



# AREN'T WE READY YET? CLOSING THE PLANNING, RESPONSE, AND RECOVERY GAPS FOR RADIOLOGICAL TERRORISM

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# Disclosure

The views and opinions expressed during this presentation are solely those of the presenter and not the HHS Office of the Assistant Secretary for Preparedness and Response or the U.S. Government.

# America's Threats

- The U.S. is vulnerable to both natural hazards and human threats
- Floods, Fires, Winter Storms
- Since 2000, there have been over 2,100 major disaster declarations



Source: [www.terrain.org](http://www.terrain.org)



Source: [www.suffolkcountyny.gov](http://www.suffolkcountyny.gov)

# America's Threats

- Notable Disasters
  - September 11, 2001- Terrorist Attacks
  - Anthrax Attacks (2001)
  - Hurricane Katrina (2005)
  - Superstorm Sandy (2012)



Source: [www.factslides.com](http://www.factslides.com)



Source: [www.ncronline.com](http://www.ncronline.com)

# Emerging Infectious Disease

- In the 21<sup>st</sup> century, emerging infectious disease responses have taken priority to other planning efforts

2002-2003 – SARS (Severe Acute Respiratory Syndrome)

2005 – West Nile virus

2008 – H5N1 – Avian influenza

2009-2010 H1N1 – “Swine flu”

2012-present – MERS-CoV (Middle East Respiratory Syndrome Corona Virus)

2013-2015 Chikungunya virus

2014-2016 – Ebola virus

2015-present – Zika virus

2017 – H7N9

21<sup>st</sup> Century

# Nuclear Preparedness: A Thing of the Past

- Minimal experience with nuclear and radiological incidents
  - World War II
  - Cold War Era



Source: fallout.wikia.com



Source: www.pinterest .com

# Nuclear Preparedness: A Thing of the Past

- The U.S. Civil Defense Program
  - Public Awareness
  - Community preparedness
  - Training for “nuclear attack”



Source: [www.hastac.org](http://www.hastac.org)



Source: [www.en.wikipedia.org](http://www.en.wikipedia.org)



# Nuclear Disasters

## An Impetus for Awareness and Preparedness

### Three Mile Island Nuclear Generating Station (March 28, 1979)

- “One of the most significant accidents in U.S. commercial nuclear power plant history”
- Cooling system malfunction
- Partial meltdown of the reactor core
- Release of radioactive krypton-85 gas and iodine-131 into surrounding environment
- No deaths, injuries, or adverse health effects
- Resulted in stricter regulations and States and localities conducting new planning efforts



Source: [www.epa.gov](http://www.epa.gov)



# Nuclear Disasters

## An Impetus for Awareness and Preparedness

- Chernobyl Nuclear Power Station (April 26, 1986)
  - Human-caused
  - Explosion, fire, and meltdown released massive quantity of radioactive material over Northern and Eastern Europe
  - Sheltering in place vs. evacuation
  - Large-scale displacement of residents
  - Monitor long-term health effects
  - Environmental clean-up



Source: [www.foccc.org.uk](http://www.foccc.org.uk)

# Nuclear Disasters

## An Impetus for Awareness and Preparedness

- Fukushima Daiichi Nuclear Power Plant (March 11, 2011)
  - Earthquake/Tsunami
  - Meltdown of 3 nuclear reactors
  - Hydrogen-air chemical explosions and release of radioactive material



Source: [www.sites.suffolk.edu](http://www.sites.suffolk.edu)

# Nuclear Disasters

## An Impetus for Awareness and Preparedness

- Response Challenges
  - Contain the threat and prevent further damage
  - Determine appropriate evacuation and exposure zones
  - Determine where to house evacuees
  - Reuniting displaced family members
  - Procuring safe food and water
  - Evaluating and treating the contaminated and the injured

