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Update: Universal Precautions for Prevention of Transmission of Human Immunodeficiency Virus, Hepatitis B Virus, and Other Bloodborne Pathogens in Health-Care Settings

Introduction

The purpose of this report is to clarify and supplement the CDC publication entitled "Recommendations for Prevention of HIV Transmission in Health-Care Settings" (*1*).*

In 1983, CDC published a document entitled "Guideline for Isolation Precautions in Hospitals" (*2*) that contained a section entitled "Blood and Body Fluid Precautions." The recommendations in this section called for blood and body fluid precautions when a patient was known or suspected to be infected with bloodborne pathogens. In August 1987, CDC published a document entitled "Recommendations for Prevention of HIV Transmission in Health-Care Settings" (*1*). In contrast to the 1983 document, the 1987 document recommended that blood and body fluid precautions be consistently used for all patients regardless of their bloodborne infection status. This extension of blood and body fluid precautions to **all** patients is referred to as "Universal Blood and Body Fluid Precautions" or "Universal Precautions." Under universal precautions, blood and certain body fluids of all patients are considered potentially infectious for human immunodeficiency virus (HIV), hepatitis B virus (HBV), and other bloodborne pathogens.

*The August 1987 publication should be consulted for general information and specific recommendations not addressed in this update.

Copies of this report and of the *MMWR* supplement entitled *Recommendations for Prevention of HIV Transmission in Health-Care Settings* published in August 1987 are available through the National AIDS Information Clearinghouse, P.O. Box 6003, Rockville, MD 20850.

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Universal precautions are intended to prevent parenteral, mucous membrane, and nonintact skin exposures of health-care workers to bloodborne pathogens. In addition, immunization with HBV vaccine is recommended as an important adjunct to universal precautions for health-care workers who have exposures to blood (*3,4*).

Since the recommendations for universal precautions were published in August 1987, CDC and the Food and Drug Administration (FDA) have received requests for clarification of the following issues: 1) body fluids to which universal precautions apply, 2) use of protective barriers, 3) use of gloves for phlebotomy, 4) selection of gloves for use while observing universal precautions, and 5) need for making changes in waste management programs as a result of adopting universal precautions.

Body Fluids to Which Universal Precautions Apply

Universal precautions apply to blood and to other body fluids containing visible blood. Occupational transmission of HIV and HBV to health-care workers by blood is documented (*4,5*). **Blood is the single most important source of HIV, HBV, and other bloodborne pathogens in the occupational setting. Infection control efforts for HIV, HBV, and other bloodborne pathogens must focus on preventing exposures to blood as well as on delivery of HBV immunization.**

Universal precautions also apply to semen and vaginal secretions. Although both of these fluids have been implicated in the sexual transmission of HIV and HBV, they have not been implicated in occupational transmission from patient to health-care worker. This observation is not unexpected, since exposure to semen in the usual health-care setting is limited, and the routine practice of wearing gloves for performing vaginal examinations protects health-care workers from exposure to potentially infectious vaginal secretions.

Universal precautions also apply to tissues and to the following fluids: cerebrospinal fluid (CSF), synovial fluid, pleural fluid, peritoneal fluid, pericardial fluid, and amniotic fluid. The risk of transmission of HIV and HBV from these fluids is unknown; epidemiologic studies in the health-care and community setting are currently inadequate to assess the potential risk to health-care workers from occupational exposures to them. However, HIV has been isolated from CSF, synovial, and amniotic fluid (*6–8*), and HBsAg has been detected in synovial fluid, amniotic fluid, and peritoneal fluid (*9–11*). One case of HIV transmission was reported after a percutaneous exposure to bloody pleural fluid obtained by needle aspiration (*12*). Whereas aseptic procedures used to obtain these fluids for diagnostic or therapeutic purposes protect health-care workers from skin exposures, they cannot prevent penetrating injuries due to contaminated needles or other sharp instruments.

Body Fluids to Which Universal Precautions Do Not Apply

Universal precautions do not apply to feces, nasal secretions, sputum, sweat, tears, urine, and vomitus unless they contain visible blood. The risk of transmission of HIV and HBV from these fluids and materials is extremely low or nonexistent. HIV has been isolated and HBsAg has been demonstrated in some of these fluids; however, epidemiologic studies in the health-care and community setting have not implicated these fluids or materials in the transmission of HIV and HBV infections (*13,14*). Some of the above fluids and excretions represent a potential source for nosocomial and community-acquired infections with other pathogens, and recommendations for preventing the transmission of nonbloodborne pathogens have been published (*2*).

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Precautions for Other Body Fluids in Special Settings

Human breast milk has been implicated in perinatal transmission of HIV, and HBsAg has been found in the milk of mothers infected with HBV (*10,13*). However, occupational exposure to human breast milk has not been implicated in the transmission of HIV nor HBV infection to health-care workers. Moreover, the health-care worker will not have the same type of intensive exposure to breast milk as the nursing neonate. Whereas universal precautions do not apply to human breast milk, gloves may be worn by health-care workers in situations where exposures to breast milk might be frequent, for example, in breast milk banking.

Saliva of some persons infected with HBV has been shown to contain HBV-DNA at concentrations 1/1,000 to 1/10,000 of that found in the infected person's serum (*15*). HBsAg-positive saliva has been shown to be infectious when injected into experimental animals and in human bite exposures (*16–18*). However, HBsAg-positive saliva has not been shown to be infectious when applied to oral mucous membranes in experimental primate studies (*18*) or through contamination of musical instruments or cardiopulmonary resuscitation dummies used by HBV carriers (*19,20*). Epidemiologic studies of nonsexual household contacts of HIV-infected patients, including several small series in which HIV transmission failed to occur after bites or after percutaneous inoculation or contamination of cuts and open wounds with saliva from HIV-infected patients, suggest that the potential for salivary transmission of HIV is remote (*5,13,14,21,22*). One case report from Germany has suggested the possibility of transmission of HIV in a household setting from an infected child to a sibling through a human bite (*23*). The bite did not break the skin or result in bleeding. Since the date of seroconversion to HIV was not known for either child in this case, evidence for the role of saliva in the transmission of virus is unclear (*23*). Another case report suggested the possibility of transmission of HIV from husband to wife by contact with saliva during kissing (*24*). However, follow-up studies did not confirm HIV infection in the wife (*21*).

