THE GENERIC BIOTHREAT, OR, HOW WE BECAME UNPREPARED

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In early 1976, federal health officials warned the Ford administration that a new strain of influenza had appeared in the United States, and threatened to become a deadly pandemic. A soldier had died in Fort Dix, and others at the base were infected with the virus. Infectious disease experts gathered and quickly recommended a plan of action to the president: an urgent, intensive program to immunize the entire U.S. population before the next flu season, at an estimated cost of $135 million. Such a program had never been tried before—indeed, it had only recently become technically feasible. But given the perceived scale of the swine flu threat and the new possibility of intervention, public health experts were nearly unanimous about the most responsible course of action: mass vaccination. "If we believe in preventive medicine," as one well-regarded expert said, "we have no choice" (Neustadt and Fineberg 1983).

Three decades later, in the fall of 2005, the U.S. government again focused its attention on the threat of pandemic influenza. This time the threat had not arrived suddenly—public health officials had been warning the danger of a flu pandemic with increasing urgency since the appearance of a deadly strain of the virus in Hong Kong in 1997. But it seemed that now a major initiative was possible, in part because of an increasing perception of the seriousness of the threat, as the virus spread globally through poultry stocks and migratory birds; in part as a result of fallout from the administration's widely perceived failure to respond to Hurricane Katrina. President Bush described the combination of urgency and uncertainty posed by avian flu: "Scientists and doctors cannot tell us where or when the next

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pandemic will strike, or how severe it will be, but most agree: at some point, we are likely to face another pandemic" (White House 2005). Or, as a concerned U.S. Senator put it, echoing the admonitions of health officials: "Experts no longer ask if such a pandemic could occur, rather they question when it will occur" (U.S. Senate 2006a).[1]

In November 2005, the administration unveiled a $7.1 billion pandemic preparedness strategy described by the U.S. Secretary of Health as "the most robust proposal ever made for public health at one time" (Leavitt 2005). The plan included funds for disease surveillance, stockpiling antiviral medicine, and new methods of vaccine production. The details of the administration's plan were sharply criticized in the public health world as overly focused on pharmaceutical interventions, and as underemphasizing the needs of state and local health agencies. But among various commentators, there was remarkable accord on several points. First, that pandemic planning was a matter of urgent concern; second, that the nation was currently far from adequately prepared for such an event; and third, that whether or not a pandemic occurred, the process of preparing for it would strengthen readiness for other potential threats. As the Senator put it, "even if we are spared from a flu pandemic, the work that we do today will serve us all well in the event of any national emergency" (U.S. Senate 2006a).

Indeed, the flu threat had become a vehicle for a more general form of planning—one oriented toward a variety of dangerous events. The U.S. Assistant Secretary of Health said, "preparedness for a pandemic makes us a nation better prepared for any and all hazards, manmade or natural" (Agwunobi 2006). But, he warned, such a condition would not come quickly or easily: "preparedness is a journey, not a destination. It's a journey that must be nationwide, involve federal, state and local leaders in partnership, and include every sector of society." As the U.S. Secretary of Health testified, "We're overdue and we're not as well prepared as we need to be. We're better prepared than we were yesterday. We'll be better prepared tomorrow than we are today. It's a continuum of preparedness" (Leavitt 2006). A leading state health official agreed: "Are we fully prepared? Absolutely not. We are more prepared than we were several years ago but not prepared enough" (Selecky 2005).

Over the course of three decades, a new way of thinking about and acting on disease threat had arisen: It was no longer a question only of prevention, but also—and perhaps even more—one of preparedness. How did this shift happen? How did the U.S. public health and security establishments come to be "unprepared"? By this question I do not mean that the nation had once been prepared and was now

less so, but rather, I mean to ask how a norm of preparedness came to structure thought about threats to public health, and how a certain set of responses to these threats became possible. The story is a complex one, involving the migration of techniques initially developed in the military and civil defense to other areas of governmental intervention.

My analysis is centered not on widespread public discussion of biological threats, but rather on particular sites of expertise where a novel way of understanding and intervening in potential future events was developed and deployed. In what follows, I focus on one particular technique, the scenario-based exercise. I argue that this technique served two important functions: first, to generate an affect of urgency among officials in the absence of the event itself; and second, to generate knowledge about vulnerabilities in response capability that could then guide anticipatory intervention. The scenario-based exercise, I suggest, is exemplary of the type of rationality that underlies the contemporary articulation of national security and public health in the United States.

This analysis also contributes to ongoing scholarly discussions of the construction of potential futures by experts, and of the effects these imagined futures have on possibilities for political action in the present. The question of the role of "anticipatory knowledge" in shaping technoscientific practice has recently attracted significant anthropological interest. Much of this work has concerned the contemporary intersection of the life sciences and the market, and the role of an image of a hopeful, healthier future in generating value in the present.[2] Like such studies, this essay takes forms of future orientation in a climate of uncertainty as its object of investigation. However, it analyzes a different encounter—the life sciences with state-based security practices—and a different vision of the future, not one of hope but of fear.

An initial orientation comes from the social theorist Niklas Luhmann (1998), who poses the question: "In what form does the future manifest itself in the present?" Luhmann's interest is not in a prophetic temporality in which an already-determined human fate is prefigured in the present, but rather in a distinctively modern time that calculates a future that "can always turn out otherwise"—a provisional foresight. He is particularly interested in the role of experts in an "ecology of ignorance." For such authorities, the problem for making decisions in the present is not one of knowing what will unfold, but of taking responsible action in the face of uncertainty.

Risk assessment and insurance are examples of techniques that calculate the probability of future events in order to guide rational action in the present. They

rely on historical patterns of incidence to make such calculations. For this form of planning, the future is the product of calculated decisions made in the present, based on a limited number of possibilities: the past contains the elements of what is to come. However, as Luhmann argues, the contemporary problem of catastrophe—the event whose likelihood cannot be known, and whose consequences cannot be managed—seems to defy such calculations. It is, as Luhmann (1998) puts it, "the occurrence that no one wants and for which neither probability calculations nor risk assessments nor expert opinions are acceptable." This formulation leads to the question I want to focus on here: how, in the absence of tools for quantitative risk assessment, do national security and public health experts bring the future prospect of catastrophic disease into the present as an object of knowledge and intervention? One prominent method, as I will show, is the "imaginative enactment" of potential disasters.

NATIONAL SECURITY AND PUBLIC HEALTH

In his 2006 congressional testimony on avian flu preparedness, former White House Homeland Security Advisor Richard Falkenrath said: "When viewed in comparison to all other conceivable threats to U.S. national security, the catastrophic disease threat is and for the foreseeable future will remain the greatest danger we face" (U.S. Senate 2006b). Given Falkenrath's background as an expert in counterterrorism and nuclear proliferation, this was a striking statement—a clear affirmation that national security strategists must now turn their attention to a subject that had, until recently, been mostly under the purview of public health.

