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Panic Could Magnify Harm, Experts Say; Governments Working to Curb Spread of Radioactive Matter in Case of Attack

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If terrorists set off a "dirty bomb" in downtown Washington, the number of fatalities would probably be fairly low but the psychological impact could cause wide-scale panic that would clog hospitals and roadways, interfere with rescue efforts and create a long-term economic crisis, government officials and outside specialists said yesterday.

Instead of staying put and waiting for help, people in the contaminated area will be tempted to go off on their own, either to hospitals or their families, raising the possibility of spreading the danger, according to those who have studied the issue.

"We've never had to address an issue like this," said Phil Anderson, a senior fellow at the Center for Strategic and International Studies, which conducted a mock exercise for Washington area government officials involving a dirty-bomb scenario in March.

Anderson and others said yesterday's announcement that U.S. authorities had arrested an al Qaeda operative who was planning to detonate a crude radiological weapon underscored the importance of not only preparing federal, state and local governments for such an attack but also educating the public about the consequences.

A dirty bomb is a relatively simple device in which a bomber combines conventional high explosives with some sort of radioactive material and detonates it. The blast spreads the radioactive material over the explosion's immediate area.

A nuclear explosion, by contrast, is a completely different phenomenon, in which radioactive material is compressed or combined until it reaches "critical mass," triggering a chain reaction accompanied by a spectacular and catastrophic release of energy.

Michael Levi, a physicist with the Federation of American Scientists, questioned whether federal, state and local governments would be able to handle the evacuation and decontamination of a large area and the medical demands of a

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frightened public.

"We haven't had any dress rehearsals for this, and we won't ever have any," Levi said. "If our medical personnel aren't trained to separate the immediate radiation sicknesses from psychosomatic symptoms, our public health systems will be overwhelmed."

Mohammad Akhter, executive director of the American Public Health Association, said the public's reaction would be the key. "Medically, professionally speaking we are ready," he said. "It's the terror part, the fear part you really need to prepare for."

Moreover, detonation of a dirty bomb would require a cleanup of the contaminated area, something that would likely be extremely costly, Anderson said. It could also cause long-term economic problems if people began pulling out of the city or workplaces, he said.

Although experts do not discount the dangers of a dirty bomb, several pointed out that the hazards are relatively modest compared with those that could accompany a biological or chemical attack, and do not compare with the potential damage wrought by a nuclear weapon.

"You can hurt a couple of people badly if you leave the radiation source intact, and you can panic a lot of people without hurting them if you sprayed it over a big area," said University of Rochester radiation expert Andrew Karam. "But I haven't figured out how you can hurt a lot of people in a big area."

Should a dirty bomb explode, Karam suggested, the largest number of deaths and injuries would occur as an immediate result of the explosion. But, ultimately, Karam added, "The biggest source of casualties will be ignorance, because people will be needlessly flooding emergency rooms, getting in car accidents or having heart attacks."

Yet, Karam and others said, the fallout dangers from a dirty bomb are relatively slight, with sickness likely to develop only after spending years in an exposed area.

Although the 1985 nuclear accident at Chernobyl in the Soviet Union may eventually have killed 2,000 people, Karam said, "the level of exposure was orders of magnitude higher" than anything envisioned in a dirty bomb.

"In dirty bombs . . . for the vast majority of people, there is time to respond," said Norman Coleman, head of the radiation oncology sciences program at the National Cancer Institute. "It's almost common sense. You get inside, get clean and get the chemicals off you."

Coleman said a dirty bomb might produce a radioactive isotope of iodine, a common component of fallout that is readily absorbed by the human thyroid gland. The effects can be completely blocked by taking potassium iodide tablets, which saturate the thyroid with nonradioactive iodine. Federal officials now are reviewing how widely they should distribute potassium iodide pills to citizens as a precaution.

A small percentage of people may suffer from cancer in the future, Coleman said, but this may only occur after years of exposure.

Even though there is no comparison between the heat and blast effects of dirty bombs and nuclear weapons, both bring radioactive contamination. Taking care of this will be the chief task of those who respond to a dirty bomb, the specialists said.

And the United States has 60 years of experience studying and thinking about nuclear radiation. "We know an awful lot about it," said Richard L. Garwin, senior fellow for science and technology at the Council on Foreign Relations.

Scientists studying dirty bombs suppose that a terrorist would use radioactive isotopes of cobalt or cesium -- found in food irradiation or medical equipment -- or the heavy metal americium, used in oil prospecting.

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Federal officials maintained yesterday that they are well prepared to deal with the detonation of a dirty bomb and able to assist local emergency personnel with medications, emergency medical care and sophisticated technical expertise.

Some officials acknowledged that there remains plenty of room for improvement. "With the exception of the areas around nuclear power plants, radiological preparedness has not caught up to where we are at with chemical preparedness and even biological preparedness in many locations," said Jerome M. Hauer, director of the Office of Public Health Preparedness in the Department of Health and Human Services. He added that the pace has recently picked up.

In Washington, the federal and local governments have been training for years to deal with dirty bombs.

In May 2000, the FBI led an exercise that simulated radiological attacks at St. Elizabeth's Hospital in Southeast Washington and US Airways Arena in Landover. The District tested its response to a similar explosion over Union Station last year, and that was followed by this March's workshop by the Center for Strategic and International Studies, which involved a hypothetical dirty bomb over the Mall.

The D.C. government is spending \$ 18 million in emergency federal aid on protective gear, decontamination equipment and radiation sensors in every neighborhood, and millions more to train several thousand firefighters, police, hazardous-material units and health officials to test for nonconventional threats in unusual events.

Staff writer Spencer S. Hsu contributed to this report.

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