

OUR RECOMMENDED INDIVIDUAL'S STRATEGY

Our recommended strategy involves actions that individuals can take that can save lives, even in catastrophic terrorist attacks. This can be demonstrated by tracing the recommended actions back to the terrorist attack scenarios and seeing how they respond effectively to an individual's needs for safety and health. Protection can be achieved against chemical agents, dirty bombs, and nuclear fallout. Once a biological attack has been identified, medical treatment can help prevent smallpox and anthrax infections. Even in the most challenging situations of nuclear and indoor chemical attacks, individuals can avoid the dangers, if they act quickly.

Terrorist attacks and the accompanying uncertainties can be expected to evoke intense emotional and behavioral responses on the part of individuals. Knowing that individuals can act to save lives and knowing what to do has the additional advantage of making it easier and potentially more likely that individuals will be able to cope in such catastrophic situations.¹

The individual's strategy is sensitive to potential variations in how terrorist attacks might unfold. This is by design because the response actions are derived from scenarios representative of each of the types of attacks and were chosen because of their effectiveness, even when the underlying assumptions in the scenarios change (e.g., warning time). At the same time, we recognize that the response actions may not be ideal for every possibility and every kind of potential attack. Many uncertainties surround what terrorists will be able

¹The guidelines on coping from the American Red Cross (<http://www.redcross.org/services/disaster/afterdis/>), American Psychological Association (<http://www.helping.apa.org/daily/terrorism.html>), and the National Center on Post-Traumatic Stress Disorder (<http://www.ncptsd.org/facts/disasters/>) suggest the importance of individuals understanding the nature of the events and gaining a sense of control in coping with trauma. A recent workshop reached a consensus that physical safety and security are essential components of effective interventions for mental health consequences of traumatic events. See National Institute of Mental Health (2002).

and willing to do, as well as their adaptability to changing circumstances. Nevertheless, the alternative of not providing individuals with a strategy with specific actions is much less attractive. Without such guidance, individuals would be required to decide what to do when an attack occurs, with the associated risks of acting in far more dangerous ways.

In the public mind since the September 11 attacks, and even in official pronouncements, catastrophic terrorism has been associated with massive numbers of casualties and widespread devastation. Indeed, these could be the results. However, what individuals need to do to survive has little to do with the extent of the effects but rather with the dangers that arise to their own personal safety and health. Thus, the individual's strategy is not based on the scale of potential attacks, and in presenting the strategy, no mention is made about the likely number of casualties in the different types of attacks.²

By exhaustively analyzing the effects of various terrorist scenarios, we discovered that individuals would have only a few primary needs rather than the multiplicity that might be expected in such catastrophic situations. These primary needs are captured in the individual's strategy in terms of the overarching goals that an individual would seek in each type of attack.

Chemical Attack:	Find clean air quickly.
Radiological Attack:	Avoid inhaling dust that could be radioactive.
Nuclear Attack:	Avoid radioactive fallout—evacuate the fallout zone quickly or, if not possible, seek best available shelter.
Biological Attack:	Get medical aid and minimize further exposure to agents.

Such a small number of key responses makes it easy for individuals to remember. Keeping these overarching goals in mind helps individuals understand the reasoning behind the strategy's specific response actions and also allows an individual to adapt to the circumstances as they may actually arise at the time of an attack. Acting simply on the basis of these goals would improve an individual's chances of survival.

By understanding the effects of the scenarios, it is then possible to discover what factors are most critical to an individual's ability to achieve these over-

²By contrast, those responsible for emergency planning and response need to pay particular attention to the scale of potential attacks.

arching goals. For chemical and radiological attacks, the critical factors are whether the release is inside a building or outdoors and where an individual is in relation to that release. In nuclear attacks, the critical factors are where the radioactive fallout cloud spreads and whether an individual can move out of this area before it becomes contaminated. The critical factors in biological attacks involve whether the agent is or is not contagious and whether an individual has been exposed or infected.

Guided by these overarching goals and critical factors, the individual's strategy that emerges is one tailored to the different types of terrorist attacks. Generic concepts for response actions are not appropriate. Finding shelter can be useful in all but an undetected biological attack. However, the form of sheltering needed differs significantly. Moving inside is what is needed in both chemical and radiological attacks that are outdoors. However, in a chemical attack, even more protection is called for: finding an interior room and closing down the air flows. To be effective in a nuclear attack, sheltering needs to be as far underground as possible.

Different types of respiratory protection are available, but in the same way, their value depends critically on the type of attack. The predominant threat to survival in a nuclear attack is from radiation outside the body, not inhaled radioactive particles. Thus, a filter mask helps, but relatively little compared with other actions. However, in a radiological attack, using a filter mask, or covering one's nose and mouth, is the appropriate response, given the primary danger is inhaling radioactive dust. For chemical attacks inside a building, an emergency escape hood, if available, would make it possible to evacuate the premises safely. Filtering systems that are always on could usefully protect against covert biological attacks.