# Fukushima: A Threat to the U.S.?

- International differences in planning and response paradigms
- Potential threats to the U.S.
  - Contaminated passengers traveling on commercial airliners
  - Importation of contaminated food and other products
  - Air, ocean, and rain water contamination of the Pacific Ocean and U.S. west coast cities and potential effects on human and animal health
- Confusing public messaging
  - Fear of inappropriate hoarding and use of KI
  - Worried well

# Radiological Terrorism: The Other Threat

- Following the terrorist attacks of September 11, 2001 and the subsequent anthrax attacks, preparing the nation for incidents involving WMD became a priority.

weap-on of mass de-struc-tion

*noun*

plural noun: **weapons of mass destruction**

a chemical, biological or radioactive weapon capable of causing widespread death and destruction.

# 2010 Nuclear Security Summit



Source: [www.en.wikipedia.org](http://www.en.wikipedia.org)

*“The central focus of this nuclear summit is the fact that the single biggest threat to U.S. security, both short term, medium term and long term, would be the possibility of a terrorist organization obtaining a nuclear weapon.”*

President Obama  
2010 Nuclear Security Summit  
Washington, DC

# 2013 Boston Marathon Bombing

- April 15, 2013
  - Two homemade bombs
  - Detonated 10 seconds apart near the finish line
  - 3 dead, several hundred injured
  - Fear spread throughout the city
  - Initial concerns of a radioactive dispersal device
  - Renewed need for preparedness for radiological terrorism

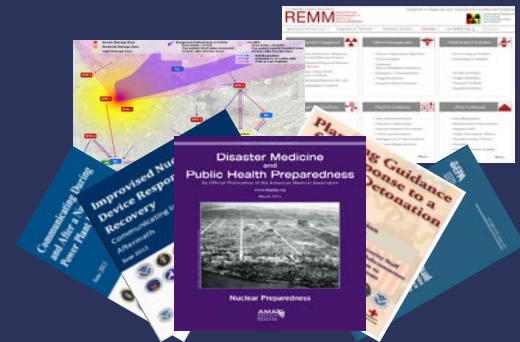


Source: [www.newsweek.com](http://www.newsweek.com)



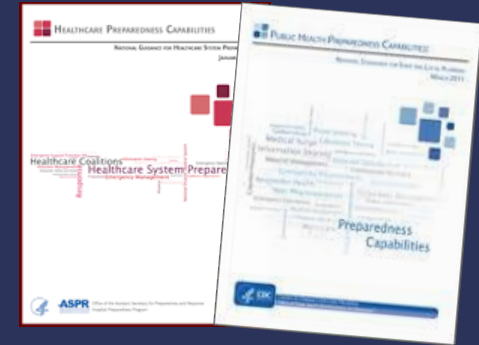
# A Whole of Community Approach to Planning

- The Federal Government has accomplished much in disaster preparedness, especially for nuclear detonations
  - Response plans and paradigms
  - Situational awareness tools
  - Personal protective guidance
  - Treatment guidance for health care professionals
  - Pre-scripted risk communication messages
  - Exercises and drills



# A Whole of Community Approach to Planning

- SLTT Preparedness Planning
  - CDC Public Health Emergency Preparedness Grant Program (PHEP)
  - ASPR Hospital Preparedness Grant Program (HPP)
  - DHS Homeland Security Grant Program
    - THIRA
    - Build and enhance preparedness and response capabilities
    - Drills and exercises

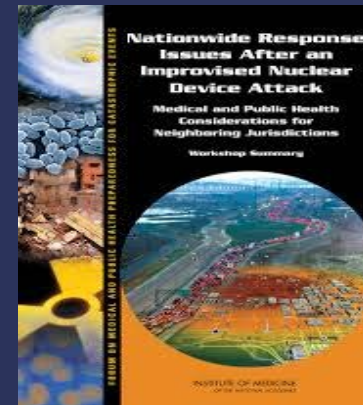


# Public Health and Healthcare Planning and Response Gaps

- ProPublica-“U.S. Health Care System Unprepared for Major Nuclear Emergency”
  - “The nation’s health system is ill-prepared to cope with a catastrophic release of radiation, despite years of focus on the possibility of a terrorist “dirty bomb” or an improvised nuclear attack”
  - Medical personnel felt untrained and inexperienced to deal with radiological and nuclear disasters
  - Fears about radiation exposure could impact their willingness to report to work
  - Drills and exercises occur infrequently and lack value

