

The Role of Internists During Epidemics, Outbreaks, and Bioterrorist Attacks

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Internists are well-positioned to play significant roles in recognizing and responding to epidemics, outbreaks, and bioterrorist attacks. They see large numbers of patients with various health problems and may be the patients' only interaction with the medical community for symptoms resulting from infectious diseases and injuries from radiation, chemicals, and/or burns. Therefore, Internists must understand early warning signs of different bioterrorist and infectious agents, proper reporting channels and measures, various ways that they can assist the public health response, and roles of different local, state, and federal agencies. In addition, it is important to understand effects of a public health disaster on clinic operations and relevant legal consequences.

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INTRODUCTION

During the past half decade, well-publicized events, including the anthrax mail attacks,¹ Hurricane Katrina,² and severe acute respiratory syndrome (SARS)^{3,4} have reminded us that epidemics, disease outbreaks, bioterrorist attacks, and natural disasters can occur. Although there is debate over when and how they may happen, there is little question that such events could have significant and far-reaching health, social, and economic consequences. Moreover, smaller outbreaks, such as influenza and West Nile Virus,⁵ occur with greater regularity. Internists can play vital roles in identifying, responding to, and containing bioterrorist attacks and disease outbreaks if they understand their role in these events.

Internists may be among the first to recognize clues that a problem is occurring, especially as initial signs and symptoms may be subtle or mimic common disorders, prompting victims to contact their primary care physicians, rather than go to emergency departments.⁶ Furthermore, Internists' broad range of medical knowledge, experience, and skills make them uniquely qualified to diagnose and treat a variety of potential health problems. Internists are also well-positioned to work with various health care personnel and services during a disaster.

Therefore, Internists must understand early warning signs of bioterrorist and infectious agents, proper reporting channels and measures, and ways that they can help contain and treat the consequences of epidemics, outbreaks, and attacks.

IDENTIFYING BIOTERRORIST ATTACKS, EPIDEMICS, OR OUTBREAKS

During its initial stages, an attack, epidemic, or outbreak may not be obvious. Depending on the agent and its mode of transmission, the population density, and the population's access to health care, it can be days or even weeks before anyone can recognize the problem. As the early response may be crucial in containing the problem and minimizing resultant morbidity and mortality, efforts have been made to develop biosurveillance systems to detect outbreaks and attacks.⁷⁻⁹ These systems collect pertinent data (e.g., pharmacy drug sales, emergency department visit chief complaints, and air samples) and search for irregularities that suggest a problem is occurring. However, these systems are by no means foolproof because they only look for a finite set of clues, do not cover every part of the United States, and may provide equivocal information. Moreover, there could be delays between the point that biosurveillance systems detect suspicious patterns and when the public health system responds. Therefore, Internists might be the first to become aware of a problem and pivotal in initiating the public health response.

Internists see large numbers of patients with various health problems and may be the patients' only interaction with the medical community for symptoms resulting from infectious diseases and injuries from radiation, chemicals, and/or burns. So they could be the first to report attacks or outbreaks and initiate public health response. Indeed, there are examples of "astute" clinicians being the first to recognize epidemic or bioterrorist attacks (e.g., the 1999 New York City West Nile outbreak,⁵ the 2001 anthrax attack cases,^{10,11} and the 2003 SARS epidemic in Vietnam¹²).

In some cases, bioterrorist and infectious agents cause distinctive signs and symptoms.^{13,14} For example, of the 10 inhalational anthrax cases in the 2001 attacks, all had fever, chills, lethargy, and chest x-ray abnormalities. Seven had mediastinal widening, and 8 had pleural effusions. All but 1 had elevated liver transaminases. A combination of these findings is highly suspicious for inhalational anthrax, especially in a young, otherwise healthy patient and/or when a patient initially experiences nonspecific influenza-like symptoms followed first by a brief period of apparent recovery, and then, by an abrupt resurgence of more severe symptoms.¹⁵

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However, in a majority of cases, early symptoms are vague and readily mistaken for more common upper respiratory infections (e.g., influenza, plague, tularemia, and staphylococcal enterotoxin B) or viral gastroenteritis (e.g., hepatitis A, cryptosporidium, and salmonella).