As Nicholas King (2002) and others have shown, this was by no means the first time that U.S. national security concerns had been linked to public health.[3] To understand the implications of Falkenrath's claim—and its distinction from prior such conjunctures—a useful initial step is to analytically disaggregate the concept of "national security." In other words, to ask: what type of security is meant? What are its political objectives and what are its technical methods? In this context, as we will see, security experts who were concerned with the catastrophic disease threat did not for the most part articulate the logic of interdiction associated with traditional state-based security practices.[4] Nor could their approach best be described in terms of the rationality of prevention linked to classical public health. Rather, they were engaged in formulating a distinctive way of approaching security threats—one of ongoing, vigilant readiness for emergency.

To show this, it will be useful to introduce a set of analytic distinctions among forms of collective security.[5] *Sovereign state security* dates from the monarchical states

	Sovereign State Security	Population Security	Vital Systems Security
Moment of articulation	17th-century territorial monarchies	19th-century urban hygiene	Mid-20th-century civil defense
Normative rationality	Interdiction	Prevention	Preparedness
Types of threat	Adversaries	Regularly occurring events	Unpredictable, potentially catastrophic events
Exemplary form of knowledge	Strategy	Statistics	Enactment
Operation	Deter or defend against enemy	Distribute risk	Gauge vulnerability, develop capability

FIGURE 1. Forms of collective security.

of the 17th century, and refers to practices oriented to the defense of territorial sovereignty against foreign enemies using military means. *Population security,* which came to prominence in the 19th century, involves the protection of the national population against regularly occurring internal threats, such as illness, industrial accident, or infirmity. Its exemplary knowledge forms include epidemiology and demography, and its interventions range from social insurance and public health to urban infrastructure development.

However, a number of current security initiatives in the United States—such as pandemic preparedness or critical infrastructure protection—do not fit neatly into either one of these familiar security frameworks. In recent years, a third form, which Stephen Collier and I have called *vital systems security,* has become increasingly central to the politics of security. This form of security is oriented to a distinctive type of threat: the event whose probability cannot be calculated, but whose consequences are potentially catastrophic. Its object of protection is not the national territory or the population but, rather, the critical systems that underpin social and economic life. Vital systems security does not seek information about a foreign enemy or about regularly occurring events but, rather, uses techniques of imaginative enactment to generate knowledge about internal system–vulnerabilities. Its interventions are not focused on protecting against foreign enemies or modulating the living conditions of the population; instead, they seek to assure the continuous functioning of critical systems in the event of emergency (see Figure 1).[6]

Vital systems security did not emerge whole cloth, but rather came out of one practice of sovereign state security—civil defense—beginning in the 1960s.

Its techniques were initially developed to approach the threat of nuclear attack, but were gradually extended to approach other potential catastrophes, ranging from natural disasters to technological accidents to terrorist attacks to epidemics of infectious disease. As we will see, when infectious disease is approached as a problem of population security, interventions are structured by a logic of prevention; whereas when it is taken up from the vantage of vital systems security, the guiding logic is one of preparedness.

It should be underlined that these distinctions do not mark epochal shifts: it is not that there have been overarching transformations from one form of security to another, but rather that these three forms operate in dynamic relation to one another. Moreover, these forms of security may combine and overlap in diverse contexts. For example, the very practices that were initially developed as the means of population security have now, in some cases, become the targets of vital systems security. In what follows, I describe how this has occurred in the case of public health—how a "biopreparedness" apparatus has consolidated in response to the rise what Falkenrath called "the catastrophic disease threat."

SWINE FLU: THE LIMITS OF POPULATION SECURITY

The object of knowledge and intervention for modern public health is the population, described by Foucault as "a global mass affected by overall pressures of birth, death, production, illness" (2003:243). As he notes, "these are phenomena that are aleatory and unpredictable when taken in themselves or individually, but which, at the collective level, display constants that are easy, or at least possible, to establish." Statistical knowledge makes such collective regularities visible. Public health interventions seek to know and manage these regularities, to decrease mortality and increase longevity, to "optimize a state of life."

Thus modern public health interventions are based on the analysis of historical patterns of disease incidence in a population. The case of 19th-century Britain is instructive. As George Rosen shows, British health reformers carefully tracked the occurrence of disease according to differential social locations to make the argument that "health was affected for better or worse by the state of the physical or social environment" (Rosen 1993:185).[7] Such knowledge was cumulative and calculative. Reformers gathered and analyzed vital statistics—rates of birth, death, and illness among various classes—to demonstrate the economic rationality of disease prevention measures such as the provision of clean water or the removal of waste from streets. For example, as Chadwick's famous 1842 *Inquiry* into living conditions among the working classes argues, "the expenditures necessary to the

adoption and maintenance of measures of prevention would ultimately amount to less than the cost of disease now constantly expanded" (Rosen 1993:187).[8] This type of political calculation typically justified modern public health interventions: the economic benefits of improving the living conditions of populations would outweigh the costs of such measures.

If this initial mode of public health intervention emphasized social conditions—sanitation, nutrition, the safety of factories—a next iteration worked more directly on the bodies of members of the collectivity. The rise of bacteriology in the late 19th century led to the systematic practice of immunization against infectious disease. But again, making rational policy decisions about public health interventions required knowledge about the historical pattern of disease incidence in the population. For example, as Rosen notes, in designing New York City's vaccination campaign against diphtheria among schoolchildren in the 1920s, it was "necessary to know the natural history of diphtheria within the community: How many children of different ages had already acquired immunity, how many were well carriers, and what children were highly susceptible?" (Rosen 1993:312). Such data were gathered to make decisions on the basis of the balance between the expected costs and benefits of a given intervention.

Given this form of rationality, public health expertise has difficulty in approaching events that cannot be mapped through statistical means. How, then, do officials take responsible action when faced with the prospect of a singular event—one whose probability is not known, but whose consequences could be catastrophic?

THE SWINE FLU FIASCO

Let me return now to the situation with which I began: the apparent outbreak of swine flu in 1976. As we will see, the guiding logic of public health structured the way that the threat was taken up by government officials—and led to an eventual "fiasco." In January 1976, the U.S. Centers for Disease Control (CDC) reported that a soldier at Fort Dix had died of an unfamiliar strain of swine flu. Moreover, there had been several other cases of the same type of flu, and so the virus seemed to be both virulent and capable of human-to-human transmission. Was a pandemic on the horizon? At the time, some experts thought that antigenic shifts in the influenza virus leading to deadly pandemics occurred approximately once per decade. The last one had occurred in 1968. In the worst case, the damage wrought by this strain might be comparable to the 1918 Spanish Flu, which, it was estimated, had killed over 50 million people worldwide.[9]

The possibility of pandemic flu had not been part of the planning process for U.S. health officials. For this reason, it was not immediately clear what options were available to them. A catastrophe on the scale of 1918 was not predictable, but was possible. Edwin Kilbourne, a leading influenza expert, warned health officials to plan without delay for an imminent natural disaster. Given the tools available to officials, there seemed to be only one possible course of action: vaccination of the entire U.S. population. Such an option would be both expensive and practically daunting. It would mean producing and distributing enough vaccine to immunize over 200 million people by the next flu season. This was a new technical possibility: only recently could enough flu vaccine be produced in a given year to envision mass immunization. But a decision would have to be made immediately. And there was no way of knowing whether the cases at Fort Dix were signs of an imminent pandemic or a fluke.