# Public Health and Healthcare Planning and Response Gaps

- NASEM Workshop-January 2014
  - *Nationwide Response Issues After an Improvised Nuclear Device Attack*
  - Key challenges in U.S. preparedness for radiological and nuclear incidents



Source: [www.nap.edu](http://www.nap.edu)

# Radiological & Nuclear Preparedness and Response Challenges

- Establish command and control
- Address the fears of the public and emergency responders
- Provide timely and accurate risk communication
- Educate the public on mass evacuation and shelter-in-place
- Enhance public health and healthcare sector preparedness

# Public Health and Healthcare Capability Challenges

- Provide ready access to point of care diagnostics
- Establish rapid decontamination procedures
- Administer timely life-saving medical countermeasures and other clinical treatments
- Develop appropriate procedures to handle the deceased



Source: [www.uk.pinterest.com](http://www.uk.pinterest.com)



Source: [www.bmjk2.com](http://www.bmjk2.com)

# Public Health and Healthcare Capability Challenges

- Employ robust surveillance systems to monitor acute and long-term health effects of radiation illness
- Establish evidence-informed guidelines for environmental clean-up and repatriation of the contaminated area
- Address short and long-term mental and behavioral health impacts



Source: [www.designboom.com](http://www.designboom.com)

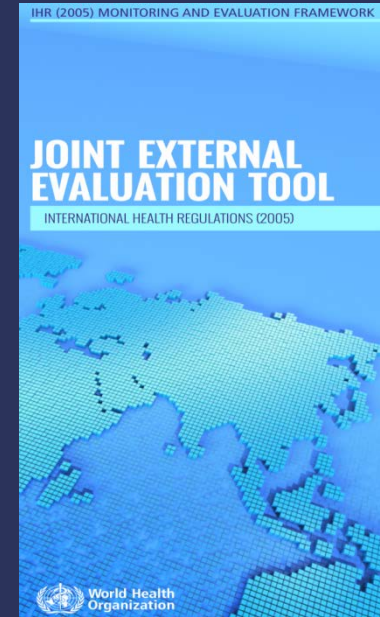


Source: [www.shponlin.co.uk](http://www.shponlin.co.uk)



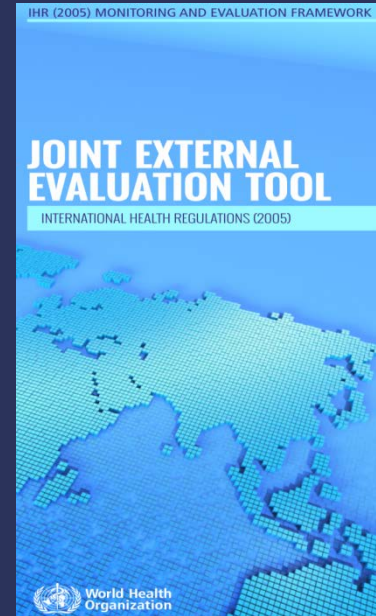
# United States Joint External Evaluation

- Comprehensive all-hazards assessment of public health emergency “core capacities” required by the IHR.
  - **Prevent** emergencies through responsible actions and mitigation of hazards
  - **Detect** the earliest indicators of an emerging/re-emerging risk and coordinate assessment with other sectors
  - **Respond** quickly to reduce impacts and notify international stakeholders of a potential threat