Therefore, in addition to looking for specific symptoms, Internists should remain vigilant about general trends and patient flow in their clinics.¹⁶ Any of the following may be the only sign that an attack or outbreak has occurred^{17,18}:

1. a sudden, unexplained, significant increase in the number of patients, especially when it occurs outside influenza or allergy season;
2. a disproportionate number of patients presenting with similar symptoms (e.g., the 1993 Milwaukee cryptosporidium outbreak¹⁹);
3. many patients coming from the same location (e.g., household, school, restaurant, or workplace) or participating in similar activities (e.g., evening outdoor activities in the 1999 New York City West Nile Virus outbreak⁵ and dining in the same restaurant in the 2003 Pennsylvania Hepatitis A outbreak²⁰);
4. patients reporting sick or dead animals (e.g., crows in West Nile Virus outbreaks^{21,22} and rabbits in tularemia outbreaks²³);
5. physicians or other clinic staff becoming ill after coming into contact with patients (e.g., the 2003 SARS epidemic⁴);
6. a patient's health rapidly deteriorates out of proportion to the presenting symptoms and diagnosis (e.g., a 30-year-old non-immunocompromised patient dying of pneumonia is rare);
7. an unusual number of patients fail to respond to treatments.

An Internist's index of suspicion should be even higher when bioterrorism or epidemic alerts are issued.

TREATMENT AND PROPHYLAXIS

Internists must be prepared to address a wide range of physical, psychological, and social consequences of public health disasters. Patients may be injured by either a public health disaster or the ensuing mass panic. In addition, Internists may have to function as emergency physicians when emergency departments are overcrowded or unavailable. Specifically, Internists must be prepared to:

1. treat the exposed and infected. Different organ systems can be affected (e.g., meningitis from inhalational anthrax, sepsis from typhoidal tularemia, and pneumonia from influenza), so complete examinations are important. Websites providing extensive treatment and prophylaxis information include the Center for Disease Control and Prevention (CDC) (<http://www.bt.cdc.gov/>), Food and Drug Administration (FDA) (<http://www.fda.gov/cder/drugprepare/default.htm>), Department of Health and Human Services (<http://www.hhs.gov/disasters/index.shtml>), and National Library of Medicine (<http://www.nlm.nih.gov/medlineplus/biodefenseandbioterrorism.html>);
2. administer prophylaxis to the exposed but not the infected. Determining exposure can be difficult as patients may claim that they have been exposed. In a large-scale

epidemic or attack, public health officials may set up temporary stations for mass vaccination and prophylaxis. However, many patients may still appear at clinics requesting prophylaxis;

3. triage who gets treated in a large outbreak/attack. Internists will have to prioritize who should receive treatment, especially when necessary resources and skilled manpower are limited. Knowing when and how to ration treatments can be challenging, particularly in chaotic conditions. Although Internists may feel compelled to acquiesce to every patient's needs, their primary responsibility in public health emergencies is the public.²⁴ While clear guidelines have not been established and rationing decisions are rather controversial, certain groups such as essential personnel (e.g., health care workers, police, fire fighters, and other individuals integral in responding to a public health disaster) should receive priority. Essential personnel are needed to prevent more casualties and fatalities and could spread contagious diseases to many other people;
4. treat mental health consequences. Public health disasters can result in significantly increased mental health problems including anxiety, depression, and posttraumatic stress disorders.²⁵⁻²⁸ Evidence suggests that even people who witness, hear, or read about a disaster can be affected.^{29,30} Shortages of mental health professionals in a disaster often require Internists to handle patients' mental health issues.³¹⁻³⁵
5. treat comorbidity exacerbations. Evidence suggests that undue environmental stresses can exacerbate comorbidities such as heart disease and respiratory disease.³⁶⁻⁴³ In addition, during public health disasters, patients with certain chronic diseases (e.g., diabetes and chronic obstructive pulmonary diseases) may not have adequate access to maintenance treatments.⁴⁴

PROPER REPORTING AND THE PUBLIC HEALTH AND LAW ENFORCEMENT CHAIN OF COMMAND

Figure 1 illustrates the public health chain of command. Internists suspecting an attack or epidemic should immediately inform the local or state health department and contain any possible threat in their clinics, especially if the agent is contagious. Providing information to wrong people (especially news media) may cause mass terror and delay the public health system's response. Therefore, Internists must remain calm, understand how their words can be misunderstood and misconstrued, follow instructions from appropriate health, military and law enforcement officials, and allow properly trained public health officials to deal with the media.

