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Viewpoint...

A More Effective Approach to US Security

By Frederick Lamb

Nuclear weapons are the only weapons that could kill millions of people almost instantly and destroy the infrastructure and social fabric of the United States. Even a simple fission weapon can release a million times more destructive energy per kilogram than conventional explosives such as TNT. For these reasons, nuclear weapons were for decades considered the only weapons of mass destruction. However, in recent years there has been a tendency to include radiological weapons ("dirty bombs"), chemical weapons, and biological agents in this same category. Broadening the definition in this way obscures the profound differences in the lethality and destructiveness of these weapons, the timescales on which their effects are felt, and the possibility of protecting against them. It also distracts us from focusing on the most dangerous threat, the threat posed by nuclear weapons.

A device that spreads radio- active material is a weapon of mass disruption, not mass destruction. Release of radioactive material in a city would not physically damage structures or immediately injure anyone, but probably would contaminate a few city blocks with intensely radioactive material and a larger area with more weakly radioactive material. (If explosives were used to disperse the material, the explosion could cause a small amount of damage and some injuries.) Depending on their exposure to radiation and how they were treated, hundreds or perhaps even thousands of people could become sick. A larger number could have a somewhat higher probability of developing cancer and other diseases decades later. However, the main effect of a radiological weapon would be to create fear and disrupt normal activities.

Release of a toxic chemical in a city would create fear, disrupt normal activities, and possibly cause a large number of casualties, but would not cause mass destruction. The most deadly chemicals, such as nerve gases, are complicated to synthesize, extremely dangerous to handle, and difficult to use effectively. A complex long-term effort would be needed to develop and effectively deliver such an agent. If dispersed effectively, a chemical agent could contaminate a substantial area and, if toxic enough, might cause hundreds or perhaps even thousands of casualties, but it would not destroy buildings or vital infrastructure. Precautions before such a release and rapid medical treatment and decontamination afterward could reduce substantially the number of casualties, especially for less deadly agents.

Release of a biological agent would likewise create fear and disrupt normal activities, but would not cause mass destruction. In order to cause mass casualties, substantial amounts of agents such as anthrax, smallpox, and plague would have to be converted into tiny particles and then dispersed in an aerosol. Because these agents are so deadly, the required forms and the equipment needed to disperse them are difficult to come by. A pathogen such as anthrax that does not produce contagious disease could be used to attack a particular building or city, but a pathogen such as smallpox that produces a deadly contagious disease would be a "doomsday" weapon, because it could kill millions of people around the globe, including the group or nation that released it. In countries with an effective public health service, prompt

quarantine, vaccination, and other measures could reduce the number of casualties, the area affected, and the time required to get the disease under control. In less developed countries, a contagious deadly disease could be devastating.

In contrast to a chemical or biological agent, a "small" (10 kiloton) nuclear weapon detonated in a major city would kill more than 100,000 people and reduce tens of square kilometers to rubble almost instantly. Even a crude nuclear device that fizzled would destroy many square kilometers of a city and kill tens of thousands of people. A large (1 megaton) nuclear weapon could kill millions of people and destroy hundreds of square kilometers within a few seconds. Those who survived a nuclear explosion would have to deal with severe physical trauma, burns, and radiation sickness. Vital infrastructure would be destroyed or damaged, and radioactivity would linger for years near and downwind of the explosion. Unlike the effects of a chemical or biological weapon, the devastating effects of a nuclear weapon on a city cannot be reduced significantly by actions taken before or after the attack.

How might a nuclear weapon be delivered to a US city? The current administration has tended to focus on the possibility that an emerging missile state such as North Korea or Iran could use long-range ballistic missiles capable of striking the United States. However, the US intelligence community considers long-range ballistic missiles the least likely method an enemy might use to attack the United States, and no emerging missile states currently have missiles that could reach the US homeland.

