

# Strategies for Correcting Health & Safety Misinformation: *A Case Study*

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# The Challenge of the Information Age

- Public apprehension about certain workplace and environmental hazards persists.
- The challenge is: How do we communicate with, and educate, the public so that important decisions can be made based on facts rather than emotion?
- To accomplish this, in some cases we must counteract "misinformation"
  - What does the science associated with risk communications tell us?

# Misinformation

- *“information that people have acquired that turns out to be incorrect, irrespective of why and how the information was acquired in the first place”*

Cook and Lewandowsky 2011

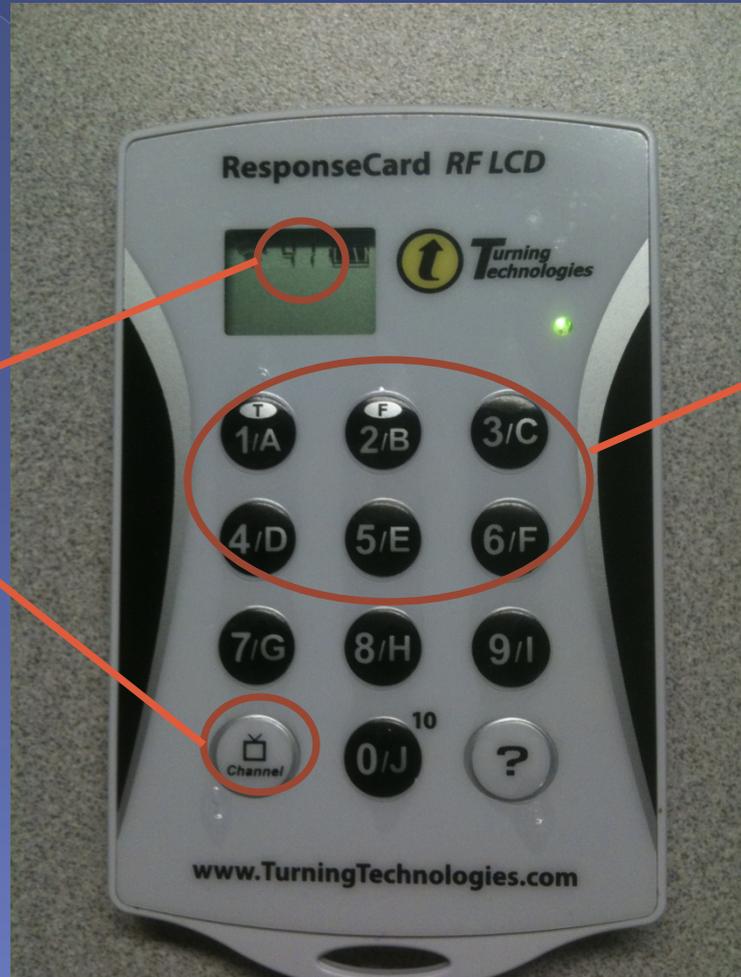
- Once acquired, studies show it is quite difficult to remove the influence of misinformation

# The Japanese Earthquake and Tsunami of March 2011 – *Before and After*



# Clicker Tutorial

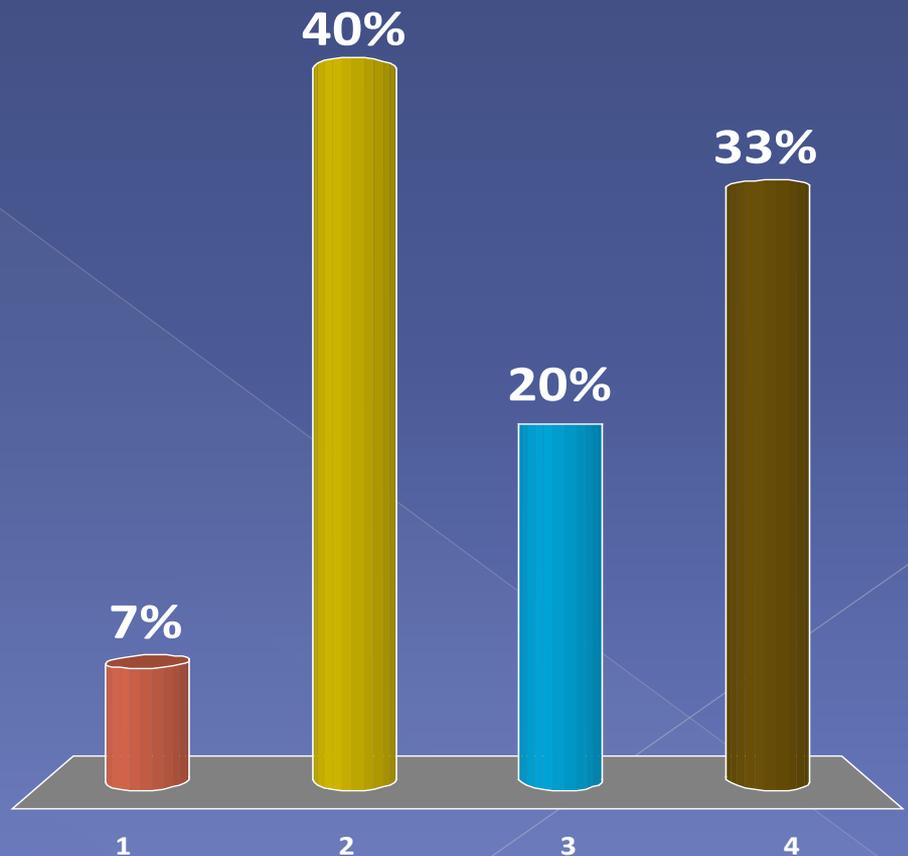
1. Push channel button; check for channel 41



