



## MORBIDITY AND MORTALITY WEEKLY REPORT

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*Current Trends*

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**Recommended Infection-Control Practices for Dentistry**

Dental personnel may be exposed to a wide variety of microorganisms in the blood and saliva of patients they treat in the dental operatory. These include *Mycobacterium tuberculosis*, hepatitis B virus, staphylococci, streptococci, cytomegalovirus, herpes simplex virus types I and II, human T-lymphotropic virus type III/lymphadenopathy-associated virus (HTLV-III/LAV), and a number of viruses that infect the upper respiratory tract. Infections may be transmitted in dental practice by blood or saliva through direct contact, droplets, or aerosols. Although not documented, indirect contact transmission of infection by contaminated instruments is possible. Patients and dental health-care workers (DHCWs) have the potential of transmitting infections to each other (1).

A common set of infection-control strategies should be effective for preventing hepatitis B, acquired immunodeficiency syndrome, and other infectious diseases caused by bloodborne viruses (2-4). The ability of hepatitis B virus to survive in the environment (5) and the high titers of virus in blood (6) make this virus a good model for infection-control practices to prevent transmission of a large number of other infectious agents by blood or saliva. Because all infected patients cannot be identified by history, physical examination, or readily available laboratory tests (3), the following recommendations should be used routinely in the care of all patients in dental practices.

**MEDICAL HISTORY**

Always obtain a thorough medical history. Include specific questions about medications, current illnesses, hepatitis, recurrent illnesses, unintentional weight loss, lymphadenopathy, oral soft tissue lesions, or other infections. Medical consultation may be indicated when a history of active infection or systemic disease is elicited.

**USE OF PROTECTIVE ATTIRE AND BARRIER TECHNIQUES**

1. For protection of personnel and patients, gloves must always be worn when touching blood, saliva, or mucous membranes (7-10). Gloves must be worn by DHCWs when touching blood-soiled items, body fluids, or secretions, as well as surfaces contaminated with them. Gloves must be worn when examining all oral lesions. All work must be completed on one patient, where possible, and the hands must be washed and regloved before performing procedures on another patient. Repeated use of a single pair of gloves is not recommended, since such use is likely to produce defects in the glove material, which will diminish its value as an effective barrier.

2. Surgical masks and protective eyewear or chin-length plastic face shields must be worn when splashing or spattering of blood or other body fluids is likely, as is common in dentistry (11,12).

*Infection Control — Continued*

3. Reusable or disposable gowns, laboratory coats, or uniforms must be worn when clothing is likely to be soiled with blood or other body fluids. If reusable gowns are worn, they may be washed, using a normal laundry cycle. Gowns should be changed at least daily or when visibly soiled with blood (13).

4. Impervious-backed paper, aluminum foil, or clear plastic wrap may be used to cover surfaces (e.g., light handles or x-ray unit heads) that may be contaminated by blood or saliva and that are difficult or impossible to disinfect. The coverings should be removed (while DHCWs are gloved), discarded, and then replaced (after ungloving) with clean material between patients.

5. All procedures and manipulations of potentially infective materials should be performed carefully to minimize the formation of droplets, spatters, and aerosols, where possible. Use of rubber dams, where appropriate, high-speed evacuation, and proper patient positioning should facilitate this process.

**HANDWASHING AND CARE OF HANDS**

Hands must always be washed between patient treatment contacts (following removal of gloves), after touching inanimate objects likely to be contaminated by blood or saliva from other patients, and before leaving the operatory. The rationale for handwashing after gloves have been worn is that gloves become perforated, knowingly or unknowingly, during use and allow bacteria to enter beneath the glove material and multiply rapidly. For many routine dental procedures, such as examinations and nonsurgical techniques, handwashing with plain soap appears to be adequate, since soap and water will remove transient microorganisms acquired directly or indirectly from patient contact (13). For surgical procedures, an antimicrobial surgical handscrub should be used (14). Extraordinary care must be used to avoid hand injuries during procedures. However, when gloves are torn, cut, or punctured, they must be removed immediately, hands thoroughly washed, and regloving accomplished before completion of the dental procedure. DHCWs who have exudative lesions or weeping dermatitis should refrain from all direct patient care and from handling dental patient-care equipment until the condition resolves (15).

**USE AND CARE OF SHARP INSTRUMENTS AND NEEDLES**

1. Sharp items (needles, scalpel blades, and other sharp instruments) should be considered as potentially infective and must be handled with extraordinary care to prevent unintentional injuries.

2. Disposable syringes and needles, scalpel blades, and other sharp items must be placed into puncture-resistant containers located as close as practical to the area in which they were used. To prevent needlestick injuries, disposable needles should not be recapped; purposefully bent or broken; removed from disposable syringes; or otherwise manipulated by hand after use.

3. Recapping of a needle increases the risk of unintentional needlestick injury. There is no evidence to suggest that reusable aspirating-type syringes used in dentistry should be handled differently from other syringes. Needles of these devices should not be recapped, bent, or broken before disposal.

4. Because certain dental procedures on an individual patient may require multiple injections of anesthetic or other medications from a single syringe, it would be more prudent to place the unsheathed needle into a "sterile field" between injections rather than to recap the needle between injections. A new (sterile) syringe and a fresh solution should be used for each patient.

*Infection Control — Continued***INDICATIONS FOR HIGH-LEVEL DISINFECTION OR STERILIZATION OF INSTRUMENTS**

Surgical and other instruments that normally penetrate soft tissue and/or bone (e.g., forceps, scalpels, bone chisels, scalers, and surgical burs) should be sterilized after each use. Instruments that are not intended to penetrate oral soft tissues or bone (e.g., amalgam condensers, plastic instruments, and burs) but that may come into contact with oral tissues should also be sterilized after each use, if possible; however, if sterilization is not feasible, the latter instruments should receive high-level disinfection (3, 13, 16).

**METHODS FOR HIGH-LEVEL DISINFECTION OR STERILIZATION**

Before high-level disinfection or sterilization, instruments should be cleaned to remove debris. Cleaning may be accomplished by a thorough scrubbing with soap and water or a detergent, or by using a mechanical device (e.g., an ultrasonic cleaner). Persons involved in cleaning and decontaminating instruments should wear heavy-duty rubber gloves to prevent hand injuries. Metal and heat-stable dental instruments should be routinely sterilized between use by steam under pressure (autoclaving), dry heat, or chemical vapor. The adequacy of sterilization cycles should be verified by the periodic use of spore-testing devices (e.g., weekly for most dental practices) (13). Heat- and steam-sensitive chemical indicators may be used on the outside of each pack to assure it has been exposed to a sterilizing cycle. Heat-sensitive instruments may require up to 10 hours' exposure in a liquid chemical agent registered by the U.S. Environmental Protection Agency (EPA) as a disinfectant/sterilant; this should be followed by rinsing with sterile water. High-level disinfection may be accomplished by immersion in either boiling water for at least 10 minutes or an EPA-registered disinfectant/sterilant chemical for the exposure time recommended by the chemical's manufacturer.

