

From Radio to "Retweets": Communications and Public Information in Nuclear and Radiation Disasters



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Radiation Disasters are Different

- **Radiation is:**
 - Invisible
 - Silent
 - Odorless
 - Can only be detected with specialized equipment
- **Radiation concepts, terms, and risks are poorly understood by the public**
 - Fear
 - Fatalism



Japan-2011

"I still have no idea what the numbers they are giving about radiation levels mean. It's all so confusing. And I wonder if they aren't playing down the dangers to keep us from panicking. I don't know who to trust."

- Tsugumi Hasegawa, age 29, living with her young daughter in a shelter with 1,400 other people on the outskirts of Fukushima city, 80 km (50 miles) away from the plant

*From "Japan's efforts to ease nuke crisis hit setback", Mary Yamaguchi, AP
3/20/2011*

Japan-2012

"I had kind of a scary image of radiation because it's invisible. But after I've learned about it, I know what to avoid and where not to go. Also, I now understand the news about the nuclear crisis. I understand (radioactive materials) better than my mother. When we go to a supermarket together, I tell her which produce to avoid."

- Teppei Sato, a Fukushima fourth-grader, on the benefits of radiation education

From "Children Taught Radiation Studies: Nuke Education Now Compulsory Subject in Schools in Fukushima", Mizuho Aoki, The Japan Times, 2/21/2012

Communication Goals

Effective communication in radiation emergencies can:

- Decrease illness, injury, and death
- Facilitate response and recovery efforts
- Avoid misallocation of limited resources
- Reduce rumors
- Minimize medically unnecessary self-referrals to hospitals and other critical facilities

Key Communications Questions

- Are we meeting audience needs for information?
- How can we bridge the gap between technical information and risk perception?
- How can we describe radiation in ways that promote *responsible* public action?



Key Target Audiences

- Public
 - American Citizens living in Japan
 - American Citizens in U.S.
- Public Health Professionals
- Clinicians



Message Development

- Few differences in higher vs. lower education level
- Professional responders will have the same concerns as members of the public
- Non-English speakers and other special populations will have specific communication needs



Findings from Public Focus Group Research

2011 CDC Public Focus Group Message Testing

- **90-minute focus groups of 4-8 people (general public)**
- **January 2011 (Protective Actions: 152 participants)**
 - New York City, NY
 - Washington, D.C.
 - Chicago, IL
 - Houston, TX
 - Los Angeles, CA
- **October 2011 (Health Effects: 75 participants)**
 - Boston, MA
 - Atlanta, GA
 - Denver, CO
 - Seattle, WA

2011 CDC Public Focus Group Message Testing

- ❑ Participants shown a brief video depicting an IND scenario**
- ❑ Pre-scripted messages developed by the Nuclear Detonation Response Communications Working Group presented to participants by audio-only, followed by written copy**
- ❑ Messages were tested for relevance, comprehensibility, credibility, and effectiveness**
- ❑ SME from CDC's Radiation Studies Branch answered questions from participants at the conclusion of every group**

Public Focus Group Research

- Give prioritized action items in each message.

“If you give somebody a little bit of control in this situation by giving them measures they can take to help or reduce the exposure that would be a nicer approach.”

“It’s purely clinical. There’s no practical example of what they’re trying to tell you and how you can protect yourself.”

“I don’t have time for all that, because that doesn’t tell me anything to do. That doesn’t tell me how I’m going to help our situation. That just gives me a bunch of useless knowledge that really doesn’t help me.”

“Tell me something to help me to survive, and then I’ll get more trust. Don’t tell me things that I don’t want to hear and that are useless, because then I won’t want to hear.”

Public Focus Group Research

- Give prioritized action items in each message. (continued)

“It’s going to be a chaotic situation because none of us have experience with it...We need as many specifics as possible and we’re not getting specifics. We need one, two, three, A, B, C.”

“I don’t want to spend time guessing.”

“I’m more interested in what I can do now. When there’s an accident on the freeway, we’re told which route to take to get around it, not how the accident took place...”

“It’s giving me information, but it’s not telling me what to do with that information.”

“Honestly, when it happens, you don’t care about particles, you want to know what to do.”

Public Focus Group Research

- Tailor messages by time post-incident.

“I just don’t think that’s the first thing you’re going to want to hear...I want a message that’s going to calm me and not make me feel like, why are you telling me all this? I don’t need to know all this right now, I just want to know how to get rid of it.”

“Certain information, you’d need to put that out immediately. Then, as time progresses, you could send out other less pertinent information and just so on and so forth. There would always be something to inform you, but at least those first critical- that first stage within the first hour or so, have the most pertinent information.”

