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How to Fight Bioterrorism

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Government authorities have asked citizens to participate in the war on terrorism by being alert. Alertness does matter. The alertness of the flight crew of American Airline Flight 587 enabled it to see in the lighting of a match something more -- and the alertness and actions of passengers and crew then thwarted the terrorist attack and avoided the destruction of the aircraft and its passengers.

But many of us still wonder what concrete actions we can take as individuals to counter terrorism, or to make ourselves or our families safer. There is in fact much we can do to counter bioterrorism, in many ways the most daunting form of terrorism. Bioterrorism is human intervention to spread disease. Historically the usual role of humans has been to fight the spread of disease through clean water and personal hygiene, and to counter the disease once it enters humans with nutrition, antibiotics and vaccines. Now we see the deliberate transmission of anthrax through the U.S. mail, hardly its natural method of infection, and there are, unfortunately, many other possibilities. We can intervene to inhibit this man-aided spread of disease -- this time not by cleaning the water but by cleaning the air we breathe. Many pathogens, including anthrax and smallpox, can be spread through the air. However, these airborne pathogens can be removed by filtering the air, making the task of a bioterrorist more difficult and less rewarding.

This improved environment will be needed. Aside from the immediate terrorist threat from abroad, the rapid advance of knowledge about molecular biology is making it easier every year for very small extremist groups, whether from abroad or from the United States, to equip themselves with what are in fact biological weapons of mass destruction. We need to counter this threat. It is one that will not go away.

Beyond deterring bioterrorism, filtering air in buildings is likely to also produce a significant public health dividend, in reducing the spread of ordinary respiratory illness. Air filtering will pay an immediate health dividend and will make us, our families and our country more resistant to the unavoidable threat of bioterrorism.

There are several ways to filter air. All help, and all are complementary to the defenses erected by antibiotics and by vaccines. Antibiotics and vaccines act to strengthen the body's defenses against a pathogen that has already entered; air filtering acts to prevent pathogens from entering the body in the first place.

People worry, rightly, that the heating ventilating and air conditioning (HVAC) systems, found in most large buildings, could be exploited by terrorists to spread anthrax. But HVACs can also work the other way around. Equipped with proper filters, as they are today in hospital operating rooms and in semiconductor manufacturing plants, they can clean the air they circulate. What is required is to put the right filters into the HVAC system -- and this can usually be done at affordably low cost. The filtered system then becomes not a conduit for, but a defense against, bioterrorist attack.

Individual homes and offices can also be strengthened against airborne pathogens by making use of individual portable filter fans that can be bought and simply plugged in. These fans are widely used today by people who have allergies and are made by many major manufacturers. Filter fans will clean the air even of particles considerably smaller than the usual airborne pathogens. These fans process air about 1,000 times faster than a person breathes it, so a free-floating particle in a closed-in area is much more likely to end up in the fan's filter than in a human lung. If the elderly anthrax victim from Connecticut, who died of

airborne anthrax, had had a filter fan in her room, she might be alive today.

There are also possibilities beyond what is commercially available today. A product that would be easy to make and would be significant in bioterrorism defense of an individual home is an inward-facing window fan unit equipped with proper filters. This unit would clean the air that is pulled into a house and maintain positive pressure in the house so that air does not leak in.

Another commercially available option is simple masks. These are not elaborate "gas masks" but look more like a surgeon's mask or the masks worn in some Asian countries by people with colds. These masks can fold up and fit in your pocket. There are commercially available versions of these that are made of material that, like the filter fans, filter out pathogen-sized particles.

While filter fans and HVACs are always on and will filter out pathogens whether or not we know they are present, masks are different. You won't tend to have one on unless you know there is a problem. But it is likely that many bioterrorist attacks, ranging from the small-scale delivery of an anthrax parcel to a large-scale smallpox outbreak, will reveal themselves at some point. Then masks can play a vital role in self-protection and in limiting the spread of a contagious disease. And a simple mask can provide significant protection while opening mail.

Humans are intervening to spread disease; let us intervene to create an environment that makes the spread of disease through the air much more difficult. It can be done. Demand will spur both better products and the independent testing of what already exists. But much can be done with what is already available. Let us start now.

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