Evacuation of the area of the radioactive fallout in a nuclear attack is the best response for an individual. If inside in a building where a chemical or radiological attack has occurred, evacuating the building is in most cases the best way to find clean air. However, evacuating is not the best response in such attacks that occur outdoors. In these cases, an individual needs to find shelter immediately inside a building. Evacuation is not called for in biological attacks, although it may be necessary for individuals to relocate out of an anthrax-contaminated area.

Because the response actions in the individual's strategy presented here are tailored to the different types of attacks and to the situational factors, they are fairly large in number. Nevertheless, they can each be defined in terms of simple rules that an individual can understand and adopt. They are available and can be implemented fairly easily. One problem, however, is that the recommended response actions may not be the ones that individuals would intu-

itively undertake. Indeed, an individual's first instincts may often be to care for others or find one's family or friends. This is why our individual's strategy includes the priorities that should guide an individual's actions, the first being to act to ensure one's own survival.

Success in implementing the individual's strategy will depend critically on individuals having advance knowledge about the characteristics of terrorist attacks and the appropriate response actions. This is especially the case for those attacks (chemical, radiological, nuclear) where individuals will need to act on their own quickly without official guidance.

This places a premium on communications and selling our strategy to individuals. How this should be accomplished is beyond the purview of this report. At the same time, we have drawn on the general principles found in the risk perception and risk communication literature in choosing how to present our recommended individual's strategy.³ One of these principles is that individuals need to understand the nature of the risks. As a result, for each type of terrorist attack, the strategy describes specific dangers of exposure to chemical gases, radiological dust, radioactive fallout, and smallpox and anthrax, as well as how long the dangers can be expected to last. Building trust in the adequacy of recommendations is also key to gaining an individual's acceptance. This is why we include in our strategy a detailed description of the reasons for each recommended response action, as well as why other actions are not recommended.

Beyond having an advance understanding of what to do in the event of a terrorist attack, the individual's strategy includes additional preparatory steps. Because these have been derived from the response actions, the strategy can ensure that an individual focuses on those critical for terrorist attacks. It turns out that only a few things need to be included in an individual's emergency kit for terrorist attacks beyond what should already be there for general emergencies: a dust mask with an N95-rated particulate filter, battery-powered radio, and duct tape and plastic sheeting. Gathering information and making plans are by far the most important preparatory steps (e.g., creating a family communication plan, learning about the evacuation plans in buildings one occupies frequently). At the same time, these preparatory steps are not absolutely essential to the success of the individual's strategy. It is also the case that the response actions for the most part do not require any advance training or practice.

The strategy that we recommend involves actions that individuals can take that can be effective in saving lives, even in catastrophic terrorist attacks. These

³For a brief description of the main principles in the risk perception and risk communication literature, see Appendix D.

actions differ in important ways from how individuals should prepare for natural and other types of disasters. They are appropriate regardless of the likelihood of an attack or whatever the government alert level might be. They are designed to be sensitive to potential variations in how such attacks might unfold but are presented in ways to prepare individuals for surprises. Although comprehensive in character, the strategy is defined in terms of simple goals and rules that should be easy for an individual to adopt both to prepare for and respond to terrorist attacks.

COMPARISON WITH CURRENT TERRORISM GUIDELINES

In comparing the recommendations that have emerged from our approach and the guidelines in the Department of Homeland Security's Ready campaign, there are many similarities and some important differences.⁴

The Ready campaign guidelines provide recommendations for chemical, radiological, nuclear, and biological terrorist attacks. By beginning with terrorist scenarios, our strategy is, however, able to provide more specific guidance, leaving individuals with less uncertainty about what to do at the time of an attack or with the need to make choices. We have been able to tailor our recommended actions to the specific type of attack, rather than having to rely on generic concepts, as do the Ready campaign guidelines. They, for example, recommend a sheltering concept (known as "shelter-in-place") that calls for an individual to go inside, lock the doors, close the windows, turn off fans, go into an interior room, and seal the windows and doors in case of indoor and outdoor chemical attacks, as well as for nuclear attacks. This response, in our view, is appropriate for outdoor chemical attacks but not for chemical attacks inside. Such steps would also provide little protection in a nuclear attack.

The Ready campaign guidelines for terrorist nuclear attacks correctly distinguish between the dangers from the immediate blast effects and subsequent radiation fallout. Problems arise when they recommend that an individual "take cover immediately below ground if possible though any shield or shelter will help protect you from the immediate effects of the blast and the pressure wave." This is misleading, because an individual is unlikely to have sufficient time to make such a step effective. Such guidance seems to be a holdover from earlier Cold War nuclear scenarios in which up to 30 minutes of warning was expected.