Local authorities are responsible for the initial response to any public health emergency with appropriate state agencies providing additional support when necessary. Depending on the nature and magnitude of the problem, local or state authorities may choose to involve federal agencies. Unlike naturally occurring disease outbreaks, bioterrorist attacks are criminal acts and require intervention of law enforcement agencies.⁴⁵

When there is a risk of contagious disease transmission across state lines or state efforts are deemed inadequate, the federal government assumes authority. The President makes executive decisions. The CDC administers federal quarantine

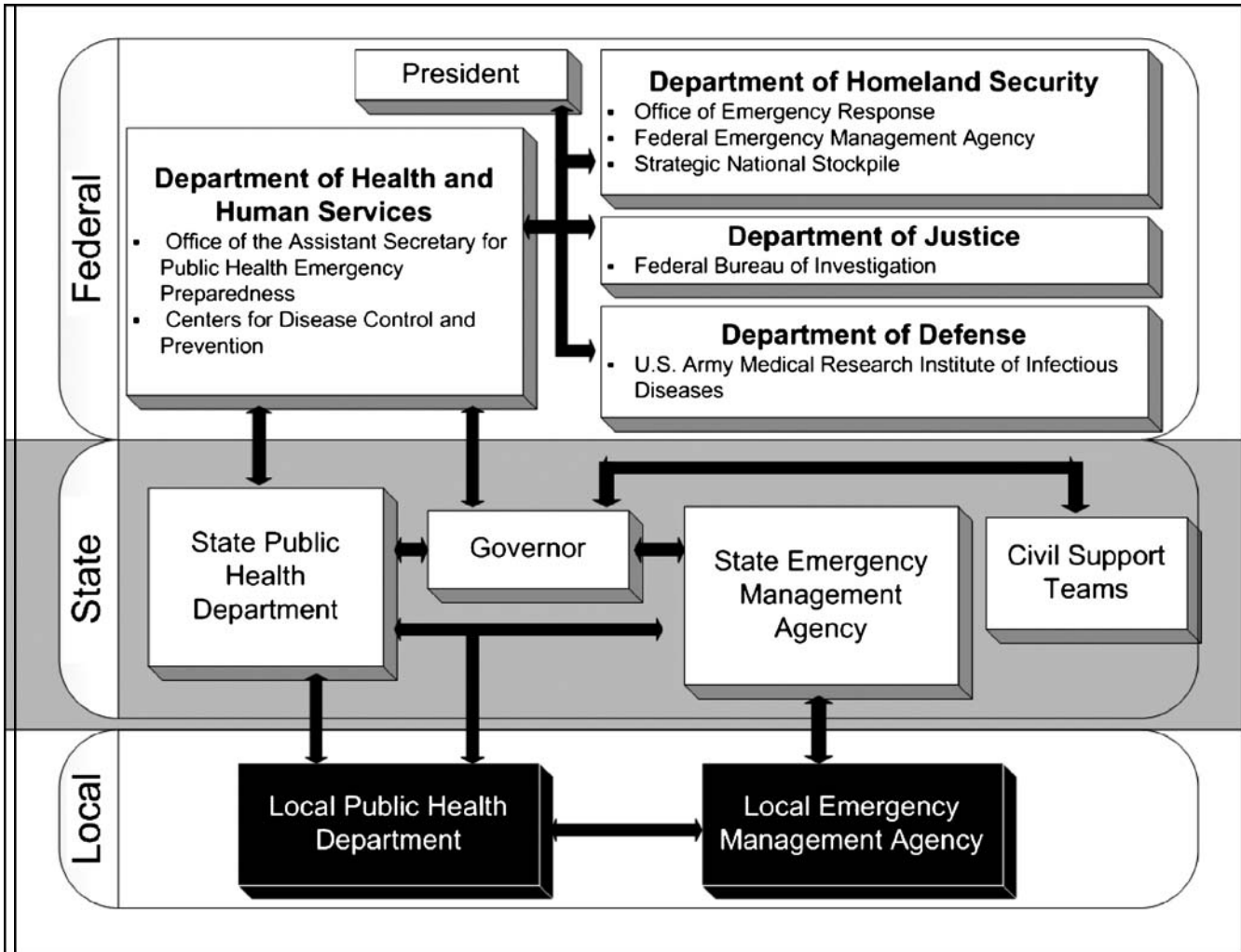


Figure 1. Chain of command and departments, agencies, and offices that may be involved in a bioterrorist attack or epidemic. Source: United States General Accounting Office (GAO). Adapted from GAO-03-373 State and Local Bioterrorism Preparedness.⁶²

