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Recognition of Illness Associated with the Intentional Release of a Biologic Agent

Summary

On September 11, 2001, following the terrorist incidents at the World Trade Center and the Pentagon, the Centers for Disease Control and Prevention (CDC) recommended heightened surveillance for any unusual disease occurrence or increased numbers of illnesses that might be associated with the terrorist attacks. Subsequently, cases of anthrax have demonstrated the risks associated with intentional release of biologic agents. Healthcare providers, clinical laboratory personnel, infection control professionals, and health departments play critical and complementary roles in recognizing and responding to illnesses caused by intentional release of biologic agents. This issue of the *Bulletin* provides guidance about recognizing illnesses or patterns of clinical syndromes that might be associated with intentional release of a biologic agent and provides reference materials on biologic agents of concern. Much of this article is adapted from the October 19, 2001, issue of *Morbidity and Mortality Weekly Report*.[1]

Introduction

Since the attacks on September 11, and the intentional release of *Bacillus anthracis* through the United States Postal Service, the nation's public health system has been on heightened alert for other potential acts of terrorism. Public health agencies across the country have taken the necessary action to notify health care providers to be on the alert for any possible unusual disease occurrence or increased numbers of illness that might be associated with biologic agents.

In Virginia, the health department is working closely with hospitals to monitor the volume of patient encounters and the occurrence of specific disease syndromes. We are looking at naturally occurring illnesses and any other reports of unusual or ill-defined clinical presentations.

In the absence of adequate measures to predict or prevent acts of terrorism, early detection is critical to minimizing the consequences related to the deliberate release of a biologic agent. Increased vigilance for the detection of unexplained illnesses and disease clusters is essential. Therefore, it is necessary that health care providers, especially those who may be the first to examine and treat victims, become familiar with the syndromes associated with the critical agents (Table 1, adapted from materials from the California State and Local Health Department Bioterrorism Surveillance and Epidemiology Working Group, 2001).

Critical Biologic Agents and Clinical Characteristics

CDC defines three categories of biologic agents with potential to be used as weapons based on ease of dissemination or transmission, potential for major public health impact (e.g., high mortality), potential for public panic and social disruption, and requirements for public health preparedness.[2] Agents of highest concern are *Bacillus anthracis* (anthrax), *Yersinia pestis* (plague), variola major (smallpox), *Clostridium botulinum* toxin (botulism), *Francisella tularensis* (tularemia), filoviruses (Ebola hemorrhagic fever, Marburg hemorrhagic fever); and arenaviruses (Lassa [Lassa fever], Junin [Argentine hemorrhagic fever], and related viruses). The following summarizes the clinical features of these agents.[3-6]

Anthrax. A nonspecific prodrome (i.e., fever, dyspnea, cough, and chest discomfort) follows inhalation of infectious spores. Respiratory failure and hemodynamic collapse ensue approximately 2 - 4 days after initial symptoms. Signs of inhalational anthrax also might include thoracic edema and a widened mediastinum on chest radiograph or CT scan. Gram-positive bacilli can grow on blood culture, usually 2 - 3 days after onset of illness. Cutaneous anthrax follows deposition of the organism onto broken or abraded skin, occurring particularly on exposed areas of the hands, arms, or face. An area of local edema becomes a pruritic macule or papule, which enlarges and ulcerates after 1 - 2 days. Small, 1 - 3 mm vesicles may surround the ulcer. A painless, depressed, black

In This Issue:

eschar usually with surrounding local edema subsequently develops. The syndrome also may include lymphangitis and painful lymphadenopathy.

Plague. Clinical features of pneumonic plague include fever, cough with muco-purulent sputum (gram-negative rods may be seen on gram stain), hemoptysis, and chest pain. A chest radiograph will show evidence of bronchopneumonia.

Botulism. Clinical features include symmetric cranial neuropathies (e.g., ptosis, dysphagia, and dysphasia), blurred vision or diplopia, symmetric descending weakness in a proximal to distal pattern, and respiratory dysfunction from respiratory muscle paralysis or upper airway obstruction without sensory deficits. Inhalational botulism would have a similar clinical presentation as foodborne botulism; however, the gastrointestinal symptoms that accompany foodborne botulism may be absent.