Health officials were thus faced—for perhaps the first time—with the possibility of intervening in advance of a potential flu pandemic. This situation presented a problem for public health expertise. As we have seen, modern public health institutions had been set up in response to actual—rather than potential—disease incidence. Indeed, they relied on historical data about the timing and location of outbreaks to design and implement effective interventions. For this reason, as the swine flu affair demonstrates, experts had difficulty in approaching a foreseeable, but not statistically calculable event.

On March 10, CDC officials met with the Advisory Committee on Immunization Practices (ACIP). Each year the committee recommended which strains of influenza to vaccinate against and which groups to target for vaccination. Because the general population did not have any immunity to this new strain, a vaccination plan could not be limited to high-risk groups.[10] At the meeting, the group observed: first, there was evidence of a new strain that was transmissible from human to human; second, all previous new strains had been followed by pandemics; and third, for the first time there was both knowledge and time to provide for mass immunization, given advances in vaccine production techniques. Some public health leaders also saw an opportunity to demonstrate the importance of preventive medicine, to "strike a blow for epidemiology in the interest in humanity" (Neustadt and Fineberg 1983:26). If the plan were immediately put in motion, inoculation could begin by the summer.

One question was raised at the time, but not pursued: Under what circumstances might it make sense to produce and then stockpile the vaccine rather than moving straight to mass vaccination? CDC Director David Sencer argued that the

virus would spread too quickly and that distribution logistics were too difficult to consider waiting for evidence of an epidemic before beginning vaccination. Sencer was also worried about future blame—that if members of the committee chose not to vaccinate and then there was a deadly pandemic, they would face biting criticism. It would be said that "they had opportunity to save life," but did not take it (Neustadt and Fineberg 1983:28).

Following the meeting, Sencer wrote a strongly worded memorandum to his superiors at the U.S. Department of Health summarizing the committee's advice. Given what he called a "strong possibility" of widespread swine influenza that could be highly virulent, the Committee recommended a plan to immunize 213 million people in three months, at a cost of $134 million. The memo's tone was urgent: "The situation is one of 'go or no go' . . . there is barely enough time. . . . A decision must be made now" (Neustadt and Fineberg 1983:30).[11] In turn, the U.S. Secretary of Health wrote a note to President Ford, which shifted Sencer's conditional to the future tense, from possibility into apparent certainty:

> There is evidence there will be a major epidemic this coming fall. The indication is that we will see a return of 1918 flu virus that is the most virulent form of flu. In 1918 a half a million people died. The projections are that this virus will kill one million Americans in 1976. [Neustadt and Fineberg 1983:35]

Ford consulted a number of leading experts in virology and public health, including Jonas Salk, who urged mass vaccination (Neustadt and Fineberg 1983:35).[12] The president publicly announced the national vaccination plan on March 24, saying: "No one knows exactly how serious this threat could be. Nevertheless, we cannot afford to take a chance with the health of the nation" (Neustadt and Fineberg 1983:46).

Outside of the administration and its circle of experts there was criticism of the program. The New Jersey state epidemiologist publicly warned of dangerous side effects. *New York Times* editorials were repeatedly skeptical, accusing the administration of engaging in politics at the expense of science. In advance of a major meeting of program participants in Atlanta, one cautious expert wrote to Sencer to recommend an alternative to mass vaccination: stockpiling vaccines, "along the lines of military defense," and developing "well worked-out contingency plans" (Neustadt and Fineberg 1983:60). The idea would be to use military logistics techniques to create an intermediary period of potential intervention in anticipation of the event, rather than engaging in immediate intervention. The proposal was

not taken seriously: as I argue below, this type of "preparedness" measure based on contingency planning was not, at the time, part of the shared toolkit of public health.

The goal of the vaccination program was to start immunizations in August and finish before the end of winter. Field trials of the vaccine launched in April. By June, the epidemic had not yet appeared.[13] An unexpected blow to the program came in the summer: vaccine manufacturers announced that they would not bottle the vaccine without liability insurance. Insurers, in turn, were unwilling to offer such coverage, given uncertainties about the health risks of the vaccine itself.[14] For the program to begin, the government would have to find a way to assure manufacturers that liability risk would be covered.[15] Once this problem was legislatively solved and the program finally began, there were major problems with the logistics of vaccine distribution at the federal level, and wide variability in individual states' capacity to actually implement the program.

What then became clear was that the CDC had not seriously considered how to manage the risk of side effects. When several elderly vaccine recipients died shortly after receiving their shot, the agency simply announced that a certain number of such deaths were to be "expected." Despite these problems, by December 40 million people had been immunized, although these vaccinations were oddly distributed given variation in individual states' execution of the plan. In the middle of the month, Minnesota health officials reported multiple cases of Guillain-Barré syndrome, a severe neurological condition, among vaccinees. By this point it was clear that the expected epidemic was not coming, and the program was immediately suspended. The *New York Times* editorialized: "Swine Flu Fiasco."

A later report on the program did not fault the Ford administration's decision to go ahead with it; experts were, after all, unanimous. But it did suggest that one source of failure was its administrators' lack of foresight. Health officials did not have contingency plans in place, and so reacted in an ad hoc manner. Thus they were not able to make available to themselves a solution that could have helped: stockpiling vaccine in advance, and then—if the epidemic did develop—applying advanced logistics methods to design an efficient method of distribution. Moreover, they did not envision and plan in advance for potential problems such as manufacturers' liability, variations in state distribution capacities, and side effects. Given the rationality of prevention and the existing tools of public health, there was "no choice" but to go forward with mass vaccination. Public health officials did not have a mechanism with which to engage in responsible, but provisional action under conditions of urgency and uncertainty.

CRISIS MANAGEMENT AND THE VULNERABLE SYSTEM

Interestingly, around the same time a systematic method for dealing flexibly with potential crises was being developed in a very different domain of government. Civil defense had expanded its purview from a focus on nuclear catastrophe to a more general form of preparedness for emergencies. In this section, I describe the articulation of "crisis management" as a novel way of dealing with uncertain, but potentially catastrophic threats. Although in its inception crisis management was not linked to public health, the field would eventually extend its purview to approach the threat of catastrophic disease.