Universal precautions do not apply to saliva. General infection control practices already in existence — including the use of gloves for digital examination of mucous membranes and endotracheal suctioning, and handwashing after exposure to saliva — should further minimize the minute risk, if any, for salivary transmission of HIV and HBV (*1,25*). Gloves need not be worn when feeding patients and when wiping saliva from skin.

Special precautions, however, are recommended for dentistry (*1*). Occupationally acquired infection with HBV in dental workers has been documented (*4*), and two possible cases of occupationally acquired HIV infection involving dentists have been reported (*5,26*). During dental procedures, contamination of saliva with blood is predictable, trauma to health-care workers' hands is common, and blood spattering may occur. Infection control precautions for dentistry minimize the potential for nonintact skin and mucous membrane contact of dental health-care workers to blood-contaminated saliva of patients. In addition, the use of gloves for oral examinations and treatment in the dental setting may also protect the patient's oral mucous membranes from exposures to blood, which may occur from breaks in the skin of dental workers' hands.

Use of Protective Barriers

Protective barriers reduce the risk of exposure of the health-care worker's skin or mucous membranes to potentially infective materials. For universal precautions,

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protective barriers reduce the risk of exposure to blood, body fluids containing visible blood, and other fluids to which universal precautions apply. Examples of protective barriers include gloves, gowns, masks, and protective eyewear. Gloves should reduce the incidence of contamination of hands, but they cannot prevent penetrating injuries due to needles or other sharp instruments. Masks and protective eyewear or face shields should reduce the incidence of contamination of mucous membranes of the mouth, nose, and eyes.

Universal precautions are intended to supplement rather than replace recommendations for routine infection control, such as handwashing and using gloves to prevent gross microbial contamination of hands (*27*). Because specifying the types of barriers needed for every possible clinical situation is impractical, some judgment must be exercised.

The risk of nosocomial transmission of HIV, HBV, and other bloodborne pathogens can be minimized if health-care workers use the following general guidelines:[†]

1. Take care to prevent injuries when using needles, scalpels, and other sharp instruments or devices; when handling sharp instruments after procedures; when cleaning used instruments; and when disposing of used needles. Do not recap used needles by hand; do not remove used needles from disposable syringes by hand; and do not bend, break, or otherwise manipulate used needles by hand. Place used disposable syringes and needles, scalpel blades, and other sharp items in puncture-resistant containers for disposal. Locate the puncture-resistant containers as close to the use area as is practical.
2. Use protective barriers to prevent exposure to blood, body fluids containing visible blood, and other fluids to which universal precautions apply. The type of protective barrier(s) should be appropriate for the procedure being performed and the type of exposure anticipated.
3. Immediately and thoroughly wash hands and other skin surfaces that are contaminated with blood, body fluids containing visible blood, or other body fluids to which universal precautions apply.

Glove Use for Phlebotomy

Gloves should reduce the incidence of blood contamination of hands during phlebotomy (drawing blood samples), but they cannot prevent penetrating injuries caused by needles or other sharp instruments. The likelihood of hand contamination with blood containing HIV, HBV, or other bloodborne pathogens during phlebotomy depends on several factors: 1) the skill and technique of the health-care worker, 2) the frequency with which the health-care worker performs the procedure (other factors being equal, the cumulative risk of blood exposure is higher for a health-care worker who performs more procedures), 3) whether the procedure occurs in a routine or emergency situation (where blood contact may be more likely), and 4) the prevalence of infection with bloodborne pathogens in the patient population. The likelihood of infection after skin exposure to blood containing HIV or HBV will depend on the concentration of virus (viral concentration is much higher for hepatitis B than for HIV), the duration of contact, the presence of skin lesions on the hands of the health-care worker, and — for HBV — the immune status of the health-care worker. Although not accurately quantified, the risk of HIV infection following intact skin contact with infective blood is certainly much less than the 0.5% risk following percutaneous

[†]The August 1987 publication should be consulted for general information and specific recommendations not addressed in this update.

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needlestick exposures (*5*). In universal precautions, *all* blood is assumed to be potentially infective for bloodborne pathogens, but in certain settings (e.g., volunteer blood-donation centers) the prevalence of infection with some bloodborne pathogens (e.g., HIV, HBV) is known to be very low. Some institutions have relaxed recommendations for using gloves for phlebotomy procedures by skilled phlebotomists in settings where the prevalence of bloodborne pathogens is known to be very low.

Institutions that judge that routine gloving for *all* phlebotomies is not necessary should periodically reevaluate their policy. Gloves should always be available to health-care workers who wish to use them for phlebotomy. In addition, the following general guidelines apply:

1. Use gloves for performing phlebotomy when the health-care worker has cuts, scratches, or other breaks in his/her skin.
2. Use gloves in situations where the health-care worker judges that hand contamination with blood may occur, for example, when performing phlebotomy on an uncooperative patient.
3. Use gloves for performing finger and/or heel sticks on infants and children.
4. Use gloves when persons are receiving training in phlebotomy.

Selection of Gloves

The Center for Devices and Radiological Health, FDA, has responsibility for regulating the medical glove industry. Medical gloves include those marketed as sterile surgical or nonsterile examination gloves made of vinyl or latex. General purpose utility ("rubber") gloves are also used in the health-care setting, but they are not regulated by FDA since they are not promoted for medical use. There are no reported differences in barrier effectiveness between intact latex and intact vinyl used to manufacture gloves. Thus, the type of gloves selected should be appropriate for the task being performed.

The following general guidelines are recommended:

1. Use sterile gloves for procedures involving contact with normally sterile areas of the body.
2. Use examination gloves for procedures involving contact with mucous membranes, unless otherwise indicated, and for other patient care or diagnostic procedures that do not require the use of sterile gloves.
3. Change gloves between patient contacts.
4. Do not wash or disinfect surgical or examination gloves for reuse. Washing with surfactants may cause "wicking," i.e., the enhanced penetration of liquids through undetected holes in the glove. Disinfecting agents may cause deterioration.
5. Use general-purpose utility gloves (e.g., rubber household gloves) for housekeeping chores involving potential blood contact and for instrument cleaning and decontamination procedures. Utility gloves may be decontaminated and reused but should be discarded if they are peeling, cracked, or discolored, or if they have punctures, tears, or other evidence of deterioration.

Waste Management

Universal precautions are not intended to change waste management programs previously recommended by CDC for health-care settings (*1*). Policies for defining, collecting, storing, decontaminating, and disposing of infective waste are generally determined by institutions in accordance with state and local regulations. Information

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regarding waste management regulations in health-care settings may be obtained from state or local health departments or agencies responsible for waste management.