Public Focus Group Research

- **Tailor messages by distance from incident.**

“They should draw a line on a map and tell each group, if you are within this group, then you do this. If you are within that group, then do this.”

“If you’re near an area that’s been exposed to radiation...how near is near? I’m still affected by radiation, but to what degree? I don’t know to what degree I need to really be serious about how much radiation I’m taking in until I know where it’s at.”

“I would rate these on different levels depending on where I was in regards to where it happened. If I was farther away, I’d want to know more details about how I could be exposed, so that would be more important. But if I was right there in the emergency, I’d want to know where to go, how to protect myself, all that, so this would be less important to me.”

Public Focus Group Research

- Tailor messages by message delivery method.

“If I was seriously hearing it, just personally I would think I would need it a lot shorter, something easier to follow. But because I know I’m about to have the paper, I can follow up with that.”

“You should create an app.”

“Put it on Twitter.”

“There is a big difference in reading something and hearing it. So you have to put it in a format when it’s on Facebook where you’re going to get a range of people from 8 years old to 78 years old reading... so you have to put it in a context that- so they don’t panic.”

Public Focus Group Research

- Tailor messages for different environments.

*“Is it better to be outside on the street or in your car? Is there a difference?
The first few hours after an explosion, is there a difference?”*

*“Something like if you are not at home, if you are at work now or at school
here’s what you might do.”*

*“I think to comfort the parents of the school children, they should say, don’t go
try to pick up your kids, they’ll be safer inside in school.”*

*“You know, I don’t know what that means because here [Los Angeles] we
don’t have basements.”*

“When the power gives out, I don’t have water. [New York City]”

Public Focus Group Research

- The tone of the messages should be urgent and serious, but should also provide a sense of hope.

“I personally want to know that...there is some optimism here.”

“I think it just has to have a more human, down to earth person to person approach with recognition on the part of the speaker that the listeners are frightened and confused and need reassurance.”

“I think the overall tone and the structure of the sentence is pretty much what makes it a little bit like a – they’re trying to scare you and not inform you. Like I don’t trust them, because like, it’s not like specifically what I want to hear. It’s similar to propaganda.”

“I mean, look, we’re in the middle of some crazy thing, and people are dying all around us...these things come across like they’re telling people how to plant petunias. This is a big deal.”

Public Focus Group Research

- **The tone of the messages should be authoritative and direct.**

“Not an appropriate tone. It’s an informative tone. It’s not like emergency, take action.”

“You know, I think that the language is too permissive. I think it should be more authoritative. It uses words like, maybe, ask to, follow, you should do this. I think it should be very direct; get right to the point. You do this.”

Public Focus Group Research

- **Avoid messages that contain perceived contradictions.**

“I’m unclear on how it can be spread, but it’s not contagious or infectious.”

“It contradicted itself. If you’ve been exposed go seek medical attention but stay inside.”

“What exactly are they trying to say? The statement could be very misunderstood, because I can read it two or three different ways.”

“It’s contradictory. At the very least, it’s misleading. Even if it is true, they need to clarify it. If I’m confused, I’m not going to do it.”

“It’s a contradictory thing; it says get as far away from the radiation as possible; and then stay where you are.”

Public Focus Group Research

- **Use plain, non-technical language.**

“I’m thinking of my grandparents, or my mom. She speaks English, yes, but for her to actually follow a message like that...it would be hard.”

“If you’re going to use a term that probably most laymen don’t understand, then you need to also have some sort of definition for us.”

“I was so busy trying to decode that sentence it pulled my brain out of the message and I stopped listening to what began to be important information.”

“When you have a disaster happen, you don’t want to have to read the dictionary. You want point blank this is what’s happening. This is what you should do.”

“I think you need to do it as plain as plain gets. Simple easy words. No SAT words.”

Public Focus Group Research

- **Use plain, non-technical language (continued)**

“When people see this they’re hearing radioactive and they’re hearing radiation and they may not be able to differentiate between the two and then they hear external and internal and then they’re hearing infectious. And there’s a lot of verbiage that sounds similar-radiation, radiological, radioactive-they’re not going to know the difference, they’re just going to keep hearing the radio and assume it’s all the same thing.”

Public Focus Group Research

- **Make messages concise.**

“It was informative, but it gave you almost too much information.”

“The alternate is a little more concise, and it’s less information, but giving you more at the heart of it.”

“You want to keep the instructions very succinct because people are in a state of shock and they’re not going to have much time to read or even listen.”

“Tightly deliver information ...because time is valuable to deliver your message so you’ve got to make sure that you’re conveying as much helpful information as possible.”

