CDC
CENTERS FOR DISEASE CONTROL AND PREVENTION

October 22, 1993 / Vol. 42 / No. 41

MMWR
MORBIDITY AND MORTALITY WEEKLY REPORT

Epidemiologic Notes and Reports

Outbreaks of *Salmonella enteritidis* Gastroenteritis — California, 1993

Foodborne infections cause an estimated 6.5 million cases of human illness and 9000 deaths annually in the United States (*1*). *Salmonella* is the most commonly reported cause of foodborne outbreaks, accounting for 28% of such outbreaks of known etiology and 45% of outbreak-associated cases during 1973–1987 (*2*). During 1985–1992, state and territorial health departments reported 437 *Salmonella enteritidis* (SE) outbreaks (Table 1), which accounted for 15,162 cases of illness, 1734 hospitalizations, and 53 deaths. This report describes three SE outbreaks in California during a 4-month period in 1993.

Outbreak 1: Los Angeles County

In January 1993, routine surveillance for salmonellosis identified four unrelated persons with gastroenteritis and stool cultures yielding SE who recently had eaten at a local restaurant; one person had been hospitalized. The mean period from eating at the restaurant to onset of illness was 20 hours (range: 11–24 hours); duration of

TABLE 1. Reported outbreaks* of *Salmonella enteritidis* infection, by region — United States, 1985–1992

	Northeast†		Outside Northeast		Total	
Year	No.	(%)	No.	(%)	No.	(%)
1985	21	(81)	5	(19)	**26**	**(6)**
1986	39	(81)	9	(19)	**48**	**(11)**
1987	40	(77)	12	(23)	**52**	**(12)**
1988	24	(60)	16	(40)	**40**	**(9)**
1989	58	(77)	17	(23)	**75**	**(17)**
1990	32	(48)	35	(52)	**67**	**(16)**
1991	34	(51)	33	(49)	**67**	**(16)**
1992	39	(71)	16	(29)	**55**	**(13)**
Total	**287**	**(67)**	**143**	**(33)**	**430**	**(100)**

*Seven outbreaks that originated outside the United States and its territories were not included.
†Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

Salmonella enteritidis — *Continued*

symptoms ranged from 1 to 14 days. All four isolates were phage type 13a and plasmid profile type 2 (36 and 3.7 megadalton plasmids), an unusual pattern among SE isolates. All four ill persons reported having eaten an egg-based dish (omelette, scrambled eggs, or egg salad) at the restaurant during December 26, 1992–January 6, 1993.

An investigation by the Los Angeles County Department of Health Services involved the four reported cases, five well meal companions, and 100 restaurant patrons identified through credit card receipts; two additional cases were identified. A case was defined as onset of diarrhea (three or more loose stools in a 24-hour period) plus fever, abdominal cramps, nausea, and/or vomiting within 3 days after eating at the restaurant. Five of the six case-patients had eaten an egg-based dish, compared with 16 (16%) of 103 well persons (odds ratio [OR]=27.2; 95% confidence interval [CI]=2.7–1300); no other food was associated with illness.

Inspection of the restaurant revealed that egg salad was stored on a cold table at a holding temperature of 60 F (15.5 C), a temperature that allows growth of *Salmonella*. For pooled egg dishes, 22–30 dozen extra-large grade AA eggs were pooled several times daily and stored in a walk-in refrigerator. A 2-quart container of pooled eggs was stored in a reach-in refrigerator. The temperature of the pooled eggs in the reach-in refrigerator was 50 F (10 C); California regulations require eggs to be refrigerated at ≤45 F (≤7.2 C).

In February, cultures of swabs of utensils used for pooling and storing the eggs were negative for SE, and rectal swabs obtained from all 43 food handlers at the restaurant also were negative. No eggs from the implicated shipment remained. Eggs from a later shipment from the same distributor, delivered February 9, did not yield SE.

The U.S. Department of Agriculture (USDA) *Salmonella enteritidis* Control Program and the California Department of Food and Agriculture (CDFA) attempted to trace the implicated eggs back to the farm of origin. However, the traceback was terminated because the eggs were purchased from a distributor who bought and mixed eggs from many different suppliers. Current USDA *Salmonella* regulations limit the testing of flocks to a single, clearly implicated flock.

Outbreak 2: San Diego County

In February 1993, 23 persons who had eaten at a local restaurant on February 16 developed abdominal cramps and diarrhea; two were hospitalized. The mean period from eating at the restaurant to onset of illness was 20 hours (range: 3.5–77.0 hours); duration of symptoms ranged from 2 to 14 days. Stool cultures from 11 of 13 ill persons tested yielded SE; all isolates were phage type 13a and plasmid profile type 2, indistinguishable from the SE strains in outbreak 1.

