Formative Research IND Message Testing with the General Public

conducted by

Oak Ridge Institute for Science and Education

for

National Center for Environmental Health
Radiation Studies Branch
U.S. Centers for Disease Control and Prevention

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Executive Summary

Background: In 2009-2010, the Nuclear Detonation Response Communications Working Group, a federal interagency group of communications and radiation technical experts, developed key messages for affected communities, as well as the rest of the nation, to be used during the immediate aftermath of an Improvised Nuclear Device (IND) detonation. The Centers for Disease Control and Prevention (CDC) was part of the interagency group that developed the key messages for communities affected by the detonation of an IND. To help ensure the quality of those messages, CDC, in partnership with the Oak Ridge Institute for Science and Education (ORISE) set out to test selected messages with the public.

Methods: In January 2011, fifteen 90-minute focus groups were conducted to explore the relevance, comprehensibility, credibility, and effectiveness of the selected messages. A total of 108 adults participated in the focus groups that were conducted in New York City, New York; Washington, D.C.; Chicago, Illinois; Houston, Texas; and Los Angeles, California. After the focus groups, ORISE staff analyzed the demographic data and examined participants' transcribed responses using thematic procedures to identify emerging themes from the comments for each message and the overall project.

Key Themes:

Participants' overall recommendations for all the messages included:

- Segment the messages for blast zones and regions of the country
- Create short, concise, and simple messages
- Use active voice and personal/plural pronouns
- Use more authoritative and declarative language
- Avoid unfamiliar terms and phrases such as radioactive material and downwind, and
- Incorporate consistent instructions and messaging throughout all the messages

Additional findings of interest included:

- If battery/crank radios are the only source of information, many participants could be isolated from communications because only 30-40% owned a battery/crank radio.
- Participants wanted a live voice, not a recording, delivering the messages. This was reassurance that others are alive and gave participants a sense of hope.
- Participants stated that the directives were counterintuitive. They expressed they would most likely not stay inside as instructed.
- Many people did not realize that radioactivity could diminish in a few hours or days. Participants often referenced worse-case scenarios, like Chernobyl and Hiroshima.

Conclusion: Communication after the IND event must address the public's concerns regarding the radiation emergency in short, simple, and concise messages. In order to communicate with the public effectively during an IND emergency, the feedback from the focus groups combined with risk communication principles should be utilized to revise the current IND messages.

Introduction

Detonation of an Improvised Nuclear Device (IND) in a metropolitan area of the United States would be catastrophic. Planning for such an event is critical to the nation's overall preparedness for emergency events. Amidst the calamity ensuing from a nuclear detonation, a crucial task for federal, state, and local authorities will be communicating clear and consistent messages to the public. Effective communications will be a critical factor in saving lives and minimizing injury.

In 2009-2010, the Nuclear Detonation Response Communications Working Group, a federal interagency group of communications and radiation subject matter experts, developed key messages for affected communities, as well as the rest of the nation, to be used during the immediate aftermath of an IND detonation. These messages are intended to provide key life-saving protective action guidance as well as responses to questions anticipated in such an event. Although incident-specific messages will still be needed, these messages will enable decision makers and communicators to provide consistent, well-developed information about a variety of concerns that will arise.

The Radiation Studies Branch of the Centers for Disease Control and Prevention (CDC) provides basic information on radiation and its health effects as well as emergency instructions for individuals and families. CDC was part of the interagency group that developed the key messages for communities affected by the detonation of an IND. To help ensure the quality of those messages, CDC, in partnership with Oak Ridge Institute for Science and Education (ORISE), set out to test them with the public. This document reports on the findings from the message testing study.

Methods

In January 2011, fifteen 90-minute focus groups were conducted to explore the relevance, comprehensibility, credibility, and effectiveness of selected messages developed by the Nuclear Detonation Response Communications Working Group. These focus groups were conducted with the general public who lived in one of the five following metropolitan areas:

1. New York City, New York
2. Washington, D.C.
3. Chicago, Illinois
4. Houston, Texas
5. Los Angeles, California

Demographic Characteristics of Participants

A total of 108 adults participated in the focus groups. Each group consisted of seven to eight participants who were varied in gender, age, race, and education level.

Figures 1-5 summarize the demographic characteristics of the 108 focus group participants.

- Fifty-two percent (52%) of the focus group participants were male and 48% female (see Figure 1).
- The majority of focus group participants were between the ages of 25-54 years old (see Figure 2).
- Fifty-three percent (53%) of the focus group participants were Caucasian (See Figure 3).
- Most participants had some college courses or a four-year college degree (See Figure 4).
- The majority of the focus group participants did not have children under 18 years old living in their household (see Figure 5).