Reported by: Center for Devices and Radiological Health, Food and Drug Administration. Hospital Infections Program, AIDS Program, and Hepatitis Br, Div of Viral Diseases, Center for Infectious Diseases, National Institute for Occupational Safety and Health, CDC.

Editorial Note: Implementation of universal precautions does not eliminate the need for other category- or disease-specific isolation precautions, such as enteric precautions for infectious diarrhea or isolation for pulmonary tuberculosis (*1,2*). In addition to universal precautions, detailed precautions have been developed for the following procedures and/or settings in which prolonged or intensive exposures to blood occur: invasive procedures, dentistry, autopsies or morticians' services, dialysis, and the clinical laboratory. These detailed precautions are found in the August 21, 1987, "Recommendations for Prevention of HIV Transmission in Health-Care Settings" (*1*). In addition, specific precautions have been developed for research laboratories (*28*).

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TABLE I. Summary — cases of specified notifiable diseases, United States

Disease	24th Week Ending			Cumulative, 24th Week Ending		
	Jun. 18, 1988	Jun. 20, 1987	Median 1983-1987	Jun. 18, 1988	Jun. 20, 1987	Median 1983-1987
Acquired Immunodeficiency Syndrome (AIDS)	198	U *	187	13,918	8,486	3,267
Aseptic meningitis	98	164	123	1,855	2,374	2,102
Encephalitis: Primary (arthropod-borne & unspec)	10	18	17	300	405	405
Post-infectious	1	4	3	44	54	54
Gonorrhea: Civilian	11,071	14,550	17,073	303,455	363,500	383,650
Military	189	282	407	5,531	7,687	9,454
Hepatitis: Type A	419	481	439	10,868	11,471	10,071
Type B	351	479	532	9,614	11,666	11,451
Non A, Non B	51	60	74	1,137	1,461	1,623
Unspecified	23	75	102	930	1,477	2,212
Legionellosis	16	16	16	376	399	314
Leprosy	6	1	3	80	93	121
Malaria	13	17	20	304	341	349
Measles: Total†	21	92	92	1,406	2,379	1,620
Indigenous	12	73	73	1,263	2,089	1,436
Imported	9	19	10	143	290	195
Meningococcal infections	44	55	55	1,592	1,648	1,575
Mumps	84	255	93	2,749	9,053	2,000
Pertussis	43	42	58	984	800	865
Rubella (German measles)	15	15	28	115	196	302
Syphilis (Primary & Secondary): Civilian	728	719	566	17,246	15,492	12,764
Military	1	2	2	84	80	93
Toxic Shock syndrome	6	5	5	131	145	178
Tuberculosis	435	442	475	8,999	9,396	9,397
Tularemia	7	9	8	68	64	68
Typhoid Fever	6	6	5	159	136	136
Typhus fever, tick-borne (RMSF)	27	35	35	130	154	177
Rabies, animal	78	85	111	1,874	2,368	2,368

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1988		Cum. 1988
Anthrax	-	Leptospirosis	13
Botulism: Foodborne (Md. 1)	10	Plague	2
Infant	16	Poliomyelitis, Paralytic	-
Other	2	Psittacosis (Upstate N.Y. 1)	36
Brucellosis (Minn. 1)	26	Rabies, human	-
Cholera	-	Tetanus	20
Congenital rubella syndrome	3	Trichinosis (Alaska 28)	37
Congenital syphilis, ages < 1 year	-		
Diphtheria	-		

*Because AIDS cases are not received weekly from all reporting areas, comparison of weekly figures may be misleading.
†Nine of the 21 reported cases for this week were imported from a foreign country or can be directly traceable to a known internationally imported case within two generations.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending June 18, 1988 and June 20, 1987 (24th Week)

