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From Here to Biosecurity: Advice for an Incoming Administration

R. H. SPRINKLE

Not so long ago, “biosecurity” was neither a word nor a concept. Nor was it a goal of governments, a cornerstone of industrial and academic ventures, a distractor of investigational intentions, or a prod to community protest. Biosecurity, in its expansive sense, is as vital a global good as can be imagined. Nearly every nation has come to see this. But no other nation has sought biosecurity as the United States has.

America’s progress toward biosecurity cannot confidently be measured. Graphs might be drawn plotting surrogate markers known or surmised: dollars spent, firms surviving, Biosafety Level 3 and 4 laboratories registered, people employed, “select agents” studied, surveillance methods and countermeasures devised, results withheld, patent-disclosure applications filed, and papers published.

One marker would be at zero. No big “second event” has followed the anthrax attacks of 2001, the Amerithrax case, despite claims of inevitability, if not imminence. Yet little assurance can be taken from—and no credit assigned for—this remission. If the current theory of Amerithrax guilt holds, then modern history’s signal act of bioterrorism will resolve into a tale of crank criminality distinguished chiefly by the scandalous news that a murder weapon had been mixed in and stolen from a government-regulated biosecurity laboratory. Fifty-seven billion dollars later, and with a new government assembling, several observations might be made.

Collective biosecurity is the best biosecurity we have

As the world’s life-sciences hegemon, the United States would surely dominate any biological-weapons competition it chose to enter. Some national-security figures have long reasoned,

therefore, that the United States would enhance its biosecurity by pressing its technological advantage, even if “pressing” meant pushing against, or arguably through, a collective-security agreement, the Biological Weapons Convention (BWC). The contemporary American biosecurity profile—select agents being studied in more than a thousand registered laboratories, for example—suggests this reasoning has been accepted. So does asserting to be “prophylactic, protective or...peaceful,” and thus allowable under the BWC, projects enhancing the weapons potential of certain organisms so as to study that potential “realistically.”

The record of such reasoning cannot fully be known. Microbial near misses have occurred, but, Amerithrax aside, little has been heard of their occurrence except when the Freedom of Information Act has been used to cast light on shielded science. Whether other states have been trying to keep current in biodefense or have been shuttering hopelessly outclassed operations no private citizen can say. Yet exclusively in security terms, if only as openly known, the outcome of biology’s service in the “War on Terror” has so far been negative: America’s self-endangerment.

Years into the biothreat story, the wisdom of our disrespect for the BWC must be doubted. The BWC is not perfect, nor is its perfection at hand, but the chief beneficiary of its more faithful observance by the United States would be the United States itself.

Less powerful states also may defect from collective biosecurity. Noncooperation by governments has seriously impeded both the analysis and the containment of emergent dangers. China’s reluctance-to-disclose dangerously complicated the global response to the severe acute respiratory syndrome, SARS, and

Indonesia’s reluctance-to-share has hampered both the virology and vaccinology of highly pathogenic avian influenza (HPAI). China feared embarrassment and economic harm, and it suffered both. Indonesia, however, presented its reluctance-to-share forthrightly; it suspected a gift of samples to foreign experts would be repaid by the opportunity to buy an unaffordable vaccine based on those samples.

Through its example, which a new administration should seek to improve, and through its influence on international organizations and, not least, on corporations and commerce, the United States would do well to help reluctance-to-disclose and reluctance-to-share disappear from the biosecurity stage.

Biodefense is no ordinary public-health problem

Evidence-based medicine, a traditional aspiration now stressed as a genuine standard, cannot resolve the future. Ready ourselves for a problem new or rare stretches evidence-based medicine to its anticipatory limit. Public-health planning stretches not much farther.

A biological attack might be designed expressly to minimize the value of a targeted society’s experience, so as to make an evidence-based response ineffective or even exacerbating. But such an attack would require first-rate planning; a state might manage it, but a state would need an extraordinarily compelling reason to attempt it. Attacks by amateurs would be expected to fail most tests of propagation, if not pathogenicity, even if a promising agent had been bought cheaply from a cash-hungry

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bioweaponizing state. With the prudence of most states and the shortcomings of most amateurs weighing against risk, biodefense is susceptible to dismissal as just one of many public-health problems with a criminal aspect.