Figure 1. Gender of Focus Group Participants

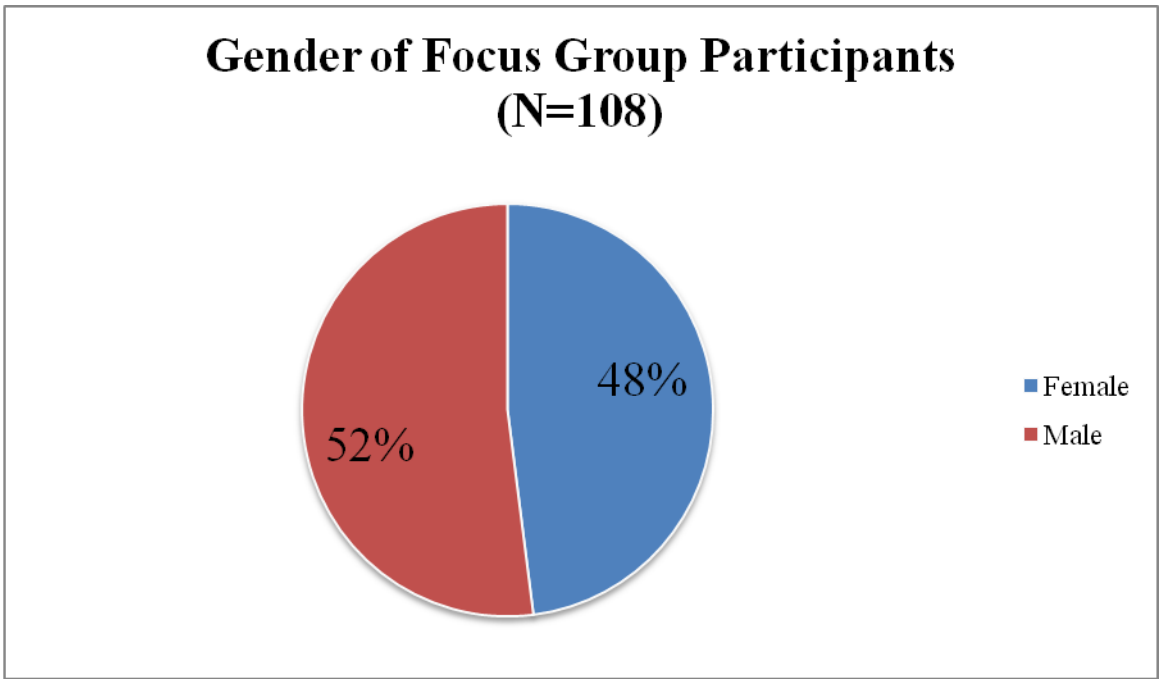


Figure 2. Age Ranges of Focus Group Participants

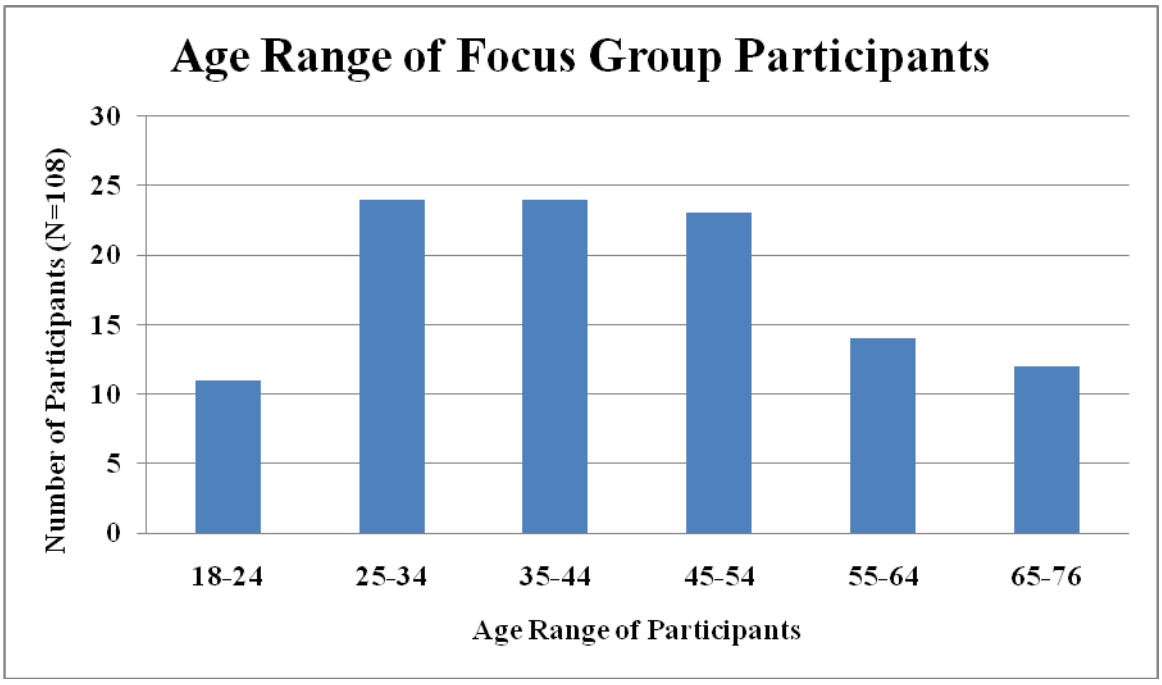


Figure 3. Race of Focus Group Participants

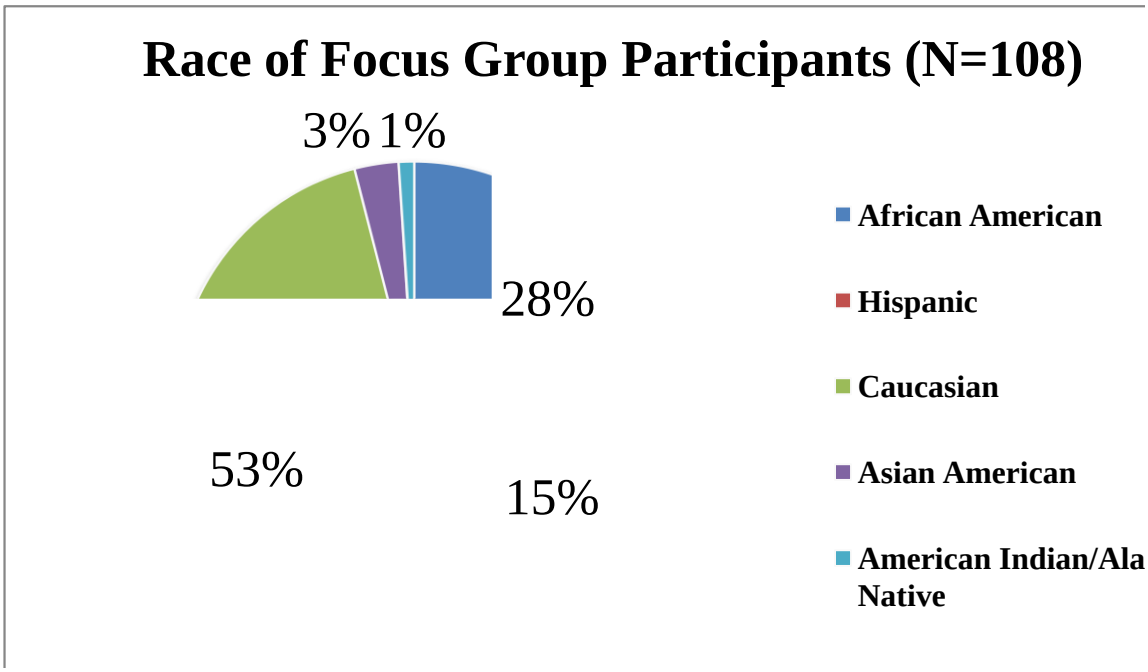


Figure 4. Education Level of Focus Group Participants

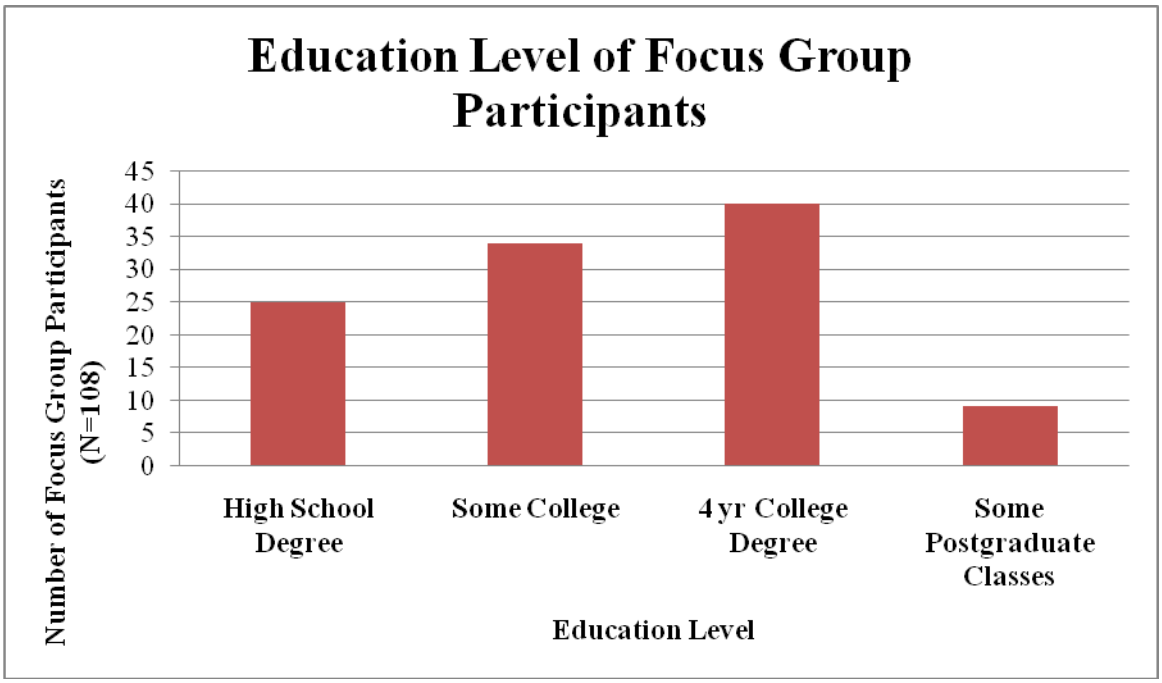
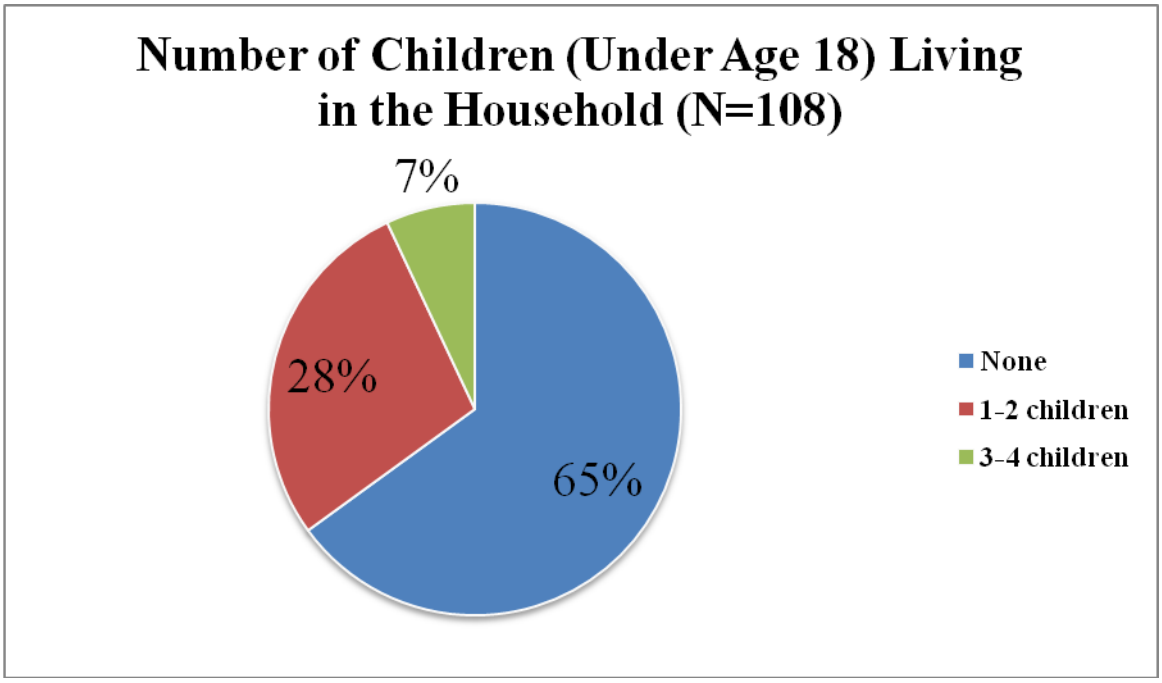


Figure 5. Number of Children (under age 18) Living in the Household of the Focus Group Participants



Process

Market research facilities at the five different locations recruited participants, under the supervision of ORISE. The screening instrument used is included in Appendix A. Prior to participating in the study, participants received an information sheet providing such information as sponsorship of the study, their rights as participants, risks and benefits in participating, and contacts for more information. Appendix B contains the Participant Information Form. Participants were paid a cash incentive for participation.

Data Collection

Each focus group was moderated by an experienced moderator, Mark Herring, Ed.D., working from a discussion guide (see Appendix C). All sessions were audio recorded and attended by CDC and ORISE. Other observers of the focus groups included representatives from United States Department of Agriculture (USDA), Environmental Protection Agency (EPA), Department of Homeland Security (DHS), as well as various state and local partners. At the beginning of each focus group session, the moderator played a video to familiarize the participants with the IND detonation scenario. After the video, the moderator played a pre-recorded audio recording of the message and asked participants to share their initial reactions and impressions of the message based on just hearing it. Next, the moderator passed out a hard copy of the message and read it aloud to the participants. Participants were asked to underline important parts of the message and circle confusing parts of the message. After that activity, the moderator facilitated a discussion with participants about the elements that they liked, found important, disliked, or found unclear/confusing. As part of the discussion, participants were asked about the difficulty of implementing the suggested instructions and the believability of information in the message. Each group went through the process above with a total of three

messages. The messages were rotated among different groups (see Appendix D for Messages Tested; Appendix E for the Rotating Message Schedule). Groups concluded with participants identifying credible spokespeople and sources of information they would trust and utilize during an IND emergency. Subject matter experts (SMEs) from CDC's Radiation Studies Branch were available to answer questions at the completion of each focus group session.

Data Analysis

After the focus groups, ORISE staff analyzed the demographic data and examined participants' transcribed responses using thematic procedures to identify emerging themes from the comments for each message and the overall project.

Findings and Comments

(See Appendix D Tested Messages)

Message 16:

Who should evacuate and who should seek shelter (go inside and stay inside)?

Perceived Main Idea(s):

- When prompted to provide the main idea of the message, participants stated message 16 was directing them to go inside and stay inside to avoid radiation exposure. The concept of protecting oneself with barriers such as walls, brick, and concrete was deemed important to reduce health risks from radiation exposure.
  - *Go inside. For protection.*
  - *The idea of going inside, and having protection and a barrier is obviously the most important thing.*
  - *The more stuff you put between yourself and the outside, the safer you'll be, the less radioactive contamination you'll have.*
  - *Walls. Get a lot of walls in between you, to protect you.*
  - *It just wants you to know that you need to stay as far away from the outside as possible because of the contamination.*

Perceived Strengths:

- In general, participants saw message 16 as an informative message because it provided simple instructions for personal actions to reduce radiation exposure.
  - *They tell me where to go, how to prevent getting radiation, what floor to go to, stay inside or go outside.*
  - *It's informative on what I had to do.*

Perceived Weaknesses:

- Participants criticized the length of the message and they worried people would not remember the critical information in an emergency.
  - *I liked the information that came right at the beginning it gave you a lot of stuff but right in the middle you got kind of lost. You forgot what they told you in the beginning at the end.*
  - *I forgot what the message was before it was over.*
  - *That would lose somebody that is panicking.*
  - *It's a bit lengthy. I think you could cut it down to maybe half of everything that was -- there was one main point, which is to stay inside.*
  - *Wow, that's an overload.*
  - *They overwhelmed me. That was just too much.*
- Participants thought the message only provided personal actions for sheltering and multi-storied buildings, not evacuation. Since the message only addressed multi-story buildings, participants assumed the message was not relevant to other areas such as homes, apartments, and outdoors. In addition, the message did not answer the question of "Who should shelter and who should evacuate?"
  - *I thought the whole message was go inside and stay. You're told to go inside and find shelter so the first sentence kind of throws you off.*

- *Then it said if it's a ten story building, go on the 5th floor, but what about if you're in a two-story house?*
- *It didn't mention anything about apartments.*
- *There's no mention of regular houses.*
- *What about the people that are outside, are they like assumed dead?*
- *Who should evacuate and who should seek shelter? It's leaving it up in the air like who are these people that should seek shelter? It seems like we're all at risk.*

Points of Confusion:

- Several participants mentioned they would leave the area to get away from the disaster. They also found it counterintuitive to stay inside during a radiation emergency because of previous disasters such as 9/11.
  - *Some of the things are counterintuitive, going towards the center of the building rather than getting out of the building.*
  - *I was thinking of the Twin Towers when they came down, you know, I think a lot of those people were told to stay inside also and it wasn't the best thing.*
  - *The first thing that's going to run through anyone's mind is 9/11 when buildings collapsed on each other.*
- The recommendation regarding sheltering in the basement was a point of confusion for several participants because cities such as Houston and Los Angeles do not have basements. The message also provides instructions to increase the distance between a person and the ground to reduce their exposure, yet the basement is close to the ground.
  - *We have a lot of two story houses here with no basement. Where do you go?*
  - *Which is better, the middle of a building or the basement?*
  - *Who has a basement?*
  - *Isn't the basement closer to the ground and soil?*
  - *There are no basements in Houston.*
- The statement "the levels decrease rapidly, in just hours to a few days" provided reassurance to some participants, but skepticism among others. The statement left too much variance, lacked a sense of urgency, and did not provide enough concrete information for some participants.
  - *I think it was very important to me to hear the radiation levels decrease. That was extremely important, and I think it would be important for someone who does not know about radiation.*
  - *It is comforting. I like that because it gave me something to work for. I would have thought that but it was reassuring to hear it. Okay, stay inside, 48 hours, we'll get more instructions.*
  - *I didn't think that was accurate, because like in Hiroshima -- well, you don't have a nuclear blast everywhere but where they've had contamination, like in Chernobyl and Hiroshima, the levels were there for years.*
  - *I guess it would be nice to know about what period of time is the highest level of radiation because it says the highest radiation. Well, when is that? Is it right after the explosion? Is it a few hours after the explosion when the winds pick up? I guess a frame of reference would be helpful.*
- Terminology such as "responders," "radioactive material," and "protective measures" were unfamiliar or confusing to several focus group participants.
  - *Who are responders? I figure when the white suits come I'm supposed to listen to them. Police? Firemen?*
  - *Are the responders, the people saying the message? Is that supposed to be the responder or is it like firemen?*

- *It says shelter away from the material outside. What material? What are they talking about?*
- *The next thing is material. It bothers me. What are you talking about? Stay away from the material outside. Cars, grass, trees, sidewalk?*
- *Add information about the use of protective measures like gas masks or things like that.*
- *Then the last one [sentence] says people in the path of the radioactive material may be asked to take protective measures. What measures? What is protective…?*

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Message 19:

Why are some people being told to stay inside and some people being evacuated?