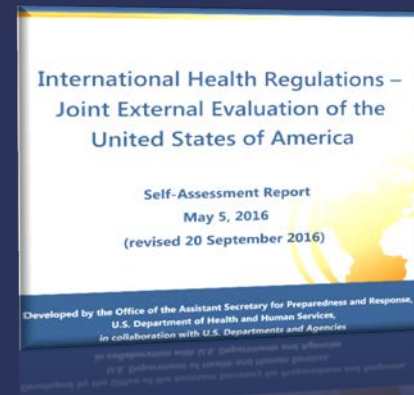
# United States Joint External Evaluation

- 23 U.S. agencies and 15 international subject matter experts
- Met May 23-27, 2016 to review the U.S. core capacities, including those needed to handle *radiation emergencies*
  - Gaps identified that require subsequent action
  - Radiation core capacities scored among the lowest



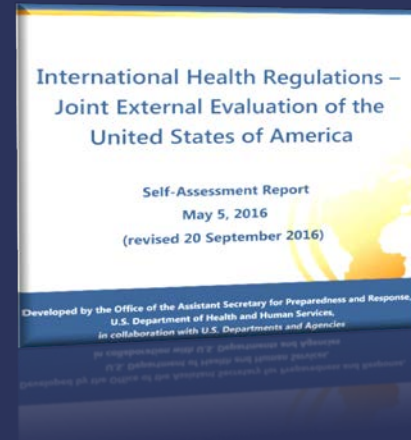
# JEE Radiation Emergency Preparedness Findings

- Mechanisms are established and functioning for detecting and responding to radiological and nuclear emergencies
  - Lack of surveillance guidelines/SOPs at all levels
  - Weak information exchange among health clinics, health departments, and federal government following radiation exposure
  - Poor coordination of post-exposure care



# JEE Radiation Emergency Preparedness Findings

- Enabling environment is in place for management of radiation emergencies
  - Lack of radiation emergency response plans at all levels
  - Weak plans for handling waste and disposal
  - Absence of response exercises to test communication and coordination
  - Too few radiation professionals at all levels, and too few being trained



# Strengthening the Nation's Resilience to Radiological and Nuclear Disasters

- Build Partnerships for Planning
  - Planning should be integrated at all levels and not be done in a silo
  - Strengthen planning efforts between Federal, State, Local, Tribal, and Territorial partners
  - Include private sector and academic partners, especially radiation professionals
  - Utilize the knowledge, practices, protocols, and tools that exist before developing new ones

# Strengthening the Nation's Resilience to Radiological and Nuclear Disasters

- Conduct Routine Drills and Exercises
  - Don't conduct drills and exercises in a silo
  - Include as many partners as possible (e.g., radiation professionals)
  - Incorporate radiological and nuclear specific capabilities into all-hazards drills and exercises
  - Generously share findings from After Action Reports with partners to expand learning

# Strengthening the Nation's Resilience to Radiological and Nuclear Disasters

- Advance the Science of Radiological and Nuclear Disasters
  - Radiation incidents are unique opportunities to address critical knowledge gaps that cannot be replicated outside an emergency without endangering lives and the environment
  - Research during a disaster response is vital to guide planning and best practices
  - Research topics include:
    - Efficacy of medical countermeasures
    - Time course of interventions
    - Short, intermediate, and long-term health effects (e.g., environmental contamination of food and water supply)



# Strengthening the Nation's Resilience to Radiological and Nuclear Disasters

- Expand Education and Training Opportunities
  - Beyond traditional “first responder” community
  - Include radiation professionals, elected officials, healthcare workers, and the general public
  - Increase understanding of radiation effects and protective measures

# In Summary

- We've done a lot of work, but there is still more to be done.
- Our challenges are not insurmountable and can be addressed by building collaborative partnerships, conducting radiological and nuclear specific drills and exercises, advancing the science and evidence base before, during, and after incidents, and expanding training and education opportunities.

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# Thank you

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