Much of this development initially took place in government agencies devoted to planning for nuclear attack. Beginning in the early years of the Cold War, civil defense planners had sought to develop techniques of nuclear preparedness such as urban vulnerability mapping and the coordination of emergency response (Collier and Lakoff 2008; Masco 2006). These techniques later extended to a more general form of preparedness for emergencies. An exemplary figure in this process was Robert H. Kupperman, an applied mathematician who was Assistant Director of Nixon's Office of Emergency Preparedness (OEP) in the late 1960s and early 1970s. Kupperman's task at OEP was to bring sophisticated mathematical techniques to bear on problems of emergency preparedness—for example, ensuring the "survivability" of critical networks such as oil pipelines and telecommunications systems. Based in the Systems Evaluation Division of OEP, Kupperman was involved in U.S. government response to a number of crises in the early 1970s, including the wage-price freeze, Hurricane Agnes, a rash of terrorist attacks, and the 1973 energy crisis.

In this context Kupperman developed an interest in the common structure of crisis situations, and in the development of methods that could be used to prepare for them in advance. He argued that crises, however diverse, shared a certain number of common problems: the paucity of accurate information, the difficulty of communication among decision makers, and a confusing array of authorities seeking to take charge of the situation. Such situations involved uncertainty about what was unfolding, coupled with an urgent demand for immediate action to alleviate the crisis. Flexibility for decision makers depended on the extent to which the crisis manager had forecast the situation and invested in preparation for it. The apparent recent increase in numbers of crises demonstrated the contemporary importance of such foresight. "As we begin to recognize the complex problems that threaten every nation with disaster," he and two colleagues from OEP asked, "can we continue

to trust the ad hoc processes of instant reaction to muddle through?" (Kupperman et al. 1975:229).

Kupperman's background was in operations research (OR), a relatively new field dating from WWII efforts to introduce quantitative analysis to military practice. OR developed tools for analyzing and optimizing complex systems. This meant first of all seeing multiple, heterogeneous elements as part of a coherent system whose behavior was, as Jay Forrester put it, "a consequence of the interaction of its parts" (Hughes 1998:141). For example, in studying the efficiency of allied bombing strategy during WWII, OR analysts gathered detailed data on specific bombing runs, looking at the interconnection and interaction of multiple variables such as altitude, speed, number and formation of bombers, weather and light. "In general," as historian Thomas Hughes writes, "advocates of the systems approach perceived, conceived of, or created a world made up of systems" (1998:142). The systems view gained prominence in the 1950s and 1960s in settings including the RAND Corporation and the U.S. Defense Department under Robert McNamara.

If early operations researchers were interested in the optimization of systems, Kupperman was most concerned with their potential failure. His experience in the OEP led him toward an emphasis on the vulnerability of critical systems to sudden, unexpected events. After leaving the OEP, he continued to think about how to systematize governmental response to crisis, especially through his work at a Washington, D.C. think tank, the Center for Strategic and International Studies (CSIS), beginning in the late 1970s. He was coauthor, with James Woolsey, of a 1984 CSIS report on "crisis management in a society of networks" called *America's Hidden Vulnerabilities.* The report argued that the United States relied for its collective well-being on a sophisticated and intricate set of systems, or networks, for energy distribution, communication, and transportation. It noted recent disruptions of these systems, and warned: "A serious potential exists . . . for much more serious disabling of networks crucial to life support, economic stability, and national defense" (Woolsey and Kupperman 1985:2).

America's Hidden Vulnerabilities listed a number of measures to ensure the continued functioning of vital systems in the event of emergency, including: improving system resilience, building in redundancy, stockpiling spare parts, performing risk analysis as a means of prioritizing resource allocation, and running scenario-based exercises. A final key element of crisis management, according to the report, was the specification in advance of the distribution of responsibilities during the crisis situation itself.[16]

At CSIS, Kupperman and his colleagues sought to persuade national security officials of the problem of system vulnerability, and the need to develop techniques for managing potential future crises. One of their approaches was to hold scenario-based simulations of crisis situations, and invite government officials to participate (Goldberg 1987:16). The "emergency exercise" was a tool for demonstrating to leaders the vulnerabilities of vital systems. As he and Woolsey wrote:

> If planning has involved the operating teams and managers (as it always should) these critical personnel gain an increased understanding of how the system works and, particularly valuable, how it is likely to behave under abnormal conditions. Training with crisis games and emergency exercises will augment this benefit significantly. [Woolsey and Kupperman 1985:16]

There is, of, a long history of reflection on how to approach specific crisis situations—extending from early quarantine plans to Cold War civil defense. And the military practice of training simulations or "war games" of course also has an lengthy pedigree.[17] What was perhaps distinctive about Kupperman's approach was the application of the method of imaginative enactment to the generic crisis situation to generate knowledge about internal system vulnerabilities. As we will see, the CSIS technique of crisis simulation would eventually help convince national security planners to think seriously about biological threats. It would also help to make visible the elements of a new object of knowledge and intervention: the public health infrastructure.

MILITARY MEDICINE AND TROPICAL DISEASE

How were the two strands we have so far been looking at—public health on the one hand, and crisis management on the other—brought together? The first conjuncture I want to follow is an encounter between military medicine and international health. At a conference of tropical disease specialists in Honolulu in 1989, Colonel Llewellyn Legters ran a table-top exercise simulating the outbreak of a deadly and highly contagious virus. Legters, then head of preventive medicine at the Uniformed Services Hospital, had been a special forces doctor in Vietnam, where he had treated the first reported case of drug-resistant malaria in 1964.[18] His exercise in Honolulu focused on the lack of international public health resources to manage a dangerous outbreak. The event had a primarily pedagogical purpose: to convince participants of the urgency of the problem of "emerging infectious disease."

The premise of the exercise was that a pandemic caused by a novel and horrifying virus—an "airborne Ebola"—had broken out among refugees in war-torn African republic. As the epidemic extended to humanitarian aid workers, initial public health response was tepid, and the disease spread rapidly to the United States, with devastating results. In their experience of the simulated disaster, participants in the exercise saw that there was no system in place to detect and contain such an outbreak if it occurred. After the exercise, Legters announced that "the outbreak has confirmed, in a very dramatic way, just how ill-prepared we are to detect global epidemic disease threats in a timely fashion, and, once detected, to respond appropriately" (Morse 1993:277).

Experts in attendance at the conference were alarmed. As journalist Laurie Garrett reported:

> "I found this scenario very realistic," said Dr. William Reeves, professor emeritus from the University of California at Berkeley and one of the world's experts on disease-carrying insect control. "You could take any disease as a model—Ebola, malaria, whatever—and it would reveal the same thing. We aren't ready. Where are the people? The expertise? The equipment? Some planning needs to be done on this." [1990]

Legters's exercise framed the closing chapter of Garrett's 1994 best seller, *The Coming Plague*. "What the war games revealed," she wrote, "was an appalling state of nonreadiness. Overall, the mood in Honolulu after five hours was grim, even nervous. The failings, weaknesses, and gaps in preparedness were enormous" (Garrett 1994:594).

