

## Unready for Anthrax

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In any attempted terrorist attack against this country, smallpox and anthrax would be the only two biological agents capable of causing mass casualties. And while the government has invested considerable effort in planning for a potential smallpox attack, no equivalent plan exists for anthrax.

In a recently completed study, we looked into various emergency responses to an airborne anthrax attack and concluded that the United States is woefully unprepared. Two pounds of weapons-grade anthrax dropped on a large American city could result in more than 100,000 deaths, even if early cases were successfully diagnosed, antibiotics were distributed broadly and drug adherence was high. The reason for the catastrophic death toll: Not enough people would receive antibiotics quickly enough to prevent symptoms from developing, and those who developed symptoms would overwhelm the medical facilities.

Any plan to cope with this scenario must include (1) immediate intervention, (2) rapid distribution of antibiotics to everyone in the affected region, (3) aggressive education to ensure adherence to the full course of treatment and (4) creation of "surge capacity" to treat the sudden influx of patients.

While a response to smallpox can be measured in days, the response to anthrax needs to be measured in hours. As soon as the first case is diagnosed, intervention must be initiated. The risk of a false alarm, which include out-of-pocket costs and perhaps some panic and reduced confidence in the nation's response infrastructure, are dwarfed by the risks of waiting too long to act: an estimated 10,000 deaths per day.

Although the U.S. government promises to get antibiotics to any local airport within 12 hours, cities vary widely in their ability to move these antibiotics from their airports into the mouths of their citizens. There are several options for rapid distribution of antibiotics. We could distribute them within six hours of an attack -- after all, if we can vote in a day, we should be able to hand out pills in a day -- through pre-processing of contraindication data and disclaimer forms, local storage of antibiotics and police-escorted mail workers (or having points of distribution partially manned by nonmedical professionals).

Or we could distribute them prior to an attack. Pre-attack distribution of antibiotics might save 10,000 lives for every day that it would take to hand them out post-attack, and it could also significantly reduce the panic.

These benefits of distributing the antibiotics before any attack need to be balanced against the costs and risks: the possibility of exhausting our antibiotic supply and the chances of generating

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drug resistance in the population through misuse of the antibiotics. Such problems could be mitigated by distributing only a few days' supply in advance, which would also reduce the losses caused by perishability of the drugs.

The third element of an effective response is education about drug adherence. In the 2001 postal attack, only 40 percent of postal workers who were told to take a 60-day course of antibiotics actually adhered to the full regimen. The government needs to educate people now -- before an attack -- about the importance of adherence. And if an attack occurs, public health workers need to go into the neighborhoods and make it clear that adherence is a life-or-death matter.

The most challenging aspect of the response plan is the creation of surge capacity for medical care of anthrax victims. Even if we distribute antibiotics rapidly and make full use of local, federal and military medical personnel, tens of thousands of people could die.

The only way that we can see to avoid such a catastrophe is to tap into the pool of brave and selfless medical workers in this country by starting a national volunteer system of pulmonary specialists, which would behave in much the same way as a volunteer fire department in rural areas. For example, if there were an anthrax attack in New York City, a small fraction of specialist doctors from other major cities would jump on the next airplane with their ventilators, ingest antibiotics and arrive six hours later ready to save lives.

Our analysis also suggests that deployment of biosensors could act as a substitute for rapid antibiotic distribution, but it would be a much more expensive and less reliable measure. If we distribute antibiotics rapidly, the additional savings from biosensors are quite incremental.

Because an anthrax attack seems more likely than a smallpox attack, and its consequences appear to be more difficult to manage in terms of both loss of life and widespread contamination of assets, a stronger case can be made for voluntary pre-attack mass vaccination for anthrax than for smallpox.

Unfortunately, this option is not viable for at least the next few years: The only producer of an anthrax vaccine is having difficulty satisfying the military's requirements, and the vaccine requires a series of six shots over 18 months, along with annual boosters.

We have already dodged one bullet: Had the 10 grams of weapons-grade anthrax from the 2001 attack been airborne rather than mailborne, 10,000 people could have died, even with rapid antibiotic distribution. It is time for a credible national response to anthrax. The government must close this window of vulnerability in our homeland.

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