



Center for Biosecurity of UPMC

Rad Resilient City

A preparedness checklist to save lives after a nuclear detonation

EXECUTIVE SUMMARY

The purpose of this document is to provide cities and their neighbors with a checklist of preparedness actions that could save tens of thousands of lives following a nuclear detonation through adequate protection against radioactive fallout. This *Fallout Preparedness Checklist* converts the latest federal guidance and technical reports into clear, actionable steps for communities to take to protect their residents. The checklist and supporting materials reflect the shared judgment of the Nuclear Resilience Expert Advisory Group, led by the Center for Biosecurity of UPMC in 2011. This interdisciplinary panel includes government decision makers, scientific experts, emergency responders, and leaders from business, volunteer, and community sectors.

Nuclear terrorism is a real and urgent threat, according to assessments by the U.S. and other governments and by independent nongovernment experts.¹⁻³ Detonation of a crude nuclear bomb in a thriving city could kill tens of thousands of people, dislocate millions, and inflict immense economic and social damage.⁴ Even if prevention fails, U.S. cities need not be resigned to a worst-case toll of injuries and deaths. Casualties due to exposure to radioactive dust and debris—that is, “fallout”—could be minimized if the public immediately sought adequate shelter and awaited further information before evacuating.^{5,6} Federal modeling of a 10-kiloton groundburst in Los Angeles suggests that if everyone at risk of exposure to dangerous fallout quickly went into a shallow basement or an equally protective place, then 280,000 lives could be saved.⁷

Cold War memories and movies have shaped popular ideas about nuclear weapons and created a fatalistic outlook about nuclear terrorism that still persists. But the terrorist scenario of a low-yield explosion in a modern urban setting does not, by any means, approach the wholesale destruction imagined in an all-out nuclear war. This document dismantles these and other misconceptions that may be held by communities and their leaders. Users learn that:

- Not all casualties due to a nuclear detonation are predetermined; those from exposure to fallout can be prevented.
- Quickly sheltering in the right place—not fleeing the area—is the safest thing to do after a nuclear attack.
- People can protect themselves immediately following a detonation and should not wait for emergency professionals to help them.

The *Fallout Preparedness Checklist* provides mayors, county executives, city administrators, emergency managers, public health and safety officers, business executives, heads of volunteer- and community-based groups, and other local opinion leaders with a unified vision and concrete implementation plan for fallout preparedness. Recognizing that implementation will take time, the checklist balances the practical and the “perfect,” and it puts actions in order of priority. A high-level summary of the checklist is below.

FALLOUT PREPAREDNESS CHECKLIST

ACTION 1: Obtain broad community backing for nuclear incident preparedness. Fallout preparedness requires commitment across a community. There is no single entity that can deliver this public service. Sound emergency management structures and strategies are essential, but so too are efforts by businesses, schools, nonprofits, and average citizens. A coalition of diverse stakeholders can help overcome the political and popular resistance to planning for an unthinkable incident like a nuclear detonation.

ACTION 2: Conduct ongoing public education to inform members of the public about the effects of a nuclear detonation and how they can protect themselves. In a “no notice” nuclear detonation, people need to be empowered beforehand with the knowledge that the most effective action they can take is to find adequate shelter immediately. Following a detonation, it will be difficult or impossible to issue fallout warnings in the areas that most need them due to destruction and disruption of the communication infrastructure.

ACTION 3: Enable building owners and operators—from individual householders to skyscraper managers—to assess shelter attributes and to teach others. U.S. studies show that people spend almost 90% of their time in enclosed buildings. Homeowner associations, commercial building managers, public building operators, faith-based entities, and school facility administrators can adopt and promulgate shelter rating information so that occupants of all types learn which structures and which places within them provide the most safety.

ACTION 4: Hone the ability to deliver public warnings post-incident. Assuming a degraded communication infrastructure in certain locales, jurisdictions need to devise creative ways to deliver fallout warnings (eg, blending radio broadcasts with text-based messaging) and to have pre-scripted, scientifically based public messages about protective actions. City leaders should not wait until after an incident to decide who should authorize the release of a fallout warning and what it should say. Time delays can result in preventable deaths.

ACTION 5: Establish a rapid system for mapping and monitoring the dangerous fallout zone. Knowing the fallout “footprint” (from on-the-ground monitoring) can vastly improve guidance about which residents need to evacuate, how quickly, and which routes present the lowest possible exposure. It will be just as important to communicate to people for whom fallout is not a health risk. Unnecessary evacuation strains resources and infrastructure needed for people in high-risk areas.

ACTION 6: Develop capabilities to support a large-scale, phased evacuation. At a certain point in time, some people will need to transition from their protective shelter to a place of greater safety. This complex task calls for advance planning. People still exposed to significant radiation levels and those suffering from life-threatening injuries will need to leave the area sooner than others, and their departure could be impeded by impassable roads and heavy demand.