The exercise was exemplary of the problematic of emerging infectious disease as it was articulated the late 1980s and early 1990s.[19] Also in 1989, virologist Stephen Morse and Nobel Prize winner Joshua Lederberg hosted a major conference on the topic, which led to the landmark volume, *Emerging Viruses* (Morse 1993). Participants in the conference warned of a dangerous intersection: On the one hand, there were a number of new disease threats, including emerging viruses such as AIDS and Ebola as well as newly drug resistant strains of diseases such as tuberculosis and malaria. On the other hand, public health systems had been left to decay, beginning in the late 1960s with the assumption that infectious disease had been conquered. Moreover, the emergence of dangerous new infectious diseases could be expected to continue, because of a number of global processes, such as increased travel, urbanization, civil wars and refugee crises, and environmental destruction.

In his contribution to *Emerging Viruses* epidemiologist D. A. Henderson argued that novel pathogen emergence was inevitable—that "mutation and change are facts of nature, that the world is increasingly interdependent, and that human health and survival will be challenged, ad infinitum, by new and mutant microbes, with unpredictable pathophysiological manifestations" (Morse 1993:283).[20] As a result, he said, "we are uncertain as to what we should keep under surveillance, or even what we should look for." What we need, Henderson concluded, is a system that can detect novelty: in the case of AIDS, such a detection system could have warned early of new virus and put measures in place to prevent its spread. He endorsed a system of global surveillance units to be run by the CDC, and located in periurban areas in major cities in the tropics, which could provide a "window on events in surrounding areas."

Legters also contributed to the volume, using the results of the exercise in Honolulu to make the case for a rejuvenation of the field of tropical medicine as the generation trained in WWII retired. He pointed to declining U.S. capability in epidemiology, diagnosis, and treatment of tropical disease. His chapter identified both the sources of the new disease threat, along the lines of Morse and Lederberg, and institutional responses that would be necessary to manage it: a global surveillance system to identify the outbreak; a laboratory system to characterize the agent; a reporting system to alert world health community; and academic training of a new generation of tropical disease experts.

Garrett's vision of the source of the problem was broader than that of scientists such as Lederberg or Henderson. On the one hand, she diagnosed a collapse of the public health system. Problems included discrepancies in capabilities between different health departments, widespread deficiencies in disease reporting systems, little staff for disease surveillance, and suffering health department laboratories. On the other hand, Garrett argued that global living conditions—poverty, civil war, lack of basic health care—were the true source of the emerging disease threat, and that these social problems would need to be addressed in order to provide security against emerging pathogens. She quoted former CDC director William Foege, who argued that new disease emergence was linked to "thirdworldization": the overall status of health care, immunizations, sanitation, education (Garrett 1994:609).[21] But in the ensuing policy discussions, this "population security" orientation to the threat of emerging disease was mostly overshadowed by a more narrow technical focus on developing a global system for detecting and managing outbreaks.

DISEASE AS A NATIONAL SECURITY THREAT

At this stage, "emerging infectious disease"—although widely taken up as a public health and biomedical issue—was not yet conceptualized as a problem of national security. This changed over the following decade, as the emerging infectious disease problematic combined with increased anxiety about bioterrorism. Scenario-based exercises were central to this process. In the mid-1990s, accounts began to circulate of a massive, secret Soviet bioweapons program that had continued throughout the Cold War, and that had employed scores of scientists whose whereabouts were now unknown.[22] D. A. Henderson was one of the prominent biomedical experts—along with Joshua Lederberg—who linked the new bioterrorist threat to the problem of emerging diseases.[23] Henderson argued that a global disease surveillance system would be useful for both types of threat—emerging diseases and proliferating bioweapons knowledge. In 1998, he founded the Johns Hopkins Center for Civilian Biodefense Studies, which became a leading site of knowledge production around the new biological threat.

The CDC developed a number of initiatives in response to the perceived bioterrorist threat—one of which was a program of global disease surveillance, following the prescriptions outlined by the authors of *Emerging Viruses.* Another was the Office of Bioterrorism Preparedness and Response, which provided $40 million per year in bioterrorism grants to local public health departments. However, critics such as Tara O'Toole of the Johns Hopkins Biodefense Center argued that these measures were not nearly enough (O'Toole 2001). The question was: how to convince policy makers of the need to address the problem? This threat was distinct from what public health experts were accustomed to dealing with: there was no historical record on which to estimate its likelihood of occurrence or to calculate the most effective intervention measures. Nor was infectious disease a problem that national security experts were accustomed to thinking about. What kind of experience could convey a sense of urgency and generate knowledge about necessary interventions?

With O'Toole's lead, the Johns Hopkins Biodefense Center entered into a collaboration with Kupperman's former think tank, the Center for Strategic and International Studies, to design a table-top exercise simulating a smallpox attack on the United States.[24] The exercise, called "Dark Winter," took place at Andrews Air Force Base in June 2001. It was aimed at influential national security experts and government officials. Participants played members of the National Security Council (NSC), including Sam Nunn as the President, David Gergen as National Security Advisor, and James Woolsey (reprising the role he had played in the Clinton

administration) as Director of the CIA. The exercise took place in three segments over two days, depicting a time span of two weeks after the initial attack. Although designers used historical data on the patterns of smallpox outbreaks to design the exercise, the point of using this epidemiological data was not to accurately model probability but, rather, to create a plausible scenario.[25]

The first NSC meeting laid out the situation for council members. There were reports of an outbreak of smallpox in Oklahoma City, assumed to be the result of a terrorist attack. Initial questions for the council were technical: "With only 12 million doses of vaccine available, what is the best strategy to contain the outbreak? Should there be a national or a state vaccination policy? Is ring vaccination or mass immunization the best policy?" The problem was that there was not enough information about the scale of the attack to come up with a solution. By the second meeting, the situation looked increasingly grim. "Only 1.25 million doses of vaccine remain, and public unrest grows as the vaccine supply dwindles," read the scenario. "Vaccine distribution efforts vary from state to state, are often chaotic, and lead to violence in some areas." International borders were closed, leading to food shortages. Meanwhile simulated 24-hour news coverage, shown to participants as video clips, sharply criticized the government's response. Graphic photographs of U.S. smallpox victims were also displayed.

As vaccine stock dwindled further, the prospect of using the National Guard to enforce containment was broached. But who had the authority to make emergency decisions? In one sequence, an NSC member advised the president to federalize the National Guard, as states had begun to seal their borders. Governor Keating of Oklahoma objected:

> Keating: "That's not your function."
>
> Terwillinger: "Mr. President, this question got settled at Appomattox. You need to federalize the National Guard."
>
> Nunn: "We're going to have absolute chaos if we start having war between the federal government and the state government."