2. Push the number corresponding to your answer

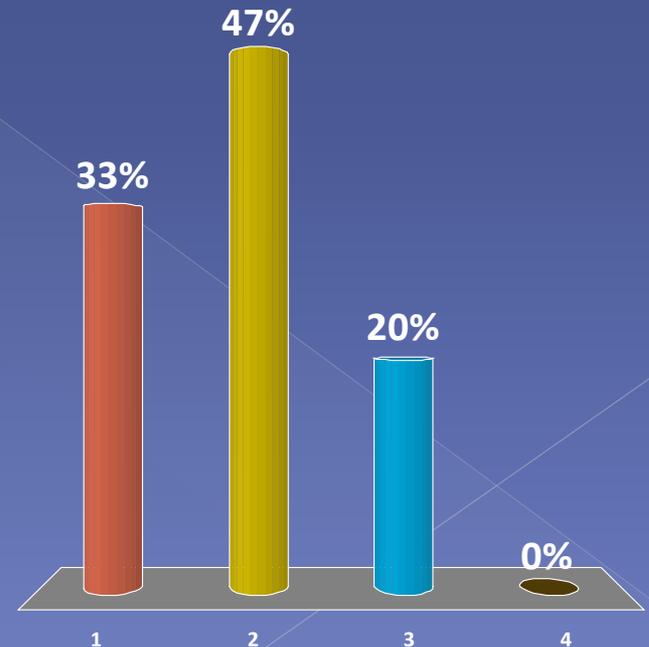
# What is the number of confirmed deaths due to the earthquake and associated tsunami?

1. A. 100
2. B. 1,000
3. C. 5,000
4. D. 15,000



# Fukushima Reactor: How many deaths in Japan were caused by the damage to the three reactors at Fukushima?

1. A. 0
2. B. 4
3. C. 15
4. D. 15,000



# Case Study: December 19, 2011 Press Release

- MEDICAL JOURNAL ARTICLE: 14,000 U.S. DEATHS TIED TO FUKUSHIMA REACTOR DISASTER FALLOUT

Impact Seen As Roughly Comparable to Radiation-Related Deaths After Chernobyl...

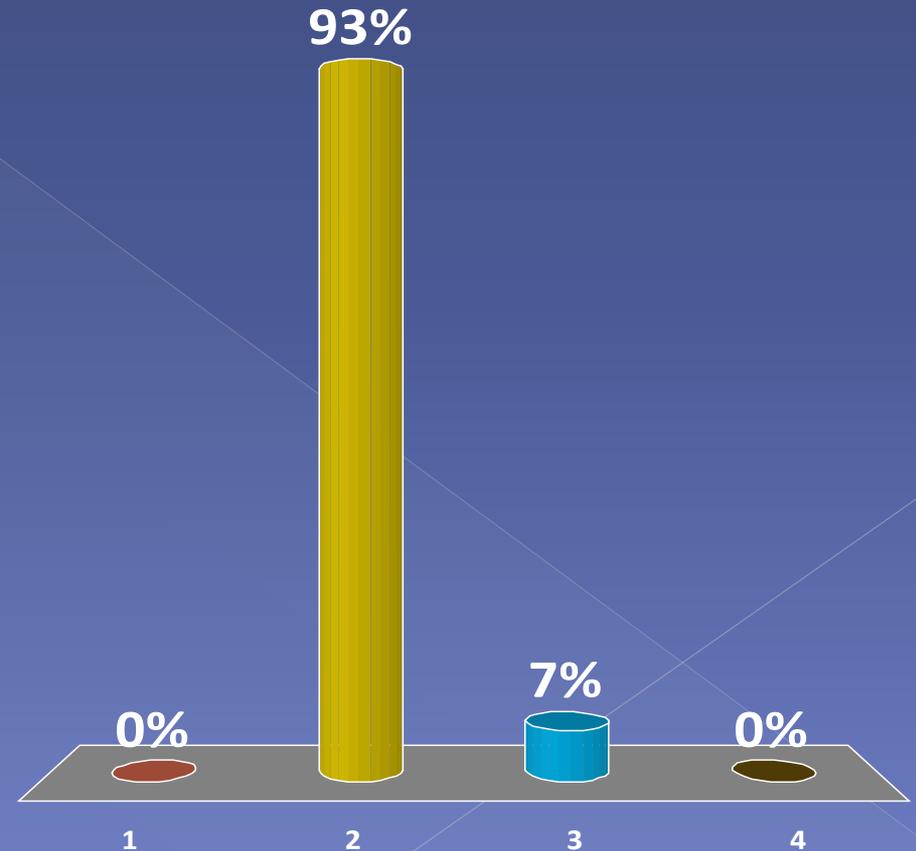
"...according to a major new article in the December 2011 edition of the **International Journal of Health Services.**"

# Summary of Study

- Examined CDC MMWR reported death data in 122 U.S. cities with populations >100,000 (represents 25 - 35% of nation's deaths)
- Compared number deaths in 2010 and 2011 during the 14 week period after the first arrival of Fukushima radioactivity in the U.S.
- 4.46% increase in deaths observed after radioactivity was detected in U.S. – authors speculate cause was exposure to radioactivity from Fukushima

# Your Impressions of this Work?

1. A. Reveals a major public health threat
2. B. Not plausible
3. C. Not sure
4. D. Don't really care



# Critical Review

- Beyond the biological implausibility of such health outcomes from the reported radiation doses....
  - > Limited comparison, 2010 to 2011 – is the “increase” actually real? Did the population grow?
  - > Could these deaths possibly be due to any other causes?
  - > Why published in a “health services” journal?
    - Why not a radiological or epidemiological journal?
  - > Why no information on author affiliation that would reveal any possible conflict of interest?
    - See “radiation.org”



## Radiation and Public Health Project



Please help. [Click here](#) to make a tax-deductible contribution.

