Strategies for Correcting Misinformation About Radiation: *A Case Study*

Robert Emery, DrPH, CHP, CIH, CBSP, CSP, CHMM, CPP, ARM
Vice President for Safety, Health, Environment & Risk Management
The University of Texas Health Science Center at Houston
Professor of Occupational Health
The University of Texas School of Public Health

UTHealth
The University of Texas
Health Science Center at Houston

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 misinformation is acquired, it is quite difficult to remove its influence

March 2011

Radiation Subject Matter Expert Meeting, September 7, 2011,
The University of Texas Health Science Center at Houston, Texas

From: Health Physics News, November 2011

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."

From: radiation.org

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

Critical Review

- Beyond the biological implausibility of such health outcomes from the radiation doses recorded in the US....
  - 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?

radiation.org the "Radiation and Public Health" website

"Sound Science"

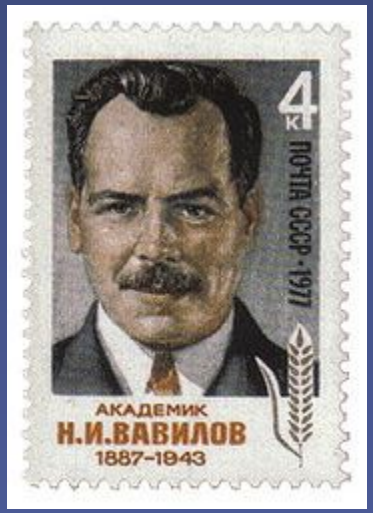
or

"Sounds Like Science"?

Michaels, D Doubt is Their Product, 2008

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, but they gained support from the ruling party. Ultimately, the practices he promoted resulted in serious damage to the entire country's ability to farm and feed itself
- "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



A Word of Caution About Peer Review!

- Dr. 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 supports 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

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/QIyizU6a #cleanenergy about 10 hours ago
- #Nuclear energy is only proven technology that can provide emission-free, affordable baseload electricity http://t.co/QIyizU6a #cleanenergy about 11 hours ago

March 11, 2012
(3 months after press release)

- Op Ed piece in LA Times by Gale and Hoffman entitled:

"Assessing Fukushima, one year later: despite worries, radiation exposure from Japanese nuclear plant damaged by tsunami is unlikely to cause an increase in cancers"

March 2012 National Press Club, Washington, DC

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
  - included a new revised increase in the asserted number of excess fatalities – from 14,000 to 22,000!

The Challenge

- Just one example of many sources of misinformation available, most available on the web
- Such 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"*

    Kata, A. Vaccine 2010
- What do to?

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…."*

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 from your food and makes it healthier for you"

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

Fill the Gap with an Alternative Explanation

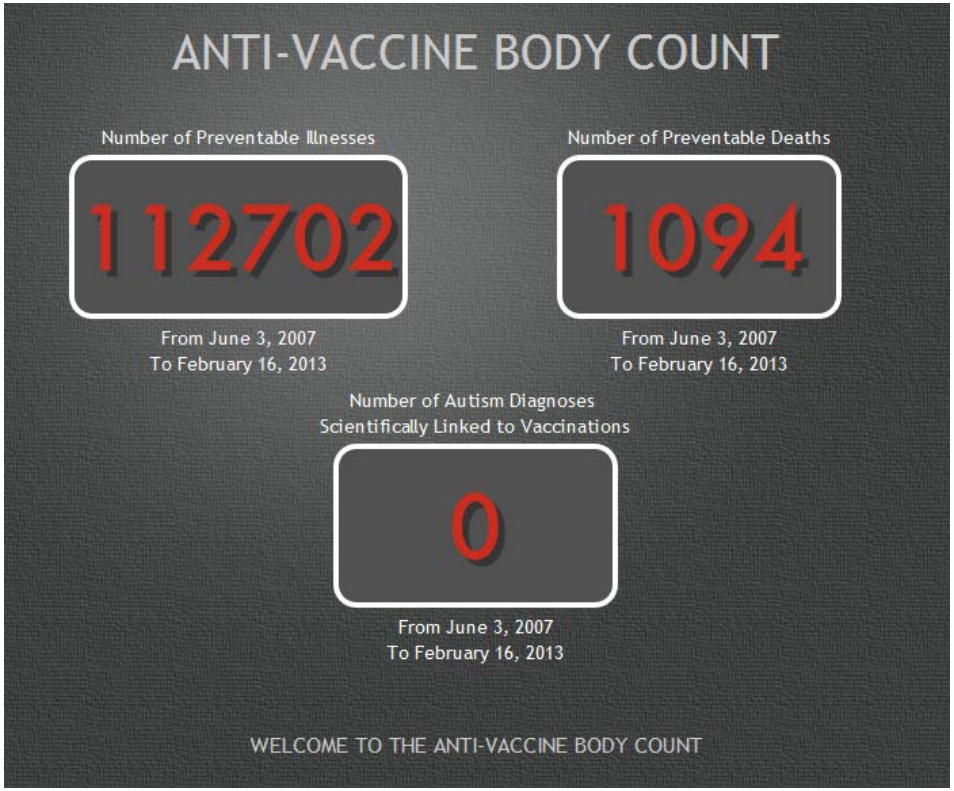
- When people hear misinformation, they build a mental model, with the myth providing the explanation
- When a myth is debunked, a gap is left
- Studies show people prefer an incorrect model over an incomplete model
- Be sure to fill the gap!