In the public-health community, the unprecedented gets respect when it happens. In the national-security community, the unprecedented often drives planning. For this reason and others, the two communities are less compatible than the word “biodefense” implies. Government’s responsibility is to make them complementary.

Preparation adaptable to a full range of threats requires governmental, professional, and institutional cooperation, as well as formalized regional coordination. Useful would be the listing and loaning of medical and surgical resources and, if confidence in “confidentiality” can be earned anew, the interchangeability of personal health records. Useful also, and decades overdue, would be the national credentialing of physicians, nurses, technologists, and emergency workers. All such innovation is not only beyond the scope of, say, a regional medical center but also beyond its interest. A health system disciplined by “market forces” cannot simultaneously behave as if attentive chiefly to the public’s health.

Public health is everyone’s business

Decades of regressive finance, off-the-mark reforms, and underregulated commercialization have purged public and private hospitals of excess capacity. This purging has yielded several brief moderations in the rise of health’s share of national economic activity and hard-to-replete deficits in regional and national surge capacity. If a severe influenza season, or a major multifocal biological attack *during* a severe influenza season, forced a sudden unexpected rise in demand for hospitalization and instrumentation—notably, a demand for short-term mechanical ventilation—we would find ourselves betrayed by our own efficiencies. Regional and national planning has begun to show how the most might be made of residual “excess,” but limitations would remain,

with disaster relief expected to compensate. Public health’s repair would take years even if plausible remedies had already been proposed, accepted, enacted, and funded; they have not.

Agriculture’s vulnerabilities are home-grown, mostly

Concentrations of similar organisms invite the proliferation of pests and may also tempt parties interested in committing political or economic crimes against agriculture. Measures designed to decrease the proliferation of pests may also decrease the effectiveness, if not the incidence, of malicious attacks. Measures applying ecological insight would most likely prove more robust than those emphasizing chemical application or antimicrobial administration. Experience with nonchemical suppression of rice blast shows that at least one intuitive, inexpensive, scalable strategy—planting disease-susceptible varieties in mixtures with resistant varieties—can actually increase yields. The encouragement of ecologically smart practices has so far not made much headway, the Food Quality Protection Act notwithstanding, aside from suppliers’ efforts to conform more closely to consumers’ preferences in selected market segments. Encouragement on biosecurity grounds explicitly would make sense academically but, absent galvanizing proof of vulnerability’s consequences, not politically.

Trade is another matter, at least as it bears upon the spread of agriculturally important diseases, bovine spongiform encephalopathy and foot-and-mouth disease being recent examples and HPAI being a current example. The virus causing this third disease continues its evolution, and it crosses borders not only through the migration of infected wild birds but also, and often illegally, through the sale of birds for breeding or sport. The United States has been less affected than many other countries but might not remain so.

A broader focus, and more eyes, might help

Biosecurity, in its state-against-state or state-against-extremists meaning,

endeavors to prevent events low in incidence and high in consequence. The Amerithrax case was certainly high in consequence but not especially high in deaths and injuries—well within the range of random and revenge shootings—unless asymptomatic immune response and acceptance of antibiotic prophylaxis are counted as markers of casualty status. If dangerous materials intended to be kept secure are indeed kept secure, then biosecurity’s state-against-state or state-against-extremists meaning may cease to motivate.

Yet Amerithrax caused an environmental crisis. Had they been less valued, the areas affected might have been condemned, abandoned, or entombed, like Chernobyl, rather than meticulously decontaminated. A biological weapon, in the act of being used, would always create an environmental crisis of some scale; an assassination by toxin might be an exception.

A transnational professional organization interested principally in microbial-ecological stress—oriented to the environment writ very small—would necessarily be interested in biology’s malicious use, however rare. But it would also be concerned with other sources of environmental destabilization: the release of novel organisms, the flow of engineered genes, the microbial metabolism of industrial chemicals and pharmaceuticals, the proliferation and spread of highly dangerous organisms, and so on. Staying sharp, active, and worried would be easy enough. If such an organization were to form, the United States should hope it succeeds.

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