Please read the appeal from the daughter of a researcher who lived in Hiroshima for several years, asking for support for the landmark RPHP study of cancer risk to Baby Boomers using baby teeth.

[Click here to read](#)

RPHP is a nonprofit educational and scientific organization, established by scientists and physicians dedicated to understanding the relationships between low-level, nuclear radiation and public health. Learn more or make a financial contribution.

“.....  
To document a possible radiation/cancer connection, RPHP needs only one of the baby teeth that your child has lost...So please help. Every tooth is a clue! ~ Alec Baldwin  
”

[Please click here to read personal stories from persons with thyroid cancer who support RPHP research](#)

4780 teeth collected!



### PUBLIC EDUCATION FORUMS AND CAMPAIGNS

Find out about our public int campaigns to educate concos adverse health effects of rad exposure. [Learn more](#)



### TOOTH FAIRY PROJECT

Help us track the effects of radiation in your community by simply donating one of your child's baby teeth. [Learn more](#). [Download a tooth donation form](#).



### LONG-TERM HEALTH EFFECTS STUDY

Could you be an adult who donated a tooth as a child in the 1960s? We have over 85,000 teeth from the original study and would like to follow up with you. [Learn more](#).

We are currently not testing teeth. When this changes we will announce it here.

### RPHP releases new journal article on U.S. mortality after the Fukushima meltdowns

[After 4 p.m. EST, click here to listen to December 19, 2011 news event via streaming audio](#)

[Click here to read the December 19, 2011 press release](#)

[Click here to read the article in the December 2011 International Journal of Health Services by Joseph Mangano and Janette Sherman \(the 28th published by RPHP\), on the increase in reported U.S. deaths after arrival of fallout from the nuclear meltdowns in Fukushima, Japan](#)

[Click here to read articles written by our board members Karl Grossman and Bob Alvarez](#)

[Read Dr. Helen Caldicott's editorial in the April 20, 2011 New York Times, asserting that radiation is harmful, even at low doses.](#)

# [radiation.org](http://radiation.org) the "Radiation and Public Health" website

## spotlight



Photo of Christie and Joseph Mangano, at 2008 RPHP luncheon

Christie Brinkley discusses RPHP in the cover story of the June 2010 *Ladies Home Journal*. As an activist concerned about the dangers of nuclear power plants, she can knowledgeably cite facts and figures about the issue.

"Christie cares, but it's more than that," says Joseph Mangano, the executive director of the Radiation and Public Health Project, of which Brinkley is a board member. "The issues we deal with are very sophisticated. Christie is very fluent in discussing Strontium 90 and children's cancer rates." Even with the stresses of recent years, she has remained committed to that cause and pragmatic about using her celebrity to gain media attention. "I know when I go someplace that they're going to want to find out about what I'm wearing instead of what I'm saying," Brinkley says. "But to be able to get something about a nuclear power plant on *Extra* or *Access Hollywood* is incredible." [Click here to read the article in the \*Lady's Home Journal\*](#)

*"Sound Science"*

or

*"Sounds Like Science"?*

# Classic Case of “Lysenkoism”

- Trofim Lysenko was a Soviet agronomist who claimed to have developed a technique that tripled crop yields
- His claims were not based on objective science, and ultimately resulted in serious damage to the entire country's ability to farm
- “Lysenkoism” is used to describe the manipulation or distortion of the scientific process as a way to reach a predetermined conclusion as dictated by ideological bias, often related to social or political objectives

# Techniques Used By Big Tobacco and Others

- Demand science produce absolute certainty of the presence or absence of risk – or when convenient, manufacture uncertainty
- Fund or hire researchers to selectively reanalyze data to focus on lack of “scientific certainty” of presence or absence of risk
- Fail to reveal sources of funding, affiliations , conflicts of interest
- Seize upon the media’s need for “balanced reporting” regardless of legitimacy

# Caution About Peer Review!

- John Bohannon, Harvard biologist
  - > Crafted a fake research paper, from a fake institution with multiple, clear flaws
  - > Submitted to 304 journals that claimed to use peer review
  - > 157 accepted it for publication

# How to Respond, and in What Timeframe?

## December 23, 2011 (4 days after press release)

### NEI Nuclear Notes

News and commentary on the commercial nuclear energy industry.

FRIDAY, DECEMBER 23, 2011

#### ➔ Dr. Robert Emery Disputes Joe Mangano's Findings on Radiation and Fukushima

Just a few minutes ago, I received the following statement from [Dr. Robert Emery, Vice President for Safety, Health, Environment & Risk Management at the University of Texas Health Science Center at Houston](#) concerning [Dr. Joseph Mangano's recent study on fallout from the Fukushima Daiichi nuclear energy facility](#) reaching the U.S.