**DECONTAMINATION OF ENVIRONMENTAL SURFACES**

At the completion of work activities, countertops and surfaces that may have become contaminated with blood or saliva should be wiped with absorbent toweling to remove extraneous organic material, then disinfected with a suitable chemical germicide. A solution of sodium hypochlorite (household bleach) prepared fresh daily is an inexpensive and very effective germicide. Concentrations ranging from 5,000 ppm (a 1:10 dilution of household bleach) to 500 ppm (a 1:100 dilution) sodium hypochlorite are effective, depending on the amount of organic material (e.g., blood, mucus, etc.) present on the surface to be cleaned and disinfected. Caution should be exercised, since sodium hypochlorite is corrosive to metals, especially aluminum.

**DECONTAMINATION OF LABORATORY SUPPLIES AND MATERIALS**

Blood and saliva should be thoroughly and carefully cleaned from laboratory supplies and materials that have been used in the mouth (e.g., impression materials, bite registration), especially before polishing and grinding intra-oral devices. Materials, impressions, and intra-oral appliances should be cleaned and disinfected before being handled, adjusted, or sent to a dental laboratory (17). These items should also be cleaned and disinfected when returned from the dental laboratory and before placement in the patient's mouth. *Because of the ever-increasing variety of dental materials used intra-orally, DHCWs are advised to consult with manufacturers as to the stability of specific materials relative to disinfection procedures.* A chemical germicide that is registered with the EPA as a "hospital disinfectant" and that has a label claim for mycobactericidal (e.g., tuberculocidal) activity is preferred, because mycobacteria represent one of the most resistant groups of microorganisms; therefore, germicides that are effective against mycobacteria are also effective against other bacterial and viral pathogens (15). Communication between a dental office and a dental laboratory with regard to handling and decontamination of supplies and materials is of the utmost importance.

*Infection Control – Continued***USE AND CARE OF ULTRASONIC SCALERS, HANDPIECES, AND DENTAL UNITS**

1. Routine sterilization of handpieces between patients is desirable; however, not all handpieces can be sterilized. The present physical configurations of most handpieces do not readily lend them to high-level disinfection of both external and internal surfaces (see 2 below); therefore, when using handpieces that cannot be sterilized, the following cleaning and disinfection procedures should be completed between each patient: After use, the handpiece should be flushed (see 2 below), then thoroughly scrubbed with a detergent and water to remove adherent material. It should then be thoroughly wiped with absorbent material saturated with a chemical germicide that is registered with the EPA as a "hospital disinfectant" and is mycobactericidal at use-dilution (15). The disinfecting solution should remain in contact with the handpiece for a time specified by the disinfectant's manufacturer. Ultrasonic scalers and air/water syringes should be treated in a similar manner between patients. Following disinfection, any chemical residue should be removed by rinsing with sterile water.

2. Because water retraction valves within the dental units may aspirate infective materials back into the handpiece and water line, check valves should be installed to reduce the risk of transfer of infective material (18). While the magnitude of this risk is not known, it is prudent for water-cooled handpieces to be run and to discharge water into a sink or container for 20-30 seconds after completing care on each patient. This is intended to physically flush out patient material that may have been aspirated into the handpiece or water line. Additionally, there is some evidence that overnight bacterial accumulation can be significantly reduced by allowing water-cooled handpieces to run and to discharge water into a sink or container for several minutes at the beginning of the clinic day (19). Sterile saline or sterile water should be used as a coolant/irrigator when performing surgical procedures involving the cutting of soft tissue or bone.

**HANDLING OF BIOPSY SPECIMENS**

In general, each specimen should be put in a sturdy container with a secure lid to prevent leaking during transport. Care should be taken when collecting specimens to avoid contamination of the outside of the container. If the outside of the container is visibly contaminated, it should be cleaned and disinfected, or placed in an impervious bag (20).

**DISPOSAL OF WASTE MATERIALS**

All sharp items (especially needles), tissues, or blood should be considered potentially infective and should be handled and disposed of with special precautions. Disposable needles, scalpels, or other sharp items should be placed intact into puncture-resistant containers before disposal. Blood, suctioned fluids, or other liquid waste may be carefully poured into a drain connected to a sanitary sewer system. Other solid waste contaminated with blood or other body fluids should be placed in sealed, sturdy impervious bags to prevent leakage of the contained items. Such contained solid wastes can then be disposed of according to requirements established by local or state environmental regulatory agencies and published recommendations (13,20).

*Developed by Dental Disease Prevention Activity, Center for Prevention Svcs, Hospital Infections Program, Center for Infectious Diseases, CDC.*

**Editorial Note:** All DHCWs must be made aware of sources and methods of transmission of infectious diseases. The above recommendations for infection control in dental practices incorporate procedures that should be effective in preventing the transmission of infectious agents from dental patients to DHCWs and vice versa. Assessment of quantifiable risks to dental personnel and patients for specific diseases requires further research. There is no current documentation of patient-to-patient blood- or saliva-borne disease transmission from

*Infection Control — Continued*

procedures performed in dental practice. While few in number, reported outbreaks of dentist-to-patient transmission of hepatitis B have resulted in serious and even fatal consequences (9). Herpes simplex virus has been transmitted to over 20 patients from the fingers of a DHCW (10). Serologic markers for hepatitis B in dentists have increased dramatically in the United States over the past several years, which suggests current infection-control practices have been insufficient to prevent the transmission of this infectious agent in the dental operator. While vaccination for hepatitis B is strongly recommended for dental personnel (21), vaccination alone is not cause for relaxation of strict adherence to accepted methods of asepsis, disinfection, and sterilization.

Various infection-control guidelines exist for hospitals and other clinical settings. Dental facilities located in hospitals and other institutional settings have generally utilized existing guidelines for institutional practice. These recommendations are offered as guidance to DHCWs in noninstitutional settings for enhancing infection-control practices in dentistry; they may be useful in institutional settings also.

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

Disease	15th Week Ending			Cumulative, 15th Week Ending		
	Apr. 12, 1986	Apr. 13, 1985	Median 1981-1985	Apr. 12, 1986	Apr. 13, 1985	Median 1981-1985
Acquired Immunodeficiency Syndrome (AIDS)	380	199	N	3,580	1,878	N
Aseptic meningitis	82	71	58	1,207	1,039	1,144
Encephalitis: Primary (arthropod-borne & unsp.)	14	21	19	235	271	256
Post-infectious	2	3	1	25	38	25
Gonorrhea: Civilian	15,880	15,194	15,194	224,979	223,900	256,543
Military	221	276	355	4,457	5,335	7,059
Hepatitis: Type A	405	407	416	6,437	6,114	6,575
Type B	498	536	434	7,042	7,139	6,532
Non A, Non B	54	88	N	932	1,195	N
Unspecified	95	123	127	1,429	1,482	2,093
Legionellosis	7	8	N	157	173	N
Leprosy	7	6	6	78	114	58
Malaria	12	11	18	201	192	198
Measles: Total*	167	104	58	1,607	721	721
Indigenous	165	96	N	1,565	597	N
Imported	2	8	N	42	124	N
Meningococcal infections: Total	66	48	67	959	894	1,041
Civilian	66	48	67	957	893	1,040
Military	-	-	-	2	1	4
Mumps	137	62	101	970	1,194	1,254
Pertussis	23	35	35	545	436	436
Rubella (German measles)	11	11	34	145	115	344
Syphilis (Primary & Secondary): Civilian	420	433	540	6,821	7,051	8,771
Military	10	3	7	68	53	109
Toxic Shock syndrome	9	6	N	95	108	N
Tuberculosis	368	433	489	5,458	5,361	6,258
Tularemia	1	-	2	18	24	27
Typhoid fever	4	8	8	64	74	106
Typhus fever, tick-borne (RMSF)	2	5	5	18	19	22
Rabies, animal	110	107	158	1,400	1,302	1,579