Smallpox (variola). The early acute clinical symptoms of smallpox resemble other acute viral illnesses such as influenza, beginning with a 2 - 4 day nonspecific prodrome of fever and myalgias before rash onset. Several clinical features can help clinicians differentiate varicella (chickenpox) from smallpox. The rash of varicella is most prominent on the trunk and develops in successive groups of lesions over several days, resulting in lesions in various stages of development and resolution. In comparison, the vesicular/pustular rash of smallpox is typically most prominent on the face and extremities, and lesions develop at the same time.

Inhalational tularemia. Inhalation of *F. tularensis* causes an abrupt onset of an acute, nonspecific febrile illness beginning 3 - 5 days after exposure, with pleuropneumonitis developing in a substantial proportion of cases during subsequent days.[7]

Hemorrhagic fever (such as would be caused by Ebola or Marburg viruses). After an incubation period of usually 5 - 10 days (range: 2 - 19 days), illness is characterized by abrupt onset of fever, myalgia, and headache. Other signs and symptoms include nausea and vomiting, abdominal pain, diarrhea, chest pain, cough, and pharyngitis. A maculopapular rash, prominent on the trunk, develops in most patients approximately 5 days after onset of illness. Bleeding manifestations, such as petechiae, ecchymoses, and hemorrhages, occur as the disease progresses.[8]

Front Line Responders

Health-Care Providers

Health-care providers should be alert to illness patterns and diagnostic clues that might indicate a single case of an unusual infectious disease associated with intentional release of a biologic agent and should report any clusters or findings to their local or state health department. Delays in the recognition and subsequent reporting of suspected bioterrorist events could affect the health of many. The covert release of a biologic agent may not have an immediate impact because of the delay between exposure and illness onset, and outbreaks associated with intentional releases might closely resemble naturally occurring outbreaks. Indications of intentional release of a biologic agent include:

1) a large number of persons presenting with clinical signs and symptoms that suggest an infectious disease outbreak (e.g., ≥2 patients presenting with an unexplained febrile illness associated with sepsis, pneumonia, respiratory failure, or rash, especially if occurring in otherwise healthy persons);

2) an unusual temporal or geographic clustering of illness;

3) an unusual age distribution for common diseases (e.g., an increase in what appears to be a chickenpox-like illness among adult patients, but which might be smallpox); and

4) an unusual pattern of death or illness among animals that precedes or accompanies death or illness in humans.

Clinical Laboratory Personnel

Although unidentified gram-positive bacilli growing on agar may be considered as contaminants and discarded, CDC recommends that these bacilli be treated as a "finding" when they occur in a suspicious clinical situation (e.g., febrile illness in a previously healthy person). The laboratory should attempt to characterize the organism by determining motility, sensitivity to penicillin, absence of hemolysis on sheep blood agar and conducting other appropriate biochemical tests to identify species.

An unusually high number of samples, particularly from the same biologic medium (e.g., blood and stool cultures), may alert laboratory personnel to an outbreak. In addition, central laboratories that receive clinical specimens from several sources should be alert to increases in demand or unusual requests for culturing (e.g., uncommon biologic specimens such as cerebrospinal fluid or pulmonary aspirates).

When collecting or handling clinical specimens, laboratory personnel should:

1) use Biological Safety Level II (BSL-2) or Level III (BSL-3) facilities and practices when working with clinical samples considered potentially infectious;

2) handle all specimens in a BSL-2 laminar flow hood with protective eyewear (e.g., safety glasses or eye shields), use closed-front laboratory coats with cuffed sleeves, and stretch the gloves over the cuffed sleeves;

3) avoid any activity that places persons at risk for infectious exposure, especially activities that might create aerosols or droplet dispersal;

4) decontaminate laboratory benches after each use and dispose of supplies and equipment in proper receptacles;

5) avoid touching mucosal surfaces with their gloved or ungloved hands, and never eat or drink in the laboratory; and

6) remove and dispose of their gloves in a biohazard container, wash their hands, and remove their laboratory coat before leaving the laboratory.