Commonly Misunderstood Terms

- Background radiation
- Contamination/Contaminant
- Detrimental health effects
- Dose
- Hereditary genetic damage
- In the path/Downwind
- Internal/external contamination
- Low/high radiation levels
- Potassium Iodide
- Protective actions
- Protective measures
- Radiation particles
- Radiation protection standards and practices
- Radioactive material
- Rem/Sievert
- Responders
- Risk of exposure
- Sheltering

Other Words to Avoid

- May
- Might
- Probably
- Possibly
- Should
- Instructions may change

"It makes me even more suspicious. Either it is or it isn't. What changes?"

"How will the instructions change? It makes me suspicious."

"I don't like "safety measures may change."

"You shouldn't word it so friendly so as to give them options. You should specifically state what you need to do, not 'maybe' or 'should'."

Sources of Information During an Emergency

- Participants wanted to hear from radiation scientists

“If your car had a problem, you’d take it to a mechanic. You want to go to the experts.”

- Participants wanted a live voice, not a recording
 - Reassurance that others are alive and out there

“I felt a sense of relief because I heard a voice telling us what to do.”

“Acknowledge the desperate need for the knowledge of others.”

“It must be live, not a recording.”

- If battery/crank radios are the only source of information many participants would be isolated from communications

Frames of Reference

When uncertain, participants often based intended actions on familiar situations, both real and fictional.

- Japanese Earthquake/Tsunami
- 9/11
 - *“People who stayed in on 9/11 died.”*
- Hiroshima, Nagasaki
- Chernobyl
- Blackout (New York)
- Earthquake (Los Angeles)
- Fires (Los Angeles)
- Hurricane Katrina, Ike, Rita (Houston)
- Cold War
 - Large weapons
 - Areas uninhabitable
- Movies
 - Silkwood
 - The Sum of All Fears
 - 28 Days
 - I Am Legend

Impact of Japanese Nuclear Power Plant Disaster

- Participants mentioned the nuclear power plant disaster in Japan in almost every focus group as a frame of reference.

“I think that we all have an awareness that maybe we didn't have before Japan.”

- Some reported that they had tried to obtain Potassium Iodide (KI) for themselves or their families in the days following the events.

“Did you try to get potassium iodide by any chance after Japan? Did anybody? I did. I got it three weeks, no four weeks after because they were on back order...good luck with getting anything. Good luck with buying kelp or iodide.”

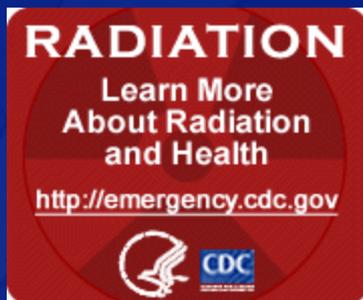
“I knew about potassium iodide because of Japan.”

Message Delivery Methods

- Website
- Mobile site
- Twitter
- Facebook
- Badges
- Widgets
- Content Syndication
- Blogs



The screenshot shows the CDC Facebook page. The header includes the Facebook logo and a search bar. The CDC profile picture is a blue square with the white text 'CDC' and the tagline 'SAFER • HEALTHIER • PEOPLE™ Your Online Source for Credible Health Information'. The page shows a post from CDC, dated Friday at 3:58pm, with 105 likes. The post text reads: 'No one in the United States needs to take Potassium Iodide (KI) or iodine supplements in response to the radiation releases in Japan. Taking KI can be harmful to your health. CDC and other agencies are closely tracking health effects.' Below the text is a link to 'CDC Radiation Emergencies | Potassium Iodide (KI) emergency.cdc.gov' and a note that the information is provided by the Centers for Disease Control and Prevention (CDC).



RADIATION
Learn More
About Radiation
and Health
<http://emergency.cdc.gov>

The graphic is a red square with rounded corners. It features the CDC logo at the bottom right and a stylized eagle logo at the bottom left.



CDCemergency CDC Emergency
RT @CDCemergency NO ONE in US needs KI b/c of Japan nuclear
nuclear pwr plants, KI has serious health risks, #japan
<http://go.usa.gov/4hR>
19 hours ago

The image shows a tweet from the account CDCemergency. The tweet text is: 'RT @CDCemergency NO ONE in US needs KI b/c of Japan nuclear nuclear pwr plants, KI has serious health risks, #japan http://go.usa.gov/4hR'. The tweet was posted 19 hours ago.

