The Risk of Risk Perception:
When Misplaced Fear is Dangerous to Your Health
Risk Science Innovation and Application (RSIA)

Stakeholder-balanced expert groups develop practical science for current risk policy issues

Public-private partnerships in funding and operation

Trusted solutions to risk stalemates
Flow of the talk today

1. The potential health effects of discussing risk in public

2. Measuring the “health risk” of those discussions

3. How routine measurement of risk of risk perception could change public debate and improve health
What is the effect of discussing uncertain risk in public?
“Misdirected communications can prompt wrong decisions, create confusion, provoke conflict and cause undue alarm or complacency.”
“Indeed, poor communications can have a greater public health impact than the risks that they attempt to describe.”
“When that is true, it should be no more acceptable to release an untested communication than an untested drug.”

Baruch Fischhoff, PhD
Chair of US FDA’s Risk Communication Advisory Committee
Cambridge Handbook of Psychology, Health, and Medicine 2007
Arsenic in your juice
How much is too much?
Federal limits don’t exist.
Consumer Reports Magazine: January 2012

Orange Juice and the Toxic Side of International Trade
By Gary Ginsberg, PhD

Juice Products Association Q&A: Orange Juice Standards

What is the intention of these messages?
FDA and EPA Announce the Revised Consumer Advisory on Methylmercury in Fish

FDA’s Current Perspective on BPA
At this interim stage, FDA shares the perspective of the National Toxicology Program that recent studies provide reason for some concern about the potential effects of BPA on the brain, behavior, and prostate gland of fetuses, infants and children.

NewsInferno
FDA Sees No Danger From Soda Chemical
The U.S. Food and Drug Administration (FDA) says it sees no danger from a soda chemical that has at least one advocacy group concerned. After reviewing a complaint from The Center for Science in the Public Interest (CSPI) in which it said that a chemical, 4-methylimidazole, used in cola sodas causes tumors in animals, the FDA said there is no immediate risk, wrote Bloomberg News.

And these messages?
The intended effect may be over-ridden, because

Risk perceptions have their own effects

Risk perceptions can cause behaviors that

- Reduce health risk (avoid a risk)
- Increase health risk (e.g., replace an avoided risk with something riskier)
- Do not affect health risk, but have adverse economic effects

*We almost never measure the effects.*

*But everyone agrees we should cause no harm when we create risk perceptions.*
Fear of vaccination was stimulated by a 1998 study in Lancet (and press coverage) that suggested a link between MMR vaccination and autism.

Vaccination rates declined to lower than 80% in UK (and probably elsewhere), and measles incidence rose after the news.

“In 2008, for the first time in 14 years, measles was declared endemic in England and Wales.”

http://www.bmj.com/content/342/bmj.c7452
Viewed as epidemiology, or a newsworthy blame story, *the risk of harm from the Lancet paper and the press coverage* seems as measureable as the risk of harm estimated from contaminants of food or the environment.
Why do agencies never ask, formally as public health protectors, whether a risk message causes public harm?
Example: Fear of flying

- Stories of airplane accidents cause a choice to drive instead of fly
  - Air travel was lower for months after 9/11
- Driving is riskier than flying
- It’s a simple “epidemiologic odds ratio” to compare drivers to flyers after a news event
- Stories of airline accidents = increased death
Did risk perception cause starvation?

“Simply because my people are hungry, that is no justification to give them poison, to give them food that is intrinsically dangerous to their health,”

President Levy Mwanawasa of Zambia, 2002. During a food crisis that threatened millions of Zambians, as he refused food aid containing genetically modified grain.

http://news.bbc.co.uk/2/hi/africa/2233839.stm
Examples of places where marketed fear may cause health effects

- New technology fear stories vs beneficial innovation
  - Biotech, Nanotech, Cloning, etc
- Pesticide levels vs benefits of fresh fruit consumption
- “Chemical of the day” tox data vs changes in diet
- “Processed foods” vs food security, nutrition and weight management

Generally: low-benefit media stories about the risk of the day vs unevaluated consumer behavior?
Can we measure the risk of risk perception?
Premise for the risk of risk perception project

Perceptions of risk are variables to measure and address as public health risk factors.

We will explore whether we are doing enough to avoid harm in actions that affect risk perception.

We will develop methods to measure and prevent unintended risk of risk messages.
Discussions of the concept so far

February 2011 Framing Meeting, Washington DC
• Is there a “there” there for risk perception risk?
• FDA, EPA, USDA, OMB, OSTP, CDC, EFSA, GAO, NRDC, PEW, RFF, IFIC, NSF, NYTimes, National Public Radio, ...

July 2011 Symposium at Institute of Food Technologists
“...the roles of chemistry and technology in the food industry... how did we get here?”