Reporting Area	AIDS	Aseptic Meningitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1987	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988
UNITED STATES	13,918	1,855	300	44	303,455	363,500	10,868	9,614	1,137	930	376	80
NEW ENGLAND	585	77	10	-	9,176	11,637	381	541	79	46	19	11
Maine	17	5	1	-	194	351	14	26	3	1	2	-
N.H.	15	10	-	-	128	192	29	32	5	3	1	-
Vt.	5	5	3	-	72	93	4	16	5	1	1	-
Mass.	330	33	5	-	3,260	4,276	195	346	53	36	12	10
R.I.	28	19	-	-	869	914	49	57	9	-	3	1
Conn.	190	5	1	-	4,653	5,811	90	64	4	5	-	-
MID. ATLANTIC	4,680	191	34	2	47,107	59,415	661	1,242	76	100	90	7
Upstate N.Y.	685	109	22	1	6,183	7,460	383	333	37	10	36	-
N.Y. City	2,491	35	7	1	20,593	32,444	137	568	7	70	13	6
N.J.	1,092	47	5	-	6,754	7,215	114	298	25	20	20	1
Pa.	412	-	-	-	13,577	12,296	27	43	7	-	21	-
E.N. CENTRAL	1,021	245	70	5	47,276	52,030	635	984	71	51	82	1
Ohio	221	87	25	2	11,224	11,229	164	249	16	8	33	-
Ind.	78	34	10	-	3,764	4,090	64	148	7	16	5	-
Ill.	475	36	12	3	13,632	15,909	116	110	7	5	-	-
Mich.	194	80	16	-	15,287	15,990	176	352	24	19	34	-
Wis.	53	8	7	-	3,369	4,812	115	125	17	3	10	1
W.N. CENTRAL	286	82	20	4	12,224	14,741	662	476	54	16	43	-
Minn.	52	16	2	1	1,687	2,362	36	66	7	3	2	-
Iowa	17	18	8	-	928	1,411	30	44	9	-	11	-
Mo.	149	25	1	-	6,805	7,532	382	287	27	8	8	-
N. Dak.	1	-	-	-	75	141	3	3	1	3	1	-
S. Dak.	4	6	1	1	234	276	5	2	2	-	12	-
Nebr.	17	3	3	2	726	867	21	24	-	-	4	-
Kans.	46	14	5	-	1,769	2,152	185	50	8	2	5	-
S. ATLANTIC	2,287	442	42	16	87,507	95,475	937	2,022	170	141	73	1
Del.	22	11	2	-	1,246	1,437	17	61	5	1	6	-
Md.	254	48	4	3	8,886	10,788	124	309	14	8	9	1
D.C.	229	9	-	1	6,214	6,415	9	23	3	1	-	-
Va.	183	50	15	2	6,016	7,063	183	131	38	93	6	-
W. Va.	7	8	1	-	624	726	8	29	2	3	-	-
N.C.	141	71	14	-	13,819	14,411	166	369	36	-	24	-
S.C.	74	5	-	1	6,422	7,961	27	266	7	3	11	-
Ga.	314	48	1	-	17,173	16,228	178	310	8	3	8	-
Fla.	1,063	192	5	9	27,107	30,446	225	524	57	29	9	-
E.S. CENTRAL	369	128	22	5	23,388	26,872	373	601	75	6	13	1
Ky.	44	43	6	1	2,261	2,704	321	107	30	2	5	-
Tenn.	177	12	6	-	7,884	9,289	29	306	21	-	4	-
Ala.	94	59	10	2	7,474	8,776	8	150	18	4	2	1
Miss.	54	14	-	2	5,769	6,103	15	38	6	-	2	-
W.S. CENTRAL	1,188	200	23	-	34,462	40,937	1,156	755	87	231	10	16
Ark.	45	3	2	-	3,196	4,194	133	44	1	4	2	-
La.	188	40	4	-	7,286	7,445	64	169	14	9	4	1
Okla.	68	17	4	-	3,127	4,496	241	84	23	17	4	-
Tex.	887	140	13	-	20,853	24,802	718	458	49	201	-	15
MOUNTAIN	450	78	19	1	6,621	9,502	1,558	777	128	90	19	-
Mont.	8	2	-	-	217	233	21	30	6	3	-	-
Idaho	4	1	-	-	186	348	64	50	3	1	-	-
Wyo.	3	1	-	-	111	188	4	6	3	-	1	-
Colo.	149	28	3	-	1,496	2,075	107	100	33	42	5	-
N. Mex.	22	4	2	-	619	1,029	289	116	9	1	-	-
Ariz.	160	21	5	-	2,341	3,222	782	294	42	25	9	-
Utah	34	13	4	1	266	312	185	76	24	14	2	-
Nev.	70	8	5	-	1,385	2,095	106	105	8	4	2	-
PACIFIC	3,052	412	60	11	35,694	52,891	4,505	2,216	397	249	27	43
Wash.	175	-	3	4	2,730	4,003	1,014	316	72	22	7	3
Oreg.	95	-	-	-	1,414	2,001	703	283	39	12	-	1
Calif.	2,720	365	54	7	30,748	45,629	2,648	1,564	281	207	17	35
Alaska	10	8	2	-	486	825	134	30	4	4	-	1
Hawaii	52	39	1	-	316	433	6	23	1	4	3	3
Guam	1	-	-	-	56	98	3	3	-	2	1	3
P.R.	627	18	2	1	691	1,028	17	129	20	23	-	4
V.I.	10	-	-	-	170	126	1	3	2	-	-	-
Amer. Samoa	-	-	-	-	31	42	-	2	-	3	-	2
C.N.M.I.	-	-	-	-	26	-	1	2	-	4	-	-

N: Not notifiable U: Unavailable C.N.M.I.: Commonwealth of the Northern Mariana Islands

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending June 18, 1988 and June 20, 1987 (24th Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1988	1988	Cum. 1988	1988	Cum. 1988	Cum. 1987	Cum. 1988	1988	Cum. 1988	1988	Cum. 1988	Cum. 1987	1988	Cum. 1988	Cum. 1987
UNITED STATES	304	12	1,263	9	143	2,379	1,592	84	2,749	43	984	800	15	115	196
NEW ENGLAND	27	-	19	2	48	218	128	1	95	8	88	20	-	1	1
Maine	2	-	-	-	-	3	3	-	-	-	11	1	-	-	1
N.H.	-	-	13	-	44	149	15	1	91	6	29	2	-	-	-
Vt.	-	-	-	-	-	23	8	-	1	-	2	3	-	-	-
Mass.	17	-	1	-	-	23	55	-	3	2	36	5	-	-	-
R.I.	4	-	-	-	-	1	20	-	-	-	1	1	-	1	-
Conn.	4	-	5	2†	4	19	27	-	-	-	9	8	-	-	-
MID. ATLANTIC	43	7	449	-	23	448	152	5	225	6	42	108	1	10	9
Upstate N.Y.	16	-	4	-	2	25	76	3	46	3	24	82	1	2	7
N.Y. City	19	-	28	-	1	369	30	-	82	-	1	-	-	5	1
N.J.	5	-	2	-	11	16	45	1	30	-	4	6	-	1	1
Pa.	3	7	415	-	9	38	1	1	67	3	13	20	-	2	-
E.N. CENTRAL	17	2	111	5	23	275	178	34	582	4	109	102	-	22	22
Ohio	2	-	2	-	4	5	71	20	88	4	25	26	-	-	-
Ind.	-	1	44	-	-	-	18	1	44	-	53	1	-	-	-
Ill.	-	-	51	5†	15	105	9	4	214	-	2	9	-	18	20
Mich.	13	1	14	-	4	29	51	9	162	-	18	27	-	4	2
Wis.	2	-	-	-	-	136	29	-	74	-	11	39	-	-	-
W.N. CENTRAL	10	-	10	-	-	147	61	-	112	7	45	48	-	-	1
Minn.	4	-	10	-	-	32	14	-	-	6	13	9	-	-	-
Iowa	1	-	-	-	-	-	-	-	30	-	14	7	-	-	1
Mo.	3	-	-	-	-	113	23	-	29	-	6	16	-	-	-
N. Dak.	-	-	-	-	-	1	-	-	-	-	6	4	-	-	-
S. Dak.	-	-	-	-	-	-	2	-	-	-	2	2	-	-	-
Nebr.	1	-	-	-	-	-	6	-	11	-	-	-	-	-	-
Kans.	1	-	-	-	-	1	16	-	42	1	4	10	-	-	-
S. ATLANTIC	43	3	244	-	11	79	284	14	402	2	102	157	11	14	12
Del.	-	-	-	-	-	25	1	-	-	-	3	-	-	-	2
Md.	3	-	5	-	2	2	27	7	79	-	17	4	-	-	2
D.C.	5	-	-	-	-	1	7	2	144	-	-	-	-	-	-
Va.	8	3	147	-	2	-	31	2	96	-	16	37	11	11	1
W. Va.	-	-	6	-	-	-	2	-	7	-	2	23	-	-	-
N.C.	9	-	-	-	1	2	49	2	33	2	29	64	-	-	-
S.C.	5	-	-	-	-	-	30	-	4	-	-	-	-	-	-
Ga.	4	-	-	-	-	-	42	1	20	-	17	17	-	-	1
Fla.	9	-	86	-	6	49	95	-	19	-	18	12	-	3	6
E.S. CENTRAL	6	-	43	-	-	2	160	10	348	-	14	12	-	-	2
Ky.	-	-	32	-	-	-	31	9	155	-	-	1	-	-	2
Tenn.	-	-	-	-	-	-	98	1	184	-	8	3	-	-	-
Ala.	4	-	-	-	-	-	21	-	6	-	5	6	-	-	-
Miss.	2	-	11	-	-	2	10	N	N	-	1	2	-	-	-
W.S. CENTRAL	28	-	11	-	2	195	108	5	524	-	65	52	-	7	5
Ark.	-	-	-	-	-	-	13	-	78	-	5	2	-	3	2
La.	5	-	-	-	-	-	32	2	173	-	9	11	-	-	-
Okla.	7	-	8	-	-	2	12	-	154	-	24	39	-	1	-
Tex.	16	-	3	-	2	193	51	3	119	-	27	-	-	3	3
MOUNTAIN	16	-	116	1	3	443	44	4	140	7	332	80	-	6	19
Mont.	2	-	-	1†	1	116	-	-	2	-	1	3	-	-	3
Idaho	-	-	-	-	1	-	5	-	1	5	247	30	-	-	1
Wyo.	-	-	-	-	-	2	-	-	2	-	1	2	-	-	1
Colo.	7	-	116	-	1	5	11	1	26	-	15	20	-	2	-
N. Mex.	1	-	-	-	-	308	10	N	N	1	3	5	-	-	-
Ariz.	4	-	-	-	-	11	10	2	95	-	44	19	-	-	4
Utah	1	-	-	-	-	-	7	-	3	1	20	1	-	3	10
Nev.	1	-	-	-	-	1	1	1	11	-	1	-	-	1	-
PACIFIC	114	-	260	1	33	572	477	11	321	9	187	221	3	55	125
Wash.	8	-	2	-	-	4	40	-	16	-	40	32	-	-	-
Oreg.	6	-	3	-	-	35	26	N	N	-	6	14	-	-	1
Calif.	95	-	254	-	29	529	393	11	281	9	101	88	3	46	88
Alaska	2	-	-	-	-	-	5	-	6	-	4	3	-	-	1
Hawaii	3	-	1	1†	4	4	13	-	7	-	36	84	-	9	35
Guam	-	-	-	-	1	2	-	-	2	-	-	-	-	1	1
P.R.	1	-	175	-	-	580	7	-	6	-	7	12	-	1	2
V.I.	-	-	-	-	-	-	-	-	12	-	-	-	-	-	-
Amer. Samoa	-	-	-	-	-	-	2	-	3	-	-	-	-	-	-
C.N.M.I.	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-