Meanwhile civil unrest grew. "With vaccine in short supply, increasingly anxious crowds mob vaccination clinics," the scenario continued. "Riots around a vaccination site in Philadelphia left two dead. At another vaccination site, angry citizens overwhelmed vaccinators" (Johns Hopkins Center for Civilian Biodefense et al. 2001:24). By the third NSC meeting, there had been thousands of deaths, and the situation was growing still worse. The exercise ended as the disaster continued

to escalate: there was no vaccine remaining and none was expected for four weeks. CSIS Director John Hamre later narrated the final stage: "In the last 48 hours there were 14,000 cases. We now have over 1,000 dead, another 5,000 that we expected to be dead within weeks. There are 200 people who died from the vaccination, because there is a small percentage [of risk], and we have administered 12 million doses. . . . At this stage the medical system is overwhelmed completely" (U.S. House of Representatives 2001).

Political influence worked through a process of dissemination. At congressional hearings on the exercise, participants reported on their experience of Dark Winter. For example, Sam Nunn reflected on the debate over using the National Guard: "It is a terrible dilemma. Because you know that your vaccine is going to give out, and you know the only other strategy is isolation, but you don't know who to isolate. That is the horror of this situation." As Hamre said, "We thought that we were going to be spending our time with the mechanisms of government. We ended up spending our time saying, how do we save democracy in America? Because it is that serious, and it is that big."

The point of the exercise was to give national security officials a feeling of how an unprecedented event might unfold. Its circle of influence extended outward through a series of briefings featuring a realistic video of the event. Vice President Cheney, DHS Secretary Tom Ridge, and key congressional leaders were among those briefed. At a congressional hearing where the video was about to be shown, Representative Christopher Shays asked Hamre about its affective qualities:

> Mr. Shays: I'm told that some of it is not pleasant.
>
> Mr. Hamre: It is not pleasant. Let me also emphasize, sir, this is a simulation. This had frightening qualities of being real, as a matter of fact too real. And because we have television cameras here broadcasting, we want to tell everyone, this did not happen, it was a simulation. But, it had such realism, and we are going to try to show you the sense of realism that came from that today. [U.S. House of Representatives 2001]

Indeed, Shays did react strongly to the video, noting afterward how nervous he had felt while watching it:

> I felt like I've been in the middle of a movie, and maybe that's why I was anxious. I wanted to know how it turned out. And so I asked my staff how did we finally get a handle on it, you know, 12 million vaccines out, the disease spreading? And the response was we did not get a handle on it. They stopped the exercise before resolution. Kind of scary, huh?

The exercise was successful in that it convinced participants—and later briefing audiences—of the urgent need to plan for a bioattack. Keating was stunned at the lack of preparedness demonstrated by the exercise: "We think an enemy of the United States could attack us with smallpox or with anthrax . . . and we really don't prepare for it, we have no vaccines for it—that's astonishing." As Woolsey noted, this was a new type of enemy: "we are used to thinking about health problems as naturally occurring problems outside the framework of a malicious actor." With disease as tool of attack, "we are in a world we haven't ever really been in before."

The exercise demonstrated a number of vulnerabilities. First, officials did not have real-time understanding—"situational awareness"—of the various aspects of the crisis while it unfolded. As the scenario designers wrote, "this lack of information, critical for leaders' situational awareness in Dark Winter, reflects the fact that few systems exist that can provide a rapid flow of the medical and public health information needed in a public health emergency" (O'Toole et al. 2002:980). Second, without adequate stockpiles of medical countermeasures, leaders could not properly manage the crisis. Third, there was a gulf between public health and national security expertise: "It isn't just [a matter of] buying more vaccine," said Woolsey. "It's a question of how we integrate these public health and national security communities in ways that allow us to deal with various facets of the problem."

Participants had concrete suggestions for improvement. Nunn argued for vaccination of first responders in advance of an attack: "every one of those people you are trying to mobilize is going to have to be vaccinated. You can't expect them to go in there and expose themselves and their family to smallpox or any other deadly disease without vaccinations." Hauer, a former New York City emergency manager, spoke of the problem of distributing vaccines in cities: "The logistical infrastructure necessary to vaccinate the people of New York City, Los Angeles, Chicago is just—would be mind-boggling." But the broader lesson was the need to imaginatively enact the event in order to adequately to plan for it. As Hamre said, "We didn't have the strategy at the table on how to deal with this, because we have never thought our way through it before, and systematically thinking our way through this kind of a crisis is now going to become a key imperative. It clearly is going to require many more exercises."

TOWARD BIOPREPAREDNESS

The period from 2001 to 2005 witnessed a massive increase in U.S. civilian biodefense budgets, as part of the government's response to the attack of 9/11 and

the anthrax letters.[26] Until 2005, U.S. biological preparedness efforts were mainly focused on specific threat agents such as smallpox and anthrax. The outbreak of severe acute respiratory syndrome (SARS) in 2004, and increasing attention to the prospect of an avian influenza pandemic began to orient biosecurity experts toward a broader range of disease threats. The process was intensified by the failed governmental response to Hurricane Katrina. For thinkers of preparedness, Katrina served as a "live action" exercise demonstrating gaps in the nation's emergency response system. The disaster also suggested that although homeland security planners had been focused on the threat of terrorism, the problematic of emergency was much broader: the rubric of "all-hazards planning" that had originally structured federal emergency response returned to the fore (Lakoff 2007). Washington, D.C., was in what anthropologist Monica Schoch-Spana (2006) called a "post-Katrina, pre-pandemic" moment. As a member of the U.S. House of Representatives Homeland Security Committee said, "the pandemic flu scenario is affording us much more time to prepare, but as of today it appears that the nation is poised to repeat a grave error by not heeding the lessons learned from Katrina" (U.S. House of Representatives 2006b).

The problem of avian flu now appeared in a new light—in terms of the vulnerability of the nation's public health infrastructure. For Senator Richard Burr, chairman of the Subcommittee on Public Health Preparedness, Katrina "exposed an unstable public health infrastructure at all levels of government during an emergency event" (U.S. Senate 2006c). According to Burr, the challenge at hand was akin to the project of constructing the national highway infrastructure in the 1950s. "For the purpose of national public health and defense we need a national standardized public health system," he said. Such a system would have to do more than prepare for known threats: "The question is, are we smart enough to design a template that enables us to address the threats that we don't know about for tomorrow?"

What were the necessary elements of such a system for anticipating the unexpected? These could be seen through an analysis of current gaps in response. "There are multiple holes in our capacity to respond," said Representative Henry Waxman. "We need to increase our vaccine production capacity, strengthen our public health infrastructure, create adequate hospital surge capacity and draft contingency plans that will ensure the continued operation of important government functions" (U.S. House of Representatives 2006a). The task was to constitute the elements of a biological preparedness system, based on knowledge of current vulnerabilities.