**TABLE II. Notifiable diseases of low frequency, United States**

	Cum 1986	Cum 1986
Anthrax	-	13
Botulism: Foodborne	3	-
Infant (Calif. 1)	15	-
Other	-	16
Brucellosis (lowa 1)	14	-
Cholera	-	11
Congenital rubella syndrome	1	7
Congenital syphilis, ages < 1 year	11	5
Diphtheria	-	-
Leptospirosis	-	-
Plague	-	-
Poliomyelitis, Paralytic	-	-
Psittacosis	-	-
Rabies, human	-	-
Tetanus	-	-
Trichinosis	-	-
Typhus fever, flea-borne (endemic, murine)	-	-

\*There were no cases of internationally imported measles reported for this week.

**TABLE III. Cases of specified notifiable diseases, United States, weeks ending  
April 12, 1986 and April 13, 1985 (15th Week)**

Reporting Area	AIDS Cum. 1986	Aseptic Meningi- tis 1986	Encephalitis		Gonorrhea (Civilian) Cum. 1986 Cum. 1985		Hepatitis (Viral), by type				Legionel- losis 1986	Leprosy Cum. 1986
			Primary Cum. 1986	Post-in- fectious Cum. 1986			A 1986	B 1986	NA,NB 1986	Unspeci- fied 1986		
UNITED STATES	3,580	82	235	25	224,979	223,900	405	498	54	95	7	78
NEW ENGLAND	155	2	9	1	5,239	7,080	18	31	2	2	-	1
Maine	9	-	-	-	278	288	1	2	-	-	-	-
N.H.	7	-	2	-	148	151	-	-	-	-	-	-
Vt.	2	-	2	1	83	63	1	-	-	-	-	-
Mass.	92	1	2	-	2,240	2,621	10	19	1	2	-	1
R.I.	9	-	-	-	487	524	1	2	-	-	-	-
Conn.	36	1	3	-	2,003	3,433	5	8	1	-	-	-
MID ATLANTIC	1,337	5	38	-	41,852	30,976	12	30	2	38	-	7
Upstate N.Y.	118	3	12	-	4,519	4,332	5	6	-	-	-	-
N.Y. City	908	1	10	-	24,599	14,072	3	7	-	32	-	7
N.J.	223	-	5	-	5,721	6,342	4	17	2	6	-	-
Pa.	88	1	11	-	7,013	6,230	-	-	-	-	-	-
E.N. CENTRAL	176	9	47	4	27,554	32,404	19	73	8	3	2	4
Ohio	30	4	15	2	7,715	8,200	7	28	1	-	1	-
Ind.	24	1	5	2	4,299	3,061	1	7	-	-	-	-
Ill.	71	1	6	-	4,074	9,243	7	16	1	-	-	3
Mich.	46	3	20	-	9,706	9,380	4	22	6	3	1	1
Wis.	5	-	1	-	1,760	2,520	-	-	-	-	-	-
W.N. CENTRAL	74	4	6	5	10,395	11,487	8	19	2	-	1	1
Minn.	33	1	4	-	1,561	1,701	1	2	1	-	-	1
Iowa	8	-	2	-	1,043	1,221	1	3	1	-	-	-
Mo.	20	2	-	-	5,159	5,298	1	10	-	-	1	-
N.Dak.	2	-	-	-	103	84	-	-	-	-	-	-
S.Dak.	1	-	-	-	209	208	1	1	-	-	-	-
Nebr.	3	-	-	-	696	1,136	-	1	-	-	-	-
Kans.	7	1	-	5	1,624	1,839	4	2	-	-	-	-
S. ATLANTIC	481	19	39	11	50,318	48,254	32	84	7	7	1	1
Del.	9	-	3	-	965	1,071	-	1	-	-	-	-
Md.	45	6	10	-	7,214	7,723	6	25	1	1	-	-
D.C.	69	-	-	-	4,480	4,036	3	1	1	-	-	-
Va.	51	2	14	-	5,068	5,170	-	4	-	2	-	1
W.Va.	2	-	6	-	718	659	1	2	-	-	-	-
N.C.	21	1	5	1	9,949	9,203	4	11	1	1	-	-
S.C.	14	-	-	-	5,328	6,083	-	11	1	-	-	-
Ga.	64	-	-	-	-	-	4	13	1	-	-	-
Fla.	206	10	1	10	16,596	14,309	14	16	2	3	1	-
E.S. CENTRAL	32	1	18	1	19,564	19,645	5	44	2	1	-	-
Ky.	10	1	8	-	2,318	2,196	1	9	1	-	-	-
Tenn.	13	-	1	1	7,490	7,676	2	28	1	1	-	-
Ala.	5	-	9	-	5,605	6,119	1	6	-	-	-	-
Miss.	4	-	-	-	4,151	3,654	1	1	-	-	-	-
W.S. CENTRAL	304	13	19	-	28,854	31,341	52	34	2	24	2	5
Ark.	9	-	-	-	2,666	2,993	-	-	-	-	-	-
La.	42	1	2	-	5,015	6,522	3	8	-	1	-	-
Okla.	16	-	4	-	3,334	3,199	6	5	-	1	1	-
Tex.	237	12	13	-	17,839	18,627	43	21	2	22	1	5
MOUNTAIN	82	1	11	1	7,580	7,281	25	20	5	4	-	7
Mont.	1	-	-	1	184	222	1	1	-	1	-	-
Idaho	1	-	-	-	232	244	-	1	-	-	-	-
Wyo.	2	-	2	-	172	199	-	-	-	1	-	-
Colo.	36	-	2	-	1,929	2,191	5	4	2	-	-	3
N.Mex.	6	-	1	-	780	846	3	1	1	1	-	-
Ariz.	21	-	4	-	2,356	2,143	8	10	2	1	-	2
Utah	6	1	1	-	308	297	5	1	-	-	-	-
Nev.	9	-	1	-	1,619	1,139	3	2	-	-	-	2
PACIFIC	939	28	48	2	33,623	35,432	234	163	24	16	1	52
Wash.	34	2	5	-	2,506	2,553	16	7	-	-	-	6
Oreg.	18	-	-	-	1,316	1,847	40	13	1	-	-	-
Calif.	869	25	41	2	28,501	29,591	176	138	23	15	1	40
Alaska	8	1	2	-	931	871	1	1	-	1	-	-
Hawaii	10	-	-	-	369	570	1	4	-	-	-	6
Guam	-	-	-	-	28	52	-	-	-	-	-	1
P.R.	32	-	2	-	651	1,109	4	5	1	1	-	-
V.I.	-	-	-	-	66	130	-	-	-	-	-	-
Pac. Trust Terr.	-	-	-	-	42	235	-	1	-	-	-	1
Amer Samoa	-	-	-	-	12	-	1	-	-	-	-	-