*For measles only, imported cases includes both out-of-state and international importations.

N: Not notifiable U: Unavailable †International §Out-of-state

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending June 18, 1988 and June 20, 1987 (24th Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1988	Cum. 1987	Cum. 1988	Cum. 1988	Cum. 1987	Cum. 1988	Cum. 1988	Cum. 1988	Cum. 1988
UNITED STATES	17,246	15,492	131	8,999	9,396	68	159	130	1,874
NEW ENGLAND	458	246	11	188	291	1	12	3	3
Maine	5	1	2	3	17	-	-	-	1
N.H.	5	2	3	-	8	-	-	-	2
Vt.	1	1	2	1	6	-	1	-	-
Mass.	186	117	4	116	153	1	7	1	-
R.I.	14	7	-	16	24	-	-	2	-
Conn.	247	118	-	52	83	-	4	-	-
MID. ATLANTIC	3,571	2,879	21	1,612	1,616	-	22	2	197
Upstate N.Y.	237	97	10	256	250	-	4	1	4
N.Y. City	2,303	2,084	3	771	784	-	8	1	-
N.J.	378	298	3	278	290	-	10	-	-
Pa.	653	400	5	307	292	-	-	-	193
E.N. CENTRAL	499	425	19	1,034	1,097	1	18	9	54
Ohio	52	49	15	186	210	-	5	8	-
Ind.	29	27	-	110	118	-	2	-	13
Ill.	242	235	-	422	438	-	9	-	11
Mich.	159	78	4	260	282	1	1	-	9
Wis.	17	36	-	56	49	-	1	1	21
W.N. CENTRAL	113	69	18	243	280	37	4	22	227
Minn.	8	8	3	40	64	3	2	-	82
Iowa	10	11	4	17	17	-	-	-	13
Mo.	62	32	6	126	153	25	2	16	6
N. Dak.	1	-	-	3	4	-	-	-	44
S. Dak.	9	7	1	19	14	6	-	2	63
Nebr.	17	7	2	7	12	2	-	-	7
Kans.	6	4	2	31	16	1	-	4	12
S. ATLANTIC	6,198	5,345	10	1,986	1,944	4	19	33	626
Del.	59	42	1	18	20	1	-	-	24
Md.	346	282	1	199	167	-	1	6	163
D.C.	279	160	-	84	63	-	-	-	4
Va.	205	129	-	198	184	2	8	3	192
W. Va.	6	5	-	38	56	-	-	1	51
N.C.	354	285	5	172	208	-	1	15	-
S.C.	292	343	-	219	181	-	-	5	37
Ga.	992	730	-	321	304	1	2	2	105
Fla.	3,665	3,369	3	737	761	-	7	1	50
E.S. CENTRAL	886	920	12	739	821	6	3	23	143
Ky.	31	6	5	189	199	4	1	4	62
Tenn.	366	403	4	193	236	1	-	14	45
Ala.	262	226	3	230	244	-	1	3	36
Miss.	227	285	-	127	142	1	1	2	-
W.S. CENTRAL	1,894	1,935	14	1,157	1,068	12	6	32	278
Ark.	107	106	-	123	127	6	-	2	47
La.	372	343	-	159	133	-	2	-	1
Okla.	73	78	4	101	102	6	-	26	22
Tex.	1,342	1,408	10	774	706	-	4	4	208
MOUNTAIN	310	316	15	195	275	5	6	4	164
Mont.	2	8	-	5	8	-	1	3	116
Idaho	-	3	2	2	17	-	-	1	-
Wyo.	1	1	-	1	1	-	-	-	18
Colo.	45	48	3	21	57	4	3	-	2
N. Mex.	22	29	-	38	47	1	1	-	4
Ariz.	83	148	5	104	129	-	1	-	23
Utah	10	15	5	-	6	-	-	-	1
Nev.	147	64	-	24	10	-	-	-	-
PACIFIC	3,317	3,357	11	1,845	2,004	2	69	2	182
Wash.	98	69	2	109	116	-	3	-	-
Oreg.	137	123	-	65	57	-	6	1	-
Calif.	3,056	3,156	9	1,578	1,703	-	58	1	175
Alaska	7	2	-	20	30	2	-	-	7
Hawaii	19	7	-	73	98	-	2	-	-
Guam	1	2	-	7	24	-	-	-	-
P.R.	300	472	-	100	131	-	2	-	35
V.I.	1	3	-	3	2	-	-	-	-
Amer. Samoa	-	-	-	3	1	-	-	-	-
C.N.M.I.	1	-	-	11	-	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending June 18, 1988 (24th Week)