ACTION 7: Integrate, test, and conduct training on the above elements of a comprehensive fallout preparedness and public warning system. Unless people have a chance to train and to practice in routine—that is, nonemergency—time, they will be less likely to perform well when it really matters.

Successful adoption of the *Fallout Preparedness Checklist* can benefit communities by:

- producing spillover effects for the management of other complex, regional disasters;
- making a jurisdiction's all-hazards framework more robust in addressing nuclear terrorism;
- creating momentum to tackle other difficult nuclear response issues like the sheltering of mass displaced populations; and
- saving tens of thousands of lives after an actual nuclear detonation.

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NUCLEAR RESILIENCE EXPERT ADVISORY GROUP

Claudia Albano, Neighborhood Services Manager, City of Oakland, California

Steven M. Becker, PhD, Associate Professor of Environmental Health Sciences; Director, Disaster and Emergency Communication Research Unit, University of Alabama at Birmingham School of Public Health

James S. Blumenstock, MA, Chief Program Officer, Public Health Practice, Association of State and Territorial Health Officials; Project Liaison to the National Alliance for Radiation Readiness

Brooke Buddemeier, MS, CHP, Certified Health Physicist, Risk and Consequence Management, Lawrence Livermore National Laboratory

Anita Cicero, JD, Chief Operating Officer and Deputy Director, Center for Biosecurity of UPMC

Daniel Dodgen, PhD, Director, Division for At Risk Individuals, Behavioral Health, and Community Resilience; Office of the Assistant Secretary for Preparedness and Response; U.S. Department of Health and Human Services

Joseph B. Donovan, Senior Vice President, Beacon Capital Partners

Elizabeth Dugan, MS, MPH, PhD, Principal Analyst, Homeland Security Studies & Analysis Institute

Joseph E. Fitzgerald, Jr., MS, Saliant, Inc.; Contributing Scholar, Center for Biosecurity of UPMC

Thomas C. Heneghan, Manager—Preparedness; Preparedness and Health & Safety Services, American Red Cross, National Headquarters

Thomas V. Inglesby, MD, Chief Executive Officer and Director, Center for Biosecurity of UPMC

Peter Jutro, PhD, Deputy Director for Science and Policy, National Homeland Security Research Center, Environmental Protection Agency

Kathleen Kaufman, Former Director of Radiation Management, Los Angeles County Department of Public Health, California

John J. Lanza, MD, PhD, MPH, FAAP, Director, Florida Department of Health—Escambia County Health Department

Robert M. Levin, MD, Health Officer/Medical Director, Ventura County Public Health, California

Carmen E. MacDougall, Vice President, Communications, Nuclear Threat Initiative

Karen Marsh, MBA, Director, Community Preparedness Division, National Preparedness Directorate, Federal Emergency Management Agency, U.S. Department of Homeland Security

David M. McKernan, MS, Coordinator, Office of Emergency Management, Fairfax County, Virginia

Executive Summary

Dennis Mileti, PhD, Professor Emeritus of Sociology, University of Colorado at Boulder

Charles W. Miller, PhD, Chief, Radiation Studies Branch, Division of Environmental Hazards and Health Effects, National Center for Environmental Health, Centers for Disease Control and Prevention

Ryan Morhard, JD, Legal Analyst, Center for Biosecurity of UPMC

Patrick D. Neville, Captain, Las Vegas Metropolitan Police Department—Homicide Bureau

Ann Norwood, MD, Senior Associate, Center for Biosecurity of UPMC

Juan M. Ortiz, Emergency Management Coordinator, Office of Emergency Management, City of Fort Worth, Texas

Irwin Redlener, MD, Director, National Center for Disaster Preparedness, Columbia University; President, Children's Health Fund

Jeffrey W. Runge, MD, Principal, Chertoff Group, LLC; former Assistant Secretary for Health Affairs and Chief Medical Officer, U.S. Department of Homeland Security

Monica Schoch-Spana, PhD, Senior Associate, Center for Biosecurity of UPMC; Chairperson, Nuclear Resilience Expert Advisory Group

James Schwartz, Chief, Arlington County Fire Department, Arlington, Virginia

Tara Kirk Sell, MA, Analyst, Center for Biosecurity of UPMC

John H. Sorensen, PhD, Environmental Sciences Division, Oak Ridge National Laboratory

Page O. Stoutland, PhD, Vice President, Nuclear Materials Security, Nuclear Threat Initiative

Tammy P. Taylor, PhD, PE, Nuclear Nonproliferation Division Office, Los Alamos National Laboratory

Katherine Uraneck, MD, Senior Medical Coordinator, Office of Emergency Preparedness and Response, New York City Department of Health and Mental Hygiene

John C. White, CNMT, Radiation Safety Officer, VA North Texas Health Care System; Vice Chair, Texas-Vermont Low Level Radioactive Waste Compact Commission; Chair, North Texas Radiation Response Group

Jessica Wieder, Public Affairs Specialist, Radiation Protection Division, Environmental Protection Agency