Exploring Medical and Public Health Preparedness for a Nuclear Incident: A Workshop

Nuclear Events: Communication, Education and Information Challenges

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Background

Steps Forward

Continuing Gaps
In any disaster or emergency, communication is one of the most important factors determining how the situation unfolds.
Importance of Effective Disaster Communication

• Timely, credible, comprehensible messaging can
  – Provide people with vital protective action information
    • Reduce the toll of deaths, injuries, illness
    • Prevent responses that interfere with efforts to manage the incident
  – Reduce social and psychological impacts
  – Help maintain public trust and confidence
  – Facilitate recovery
Chernobyl

Dramatic increase in childhood thyroid cancer in Southern Belarus, Northern Ukraine

WHO: Drinking milk “from cows that ate contaminated grass. . . was one of the main reasons . . . why so many children subsequently developed thyroid cancer.”

If proper information had been communicated in a timely fashion, the results could have been different.

“Since radioactive iodine is short lived, if people had stopped giving locally supplied contaminated milk to children for a few months following the accident, it is likely that most of the increase in radiation induced thyroid cancer would not have resulted.”

Nuclear Incident Communication Challenges

• Effective communication has enormous potential to reduce morbidity and mortality

• But scenario also poses enormous challenges with respect to effective communication
  – Event may occur suddenly and without warning
  – Massive devastation (with infrastructure damage closer in)
  – Possibility/expectation of additional attacks to follow
  – Authorities will likely have incomplete information and also face unprecedented demands for information
  – Time is of the essence
  – Event involves nuclear technology, radiation and radioactive contamination
Communication Challenges

- Decades of research and experience have consistently shown that radiation associated with nuclear technology is *perceived* by the general public as *one of the most feared of all hazards*.

- Radiation incidents: “have a remarkable capacity to produce widespread fear, a profound sense of vulnerability, and a continuing sense of alarm and dread.”

Communication Challenges

Radiation **concepts/terms** can be complex, difficult to understand.

There can be **confusion** about incident types.

Before today, did you know the *difference* between a “dirty bomb” and an atomic bomb?

- Yes; did know that: 50%
- No; did not know that: 50%

In discussing potential terrorism threats, people say they **know the least** about how to protect themselves from radiological agents.
Communication Challenges

People report lower confidence in their ability to respond to radiation incidents as compared to other threats.

Fatalistic attitudes towards radiation/radioactive contamination are not uncommon:

- “I don’t think we’d have a chance…”
- “It’s radioactive material. Once it gets in you, [you’re] dead anyway.”
- “There is nothing you can do.”

Nuclear Incident Communication: Notable Advances
Improving Nuclear Incident Communication Through Research

- **Pre-Event Message Development Project (PEMDP)**
  - Cooperative Agreement: Centers for Disease Control and Prevention and the Association of Schools of Public Health

- Four nationally-known public health research teams
  - Strong expertise in communication & messaging, public health preparedness and response, new threat agents
  - Coordinated approach

- Multi-year effort
  - **PEMDP**: 2002-2006
  - Follow-on studies: 2006-2008
  - Additional studies: 2009 -
    - CDC RSB, FEMA, DHS,
    - EPA, NYC DOHMH, others
Large-Scale, Multi-Site, Peer-Reviewed Research

• Total of 1013 participants
  – 79 focus groups (884 participants)
  – 129 cognitive response testing interviews

• Geographic Distribution:
  – Mid-Atlantic, Southeast, Southwest, Midwest, West

• Nine population subgroups:
  Urban African-American
  Urban Caucasian
  Urban Hispanic
  Urban Asian
  Native American
  Rural African-American
  Rural Caucasian
  Rural Hispanic
  English Second Language
Pre-Event Message Development Project

• Four Agent Types
  – Plague
  – Botulinum toxin
  – Chemical/nerve agent
  – Radiation
    • Radiological
    • Nuclear

• All four threat agents received substantial attention, but largest number of focus groups and interviews dealt with radiological/nuclear threats

• Produced first peer-reviewed work specifically on communication in nuclear detonation events
PEMDP Broke New Ground in Our Understanding of Communication Issues in Rad/Nuc Events

The Pre-Event Project’s findings regarding people’s perceptions, concerns, and information needs, preferred information sources, and views of informational materials and messages are now well known in the preparedness community. The oft-cited finding that the term “shelter in place” is not always understood came from this research. So, too, did the finding that in regions prone to natural disasters, television meteorologists may be viewed as a trusted information source during a radiological terrorism incident. (Partly as a result of this finding, the CDC held a follow-up roundtable about radiological emergency preparedness with television meteorologists.) The Pre-Event Project also found that people’s primary concerns in a radiation event center around health issues, suggesting that agencies with high credibility on health issues need to play a major role in the communication, information, and emergency messaging process. Another important finding of the project is that many people are resistant to the idea of sheltering because of their concerns about whether their children at school will be safe during an incident. In addition, the research found significant levels of fatalism regarding radiological/nuclear terrorism, with the view that “there is nothing you can do” being particularly pronounced in minority populations (Becker, 2011b).
Communicating with the Public: Following Radiological Terrorism: Results from a Series of Focus Groups and National Surveys in Britain and Germany

UK and Europe - Rad Incident Communication

Wireless Emergency Alerts in Nuclear Detonation Scenario

Incident-Based Research

Disaster Warnings in Your Pocket: How Audiences Interpret Mobile Alerts for an Unfamiliar Hazard

Wireless Emergency Alerts in Nuclear Detonation Scenario

Section 2: What Do We Communicate to People and How Do We Do It?