actions. Implementation of order could involve the Department of Defense or the Federal Emergency Management Agency (FEMA). For travelers seeking to enter the United States, the CDC has the authority to enact quarantine. In areas where the CDC’s Division of Global Migration and Quarantine personnel are not stationed, the Immigration and Naturalization Service and the United States Customs Service personnel are trained to identify travelers with potential epidemic.

PRECAUTIONS AND LOCAL CONTAINMENT

It is essential that health care professionals adequately protect themselves. They are needed to care for both victims of an outbreak/attack and “regular” patients and can inadvertently spread communicable agents rather quickly, especially to vulnerable members of the population.^{46,47} One study examined clinicians’ knowledge regarding proper infection control practices during a bioterrorist event and found numerous deficiencies.⁴⁸

Standard precautions should be exercised for all situations. Internists should wash their hands frequently and be careful when handling body tissues and fluids. Certain diseases require additional precautions (Table 1). Contaminated clothing should be removed promptly and placed in sealed plastic bags. Soap and warm water can wash off most noncontagious agents.^{49,50} Bleach is needed for chemical decontamination. Any health care worker who receives a needle stick from a potentially bacteremic anthrax-infected patient should receive prophylactic antibiotics.

Although the words *quarantine* and *isolation* have been erroneously used interchangeably, quarantine means the separation and confinement of currently healthy people who may have been exposed to a contagious disease, while isolation refers to the separation and confinement of people known or suspected to be infected with the contagious disease. When an infectious disease is confined to a specific locale, the authority to order quarantines usually rests with local or state public health officials. When the event spreads across jurisdictional boundaries within the state, such authority usually is relin-

Table 1. Bioterrorist agents as categorized by the Centers for Disease Control and prevention (CDC) and required precautions

Agent	Standard precautions	Contact precautions (i.e., gowns and gloves)	Airborne precautions (i.e., negative pressure room and N95 masks for all entering the room)	Droplet precautions (i.e., surgical masks)
Category A agents				
Anthrax	*			
Botulism (<i>Clostridium botulinum</i> toxin)	*			
Plague (<i>Yersinia pestis</i>)	*			*
Smallpox (<i>variola major</i>)	*	*	*	
Tularemia (<i>Francisella tularensis</i>)	*			
Viral hemorrhagic fevers [filoviruses e.g., <i>Ebola</i> , <i>Marburg</i>] and arenaviruses (e.g., <i>Lassa</i> , <i>Machupo</i>)	*	*	If cough, vomiting, diarrhea or hemorrhage*	Surgical mask and eye protection if within 3 feet of patient*
Category B agents				
Brucellosis (<i>Brucella</i> species)	*	If draining lesions*		
Epsilon toxin of <i>Clostridium perfringens</i>	*			
Food safety threats (e.g., <i>Salmonella</i> species, <i>Escherichia coli</i> O157:H7, <i>Shigella</i>)	*			
Glanders (<i>Burkholderia mallei</i>)	*	If skin involvement*		
Melioidosis (<i>Burkholderia pseudomallei</i>)	*			
Psittacosis (<i>Chlamydia psittaci</i>)	*			
Q fever (<i>Coxiella burnetii</i>)	*			
Ricin toxin from <i>Ricinus communis</i> (castor beans)	*			
<i>Staphylococcal enterotoxin B</i>	*			
Typhus fever (<i>Rickettsia prowazekii</i>)	*			
Viral encephalitis [alphaviruses (e.g., <i>Venezuelan equine encephalitis</i> , <i>eastern equine encephalitis</i> , <i>western equine encephalitis</i>)]	*			
Water safety threats (e.g., <i>Vibrio cholerae</i> , <i>Cryptosporidium parvum</i>)	*	Only if patient is diapered or incontinent*		
Category C agents				
Emerging infectious diseases such as <i>Nipah virus</i> and <i>hantavirus</i>	*			

Sources: City of Philadelphia Department of Public Health, Division of Disease Control, Summary of Biological Warfare Agents, and Saint Louis University, School of Public Health Center for the Study of Bioterrorism and Emerging Infections.

