

Lecture Notes: Disaster Vulnerability and Resilience

Session 6

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Risk Communication

Introduction

- I. What is Risk?
 - a. The probability of an adverse event occurring?
- II. What is Risk Perception?
 - a. How people view that probability and the way their view differs from the actual probability
 - b. Began in the 1940s with Gilbert White (geographer in University of Chicago) whose PhD on floods discovered an important paradox: though the number of floods was decreasing and the money spent on flood protection was increasing, people were claiming more flood damage.
 - i. Discovered that people like being near floodplains. Why?
 1. Better land for farming (flat, better soil)
 2. Picturesque landscape
 3. Availability of water
 4. Transportation
 5. Recreation
 - ii. Because flood protection had increased, people felt safer and would take larger risks on the floodplain.
 - iii. Begins the Chicago school of thought on Natural Hazards
 1. B. Kates
 2. I. Burton
 3. *Environment as Hazard* (1995)
 - c. Why don't people worry about natural hazards?
 - i. The benefits outweigh the costs
 - ii. They grow accustomed to the risk and they accept it.
 - d. How are natural hazards different from technological hazards
 - i. Natural hazards are perceived as being unavoidable whereas technological hazards are perceived as being avoidable
 - ii. Technological hazards are acts of humans; natural hazards are acts of "God."
 - iii. Information gap: technological hazards are not well understood, but natural hazards are familiar.
 - e. Is there a problem with the model?
 - i. Many people have no choice about where they live (especially in the developing world).
 - ii. Poor/Rich dichotomy
 - iii. Watts: *Silent violence*: In Africa, growth of cash crops (encouraged by the West) has caused massive famine.

1. Other underlying causes of famine:
 - a. International/national/local politics
 - b. Climate: “Political ecology” Piers Blaikie
- f. Chauncy Starr (engineer): Voluntary/Involuntary Risk
 - i. Voluntary: using cell-phones, relatively high risk
 - ii. Involuntary: placement of cell-phone towers in proximity, relatively low risk
 - iii. People are 1000 times more likely to accept a voluntary risk than an involuntary risk (of the same class).
- g. Paul Slovic, B. Fischhoff, S. Lichtenstein (statisticians):
- h. Kahneman and ???: heuristics and biases (Psychometric Paradigm) has influenced the shaping of the risk-management field:
 - i. Voluntary/involuntary
 - ii. Natural/technological
 - iii. Control/non-control
 - iv. Familiar/unfamiliar
 - v. No children/children
 - vi. Non-reproductive/reproductive
 - vii. Catastrophic potential: high-probability low consequence risk (cars, small earthquakes)/low-probability high-consequence risk (tsunami, airplane crash, terrorist attack)
 1. Car accident annual mortality (45,000-50,000 deaths per year) is much higher than deaths by airplane accidents (2,000).
 2. Technological failure vs. human failure
 3. Media amplification has a huge impact on how people perceive each risk:
 - a. Number of people who are impacted at once
 - b. Survivor stories
 - viii. Male/female (females are more risk-averse)
 - ix. Whites/minorities (minorities are more risk-averse) – how much is this a proxy for poverty?
 1. Thomas Freedman; The Lexus and the Olive Tree
- i. “Optimistic Bias”: people think they are going to win/survive/etc.
- j. Risk-risk Tradeoff : Mitigating one risk leaves population vulnerable to another risk. John D. Graham & Jonathan Bert Wiener. *Risk vs. Risk* (1995)

III. Risk Communication

- a. What is risk communication? How people who understand risk communicate the actual probability to bring risk perception in line with actual risk.
- b. A number of academics became high-profile consultants who educated industry about how people perceive risk.
 - i. Top-Down Risk Communication: ineffective (no reason to believe in the individual proposing the risk)

- ii. Dialogue Risk Communication: It can work if people believe that there is a real dialogue and that it is not just a façade.
- iii. Bottom-up Risk Communication: when a stakeholder communicates up the chain to make a local issue and national/international issue.
- c. Problems with Risk Communication:
 - i. Narrative: Risk communication is focused on data and numbers. Does not do much to communicate a meaningful risk to people.
 - ii. Social amplification vis-à-vis social attenuation:
 - 1. Amplified: 9-11, plane crashes, nuclear accidents
 - 2. Attenuated (taboo): Suicide (worried about copycats), STDs,
 - iii. Trust: can explain 50% of risk-perception, and it is much easier to lose trust than to gain trust. Direct correlation between high trust and low risk-perception and low-trust and high-perceived risk.