Perceived Main Idea(s):

- Overall, participants could not form a consensus about the main idea for message 19; it was considered too general.
  - *It was kind of general. Not much was said.*
  - *It's just general information just sitting there...ok, and?*
  - *I don't think most people would understand the message behind it.*

Perceived Strengths:

- Participants believed message 19 was concise compared to the other messages. The message provided participants with information to limit their radiation exposure and directions to listen for further instructions.
  - *It was quick and to the point.*
  - *Short and to the point.*
  - *Stay inside and wait further instructions.*
  - *It's intended to limit radiation exposure and provide protection.*
  - *Limit radiation exposure, provide protection, these instructions are for your safety. Okay. Great. So phrases that you're going to pay attention to.*
  - *Well, you're stating that this is the best information we have right now. In other words, stay tuned because there's more information coming as we gather the information.*

Perceived Weaknesses:

- The majority of participants felt the message did not contain enough action items for protection from radiation exposure, other than stay tuned. Some participants also considered message 19 as being "filler."
  - *They're covering their bases and then they're saying now wait and see to hear from you local officials on what to do. I like the one that tells me something to do immediately.*
  - *It's 'filler', …it's so vague to me about what's being done to help us.*
  - *Well, they could use that to fill space in the emergency broadcasting system later but, I mean, the first message [message 16] was much more important. That was the important one.*
  - *It doesn't seem like it's really geared towards us. It's geared towards what they're doing and we really don't know the basis of this…talking about the winds and all that stuff…that's what they're doing. That doesn't have really to do with us.*
- Phrases such as "protective actions may change" were not favorable to participants. They understood instructions for an emergency would evolve, but participants were concerned the earlier protective actions taken would be found to be unsafe at a later point in time.
  - *Instead of protective actions may change, I would probably say WILL change.*
  - *Changes makes it sound like there's more nuclear act [could happen].*
  -
  - *The other one was 'as we gather more information and as the situation changes'…I don't know the word changes…I don't know…the word 'develops' sounds better to me than changes. Changes makes it sound like there's more nuclear act almost. That's how I interpret it.*
  - *Hopefully it's not changing; it's just becoming more mature.*

Points of Confusion:

- The mention of evacuation in message 19 confused most participants. Participants thought the evacuation information was unnecessary and it would cause more panic among the community.
  - *When you put 'evacuate' and 'stay inside' you are confusing people.*
  - *That's a mixed message. Did they say some people are being evacuated and some are staying in shelters?*
  - *Too much information. You don't tell people that other people are evacuating.*
  - *You've got people in a situation of, like you said, panic. Tell them to go inside and stay inside. Don't talk about evacuation.*
  - *Don't tell people to evacuate.*
- Participants also did not understand why the message provided information about various factors that affect radiation exposure, without providing information to the participants about how to protect themselves from exposure and contamination.
  - *It did give basic, right to the point [information] sort of but then too much detail about the direction. I don't think anybody is going to really care about that. The wind and all that stuff.*
  - *Is the government, legally, covering up liability,…the buildings and the roads…I mean what does that have to do with me and my survival?*

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Message 21:

Is the food safe to eat?

Perceived Main Idea(s):

- Participants viewed the main idea of message 21 as food could be prepared and eaten, if they followed precautionary measures.
  - *You can still eat. It's alright to still prepare food, eat food, just certain precautions you need to take following this.*
  - *I think that's one of the most important things; use sealed frozen foods, and all the packaged foods.*
  - *It's telling you to clean the area as best you can, clean off any cans or boxed goods that you have.*
  - *There's a way to minimize the contamination. It's not hopeless to try to eat something after this disaster.*

Perceived Strengths:

- Message 21 set priorities and provided intuitive guidance to participants such as washing hands with soap and water before handling food, and consuming foods and liquids in refrigerator, freezers, and sealed packages.
  - *Food in the refrigerator or freezer is safe to eat.*
  - *How sealed or protected food is safe if you take precautions.*
  - *I would start with anything, yes, that wasn't exposed. Refrigerated, freezers, packaged foods and canned goods.*

Perceived Weaknesses:

- Participants believed water may be contaminated; therefore, they were concerned about the availability of non-contaminated water. Also, participants questioned why the content for the food and water messages were not integrated. In the food message, they were told to rinse their food with water, but in the water message, participants were told "bottled water is the only source that we are certain is free of contamination".
  - *Who is to say your water is not contaminated?*
  - *I would like to see something about being able to drink water or having access to water because they're saying wash your hands and use soap and water almost as if this didn't happen and you have access to it. You might not have access to that after something like this. So I would like to know is there an alternative place I can get water, or if my water is contaminated, what is the next step.*
  - *They're telling you that your food is contaminated, wash your hands in contaminated water, wash your food in the contaminated water, and then eat the food. Does that make sense?*
  - *You're supposed to wash the container, wash the can, but then we really haven't been properly instructed on what to wash how. Do we use bottled water? Then we don't have any water to drink. Which water do we use?*
  - *And the water, if they specified go ahead, use tap water to rinse and clean these items or no, use bottled water. Because okay this is starting to eliminate what I can drink with*

because if I'm supposed to be drinking bottled water, that kind of throws out that question.

- The message lacked information about the effectiveness of the recommended precautions on reducing the spread of the radioactive materials on food.
  - *What does really limiting mean in a situation like that? I'm only getting 50% of the radioactive material off the food? 40%? I need a little more reassurance.*
  - *I don't know if the radioactive material would be on your hands and would that really limit the spread to the food. It sounds like a good phrase but I just want some backup [information].*
- Several participants found it difficult to believe that they could remove radioactive material by washing food and packages with just soap and water. They were also interested in knowing what other cleaning products they could use to rinse off food and packages.
  - *I have a difficult time believing that I would be able to wash radioactive material off my hands with soap and water.*
  - *It sounds like, oh, radiation, no big deal, just wash it off.*
  - *So does soap deactivate radioactivity? That would be nice if they told us whether it does or not.*
  - *I think some people lose common sense in an emergency. And it says rinse off food-contact surfaces. With what? I mean, with what? Water? ….Do you use soap? Soap, bleach? Whatever.*
- The instructions to clean counters followed by instructions to keep food off counters caused fear among participants because they felt their whole house may be contaminated after the IND event.
  - *I found that very disturbing because am I going to automatically assume my house is radioactive inside from the ceiling to the floor?*
  - *It says rinse all food surfaces, counters, plates, pots…basically clean house. That's what they're telling to you do but then at the bottom it says to keep all food and everything else off contaminated areas but if you just cleaned your house what would you be putting it on if you just cleaned it. It's contradictory to itself.*

Points of Confusion:

- Participants inquired about what types of foods and food containers provide better protection from radioactive material. They also questioned if food from a sealed container could be saved after opening it.
  - *It doesn't really give any additional information with regards to the types of foods that might be safe to consume.*
  - *Should you use certain kinds of substances? Like don't ever use plastic? Or only use plastic because it permeates less and you can clean it? Don't use some other kind of material?*
  - *Say if you open a can, eat half of the can and throw the other half away? Because the air got in it. What's in the air?*
  - *Take half a hamburger, the left over, do I stick it back in or will that infect the rest? Do I throw whatever is left over away?*
- Participants questioned the USDA as primary source of information during a radiation emergency. They expressed several concerns regarding the USDA Meat and Poultry hotline, such as whether or not telephones will work, if staff will be available to answer the telephone lines, and will the hearing impaired be able to follow audio directives?

Additionally, participants were inquisitive about other methods of contacting and communicating with the USDA, such as websites and text messages.

- *When I think of being sick, I don't really think about calling the U.S. Department of Agriculture. Like if there was another entity like the CDC or whatever, that's when I think about people being sick or contagious or whatever. I'm not thinking I'm gonna call someone that knows about farming or cattle or anything like that. I want to talk to someone that knows about people being sick or ill or hurt.*
- *Consumer hotline. The question that I have, how do you know we have phone service?*
- *For you to call them? I mean, and who's going to be there to answer your call?*
- *For the hearing impaired? They're not listening to the message.*
- *In this day and age, assuming we still had internet connectivity or the three G's or the iPhones or whatever that we have in terms of those devices, it probably would be helpful to have a web address that would have a list of consumable items and treatment for those items.*
- *If they have that where you text 222 or whatever then the message will come through on your phone.*

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Message 24:

Is the water safe to drink?

Perceived Main Idea(s):

- Bottled water is the only safe water to drink was the main idea noted by participants for message 24.
  - *Bottled water is the only source we were certain was free of contamination.*
  - *The main point I got was to drink bottled water.*
  - *The message is don't drink any water unless you have bottled water.*
  - *Bottled water for the time being would be the safest.*

Perceived Strengths:

- Message 24 provided clear instructions about the use of bottled water and not going outside to look for bottled water. Participants appreciated the authoritative language used in the message.
  - *Bottled water is safe. Don't go look for bottled water.*
  - *I think it's really important to say do not go out looking for bottled water because the first thing people think of is I've gotta get in my car and go get supplies.*
  - *I like how they said don't go out looking for water.*
  - *If you've been asked to stay inside, don't go outside looking for water due to radiation levels.*

Perceived Weaknesses:

- Participants noted that the message contradicted itself because it stated "only bottled water is safe," but also provided directions for consuming tap water.
  - *The first bullet point talks about bottled water being the only source free of contamination. The second bullet point talks about if you have water pressure and need to drink water, save water in clean containers – it basically is a contradiction.*
  - *The second bullet point, if you have water pressure and need water to drink, save water in clean containers. It's a little distrusting only because of what it mentions about bottled water and that being the safest water. So it contradicts what it's saying.*
  - *Well, they kind of contradicted themselves. First, they said don't drink the water; then they said you can drink the water because most communities have covered water sources. So you kind of contradicted yourself there when you said don't drink it but then you said it's okay to drink the tap water, put it in the container. Okay, which is it?*
  - *Negative was if you have water pressure and need water to drink, save water in a clean container for drinking. It's contradicted by the statement, bottled water is the only source we are certain is free of contamination.*
- Most participants had little to no knowledge of ground water sources or water distribution systems. Some respondents interpreted a distribution system as a physical site to obtain water during an emergency.
  - *I feel that's [the second bullet point-distribution systems] very important, but I'm not sure what it means.*
  - *A distribution system? While I can guess what it is, again, this is technical language I just don't know.*
  - *Are you trying to tell us that there are reservoirs in our community that might have this safe water? Maybe we could go there for some distribution of the water?*