N Not notifiable

U Unavailable

**TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending  
April 12, 1986 and April 13, 1985 (15th Week)**

Reporting Area	Malaria	Measles (Rubeola)					Menin- gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported *		Total									
	Cum. 1986	1986	Cum. 1986	1986	Cum. 1986	Cum. 1985	Cum. 1986	1986	Cum. 1986	1986	Cum. 1986	Cum. 1985	1986	Cum. 1986	Cum. 1985
UNITED STATES	201	165	1,565	2	42	721	959	137	970	23	545	436	11	145	115
NEW ENGLAND	11	1	10	-	-	40	69	-	25	3	38	21	-	1	5
Maine	-	-	-	-	-	-	14	-	-	-	2	2	-	-	-
N.H.	-	-	-	-	-	-	3	-	5	-	14	13	-	1	2
Vt.	1	-	-	-	-	-	9	-	-	-	1	2	-	-	-
Mass.	6	-	9	-	-	40	14	-	1	-	9	3	-	-	3
R.I.	1	1	1	-	-	-	10	-	4	-	1	1	-	-	-
Conn.	3	-	-	-	-	-	19	-	15	3	11	-	-	-	-
MID ATLANTIC	25	116	616	-	3	53	163	3	55	1	73	54	-	23	29
Upstate N.Y.	3	1	2	-	2	27	45	-	21	1	48	30	-	15	7
N.Y. City	8	16	91	-	1	20	36	-	5	-	3	7	-	5	7
N.J.	3	99	523	-	-	6	27	3	13	-	4	1	-	3	3
Pa.	11	-	-	-	-	-	55	-	16	-	18	16	-	-	12
E.N. CENTRAL	5	10	158	-	2	243	115	95	484	4	131	66	3	4	9
Ohio	1	-	-	-	-	12	54	4	53	1	62	13	-	-	-
Ind.	-	-	-	-	-	1	10	-	15	2	16	11	-	-	-
Ill.	2	10	89	-	-	139	27	87	276	-	15	12	3	3	3
Mich.	2	-	-	-	-	48	24	4	64	1	14	7	-	-	5
Wis.	-	-	69	-	2	43	-	-	76	-	24	23	-	1	1
W.N. CENTRAL	5	8	78	1	1	4	52	3	45	2	32	38	1	5	7
Minn.	2	-	-	-	-	1	12	-	1	-	15	11	-	-	-
Iowa	1	-	-	-	-	-	6	1	7	1	5	2	-	-	-
Mo.	2	-	-	1 §	1	2	18	2	9	1	4	8	-	1	-
N. Dak.	-	-	-	-	-	-	-	-	2	-	2	6	-	-	-
S. Dak.	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Nebr.	-	-	-	-	-	-	6	-	-	-	-	1	-	-	-
Kans.	-	8	78	-	-	1	10	-	25	-	6	10	1	4	7
S. ATLANTIC	25	21	240	-	4	101	206	7	71	3	102	106	-	6	7
Del.	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Md.	3	3	9	-	2	4	28	-	4	-	21	34	-	-	1
D.C.	-	-	-	-	-	1	2	-	-	-	-	-	-	-	-
Va.	6	-	-	-	-	12	37	-	9	-	9	2	-	-	-
W. Va.	-	2	2	-	-	2	3	2	25	2	4	-	-	-	-
N.C.	3	-	-	-	-	-	32	3	7	-	15	7	-	-	-
S.C.	2	16	218	-	-	-	24	2	9	-	2	-	-	-	2
Ga.	3	-	-	-	1	8	30	-	5	1	43	45	-	-	-
Fla.	8	-	11	-	1	74	49	-	12	-	8	18	-	6	4
E.S. CENTRAL	4	1	1	-	-	-	50	6	13	-	15	4	-	1	1
Ky.	2	-	-	-	-	-	9	-	2	-	1	1	-	1	1
Tenn.	-	1	1	-	-	-	23	6	9	-	5	1	-	-	-
Ala.	2	-	-	-	-	-	13	-	1	-	9	2	-	-	-
Miss.	-	-	-	-	-	-	5	-	1	-	-	-	-	-	-
W.S. CENTRAL	17	2	287	-	12	23	71	2	70	-	24	40	3	30	13
Ark.	-	-	265	-	-	-	8	-	6	-	1	8	-	-	1
La.	4	-	-	-	-	1	8	-	-	-	3	1	-	-	-
Okla.	2	-	2	-	-	-	12	N	N	-	20	31	-	-	-
Tex.	11	2	20	-	12	22	43	2	64	-	-	-	3	30	12
MOUNTAIN	5	-	48	-	6	175	36	7	101	2	70	21	-	-	3
Mont.	-	-	-	-	1	120	4	-	2	-	-	3	-	-	-
Idaho	1	-	-	-	-	2	1	-	2	-	15	-	-	-	1
Wyo.	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
Colo.	1	-	-	-	3	3	7	1	5	-	16	8	-	-	-
N. Mex.	-	-	15	-	2	1	4	N	N	-	8	3	-	-	1
Ariz.	2	-	33	-	-	49	12	6	88	2	23	3	-	-	1
Utah	-	-	-	-	-	-	3	-	1	-	8	4	-	-	-
Nev.	1	-	-	-	-	-	3	-	3	-	-	-	-	-	-
PACIFIC	104	6	127	1	14	82	197	14	106	8	60	86	4	75	41
Wash.	9	-	23	-	7	1	28	-	4	2	25	12	-	1	-
Oreg.	8	-	-	-	2	2	15	N	N	1	3	16	-	-	1
Calif.	87	3	85	1 §	5	72	148	13	94	5	29	53	3	73	32
Alaska	-	-	-	-	-	-	5	-	2	-	1	2	-	-	-
Hawaii	-	3	19	-	-	7	1	1	6	-	2	3	1	1	8
Guam	1	1	3	-	-	10	-	1	2	-	-	-	-	2	1
P.R.	1	-	-	-	-	40	2	1	15	1	3	1	-	-	4
V.I.	-	-	-	-	-	9	-	-	6	-	-	-	-	-	-
Pac. Trust Terr.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Amer. Samoa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

\*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  
April 12, 1986 and April 13, 1985 (15th Week)**