Risk Communication in Action (Case Studies):

- I. Barsebäck (Nuclear Power Plant in Sweden):
 - a. Accident: insulation material fell into a valve and blocked it for 25 minutes, had it taken longer, it could have caused a core meltdown
 - b. Regulating body shut down 6 of 12 Swedish nuclear power stations (based on the company's own safety assessment) and required a number of changes to improve safety before they could reopen.
 - c. Danes like nuclear power (don't want any plants since Chernobyl), have no plants, Sweden export extra power to Denmark,
 - i. In January 1993, Seamark wants to open a plant in Denmark. Defense minister proposed declaring a war on Sweden and taking back a province lost in a war.
 - ii. Sweden threatens to cover Denmark in fermented herring.
 - iii. Danes circle plant with smelly cheese?
 - d. Swedes who aren't worried about nuclear power overwhelmingly say that they trust Swedish industry.
 - i. Swedish goods are known for being high quality
 - ii. Utility companies handled the incident very well.
 - 1. Admitted their fault, studied what happened, and made an effort to repair trust
- II. BSL-4 Facilities in Galveston, Texas
 - a. University of Texas Medical Branch (UTMB) determined the need for BSL-4 in their area in 1995.
 - i. UTMB provides healthcare for prisoners; need to look at BSL-4 pathogens to provide the care.
 - ii. Imported a team of experts from Yale University to Galveston.
 - b. Recognized the need for effective public engagement strategy
 - i. Began working with CDC (Center for Disease Control) communications experts

ii. Strategy included:

1. Focus groups, internal and external
2. Internal meetings
3. Dialogue meetings with community leaders and local media
 - a. Explain in detail over a whole day why Galveston needed a BSL-4 facility.
4. Experts did radio Q and A sessions
 - a. Analyzed movie "Outbreak" in 30-second segments and determined every possible question that could arise from the movie.
5. Two large public meetings were held
 - a. Show connection to community
 - i. First meeting was hostile
 1. Why Galveston?
 - a. History of disease
 - b. Will study pathogens that are local to the community
 - c. Will protect children (if they are exposed to a virus).
 - ii. Second meeting was much less hostile
 - b. Post-911 it is a national bio-terrorism facility that opened quickly.

III. Risk communication and acrylamide

- a. Skanska building railway tunnels in Southern Sweden,
 - i. Leaking tons of cubic liters of water per second.
 - ii. Decide to use acrylamide as a grouting material
 - iii. Imported as much acrylamide on railway tunnels in 4 weeks as the United States uses in 3 years.
 - iv. Acrylamide didn't work
 1. Leaked out
 2. Killed fish and cows
 3. Contaminated food
- b. Tunnel workers tested for acrylamide high levels, but not different from the control group.
 - i. Tested fox road kill (low levels found)
 - ii. Tested two groups of mice: those eating raw mouse-food, and those eating fried mouse-food.
 1. Mice eating fried mouse food had 5 times higher levels of acrylamide than those eating raw mouse food.
- c. 2001 Tornqvist, a scientist, measured acrylamide levels in fried carbohydrates
- d. Found more than 1000 times higher levels of acrylamide in fried carbohydrates than in raw or boiled potatoes.
- e. SLV took info seriously and sought to verify results
- f. Tornqvist wanted to wait to get the article published (April 2002).

- g. Leaks appear:
 - i. SLV have informed colleagues regarding findings
 - ii. Lab involved publishes a 2 page spread in their external customer journal.
- h. Tornqvist and SLV send out a press invite on April 23rd
 - i. Highly alarmist: “many staple foods”,
 - ii. Manipulative: “can cause cancer”
 - iii. Focused on research and not on the public
- i. Risk was amplified
 - i. Generated a public distrust of a story