Rethinking Bio-Chemical Dangers

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Last year President Clinton announced the U.S. would spend $10 billion on countering terrorism, including biological and chemical threats, for Fiscal year 2000. The presumption was that the Aum Shinrikyo sarin gas subway attack of 1995 was likely to happen here on a much grander scale. Yet, since 1900 there have only been seventy-one known terrorist acts worldwide involving the use of chemical or biological agents. Of the 123 fatalities these attacks caused, only one was American. As for biological attacks worldwide, seventy have occurred in the last century causing nine deaths but only eighteen of these seventy attacks were made by terrorists. These are not large numbers. That said, how much should one make of them? There are, after all, risks not only in underestimating the chemical and biological domestic terrorist threat, but in overestimating it as well. So far, such downside risks have received scant attention. The most prominent of these include:

Raising public consciousness about the possible threat in a manner that emboldens criminals and terrorists to attempt precisely what the government and public want to avoid.

Reassuring the public about the preparedness of government such that any government shortcoming is likely to be magnified to politically fatal levels.

Preemptively undermining U.S. civil liberties in the carne of enhanced homeland defense by encouraging scenarios similar to Ruby Ridge and Waco, Texas, that inspire chemical or biological "Oklahoma City' incidents in retaliation.

Expanding the martial law into the domestic realms of law enforcement by making the response to domestic chemical and biological attacks a core military mission.

Distracting the military from chemical and biological and conventional threats to U.S. bases and embassies overseas.

Encouraging an "America first" siege mentality and a retreat from foreign commitments critical to our nation's security.

Most of these risks, of course, are far from immediate. This, however, could change. Certainly, the downside risks listed are at least as likely as the domestic biological and chemical terrorism threats that might generate them. If we are serious about one, we need to be serious about the other. The question is how? Focusing on two broad considerations should help. The first is determining just how practical current chemical and biological agents are for military and terrorist use. The second is identifying what defensive strengths the U.S. can exploit to mitigate these throats.

About traditional chemical agents, history suggests that in military settings they injure far more than they kill. Thus, on the Western Front in World War I it took an average of just over a ton of agent to kill a single soldier. Only two or three percent of those exposed to gas on the Western Front actually died, and gas was responsible for no more than 5 percent of the wars total casualties. In Iraq's war against Iran, chemical weapons killed 5,000 Iranians. This constituted less than one percent of the 600,000 Iranians who died from all causes during the war.

If military use of chemical and biological agents has been historically rare, domestic criminal and terrorist use of them has been rarer still. Technically, using chemicals to produce massive casualties is difficult, as demonstrated by the Aum Shinrikyo experience. In an attack a year before the famous Tokyo subway strike, things wont awry. The intended targets—three judges—failed to receive fatal doses. Instead, wind blew the agent in the wrong direction and killed seven innocents. Nor are the perpetrators themselves immune. One of the Aum terrorists was overwhelmed by the agent he tried to deliver (a risk also run by those producing the agent). Also, in the case of the most successful of the subway attacks, the sarin was not

optimized for the widest possible dissemination, i.e., as a gas. All twelve of the deaths caused by the attack were due to the victims' direct contact with liquid sarin. Optimizing the agents' delivery with aerosol dispensers, however, would have increased the risk of killing the carriers and the likelihood of the operation being discovered by law enforcement officials. The technical challenges of terrorists using traditional biological agents to produce massive fatalities are no less daunting. Biological agents are lethal only if inhaled, and particles larger than ten microns are likely to be blocked before they reach the lungs. On the other hand, agent particles approaching one micron are likely to be exhaled and so will not remain in the lungs. Operationally, particles sized between five and ten microns are optimal.

Spreading biological agent in particles of that precise size, however, is difficult. The only organizations that have done so are states. Sunlight, moreover, kills or denatures most biological agents (making night-time dispersal imperative), and wind patterns and humidity can reduce the lethality of an anthrax attack 1,000 fold. All of the above observations pertain to the use of traditional chemical and biological agents to produce massive casualties.