- *Could we go there [distribution system]? If they've got several things of water?*

- The statement about the water analysis, which could take weeks, concerned participants because the analysis could ultimately conclude tap water was unsafe.
  - *Then it says until we have verified test results…none of this is comforting to me. And then it says complete analysis can take weeks?*
  - *They say complete analysis can take weeks. So you drink the water because they say it's okay. And then they come out and say the water wasn't good to drink.*

Points of Confusion:

- Participants questioned the effectiveness of traditional methods for sanitizing water, such as boiling water, filtration systems, and bleach, to remove radioactive contamination.
  - *I would like an instruction if I boil the water, could it start a fire? If I boil water am I better off, not better off?*
  - *One thing the message didn't mention also, what about water filtration systems? People have thosePur® faucets. And I have a Brita pitcher that I use.*
  - *I have heard of people filling their bathtubs for water and you can use Clorox. I don't remember the exact, but the amount to put in a gallon of water is on the Clorox bottle to purify it if you can't boil it.*
  - *Will the charcoal filters filter out any radiation?*
  - *Boil water from the faucet….They didn't mention that at all. I wonder why.*
- Participants wondered if they could utilize alternative sources of hydration such as juices, canned vegetables, hot water heaters, toilet tanks, etc.
  - *What happens to the person who doesn't have bottled water? There's no suggestions in the event that you don't have water supply, your water isn't on and you don't have bottled water. It would be helpful to give suggestions on how people could remain hydrated or semi hydrated and that information is not there.*
  - *When I first heard the message, I was thinking in every household there is water inside of your water heater.*
  - *The water in your toilet tank.*
  - *Juices, canned vegetables, hot water heaters, etc.*
  - *Would soda be the same?*
- The statement regarding using a clean towel to remove contaminants from water bottles confused some participants because they were unclear on what was considered a "clean" towel. This message also introduced some concern among participants about their houses being contaminated.
  - *Well, if the bottle potentially has contaminants, who's to say that the towel doesn't have contaminants that you're wiping onto the bottle? So that kind of puts me in a question where I'm wondering where are the contaminants? If the bottle is well sealed and the seal has not been broken but potentially there are contaminants, say I'm grabbing a rag with contaminants and wiping it on the bottle?*
  - *How we would determine if a towel is clean or not?*
  - *That worried me. If it's in your house, why are you going to have to clean it once the contaminant is now in your home? That kind of worries me.*
- Participants thought the tap water was immediately contaminated and dangerous, and therefore, questioned if they could use water for personal hygiene and to cleanse wounds.
  - *Do we still use it to clean hands and faces?*
  - *I would imagine that you wouldn't bathe in it either because it would be radioactive.*
  - *You might need water to help dress their wounds, so you've got a whole other thing, you know, is it safe to drink but would it be safe for medical purposes.*
  - *Personal hygiene?*

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Message 25:

Is the air safe to breathe?

Perceived Main Idea(s):

- Participants perceived the main ideas of message 25 as cover your mouth and nose with a protective layer, stay inside, and use walls and other physical barriers as protection.
  - *Cover your mouth with a mask.*
  - *Stay inside for protection from radioactivity.*
  - *If you're in a basement, go down deep. Try to be deep in some area. The deeper you are the better you are.*
  - *I think it basically comes down to stay inside and cover your face.*
  - *Be very careful going outside and breathing air without protection.*
  - *Stay inside for protection from radioactivity.*

Perceived Strengths:

- Message 25 provided vital information on air safety. Participants perceived the actions as do-able, intuitive, and an immediate priority.
  - *It's just addressing the first question I have if I were in a scenario like that, is it okay to be out and breathing and exposed to the air?*
  - *It was actually very thorough because I would want to know right away, what can I breathe?*
  - *Covering your mouth and nose…that's very informative. They are telling me what to do.*

Perceived Weaknesses:

- Participants thought the statement about the officials "monitoring the air across the country" was of little or no importance to them.
  - *I don't think this message could raise any urgency. I think it's more informational.*
  - *It's talking about other things that aren't relevant to breathing. Right now. Like, what do I do right now? I don't care that you're going to test the air all across the country. I really don't.*
  - *If you're testing the air in the United States how's it helping me in New York? If you're testing it in Iowa.*

Points of Confusion:

- Message 25 contained terms such as "pollutant," "radioactive material and debris," and "downwind" that were unfamiliar or confusing to participants.
  - *Most of the time when we think of pollutants today, we think of water bottles, plastic trash bags, and chemicals in the water and things like that. So I think this is too broad a word.*
  - *It mentioned debris also, so not just the radio[active] material you can't see. I guess that would include particles and whatever else would come with a radioactive explosion.*
  - *Nobody's gonna know whether they're downwind or not and that's just confusing to have that in there.*
  - *Downwind? I don't know anything about wind. Does wind shift? Is down wind always downwind? I don't know anything about wind -- I never did any research about it.*
- Participants were curious about what type of mask to wear for protection. They also expected information on additional precautionary measures to take to protect themselves such as sealing doors and windows and turning off HVAC systems.

- *Mask, cloth -- what kind of material can it be? Is it regular cotton? I'm assuming radioactive material can go through that.*
- *For me, I'd just like more of a list of what can I do to reduce my exposure because a lot of this is just information. Tell me what steps I can do to lower my risk.*
- *Am I doing anything? Am I taping up windows? Obviously, don't turn on air conditioners and stuff like that. But pretty much what do I have to do to cover up, to kind of keep my little air, my little bubble of air and not let anything else in.*
- *What do we do to save the air that I have in my apartment right now? Can I tape the windows up?*

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Message 31:

How do you decide when and where to implement protective actions, specifically evacuate or shelter (go inside and stay inside)?

Perceived Main Idea(s):

Participants considered the following as main ideas for message 31:

- Stay inside based on expert recommendations.
  - *It's good to stay inside as opposed to evacuate based on the experts and their recommendations.*
  - *During the time with the highest radiation levels it's safest to stay inside shelter away from the material outside.*
- Stay tuned for additional information.
  - *Keep listening to the radio so you know what's going on, what's next, what's going to happen.*
  - *As we get more information we will give that to you.*
  - *Radioactivity can change so stay tuned for further instructions.*
- Radiation levels reduce rapidly.
  - *They said a couple of days, a few hours, we may not be in here that long; maybe there's hope, that's what it gave me the feeling of.*
  - *I liked how they said the radioactive material like dissipates soon after the blast because people will be panicking.*

Perceived Strengths:

- Knowing that "radiation specialists" and "experts" would be involved was reassuring and comforting to some participants.
  - *Hearing radiation specialists were on the job….that was very comforting.*
  - *When they say radioactive specialists, I think that makes people probably a little bit more comfortable knowing that there is a technical person not like Joe around the corner.*
  - *Well, I find it comforting that a group of radiation specialists, experts, scientists, so there's some actual thought process going on.*
  - *I think it's important to know that they have specialists involved. Where it says with the support of radiation specialists, that's important.*

Perceived Weaknesses:

- Participants noted that message 31 did not answer the questions about when and where to implement protective actions for evacuation or sheltering.
  - *I'm a little bit confused on what the main point of it was and it might have been because I found it a little bit, I guess I want to say technical, getting into weather and obstructive paths.*
  - *How do you decide to go inside or evacuate?*
  - *Go inside and stay inside in parenthesis, is that defining shelter, seeking shelter?*
- The message lacked action items to help participants protect themselves.
  - *Tell me what to do. Just be straightforward. Just say you need to stay inside; you need to do this and do that. I wasn't even listening to that to be honest with you because he wasn't telling us what to do.*

- *Something a little more specific than just staying inside. I mean, is there something else I can do? That feeling of helplessness is a pretty awful feeling.*
- *I'm wondering if they could add something here to tell you what, besides staying inside, what other kinds of measures can you take?*
- *And give me another bit of advice to start, maybe, collect some water…maybe give me some things to do that can relieve some of that anxiety about not knowing.*

Points of Confusion:

- Participants questioned the terminology "protective actions" and "protective measures" because they were unsure how to implement them. They were also confused by the phrase "in the path" because of the lack of information indicating how a person would know if they were "in the path."
  - *Implement protective actions just like totally threw me off. If I had to listen to audio and I'm in a panic, I would have not even known what they were talking about. So there's a lot of things that could be worded easier and a lot of things taken out, probably make it a little clearer.*
  - *What kind of protective measures perhaps? Gas masks, things of that nature.*
  - *What determines who is in the path?*
  - *Makes me wonder who the people are and where the path is?*
- Many participants were unclear on what "radioactive material" was and how to recognize it. They also questioned if there was a difference between "radioactive material" and "radioactive fallout" and if so, how is the difference determined.
  - *They could tell you moving it's [radioactive material] in the air but again, give something more definitive where people could be more aware, not only of their surroundings but of themselves.*
  - *What is radiation? Where it comes from? How it happens? How secure it is? What it can do? Yeah, how are you going to protect yourself if you don't know?*
  - *Maybe put in a very short concise definition of what radioactive fallout is so that people aren't looking for it. Radioactive fallout is something you cannot see.*

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Message 73:

What should people do if they think they may have been contaminated?

Perceived Main Idea(s):

- The perceived main idea of message 73 was to remove the contamination from the body. Participants indicated showering as the best protective action to remove contamination.
  - *If things have been contaminated, here's the steps to take to best aid you in your survival.*
  - *Take off your clothes and get to water. Some kind of washing opportunity. And avoid other people.*
  - *Remove your clothing, be careful not to inhale and be careful not to scratch yourself.*

Perceived Strengths

- Participants indicated message 73 provided valuable, simple, and succinct instructions to remove contamination. The message increased self-efficacy among participants because they believed the actions were feasible during an IND emergency.
  - *It's simple, to the point, tells you what to do.*
  - *They gave specific examples of what to do so I thought that was definitely beneficial.*
  - *I liked it; I thought it was great. You felt like you can do something. Okay, do this and then do this and then do this.*
- Participants favored the message because it provided alternative protective actions to decontaminate themselves based on their available resources.
  - *Gives you several options. Like if you don't have water use wet naps, dry towels, and what to do with them. They just gave you immediate information and if you run into any issues of not even having the things they gave you other options.*
  - *And also it gave you, it said if you didn't have water then use baby wipes or wet naps or whatever or even just a towel and you know, a paper towel because you might be in a place where there isn't any water.*
  - *And secondary methods, if you don't have water, baby wipe – I think that's good to know.*
- Knowing that 90% of contamination could be removed was reassuring to participants.
  - *I, myself, can get ninety percent of the radiation off by doing something. It was proactively positive and the last thing that it helped me do was to remain calm.*
  - *You can take steps and get rid of ninety percent of contamination.*

Perceived Weaknesses

- Participants thought message 73 was too long and contained repetitive information.
  - *I think it can be consolidated. Here the message is if you've been contaminated, there are two possibilities, one you have water and two you don't. One, if you have water, you could say something like, if you have water, take a shower. If you cannot take a shower then follow these steps. I think there's just a lot of repetition there.*
  - *Taking out how to dispose of the clothing…it was repetitive…they said it twice. They said it once in the top part, and they said it again…of how to get rid of it in the plastic bag…maybe just once and then you're done.*