Communicating About a Nuclear Detonation

DECISION MAKING CONSIDERATIONS:
- What messages should be developed for the public?
- What lessons learned are necessary to communicate after an event?
- What challenges may arise when developing a message for the public?
- What are the recommended channels of transmitting messages?

KEY INFORMATION:
- An expert spokesperson should be available to discuss radiation and risk at a sophisticated level and be able to explain and/or counter partial or incorrect information that may be in the media.
- Pre-scripted messages are available for use in an emergency.
- See CDC - CDC Radiation Emergencies website
- See FEMA - FEMA IND Communications Guidance

Initial Shelter and Evacuation Message [Source: CDC]

Get Inside
In a radiation emergency you may be asked to get inside a building and take shelter for a period of time.
- This action is called “sheltering in place.”
- Go to the middle of the building, or basement, away from doors and windows.
- Bring pets inside.

Stay Inside
Staying inside will reduce your exposure to radiation.
- Close and lock windows and doors.
- Take a shower or wipe exposed parts of your body with a damp cloth.
- Drink bottled water and eat food in sealed containers.

Stay Toned
Emergency officials are trained to respond to disaster situations and will provide specific actions to help keep people safe.
- Use radios, televisions, computers, mobile devices, and other tools to get the latest information.
- Emergency officials will provide information on where to go to get screened for contamination.

If you are in a car, bus, or other vehicle during a radiation emergency:

1. Get inside a building right away. Cars do not provide good protection from radioactive material. If you can get to a brick or concrete multi-story building or basement within a few minutes, go there. But being inside any building is safer than being outside. Once inside, go to the basement or the middle of the building. Radioactive material settles on the outside of buildings; so the best thing to do is stay as far away from the walls and roof of the building as you can.

2. Carefully remove your outer layer of clothing before entering the building. If you can. Radioactive material can settle on your clothing and your body, like dust or mud. Once inside, wash the parts of your body that were uncovered when you were outside. Then put on clean clothing, if you can. This will help limit your radiation exposure and keep radioactive material from spreading.
Improvised Nuclear Device Response and Recovery
Communicating in the Immediate Aftermath
June 2013

Comprehensive Q&As for Nuclear Detonation Scenario
Informed by PEMDP and Other Research, Released by FEMA in 2013

New Message Content on KI, People with Disabilities, Other Key Topics;
Initial Research Funded by DHS DNDO; Adapted by EPA for Use in All Rad/Nuc Emergencies, Released by U.S. EPA in 2017
**Comprehensive Medical Planning and Response Guide**  
ASPR, November 2017

**Communication Integral, Informed by Research**

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### Phase 1: 0 - 48 Hours Post Detonation  
Radiation Basics, Initial Public Protection, & Communication

**Radiation Basics**
- How do people get exposed to radiation?

**What are the effects of radiation exposure?**

**What is the usual fallout period?**

**How quickly does radioactivity begin to disappear?**

**What are the protection exposure limits for radiation exposure?**

**How long does time limit exposure?**

**Public Information - Shelter and Orderly Evacuation**

**Should we distribute and display Public Information (PI) signs?**

**Is it responsible for the distribution of emergency shelters?**

**What is the shelters from nuclear fallout important?**

**What type of shelters shelter best?**

**What is a safe room concept?**

**How should people choose a shelter room?**

**What supplies and how many supplies should people keep for emergency?**

**How do people keep a safe room?**

**Essential Messaging and Communication**

**What messaging channels are used to disseminate information after an IED?**

**What messaging channels should be developed for the public?**

**What are the recommended channels of transmitting messages?**

**What challenges may arise when developing a message for the public?**

**How can people physically prepare for a nuclear detonation?**

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### Table 2: Communication Channels by Target Audiences

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<tr>
<th>Community</th>
<th>Target Audience</th>
<th>Audiences</th>
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<tbody>
<tr>
<td>Blast Damage Zone</td>
<td>Radios</td>
<td>Short-wave and NOAA/weather radio</td>
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<td></td>
<td>Public information (PI) systems</td>
<td>Public information (PI) systems</td>
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<td>Print</td>
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<td>Web</td>
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<tr>
<td>Dangerous Fallout Zone</td>
<td>Radios</td>
<td>Short-wave and NOAA/weather radio</td>
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### Communication Channels

**National and International Communities**

- Visual media
- Television
- Newspapers
- Magazines
- Brochures

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### Notes of Related

- Some individuals may find the comparison to other radiations and exposure to be frightening.
- Expert psychologists should be available to discuss radiation and risk at a supported level and to facilitate discussion and provide support for those who may find the information frightening or overwhelming. 