"We aggressively monitored for the presence of environmental radioactivity in Houston following the Fukushima event and worked closely with local public health authorities in the event we detected any threat to public health. We never detected any elevated radiation levels. I don't see any evidence to support the assertion made by this report that the additional 484 deaths in Houston in 2011 could in any way be related to radioactivity from Fukushima - we never detected any."

"Moreover the study bases its conclusion on the comparison of data from deaths in the U.S. in 2010 and 2011. Using this method you really can't determine the specific cause of any increase in deaths over the two years. Perhaps the most important question is: what did the 148,395 U.S. citizens die of in 2010, the year before the Japanese earthquake? Most likely the overwhelming causes were heart disease, cancer, and stroke. I believe this is likely the case in 2011 as well. I also believe our finite public health resources are better spent on the issues we know are causing people to die rather than being diverted to explore hypothetical projections"

It ought to be clear by now that Mangano's claims are being broadly discredited by the wider scientific community. [Click here](#), [here](#) and

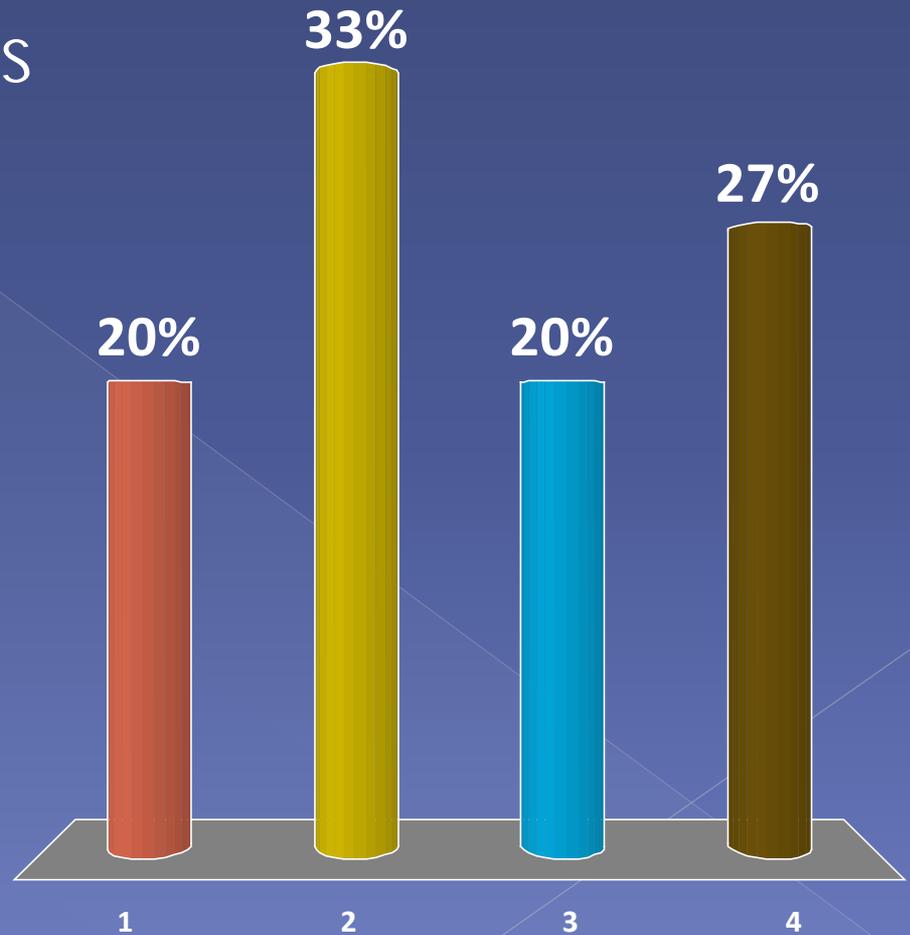


#### Twitter Updates - @N\_E\_I

- ➔ It's National #Nuclear Science Week! Today's topic: Nuclear Energy Generation. Learn more: <http://t.co/m34jsBb7> @nuclearsciweek 58 minutes ago
- ➔ #Nuclear plants create some of largest #economic benefits compared to other #electric generating techno. <http://t.co/QlyizU6a> #cleanenergy about 10 hours ago
- ➔ #Nuclear energy is only proven technology that can provide emission-free, affordable baseload electricity <http://t.co/QlyizU6a> #cleanenergy about 11 hours ago
- ➔ #Nuclear industry can play an important role in job creation & economic growth - see our latest numbers: <http://t.co/QlyizU6a> #SOTU about 11 hours ago
- ➔ #Obama during #SOTU - I will not walk away from promise of #clean #energy about 11 hours ago

# How Many People Read That?

1. A. 0
2. B. 2 – Emery and his Mom
3. C. 15
4. D. 150,000



# March 11, 2012

(3 months after press release)

- Op Ed piece in LA Times by Gale and Hoffman
- “Assessing Fukushima, one year later: Despite worries, radiation exposure from Japanese nuclear plant damaged by tsunami is unlikely to cause an increase in cancers”

# August 2012 – Letters to IJHS

(8 months after press release)

- Critical review letters sent to *International Journal of Health Services* regarding the Mangano & Sherman article published
  - › Letters from Gale, Korblein, Wolf
- Mangano's response to the critical reviews also published
  - › includes a new revised increase in the asserted number of excess fatalities – from 14,000 to 22,000!