Radiation Emergencies Website

<http://emergency.cdc.gov/radiation>

91,510 Page Views
(Highest Traffic Ever)



Japan Earthquake
and Tsunami

Referrals

- **Federal websites**
- **United States Embassy in Japan**
- **News sites**
- **State health department websites (especially west coast)**
- **Social Media**
 - Twitter
 - Bloggers
 - Wikipedia
 - Facebook

Twitter: @CDCEmergency

- **Tweets:**
 - Don't take KI (Potassium Iodide) (3/18/2011)
 - Protect Yourself and Your Family (3/25/2011)
 - Be Prepared (3/27/2011)
- **Added over 7,000 followers over the course of the event**
- **1,259,796 total followers as of 4/14/2011**
- **“Top Tweet” on 3/21/2011**



CDCEmergency CDC Emergency

RT @CDCEmergency NO ONE in US needs KI b/c of Japan nuclear
nuclear pwr plants, KI has serious health risks, #japan

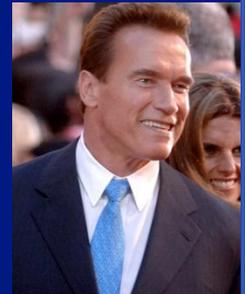
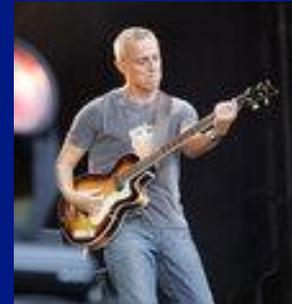
<http://go.usa.gov/4hR>

19 hours ago

Twitter: @CDCEmergency

- **Famous Followers**

- Al Gore
- Ellen DeGeneres
- Jim Cantore
- Curt Smith
- Arnold Schwarzenegger



Facebook

- **3 Facebook Status Updates**
 - 3/17/2011: Travel Advisory
 - 3/18/2011: KI Warning
 - 3/21/2011: Web Tools
- **CDC Emergency Preparedness Facebook page launched 5/16/2011**

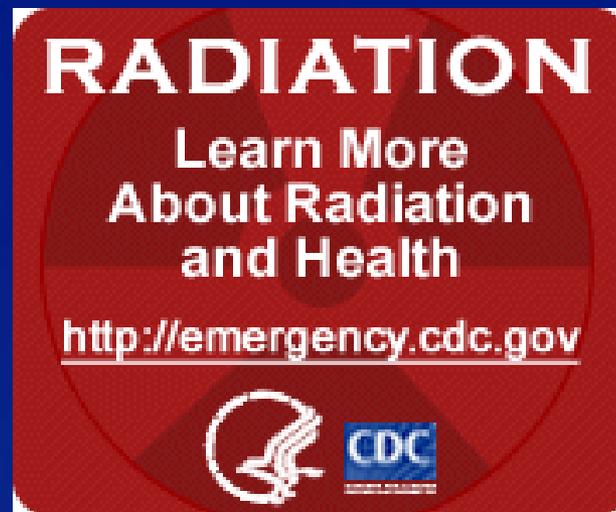
The screenshot shows the CDC Facebook page interface. The header includes the Facebook logo and a search bar. The CDC profile picture and cover photo are visible. The main content area features a post from CDC, dated Friday at 3:58pm, with 105 likes. The post text reads: "No one in the United States needs to take Potassium Iodide (KI) or iodine supplements in response to the radiation releases in Japan. Taking KI can be harmful to your health. CDC and other agencies are closely tracking health effects." Below the text is a link to "CDC Radiation Emergencies | Potassium Iodide (KI) emergency.cdc.gov" and a note that the information is provided by the Centers for Disease Control and Prevention (CDC). The left sidebar contains navigation links such as "Wall", "Info", "Welcome", "CDC", "Vital Signs", "Comment Policy", "Photos (3)", and "Video".

This screenshot shows a Facebook post from the CDC, dated March 21 at 10:48am, with 49 likes. The post text states: "New CDC web graphics are now available for sharing information about radiation emergencies and health. Add one to your website or blog:". Below the text is a link to "CDC - Social Media Tools for Consumers and Partners - Buttons and Badges Gallery www.cdc.gov". A red button graphic is visible with the text "RADIATION Learn More About Radiation and Health http://emergency.cdc.gov". A comment box at the bottom contains the text "Write a comment...".

This screenshot shows a Facebook post from the CDC, dated March 17 at 1:45pm, with 38 likes. The post text reads: "Travel Health Precaution for Japan. US residents are urged to avoid nonessential travel to Japan. For additional information:". Below the text is a link to "2011 Earthquake, Tsunami, and Radiation Release in Japan - Travel Information | CDC Travelers' Health wwwnc.cdc.gov". A small map of Japan is included in the post. A comment box at the bottom contains the text "Write a comment...".