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic- shock Syndrome	Tuberculosis		Tula- remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1986	Cum. 1985	1986	Cum. 1986	Cum. 1985	Cum. 1986	Cum. 1986	Cum. 1986	Cum. 1986
UNITED STATES	6,821	7,051	9	5,458	5,361	18	64	18 +3	1,400
NEW ENGLAND	140	158	2	167	191	-	3	1	1
Maine	10	5	2	18	16	-	-	-	-
N.H.	6	3	-	3	6	-	-	-	-
Vt.	6	-	-	7	3	-	-	-	-
Mass.	67	87	-	82	115	-	2	1	-
R.I.	8	5	-	11	16	-	-	-	1
Conn.	43	58	-	46	35	-	1	-	-
MID ATLANTIC	1,003	949	-	1,087	1,046	-	7	1	118
Upstate N.Y.	51	65	-	174	157	-	1	1	20
N.Y. City	570	606	-	526	561	-	4	-	-
N.J.	196	206	-	197	92	-	2	-	-
Pa.	186	72	-	190	236	-	-	-	98
E.N. CENTRAL	175	339	2	700	674	-	4	-	27
Ohio	34	34	2	103	128	-	-	-	2
Ind.	40	29	-	86	83	-	-	-	7
Ill.	39	178	-	304	300	-	-	-	8
Mich.	43	82	-	167	128	-	3	-	3
Wis.	19	16	-	40	35	-	1	-	7
W.N. CENTRAL	67	75	-	156	141	6	3	1 +1	184
Minn.	8	19	-	36	23	-	1	-	20
Iowa	5	11	-	11	22	1	-	-	40
Mo.	38	29	-	85	66	5	2	-	16
N. Dak.	2	-	-	3	2	-	-	-	46
S. Dak.	1	4	-	5	7	-	-	-	41
Nebr.	8	3	-	4	7	-	-	-	5
Kans.	5	9	-	12	14	-	-	1	16
S. ATLANTIC	1,767	1,790	-	1,073	1,085	4	6	6 +1	372
Del.	10	14	-	13	9	-	-	-	-
Md.	142	137	-	77	86	1	-	-	231
D.C.	105	96	-	42	52	-	-	-	-
Va.	139	97	-	100	79	1	2	1	60
W. Va.	3	2	-	40	25	-	-	-	8
N.C.	155	211	-	137	131	1	2	2	-
S.C.	201	230	-	128	140	-	-	2	10
Ga.	-	-	-	132	159	1	-	1	42
Fla.	1,012	1,003	-	404	404	-	2	-	21
E.S. CENTRAL	486	635	2	495	469	3	-	5	74
Ky.	25	25	2	135	99	2	-	1	24
Tenn.	202	173	-	136	138	1	-	-	30
Ala.	163	220	-	162	163	-	-	1	20
Miss.	96	217	-	62	69	-	-	3	-
W.S. CENTRAL	1,586	1,729	1	665	556	4	2	4 +1	197
Ark.	77	82	-	92	40	3	-	-	42
La.	247	306	-	125	82	-	-	-	4
Okl.	47	48	1	56	69	1	1	2	18
Tex.	1,215	1,293	-	392	365	-	1	2	133
MOUNTAIN	190	238	-	108	123	-	2	-	231
Mont.	3	1	-	5	19	-	-	-	88
Idaho	1	2	-	5	3	-	-	-	-
Wyo.	-	-	-	-	1	-	-	-	102
Colo.	61	55	-	1	16	-	-	-	-
N. Mex.	22	27	-	25	22	-	-	-	2
Ariz.	80	133	-	55	53	-	1	-	39
Utah	3	3	-	4	3	-	1	-	-
Nev.	20	12	-	13	6	-	-	-	-
PACIFIC	1,407	1,138	2	1,007	1,076	1	57	-	196
Wash.	27	43	-	56	53	-	2	-	-
Oreg.	128	29	-	36	35	-	-	-	-
Calif.	1,337	1,045	2	844	892	-	33	-	190
Alaska	-	-	-	17	44	1	-	-	6
Hawaii	15	21	-	54	52	-	2	-	-
Guam	1	2	-	-	12	-	-	-	-
P.R.	245	262	-	76	84	-	2	-	14
V.I.	-	1	-	1	1	-	-	-	-
Pac. Trust Terr.	45	15	-	7	23	-	6	-	-
Amer. Samoa	-	-	-	-	-	-	-	-	-

U Unavailable

TABLE IV. Deaths in 121 U.S. cities,\* week ending  
April 12, 1986 (15th Week)