# HPS Presentation at National Press Club



# What The New Frontier Holds

- Just one example of many sources of misinformation available, many on the web
- Publications or postings by “ crusaders, critics, and conspiracy theorists” serve to weaken the messages made by qualified experts
- With so many inaccurate or deceptive sources of information available, Kata notes:
  - > *“that officials speak with any special authority or knowledge is a concept now rejected by laypeople, as readers encountering expertise may believe themselves to then be experts”*
- What do to?

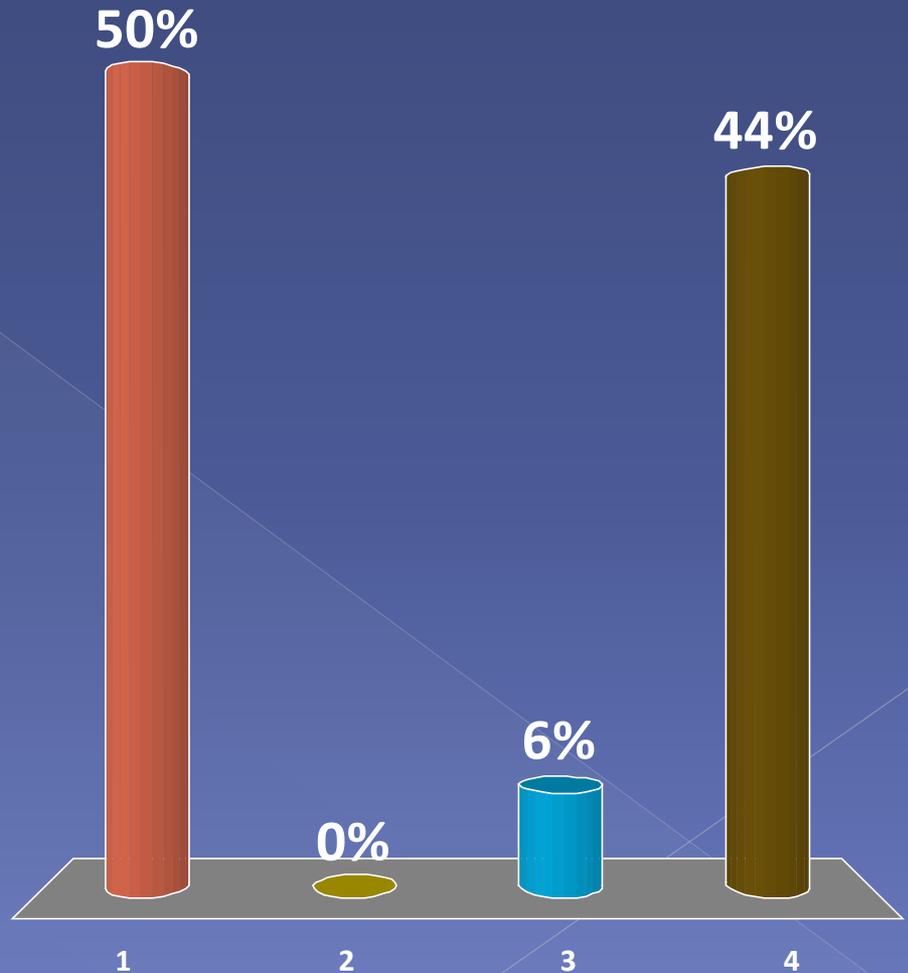
Kata, A. Vaccine 2010

# Use “Words That Work”

- Luntz, F. Words That Work
  - > “It’s not what you say, it’s what they hear”
- Examples of words/terms found to work
  - > “Energy” (not “power”)
  - > “Facilities” (not “plants”)
  - > “Total accountability” “100% transparency”
  - > Prefacing responses to concerns about exposures with reaffirmation:
    - *“As a radiation safety professional, I take any exposure to radiation seriously....”*

# What Word Comes to Mind When You Hear “Radiation”?

1. A. cancer
2. B. death
3. C. glowing
4. D. energy



# Avoid the “Familiarity Backfire Effect”

- ◉ Studies show that familiarity increases the chances of accepting information as true
  - > (example: common misperceptions about food irradiation)
- ◉ When refuting misinformation avoid mentioning the wrong information, as individuals tend to lose the “tag” and actually remember the myth
  - > (don’t say: “irradiation won’t make your food radioactive”)
- ◉ Better to focus on the facts you wish to communicate
  - > (say: “the procedure eliminates dangerous pathogens and makes your food safer”)

# Overkill Backfire Effect

- We assume that the more counter-arguments we provide, the more likely we are to correct misinformation
- But studies show that more is not always better...
  - > 3 counter arguments are better than 12, which could end up reinforcing the original misconception

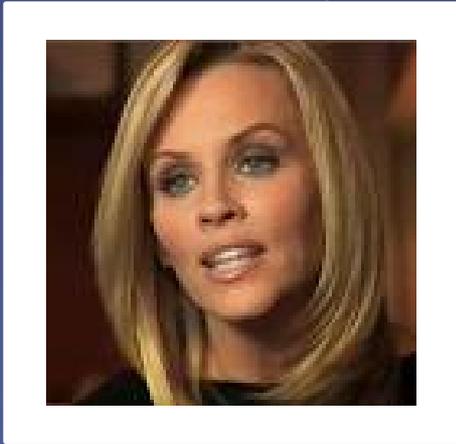
# Worldview Backfire Effect

- For some with strongly fixed views, being confronted with counter-arguments can cause their views to be strengthened
- If conducting outreach, focus on undecided majority rather than unswayable minority
- Re-frame terms, approach
  - > Use "probability" or "chance" instead of "risk"
  - > Use "energy" instead of "radiation"
    - Perhaps comparing to other examples of energy such as visible light and sound?

