

DO YOU HEAR WHAT I HEAR?

Overcoming Literacy, Numeracy and Perception Barriers in Communicating Environmental and Public Health Risk



Science Forum on Brownfields Redevelopment



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Overview

- **Context for Communicating Risk**
- **Realities and Implications**
 - Literacy
 - Numeracy
 - Perception
- **Overcoming the Barriers**

Context: Risk Communication

- High concern-low trust situations
 - “*Culture of Fear*”: risk messages in the media daily; “new” threats
 - Pandemic, drug side-effects, (bio)terrorism, tainted water...and the list goes on
 - People aren’t sure who to trust, and whether to trust you
- Stakeholder capacity
 - *Literacy and numeracy* are central to *understanding* complex information
 - ‘Capacity’ varies between (and within) communities, and over time
- Trust and credibility
 - For spokespeople, information sources, and processes
 - *Perception* influences responses to risk information

Literacy Levels

- **Level 1 (LOW):** ...difficulty with printed materials and identify themselves as unable to read.
- **Level 2 (BASIC):** ...can use printed materials for limited purposes such as finding a familiar word in a simple text.
- **Level 3:** ...can use reading materials in a variety of situations providing it is simple, clearly laid out and the tasks involved are not too complex.
- **Level 4:** ...can use a wide range of reading materials and meet most every day reading demands.

*ABC Canada Literacy Foundation,
www.abc-canada.org/literacy_facts/*

Literacy in Canada

- “2 of 5 Canadians (40%) would have difficulty reading this sentence, or following the instructions on a prescription bottle...”

Canadian Education Association, 1984

- “The Adult Literacy and Life Skills Survey [2003]... found that the average literacy score for Canadians had not changed significantly ... since the last major survey was conducted in 1994.”

Statistics Canada, “The Daily”, May 11, 2005

www.statcan.ca/Daily/English/050511/d050511b.htm

Literacy and Understanding

- > 90 million adults (U.S.) had 'LOW' or 'BASIC' scores
 - Many of them described themselves as being able to read or write English "well" or "very well"

Level 1 (LOW):	66 to 75 %
Level 2 (BASIC):	93 to 97 %
- Relevant literacy skills (English) do not always correspond to level of knowledge or education
 - Non-English stakeholders
 - Non-scientists
 - Non-specialists

Numeracy Terminology

Numeracy:

“The knowledge and skills required to apply arithmetic operations, either alone or sequentially, using numbers embedded in printed material, such as balancing a chequebook, figuring out a tip, completing an order form or determining the amount of interest on a loan.”

International Adult Literacy Survey, 2003

Math Anxiety:

“...a state of uncertainty; disturbance of the mind regarding the subject of mathematics.”

Ohio Mathematical Planning Committee, 1996

Numeracy in Canada

- **>40% of Canadians have basic or low numeracy**
 - Difficulty with everyday tasks
 - Examples: measuring distance or volume in household chores
- **Numeracy in Canada varies regionally**
- **“Math anxiety affects 50% of the population in any occupation”**

Ohio Mathematical Planning Committee, 1996

Numeracy in Canada

- Age differences in Canadian numeracy measures
- Gender differences
 - Men are less likely to ask for an explanation if they don't understand the math

Age Group	Basic/Low Numeracy
16-25	39%
26-35	38%
36-45	34%
46-55	56%
56-65	62%
Over 65	80%

Numeracy and Statistics

Outcomes are understood better...

- “2,730 Canadians died in car accidents in 2004”

CTV News, ctv.ca, Jan. 8, 2006

...than **probabilities**

- “There’s about a 1-in-4 or 1-in-3 chance of getting cancer”
- 10^{-6} risk
- 95th percentile

Perception Influencers

- Strongly influenced by word-of-mouth, credibility of victims, spokespeople and information sources
- Risk professionals and laypeople often think very differently about health and environmental risk:
 - Numbers vs. words
 - Probabilities vs. outcomes
 - Models vs. real world
 - Data vs. feelings, memories, and local experiences
 - Evolving understanding vs. absolute knowledge

Perception Influencers

- **When trust is low and concern is high, non-verbal cues**
 - provide most of the message content
 - can be seen at a distance
 - are intensely noticed
 - are likely to be negatively interpreted
- **Non-verbal messages win**
 - When the words and the picture don't match, the picture will have more impact
- **Distractions**
 - Fidgeting, lip licking, hand position, defensive or protective posture, shifty eyes, gulping air, playing with keys, hands in pockets

If you can be seen you can be heard

Perception and Understanding

- Words can create barriers to understanding and can influence perception of risk
- Variable or poorly understood meaning
 - Contaminant
 - Toxic
 - Above (or below) the standard
- Jargon and acronyms
 - SVE
 - Hypothetical receptor
 - De minimus risk

(Mis)perceptions About Cancer

- **American Cancer Society survey assessed cancer knowledge** (of Americans who never had cancer)
- **Common misconceptions:**
 - Surgical treatment can cause cancer to spread throughout the body (41%)
 - The medical industry is withholding a cure for cancer in order to increase profits (27%)
- **Little correlation between respondents' self-assessment of their cancer knowledge and accuracy of responses**
...yet cancer is relatively familiar to most people

Putting it Together

- Literacy, numeracy and perception challenges create obstacles to understanding
- People form opinions based on what (and who) they see, how they feel, and what they understand
 - These may have more impact than the facts
- Some people think they understand, even if they don't
 - True for cancer knowledge; what about less familiar issues?
 - Messages can be distorted when passed by word-of-mouth
- Information from a credible source is likely to be believed, **even if it is inaccurate**

Overcoming the Barriers

- **Set goals:**
 - Help people understand, but let them form their own opinions
 - Plan, then implement, check with your audience, and refine
 - Steadily build spokesperson, organization and process credibility
- **Assess and build stakeholder capacity:**
 - Know your audience's values, fears, priorities, info needs
 - Regularly benchmark understanding, social and cultural factors and other influencers
 - Start capacity building early and finish late

Overcoming the Barriers

- Prepare for emotional questions
 - Are my children at risk?
 - How will you deal with those who get sick?
 - Is this thing being contained?
 - What can we expect?
 - Why aren't you doing something about it?
 - Can you guarantee my safety?
 - What else can go wrong?
 - When were you first notified about this?
 - What bad things aren't you telling us?

Overcoming the Barriers

- **Simple visuals help convey complex information**
 - Use simple maps and photos rather than graphs, charts and cluttered diagrams
- **Information is more useful than data – know the difference**
 - Lead with information; back up with data
 - Explain key concepts in plain language
 - Choose “risk-neutral” terms where they give the same factual information

Communication is a process, not an event

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