When I first began writing on bioterrorism in the late 1980s [1], there were two main criticisms leveled at anybody who was dealing with this subject. The first was that you might be giving new ideas to terrorists, who were busy at the time setting off car bombs, hijacking planes, kidnapping individuals, and doing other types of conventional terrorist attacks throughout the world. The assumption then was that terrorists did not know much about biological weapons, so the less said or written about the subject, the better. The days of bioterrorism being a taboo topic, however, are long gone. Today, there are countless numbers of books, articles, Internet websites, television commentaries, and government reports devoted to this threat.

The second criticism was that terrorists did not have the motivations or capabilities to effectively acquire and use biological weapons, and therefore any publications that warned about the threat would needlessly alarm the public. That criticism can still be heard today. However, since the consequences of a major terrorist attack with a biological weapon could be catastrophic in terms of lives lost and the medical, political, and social crisis it would produce, it is important to answer the skeptics so there can be little doubt of the need to prepare for the day when terrorists might unleash these weapons upon a civilian population.

First, it is important to explain how devastating a major bioterrorist attack could be. A U.S. Congressional report published many years ago estimated that the dispersal of 100 kilograms of anthrax from an airplane flying over Washington, D.C. could kill between 1 and 3 million people [2]. In addition to unprecedented casualty totals, a major bioterrorist attack could also lead to widespread panic among the public as hospitals and clinics may have to close their doors due to a lack of space, medicine, and other resources. There is also the potential for adverse psychological reactions among survivors, emergency workers, and the public in the aftermath of a bioterrorist attack. Terrorism is a form of psychological warfare with terrorists oftentimes perpetrating their violence to cause fear among the public. The psychological dimension of terrorism will be even more pronounced in the case of biological terrorism. Some of the expected reactions to a biological terrorist attack, for example, would be widespread fear, anxiety, and depression among the general public, emergency service personnel and others, including both those people who are infected and those who are not. For those who are infected, there will be the understandable fear of a mysterious and invisible biological agent slowly working its way through one’s body. People not infected may nevertheless believe that they are infected, and in the process interfere with the emergency medical response by seeking unnecessary treatment at already overcrowded hospitals and clinics. And while the emergency services and medical community will hopefully save many lives, it may be too late in some cases, depending upon the biological agent used or how long it took to diagnose the illness. Therefore, there could be a sense of hopelessness among the public and emergency services personnel as large numbers of people may die despite medical attention [3].

The medical, psychological, and political repercussions of a major bioterrorist attack demands that we not underestimate this threat. Yet those observers who question whether bioterrorism will ever occur raise several important points that need to be addressed. The first is the fact that throughout the long history of terrorism, there has not been a single, successful major attack with a biological weapon. (The 2001 anthrax letter attacks are not considered by most observers to constitute a “major” bioterrorist attack since the casualty total was relatively low with 5 people being killed.) The thinking, therefore, is that if we haven’t yet experienced one, why should we assume that we would now? There are trends in terrorism, however, that indicate that terrorists will likely use these weapons in the near future. The most important trend is the emergence of smarter and more creative terrorists that are taking advantage of the information and technological revolution that affects all aspects of life in the twenty-first century. Terrorists today would have a much easier time than in previous periods to learn about biological weapons. The Internet provides terrorists an easy way to catch up to speed on all types of knowledge about biological weapons, including which agents are best suited for use as a terrorist weapon, how to acquire the agents, how to use them, etc. They would also be able to recruit or hire somebody with that knowledge given the large number of microbiologists and other experts who worked on biowarfare programs in the former Soviet Union, Iraq, and other countries and who today may be out of work.

Another trend indicating that the use of biological weapons by terrorists is the growing threat of lone wolf terrorism. Lone wolves are individual terrorists who work alone or with the minimal assistance of one or two other people. Unlike some terrorist groups, lone wolves would not worry about possible backlashes from their supporters if they were to use biological weapons, or fear a government crackdown on their group following a bioterrorist attack. Since they work alone, there is no group decisionmaking process that might stifle their creativity in designing a terrorist operation. Lone wolves are therefore free to think up any scenario they want and then act upon it since they are accountable only to themselves. A lone wolf was responsible for the innovative anthrax letter attacks in the United States in 2001.

A second major point that the bioterrorism skeptics raise is that even if terrorists acquired biological weapons, they would not know how to effectively use them. Biological agents need to be dispersed properly if they are to achieve maximum killing capacity. Sunlight, wind, temperature and other environmental factors can affect the dispersal of anthrax spores and other biological agents from the air, while filters, airflow-diversion technology, and neutralizing equipment may make it hard for terrorists to release ricin or other agents inside buildings [4]. One example that is often cited is the failure of the Japanese cult, Aum Shinryko, to launch a successful attack with a weapon of mass...
destruction despite a multi-year research effort to acquire and use such weapons and virtually unlimited funds and personnel to support that effort [5]. Their 1995 Sarin nerve gas attack in the Tokyo subway did not cause maximum casualties (12 people died), mainly because the cult did not manufacture a potent enough batch of the nerve agent. Even if they had, they still chose a poor delivery method to disperse the Sarin; they simply left several punctured containers of the chemical agent on the floors of the five subway trains that they attacked. Aum also failed in its efforts to produce lethal biological agents. They were working on anthrax and botulinum toxin. On one occasion, the cult sprayed a liquid suspension of Bacillus anthracis spores from their headquarters building in Kameido, Japan which is near Tokyo. The spores, however, turned out to be from the non-lethal Sterne vaccine strain that is used in Japan for animal prophylaxis against anthrax [6]. On another occasion, Aum was suspected of attempting to kill an attorney by mixing what they thought was botulinum toxin into his drink. However, the attempt failed because the cult had not acquired the necessary strain of Clostridium botulinum from which botulinum toxin is derived [7]. A botulinum toxin attack against the food supply chain could result in a large numbers of casualties [8,9].