*Precaution is required.

quished to the state. There is great variability in quarantine regulations from state to state.⁵¹

CLINIC OPERATIONS

Clinic patient volume can increase significantly from ill patients and concerned healthy patients (the “worried well”). This “worried well” phenomenon was seen after the 2001 Anthrax attacks.^{52,53} Internists will have to offer reassurance to the “worried well,” relay appropriate disease information, and direct them to the right public health agencies and relevant websites (e.g., Fig. 1 and websites listed in “Treatment and Prophylaxis”) for information and mass prophylaxis (if needed).⁵⁴ Clinics should minimize potentially contagious patients’ contact with health care workers and other patients by either temporal segregation (clustering potentially contagious patients later in the day) or spatial segregation (shunting potentially contagious patients towards specific rooms). Therefore, clinic schedulers and telephone operators should be aware of the signs and symptoms that suggest a patient is contagious.⁵⁵

Proper triaging is necessary. Minor issues and complaints may have to wait, but urgent problems must be addressed. The clinic will not operate with normal efficiency. Health care

workers may become ill or be absent. Running additional tests, notifying authorities, taking on and off personal protective equipment, rearranging the clinic, and decontaminating rooms will cause operational delays.

Clinics that routinely run at peak capacity could become overwhelmed, especially if the clinic staff themselves become ill. Every clinic should have clearly established contingency plans and build an extra capacity that can handle unexpected surges in patients.⁵⁶ Specifically clinics will need:

1. additional rooms to place and examine patients. Clinics should identify other patient areas (e.g., procedure, radiology, and operating rooms) that can be converted into examination rooms. Rooms not normally used for patients (e.g., offices or conference rooms) may be utilized if they meet basic requirements for patients who do not require isolation. Mobile clinics and hospitals may be available⁵⁷;
2. additional health care professionals and staff. Clinics should know where and how to reach additional personnel who are cross-trained to handle a wide range of responsibilities in an emergency;
3. diversion plans. When a clinic is overwhelmed, it must know when to close to additional patients and where to send them.

LEGAL BARRIERS AND CONCERNS

Anytime medical treatment is administered, legal concerns come into play. Public health disasters are no exception. In a mass casualty setting, the ability to mount an adequate response may be hindered by the myriad of rules and regulations that govern the everyday practice of medicine. Laws vary from state to state, so Internists should be aware of their state's specific regulations. Unfortunately, many states have not yet adequately addressed or clarified medico-legal issues and regulations in public health disasters.⁴⁵ Some of these include:

1. licensing and admitting privileges. Internists willing to provide assistance may not be licensed in that state, have appropriate admitting privileges, or have the time or means to complete the necessary paperwork before administering treatment. Some states (e.g., Colorado) have introduced statutes that ease some regulatory barriers by providing protection to health care workers during a public health disaster, such as allowing physicians to administer care even though they are not licensed in that state;
2. malpractice liability. While states do have "Good Samaritan" laws that offer some legal protection to physicians who aid strangers in "good faith," the extent of these laws varies from state to state and currently do not cover all potential eventualities. "Good Samaritan Laws" may not apply when treatment is administered against a patient's will.⁵⁸
3. maintaining patient confidentiality. Bioterrorist attacks and epidemics require physicians to quickly transmit patient and case information to other health care personnel and appropriate authorities. While such communication is paramount, efforts should be made to maintain patient confidentiality and transmit only necessary information. At present, it is unclear how Health Insurance Portability and Accountability Act (HIPAA) regulations would affect the public health and health care system response. In a public health emergency, the HIPAA Privacy Rule does allow disclosure of the following protected health information (PHI): for treatment by health care providers; to avert a serious threat to health or safety; to public health authorities for public health purposes; to protect national security; to law enforcement under certain conditions; and for judicial or administrative proceedings.^{59,60} However, during an emergency, misunderstandings of the Privacy Rule's requirements may hinder the flow of PHI.⁶¹

SUMMARY

As Internists could play a vital role in epidemics, disease outbreaks, or bioterrorist attacks, they must be knowledgeable, equipped, and prepared. In an emergency, potential legal and administrative barriers should be eased. Clinics should have appropriate contingency plans. Although the risk of large-scale attacks and epidemics seems low, the risk of smaller epidemics and local public health emergencies is much higher. Preparing for large events will help prepare for such smaller events.