Reporting Area	All Causes, By Age (Years)						P&I** Total	Reporting Area	All Causes, By Age (Years)						P&I** Total
	All Ages	≥65	45-64	25-44	1-24	<1			All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	675	486	116	28	18	27	66	S. ATLANTIC	1,359	867	308	101	44	37	75
Boston, Mass.	192	125	34	14	5	14	22	Atlanta, Ga.	157	100	35	18	2	2	5
Bridgeport, Conn.	38	27	7	1	2	1	4	Baltimore, Md.	237	153	53	19	7	5	9
Cambridge, Mass.	29	24	3	2	-	-	5	Charlotte, N.C.	82	50	21	6	2	3	6
Fall River, Mass.	20	16	4	-	-	-	-	Jacksonville, Fla.	120	73	32	7	3	5	7
Hartford, Conn.	61	44	10	3	2	2	6	Miami, Fla.	130	77	35	10	7	1	3
Lowell, Mass.	27	21	5	-	1	-	2	Norfolk, Va.	30	15	9	1	3	2	3
Lynn, Mass.	15	12	3	-	-	-	1	Richmond, Va.	92	57	21	5	2	6	10
New Bedford, Mass.	28	18	9	-	1	-	2	Savannah, Ga.	48	29	14	3	1	1	2
New Haven, Conn.	50	39	7	1	1	2	3	St. Petersburg, Fla.	116	92	14	5	4	1	10
Providence, R.I.	55	39	9	2	-	5	1	Tampa, Fla.	77	57	11	4	2	3	5
Somerville, Mass.	7	6	1	-	-	-	1	Washington, D.C.	223	129	54	21	10	8	13
Springfield, Mass.	52	40	9	-	3	-	8	Wilmington, Del.	47	35	9	2	1	-	2
Waterbury, Conn.	37	25	7	2	2	1	4								
Worcester, Mass.	64	50	8	3	1	2	7								
MID ATLANTIC	2,864	1,926	580	234	69	54	145	E.S. CENTRAL	860	521	200	67	37	35	58
Albany, N.Y.	49	38	8	2	-	1	3	Birmingham, Ala.	112	66	29	9	6	2	6
Allentown, Pa.	20	17	2	1	-	-	-	Chattanooga, Tenn.	81	46	25	5	4	1	5
Buffalo, N.Y.	129	83	29	9	3	5	15	Knoxville, Tenn.	100	66	20	8	3	3	10
Camden, N.J.	43	27	11	2	-	3	2	Louisville, Ky.	105	70	23	6	4	2	11
Elizabeth, N.J.	15	11	4	-	-	-	-	Memphis, Tenn.	218	137	45	16	6	14	10
Erie, Pa.†	40	24	11	5	-	-	3	Mobile, Ala.	58	32	15	6	1	4	3
Jersey City, N.J.	45	30	4	8	2	1	3	Montgomery, Ala.	62	36	12	5	8	1	2
N.Y. City, N.Y.	1,671	1,111	342	148	41	29	68	Nashville, Tenn.	124	68	31	12	5	8	11
Newark, N.J.	66	29	19	11	2	5	4	W.S. CENTRAL	1,484	881	355	136	49	63	69
Petersen, N.J.	23	15	6	1	-	1	-	Austin, Tex.	78	42	17	10	1	8	10
Philadelphia, Pa.	302	203	59	18	13	9	12	Baton Rouge, La.	22	11	9	2	-	-	2
Pittsburgh, Pa.†	65	47	14	3	1	-	3	Corpus Christi, Tex.	27	14	4	6	2	1	1
Reading, Pa.	29	19	8	2	-	-	3	Dallas, Tex.	221	107	66	35	5	8	12
Rochester, N.Y.	104	78	18	6	2	-	8	El Paso, Tex.	48	24	13	5	3	3	-
Schenectady, N.Y.	30	22	3	4	1	-	5	Fort Worth, Tex.	105	61	24	7	9	4	7
Scranton, Pa.†	31	27	4	-	-	-	1	Houston, Tex. §	416	268	87	33	10	18	12
Syracuse, N.Y.	95	70	17	5	2	-	8	Little Rock, Ark.	71	43	22	3	-	3	6
Trenton, N.J.	48	32	8	7	1	-	3	New Orleans, La.	131	77	29	14	4	7	-
Utica, N.Y.	23	18	5	-	-	-	1	San Antonio, Tex.	201	122	54	12	9	4	10
Yonkers, N.Y.	36	25	8	2	1	-	3	Shreveport, La.	52	35	10	2	-	5	1
								Tulsa, Okla.	112	77	20	7	6	2	8
E.N. CENTRAL	2,383	1,575	523	157	53	75	112	MOUNTAIN	710	449	145	54	41	21	30
Akron, Ohio	73	53	13	4	2	1	7	Albuquerque, N.Mex.	81	54	12	6	8	1	7
Canton, Ohio	35	23	8	2	2	-	4	Colo. Springs, Colo.	48	26	16	5	-	1	3
Chicago, Ill. §	570	368	125	42	12	23	18	Denver, Colo.	132	84	23	15	7	3	2
Cincinnati, Ohio	128	94	22	3	2	7	7	Las Vegas, Nev.	83	56	16	6	3	2	3
Cleveland, Ohio	154	99	30	14	5	6	6	Ogden, Utah	19	14	3	1	1	-	1
Columbus, Ohio	129	85	30	8	3	3	5	Phoenix, Ariz.	155	94	31	11	14	5	4
Dayton, Ohio	124	81	33	5	-	5	6	Pueblo, Colo.	22	18	3	-	-	1	2
Detroit, Mich.	282	154	79	37	7	5	8	Salt Lake City, Utah	49	23	11	4	7	4	1
Evansville, Ind.	49	36	10	1	1	1	-	Tucson, Ariz.	121	80	30	6	1	4	7
Fort Wayne, Ind.	69	48	13	6	2	-	3								
Gary, Ind.	12	7	4	1	-	-	-	PACIFIC	2,082	1,404	381	180	61	51	127
Grand Rapids, Mich.	57	38	13	3	2	1	5	Berkeley, Calif.	15	11	2	2	-	-	-
Indianapolis, Ind.	144	88	41	6	4	5	3	Fresno, Calif.	85	60	12	7	2	4	7
Madison, Wis.	38	24	9	2	2	1	4	Glendale, Calif.	31	25	3	1	1	1	3
Milwaukee, Wis.	135	97	20	8	4	6	5	Honolulu, Hawaii	80	57	16	3	1	3	5
Peoria, Ill.	38	29	6	1	1	1	3	Long Beach, Calif.	92	60	23	5	3	1	8
Rockford, Ill.	44	29	9	3	-	3	4	Los Angeles, Calif.	665	445	117	69	21	8	23
South Bend, Ind.	57	47	7	2	-	1	6	Oakland, Calif.	78	49	14	6	1	8	2
Toledo, Ohio	172	119	39	6	3	5	15	Pasadena, Calif.	37	30	4	2	1	-	3
Youngstown, Ohio	73	56	12	3	1	1	3	Portland, Ore.	133	90	22	10	6	5	8
								Sacramento, Calif.	138	85	30	16	6	1	14
W.N. CENTRAL	780	550	139	43	29	19	45	San Diego, Calif.	162	105	26	15	6	10	24
Des Moines, Iowa	69	47	16	2	2	2	4	San Francisco, Calif.	130	77	32	20	-	1	3
Duluth, Minn.	29	27	1	1	-	-	4	San Jose, Calif.	184	120	38	14	10	2	14
Kansas City, Kans.	22	14	5	2	1	-	1	Seattle, Wash.	153	120	22	7	2	2	5
Kansas City, Mo.	132	91	30	6	1	4	10	Spokane, Wash.	56	39	15	-	1	1	7
Lincoln, Nebr.	46	32	6	-	5	3	-	Tacoma, Wash.	43	31	5	3	-	4	1
Minneapolis, Minn.	83	60	12	7	3	1	3								
Omaha, Nebr.	93	60	18	7	6	2	10								
St. Louis, Mo.	161	107	28	11	8	7	5	TOTAL	13,197 <sup>††</sup>	8,659	2,747	1,000	401	382	727
St. Paul, Minn.	77	58	12	5	2	-	1								
Wichita, Kans.	68	54	11	2	1	-	7								

\* 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 4 weeks.