The thinking, therefore, among the skeptics is that if Aum with all its resources and personnel failed to launch a major bioterrorist attack, why then should we believe that any other terrorist group or cult would be able to do so. However, one could argue that it was Aum’s large size, approximately 50,000 members, that may have actually worked against the cult’s efforts to launch a major, successful chemical or biological terrorist attack. Bureaucratic politics, factions, divisions in the group, lack of focus and coordination, etc., all could add to the problems that large groups sometimes face in planning and implementing a terrorist operation. Aum’s members were constantly striving to please their leader and guru, Shoko Asahara and were basically on a “fishing expedition” to find the most effective weapon, including conventional weapons, for an attack [10]. The ineptitude of the cult’s delivery system for the Sarin (just leaving it on the floors of the subway trains) indicates that the group had not researched enough or correctly understood how to effectively disperse chemical and biological agents, but simply decided upon Sarin to use in its attack [11]. As noted above, the information and technological revolutionary age that we are now living in will aid terrorists interested in using biological weapons, including learning how to effectively disperse these agents. As analysts at Sandia National Laboratories state, “The ever increasing technological sophistication of society continually lowers the barriers, resulting in a low but increasing probability of a high consequence bioterrorism event [12]. It should also be noted that crude extracts of ricin or crude preparations of anthrax spores, which do not require a lot of technological ability or equipment, could still inflict panic, fear, and casualties among the public.

The third major point raised by those who do not believe terrorists will use biological agents is that terrorists are achieving their objectives with conventional attacks and therefore have no need to escalate to biological weapons. However, the history of terrorism teaches us that terrorists escalate their violence when they perceive that the public and governments have become desensitized to the “normal” flow of terrorism. By perpetrating a violent act that causes more casualties than previous incidents, or by introducing a new tactic or weapon, terrorists are guaranteed widespread publicity for their cause and reaction from various parties. With numerous conventional terrorist attacks occurring throughout the world, such as car bombings, suicide attacks, shootings, etc., there will be some terrorists who will be tempted to do something significantly different than what is currently being done. Biological weapons provide them with that opportunity. Furthermore, the September 11, 2001 hijacking-suicide attacks in the United States, which killed nearly 3,000 people, have set a difficult threshold for terrorists to surpass with conventional weapons. Those groups or individuals that want to “top” 9/11, will have to turn to weapons of mass destruction if they want to kill many more people than were killed on that tragic day.

Finally, the bioterrorism skeptics also question the need for the billions of dollars that are being spent to deal with this threat. As one observer argued, “Fears of bioterrorism are overblown. We should be spending much more money, time, effort, and print (including e-print) on naturally occurring outbreaks, epidemics, and human behavioral risk factors [13]”. However, preparing for bioterrorism can have important payoffs should a major incident occur. There will be more opportunity for saving lives in the aftermath of a biological terrorist attack than in the response to a conventional terrorist attack. Whereas most of the fatalities in a conventional terrorist bombing occur immediately or shortly after the explosion, in bioterrorism the incubation period for the virus, bacterium, or toxin could be several days. Accurate diagnosis and speedy treatment could save many lives [3].

However, in a 2010 report by a bipartisan Congressionally appointed commission, it was found that the U.S. is lacking in its preparations for bioterrorism. The commission gave the U.S. government an “F” grade in the category of bioterrorism response. The commission wrote that there was a “lack of U.S. capability to rapidly recognize, respond, and recover from a biological attack.” The report also stated that there was “no national plan to coordinate federal, state, and local efforts following a bioterror attack” and that “virtually all links [in the biodefense chain] are weak.” These weak links were: rapid detection and diagnosis capabilities; providing actionable information to federal, state, and local leaders and the general public; having adequate supplies of appropriated medical countermeasures; quickly distributing those countermeasures; treating and isolating the sick in medical facilities; protecting the well through vaccines and prophylactic medications; and in certain cases, such as anthrax, environmental cleanup [14].

The commission did not address, however, one of the most serious problems in bioterrorism preparedness, namely, the failure to include the public in contingency planning. Since terrorists who use biological agents will likely be attracted to the mass killing potential of these weapons, individuals living in metropolitan areas will be the ones at most risk. Yet there have not been any bioterrorism civil defense programs for the public. Most people will not know what to do or where to go in the aftermath of a major bioterrorism attack. There is thus a need for pre-incident education for the public about biological agents. The objective of the public education programs should be to inform people about biological warfare agents without raising their fear level. Many people do not know, for example, that even after being infected with biological agents, their lives can still be saved with speedy treatment. The more knowledge and education there is about biological terrorism, the more prepared the public might be when an actual incident occurs.

One can hope that the bioterrorism skeptics are correct and that we will not see the day when terrorists launch a major, successful attack with biological weapons. A positive sign is that progress is being made in many aspects of combating bioterrorism, including biodetection, diagnosis, prophylaxis, and treatments [15,16]. These efforts, which hopefully may also serve as a deterrent to would-be bioterrorists, need to continue. I am reminded, though, of the Irish Republican Army’s chilling statement following a failed attempt to assassinate British
Prime Minister Margaret Thatcher in 1984. The IRA warned, “Today we were unlucky, but remember, we only have to be lucky once. You will have to be lucky always [17]”. Unfortunately, we can’t expect to always be lucky against terrorism. What separates terrorism from all other types of conflict is the ability of a single incident to throw an entire nation into a crisis and have repercussions far beyond the original event. It is therefore crucial that in the battle against terrorism we be prepared for all types of contingencies, including bioterrorism.

References