When a laboratory is unable to identify an organism in a clinical specimen, the specimen should be sent to the state laboratory where the agent can be characterized. Any clinical specimens suspected to contain variola virus (smallpox) should be reported to local and state health authorities immediately and then transported to CDC. All variola diagnostics should be conducted at CDC laboratories.

continued on page 6

Index to Volume 101 (by Issue Number)

Table 1. Bioterrorism Syndromes Quick Reference Chart

If you suspect disease from a potential bioterrorism event, please contact your local health department immediately.

Syndrome	Bioterrorism threat disease description	Differential diagnosis	Initial laboratory & other diagnostic test results	Immediate public health & infection control actions
Acute Respiratory Distress with Fever	**Inhalational Anthrax** Abrupt onset of fever, chest pain, respiratory distress without radiographic findings of pneumonia; no history of trauma or chronic disease; progression to shock and death within 24-36 hours.	Dissecting aortic aneurysm, pulmonary embolism, influenza, tularemia	Chest x-ray or CT scan with widened mediastinum, possible pleural effusion; gram-positive bacilli in sputum or blood; definitive testing available at the Virginia State Division of Consolidated Laboratory Services (DCLS).	Call Local Health Department. Alert laboratory to possibility of anthrax. No person-to-person transmission. Standard precautions.
	Pneumonic Plague Apparent severe community-acquired pneumonia but with hemoptysis, cyanosis, gastrointestinal symptoms, shock.	Community acquired pneumonia, hantavirus pulmonary syndrome, meningococcemia, rickettsiosis, influenza	Gram-negative bacilli or coccobacilli in sputum, blood or lymph node; safety-pin appearance with Wright or Giemsa stain; definitive testing available through DCLS.	Call hospital infection control and Local Health Department. Ask family members/close contacts of patient to stay at the hospital (if already present) for public health interview/chemoprophylaxis; get detailed address and phone number information. Alert laboratory of possibility of plague. In addition to standard precautions, droplet precautions with a regular surgical mask.
	Ricin (aerosolized) Acute onset of fever, chest pain and cough, progressing to respiratory distress and hypoxemia; not improved with antibiotics; death in 36-72 hours.	Plague, Q fever, Staphylococcal enterotoxin B, phosgene, tularemia, influenza	Chest x-ray with pulmonary edema. Consult with Local Health Department regarding specimen collection and diagnostic testing procedures.	Call Local Health Department. Standard precautions.
	Staphylococcal Enterotoxin B Acute onset of fever, chills, headache, nonproductive cough and myalgia (influenza-like illness) with a NORMAL chest x-ray.	Influenza, adenovirus, mycoplasma	Primarily clinical diagnosis. Consult with Local Health Department regarding specimen collection and diagnostic testing procedures.	Call Local Health Department. Standard precautions.

continued on page 4

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If you suspect disease from a potential bioterrorism event, please contact your local health department immediately.