According to many officials, the most serious problem Katrina had exposed was that of the locus of responsibility in an emergency situation. For some, the problem was the incompetence of federal leadership. For others, it was that local authorities were not up to the task of coordinating response. Former Homeland Security Advisor Richard Falkenrath argued that state and local health authorities would be incapable of coordinating an adequate response to a catastrophic disease event. The Health Department, he testified, "is simply not going to be able to meet the American people's expectation of the federal government in a truly catastrophic disease contingency such as a high lethal pandemic or major bioterrorist attack" (Falkenrath 2006). He was especially concerned about civil unrest resulting from "shortages in vital, life-saving counter-measures to the disease in question"—the premise of Dark Winter. Falkenrath focused on the logistics of medication distribution as the central problem: "I mean something very, very specific, which is to prepare to distribute life-saving medications to extremely large populations, very, very quickly, when they are afraid, because there is a communicable disease out there that they do not know how to deal with."

Falkenrath cited evidence from scenario-based exercises to validate his claim that government health agencies did not have the operational capabilities to distribute medical supplies in a crisis: "This extraordinary national deficiency was first revealed during the first TOPOFF exercise in May 2000 at which I was an observer," and "in a wide variety of smaller scale table top exercises and simulations." He continued: "The implication is inescapable: the plans, if put to the severe test of a catastrophic disease scenario in the near future, will fail." There was a clear policy implication: the National Response Plan should be amended to assign Emergency Support Function Number 8 (ESF#8) to the military in a catastrophic disease incident, at the order of the president: "Only the Department of Defense has the planning, logistics, and personnel resources needed to conduct nationwide medical relief operations in a full-scale catastrophic disease scenario." The scenario-based exercise thus functioned to authorize knowledge claims in the absence of actual events.

But such claims were not uncontested. Thus O'Toole drew a different lesson from Katrina: "What we have to do, and what the main point of planning is, as we have learned in all of the emergency preparedness done so far, is that we have to start talking with each other" (U.S. House of Representatives 2006b). She disagreed with Falkenrath about the role of the military: "I think it would be a big mistake to . . . plan to put DOD in charge whenever we have a big bad thing happening." Although it is necessary to "rethink federalism," she argued, the federal role is one

of creating infrastructure to enable local response: "What the feds have to do is create the capacity to plug in and that's where they ought to be focusing on. But I don't think we want the DOD to suddenly become everybody's responder in cases of dire need" (U.S. Senate 2006c).[27]

One thing that everyone seemed to agree on was that local health agencies should do more exercises. A representative of the American College of Emergency Physicians said: "We need to train the hospital and health care workers to more long-term pandemic scenarios. And then we need to take these lessons learned, the best practices and lessons learned, and disseminate" (U.S. House of Representatives 2006b). The Commissioner of Health of Duchess County, New York, testified: "I think over the last five years we've built the framework of a system that we can carry forward . . . but we need to strengthen that and continue to have strategic exercises community wide, not just public health departments, but every single community drill to include as many partners as possible so that we can learn from each other" (U.S. Senate 2006c). And a Virginia emergency health official said: "we have been working very closely with DHS in terms of developing metrics as well as with the CDC and DHHS, but we need to assure that we have the exercises and events to test our plans and that's really the test of preparedness. What we've done in Virginia is we've used every event as an opportunity to test our plans and we've had many" (U.S. Senate 2006c).

By the end of the year, Congress had moved to address the problem of biopreparedness in a more sustained, integrated way, with the passage of The Pandemic and All-Hazards Preparedness Act of 2006. Even critics of the prior year's plan hailed the bill's passage as a "milestone" piece of public health legislation (Mair et al. 2006). The Act included a range of measures, from the reorganization of federal health administration, to funding for local and state health agencies, the training of epidemiological investigators, and a novel biomedical research initiative. A key issue the Act sought to address was how to create an integrated "system" of biopreparedness, one that extended from disease detection to vaccine production to the relations among the various government agencies that would be charged with response. This system was focused not specifically on pandemic flu, but on a generic form of biological threat: the unpredictable but potentially catastrophic disease event.

There was general agreement among biopreparedness advocates that addressing this threat was not simply a matter of public health, but one of national security. Although the link between national security and public health was not in itself new, what was distinctive about these measures was the attempt to integrate

	Swine Flu (1976)	Pandemic Preparedness (2006)
Type of threat	Specific	Generic
Normative rationality	Prevention	Preparedness
Target	National population	Public health infrastructure
Form of knowledge	Risk calculation	Imaginative enactment
Technique of intervention	Mass vaccination	Capacity building

FIGURE 2. Swine flu versus pandemic preparedness.

the institutions, forms of knowledge, and techniques of intervention developed in the period of modern public health into a more general system of preparedness, in the context of a broader security problematic that focused on the vulnerability of the nation's vital systems.[28]

CONCLUSION

In closing, let me return to the comparison, outlined above, between the 1976 swine flu campaign and the "pandemic preparedness" measures enacted three decades later.[29] Along with the contrast in their scale, the two technopolitical responses differed profoundly in their approach to disease threat (see Figure 2). First, in the way of conceptualizing the threat to be managed: the 2005–06 measures were focused not only on the specific threat of a new and virulent strain of influenza, but at the generic "catastrophic disease threat." Second, the site of intervention differed: whereas the 1976 campaign was aimed at the national population using classical methods of public health, the later plans were aimed at multiple elements of the "public health infrastructure," both within the United States and globally, including disease surveillance capacity, the ability to produce and distribute countermeasures, and the administrative organization of response. And third, the prominent form of knowledge used to authorize expert claims about needed interventions had changed: rather than the statistical calculation of risk based on the historical incidence of disease, the emphasis of experts was on knowledge gathered through the imaginative enactment of singular events.

We can see in contrasting these two cases that a vital systems approach emerges at the limit point of population security—but that it is constrained in the type of problems it can treat. It is not that the two forms of security are necessarily in conflict or mutually exclusive: rather, vital systems security operates in reflexive relation

to population security, working to define its elements as a "critical infrastructure" whose vulnerabilities must be mitigated. However, if political attention focuses on vital systems security and not on population security, only certain types of problems become visible as possible targets of intervention. Whereas Laurie Garrett had pointed to global living conditions—such as poverty and the lack of a basic public health infrastructure—as a key source of the threat of emerging infectious disease, the eventual preparedness measures enacted in response to the threat of avian flu focused only on technical response to the potential outbreak. The ongoing living conditions of populations were outside the purview of a biopreparedness system.

ABSTRACT

This essay concerns the current intersection of national security and public health in the United States. It argues that over the course of the past three decades, a new way of thinking about and acting on the threat of infectious disease has coalesced: for public health and national security officials, the problem of infectious disease is no longer only one of prevention, but also—and perhaps even more—one of preparedness. The essay describes the process through which a norm of preparedness came to structure thought about threats to public health, and how a certain set of responses to these threats became possible. The story is a complex one, involving the migration of techniques initially developed in the military and civil defense to other areas of governmental intervention. The analysis is centered not on widespread public discussion of biological threats but, rather, on particular sites of expertise where a novel way of understanding and intervening in threats was developed and deployed. It focuses in particular on one technique, the scenario-based exercise, arguing that this technique served two important functions: first, to generate an affect of urgency in the absence of the event itself; and second, to generate knowledge about vulnerabilities in response capability that could then guide intervention. More broadly, the scenario-based exercise is exemplary of the rationality underlying the contemporary articulation of national security and public health.

