Evidence-Based Risk Communication and Pipeline Public Awareness

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Today’s Presentation

1. Challenges and importance of successful risk communication

2. Evidence-based design and evaluation of risk communication

3. Initial recommendations related to RP 1162
Perceptions of risks and contexts differ

Complex systems → more groups, wider differences in perceptions of risk

“How Public awareness of where pipelines are located and an understanding of the safety concerns and risks associated with pipeline transmission are vital to the continued safe operation of pipelines”

- PHMSA PAPWG Report 2016

Risk communications can have different goals

<table>
<thead>
<tr>
<th>Type of Communication</th>
<th>Description</th>
<th>Example Pipeline Safety Communication</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Crisis</td>
<td>Emergency situation Requires action right away</td>
<td>Evacuation announcements related to a pipeline failure</td>
</tr>
<tr>
<td>2. Care</td>
<td>Agreement on risk Agreement on what to do about risk</td>
<td>Advisory notices regarding One-Call Systems/811/”Call-Before-You-Dig”</td>
</tr>
<tr>
<td>3. Consensus</td>
<td>Less agreement on risk Less agreement on what to do about risk</td>
<td>Advising communities on the “benefits of pipelines and the risks associated with pipeline failures”</td>
</tr>
</tbody>
</table>

Another wrinkle: we assume we are better at communicating than we are.

Why?

- **Common knowledge effect** → assume others have the similar understanding as us
- **False consensus effect** → assume others will make the same decision as us
- **Other biases and myths**
Summary of challenges

Different individuals/contexts
  - Increased complexity
  - Confusion of goals
  - Tendency to use faulty intuition

Inefficient strategies
  - Misinformed or under-informed audience
  - Mistrust, acrimony, breakdown in communication
Hard to do in complex contexts →
need evidence-based strategies

Assume only one Audience

“Know”/Assume your Audiences

Listen to, Work with, and Know your Audiences
Hard to do in complex context → need evidence-based strategies
Audience-Focused Design of Risk Communications

1. Analyze information people need to know

2. Assess what they currently believe

3. Address the gaps between 1 and 2

Adapted from FDA *Communicating risks and benefits: An evidence based user's guide* and de Bruin and Bostrom (2013).
Mental Models Approach

Expert

"Lay"/Expert
Requirements for Successful Risk Communications

1. The communication contains the information needed for effective decision making.

2. The communication connects users to that information.

3. The communication is understood by users.

Adapted from FDA Communicating risks and benefits: An evidence based user's guide.
<table>
<thead>
<tr>
<th>No/Low Expense</th>
<th>Moderate Expense</th>
<th>Substantial Expense</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ask friends, family, coworkers, and staff to review and say what they think.</td>
<td>Strategies from No/Low Expense category plus:</td>
<td>Strategies from Moderate Expense category plus:</td>
</tr>
</tbody>
</table>
| “Think-Aloud” process with convenience sample focused on opinions on:  
  - comprehension  
  - completeness  
  - bias | One-on-one structured interviews | Randomized control experiments |
| Ask internal experts to review communication | Transcript/text analysis of interviews and focus groups | Surveys with representative samples and pre/post testing |
| Some focus groups | Some survey approaches | |
| Search of public data | Search of less available data | |
Summary of research guidance

• Evidence-based design and evaluation

• Includes and requires more interaction with audiences

• Resources upfront + understanding audience context → efficiency, effectiveness, trust
Initial Recommendations re: RP 1162

Stakeholders/Participation
Involve additional experts and public stakeholders in development of future guidance → close gap between groups

Goals
Clarify when the goal of the public awareness program is to improve decision making and when is the goal to induce behaviors
Initial Recommendations re: RP 1162

Design of Risk Communications
• Emphasize understanding audience as first step and clarify enhanced/baseline

Evaluation of Risk Communications
• Emphasize effectiveness in addition to implementation

Figure 2-1—Public Awareness Program Process Guide
API RP 1162 (2nd ed.)
Thank you.

References:


Original Risk Communication Strategy

“All we have to do is get the numbers right” and “All we have to do is tell them the numbers”

\[(\text{Probability of an Event}) \times (\text{Magnitude of Harm}) = \text{Expected Outcome}\]

If the Expected Outcome is worse for Option A, go with Option B.