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	≥65	45-64	25-44	1-24	<1	Total
NEW ENGLAND	655	463	130	36	12	14	62
Boston, Mass.	198	124	46	12	8	8	32
Bridgeport, Conn.	37	25	7	3	1	1	2
Cambridge, Mass.	15	11	3	1	-	-	3
Fall River, Mass.	27	21	5	1	-	-	1
Hartford, Conn.	56	38	11	4	2	1	2
Lowell, Mass.	23	19	2	2	-	-	3
Lynn, Mass.	16	10	4	2	-	-	-
New Bedford, Mass.	38	33	3	2	-	-	1
New Haven, Conn.	49	33	12	2	-	2	4
Providence, R.I.	43	31	10	-	-	2	1
Somerville, Mass.	5	4	1	-	-	-	-
Springfield, Mass.	48	35	9	3	1	-	5
Waterbury, Conn.	32	25	5	2	-	-	2
Worcester, Mass.	68	54	12	2	-	-	6
MID. ATLANTIC	2,716	1,733	540	289	86	68	131
Albany, N.Y.	72	49	14	4	2	3	4
Allentown, Pa.	16	14	2	-	-	-	-
Buffalo, N.Y.	148	85	37	15	7	4	8
Camden, N.J.	43	20	15	5	2	1	3
Elizabeth, N.J.	32	25	4	3	-	-	2
Erie, Pa.†	45	38	4	2	-	1	4
Jersey City, N.J.	71	47	14	5	1	4	3
N.Y. City, N.Y.	1,446	903	298	172	46	27	58
Newark, N.J.	57	26	10	13	8	-	4
Paterson, N.J.	40	21	11	5	2	1	1
Philadelphia, Pa.	292	179	56	24	11	22	11
Pittsburgh, Pa.†	63	39	16	6	2	-	2
Reading, Pa.	31	20	7	4	-	-	8
Rochester, N.Y.	128	94	18	12	3	1	10
Schenectady, N.Y.	29	22	5	2	-	-	4
Scranton, Pa.†	24	19	3	2	-	-	-
Syracuse, N.Y.	82	62	14	4	-	2	3
Trenton, N.J.	45	27	8	8	1	1	2
Utica, N.Y.	28	25	2	-	-	1	1
Yonkers, N.Y.	24	18	2	3	1	-	3
E.N. CENTRAL	2,286	1,518	472	165	53	78	86
Akron, Ohio	36	25	7	3	-	1	2
Canton, Ohio	35	23	10	2	-	-	3
Chicago, Ill.§	564	362	125	45	10	22	16
Cincinnati, Ohio	123	91	22	5	5	-	13
Cleveland, Ohio	164	98	39	15	2	10	2
Columbus, Ohio	142	93	23	15	6	5	6
Dayton, Ohio	132	98	21	5	5	3	4
Detroit, Mich.	233	146	48	22	6	11	7
Evansville, Ind.	54	43	8	2	1	-	4
Fort Wayne, Ind.	59	41	8	4	3	3	-
Gary, Ind.§	16	11	4	1	-	-	-
Grand Rapids, Mich.	48	35	7	3	1	2	2
Indianapolis, Ind.	166	94	45	14	2	11	4
Madison, Wis.	52	37	4	4	6	1	2
Milwaukee, Wis.	148	101	36	9	1	1	9
Peoria, Ill.	37	28	6	1	1	1	3
Rockford, Ill.	49	34	11	2	-	2	3
South Bend, Ind.	49	36	10	1	2	-	2
Toledo, Ohio	120	82	24	11	1	2	3
Youngstown, Ohio	59	40	14	1	1	3	1
W.N. CENTRAL	852	581	152	51	36	32	40
Des Moines, Iowa	66	46	9	2	3	6	2
Duluth, Minn.	29	19	6	2	1	1	1
Kansas City, Kans.	31	23	2	2	2	2	4
Kansas City, Mo.	84	57	19	5	2	1	6
Lincoln, Nebr.	48	34	8	6	-	-	3
Minneapolis, Minn.	221	157	30	11	13	10	15
Omaha, Nebr.	85	55	20	5	2	3	5
St. Louis, Mo.	148	90	35	9	8	6	-
St. Paul, Minn.	64	49	10	2	3	-	-
Wichita, Kans.	76	51	13	7	2	3	4
S. ATLANTIC	1,303	786	266	138	65	48	41
Atlanta, Ga.	172	101	33	17	6	15	2
Baltimore, Md.	218	145	39	24	5	5	5
Charlotte, N.C.	68	42	15	5	4	2	6
Jacksonville, Fla.	108	61	13	17	13	4	-
Miami, Fla.	145	77	39	17	8	4	-
Norfolk, Va.	64	42	6	5	7	4	1
Richmond, Va.	90	60	22	5	3	-	4
Savannah, Ga.	53	29	17	3	3	1	4
St. Petersburg, Fla.	89	68	8	6	3	4	2
Tampa, Fla.	69	49	15	4	-	1	5
Washington, D.C.	206	102	50	34	12	8	12
Wilmington, Del.	21	10	9	1	1	-	-
E.S. CENTRAL	824	521	188	64	33	18	46
Birmingham, Ala.	149	92	36	15	6	-	3
Chattanooga, Tenn.	59	36	12	6	4	1	4
Knoxville, Tenn.	82	53	25	2	1	1	7
Louisville, Ky.	119	89	21	5	3	1	4
Memphis, Tenn.	183	105	46	17	7	8	17
Mobile, Ala.	58	38	10	2	5	3	2
Montgomery, Ala.	48	35	8	4	1	-	1
Nashville, Tenn.	126	73	30	13	6	4	8
W.S. CENTRAL	1,257	751	281	129	56	39	59
Austin, Tex.	66	39	17	8	1	1	1
Baton Rouge, La.	28	17	8	2	1	-	3
Corpus Christi, Tex.	34	21	8	3	2	-	-
Dallas, Tex.	203	118	51	22	4	8	7
El Paso, Tex.	54	36	7	10	1	-	2
Fort Worth, Tex	95	56	21	9	5	4	9
Houston, Tex.§	308	176	74	34	13	11	7
Little Rock, Ark.	70	42	13	4	7	3	6
New Orleans, La.	80	39	23	10	5	3	-
San Antonio, Tex.	197	124	40	19	10	4	13
Shreveport, La.	26	20	3	-	1	2	3
Tulsa, Okla.	96	63	16	8	6	3	8
MOUNTAIN	735	475	142	64	27	26	33
Albuquerque, N. Mex.	125	71	21	18	12	2	4
Colo. Springs, Colo.	45	40	3	1	1	-	10
Denver, Colo.	108	66	26	11	3	2	3
Las Vegas, Nev.	120	70	28	10	5	7	5
Ogden, Utah	23	18	3	1	-	1	2
Phoenix, Ariz.	155	98	30	17	2	8	1
Pueblo, Colo.	23	16	5	1	1	-	1
Salt Lake City, Utah	38	23	9	1	1	4	-
Tucson, Ariz.	98	73	17	4	2	2	7
PACIFIC	1,854	1,185	374	183	56	48	115
Berkeley, Calif.	17	14	3	-	-	-	1
Fresno, Calif.	68	51	10	4	2	1	10
Glendale, Calif.	14	11	2	-	-	-	-
Honolulu, Hawaii	85	59	17	5	3	1	8
Long Beach, Calif.	95	64	19	8	2	2	11
Los Angeles Calif.	469	275	100	59	17	12	16
Oakland, Calif.	82	58	14	4	4	2	9
Pasadena, Calif.	22	15	4	2	-	1	2
Portland, Oreg.	125	90	17	9	3	6	5
Sacramento, Calif.	131	76	31	14	3	7	12
San Diego, Calif.	144	82	32	12	11	6	10
San Francisco, Calif.	173	93	47	31	1	1	5
San Jose, Calif.	156	104	27	13	5	7	7
Seattle, Wash.	128	92	22	11	3	-	4
Spokane, Wash.	62	43	15	2	1	1	9
Tacoma, Wash.	83	58	14	9	1	1	6
TOTAL	12,482††	8,013	2,545	1,119	424	371	613