# Fill the Gap with an Alternative Explanation

- ◉ When people hear misinformation, they build a mental model, with the myth providing the explanation
- ◉ When a myth is debunked, a gap is left
- ◉ Studies show people prefer an incorrect model over an incomplete model
- ◉ Be sure to fill the gap!

# It's Not Just Radiation. It's a Larger Public Health Issue: Consider Immunizations



Ms. Jenny McCarthy's son is autistic

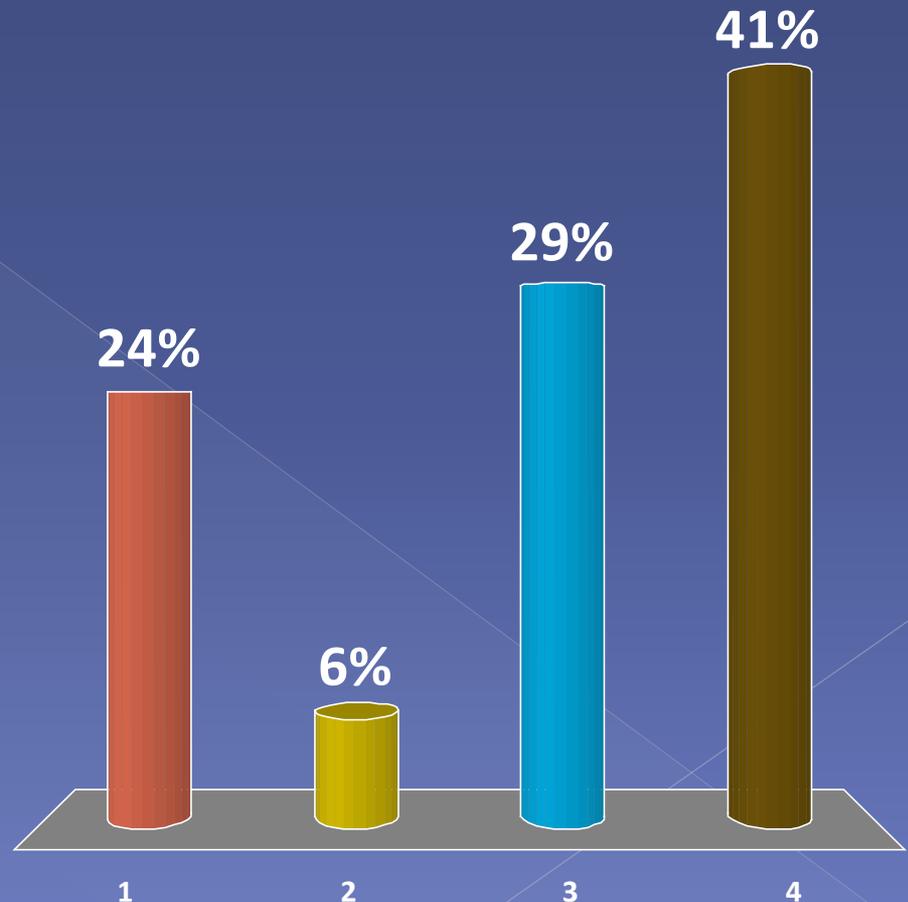
A 1998 paper in *Lancet* suggested a link between MMR vaccines and autism. Health officials pointed to the lack of evidence for such a claim.

The first author of the article had a significant conflict of interest and was subsequently found guilty of misconduct and lost his license to practice medicine. The co-authors distanced themselves from the work and the paper was retracted by the journal.

But Ms. McCarthy remains convinced that her son's autism was caused by a MMR vaccine and she advocates not having children immunized.

