

Infectious Disease

Biological Weapons Defense

Infectious Diseases and Counterbioterrorism

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Foreword

Biological Weapons Defense: Infectious Disease and Counterbioterrorism focuses on measures for dealing with the possible deliberate causation of disease and on the underlying science. The fundamental advances in molecular biology of the last several decades are only beginning to find relevant application in the development of effective sensors, rapid early diagnostics, vaccines, antimicrobials, antitoxins, and other relevant prophylactic, therapeutic, and supportive measures. Advances will also come with the increased understanding of pathogenesis and of the mechanisms by which contagious diseases spread from person to person, leading to improved practical measures to limit outbreaks, including measures that can be taken by an informed public.

Such advances will certainly be useful against naturally occurring diseases, including those that are newly emerging or re-emerging and, in the eventuality, against deliberately caused disease as well. Still, experience suggests that practical applications available to the public, although sure to come, will most likely come at a slower pace and at greater cost than legislators and the general public may expect. Unlike the conquest of certain naturally occurring communicable diseases, effective protection against deliberately caused disease will remain problematic.

All of the agents or groups of agents to which specific chapters in *Biological Weapons Defense: Infectious Disease and Counterbioterrorism* are devoted were selected as candidate biological weapons in the old offensive biological warfare (BW) programs of the United Kingdom, the United States, and the Soviet Union. Some of these agents were brought to the stage of mass production, were field-tested, and then stockpiled in bulk and in munitions. It is remarkable how much of the technical base was foreseen even before the big BW programs got underway, as exemplified, for example, in the 1942 report of Theodor Rosebury and Elvin Kabat, declassified in 1947 and published that year in the *Journal of Immunology* (1). By 1960, much of the technology of selecting, producing, and disseminating disease agents as weapons could be found in the open literature. Aside from the novel and modified agents that can be imagined, all of the "select agents" (except for smallpox) designated by the Centers for Disease Control and Prevention remain accessible from clinics or natural foci. Even so, despite the industrial-scale preparations that have come and gone and the hundreds of wars and bitter insurgencies that have transpired in the past half-century, there has been no BW, and only a few small-scale acts of bioterrorism or, more accurately, biocrime.

Prudent measures to prepare for a major biological attack and to limit its consequences are certainly in order. However, undisciplined speculation that a major biological attack is inevitable risks distracting us from measures intended to keep biological weapons from coming into use in the first place. Inadequate attention is being given to measures to sustain and reinforce the constraints that protect our species from exploiting biotechnology for hostile purposes, as it has exploited other major

technologies (2). Whatever the underlying reasons that have averted BW and bioterrorism, and whatever the factors that might disrupt this desirable state of affairs, they deserve closer and more disinterested study and attention than they have received so far.

As the old Western and Soviet programs recede into the past, the number of persons with the specific knowledge and skills required to create devastating biological weapons was rapidly declining. But some biodefense activities, especially secret ones, have begun to reverse this trend by causing a new generation of scientists, engineers, and others to turn their attention to vulnerabilities and conceivable future threat agents, and hence to technologies with offensive potential. The expanded number of facilities and individuals working with dangerous pathogens also makes access to these agents easier, and the number of individuals who may become motivated to make hostile use of them greater.

Beyond that, the impression of extensive secret work risks motivating other states to initiate or expand secret programs of their own, further multiplying the pool of potential security risks and perhaps verging into offensively oriented activities. Closer to home, a further risk of secrecy in biodefense work is that it risks losing the confidence of the public, essential to the actual implementation of protective measures. The practice of public health traditionally rests on open discussion and public understanding in order to gain the acceptance and trust of those it is intended to benefit.

Considering the great and growing pervasiveness of biotechnology, the key element in averting bioterrorism and biowarfare is not access but intent, whether on the part of individuals, groups, or national governments. At the level of the individual scientist and through our institutions and professional societies there is a modest but easily practiced way in which we can address the element of intent. That is the customary openness and professional amicability to which scientists are traditionally accustomed. Scientific visits, exchanges, joint projects, studies abroad, development of personal friendships across cultures and across national frontiers are intellectually and professionally beneficial, as well as personally rewarding. Beyond that, the more openness within a society as a whole, the more likely it is that improper activities within it will come to light or, better, be discouraged in the first place.

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