Syndrome	Bioterrorism threat disease description	Differential diagnosis	Initial laboratory & other diagnostic test results	Immediate public health & infection control actions
Acute Rash with Fever	**Smallpox** Papular rash with fever that begins on the face and extremities and uniformly progresses to vesicles and pustules; headache, vomiting, back pain, and delirium common.	Varicella, disseminated herpes zoster, vaccinia, monkeypox, cowpox	Clinical with laboratory confirmation; vaccinated, gowned and gloved person obtains specimens (scabs or swabs of vesicular or pustular fluid). **Call Local Health Department immediately before obtaining specimen;** definitive testing available through CDC.	Call hospital infection control and Local Health Department immediately. Ask family members/close contacts of patient to stay at the hospital (if already present) for public health interview and vaccination; get detailed address and phone number information. In addition to standard precautions, contact and airborne precautions required.
	Viral Hemorrhagic Fever (e.g. Ebola) Fever with mucous membrane bleeding, petechiae, throbocytopenia and hypotension in a patient without underlying malignancy.	Meningococcemia, malaria, typhus, leptospirosis, borreliosis, thrombotic thrombocytopenic purpura (TTP), hemolytic uremic syndrome (HUS)	Definitive testing available through public health laboratory network. Call Local Health Department immediately.	Call hospital infection control and Local Health Department. Ask family members/close contacts of patient to stay at the hospital (if already present) for public health interview and follow-up; get detailed address and phone number information. Standard and contact precautions.
Neurologic Syndromes	**Botulism** Acute bilateral descending flaccid paralysis beginning with cranial nerve palsies .	Guillain-Barré Syndrome; myasthenia gravis; midbrain stroke; tick paralysis; Mg++ intoxication; organophosphate, carbon monoxide, paralytic shellfish, or belladonna-like alkaloid poisoning; polio; Eaton-Lambert myasthenic syndrome	CSF protein normal; EMG with repetitive nerve stimulation shows augmentation of muscle action potential; toxin assays of serum, feces, or gastric aspirate available through DCLS.	Request botulinum antitoxin from local/state health department; call Local Health Department to arrange for testing. Standard precautions.
	Encephalitis (Venezuelan, Eastern, Western) Encephalopathy with fever and seizures and/or focal neurologic deficits.	Herpes simplex, post-infectious; other viral encephalitides	Serologic testing available through DCLS.	Call Local Health Department. Standard precautions.
Influenza-like Illness	**Brucellosis** Irregular fever, chills, malaise, headache, weight loss, profound weakness and fatigue. Arthralgias, sacroiliitis, paravertebral abscesses. Anorexia, nausea, vomiting, diarrhea, hepatosplenomegaly. May have cough and pleuritic chest pain.	Numerous diseases, including Q Fever	Tiny, slow-growing, faintly-staining, gram-negative coccobacilli in blood or bone marrow culture. Leukocyte count normal or low. Anemia, thrombocytopenia possible. CXR nonspecific: normal, bronchopneumonia, abscesses, single or miliary nodules, enlarged hilar nodes, effusions. Serologic testing and culture available through DCLS.	Notify laboratory if brucellosis suspected; microbiological testing should be done in a biological safety cabinet to prevent lab-acquired infection. Call Local Health Department. Standard precautions.
	Tularemia (Typhoidal, Pneumonic) Fever, chills, rigors, headache, myalgias, coryza, sore throat initially; followed by weakness, anorexia, weight loss. Substernal discomfort, dry cough if pneumonic disease.		Small, faintly-staining, slow-growing, gram-negative coccobacilli in smears or cultures of sputum or blood. CXR may show infiltrate, hilar adenopathy, effusion. Definitive testing available through DCLS.	Notify laboratory if tularemia suspected; microbiological testing should be done in a biological safety cabinet to prevent lab-acquired infection. Call Local Health Department. Standard precautions.

Virginia Reportable Disease List (Effective December 18, 2001)

12 VAC 5-90-80. Reportable Disease List.

A. Reportable Disease List.

The board declares the following named diseases, toxic effects, and conditions to be reportable by the persons enumerated in 12 VAC 5-90-90. Conditions listed in capital and bold letters require rapid communication, as defined in subsection B of this section:

Acquired immunodeficiency syndrome (AIDS)
Amebiasis
ANTHRAX
Arboviral infection (e.g., EEE, LAC, SLE, WNV)
BOTULISM
Brucellosis
Campylobacter infection
Chancroid
Chickenpox
Chlamydia trachomatis infection
CHOLERA
Creutzfeld-Jakob disease if <55 years of age
Cryptosporidiosis
Cyclosporiasis
DIPHTHERIA
Ehrlichiosis
Escherichia coli O157:H7 and other enterohemorrhagic *E. coli* infections
Giardiasis
Gonorrhea
Granuloma inguinale
***HAEMOPHILUS INFLUENZAE* INFECTION, INVASIVE**
Hantavirus pulmonary syndrome
Hemolytic uremic syndrome (HUS)
HEPATITIS A (IgM +)
Hepatitis B:
- Acute disease (IgM +)
- HBsAg positive pregnant woman