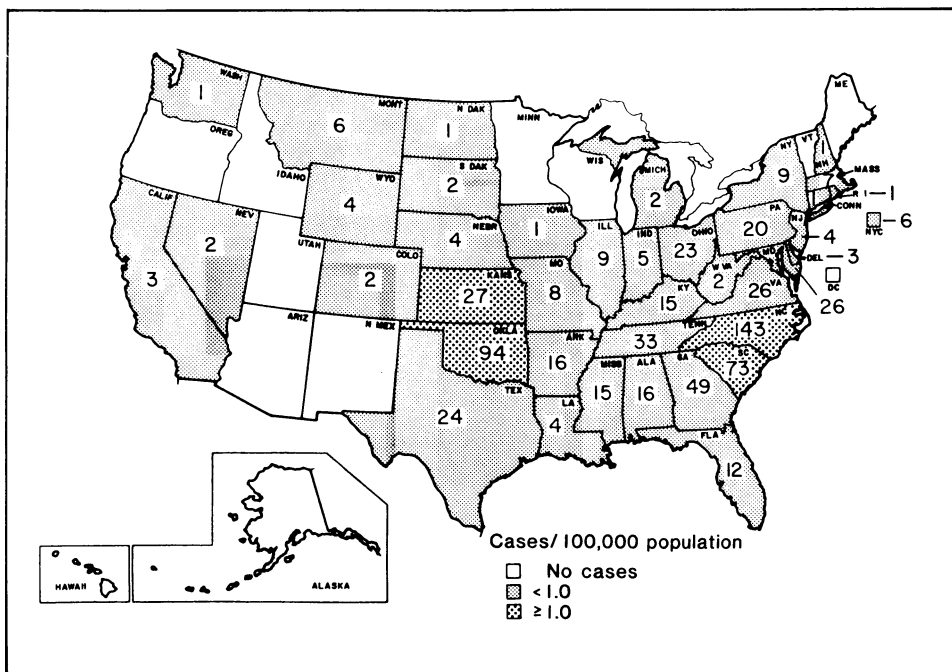
## Current Trends

### Rocky Mountain Spotted Fever — United States, 1985

For 1985, a provisional total of 700 cases of Rocky Mountain spotted fever (RMSF) was reported to *MMWR*, an incidence rate of 0.29 cases per 100,000 population. Oklahoma had the highest incidence rate (94 cases, 2.8/100,000). North Carolina reported the largest number of cases (143 cases, 2.3/100,000). Two other states had incidence rates of 1/100,000 or higher—South Carolina (73 cases, 2.2/100,000) and Kansas (27 cases, 1.1/100,000) (Figure 1).

States submitted case report forms for 587 (84%) of the 700 reported cases. Of these 587 cases, 335 (57%) were laboratory-confirmed by either serologic testing, isolation of spotted fever group rickettsia, or fluorescent antibody staining of biopsy or autopsy material. A case is considered serologically confirmed if testing reveals an indirect fluorescent antibody titer (IFA) of 1:64 or greater, a complement fixation (CF) titer of 1:16 or greater, or a fourfold rise in titer by the CF, IFA, microagglutination (MA), latex agglutination (LA), or indirect hemagglutination (IHA) assay. An additional 34 (6%) cases were classified as probable cases, as indicated by a fourfold rise in titer or a single titer 1:320 or higher in the Weil-Felix assay or an LA, MA, or IHA single titer of 1:128 or higher. The other 218 (37%) cases were supported by clinical diagnoses alone.

**FIGURE 1. Reported Rocky Mountain spotted fever cases and rates, by state — United States, 1985**



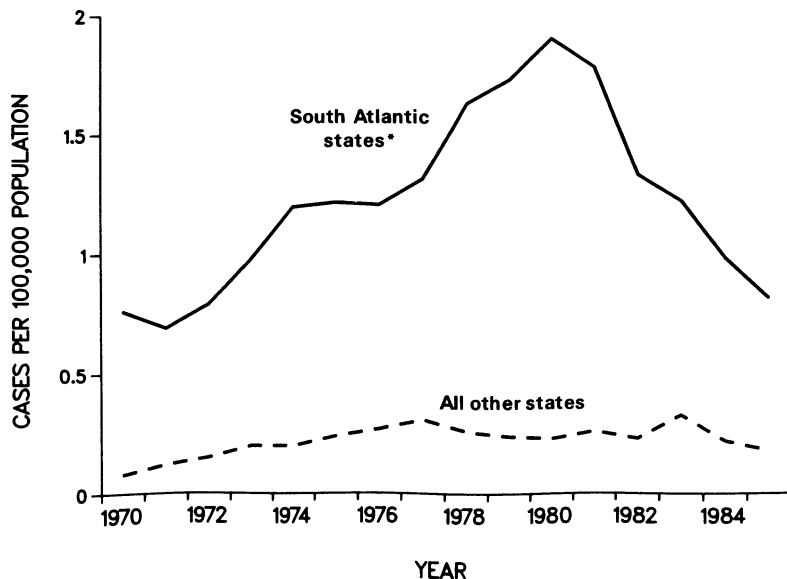
*RMSF — Continued*

The 1985 surveillance revealed case characteristics similar to those previously reported. Ninety-five percent of patients reported onset of illness between April 1 and September 30, with 66% becoming ill in May, June, or July. Sixty percent of patients were male; 41% were under 20 years of age; and 90% were white. Symptoms reported included fever (94%), headache (88%), and myalgia (85%). A rash was reported by 83% and, of these, 73% reported that the rash was noted on the palms or soles. Seventy-three percent of the patients were hospitalized. The overall case-fatality rate was 4%. The case-fatality rate was higher for blacks (16%) than whites (3%) and was higher for individuals 40 years of age or older (9%) than for individuals under age 40 years (2%). Of the patients for whom exposure histories were available, 68% reported a tick bite or attachment, and an additional 24% reported being in a tick-infested area within 14 days (but no tick bite or attachment). Eight percent did not have a known exposure of either type.

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

**Editorial Note:** The number of reported RMSF cases has waned considerably from the peak of 1,192 cases (0.51/100,000) reported in 1981 (1). The increase in the early 1970s appeared simultaneously in many regions of the United States and was stimulated by the 1970 initiation of a CDC surveillance program (2). The rate of RMSF reported in the South Atlantic states, which increased steadily from 0.76/100,000 in 1970 to a peak of 1.91/100,000 in 1980, has now fallen to 0.82/100,000 (Figure 2). Excluding the South Atlantic states, the rate of RMSF in the other states rose through 1977 and remained fairly constant between 1978 and 1985 (Figure 2). For the third consecutive year, Oklahoma reported the highest incidence of any state.

**FIGURE 2. Rates of reported Rocky Mountain spotted fever cases, by year — South Atlantic states and all other states, 1970-1985**



\*Delaware, Maryland, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, and the District of Columbia.

*RMSF — Continued*

Although the number of reported deaths has decreased with the decrease in the number of reported cases, the case-fatality rate has changed little over the last 5 years. Morbidity and mortality may be decreased by knowledge of the epidemiology and early clinical signs of RMSF (3). RMSF should be suspected, and treatment with chloramphenicol or tetracycline strongly considered, among residents of, or visitors to, RMSF-endemic areas who report fever, headache, and myalgias, even without a rash, particularly during April through October. Symptoms and signs referable to the pulmonary system (such as cough or rales), the gastrointestinal system (such as nausea, vomiting, or abdominal pain), or the central nervous system (such as stupor, meningismus, or ataxia), are seen with RMSF and should not delay diagnosis or treatment (3). Special attention is warranted for individuals 40 years of age and older, who have a greater likelihood of a fatal outcome, and dark-skinned individuals, in whom a rash may be more difficult to diagnose.

In a recent study of RMSF in a hyperendemic area, a tick bite or exposure was reported for 85% of serologically confirmed cases, compared with 54% of matched controls (4). Rash was reported in 84% of the serologically confirmed cases. However, in 16% of patients, a rash was never noted, and in an additional 10%, a rash did not develop until later than the fifth day after onset of the illness.

Prevention of RMSF is best accomplished by careful inspection of persons who may have been exposed to ticks. Ticks should be removed by grasping them with tweezers as closely as possible to the point of attachment and pulling slowly and steadily (5). If a portion of the mouth part remains, it should be treated like any other small foreign body; it may cause irritation, but it will not increase the risk of contracting RMSF. The fingers, protected with tissue paper, may be used to remove a tick from a person if tweezers are not available, but should always be washed after the removal of a tick. The fingers should not be used to detick dogs. Persons living and working in tick-infested areas should be educated about the prevention, symptoms, and signs of the disease. No vaccine against RMSF is currently available. RMSF cases should be reported to appropriate local and state health departments.