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REFERENCES

1. **Borio L, Frank D, Mani V, et al.** Death due to bioterrorism-related inhalational anthrax: report of 2 patients. *JAMA*. 2001;286(20):2554-9.
2. **Heilpern KL, Borg K.** Update on emerging infections: news from the Centers for Disease Control and Prevention. Vibrio illness after Hurricane Katrina—multiple states, August–September 2005. *Ann Emerg Med*. 2006;47(3):255-8.
3. **Gerberding JL.** Faster... but fast enough? Responding to the epidemic of severe acute respiratory syndrome. *N Engl J Med*. 2003;348(20):2030-1.
4. **Lee N, Hui D, Wu A, et al.** A major outbreak of severe acute respiratory syndrome in Hong Kong. *N Engl J Med*. 2003;348(20):1986-94.
5. **Nash D, Mostashari F, Fine A, et al.** The outbreak of West Nile virus infection in the New York City area in 1999. *N Engl J Med*. 2001;344(24):1807-14.
6. **Blendon RJ, DesRoches CM, Benson JM, Herrmann MJ, Taylor-Clark K, Weldon KJ.** The public and the smallpox threat. *N Engl J Med*. 2003;348(5):426-32.
7. **O'Connor MJ, Buckeridge DL, Choy M, Crubezy M, Pincus Z, Musen MA.** BioSTORM: a system for automated surveillance of diverse data sources. *AMIA Annu Symp Proc*. 2003:1071.
8. **Tsui FC, Espino JU, Wagner MM, et al.** Data, network, and application: technical description of the Utah RODS Winter Olympic Biosurveillance System. *Proc AMIA Symp*. 2002:815-9.
9. **Burkom HS, Elbert Y, Feldman A, Lin J.** Role of data aggregation in biosurveillance detection strategies with applications from ESSENCE. *MMWR Morb Mortal Wkly Rep*. 2004;53(suppl):67-73.
10. Anthrax case timeline. *J Health Commun*. 2003;8(suppl 1):1-2.
11. **Bush LM, Abrams BH, Beall A, Johnson CC.** Index case of fatal inhalational anthrax due to bioterrorism in the United States. *N Engl J Med*. 2001;345(22):1607-10.
12. **Reilley B, Van Herp M, Sermand D, Dentico N.** SARS and Carlo Urbani. *N Engl J Med*. 2003;348(20):1951-2.
13. Emergency preparedness and response. Atlanta, GA: Centers for Disease Control and Prevention; 2006.
14. **Hupert N, Bearman GM, Mushlin AI, Callahan MA.** Accuracy of screening for inhalational anthrax after a bioterrorist attack. *Ann Intern Med*. 2003;139(5 Pt 1):337-45.
15. **Inglesby TV, O'Toole T, Henderson DA, et al.** Anthrax as a biological weapon, 2002: updated recommendations for management. *JAMA*. 2002;287(17):2236-52.
16. **Karwa M, Bronzert P, Kvetan V.** Bioterrorism and critical care. *Crit Care Clin*. 2003;19(2):279-313.
17. NATO Handbook on the medical aspects of NBC defensive operations AmedP-6; Part II biological FM 8-9. Washington (DC): Departments of the Army, the Navy, and the Air Force, 1996.
18. **English J, Cundiff M, Malone J, et al.** APIC Bioterrorism Task Force and CDC Hospital Infections Program Bioterrorism Working Group bioterrorism readiness plan: a template for healthcare facilities. April 1999.
19. **Mac Kenzie WR, Hoxie NJ, Proctor ME, et al.** A massive outbreak in Milwaukee of cryptosporidium infection transmitted through the public water supply. *N Engl J Med*. 1994;331(3):161-7.
20. **Wheeler C, Vogt TM, Armstrong GL, et al.** An outbreak of hepatitis A associated with green onions. *N Engl J Med*. 2005;353(9):890-7.
21. **Eidson M, Komar N, Sorhage F, et al.** Crow deaths as a sentinel surveillance system for West Nile virus in the northeastern United States, 1999. *Emerg Infect Dis*. 2001;7(4):615-20.
22. **Eidson M, Miller J, Kramer L, Cherry B, Hagiwara Y.** Dead crow densities and human cases of West Nile virus, New York State, 2000. *Emerg Infect Dis*. 2001;7(4):662-4.