*Mortality data in this table are voluntarily reported from 121 cities in the United states, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

**Pneumonia and influenza.

†Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

††Total includes unknown ages.

§Data not available. Figures are estimates based on average of past available 4 weeks.

Update: HIV — Continued

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Update: HIV — Continued

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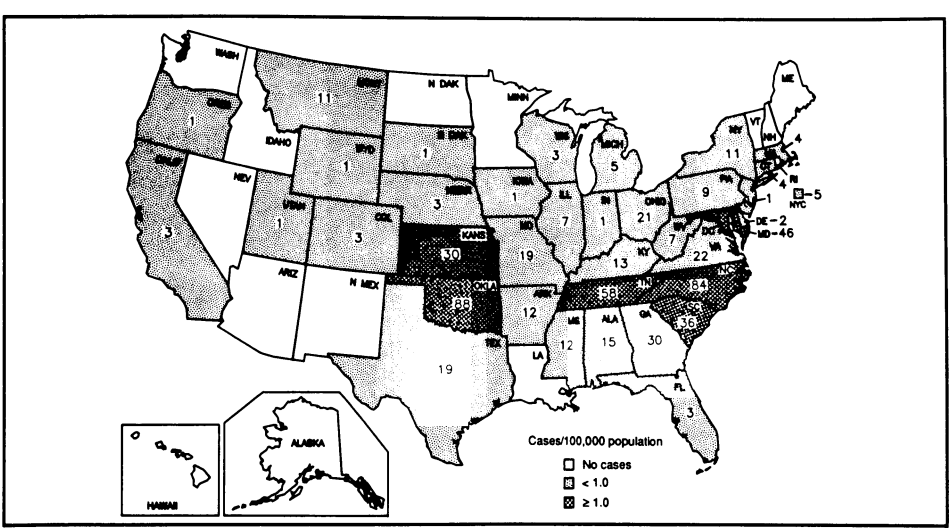
Epidemiologic Notes and Reports

Rocky Mountain Spotted Fever — United States, 1987

In 1987, 592 cases of Rocky Mountain spotted fever (RMSF) were reported to CDC, a 22% decrease from the 755 cases reported in 1986; the incidence of RMSF decreased to 0.24/100,000 in 1987, from 0.32/100,000 in 1986. The state with the highest rate was Oklahoma (2.7/100,000); other states with high rates were North Carolina (1.3/100,000), Kansas (1.2/100,000), Tennessee (1.2/100,000), South Carolina (1.1/100,000), and Maryland (1.0/100,000) (Figure 1). Thirty-nine percent of the cases were reported from the South Atlantic region and 20% from the West South Central region.

Case report forms were submitted on 446 (75.3%) of the total cases. Information from these forms showed that 57.8% of the cases were laboratory-confirmed, 9.2% were classified as probable RMSF, and the remainder were not confirmed (frequently because specific serologic testing was not performed) (*1*). Of the 446 patients, 64.8% were male, 82.6% had an onset of symptoms between April and July, and 62.6% had

FIGURE 1. Rocky Mountain spotted fever cases and rates, by state — United States, 1987



Rocky Mountain Spotted Fever – Continued

a history of tick bite within 14 days before the onset of symptoms. Symptoms included fever (91.5%), headache (75.6%), rash (78.7%), and rash on palms or soles (49.1%). The triad of fever, headache, and rash was present in 58.7% of the cases. The overall case-fatality rate was 3.1%. The case-fatality rate was 1.3% among patients under 30, 5.6% among those 30 years of age and older, and 11.5% among those 70 years of age and older. Among patients with a history of recent tick bite, the case-fatality rate was 2.7%; patients with no known tick bite or attachment had a case-fatality rate of 4.7%.

Reported by: Viral and Rickettsial Zoonoses Br, Div of Viral Diseases, Center for Infectious Diseases, CDC.