Keywords: risk, security, public health, expertise, scenario planning

NOTES

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1. The speaker was Senator Herb Kohl, Democrat of Wisconsin.
2. For examples from the life sciences, see Rabinow and Dan-Cohen (2005), Sunder Rajan (2006), and Fortun (2001). For studies of financial and corporate futures, see Marcus (1998), Zaloom (2006), and Miyazaki (2006).
3. A good example is the role of army malaria prevention during WWII in the institutional history of the CDC.
4. Of course there were other, more visible actors in the U.S. government who did treat biological threats this way, for example in the lead-up to the Iraq War. For a discussion, see Cooper (2006).
5. The initial contrast is based on the distinction that Foucault draws between sovereignty and governmentality in his 1978 lectures to the Collège de France (Foucault 2007). The analytic terms I use here were developed in collaboration with Stephen J. Collier. For a discussion, see Collier and Lakoff (in press).
6. Its objects are similar to the kinds of threats Ulrich Beck (1999) describes as central to "world risk society." However, from the vantage of vital systems security, such threats do not lead to a politics of precaution; the task, rather, is to envision and plan for the occurrence of the potentially catastrophic event.
7. For the French case, see Delaporte (1989) and Rabinow (1996).
8. Rosen here cites the classic *Inquiry into the Sanitary Conditions of the Labouring Population of Great Britain.* Ian Hacking (1989) looks to this period to find the moment when "laws of sickness" were discovered, in part through the use of benefit societies' actuarial tables.
9. This account is based on Neustadt and Fineberg (1983). For a different vantage on the same series of events, see Silverstein (1981).
10. As CDC Director David Sencer later said: "Most people were at risk. . . . An epidemic spreading into a pandemic had to be considered as a possibility." From the vantage of preventive medicine, "something had to be done" (Neustadt and Fineberg 1983:25).
11. The memo would prove politically impossible to ignore, given the later possibility of a leak. A Ford advisor recalled discussing options at a meeting with the president, and thinking: "That memo's a gun to our head."
12. Salk saw the program as an "opportunity to fill part of the 'immunity gap.'"
13. At an ACIP meeting in Bethesda that month, virologist Alfred Sabin suggested stockpiling the vaccine. Again, Sencer countered that there was "no rational basis for a general 'stockpiling' concept": because of "jet spread," the flu would move too fast.
14. Neustadt and Fineberg (1983:77) write: "These questions defied actuaries. There was no experience. . . . They were in the business to spread risk, not take it."
15. The matter was settled by the outbreak of a fatal illness at the Legionnaires Convention in Philadelphia. Although the illness turned out not to be swine flu, alarm around the episode was enough to enable the passage of legislation requiring that vaccine liability claims be filed against the government rather than manufacturers.
16. Woolsey and Kupperman write: "Cooperative action during a crisis requires coordinated preparation beforehand with responsibilities clear for resolving differences concerning both the measures to be taken and the accounts to be charged" (1985:16).
17. For the Cold War history of scenario planning, see Ghamari-Tabrizi (2005) and Lakoff (2007).
18. Two years later Legters founded the Field Epidemiological Survey Team to track this strain of malaria in the midst of the war. See Mohr (2001).
19. As King (2002) has shown, this vision quickly found prominent adherents in medicine, the life sciences and journalism. One important report was: Institute of Medicine (1992). Garrett's *The Coming Plague* and Richard Preston's *The Hot Zone* both appeared in 1994.
20. See Fearnley (2005) for a detailed analysis.
21. Similarly, former CDC epidemiologist Joseph McCormick argued that "the links between poverty, lack of basic health care, ecological disturbances, and the emergence of dangerous microbes were so obvious as to be basic tenets of public health" (Garrett 1994:609).
22. The program was described by one of its leaders, Ken Alibek (1999), in *Biohazard* and by Judith Miller and her colleagues (Miller et al. 2001) in their best-selling *Germs.*

23. For a detailed account of the politics involved in persuading officials of the urgency of the bioterrorist threat during the 1990s, see Wright (2007).
24. A third organization, the ANSER Institute—run by a former Air Force colonel and specializing in scenario development—lent its technical expertise. Funding for "Dark Winter" was provided by the Oklahoma City National Institute for the Prevention of Terrorism. For an analysis of the use of scenarios in biosecurity planning, see Schoch-Spana (2004).
25. A critical question, for example, was the transmission rate assumed. The smallpox transmission rate fluctuates widely based on multiple contextual factors. To determine the rate for the exercise, the exercise developers analyzed 34 European cases of smallpox between 1958 and 1973—and chose the example of an outbreak in Yugoslavia example as their model (O'Toole et al. 2002). For an anthropological critique focusing on the historical and political context of the Yugoslav outbreak, see Barrett (2006).
26. Total U.S. government spending on civilian biodefense increased from $294.8 million in FY2001 to $7.6 billion in FY2005. See Lam et al. (2006).
27. In the end, the Department of Health and Human Services won this battle, as it was officially assigned ESF#8 in the summer of 2007. More broadly, it should be emphasized that there was not agreement among public health and national security officials on either the right prioritization of threats, or on the best means to prepare for them. See, for example, Cohen et al. (1999).
28. Despite such agreement, it should be noted, the actual implementation of biopreparedness initiatives was fraught with tension and unexpected difficulties. For some examples, see the chapters in Lakoff and Collier (2008).
29. Of course, the situation was not equivalent—in part because in 2006, awareness of the pandemic threat was caused by a vastly increased globally surveillance capacity. What is important to note is the predominance in 2006 of preparedness measures—including disease surveillance—that did not exist in 1976.

Editor's Note: *Cultural Anthropology* has published many essays on U.S. politics and culture. See, for example, Heather Paxson's "Post-Pasteurian Cultures: The Microbiopolitics of Raw-Milk Cheese in the United States" (2008), George Lipsitz's "Learning from New Orleans: The Social Warrant of Hostile Privatism and Competitive Consumer Citizenship" (2006), and Steven Gregory's "Race, Rubbish, and Resistance: Empowering Difference in Community Politics" (1993). For a list of *Cultural Anthropology* essays focused on the United States, see http://www.culanth.org/?q=node/27

Cultural Anthropology has also published a number of essays on the ways security is conceived and pursued. See Joseph Masco's essay "Survival Is Your Business: Engineering Ruins and Affect in Nuclear America" (2008), Hugh Gusterson's "Nuclear Weapons and the Other in the Western Imagination" (1999), and John Devine's "Can Metal Detectors Replace the Panopticon?" (1995).

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