Hepatitis C (acute and chronic)
Hepatitis, Other Acute Viral
Human immunodeficiency virus (HIV) infection
Influenza
Kawasaki syndrome
Lead - elevated blood levels
Legionellosis
Leprosy (Hansen disease)
Listeriosis
Lyme disease
Lymphogranuloma venereum
Malaria
MEASLES (Rubeola)
MENINGOCOCCAL INFECTION
Mumps
Ophthalmia neonatorum
OUTBREAKS, **ALL** (including foodborne, nosocomial, occupational, toxic substance-related, waterborne, and other outbreaks)
PERTUSSIS (Whooping cough)
PLAGUE
POLIOMYELITIS
PSITTACOSIS
Q fever
RABIES, HUMAN AND ANIMAL
Rabies treatment, post-exposure
Rocky Mountain spotted fever
Rubella (German measles), including congenital rubella syndrome
Salmonellosis
Shigellosis
SMALLPOX
Streptococcal disease, Group A, invasive
Streptococcus pneumoniae, invasive if <5 years of age
Syphilis (report **PRIMARY** and **SECONDARY** syphilis by rapid means)
Tetanus
Toxic shock syndrome
Toxic substance related illnesses
Trichinosis
TUBERCULOSIS DISEASE
Tuberculosis infection in children age <4 years (Mantoux skin test reaction ≥10 mm)
Tularemia
Typhoid fever
Typhus
Unusual occurrence of disease of public health concern
Vancomycin-resistant *Staphylococcus aureus*
Vibrio infection
Viral hemorrhagic fever
YELLOW FEVER

continued from page 2

Clinical laboratories should report any clusters or findings that could indicate intentional release of a biologic agent to their state and local health departments.

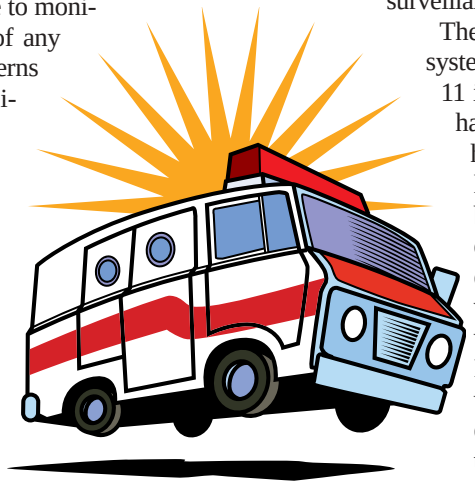
Infection-Control Professionals

Heightened awareness by infection-control professionals (ICPs) facilitates recognition of the release of a biologic agent. ICPs are involved with many aspects of hospital operations and with counterparts in other hospitals. As a result, ICPs may recognize changing patterns or clusters in a hospital or in a community that might otherwise go unrecognized.

ICPs should ensure that hospitals have current telephone numbers for notification of both internal (ICPs, epidemiologists, infectious diseases specialists, administrators, and public affairs officials) and external (state and local health departments, local police, and other local emergency responders) contacts.[9] ICPs should work with clinical microbiology laboratories that receive specimens for testing from their facility to ensure that cultures from suspicious cases are evaluated appropriately and findings communicated promptly.

Virginia Public Health Response to the Threat of Bioterrorism

Public health has a critical role in bioterrorism preparedness and response that includes surveillance for early detection of unusual patterns of disease occurrence. Over the past two years, the Virginia Department of Health (VDH) has worked to strengthen our disease surveillance capacity and to build partnerships with the health-care community and our colleagues in neighboring state health departments. In response to the terrorist attacks on September 11, and the subsequent intentional release of anthrax, the immediate public health action taken was heightened medical surveillance to monitor the occurrence of any unusual disease patterns that might be associated with these events.



While hospitals and other medical care providers statewide were encouraged to be on the highest alert for any signs of unusual disease activity, special medical surveillance projects also have been initiated. These projects involve public health staff working with selected hospital emergency departments (ED) in the northern and tidewater regions to monitor clinical data on all patients. Clinical syndromes (Table 1) are evaluated daily for trends and patterns that could signal an increase in illness consistent with a possible bioterrorist event. We are particularly interested in acute respiratory infections, symptoms of gastroenteritis, acute neurologic illness, rash illness and unexplained deaths. When an increase is detected, public health staff gather additional clinical and epidemiologic information. To date, no infectious disease outbreaks consistent with bioterrorism have been identified through these syndromic surveillance projects.

The syndromic surveillance system used since September 11 is not the first time VDH has initiated this type of enhanced medical surveillance for potential acts of bioterrorism. The department's first experience with syndromic surveillance was associated with the 2001 Presidential Inauguration. This project was designed to classify every ED patient visit at three participating hospitals in northern Virginia into one of eight categories using discharge diagnosis data that were analyzed daily. The second project involved conducting enhanced medical surveillance for illnesses around the 2001 Boy Scout Jamboree. Information was collected from two participating hospitals regarding number of admissions and percentage of admissions from EDs, as well as encounters with a Jamboree link. Each project utilized hospital and health department staff to collect the clinical data, monitor the occurrence of specific disease syndromes, and evaluate the volume of patient encounters.