23. Tularemia transmitted by insect bites—Wyoming, 2001–2003. *MMWR Morb Mortal Wkly Rep.* 2005;54(7):170–3.
24. **Lo B, Katz MH.** Clinical decision making during public health emergencies: ethical considerations. *Ann Intern Med.* 2005;143(7):493–8.
25. **Thienkrua W, Cardozo BL, Chakkraband ML, et al.** Symptoms of posttraumatic stress disorder and depression among children in tsunami-affected areas in southern Thailand. *JAMA.* 2006;296(5):549–59.
26. **van Griensven F, Chakkraband ML, Thienkrua W, et al.** Mental health problems among adults in tsunami-affected areas in southern Thailand. *JAMA.* 2006;296(5):537–48.
27. Morbidity surveillance after Hurricane Katrina—Arkansas, Louisiana, Mississippi, and Texas, September 2005. *MMWR Morb Mortal Wkly Rep.* 2006;55(26):727–31.
28. **Brackbill RM, Thorpe LE, DiGrande L, et al.** Surveillance for World Trade Center disaster health effects among survivors of collapsed and damaged buildings. *MMWR Surveill Summ.* 2006;55(2):1–18.
29. **Pfefferbaum B, Seale TW, Brandt EN, Jr., Pfefferbaum RL, Doughty DE, Rainwater SM.** Media exposure in children one hundred miles from a terrorist bombing. *Ann Clin Psychiatry.* 2003;15(1):1–8.
30. **Pfefferbaum B, Seale TW, McDonald NB, et al.** Posttraumatic stress two years after the Oklahoma City bombing in youths geographically distant from the explosion. *Psychiatry.* 2000;63(4):358–70.
31. **Trude S, Stoddard JJ.** Referral gridlock: primary care physicians and mental health services. *J Gen Intern Med.* 2003;18(6):442–9.
32. **Tsao JC, Dobalian A, Wiens BA, Gyls JA, Evans GD.** Posttraumatic stress disorder in rural primary care: improving care for mental health following bioterrorism. *J Rural Health.* 2006;22(1):78–82.
33. **Yehuda R, Hyman SE.** The impact of terrorism on brain, and behavior: what we know and what we need to know. *Neuropsychopharmacology.* 2005;30(10):1773–80.
34. **Compton MT, Cibulas BK, Gard B, et al.** Incorporating community mental health into local bioterrorism response planning: experiences from the DeKalb County Board of Health. *Commun Ment Health J.* 2005;41(6):647–63.
35. **Compton MT, Kotwicky RJ, Kaslow NJ, Reissman DB, Wetterhall SF.** Incorporating mental health into bioterrorism response planning. *Public Health Rep.* 2005;120 Suppl 1:16–9.
36. **Strike PC, Steptoe A.** Behavioral and emotional triggers of acute coronary syndromes: a systematic review and critique. *Psychosom Med.* 2005;67(2):179–86.
37. **Leor J, Poole WK, Kloner RA.** Sudden cardiac death triggered by an earthquake. *N Engl J Med.* 1996;334(7):413–9.
38. **Kloner RA, Leor J, Poole WK, Perritt R.** Population-based analysis of the effect of the Northridge Earthquake on cardiac death in Los Angeles County, California. *J Am Coll Cardiol.* 1997;30(5):1174–80.
39. **Matsuoka T, Yoshioka T, Oda J, et al.** The impact of a catastrophic earthquake on morbidity rates for various illnesses. *Public Health.* 2000;114(4):249–53.
40. **Ruidavets JB, Paterniti S, Bongard V, Giroux M, Cassadou S, Ferrieres J.** Triggering of acute coronary syndromes after a chemical plant explosion. *Heart.* 2006;92(2):257–8.
41. **Woerschling JC, Snyder AE.** Earthquakes in El Salvador: a descriptive study of health concerns in a rural community and the clinical implications, part I. *Disaster Manag Response.* 2003;1(4):105–9.
42. **Woerschling JC, Snyder AE.** Earthquakes in El Salvador: a descriptive study of health concerns in a rural community and the clinical implications: Part III—Mental health and psychosocial effects. *Disaster Manag Response.* 2004;2(2):40–5.
