a number of factors
  – High stress places limitations on what a listener can take in
  – What others say will affect the impact of your messages
Keys to Successful Risk Communication

- Anticipation, Preparation, and Practice (APP)
- Non-verbal communication skills
- Visuals (graphics, stories, analogies)
- Aim at 6th-8th grade level of education (AGL- 4)
What Should People Take Away?

• Uncertainty significantly impacts the ability of an individual to take appropriate action

• People should not leave with the impression
  – “No one knows what is going on or what we should do.”

• Important to convey:
  – Likely magnitude of the risk
  – Urgency of the risk
  – Personal applicability of a risk characterization
  – Uncertainties of the risk assessment
  – Management options
Message Map

Key Message 1
  - Supporting Fact 1.1
  - Supporting Fact 1.2
  - Supporting Fact 1.3

Key Message 2
  - Supporting Fact 2.1
  - Supporting Fact 2.2
  - Supporting Fact 2.3

Key Message 3
  - Supporting Fact 3.1
  - Supporting Fact 3.2
  - Supporting Fact 3.3
Exercise

• You are managing disaster response in an area that was just struck by a hurricane. The night before, two separate families were killed by carbon monoxide. In both cases, the families had operated a generator indoors. You are asked to make a statement.

• What would your statement include?
Exercise

Which would be appropriate to include in a statement?

A. Carbon monoxide binds hemoglobin with more affinity than oxygen, although the exact number varies based on the nature of the experimental study.

B. Thankfully, only 6 people have died.

C. If people had not misused the generators, they would still be alive.

Message Map Example

Carbon Monoxide

Key Message 1
Symptoms like the flu

Key Message 2
Generators should be operated outside the home

Key Message 3
Use Carbon Monoxide Detectors
Household Carbon Monoxide Map

**Symptoms like flu**
- Headache
- Weakness
- Nausea

**Do not use a generator indoors**
- Exhaust cannot vent properly
- Sadly, typical in disasters
- Generators outside, away from open windows

**Use carbon monoxide detectors**
- Provide early warning
- Locate near sleeping area
- Test/Change battery regularly
2014: Elk River, WV, USA

2016: Sesena, Spain
Summary

• Risk characterization is critical for risk communication
• Risk communication is as much about “communication” as it is about “risk”
  – Don’t forget to characterize the “outrage” factor
• It is OK to “not know” – it is not OK to “never know”
• 3 key messages with 3 supporting statements
  – Communication “rule”: 9 x 1 = 0 3 x 3 = 3
• Statements: accurate, understandable, positive, quotable
  – Be first, right, credible, show respect & empathy, promote action
Conclusion

• Good risk communication may not make a situation better. Bad risk communication will make a situation worse.
References

Environmental Protection Agency: Risk Assessment Website Portal  www.epa.gov/risk/
Centers for Disease Control and Prevention: A comprehensive immunization strategy to eliminate transmission of hepatitis B virus transmission in the United States. MMWR 2005;54(RR16):1-23. www.cdc.gov/mmwr/preview/mmwrhtml/rr5416a1.htm
Sandman P: The Peter Sandman risk communication website. www.psandman.com/index.htm