⁴For purposes of comparison, we will use those guidelines now being presented in Department of Homeland Security's Ready campaign, found on the web at www.ready.gov (U.S. Department of Homeland Security, 2003a). These guidelines, in turn, drew heavily on those put out by FEMA (2002).

For the radioactive fallout that will develop soon after a nuclear attack, the Ready campaign guidelines do not indicate the time urgency involved and leave it to an individual to “consider if you can get out of the area; or if it would be better to go inside a building and follow your plan to ‘shelter-in-place.’” Our individual’s strategy is based on the critical need to act quickly (within 10 minutes when in the immediate blast zone) either to move out of the path of the fallout cloud or into a deep underground shelter.

The Ready campaign guidance (“get away as quickly as possible”) is given only for those biological attacks that are detected at the time, even though they note that the “more likely” attack will be one in which health care workers later report “a pattern of unusual illness.” Such covert biological attacks form the basis for our individual’s strategy, which calls for response actions involving preventive medical treatment and preparatory steps to improve passive protection in buildings.

The Ready campaign guidelines for chemical attacks, as does our individual’s strategy, differentiate between indoor and outdoor attacks, but then leave to individuals the choice of what to do at the time, calling for an individual to “consider” whether to find shelter or evacuate the area. Our individual’s strategy specifies opening a window or evacuation for a chemical release inside a building and sheltering inside for a chemical release outdoors. Doing anything else would not provide as effective protection.

In a radiological attack, the Ready campaign guidelines call for steps based on three principles—“shielding, distance, and time”—guidance designed for conditions in laboratories handling radioactive materials. Our individual’s strategy instead focuses on protecting against the primary danger in radiological attacks (i.e., radiological dust). The recommended response actions include distancing from the explosion, but shielding provides little extra protection.

Where the Ready campaign guidelines are specific and detailed is in their recommendations for “preparatory steps” for terrorist attacks. As these are largely drawn from general emergency guidelines, they are certainly useful. The problem is that individuals could be led to believe that the measures are all essential for some or all of the different types of terrorist attacks. This is not the case.

Our approach is to focus in our individual’s strategy on those preparatory actions critical to surviving terrorist attacks. This leads us to recommend, as do the Ready campaign guidelines, that individuals learn about the characteristics of terrorist attacks, develop family plans, consult in advance with personal physicians on appropriate kinds of medical treatment, have in their emergency kit a dust mask, duct tape and plastic sheeting, and a battery powered radio.

The Ready campaign guidelines then go on, for example, to call for individuals to stock days of supplies of food and water. Having food and water could be convenient, if supplies were interrupted in the aftermath of an attack involving biological, radiological, and nuclear weapons or in cases where individuals were staying at home to protect themselves from exposure to contagious biological diseases. Supplies of food and water will probably only be “essential” for those taking shelter in a nuclear attack.

The Ready campaign guidelines also suggest ways in which individuals should prepare to evacuate quickly by car, beginning with the instruction that the circumstances and the nature of the attack will require a decision about “whether you stay put or get away.” The guidelines then suggest that an individual create an evacuation plan that would include keeping a half tank of gas in a car at all times and becoming familiar with alternate routes. In our individual’s strategy, evacuation is recommended only in a nuclear attack, and then using a car is unlikely to be feasible given the accompanying destruction and potentially impassable roads. For those situations in which individuals are asked to relocate out of contaminated anthrax or radiation areas, there will be time to prepare and plan for the exodus.

The results of our scenario-driven approach provide the empirical basis for refining the Ready campaign’s guidelines by giving more specific guidance to individuals about how to respond, by making clear the types of shelters, respiratory protection, and evacuation needed in each type of terrorist attack, and by focusing on those preparatory steps that are the most critical.

HOW CAN OUR APPROACH BE USED IN THE FUTURE?

One important advantage of our approach to defining an individual’s strategy is that it can be used now to focus on how groups of individuals in special situations, such as the elderly, sick, and disabled, should prepare for catastrophic terrorism. In some cases, these individuals could be at an advantage (e.g., those in nursing homes will already be inside in the event of outdoor chemical or radiological attacks). However, they would be at a clear disadvantage in situations in which they needed to move quickly, such as in an indoor chemical attack or a nuclear attack.

Given the uncertainties surrounding terrorist threats, our approach could also be used to update the strategy as the characteristics of the threat evolve. New and different scenarios could be examined and our recommended strategy evaluated to assess its continuing relevance in such new environments. Revisions could be introduced using the five-step process.

In addition, actions that today are not available to individuals could be evaluated as new technologies or medical treatments become available (e.g., new types of air-filtering systems or vaccines). With the development of detection systems, individuals might gain more effective ways to respond. These could be evaluated using our process and criteria.

Finally, should attacks occur in the future, lessons could be learned about the actual effects, individual needs, and utility of various response actions, and these could be introduced into our analysis to see whether any changes should be made.