- Participants also thought there was a lack of integration with the water and sheltering messages. From message 73, participants assumed that the water was safe to use for a shower.
  - *They're not saying that the water is safe at all.*
  - *What is the deal with the water?*
- In previous messages, participants were directed to stay inside, but this message recommended that participants should go outside to dispose of their clothing.
  - *I don't get, why would they say put it outside if we can't go outside? Why would they tell us to go outside if we can't go outside?*
  - *They said it twice, take the plastic bag and put it outside or leave it outside. Again, we can't go outside.*

Points of Confusion

- Although message 73 addressed what people should do if they believe they are contaminated, it did not indicate the signs or symptoms of radiation contamination.
  - *How do I know if I'm contaminated? ...Is it liquid or in the air? What is it?*
  - *You have to think the worse, that you're all contaminated at that point. And what does it look like? I mean, does it look like fire ash? Is it dandruff? Is it brown, black?*
  - *Yeah, what is it? How do you know? That's what I'm trying to understand. Is it invisible?*
  - *I think it would have been nice if they were a little more clear about what contaminants were. I mean are you going to get a green sludge on you and it's like, oh, I've got contaminants or is it just dust. What are contaminants?*
  - *They didn't give any symptoms, any signs of contamination.*
  - *Telling the essentials like if you start itching this way or if you start itching, you're contaminated, just tell me the simplest, how I would know I was contaminated.*
- Participants understood showering would remove contamination but were unsure about how long they should shower and why they should use lukewarm water.
  - *How long do I stay in the shower?*
  - *How long do I have to stay in the shower? Am I going to be decontaminated after that?*
  - *Somebody will think what if I don't have lukewarm water, am I still contaminated if I wash it off or something? Does that make a difference?*
  - *Why is it lukewarm water? Because we might have bottled waters…most of us do. So, what's wrong with that?*
- In message 73, clothing was a major concern among participants. Some participants questioned whether they must remove just the outer layer of clothing or all of their clothing. Moreover, several participants wondered if their entire house was contaminated, and if their clothes in their closets or drawers are safe to wear.
  - *This kind of makes me curious because I guess if I'm at home or anywhere where I just could change all of my clothes, I wouldn't just take the outer layer, I would just completely destroy everything I have on and move from there.*
  - *They're saying remove all your clothing but do you need to remove your underwear as well? I mean, if the contaminants is on me, if it's like dust, I suppose I can keep my boxers and T-shirt on. Or should I? Maybe I should get rid of them. I don't know.*
  - *Are my clothes in closet safe? If it's better to be naked or wear my contaminated clothes?*
  - *They should say if clothes in your dresser or your closet are acceptable.*
- Participants were also concerned about treating wounds, especially if the water was contaminated.
  - *Well, my question was -- people are going to be cut. What can you use to clean the cuts versus having an open wound?*

- *Well, what happens if you're already cut up and scratched up? So are you already contaminated?*

- In message 73, participants were unfamiliar with the term "out-of-the-way area."
  - *I kind of know, and then again I don't know, out-of-the-way area. Does that mean you can put it underneath the cabinet? In a closet? Or just down the hall?*
  - *What do you do with the items when you take them off? I get where it's saying to place them in an out of way area but do I want to go to that out of the way area?...To face further contamination?*
  - *Out of the way is maybe a little vague.*

See Appendix F for suggested changes to all the tested IND messages.

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Key Commonalities Across Messages

- Participants wanted a live voice, not a recording, delivering the messages. This was reassurance that others are alive and gave participants a sense of hope.
  - *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.*
- Several participants stated that the directives were counterintuitive. They expressed they would most likely want to explore outside because of curiosity or leave town; not stay inside as instructed. Participants also mentioned that they feared staying in concrete buildings because the World Trade Center Towers collapsed on 9/11. These statements occurred in other cities besides NYC.
  - *I think a lot of people like me would be curious by nature and immediately go outside to figure out what's going on.*
  - *One of the things that keeps running through my mind with all of these is the first thing I'd be doing is getting in my car and get out of dodge.*
  - *What came to mind was the Twin Towers, those people went up and they should have went down and out of there.*
  - *9/11 terrified me about concrete buildings. I don't know if I would do that or not. It frightens me because I don't want it to come down, which happens very easily.*
- Many people did not realize radioactivity could diminish in a few hours or days. Participants often referenced worse case scenarios, like Chernobyl and Hiroshima.
  - *I didn't realize that radioactivity diminishes after a few hours. I though it lasted for thousands of years.*
  - *I remember, from the Second World War, when they dropped the bomb on Hiroshima, the radiation killed a lot of people. I can't imagine in a couple of hours it was gone. I really don't.*
  - *Being old school, I've always been taught that nuclear weapons or any kind of bomb, total devastation, you're going to die from radioactive whatever within just a matter of hours or days. Maybe if this is referring to a small bomb or explosion, that needs to be mentioned in here because people will panic thinking they're going to die of radiation if they walk outside their house. That's the way most people think…we think, oh my god, we're gonna die and our skin is gonna fall off, and Chernobyl.*
- If battery/crank radios are the only source of information, many participants could be isolated from communications. In almost all the cities, less than half of the focus group respondents owned battery/crank radios. However, more participants in LA owned radios because of earthquake preparedness.
- Most participants thought message 25 was the most vital message after an IND emergency because it provided instructions on how to survive.

Overall Recommendations for Improving IND Messages

The following recommendations provide ways to improve current and future IND materials for the public. Focus group participants provided rich suggestions for improving current radiation messages. Recommendations include:

1. Tailor Messages To Various Audiences

During the focus groups, many participants suggested that the messages should be more specific based on the distance from the IND incident and the regional characteristics. This way, participants would only receive information that is pertinent to them and their vicinity.

- Provide specific information for audiences based on their distance from the blast.
  - *I think there would be two different kinds of messages: One for the affected area, the immediate area; one for the rest of the country.*
  - *They need to be more specific of the distance from where the center of the blast was to where the fall out has reached.*
  - *I think before this message comes out to the public maybe they should say, you know, people in the southwest or…maybe they should give the area first before they give the clarification of who should be inside and who should be outside.*
- Modify messages to address regional characteristics (e.g., almost no basements in Houston and Los Angeles).
  - *You know, I don't know what that means because here [Los Angeles] we don't have basements so we can't go underneath.*
  - *There's no basements in Houston.*

2. Key Language Concepts

To improve the comprehension of information during an emergency, IND messages must adhere to vital principles of emergency communication.

- **Create short, concise, and simple messages.** Communicate the main idea of the message in the first 1-2 sentences. Use plain language when possible and reduce the reading level.
  - *Three points, and call it a day. Make it short and simple.*
  - *I think it was written at too high a level. I think the sentences need to be shortened and the vocabulary needs to be reduced.*
- **Use active voice and plural/personal pronouns in future IND messaging.** Active voice puts more emphasis on the information presented and eliminates unnecessary wording.
  - *The point is that so many of the sentences are written in the passive voice. Ok. These decisions are based on radiation science and the best information we have. Why can't you say we are basing these decisions on information we have?*
  - *It's safer to stay inside. Why can't it say it is safest for you to stay inside?*
- **Use more authoritative and declarative language.** The tone of the message must be more directive rather than suggestive. Modify words such as "may," "might," "should," to "will." Also revise "instructions may change" to "stay tuned for updates" because participants feared previous instructions may contradict future ones.
  - *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', and 'you should do this'. I think it should be very direct; get right to the point.*
  - *I don't like the words 'if you are told' or 'should' that's giving people options. You shouldn't give them options. You should specifically state what you need to do, not maybe or should.*

- *They need to say it more directly and concretely, like go to the center, do not go outside, wait for further instructions as opposed to you 'may' or 'may not' be exposed or 'you may be one of these people'.*
- *How can you say that when you're also saying instructions will change? You might find out something a month from now that contradicted what you said a week ago.*

- **Be consistent. Make sure the same content is integrated across all messages.** Avoid contradicting statements, for example the water message, stated "bottled water is the only source that we are certain is free of contamination," but the food message stated "rinse food with tap water."
  - *The first bullet point talks about bottled water being the only source free of contamination. The second bullet point talks about if you have water pressure and need to drink water, save water in clean containers and most distribution centers have several days of water stored that can dilute the radioactive – it basically is a contradiction.*
  - *Well, they kind of contradicted themselves. First, they said don't drink the water; then they said you can drink the water because most communities have covered water sources. So you kind of contradicted yourself there when you said don't drink it but then you said it's okay to drink the tap water, put it in the container. Okay, which is it?*

- **Avoid or define unknown terms and phrases.** The following terms were unfamiliar to participants, eliminate or define from future messages. See Appendix G for alternative phrases.
  - Distribution System
  - Ground Water Source
  - Contamination/Contaminant
  - Responders
  - Protective Measures
  - Protective Actions
  - Radioactive material
  - Harmful effects
  - Downwind
  - In the path
  - Sheltering
  - Implement
  - Risk of Exposure

- **Provide messages in multiple languages** for non-English speaking people.
  - *In a city like this you've got people who don't speak English.*
  - *Is this going to be put in different languages? We're such a melting pot here there would have to be other languages.*

3. Message Structure

When communicating IND messages, including all necessary information and message structure are critical. Developing a strategic approach for communication efforts should include identifying and prioritizing important information, understanding the channels and sources of information that may be available during an IND emergency, and delivering the information as simply and concisely as possible.

- **Specify prioritized instructions in each message** by the most to least important information.
  - *We need as many specifics as possible and we're not getting specifics. We need one, two, three, A, B, C. Because like I said, there's going to be as much chaos as it is, any questions like what if? Do we do this? That's not good. So specifics more than anything throughout it all.*
  - *I like the idea of first source, second source, that idea of numbering to use bottled water first, what comes out of the faucet second.*

- **Provide details on how to stay informed.** Include specific timeframes on next available update and alternative methods to stay tuned for additional information if resources are limited (e.g., battery/crank radios).
  - *Instead of saying stay tuned, saying something like, 'this message will repeat every ten minutes' or 'this message will be updated every hour'.*
  - *As soon as possible at the very end, left a vague, like when? What's your idea of as soon as possible? So that leaves me wondering how soon am I going to be hearing something.*
- **Provide information for various scenarios.** Present specific safety instructions for those who are in cars, trains, buses, malls, single story homes, and apartments.
  - *Something like if you are not at home, if you are at work now or at school here's what you might do.*
  - *Why didn't it mention what to do if you're in your car right now or you're outside away from your car?*
- **Eliminate the question and answer format.** The message may be difficult to understand if delivered in any other format than print.
  - *This is written like a question/answer thing on some website and you click on it.*
  - *To me I can't follow…are they asking me a question…was that a question and they're going to give me the answer?*
- **Schedule the timing and order of messages accordingly.** Organize the schedule of messages by importance of information, such as stay inside (message 16) then air safety (message 25). Ensure to group messages with similar content together (e.g., food and water messages).
  - *It is going to be in the order in which you play them and the length of time this is lasting.*
  - *It's addressing the first question I have if I were in a scenario like that, is it okay to be out and breathing and exposed to the air?*
  - *It seems like it's very specific. It's not obviously within the first day or so, or maybe the first hours, because it's not about how to survive.*
  - *I'm assuming this is not right after the blast [referring to message 21]. And so by the time you're thinking about food you probably know where it [explosion] happened. They would know, they could see an epicenter most likely. And someone would come on the news and say, If you live, you know, ground zero is this many miles out, and then.*
- **Combine messages 16, 19, and 31.** These messages are very similar and could possibly be combined into one.
  - *I am wondering if those two messages couldn't be combined somehow.*
  - *I kind of felt like it was a combination of the two messages before brought into one.*
- **Create a message to encourage people not to leave their homes to check on love ones in schools, daycares and elder-care facilities.** Based on comments from participants, the research team recommends creating a separate and stronger message to encourage people not to leave their homes to check on love ones.
  - *I think a lot of people would just want to get out to save their loved ones. So they have to say something about that. You're not going to be able to save anyone. Everyone needs to stay, including wherever you loved ones are.*
  - *My instinct would be to run and find my family.*
  - *It's going to be a big problem because people will think, I don't care what's going on I'm going to get my kid.*