January 2012 Scientific Session at ILSI Annual Meeting
“The Consequences of Unexamined Fear as a Driver for Public Health Protection”

March 2014 Risk, Perception, Response Conference at Harvard School of Public Health
Presentation of 24 papers on the topic selected by a peer review committee from over 60 submitted.
Applications from medical decision making, food labeling, emergency preparedness, environmental issues
Asking three basic questions each time

How do we define the problem?
Is there a public health issue *that we can address*?
What is it and how do we frame it?

How do we measure or model adverse outcomes from risk perception?

How do we reduce risk perception risk?
Where, when, and how?
Concepts coming out of the discussions

- **YES** - There are situations where risk perception causes harm

- There are in fact “risk attributes” of risk perception
  - *Potency, Susceptibility, Externality*

- And there are approaches to doing risk assessment
  - Epidemiology – what happened after an event
  - Behavioral Economics methods – e.g., willingness to pay
Risk Attributes: risk perception potency

• Some risk perceptions have serious consequences.
  • Missed vaccination can be linked to increased mortality

• Some do not, so there is a “potency” attribute

• We can even think in classic toxicology terms of
  – Likelihood that someone will have an effect
  – Severity of that effect, and
  – Frequency of health effects across subpopulations

• Just like chemical risk assessment
Risk Attributes: susceptible populations

- Information gets to people in different “doses”
- Groups prone to a belief respond to confirming messages about it
- The same facts cause different behaviors in different people
- Affluent individuals or societies have more choices, creating a susceptibility-divide based on affluence for some risks
Like second-hand smoke, the perceptions of some people may affect the health of others. Influential voices can be more effective in convincing others to take action. So the most “potent” risk perception risks may be caused by the perceptions that get taken up by influential intermediates.
Influential voices

- Anyone trusted, with a following
- Public health officials
- Celebrities
- Regulators, Legislators, etc
Externality effects for a susceptible population?

- A public health official sends a broad message on risk of PCBs in fish, based on his perceptions that the entire population is at risk.
- The official probably selects other protein for his diet.
- A local population changes traditional diet to avoid fish, and the diet change increases diabetes rates.

• I know of no follow-up to the diabetes claim for the local population.

• If the PCBs had been thought to cause it, then it would definitely have been pursued.

• Should the effect we cause be as important to prevent as the effect of the chemical we are warning about?
If we could measure risk perception risk, how would it change public dialogue? And public health?
WHO ARE THE ACTORS CAUSING THE PERCEPTIONS?

- Scientists
  - Risk assessments
  - Overheard discussions (advisory panels)
  - Publications, Grant programs
- Medias, selling news
- Individuals – “viral” communication
- Public health officials
  - Protective actions (recalls, advisories, warnings)
  - Policy setting, Regulation, Legislation
- Advocates – pro and con
When could we take action?

• At Decision to Release Information
  – Editorial boards for journals
  – Agency announcements – decision to release
  – Press coverage of emerging scientific opinion

• Only when a potential harm threshold is reached

• Review of regulations where risk is a factor
  – Mandatory “Alternatives-review” should consider the consequences of perceptions
Framing the debate with the actors at the decision points

Public discussion about risk science should have a shared goal of improving health

not about just a goal of educating about arsenic levels, or advocating change to policies

We can provide metrics for perception risk to put the ball in the risk messengers court to show no harm.
Risk Analysis Framework: Case Study?

• **Perception Source**
  – scientific discussion between industry, advocacy groups, and government **about risk uncertainty for residue on apples**

• **Perception Fate**
  – Informational media story (emphasizing the hazard)
  – Attention grabbing headline (picking up on the hazard)
  – Agenda-driven extractions (re-tweeting to constituents)
  – Word of mouth and blogs to wide audience who do not understand the context
  – Apples are risky
• **Exposure** - How many people read the media or hear from friends?

• **Susceptibility** - How many households have a diet already low in fresh fruit? How many children in the affected homes?

• **Effects assessment** - Focus groups, willingness to pay, estimate change to diet,
  
  – *Quantitative estimate of nutritional change in a susceptible population*
  
  – *Or simply a diet change contrary to national policy to increase fruit consumption by children in impoverished areas*
If the change in diet can be related to disease incidence through lesser nutrition, then how is this risk analysis structure different from an FDA assessment of a food contaminant?
Risk perception risk in a legal framework?

If there are real health effects caused by perceptions we cause, of at least of the “one in a million” risk level of other risk management situations,

Then why should it not be in a legal framework?
Next Steps for the Risk of Risk Perception Project

Goals

Develop assessment methods.
Raise awareness of “do no harm” in communications.

Process

Publish ideas coming from the stakeholder meetings
Use expert case studies to develop conceptual framework for methods and guidelines

Effect

Change how we discuss hazard information in public
Provide tools for fighting mis-information
We will keep the focus on

• Framing the debate to “do no harm” whenever someone talks about risks
• Helping make sure that public debate actually reduces health effects
Thank you

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