In light of growing concerns for future acts of terrorism and the need to continue to improve our capability of early recognition of unusual disease patterns, there is a need to enhance surveillance. Data collected from 911 calls, hospital admissions, ED visits, intensive care unit admissions, and pharmaceutical records have been identified as potential sources for evaluating the health status of a community. The utility of these data for identifying infectious disease outbreaks is still being evaluated. Electronic linkages to these data could improve surveillance for bioterrorism.

Any unusual cluster or manifestations of illness should be reported immediately to your local health department. For more detailed clinical information on specific pathogens that might be used in a bioterrorism event, please consult the following websites:

USAMRIID's Biological Casualties Handbook
www.usamriid.army.mil/education/bluebook.html

Johns Hopkins Center for Civilian Biodefense Studies
www.hopkins-biodefense.org

APIC/CDC Recommendations for healthcare facilities
www.apic.org/bioterror/

Emerging Infectious Diseases Journal issue
www.cdc.gov/ncidod/eid/bio_links.htm

American College of Physicians
www.acponline.org/bioterr/

American Society of Microbiology
www.asmusa.org/pcsrc/bioprep.htm

CDC Bioterrorism Preparedness and Response
www.bt.cdc.gov

Conclusion

Early recognition of a bioterrorist event is crucial. Any unusual illness or disease clusters should be reported to your local health department. The first indication of the intentional release of a biologic agent may be detected by an astute health care provider. Early detection requires a level of knowledge among health care providers about potential biologic agents.

The CDC and public health agencies across the nation continue to mobilize resources to identify and investigate potential acts of bioterrorism. Cases of bioterrorism-associated disease may continue to occur and new risk populations may be identified. Even after the cause of these acts has been solved, public health and health care providers should remain alert for potential acts of bioterrorism.

Submitted by Leslie Branch, Surveillance Program Coordinator, Office of Epidemiology.

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Cases of Selected Notifiable Diseases Reported in Virginia*

Total Cases Reported, November 2001

Disease	State	Regions NW	N	SW	C	E	Total Cases Reported Statewide, January through November This Year	Last Year	5 Yr Avg
AIDS	112	11	22	15	17	47	880	739	908
Campylobacteriosis	30	5	7	8	1	9	486	531	610
E. coli O157:H7	1	1	0	0	0	0	48	69	69
Giardiasis	20	7	2	5	2	4	348	391	398
Gonorrhea	592	20	34	46	189	303	9679	9565	8626
Hepatitis A	10	0	3	1	3	3	122	146	178
B, acute	13	0	1	1	1	10	163	151	115
C/NANB, acute	0	0	0	0	0	0	0	3	13
HIV Infection	98	13	31	5	31	18	886	695	804
Lead in Children†	64	3	2	16	24	19	618	738	647
Legionellosis	1	0	0	0	0	1	21	32	29
Lyme Disease	1	0	0	0	0	1	115	140	86
Measles	0	0	0	0	0	0	1	2	5
Meningococcal Infection	1	0	1	0	0	0	37	38	49
Mumps	2	0	0	0	0	2	8	10	12
Pertussis	5	0	0	2	0	3	41	106	69
Rabies in Animals	50	15	8	10	9	8	449	545	561
Rocky Mountain Spotted Fever	3	1	0	0	1	1	26	7	23
Rubella	0	0	0	0	0	0	0	0	1
Salmonellosis	70	12	14	14	15	15	1218	924	1043
Shigellosis	92	0	5	1	29	57	390	428	361
Syphilis, Early§	26	0	8	2	2	14	228	252	458
Tuberculosis	21	0	13	0	5	3	235	244	289