- *They actually need to make that point much more strongly. Do Not Go.*

Discussion

This research set out to explore the relevance, comprehensibility, credibility, and effectiveness of IND messages to the general public. Participants provided rich information that helps develop and communicate clear and consistent messaging during an IND emergency. During the research, several participants' suggestions for improvements aligned with risk communication principles. As revisions to the IND messages are incorporated, Covello and Allen's (1988) seven cardinal rules of risk communication should be kept in mind:

1. **Accept and involve the public as a partner.** Incorporate the feedback from the focus groups. Continue to message test revised and other IND messages with the public.
2. **Plan carefully and evaluate your efforts.** Remember different goals, target audiences, and the media require different plans, messages and evaluations.
3. **Listen to the public's specific concerns.** Participants were more interested in safety instructions to protect themselves and their families than complex scientific information details.
4. **Be honest, frank and open.** Obtaining the public's trust and credibility are difficult; be careful not to lose their trust with contradictory statements. Once the public's trust is lost, it is almost impossible to regain it.
5. **Work with other credible sources.** Conflict and disagreements among organization about certain recommendations (i.e. drinking water recommendations) need to be resolved, so the public is hearing one consistent message.
6. **Meet the needs of the media.** Provide appropriate messages for the media channel. Also, supply simple, short and concise messages to the media.
7. **Speak clearly and with compassion.** Never let your efforts prevent your acknowledging the tragedy of an illness, injury or death.

In addition, risk communication experts recommend the following guidelines when presenting technical information to the public:

- Avoid using jargon; translate technical terms (e.g., water distribution systems, ground water, etc.) into everyday language the public can easily understand.
- Use active voice and plural and personal pronouns.
- Limit key messages to no more than 3 or 4 messages that are stated briefly, concisely, and clearly.
- Present actions the public can take to alleviate or manage their risk exposure.
- Provide contact for additional information; include a 24 hotline and/or web address.
- Supply audience with information about when and how to stay tuned for additional information (Covello & Heartland Center, 2003; Lundgren & McMakin, 1998).

Conclusion

The Nuclear Detonation Response Communications Working Group developed key messages for affected communities, as well as the rest of the nation, to be used during the immediate aftermath of an IND detonation. By conducting focus groups with the public before an IND detonation, the working group was provided with a unique opportunity to strengthen current and future communication efforts with the public.

Overall, participants criticized most of the messages because they were too long and contained confusing terminology. Participants preferred messages that provided easy to remember instructions and authoritative language. To improve current and future communications for the public, the working group should write short and concise directions, explain confusing terminology, and integrate the content across all the messages. The messages should also be segmented for different audiences based on the distance from the blast and regional characteristics.

Effective communication will play a vital role during an IND emergency. Communication after the IND event must address the public's concerns regarding the radiation emergency in short, simple, and concise messages. In order to communicate with the public effectively during an IND emergency, the feedback from the focus groups combined with risk communication principles should be utilized to revise the current IND messages.

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Appendices

A. Screening Instruments

B. Participant Information Form

C. Moderator's Guides

D. Message Rotation Schedule

E. Messages

F. In-Depth Feedback of Tested Messages

G. Alternative Phrases for Confusing Terms

H. Contact for More Information

Appendix A. Screening Instrument

CDC Study

Screening Instrument

Recruit

- 3 groups
  - 3:30 – 5:00 pm local time Group
  - 5:00 – 6:00 Dinner Break
  - 6:00 – 7:30 Group
  - 8:00 – 9:30 Group
- Recruit 8 per group
- Numbers in parentheses in each question correspond to question numbers in "Health Message Testing System: Question Bank" – September 2010
  - Recruiters need not attend to these numbers.

Good evening. My name is _____ and I am calling from _____, a market research firm. Today we are talking with people as part of a study for the Centers for Disease Control and Prevention. We are not selling anything. We have a few brief questions that will take just two – three minutes of your time, and if you qualify and are interested, we will invite you to take part in a discussion group with other people in your area that will take place at a later date.

1. Have you participated in a focus group, intercept interview, telephone survey, and/or online survey in which you were asked your opinions regarding a product, a service, or advertising within the past six months? (B.2.b)

   01 Yes **[THANK AND TERMINATE]**
   02 No

2. Do you, or does any member of your household or immediate family work (B.1.b):

   01 For a market research company
   02 For an advertising agency or public relations firm
   03 In the media (TV/radio/newspapers/magazines)
   04 As a healthcare professional (doctor, nurse, pharmacist, dietician, etc.)

   [IF YES TO ANY, THANK AND TERMINATE]

3. What is your current job title? What term would you use to describe your current profession? (A.10.a)

_____

[IF ANY OF THE FOLLOWING, THANK AND TERMINATE

- **Employee of U.S. Department of Health and Human Services**
- **Employee of state or local health department**
- **Employee of Department of Homeland Security**
- **Employee of state or local emergency management agency**
- **Nuclear power plant employee, Radiation Safety Officer, health physicist or other radiation-related occupation**

4. In which of the following categories does your age fall? (A.2.a)

01 under 18 years of age **[THANK AND TERMINATE]**
02 18-24 years of age
03 25-34 years of age
04 35-44 years of age
05 45-54 years of age
06 55-64 years of age
07 65-74 years of age
08 75 years of age or older

[DOCUMENT ON GRID]
[RECRUIT A MIX WITHIN EACH GROUP]
[RECRUIT SO THAT GROUPS TOGETHER ARE REFLECTIVE OF THE COMMUNITY]

5. What is the highest level of education you have completed? (A.3.a)

01 Grade school **[THANK AND TERMINATE]**
02 Less than high school graduate/some high school **[THANK AND TERMINATE]**
03 High school graduate or completed GED
04 Some college or technical school
05 Received four-year college degree
06 Some post graduate studies
07 Received advanced degree **[THANK AND TERMINATE]**
08 Other: _____ **[THANK AND TERMINATE]**

[DOCUMENT ON GRID]
[RECRUIT A MIX WITHIN EACH GROUP]
[RECRUIT SO THAT GROUPS TOGETHER ARE REFLECTIVE OF THE COMMUNITY]

6. Document gender. (A.1.a)

01 Male

02 Female

[DOCUMENT ON GRID]

[RECRUIT ABOUT A 50/50 MIX]

7. Please indicate your race or ethnic background. Are you (A.5.a)

01 Hispanic or Latino

02 Non-Hispanic

01 White/Caucasian

02 Black or African-American

03 American Indian or Alaska Native

04 Native Hawaiian or Other Pacific Islander

05 Asian

- 06 Vietnamese
- 07 Cambodian
- 08 Filipino
- 09 Japanese
- 10 Korean
- 11 Chinese

[DOCUMENT ON GRID]

[RECRUIT A MIX ACROSS GROUPS REFLECTIVE OF THE COMMUNITY]

8. Number of children (under the age of 18) living in your household? (A.13.a)

01 None

02 1-2 children

03 3-4 children

04 5 or more children

[DOCUMENT ON GRID]

[NOT A SCREENING CRITERION]

9. **ASSESS AND VERIFY ABILITY TO SPEAK AND UNDERSTAND ENGLISH**

That is all of my questions. You do qualify for our discussion group and we would like to invite you to join us on _____ at _____ PM. The discussion will last about 90 minutes; it will be recorded (audio only) to be sure we get all the information. In appreciation for your time, you will be paid $XX at the time of the discussion.

Are you willing to participate?

01 yes

02 no

Prior to the start of the group discussion, you will receive an information sheet with such information as sponsorship of the study and contacts for more information. If after we hang up, you have a question about this group discussion or decide you can't participate, please contact me at _____.

Name_____

Address_____

City/State/Zip_____

Day Number_____Night Number_____

Appendix B. Participant Information Sheet

U. S. Department of Health and Human Services
CDC Study

Information for Participants

Purpose of this survey

You are being asked to participate in a discussion being held by the Centers for Disease Control and Prevention (CDC), with the assistance of The Oak Ridge Institute for Science and Education. In the discussion, you will be asked your opinions and practices regarding some information that might be provided to you. Your answers can help efforts to provide accurate, helpful information to the public. The discussion will be recorded (audio only) to be sure we get all the information.

Please remember that:

You choose to participate.
You are not required to answer the questions.
This session should last about 90 minutes.
You will receive a cash incentive for participating in the discussion.
You are free to leave at any time without losing the cash incentive or other penalty.

Risks

The risks you take by taking part in the discussion are the same as you encounter in daily life.

Benefits

You may be better informed about a public health issue.
You may have a sense of satisfaction from contributing.
Your comments may help improve the information the public receives.

Confidentiality

We will keep the information you give us private and confidential to the extent allowed by law. Your name will not be used in the final report. No statement you make will be linked to you by name. Only members of the research staff will be allowed to look at the records. When we present this study or publish its results, your name or other facts that point to you will not show or be used.

Persons to Contact

If you have questions about this session, or taking part in it, you may call: Carol McCurley (770-488-3800) at the Centers for Disease Control and Prevention, Atlanta, GA.

If you need more information about your rights as a study participant, you may contact: Chair, Oak Ridge Site-Wide Institutional Review Board, Oak Ridge Institute for Science and Education, Oak Ridge, TN 37831-0117, 865- 576-1725.

Appendix C. Moderator's Guide

CDC/ IND Message Testing

Moderator's Guide

I. Introduction

a. Introduce self

b. CDC sponsorship
   1. Opportunity
   2. Importance

c. Recording and observers
   1. No personal identifiers used in reporting

d. Respondent introductions
   1. First Name
   2. How long lived in area
   3. A favorite hobby

II. Scenario

a. *Today we will be talking about information you might receive following the explosion of what's called an "Improvised Nuclear Device" or "IND". An IND would be an atomic bomb built and set off by terrorists. CDC and I know that this is not a pleasant thing to think about, but like many natural and man-made disasters, it's better to be prepared than to go "off the cuff" in an emergency.*

b. *Today we will be working with some draft messages that might be issued in the event of the explosion of an IND. I'll be asking you what about them you thought was well done, and what would benefit from change, and some related questions. There are three things I'd like you to keep in mind as we proceed:*

   1. *Keep in mind the questions and answers you are seeing is a sample. There are many more questions and answers – too many for one group to review in a reasonable amount of time. Please feel free to tell us other questions that occur to you so CDC can check them, but remember you are not seeing them all.*

   2. *Some things cannot be known now. For example, the exact size of the area affected. These details, along with others, would require more situation-specific information.*

   3. *Remember that in the event of an IND detonation, there will be constant news coverage, many press conferences and interviews with public health officials, elected officials, and others. TV, radio, newspapers, the Internet and other sources will have lots and lots of coverage. You are likely to hear information repeated often.*

c. *To try to give you a better feel for what we are talking about – and to help get you in the moment- I'm going to show you a short video.*

Show a short video describing what could be happening following detonation of an IND.