Russia currently has about 6,000 nuclear-tipped intercontinental-range missiles capable of striking the US homeland and China has about 20, but neither North Korea nor Iran currently has missiles capable of reaching the United States. The longest-range missile North Korea has tested (once, in 1998) is its Taepodong I. With two stages, this missile is thought capable of lofting a nuclear warhead about 2,000 km, half the distance required to reach Alaska from North Korea and about a third the distance needed to reach Hawaii. In the 1998 test, a small third stage was added and blew up in flight. If the Taepodong I had a third stage that worked, it could probably loft about 500 kg, less than the mass of an unsophisticated nuclear warhead, a distance of 3,000–4,000 km, less than the distance to Alaska or Hawaii. North Korea has for a decade been reported to be working on a more advanced missile, the Taepodong II, which might be able to loft a nuclear warhead far enough to reach Alaska or Hawaii but probably not other parts of the United States. Iran has tested a ballistic missile that has a range of 1,300 km and is reportedly developing a more advanced missile that is expected to have a range of 2,000–3,000 km, far less than that needed to strike the United States.

Developing a system that can deliver a nuclear weapon using a long-range ballistic missile requires mastering many challenging technologies. The nuclear warhead must be light enough to be carried by the missile and must be capable of surviving the harsh conditions of launch and re-entry at hypersonic speeds. If the attacker has only a few nuclear weapons, the missile must be reliable and accurate enough to risk using it to deliver a weapon.

Partly for these reasons, the US intelligence community has long judged that the United States is more likely to be attacked using shorter-range ballistic or cruise missiles. For example, several countries are considered technically capable of developing the technology to launch short- or medium-range ballistic missiles or land-attack cruise missiles against the United States from ships or other platforms positioned off our coasts. A commercial surface vessel could be covertly equipped to launch cruise missiles, providing a large and potentially inconspicuous launch platform and at least some deniability. Proliferation of nuclear weapon technology and materials increases the risk of such attacks.

The national intelligence community considers delivery of a nuclear weapon by non-missile means, such as a truck, shipping container, boat, or barge more likely than delivery by a missile, because these methods are easier and less costly to acquire than a missile, are more

reliable and accurate than the missiles of emerging missile states, could be prepared covertly, and—importantly—could be used without immediate attribution. In contrast, the launch of a ballistic missile against the United States could be detected and identified within seconds by our missile warning and tracking systems. A nuclear attack by terrorists using non-missile means is considered more likely than an attack by a nation-state, in part because terrorists are less likely to be deterred by the threat of retaliation.

According to the March 31, 2005, report of the US Government Accountability Office, $85 billion has been spent on ballistic missile defense programs since fiscal year 1985, mostly on programs to defend against long-range missiles. An additional $66.5 billion is expected to be requested between now and fiscal year 2011 to continue these programs. So far this effort has not produced a system that would be effective against a realistic ballistic-missile attack. But even if a system that would be effective against such an attack were available and could be deployed now, it would be virtually irrelevant for defending against the kinds of nuclear attacks that are considered most likely. Focusing our attention and scarce resources on a system that, even if successful, would address only the least likely threat to the United States is unwise, especially when the dangers posed by other threats are growing.

In recent years, nuclear weapon materials and designs have been traded and sold by governments unfriendly to the United States and by unofficial networks, such as the A.Q. Khan network based in Pakistan. The nonproliferation regime based on the Nonproliferation Treaty is currently facing important new challenges. In this situation our nation's top priority should be to maintain and strengthen the nonproliferation regime, reduce existing nuclear arsenals, halt the spread of nuclear weapons and technologies, and prevent their theft, diversion, or sale to terrorist groups.

If we do not make a more strenuous effort to halt and reverse nuclear proliferation and prevent nuclear terrorism, it is inevitable that a nuclear bomb will eventually explode in a US city. This catastrophe can be prevented by taking appropriate actions. We should take the actions now that we will demand after a bomb explodes. Failure to do so would be inexcusable.

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