Effectively Communicating Radiation Risks: The Toughest Task

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Overview

- Qualifications
- Perceptions
- Contamination
- Science
- Risk Communication
- Outrage Factors
- Risk of Risk Aversion
Disclosures

I Earn A Living Injecting People With Radioactive Materials.

"Nobody believes the official spokesman... but everybody trusts an unidentified source"

The Simple Lie Is Often More Believable Than The Complicated Truth

Shared Values

- Truth
- Environment
- Future For My Grandchildren And Your Grandchildren
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Perceptions

- Perceptions Are Often Very Different Than the Realities
- Determining Risk Is Very Complicated
Living With Radiation

Radiation. Hardly a word in any language generates more anxiety. And living with radiation can, in fact, be frightening... Nuclear waste is piling up.

National Geographic April 1989

“Invisible Radiation Intense Enough To Kill In Minutes..........”

National Geographic July 2002
He believes the nation is less prepared for a terrorist attack than it was five years ago, saying the government has shifted its focus to other problems such as rebuilding the economy and fighting infectious disease.

"You've got people who developed rashes," Evans said. "Until you can find out what it is and where it came from, you have to take every possible measure to protect people who might come in contact with whatever it is."

Playing It Safe
Greg Evans, professor of environmental health and director of SLU's Institute for Biosecurity, said first responders can never take too many precautions when responding to unknown or potentially terrorist threats.

Perceived Effects
Radiation is frightening.
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EPA's Definition of Contamination

- 1 in 10,000 to 1 in 1,000,000 Lifetime Chance of Dying
- 1 in 10,000 Corresponds to Approximately 2 mSv Lifetime
  - 0.03 mSv/year
- Natural Background (1 mSv/year [3 mSv with Radon])
- Background in Denver is 1 mSv More Per Year Than Florida

Contamination

- Impossible To Regulate At Levels That Other Contaminants Are Regulated
- Property Values
- Local Communities Don’t Pay The Cost of Cleanup
- Risk of Risk Aversion
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Science
- Imperfect
- Increasing Politicized
- Knowledge-based Decisions Are Most Likely To Work

Public Interest in Radiation Effects Heightened Because of Atmospheric Testing

Linear No Threshold Hypothesis
- No Safe Amount of Radiation
- What Human Activity Is Risk Free????
Atomic Bomb Survivors
- Over 100,000 Survivors
- Both Sexes
- All Ages
- Whole-Body Radiation
- Doses Well-Known

Long-Term Health Effects Difficult to Detect
- Hiroshima and Nagasaki
  - 120,000 Survivors
  - 8% Increase in Cancer Deaths
  - 500-800 Excess Deaths

Risk of 1 CT Scan
1 In 2,000 Chance Of Developing A Fatal Cancer

What Is The Risk Of Not Doing The CT?
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NCRP Report

6 times small = small
6 times 1 cent = 6 cents

1980

- 0.06 mSv
- 3 total medical

2006

- 0.3 mSv
- 1.5 total medical
- 0.4 2006
- 0.06 2006
- 3 total medical

Total Medical - 0.54 mSv
Total Medical - 3 mSv

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What Does 1 In 2,000 Chance Of Developing A Fatal Cancer Mean??

- Our Lifetime Risk of Dying of Cancer Is 25%
- One CT increases our risk to 25.05%
- Risk of Not Having The CT
- 1,999 chances in 2000 that absolutely no harm will occur

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What Does 1 In 2,000 Chance Of Developing A Fatal Cancer Mean??

- Assumption - If you get a cancer caused by radiation, you will die 15 years prematurely.
- 1/2000 times 15 years = 2.7 days of life lost

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Catalog of Risks

Loss of Life Expectancy (Days)

- Automobile
- Smoking
- Alcoholic
- Poor Social Status
- Grade School Drop Out
- Overweight
- Heart Disease
- Motor Vehicle Accidents

Catalog of Risks

- Suicide
- Drinking Water
- Fire, Burns
- Alcohol
- Murder
- Energy Conservation
- Motor Vehicle Accidents
- Loss of Life Expectancy (Days)
  - 50
  - 100
  - 150
  - 200
- Catalog of Risks

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Outrage Factors
- Involuntary
- Unnecessary
- Risks > Benefits
- Benefits and Risks Not Coupled
- Dreaded Outcome
- Ongoing Risk
- Not Shared Equitably
- Unfamiliar
- Morally Reprehensible
Risks of Risk Aversion


Cost
QALY
(\(\times 1,000\))

0 500 1000 1500 2000 2500 3000

Medical Injury Toxin

0 19 48 2800

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