III. Message Testing -- 1

a. Listening to message

First I would like you to listen to our first question and answer – like you were hearing it on the radio or emergency responders were talking to you.

Play recording of message.

b. Response to hearing message

1. What is the main idea that this message is trying to get across, in your own words. (D.1.d)?
2. How would you sum up in just a few words your first impression of this message? Did you like it? Not like it? What makes you say that? (D.7.d)
3. Is this message believable or not? Why or why not? (D.15.d)
4. What action would this message prompt you to take? (D.3.d)
    a. What makes it hard to do this? (D.41.d)
    b. What would make this easier to do? (D.51.d)

c. Reading message

Next I would l like you to read along with me as I read the message.
As I read aloud and you read along with me, please:

1. *Underline phrases, sentences or images you think are important. (D.36.d)*
2. *Circle phrases, sentences or images you think are unclear or confusing. (D36.d)*

Hand out a printed version of the fact sheet to each respondent.

1. What did you indicate as important? (D.36.d)
2. What did you indicate as unclear or confusing? (D.36.d)
    a. Were there any words used that were unusual or unfamiliar? (D.4.d)
    b. What other words can be used in their place? (D.5.d)
3. How easy are these guidelines for you to follow and understand? (D.54.d)
4. What, if anything, makes it difficult to follow? How might this be presented in an easier way? (D.55.d)
5. How could this message be improved? (D.33.d)

6. Is there anything you want to know that this item does not tell you? (D.29.d)

IV. Message Testing – 2

Repeat process for listening to, and reading, another information sheet.

V. Message Testing – 3

Repeat process for listening to, and reading, another information sheet.

VI. Sources

Next I would l like to ask you some questions about information sources.

1. Where do you get information about emergency preparedness? (D.69.d)
2. Who do you think would be a good spokesperson to use to convince you and your friends to take protective measures during an IND incident? (D.91.d)

[Messages will be rotated according to the table presented in Appendix D to give participants proper context for understanding messages.]

VI. Wrap-Up

1. Those are all of my questions for you.
2. Thank you.
3. I know thinking about this subject may have raised some questions. I'd like to introduce _____ from the Centers for Disease Control and Prevention, who will come in to the room and talk with you for a few minutes.

Appendix D. Tested Messages

16. Who should evacuate and who should seek shelter (go inside and stay inside)?

- We are working to reduce people's exposure to dangerous levels of radiation.
    - Radiation levels are extremely dangerous after a nuclear detonation, but the levels decrease rapidly, in just hours to a few days.
    - During the time with the highest radiation levels it is safest to stay inside, sheltered away from the material outside.
- As radiation levels decrease, safety measures may change.
    - If you are told to go inside and find shelter, go to the basement or the center of the middle floors of a multi-story building (for example, the center of the 5th floor of a 10 story building, or the 10th to 20th floors of a 30 story building).
    - These instructions may feel like they go against your natural instinct to evacuate from a dangerous area; however, health risks from radiation exposure can be greatly reduced by:
        - Putting building walls, brick, concrete or soil between you and the radioactive material outside, and
        - Increasing the distance between you and the exterior walls, roofs and ground, where radioactive material is settling.
    - Individuals who are sheltering will be instructed to leave the area as soon as the risk from exposure decreases.
- People in the path of the radioactive material may be asked to take protective measures.
    - Please follow instructions from responders.
    - All schools and daycare facilities should be locked down. Adults and children in those facilities should take the same protective actions you are taking – and they should not be released to go outside for any reason until they are instructed to do so by emergency responders.
    - Whether you are told to stay inside or evacuate, these instructions are meant to limit your exposure to high levels of radiation and minimize your risk of contamination.

19. Why are some people being told to stay inside while other people are being evacuated?

- This guidance is based on the best information we have right now and is intended to limit radiation exposure and provide protection.
    - These decisions are based on factors, such as direction of wind, size of the detonation, how quickly radioactive material disappears, and damage to roads and structures along evacuation routes.
- As we gather more information and as the situation changes, protective actions may change.
- Follow the instructions of state and local officials and responders.
    - These instructions are for your safety.

21. Is the food safe to eat?

- If you are concerned about the safety of your food:
    - Wash your hands with soap and water before handling any food. This will help remove radioactive material from your hands, limiting its spread to your food.
    - Rinse all food contact surfaces; counters, plates, pots and utensils before use to remove any radioactive material that may have settled on them.
    - In order to keep radioactive material from falling on areas that you already cleaned, remember to work from the higher areas to the lower levels.
    - Food in your refrigerator or freezer also is safe to eat, if you have not lost power.
    - Keep food off counters or anything else that could be contaminated with radioactive material.
    - Do not pick or eat produce from your garden.
    - You can use sealed or frozen food and liquids.
    - Rinse the outside of all packaged food before opening them.
    - Consumers can call the toll-free U.S. Department of Agriculture Meat and Poultry Hotline 24 hours a day at 1-888-MPHotline (1-888-674-6854); for the hearing impaired (TTY) 1-800-256-7072.

24. Is the water safe to drink?

- Until we have verified test results, if you are in the affected area OR if your water source is in the affected area, bottled water is the only source that we are certain is free of contamination.
    - If you have been asked to stay inside, it is because radiation levels outside are dangerously high. Do not go out looking for bottled water.
    - If you have bottled water, before opening, use a clean towel to wipe off the bottle to remove any contaminants.
- It is important to note that most distribution systems have several days of water supply in covered storage. Even above ground sources contain large amounts of water that would significantly dilute radioactive contamination.
    - If you have water pressure and need water to drink, save water in clean containers for drinking.
- We have started to collect water samples. The analyses take time.
    - Once the samples get to the laboratory, we may have initial results within several hours.
    - Complete analysis can take weeks.
- Please follow the instructions of state and local officials and responders.
    - As we gather more information, instructions may change.
    - As the data is received and verified we will work with state and local officials and responders to release the information.

25. Is the air safe to breathe?

- This explosion released large amounts of material and debris into the air.
    - Radioactive material is one of many pollutants released by this event.
    - The radioactive material released in the air is dangerous for the area downwind from the explosion.
- Please follow safety instructions provided by state and local officials and stay tuned because instructions will change.
    - Covering your mouth and nose with a protective layer – like a mask, cloth, or towel – can help reduce the amount of particles you breathe.
    - If you have been instructed to stay inside, it is because walls provide protection from the radioactive material outside.
        - Radiation levels are extremely dangerous after a nuclear detonation but the levels reduce rapidly, in just hours to a few days.
        - We are tracking the radiation levels and authorities will instruct you to leave the area when it is in your best interest to do so.
- Federal, state and local partners are monitoring the air across the country to determine the location and levels of radioactive material in the air.
    - Weather will be a major factor in determining where the radioactive material goes because it is carried by the wind as it moves through the atmosphere and can be brought to the ground by precipitation.
    - We will work with state and local officials to release the monitoring information as soon as possible.

31. How do you decide when and where to implement protective actions, specifically evacuate or shelter (go inside and stay inside)?

- The decision to shelter (go inside and stay inside) or evacuate is made by state and local officials with the support of radiation specialists.

- Officials work with experts to determine the actions that will save the most lives and keep exposure to public as low as possible.

    - These decisions are based on radiation science and the best information we have at the time.

    - These decisions are based on factors, such as direction of the wind, size of the detonation, how quickly radioactive material disappears, and damage to roads and structures along evacuation routes.

- Stay tuned because instructions may change.

    - Radiation levels are extremely dangerous after a nuclear detonation but the levels reduce rapidly, in just hours to a few days.

    - During the time with the highest radiation levels it is safest to stay inside, sheltered away from the material outside.

    - As radiation levels decrease, safety measures may change.

    - People in the path of the radioactive material moving through the air may also be asked to take protective measures.

73. What should people do if they think they may have been contaminated?

- If you think you have been contaminated, the best thing to do is take a shower.
    - Remove your clothing (being careful not to inhale contamination or get it into your mouth or eyes); put it in a plastic bag and place it outside or in an out-of-the way area.
    - Shower using lukewarm water and lots of soap and water. Wash your hair with shampoo or soap and water. Do not use conditioner in your hair because it will bind radioactive material to your hair, keeping it from rinsing out easily.
    - Be careful not to scratch the skin.
- If you have water but cannot shower, remove the outer layer of clothing and wash exposed areas.
    - This can remove up to 90% of the contamination.
    - Place the clothing in a plastic bag; leave it outside or in an out-of-the-way area.
    - When dusting off your hair or clothing, stand away from other people and be careful not to breathe in the dust or get it in your mouth or eyes.
    - Wash exposed skin using lots of soap and lukewarm water.
- If you don't have access to water, use one of the following:
    - It is best to clean off with a moist towelette, wet nap, or baby wipe.
    - Otherwise, clean off with a dry paper towel or cloth.
    - Dispose of the towels with the clothing.

Appendix E. Message Rotation Schedule

	New York City	DC	Chicago	Houston	LA
Focus Group 1	**16** **19** **31**	**16** **19** **73**	**25** **24** **21**	**31** **16** **73**	**73** **16** **19**
Focus Group 2	**21** **24** **25**	**16** **19** **31**	**73** **19** **16**	**25** **24** **21**	**31** **73** **16**
Focus Group 3	**16** **31** **73**	**21** **24** **25**	**31** **16** **73**	**19** **31** **16**	**25** **24** **21**

Appendix F. In-Depth Feedback for Tested Messages

IND Message #16	Participant Feedback and Suggested Revisions

Who should evacuate and who should seek shelter (go inside and stay inside)?
• We are working to reduce people's exposure to dangerous levels of radiation.
  ○ Radiation levels are extremely dangerous after a nuclear detonation, but the levels decrease rapidly, in just hours to a few days.
  ○ During the time with the highest radiation levels it is safest to stay inside, sheltered away from the material outside.
• As radiation levels decrease, safety measures may change.
  ○ If you are told to go inside and find shelter, go to the basement or the center of the middle floors of a multi-story building (for example, the center of the 5th floor of a 10 story building, or the 10th to 20th floors of a 30 story building).
  ○ These instructions may feel like they go against your natural instinct to evacuate from a dangerous area; however, health risks from radiation exposure can be greatly reduced by:
  ▪ Putting building walls, brick, concrete or soil between you and the radioactive material outside, and
  ▪ Increasing the distance between you and the exterior walls, roofs and ground, where radioactive material is settling.
  ○ Individuals who are sheltering will be instructed to leave the area as soon as the risk from exposure decreases.
	The message was too long and provided action items for sheltering, not evacuation. The message should be more direct and authoritative, and eliminate words such as, "may", "might", or "could."
	➢ Refer to past emergencies in the community to provide a frame of reference because recommendations to stay inside maybe counterintuitive based on experiences and knowledge of prior disasters (natural and manmade).
	➢ Include specific guidance for other areas (e.g., cars, homes, apartments, and outdoor areas) because the message only seemed relevant to those in multi-story buildings.
	➢ The recommendation "to increase the distance between you and the ground" seems to contradict the instructions to go to the basement.

IND Message #16	Participant Feedback and Suggested Revisions
• People in the path of the radioactive material may be asked to take protective measures. o Please follow instructions from responders. o All schools and daycare facilities should be locked down. Adults and children in those facilities should take the same protective actions you are taking – and they should not be released to go outside for any reason until they are instructed to do so by emergency responders. o Whether you are told to stay inside or evacuate, these instructions are meant to limit your exposure to high levels of radiation and minimize your risk of contamination.	➢ The following terminology was unfamiliar: ▪ responders ▪ radioactive material ▪ protective measures Information related to schools and daycare facilities should be highlighted in a separate message.