43. **Woerschling JC, Snyder AE.** Earthquakes in El Salvador: a descriptive study of health concerns in a rural community and the clinical implications—part II. *Disaster Manag Response.* 2004;2(1):10–3.
44. **Joshi SR.** Tsunami induced hyperglycemia and diabetes mortality—two studies from south India. *J Assoc Phys India.* 2006;54:105–6.
45. **Hoffman RE.** Preparing for a bioterrorist attack: legal and administrative strategies. *Emerg Infect Dis.* 2003;9(2):241–5.
46. **Stott DJ, Kerr G, Carman WF.** Nosocomial transmission of influenza. *Occup Med (Lond).* 2002;52(5):249–53.
47. **Yassi A, Moore D, Fitzgerald JM, Bigelow P, Hon CY, Bryce E.** Research gaps in protecting healthcare workers from SARS and other respiratory pathogens: an interdisciplinary, multi-stakeholder, evidence-based approach. *J Occup Environ Med.* 2005;47(1):41–50.
48. **Gershon RR, Qureshi KA, Sepkowitz KA, Gurtman AC, Galea S, Sherman MF.** Clinicians' knowledge, attitudes, and concerns regarding bioterrorism after a brief educational program. *J Occup Environ Med.* 2004;46(1):77–83.
49. **Weber DJ, Sickbert-Bennett E, Gergen MF, Rutala WA.** Efficacy of selected hand hygiene agents used to remove *Bacillus atrophaeus* (a surrogate of *Bacillus anthracis*) from contaminated hands. *JAMA.* 2003;289(10):1274–7.
50. **Boyce JM, Pittet D.** Guideline for Hand Hygiene in Health-Care Settings. Recommendations of the Healthcare Infection Control Practices Advisory Committee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. Society for Healthcare Epidemiology of America/Association for Professionals in Infection Control/Infectious Diseases Society of America. *MMWR Recomm Rep.* 2002;51(RR-16):1–45, quiz CE1-4.
51. **Gostin LO.** Controlling the resurgent tuberculosis epidemic. A 50-state survey of TB statutes and proposals for reform. *JAMA.* 1993;269(2):255–61.
52. **Blendon RJ, Benson JM, DesRoches CM, Pollard WE, Parvanta C, Herrmann MJ.** The impact of anthrax attacks on the American public. *MedGenMed.* 2002;4(2):1.
53. **Hall MJ, Norwood AE, Ursano RJ, Fullerton CS.** The psychological impacts of bioterrorism. *Biosecur Bioterror.* 2003;1(2):139–44.
54. **Evans RG, Crutcher JM, Shadel B, Clements B, Bronze MS.** Terrorism from a public health perspective. *Am J Med Sci.* 2002;323(6):291–8.
55. **Hotchkiss JR, Strike DG, Crooke PS.** Pathogen transmission and clinic scheduling. *Emerg Infect Dis.* 2006;12(1):159–62.
56. **Tsai MC, Arnold JL, Chuang CC, Chi CH, Liu CC, Yang YJ.** Impact of an outbreak of severe acute respiratory syndrome on a hospital in Taiwan, ROC. *Emerg Med J.* 2004;21(3):311–6.
57. **Voelker R.** Mobile hospital raises questions about hospital surge capacity. *JAMA.* 2006;295(13):1499–503.
58. **Curran WJ.** Legal history of emergency medicine from medieval common law to the AIDS epidemic. *Am J Emerg Med.* 1997;15(7):658–70.
59. **Bruce J.** Bioterrorism meets privacy: an analysis of the Model State Emergency Health Powers Act and the HIPAA privacy rule. *Ann Health Law.* 2003;12(1):75–120, table of contents.
60. HIPAA privacy rule and public health. Guidance from CDC and the U.S. Department of Health and Human Services. *MMWR Morb Mortal Wkly Rep.* 2003;52(suppl:1-17), 19–20.
61. **Hodge JG, Jr., Brown EF, O'Connell JP.** The HIPAA privacy rule and bioterrorism planning, prevention, and response. *Biosecur Bioterror.* 2004;2(2):73–80.
62. Bioterrorism preparedness varied across state and local jurisdictions. GAO-03-373 ed. Vol. 2006. Washington, DC: United States General Accounting Office; April 2003.