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

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



http://antivaccinebodycount.com/Anti-Vaccine_Body_Count/Home.html

The Saga Continues….

- New paper and press release:
  - Mangano and Sherman. Long term local cancer reductions following nuclear plant shutdown, Biomedicine International Vol 4, No 1. 2013

- Examines reported cancer rates in the county in which the now-closed Rancho Seco nuclear energy facility is located as compared to the state as a whole

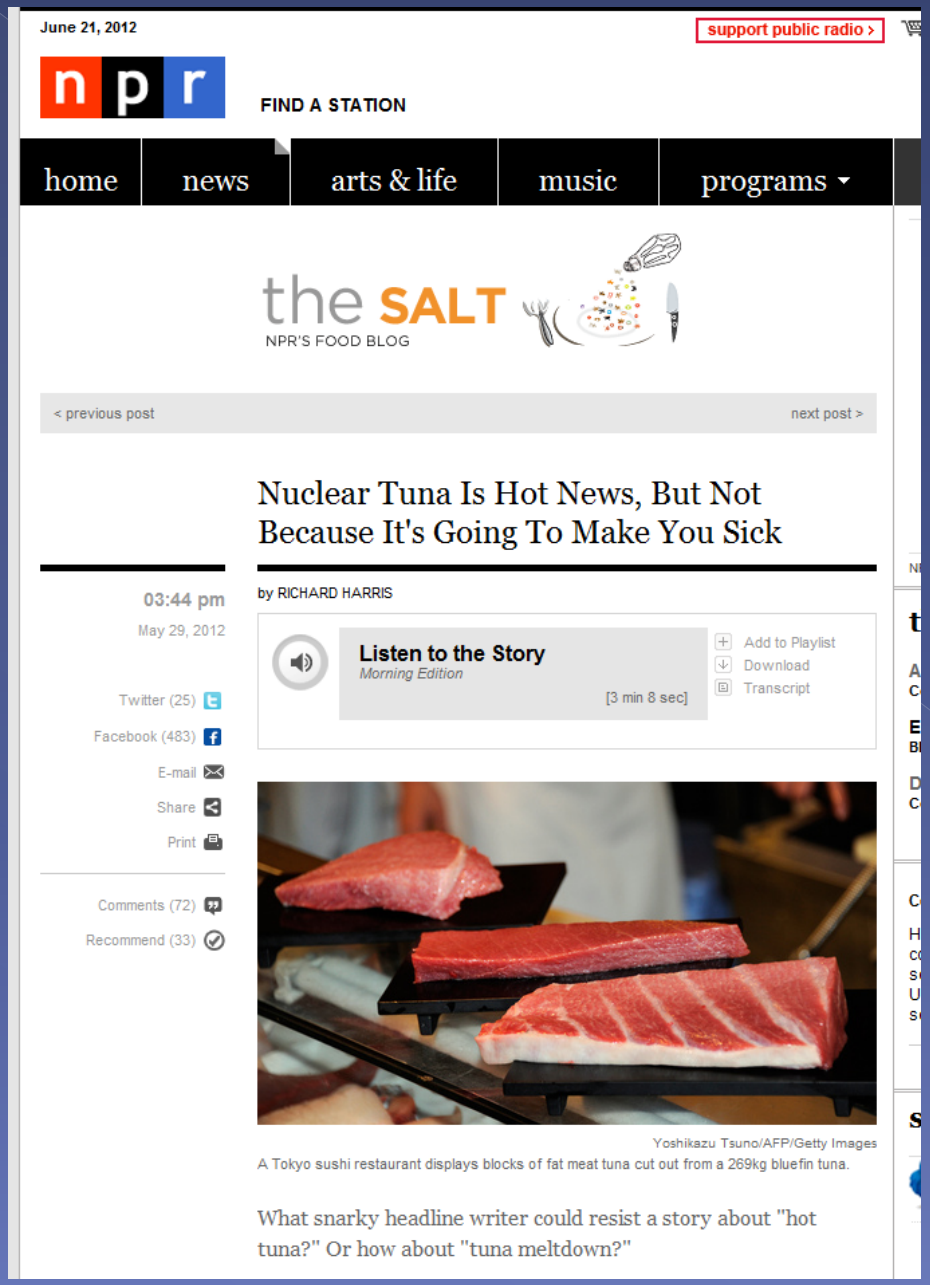
- Notes comparative decreased rates of cancer over the 20 years since closure and speculates due to the plant's shut down

Fair Comparison? Letter to the Journal Editor

- *"Given all of the statistical analysis in this paper, I wondered why a simple summary table had not also been included that listed the cancer rates in each county in the state for the 20 year period of study. 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
  - 31 exhibited decreases!



But What About the Sushi?

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.

Summary

- Misinformation regarding public health issues exists and will continue to circulate
- As public health professionals, we hold an ethical obligation to monitor for, and correct, misinformation. As public health faculty members we hold an obligation to educate our students about this issue
- Relying on the science behind effective risk communications is "not about manipulating people – it's about giving the facts a fighting chance"

Cook and Lewandowsky 2011

Thank you!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