CDC Radiation Badge

- Most popular badge during response
- Click-throughs on the radiation badge higher than the #2, 3, 4, and 5 CDC buttons/badges combined
- Busiest days 400-500 click-throughs



CDC Emergency Widget

Hosted by:

- Faith-based organizations
- State and local health departments
- University health departments
- Malaysian Health Department
- Oregon Militia
- Sacramento News

Busiest days 400-500 click-throughs

Content Syndication

- **444 total views**
- **12 syndicated websites**
- **Syndicated Material:**
 - Radiation Emergencies
 - Radiation Emergencies - Protecting Yourself and Your Family
 - Frequently Asked Questions FAQs About a Radiation Emergency
 - Radiation Emergencies - Information for Clinicians
 - Potassium Iodide (KI)
 - Frequently Asked Questions FAQs About Dirty Bombs
 - Evacuation in a Radiation Emergency
 - Shelter-in-Place in a Radiation Emergency
 - Radiation and Potassium Iodide (KI)

CDC Blog: Public Health Matters

<http://blogs.cdc.gov/publichealthmatters/>

- **3/24/2011: CDC Responds to Earthquake, Tsunami, and Radiation Release**
- **3/28/2011: JIC Never Sleeps**
- **Averaged 2,000 views per day from 3/24-4/15**

CDC Home
 Centers for Disease Control and Prevention
CDC 24/7: Saving lives, protecting people, reducing health costs

A-Z Index [A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#) <#>

Public Health Matters Blog

Sharing our stories on preparing for and responding to public health events

[Emergency Preparedness & Response](#) > [Public Health Matters Blog](#)

CDC Responds to Earthquake, Tsunami, and Radiation Release in Japan

Categories: Response
March 24th, 2011 4:44 pm ET - Ali S. Khan



Photo courtesy US Navy: An upended house among debris in Ofunato, Iwate Prefecture in Japan on March 15, 2011.

CDC Home
 Centers for Disease Control and Prevention
CDC 24/7: Saving lives, protecting people, reducing health costs

A-Z Index [A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#) <#>

Public Health Matters Blog

Sharing our stories on preparing for and responding to public health events

[Emergency Preparedness & Response](#) > [Public Health Matters Blog](#)

The JIC Never Sleeps

Categories: General, Preparedness
March 28th, 2011 3:08 pm ET - Clarice Conley



Photo by Rosa Norman: CDC's Joint Information Center (JIC) during response to Japan earthquake, tsunami, and radiation release

Communications Lessons Learned

- Pre-cleared/existing material
- Quickly adapt existing content
- Subject-matter expertise
- People get the message in many different ways
- Special populations/language resources
- Tailor message to populations

Communications Resources

- **CDC Emergency Preparedness and Response Social Media: 2011 Japan Earthquake and Tsunami Response**
<http://www.emergency.cdc.gov/socialmedia/japan.asp>
- **CDC Radiation Emergency Communications Research**
<http://www.emergency.cdc.gov/radiation/audience.asp>
- **NRC: Guidance on Developing Effective Radiological Risk Communication Messages: Effective Message Mapping and Risk Communication with the Public in Nuclear Plant Emergency Planning Zones**
<http://pbadupws.nrc.gov/docs/ML1104/ML110490120.pdf>
- **EPA booklet *Communicating Radiation Risks: Crisis Communications for Emergency Responders***
(CDC Public Health Toolkit)

Radiological Terrorism: A Toolkit for Public Health Professionals

- **Resources for Public Health**
 - Virtual Community Reception Center
 - Population Monitoring Guide
 - EPA Risk Communication Guide
 - Contaminated Decedents Guide
 - Radiation Survey DVD
 - Webcasts
 - Fact Sheets
 - Psychological First Aid Self-Study



Radiological Terrorism: A Toolkit for Emergency Services Clinicians

- Resources for Clinicians:
 - JIT Training
 - Pocket Guides
 - Radiation Triage Chart
 - Fact Sheets
 - Webcasts
 - Self-study Trainings



To order complimentary toolkits:

Email: cdcinfo@cdc.gov or

Call: 1-800-CDC-INFO (1-800-232-4636);

TTY: (888) 232-6348

Selected material available online:

www.emergency.cdc.gov/radiation

Questions?

For more information please contact Radiation Studies Branch, CDC

4770 Buford Highway NE, Atlanta, GA 30341

Telephone, 1-770-488-3800

E-mail: leeanna.allen@orise.orau.gov

Web: emergency.cdc.gov/radiation

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

National Center for Environmental Health

Division of Environmental Hazards and Health Effects