# How Many Children Have Died From Vaccine Preventable Diseases Since This Crusade Began?

1. A. none
2. B. 5
3. C. 15
4. D. 1,000



# ANTI-VACCINE BODY COUNT

Number of Preventable Illnesses

112702

From June 3, 2007  
To February 16, 2013

Number of Preventable Deaths

1094

From June 3, 2007  
To February 16, 2013

Number of Autism Diagnoses  
Scientifically Linked to Vaccinations

0

From June 3, 2007  
To February 16, 2013

WELCOME TO THE ANTI-VACCINE BODY COUNT

# Other Health and Safety Issues Primed for Misinformation

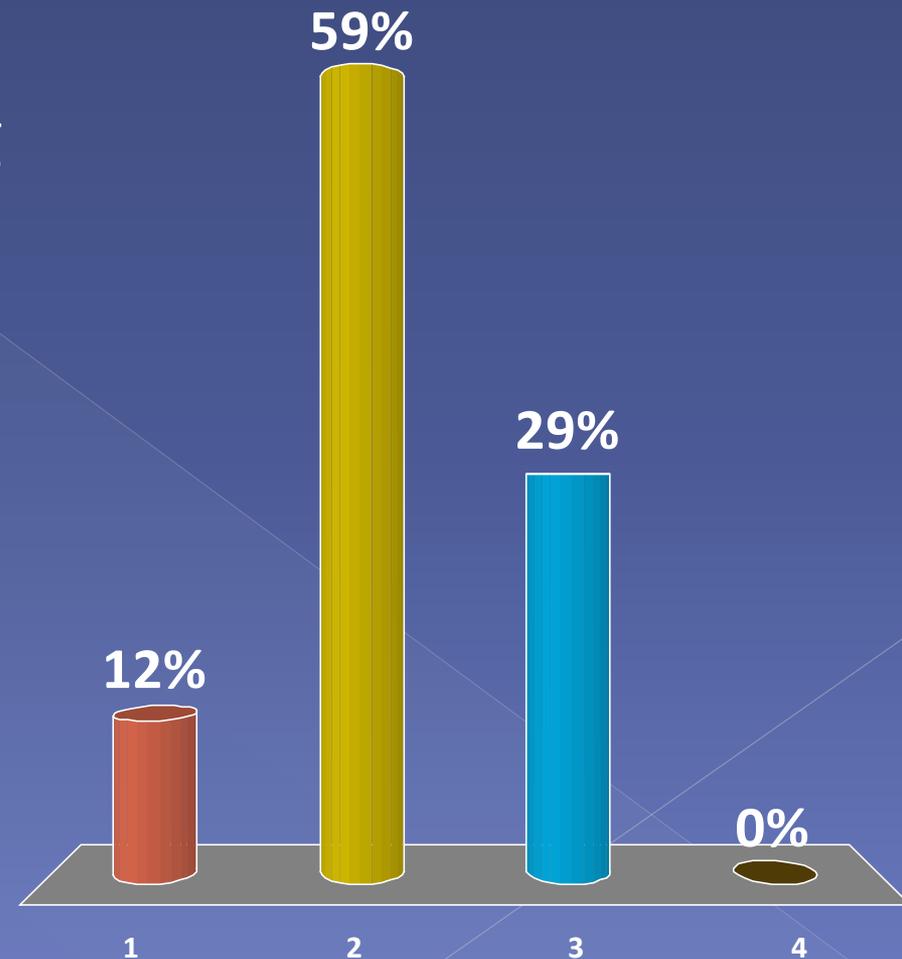
- “Toxic” mold
- Nanoparticles
- Genetically modified organisms
- Drug resistant organisms
- Emerging and re-emerging diseases
- Industrial emissions of all kinds
- Others?

# Recent Developments

- New paper:
  - › Mangano and Sherman. Long term local cancer reductions following nuclear plant shutdowns, Biomedicine International Vol 4, No 1. 2013
- Examines reported cancer rates in county near Ranch Seco Nuclear Facility as compared to the state as a whole
- Notes decreased rate of cancer, speculates due to plant shut down

# Your Impressions of this Work?

1. A. Reveals a major public health threat
2. B. Not plausible
3. C. Not sure
4. D. Don't really care



# Fair Comparison? Letter to the Journal Editor

- ...given all of the statistical analysis reflected in the paper, I wondered why a simple summary table had not been included that listed the cancer rates in each county. I presumed that such a table would highlight a trend unique to Sacramento County, but I was wrong.
- I accessed the California Cancer Registry website and created such a table myself...
  - > 16 exhibited increases in cancer rates, while 31 exhibited decreases!
  - > Since the authors speculate that the observed reduction in cancer rates in Sacramento County were due to the shutdown of the nuclear power plant, to what are we to attribute the reductions in the other counties, some of which are situated hundreds of miles away? Whatever the explanation may be for these other reductions, might they have also been at play in Sacramento County as well?



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the **SALT**  
NPR'S FOOD BLOG



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## Nuclear Tuna Is Hot News, But Not Because It's Going To Make You Sick

by RICHARD HARRIS

03:44 pm

May 29, 2012

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Yoshikazu Tsuno/AFP/Getty Images

A Tokyo sushi restaurant displays blocks of fat meat tuna cut out from a 269kg bluefin tuna.

What snarky headline writer could resist a story about "hot tuna?" Or how about "tuna meltdown?"