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**Shelter**

- After a nuclear detonation, the blast wave and radiation will have limited or no communicative ability. However, the majority of travel damage will be in the area that will affect anyone in the location (including IED damage over and damage fallout areas).

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**Shelter**

- Along with emergency systems, public safety systems are key (e.g., law enforcement, ERT, and EOC). 

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**Shelter**

- ![](https://example.com/resources/image.png)
Nuclear Incident Communication: Continuing Gaps
Gap 1: Additional Research

• Need for additional large-scale, peer-reviewed nuclear incident communication research
  – To ensure that our understanding of people’s concerns and information needs remains current
  – To test the effectiveness of already-developed tools
  – To inform the next stage of development of nuclear incident communication tools
Gap 2: A Need for Far More Attention to Communication Challenges in Drills and Exercises

• We usually put much more emphasis on practicing such skills as use of a meter, measuring contamination, plume modelling, etc. – All important

• But few drills/exercises focus on nuclear incident communication and information challenges

• Without extensive practice, communication capabilities & skills that are essential in a nuclear incident will not develop and will not be ready
Incorporating Content
Gap 3: A Communication Strategy and Messaging Tools for Areas Receiving Evacuees

• Fukushima Dai-ichi: Many examples of helping/prosocial behavior in receiving communities

• But many significant problems, too
  – Stigma
  – Some hotels refused to accept people from Fukushima
  – Suggestion that women from Fukushima are tainted, should not marry, have children
  – Healthcare facilities
  – “Children from Fukushima were bullied after evacuating to a city outside of Fukushima.” (Mainichi, 5/25)
  – “We were evacuated to another prefecture,” wrote one Fukushima mother. “My child was nicknamed ‘radiation.’” (Quoted in P Cox, 8/6/2015)
Gap 4: Communication for Children

A nuclear detonation event could result in large numbers of orphans, children separated from parents

All will have concerns and information needs

There is a pressing need for specialized, age-appropriate materials to answer children’s questions, explain key aspects of the situation, explain screening process, screening results, etc.

Gap 5: Addressing Concerns and Information Needs of Responders

- Front line in any effort to manage a nuclear incident
- Public trusts responders, looks to them for information
• High level of dedication to duty

  – “We are professionals” (clinician)

  – “If you are wearing a badge you know that you are fixing to go to work - regardless of what kind of badge it is” (first responder)

  – “We are duty bound” (hospital-based physician)

  – “I would be ready as a health professional to do what I could to help” (public health)

Research Findings

• But a much lower “comfort level” with radiation as compared to other threats  Becker, 2004, 2009 and 2010; Becker and Middleton, 2008.

“Survey research studies have found that responders express a lower willingness to be involved in dealing with radiological and nuclear events than with most, or sometimes even all, other types of incidents.”  Becker, 2013

NYS Hospital-based Nurses’ Knowledge, Attitudes, Behavior & Willingness to Respond to a Radiation Emergency (Veneema et al., 2008, SAQ, n=668): A majority of the nurses indicated they were willing to respond at least some of the time, but over 15% said they were unwilling to work in any of the more serious radiation event scenarios.
Post-Event Experience: Shortages of Hospital/Healthcare/Medical Personnel

- Japan Hospital Association – early survey of facilities in Fukushima
  - 54 out of the 127 hospitals responded; those that responded reported that over 530 physicians/nurses had left by July 2011; actual number probably significantly higher

- Japan Nursing Association
  - Approx. 40 percent drop in number of hospital nurses in area between 1 March 2011 and 1 September 2012.

- Many unfilled healthcare positions
  - Great difficulty attracting trainee doctors for residencies
  - Nursing Assoc: August 2012, 768 open positions, only 174 applicants
Continued Staffing Shortages in 2015

“The nursing home Kawauchi in the Fukushima village of Kawauchi, which newly opened in November 2015, is struggling to find workers, while the needs are high for nursing care are high as many residents returning to the village are elderly…. Some people living outside the prefecture have declined to work here due to concern about radiation, said Mitsuhiro Hayashi, head of the facility.”

Japan Times, March 29, 2016
Update: 7 Years Post Disaster

“... number of medical doctors in Fukushima has exceeded pre-disaster levels.... However, the job offers of registered nurses, public health nurses, care workers, and clinical psychologists exceed the number of job applicants.”

Gap 5: Addressing Concerns and Information Needs of Responders

• Essential to have messaging and communication strategy for proactively addressing concerns and information needs of:
  – Responders
    • Important to develop collaboratively with responder groups
      – Peer to peer approach
      – Responder families
  – Need to remember that healthcare involves more than clinicians, public health
    • Hospital staff
Conclusions
Conclusions

• Effective communication has the potential to significantly reduce the public health impacts of a nuclear incident
• Considerable progress has been made in nuclear incident communication research and in developing new communication tools
• But important gaps remain
• They require urgent attention