*References*

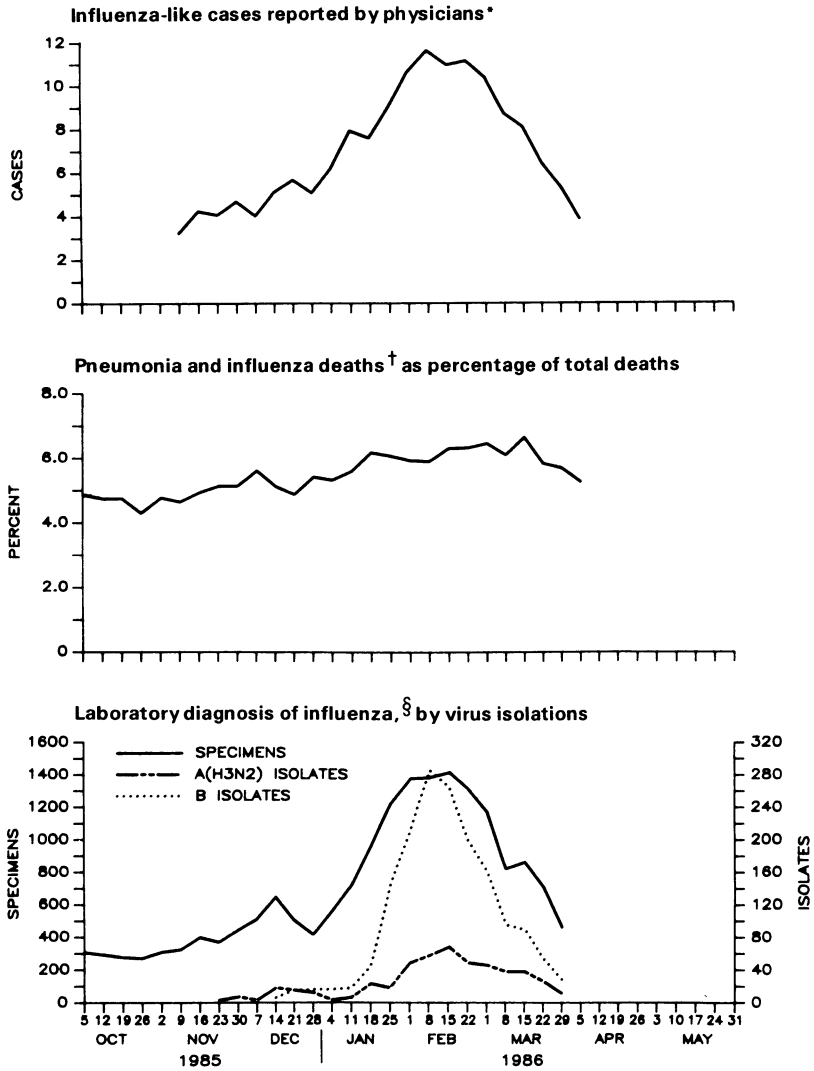
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*Current Trends***Update: Influenza Activity — United States**

Influenza activity in the United States continues to decline (Figure 3). Almost all influenza virus isolates this season have been type B (76.1%) or type A(H3N2) (23.8%). However, from February 17 to February 24, type A(H1N1) viruses were isolated from three persons, aged 3, 4, and 31 years, with influenza-like illness who lived in the same neighborhood in west Houston, Texas. Despite continued surveillance, no further type A(H1N1) isolates have been identified in Houston. In Hawaii, one type A(H1N1) virus isolate was reported this season.

*Influenza — Continued*

**FIGURE 3. Indicators of influenza activity, by week — United States, 1985-1986**



\*Reported to CDC by approximately 125 physician members of the American Academy of Family Physicians. A case was defined as a patient with fever 37.8 C (100 F) or greater and at least cough or sore throat.

<sup>†</sup>Reported to CDC from 121 cities in the United States. Pneumonia and influenza deaths include all deaths where pneumonia is listed as a primary or underlying cause or where influenza is listed on the death certificate.

<sup>§</sup>Reported to CDC by WHO Collaborating Laboratories (including military sources).

*Influenza — Continued*

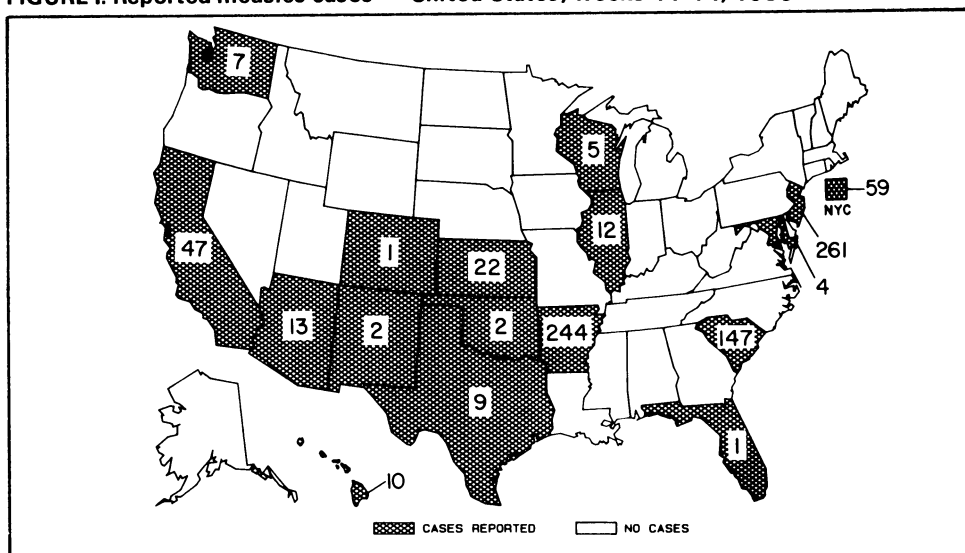
In Birmingham, Alabama, recent laboratory results have shown that an outbreak of influenza among college students reportedly caused by influenza type A(H3N2) virus (1) was primarily associated with type B influenza virus.

*Reported by Influenza Research Center, Baylor College of Medicine, Houston, Texas; State and Territorial Epidemiologists; State Laboratory Directors; Statistical Svcs Br, Div of Surveillance and Epidemiologic Studies, Epidemiology Program Office, WHO Collaborating Center for Influenza, Influenza Br, Div of Viral Diseases, Center for Infectious Diseases, CDC.*

*Reference*

1. CDC. Update: influenza activity—United States. MMWR 1986;35:135-6, 141.

FIGURE I. Reported measles cases — United States, weeks 11-14, 1986



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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: ATTN: Editor, *Morbidity and Mortality Weekly Report*, Centers for Disease Control, Atlanta, Georgia 30333.

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