Localities Reporting Animal Rabies This Month: Accomack 1 raccoon; Amelia 1 raccoon; Bath 1 raccoon, 1 skunk; Bland 1 bobcat, 1 skunk; Chesterfield 1 raccoon; Clarke 1 fox, 1 horse, 1 raccoon; Fairfax 1 bat, 1 fox, 2 raccoons, 1 skunk; Fauquier 1 raccoon; Halifax 1 skunk; Hanover 2 raccoons; Henry 1 raccoon; Highland 1 raccoon; Loudoun 1 cat; Lynchburg 1 skunk; Montgomery 1 raccoon, 1 skunk; Nelson 1 skunk; Newport News 1 raccoon; Norfolk 1 raccoon; Nottoway 1 raccoon; Page 1 skunk; Pittsylvania 2 raccoons, 1 skunk; Powhatan 1 raccoon; Prince George 1 raccoon, 1 skunk; Prince William 1 raccoon, 1 skunk; Shenandoah 1 cat, 1 skunk; Smyth 1 skunk; Spotsylvania 1 fox, 1 raccoon; Stafford 1 raccoon; Virginia Beach 4 raccoons; York 1 raccoon.
Toxic Substance-related Illnesses: Asbestosis 41; Lead Exposure 10; Pneumoconiosis 2.
*Data for 2001 are provisional. †Elevated blood lead levels ≥10µg/dL.
§Includes primary, secondary, and early latent.

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Cases of Selected Notifiable Diseases Reported in Virginia*

Disease	Total Cases Reported, December 2001: State	Regions: NW	N	SW	C	E	Total Cases Reported Statewide, January through December: This Year	Last Year	5 Yr Avg
AIDS	92	4	19	6	26	37	972	905	1,034
Campylobacteriosis	97	22	41	23	6	5	583	574	669
E. coli O157:H7	3	1	2	0	0	0	51	77	73
Giardiasis	71	10	49	5	6	1	419	437	456
Gonorrhea	996	39	76	133	199	549	10,680	10,169	9,344
Hepatitis A	41	1	26	3	6	5	163	164	209
B, acute	34	1	8	3	9	13	197	174	138
C/NANB, acute	2	0	0	0	1	1	2	3	14
HIV Infection	96	6	21	18	8	43	982	798	905
Lead in Children†	39	3	1	9	11	15	659	707	704
Legionellosis	9	1	3	4	0	1	30	37	39
Lyme Disease	29	0	28	0	0	1	144	149	94
Measles	0	0	0	0	0	0	1	2	5
Meningococcal Infection	9	2	1	2	4	0	46	42	56
Mumps	0	0	0	0	0	0	8	11	15
Pertussis	232	217	5	3	2	5	272	134	84
Rabies in Animals	53	13	13	10	9	8	502	574	601
Rocky Mountain Spotted Fever	5	1	0	0	2	2	31	7	24
Rubella	0	0	0	0	0	0	0	0	1
Salmonellosis	163	29	45	32	27	30	1,380	1,020	1,158
Shigellosis	404	1	19	1	191	192	793	460	392
Syphilis, Early§	7	0	1	0	1	5	235	266	485
Tuberculosis	45	3	29	2	6	5	306	292	333

Localities Reporting Animal Rabies This Month: Accomack 1 skunk; Amherst 1 skunk; Augusta 1 cat; Bedford 2 skunks; Bland 1 skunk; Caroline 1 skunk; Culpeper 1 skunk; Fairfax 1 cat, 1 fox, 5 raccoons, 2 skunks; Floyd 1 skunk; Franklin 1 cow; Frederick 1 dog; Giles 1 raccoon; Gloucester 1 skunk; Greene 1 raccoon; Halifax 1 skunk; Hanover 2 raccoons, 2 skunks; Henrico 1 skunk; Henry 1 raccoon; King William 1 raccoon; Loudoun 1 raccoon; Lunenburg 1 raccoon, 1 skunk; Middlesex 1 raccoon; Nelson 1 raccoon; Norfolk 3 raccoons; Pittsylvania 1 raccoon; Powhatan 1 raccoon; Prince William 1 cat, 1 dog, 1 raccoon, 1 skunk; Rockingham 1 cow; Shenandoah 1 fox, 2 skunks; Spotsylvania 1 skunk; Stafford 2 raccoons; Virginia Beach 1 raccoon; Washington 1 raccoon.

Toxic Substance-related Illnesses: Asbestosis 83; Lead Exposure 9; Pneumoconiosis 1.

*Data for 2001 are provisional. †Elevated blood lead levels ≥10µg/dL.

§Includes primary, secondary, and early latent.

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