Editorial Note: Although most states reported fewer cases of RMSF in 1987 than in 1986, the number of cases reported from Maryland increased from 29 in 1986 to 46 in 1987, and the number reported by Kansas rose from 10 to 30. This was the largest number of cases (and the highest incidence) reported from Maryland since 1981 and the largest number ever reported from Kansas. The reason for these increases is unknown; neither state reported changes in their methods of surveillance.

In 1987, four cases of RMSF were reported among residents of New York City. All four persons apparently acquired the infection in the Bronx; none had traveled outside New York City within the 3 weeks before the onset of illness (*2*). One patient, the only one to report a tick bite, died, possibly because diagnosis and treatment were delayed. These cases are the first laboratory-confirmed cases acquired in New York City, raising the possibility that other urban foci of RMSF may exist.

The 3.1% case-fatality rate for 1987 is the lowest rate recorded since forms for case reports were introduced in 1970 (*3*). Fatalities are more common among older patients and patients who do not have a history of tick bite. Persons in the latter group often do not obtain prompt treatment, thus increasing their risk of a fatal outcome.

Since no vaccine is available for RMSF, the best preventive measure is to avoid tick-infested areas. If this is not possible, persons entering such areas should wear protective clothes and use a tick repellant. Ticks attached to a person's body are best removed by grasping them with fine tweezers at the point of attachment and pulling gently (*4*). If fingers are used to remove ticks, they should be protected with facial tissue and washed afterwards.

A diagnosis of RMSF should be considered whenever a patient has an unexplained febrile illness, even if there is no history of tick bite or of travel to an area known to be endemic for the disease. If RMSF is suspected, persons over 8 years of age—except pregnant women—should be treated with tetracycline. Chloramphenicol is the recommended treatment for pregnant women and for children 8 years of age and under. Treatment should be started as soon as possible after the onset of symptoms.

References

1. Fishbein DB, Kaplan JE, Bernard KW, Winkler WG. Surveillance of Rocky Mountain spotted fever in the United States, 1981–1983. J Infect Dis 1984;150:609–11.
2. Salgo MP, Telzak EE, Currie B, et al. A focus of Rocky Mountain spotted fever within New York City. N Engl J Med 1988;318:1345–8.
3. Centers for Disease Control. Rocky Mountain spotted fever—United States, 1980. MMWR 1981;30:318–20.
4. Needham GR. Evaluation of five popular methods for tick removal. Pediatrics 1985;75:997–1002.

Heat-Wave-Related Morbidity and Mortality

Recent record-high temperatures in many parts of the United States highlight the need for awareness of the health hazards posed by environmental heat. Heat waves can cause dramatic increases in overall mortality; they have doubled or even tripled the usual number of deaths per day in particularly severe episodes.

Heatstroke, usually diagnosed in a heat-exposed individual whose core temperature is 40.5°C (105°F) or greater, is the most serious of diseases clearly attributable to the heat. It has a high death-to-case ratio. Elderly persons, residents of poorer inner-city neighborhoods, patients taking neuroleptic or anticholinergic medications, and persons confined to bed or otherwise unable to care for themselves are at particularly high risk (*1*). Reducing physical activity, drinking extra liquids, and increasing time spent in air-conditioned places all appear to significantly reduce the risk of heatstroke. Measures to prevent heatstroke should target persons at high risk and should promote behaviors associated with reduced risk—for example, elderly persons may be taken to an air-conditioned shopping mall for 2–3 hours per day. Special precautions should be taken to protect workers in certain "hot" industries.

Reported by: Division of Environmental Hazards and Health Effects, Center for Environmental Health and Injury Control, CDC.

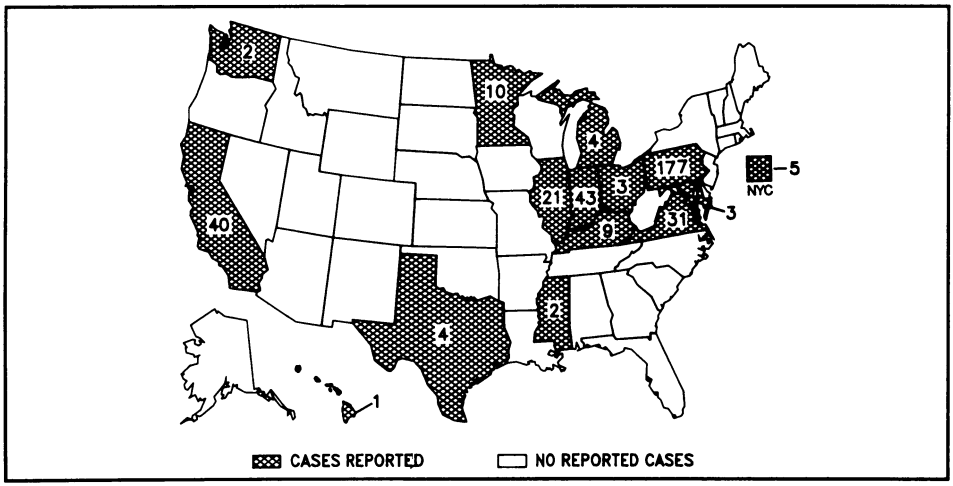
Reference

1. Kilbourne EM, Choi K, Jones TS, Thacker SB, and the Field Investigation Team. Risk factors for heatstroke: A case-control study. JAMA 1982;247:3332-6.

Erratum: Vol. 37, No. 23

p. 373 In the article entitled "Prevention and Control of Influenza," under the heading "Dosage Considerations for Amantadine," the approved dosage for children 1–9 years of age was erroneously reported. The final paragraph of the article should read: "The use of amantadine in children <1 year of age has not been adequately evaluated. The approved dosage for children 1–9 years of age is 4.4–8.8 mg/kg/day, not to exceed 150 mg/day. Although further studies would be desirable to determine the optimal dosage for children, physicians should consider prescribing 4.4 mg/kg/day to reduce the risk of toxicity. For children ≥10 years weighing <45 kg, it may also be advisable to prescribe 4.4 mg/kg/day. The dose for treatment should not exceed 150 mg for children aged 1–9 years and 200 mg for children ≥10 years of age. As for adults, a maximum dosage of 100 mg daily should be effective for prophylaxis."

FIGURE 1. Reported measles cases — United States, Weeks 20–23, 1988



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The data in this report are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday. The editor welcomes accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials. Such reports and any other matters pertaining to editorial or other textual considerations should be addressed to: Editor, *Morbidity and Mortality Weekly Report*, Centers for Disease Control, Atlanta, Georgia 30333.

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