If terrorists released *Bacillus anthracis* over a large city, hundreds of thousands of people could be at risk of the deadly disease anthrax—unless they had rapid access to antibiotic medical countermeasures (MCM). Anthrax is an infectious disease caused by *B. anthracis* spores that can be inhaled, be ingested, or come into contact with the skin. Inhalational anthrax is considered the most severe bioterrorism threat because the spores can travel significant distances through the air while remaining infectious, and it has the highest mortality rate, approaching 100 percent if untreated.

During the past decade, public health authorities and other leaders have significantly enhanced their plans for rapidly delivering MCM to a large number of people following an anthrax attack. Many public health authorities and other policy experts fear, however, that the nation’s current systems and plans are insufficient to respond to the most challenging scenarios, such as a very large-scale anthrax attack or an attack on multiple cities.

As part of efforts underway nationwide to improve the nation’s ability to rapidly distribute and dispense MCM, the Office of the Assistant Secretary for Preparedness and Response (ASPR), within the U.S. Department of Health and Human Services (HHS), commissioned the Institute of Medicine (IOM) to examine the potential uses, benefits, and disadvantages of strategies for prepositioning antibiotics. Prepositioning involves storing antibiotics close to or in the possession of the people who would need rapid access to them should an attack occur. These prepositioning strategies—intended to help ensure timely access to antibiotics in the event of an attack—would complement existing plans that rely heavily on more centralized stockpiles. Prepositioning is just one component of a broad effort to enhance the nation’s ability...
to prevent an attack and mitigate the effect in the event that one does occur.

**Delivering Antibiotics on Time**

Antibiotics are most effective at preventing anthrax if taken before symptoms begin to occur. Based on its review of the literature, the IOM committee appointed to this task finds that the earliest sign of inhalational anthrax symptoms will likely occur four days or later after an attack. It may take a day or two—if not more—to detect that an attack has occurred and for public health officials to decide that antibiotics should be dispensed to people who may have been exposed. To prevent illness, therefore, public health officials must act quickly to distribute and dispense antibiotics in the remaining time before symptoms appear.

The Centers for Disease Control and Prevention (CDC) and state and local jurisdictions currently aim to dispense antibiotics to the entire population within 48 hours after the decision is made to dispense antibiotics. The committee finds—given the limited evidence available—that this goal appears to be appropriate as long as the attack is detected soon after it occurs. Improvements to the dispensing time, however, may provide additional protection against unforeseen delays.

**Developing Multi-faceted Strategies for Distributing and Dispensing MCM**

All levels of government—federal, state, local, and tribal—and the private sector are involved in plans to distribute and dispense antibiotics to protect the public against an anthrax attack. The backbone of current distribution plans is the Strategic National Stockpile (SNS)—a national repository of medicine and medical supplies maintained by the CDC—which can be deployed rapidly around the country as a supplement to state and local antibiotic stockpiles. State and local public health authorities dispense antibiotics from all of these stockpiles to the public primarily via points of dispensing (PODs) that are set up throughout the community.

The committee defines three categories of prepositioning strategies that could complement more centralized stockpiling strategies:

- **Forward-Deployed MCM**: MCM stored near the locations from which they will be dispensed.
- **Cached MCM**: MCM stored at the locations from which they will be dispensed, such as workplaces and health care facilities.
- **Predisposed MCM**: MCM stored by the intended users or by heads of households or other nonmedical caregivers for use by those in their care (see Figure).

**Weighing the Pros and Cons of Prepositioning Strategies**

Prepositioning strategies could help ensure that large numbers of people have rapid access to antibiotics. However, prepositioning strategies will require more resources than strategies that rely on distribution from central locations after an attack; they provide less flexibility to change plans following an attack, if necessary; and some strategies could increase health risks, for example, adverse effects from taking the medication outside of the emergency situation. Prepositioning strategies provide the greatest value in enhancing response to large-scale attacks in high-risk areas in which the current POD system cannot rapidly dispense to the entire population. Conversely, prepositioning strategies may not be as valuable in areas where the risk of an attack is low and/or current dispensing capability is sufficient.

In their planning efforts, state, local, and tribal officials should focus on improving the dispensing capability of PODs and developing strategies that bring the MCM to those who need them—rather than relying on the individuals to travel to a POD. In addition, officials should consider prepositioning strategies, such as local stockpiles and workplace caches. The committee does not recommend that public health departments use home antibiotic storage as a dispensing strategy for the
general population because of concerns about inappropriate use, high cost, and lack of adaptability for other purposes. In some specific cases, however, home storage may be appropriate for individuals or groups that lack access to antibiotics through other timely dispensing mechanisms.

**Community-Level Decision Making about Prepositioning Strategies**

Because communities differ widely in their needs and capabilities, the committee developed a framework to help state, local, and tribal public health officials determine which prepositioning strategies could benefit their communities, if any. The committee recommends that state, local, and tribal jurisdictions begin by reviewing and assessing three characteristics of their communities: their risk of an anthrax attack, their current ability to rapidly detect that an attack has occurred, and their current ability to dispense MCM to their populations. Based on the results, jurisdictions should evaluate whether specific prepositioning strategies will be appropriate for the community by comparing the likely health benefits, health risks, and economic costs of implementing alternative prepositioning strategies in that community, taking into account the community’s available resources. Throughout the process, jurisdictions should incorporate ethical principles and community values into their plans.

**Working with the Private Sector**

Although the responsibility for responding to an anthrax attack traditionally lies with the public sector, private-sector organizations have relevant expertise and many may be interested in enhancing their role in distributing and dispensing MCM to ensure business continuity and to help protect
employees and their families. This also could help alleviate the burden on public health departments and better reach all those who need antibiotics. The committee recommends that HHS convene state, local, and tribal governments and private-sector organizations to develop national guidance to enhance public-private cooperation in the prepositioning, distribution, and dispensing of MCM.

Enhancing Performance Assessment

One of the challenges faced by public health officials is the difficulty of assessing how an MCM distribution and dispensing system would perform in response to an anthrax attack, and therefore evaluating what kind of improvements are needed, if any. The CDC should continue to facilitate assessment of state, local, and tribal jurisdictions’ performance in implementing dispensing plans for MCM, in addition to assessing planning efforts.

Conclusion

During a time of crisis, individuals rely on public health officials at the federal, state, and local levels to act quickly and decisively. In the case of an anthrax attack, they have a limited opportunity to provide antibiotics to prevent illness and death. While prepositioning strategies have the potential to reduce the time between the attack and when an individual receives antibiotics—and therefore to reduce the total number of deaths from an anthrax attack—this potential benefit should be weighed against increased costs and potential health risks prior to the crisis.