IND Message #19	Participant Feedback and Suggested Revisions

Why are some people being told to stay inside while other people are being evacuated?
 	
• This guidance is based on the best information we have right now and is intended to limit radiation exposure and provide protection.
  o These decisions are based on factors, such as direction of wind, size of the detonation, how quickly radioactive material disappears, and damage to roads and structures along evacuation routes.
• As we gather more information and as the situation changes, protective actions may change.
 	
• Follow the instructions of state and local officials and responders.
  o These instructions are for your safety.
	The message did not contain enough action items other than "stay tuned." Message 19 was perceived as "filler" because no actions items were provided in this message.
	
	➢ Eliminate the word "evacuation." Mentioning evacuation in this message was confusing because it was not addressed within the text.
	➢ Provide more information about how to limit radiation exposure.
	➢ Define the term radioactive material, or replace with simpler terminology.
	
	➢ Do not use the terms "may change". Use more authoritative language such as "protective actions will be updated."
	
	➢ Define the word responders or replace with simpler terminology.

IND #21	Participant Feedback and Suggested Revisions
Is the food safe to eat? • If you are concerned about the safety of your food: o Wash your hands with soap and water before handling any food. This will help remove radioactive material from your hands, limiting its spread to your food. o Rinse all food contact surfaces; counters, plates, pots and utensils before use to remove any radioactive material that may have settled on them. o In order to keep radioactive material from falling on areas that you already cleaned, remember to work from the higher areas to the lower levels. o Food in your refrigerator or freezer also is safe to eat, if you have not lost power. o Keep food off counters or anything else that could be contaminated with radioactive material. o Do not pick or eat produce from your garden. o You can use sealed or frozen food and liquids. o Rinse the outside of all packaged food before opening them. o Consumers can call the toll-free U.S. Department of Agriculture Meat and Poultry Hotline 24 hours a day at 1-888-MPHotline (1-888-674-6854); for the hearing impaired (TTY) 1-800-256-7072.	Provide instructions on the safest types of food to eat, followed by instructions on how to safely prepare and store food to limit contamination. Reassure people that they can safely shelter with minimum risk of contamination if they take certain precautions. ➢ Remove the phrase "if you are concerned." ➢ Soap and water was not seen as an adequate method to remove radioactive material from food. ➢ Provide detailed information on how much these precautions could potentially limit the spread of radioactive contamination. ➢ Prioritize and integrate decontamination instructions for food surfaces and food preparation guidelines. ➢ Rinsing food, containers, and surfaces with "unsafe water" was seen as increasing the risk of contamination. ➢ Specify: ▪ products to use to clean food and food packaging ▪ kitchen appliances that are safe to use ▪ what containers protect food best from radiation effects ▪ whether food can be saved after opening from a sealed package ➢ Address concerns about the utility of the USDA Meat and Poultry hotline, including whether phones would work, hotline would be staffed, and provide other ways to receive updates and information.

IND #24	Participant Feedback and Suggested Revisions

Is the water safe to drink?
 	
• Until we have verified test results, if you are in the affected area OR if your water source is in the affected area, bottled water is the only source that we are certain is free of contamination.
  o If you have been asked to stay inside, it is because radiation levels outside are dangerously high. Do not go out looking for bottled water.
  o If you have bottled water, before opening, use a clean towel to wipe off the bottle to remove any contaminants.
• It is important to note that most distribution systems have several days of water supply in covered storage. Even above ground sources contain large amounts of water that would significantly dilute radioactive contamination.
  o If you have water pressure and need water to drink, save water in clean containers for drinking.
• We have started to collect water samples. The analyses take time.
  o Once the samples get to the laboratory, we may have initial results within several hours.
  o Complete analysis can take weeks.
	The message provided clear instructions about the use of bottled water and not going outside to look for bottled water. The message contradicted itself because it states that "only bottled water is safe", but the message also provided directions for consuming tap water.
	
	➢ The relationship between ground water sources/ water distribution systems and water safety was unclear.
	➢ The following terms were misinterpreted:
	  ▪ Distribution system – a physical site or a truck to get water from during an emergency.
	  ▪ Ground water source – interpreted as a well.
	➢ Address the following questions:
	  ▪ Wouldn't the towels to wipe off bottles of water be contaminated too?
	  ▪ Would traditional methods of sanitizing water such as boiling water, filtration systems, and bleach remove radioactive contaminants?
	  ▪ What types of containers are best for storing water?
	  ▪ If containers are contaminated, can they be cleaned for water storage?
	  ▪ Can tap water be used for wound care and personal hygiene?
	  ▪ What are other sources of hydration (e.g., juice, soup, soda, etc.)?

IND #24	Participant Feedback and Suggested Revisions
• Please follow the instructions of state and local officials and responders. ○ As we gather more information, instructions may change. As the data is received and verified we will work with state and local officials and responders to release the information.	➢ Stating the timeframe of the analysis caused anxiety because the results may conclude that tap water was unsafe. ➢ The phrase "instructions may change" left participants with a sense of uncertainty.

IND #25	Participant Feedback and Suggested Revisions

Is the air safe to breathe?
 	
• This explosion released large amounts of material and debris into the air.
  ○ Radioactive material is one of many pollutants released by this event.
  ○ The radioactive material released in the air is dangerous for the area downwind from the explosion.
• Please follow safety instructions provided by state and local officials and stay tuned because instructions will change.
  ○ Covering your mouth and nose with a protective layer – like a mask, cloth, or towel – can help reduce the amount of particles you breathe.
  ○ If you have been instructed to stay inside, it is because walls provide protection from the radioactive material outside.
  ▪ Radiation levels are extremely dangerous after a nuclear detonation but the levels reduce rapidly, in just hours to a few days.
  ▪ We are tracking the radiation levels and authorities will instruct you to leave the area when it is in your best interest to do so.
• Federal, state and local partners are monitoring the air across the country to determine the location and levels of radioactive material in the air.
	This message provides vital information on air safety. Provide more detailed information and actions.
	
	➢ Address the following questions:
	  ▪ What's the best type of mask to use?
	  ▪ Does this message apply to the air inside and outside?
	
	➢ Provide additional instructions on reducing expose of contaminated air such as taping their windows and turning off HVAC systems.
	
	➢ Replace "instructions will change" to "instructions will be updated" or "stay tuned for updates."
	
	➢ Participants were confused by the following terms
	  ▪ radioactive material and debris
	  ▪ pollutant
	  ▪ downwind
	
	➢ Delete third bullet; the information was of little or no importance to participants.

IND #25	Participant Feedback and Suggested Revisions
○ Weather will be a major factor in determining where the radioactive material goes because it is carried by the wind as it moves through the atmosphere and can be brought to the ground by precipitation. ○ We will work with state and local officials to release the monitoring information as soon as possible.	

IND Message #31	Participant Feedback and Suggested Revisions

How do you decide when and where to implement protective actions, specifically evacuate or shelter (go inside and stay inside)?
• The decision to shelter (go inside and stay inside) or evacuate is made by state and local officials with the support of radiation specialists.
• Officials work with experts to determine the actions that will save the most lives and keep exposure to public as low as possible.
  o These decisions are based on radiation science and the best information we have at the time.
  o These decisions are based on factors, such as direction of the wind, size of the detonation, how quickly radioactive material disappears, and damage to roads and structures along evacuation routes.
• Stay tuned because instructions may change.
  o Radiation levels are extremely dangerous after a nuclear detonation but the levels reduce rapidly, in just hours to a few days.
  o During the time with the highest radiation levels it is safest to stay inside, sheltered away from the material outside.
  o As radiation levels decrease, safety measures may change.
People in the path of the radioactive material moving through the air may also be asked to take protective measures.
	Hearing that radiation specialists and experts were basing guidance on science was reassuring to participants. In general, the message did not answer the question and provided very few action items. The message should be shortened and presented in plain language.
	➢ The following terminology was unfamiliar:
	  ▪ protective actions – unsure of how to execute these actions.
	  ▪ radioactive material – unclear on how to recognize radioactive materials (gas, liquid, can I see it?, how do I know what material is radioactive?).
	  ▪ in the path – questioned "in the path of what?", and "how do they know if they are in the path?"
	  ▪ protective measures – unsure of how to execute these measures. Use consistent terminology (e.g., protective measures and protective actions).
	➢ Clarify when radiation levels will reduce to "safe" level.

IND #73	Participant Feedback and Suggested Revisions

What should people do if they think they may have been contaminated?
 	
• If you think you have been contaminated, the best thing to do is take a shower.
  o Remove your clothing (being careful not to inhale contamination or get it into your mouth or eyes); put it in a plastic bag and place it outside or in an out-of-the way area.
  o Shower using lukewarm water and lots of soap and water. Wash your hair with shampoo or soap and water. Do not use conditioner in your hair because it will bind radioactive material to your hair, keeping it from rinsing out easily.
  o Be careful not to scratch the skin.
• If you have water but cannot shower, remove the outer layer of clothing and wash exposed areas.
  o This can remove up to 90% of the contamination.
  o Place the clothing in a plastic bag; leave it outside or in an out-of-the-way area.
  o When dusting off your hair or clothing, stand away from other people and be careful not to breathe in the dust or get it in your mouth or eyes.
  o Wash exposed skin using lots of soap and lukewarm water.
	The message increased self-efficacy by providing prioritized alternatives based on their available resources. However the language of the instructions should be more concise.
	
	➢ Delete "it is best", use more authoritative language.
	➢ Address the lack of integration with the other messages, particularly about water safety and putting contaminated clothes outside.
	
	➢ Provide additional information to address the following questions:
	  ▪ How long to stay in the shower?
	  ▪ Why lukewarm water?
	  ▪ Are clothes safe if they were in the closet?
	  ▪ How is contamination determined?
	  ▪ How should wounds be treated?
	  ▪ What does "out-of-the-way place" mean?
	  ▪ Is isolate necessary?
	  ▪ Should all clothing or just the outer layer be removed?

IND #73	Participant Feedback and Suggested Revisions

• If you don't have access to water, use one of the following:
  o It is best to clean off with a moist towelette, wet nap, or baby wipe.
  o Otherwise, clean off with a dry paper towel or cloth.
  o Dispose of the towels with the clothing.	

Appendix G. Alternative Phrases for Confusing Terms

Alternative Terminology

CONFUSING TERMS	ALTERNATIVE PHRASES
Responders	Authorities, emergency workers
Protective Measures	Steps to protect yourself and your family's health and safety
Protective Actions	Steps to protect yourself and your family's health and safety
Radioactive Material	Radioactive debris, dirt ; sometimes it cannot be seen, smelled, felt or tasted
Contamination	Radioactive dust, debris, dirt on or in objects, places, or a person (clothes, skin, hair, body etc.)
Contaminant	Radioactive dust, powder, liquid; it may not be seen, smelled, felt or tasted
Risk of Exposure	The chance of radiation impacting your health and safety
Distribution System	Eliminate term; water delivery system; pipes, tanks and pumps that deliver water to the public
Ground Water Source	Eliminate term; water from the ground which is pumped up from a well called an aquifer
Implement	Take steps to protect yourself and your family
Sheltering	Stay inside; center of building for single story homes
Downwind	Eliminate term or put the direction that the wind is blowing
Harmful Effects	Provide signs and symptoms of radiation exposure or contamination
Decontaminate	Clean; wash; remove contamination, use soap and water

Appendix H. Contacts for More Information

CDC Technical Contact:

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