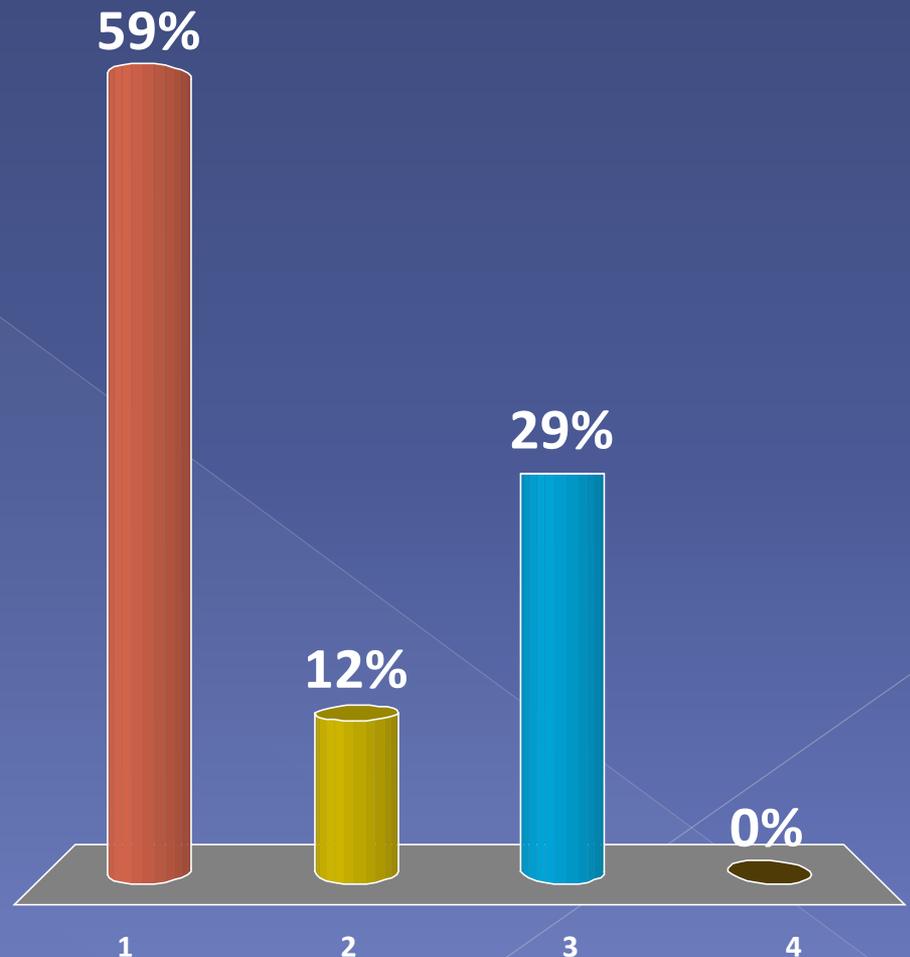
# The Story Fukushima Continues

May 2012 NPR Interview  
on bluefin tuna caught  
off California containing  
radioactivity from  
Fukushima

If you are still worried about the cesium from Fukushima, [Robert Emery](#) at the University of Texas Health Science Center at Houston says you'd need to eat 2.5 to 4 tons of tuna in a year to get a dose of cesium-137 that exceeds health limits. That's a lot of sushi.

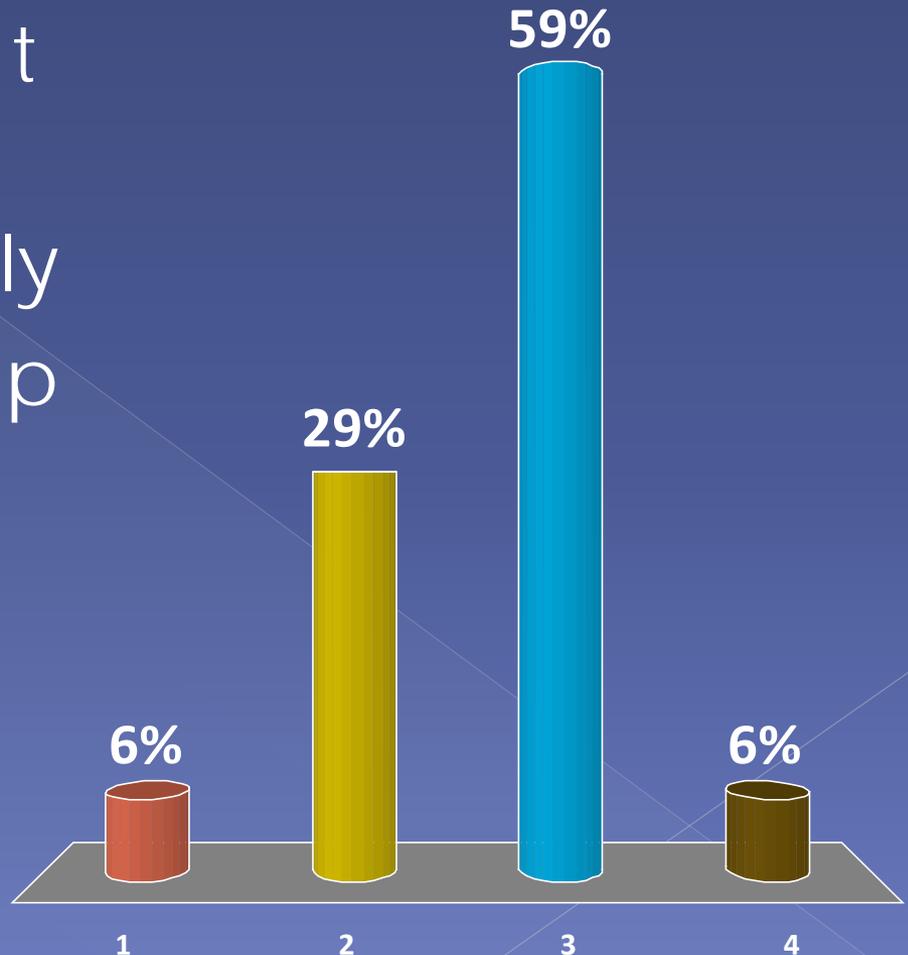
# How Much Sushi Do You Eat?

1. A. None
2. B. Once per year  
(when my spouse makes me go –  
because “*you never take me for  
sushi*”)
3. C. Weekly
4. D. Daily



# How Much Longer Should This Talk Go?

1. A. Stop now, I can't take it any more
2. B. Wrap it up quickly
3. C. Please don't stop
4. D. Too late, I'm already asleep



# Summary

- Misinformation regarding health and safety issues exists and will continue to circulate
- As health and safety professionals we hold an ethical obligation to correct misinformation
- Relying on the science behind effective risk communications is “not about manipulating people – it’s about giving the facts a fighting chance”

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