Two developments, however, may change the way we look at chemical and biological munitions. The first is Russia's recent development of a far more lethal and persistent family of binary chemical substances known as Novichok (Russian for 'newcomer") agents. The second is the possible development of a new class of biological agents known as bioregulators. In the late 1980s and early l990s, Russia produced several new agents that were made of chemicals not controlled by the Chemical Weapons Convention. These agents, referenced by a variety of code names including Substance 33, A-230, A-232 A-234, Novichok-5, Novichuk-7, are geared for the deployment of binaries munitions that use two agents that are benign when kept separate, But lethal when mixed. Indeed, these chemicals are at least as toxic and persistent as the most lethal nerve agent, VX, and some are reported to be ten times as toxic. At the same time, they are far more difficult to detect and far easier to manufacture covertly since they can be made with common chemicals in relatively simple pesticide factories. Finally, unlike VX, which can be defeated quickly with injectable antidotes, Novichok agents are at least as resistant to treatment as Soman. Clearly, these agents are much more attractive for military use than traditional agents. If delivery were accomplished covertly with special forces, there might not be any warning and targeted troops would be unable to don protective gear before lethal exposure. Also, given these agents' persistence and lethality, far less would be needed to accomplish any given mission. Mere remote than Novichok agents, But still worrisome, is the prospect that incapacitates known as bioregulators might be developed in a form that could be weaponized. Bioregulators are present in our bodies in small amounts. They determine hormone release, control of the body temperature, sloop, mood, consciousness, and emotions. Using the latest recombinant-DNA techniques, scientists might modify bioregulators to enhance their potency and effect.

So far, the key obstacle to weaponizing such agents has been dissemination. Assuming further research overcomes those problems, though, such bioregulator agents would be militarily attractive for three reasons. First, their novelty would almost guarantee their ability to evade current biological agent detectors. Second, unlike other biological agents, they would have immediate effects and thus could be used to disrupt military. Third, they could be far potency as compared to traditional chemical agents.

Given their novelty and complexity, use of bioregulators or Novichok agents by terrorists is hardly eminent. However, the possibility of criminals or terrorists using traditional agents, if only to cause panic through minor attacks, cannot be dismissed. Fortunately, the U.S. has considerable resources already in place to address such threats. All told, there are 32,000 fire departments, 8,000 emergency medical services, and 17,000 law-enforcement agencies in the U.S., constituting a force of over 2 million first- responders. A good number of fire departments located in industrial areas already are trained to deal with hazardous chemicals. With additional training and equipment, chemical terrorism could be addressed by these and other departments merely as an additional hazardous materials issue. As for dealing with

domestic biological terrorism, the U.S. is blessed with a massive health care system. The country spends nearly four times as much on its public health and medical system as it does on its entire military. Factor in the fire-fighting services and police, and it is clear that these civilian institutions (and the Centers for Disease Control) are the ones best positioned to respond to domestic terrorism. Indeed, relying more heavily on these institutions than the military has several advantages. First, they are already locally deployed. Second, having them address chemical and biological terrorism should improve public safety and health generally. Thus, enhancing our health care systems ability to deal with natural incidents should only improve its ability to cope with terrorist incidents and vice versa. Indeed, what is critical to treating both, in this case, is early detection, and there are far more natural disease outbreaks to monitor and report than terrorist acts.

Finally, using civilian institutions avoids the downside risks of relying too much on the military. Not only are civil liberties likely to be safer, but our military's ability to focus on its own self-defense will be improved. As it is, the military needs to bring its chemical and biological protection and decontamination units to bear sooner overseas, where the likelihood of use is highest. Also, our military must do more to tackle the difficult task of developing detection and protection capabilities (especially against new agents, such as the Novichok family) and to stay ahead of whatever other agents hostile biotechnologists might develop. The point hero is not to dismiss the possibility of any particular chemical or biological threat, But rather to weigh how much attention each one deserves. Assuming we are not foolish enough to demand 100 percent protection against all attacks, our medical system, federal and local governments, and military should be able to ensure against a lasting, strategic calamity. The key to success, however, will be the same as it was a decade ago in Desert Shield, which is to avoid focusing on the most horrific scenarios at the expense of preparing for the must likely ones.