



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.<sup>1-3</sup> 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.<sup>4</sup> 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.<sup>5,6</sup> 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.<sup>7</sup>

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.

### References

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