Radiation Risk Communications: Challenges and Opportunities

Presentation for:
The National Academies
Committee on Analysis of Cancer Risks in Populations near Nuclear Facilities
October 20, 2011

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Risk Communication at EPA

- Community involvement at EPA Superfund sites
  
  Citizens are actively engaged and encouraged to be part of the decision-making process
  
  http://www.epa.gov/superfund/community/

- Risk communication in radiation emergencies
## Public Perception and Radiation

<table>
<thead>
<tr>
<th>Low Perceived Risk</th>
<th>High Perceived Risk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voluntary</td>
<td>Involuntary</td>
</tr>
<tr>
<td>Under own control</td>
<td>Under control of others</td>
</tr>
<tr>
<td>Familiar</td>
<td>Unfamiliar</td>
</tr>
<tr>
<td>Personal Benefit</td>
<td>Unknown/No Benefit</td>
</tr>
<tr>
<td>Random</td>
<td>Direct</td>
</tr>
<tr>
<td>Immediate Effects</td>
<td>Delayed Effects (future generations)</td>
</tr>
<tr>
<td>Known Risk</td>
<td>Unknown Risk</td>
</tr>
<tr>
<td>Natural Origin</td>
<td>Human Origin</td>
</tr>
</tbody>
</table>

*Adapted from V. Covello, P. Sandman, 2001*
Risk Communication Principles

• Explain the risk assessment process before presenting the numbers
• Define and illustrate the routes of exposure
• Put the data in perspective
• Explain protective approach to risk assessment and standard setting

“A brilliant scientific discourse is wasted if no one listens or understands it.” Journal of the American Medical Association
Fukushima - Successes

Honolulu, HI
March 02 2011 - June 30 2011
Gamma Gross Count Rate

Graph showing Gamma Gross Count Rate from March 02 2011 to June 30 2011.

Gamma Energy Range 2 - Gamma Energy Range 10

EPA.gov/Japan2011
Fukushima Communications
Lessons Learned

1) Any health threat - perceived or real - needs a timely response
2) Use credible spokespersons
3) Collaboration and information sharing across levels of government
4) Radiation language is confusing
Public Message Testing: Nuclear Detonation

• Write short, concise and simple messages
• Use directive, authoritative language
• Do not use contradicting statements
• Provide prioritized instructions
• Say: “Instructions will be updated.”
• Tailor messages to specific audiences
Ongoing challenge:  
"How much radiation is safe?"

\[
EffXP_{TP,i} = CF \left( \frac{e^{-T_2 \lambda_i} - e^{-T_1 \lambda_i}}{-\lambda_i} \right)\]

\[
h = \frac{h}{s} \left[ \frac{e^{-s \frac{1}{s}} - e^{-s \frac{1}{s}}}{-\frac{1}{s}} \right]
\]

It depends...
Opportunity:
Improve understanding of the hazard

• Put radiation in perspective
• Explain protective measures
• Provide information to give public a measure of control  (See: epa.gov/radnet)
Questions?

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