Strategies for Correcting Misinformation About Radiation: <u>A Case Study</u>

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



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







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."

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 and Public Health Project

Please help. <u>Click here</u> 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



eeth collected!

We are currently not testing teeth. When this changes we will announce it here. RPHP releases new journal article on U.S. mortality after

ADOULNERF

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 the "Radiation and Public Health" website

spotlight



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.

Photo of Christie and Joseph Mangano, at 2008 RPHP luncheon

"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"?

Michaels, D <u>Doubt is</u> <u>Their Product</u>, 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 <u>Dr.</u> <u>Robert Emery, Vice President for Safety, Health, Environment & Risk</u> <u>Management at the University of Texas Health Science Center at</u> <u>Houston concerning Dr. Joseph Mangano's recent study on fallout</u> <u>from the Fukushima Daiichi nuclear energy facility reaching the U.S.</u>

"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: <u>http://t.co/m34jsBb7</u>
 @<u>nuclearsciweek 58 minutes ago</u>
- #Nuclear plants create some of largest #economic benefits compared to other #electric generating techno.
 <u>http://t.co/QlyizU6a</u> #cleanenergy about 10 hours ago
- #Nuclear energy is only proven technology that can provide emission-free, affordable baseload electricity <u>http://t.co/QlyizU6a</u> #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. <u>Words That Work</u>
 "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 counterarguments 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 <u>incorrect</u> model over an <u>incomplete</u> 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!



The University of Texas Health Science Center at Houston

School of Public Health