An investigation by the San Diego County Department of Health Services involved the 23 reported cases and 24 well meal companions. A case was defined as onset of diarrhea (three or more loose stools in a 24-hour period) within 5 days after eating at the restaurant. Eighteen (78%) of the 23 case-patients had eaten an entree served with hollandaise or bearnaise sauce, compared with three (13%) of 24 well persons (OR=25.2; 95% CI=4.4–170.7).

The hollandaise sauce, also used as a base for the bearnaise sauce, was prepared with 12 pooled raw egg yolks. A new batch was prepared at the beginning of each

Salmonella enteritidis — *Continued*

meal shift and placed in a clean dispenser. The dispenser was kept under a heat lamp for up to 3½ hours at approximately 100 F–120 F (37.8 C–48.9 C).

Traceback of implicated eggs by USDA and CDFA indicated they had been purchased from the same distributor that had provided eggs to the restaurant involved in outbreak 1. Again, traceback was terminated.

Outbreak 3: Santa Clara County

In March 1993, 22 persons who had eaten at a local sandwich shop during February 28–March 4 developed diarrhea, fever, and abdominal cramps; none were hospitalized. Stool cultures from all 22 ill persons yielded SE; all isolates were phage type 13a and plasmid profile type 2, indistinguishable from the SE strains in outbreaks 1 and 2. Preliminary findings of a case-control study conducted by the Santa Clara County Health Department implicated sandwiches as the vehicle of transmission; no other food was associated with illness. Further investigation revealed that mayonnaise was the only food ingredient containing a raw product of animal origin and was common to all sandwiches eaten by ill persons. None of the implicated mayonnaise remained at the time of the investigation, but unrefrigerated eggs from the implicated shipment obtained from the sandwich shop were cultured in five pools of 10 eggs each; one of the pools yielded SE. This isolate was phage type 13a and plasmid profile type 2. Traceback of implicated eggs by USDA and CDFA indicated they had been purchased from the same distributor that had provided eggs to the two restaurants in outbreaks 1 and 2. Again, traceback was terminated.

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Editorial Note: Although most reported SE outbreaks have occurred in the New England and Mid-Atlantic states (*3*), an increasing proportion of outbreaks has been reported from other areas (Table 1). From 1976 through 1991, the proportion of reported *Salmonella* isolates in the United States that were SE increased from 5% to 20%; SE was second only to *S. typhimurium*, except in 1989 and 1990, when SE was the most frequently reported serotype. In California, only four SE outbreaks had been reported since 1985, when active surveillance for SE outbreaks began; the proportion of reported *Salmonella* isolates that were SE increased from 5% to 13% from 1985 through 1992 and to 21% for the first half of 1993.

An estimated 0.01% of all shell eggs contain SE, although this percentage may be higher in the northeastern United States (*4*). Consequently, foods containing raw or undercooked eggs (e.g., homemade mayonnaise, hollandaise sauce, and runny omelettes) pose a slight risk for infection with SE. In contrast, commercial mayonnaise is made with pasteurized eggs and is safe. Outbreaks of salmonellosis—some of substantial magnitude—may occur when commercial kitchens serve foods made with contaminated shell eggs that have not been sufficiently cooked to kill *Salmonella*. This is particularly likely when refrigeration is inadequate or holding temperatures are too

Salmonella enteritidis — *Continued*

low and when eggs are pooled, whereby a single contaminated egg can contaminate a large pool. However, egg-handling practices of affected restaurants may be similar to the routine practices of many other restaurants (*5*). In August 1990, FDA issued recommendations to state agencies that directly regulate commercial establishments concerning the proper handling of shell eggs by restaurants, grocery stores, caterers, institutional feeders, and vending operators. These recommendations include guidelines on refrigeration, cooking, pooling, and substitution with pasteurized eggs.

The temporal clustering of the outbreaks in this report and the same unusual combination of phage type and plasmid profile type common to all three outbreaks suggest that one farm supplied contaminated eggs to all three restaurants. However, because eggs are distributed nationwide and 70% of eggs sold by the distributor in California were obtained or purchased from other states, the source farm may have been outside California. During most egg-associated traceback efforts, the outbreak strain of SE is almost always found on the source farm (*6*).

Most SE infections occur as sporadic cases or in limited family outbreaks, rather than as part of large common-source outbreaks. Such sporadic cases also are often associated with eating undercooked eggs (*7*). The risk for infection acquired through consumption of contaminated foods prepared in the kitchens of private homes can be reduced through improved education of consumers regarding the risks of eating raw or undercooked eggs and through increased availability of pasteurized eggs in the retail marketplace. Because most serious illnesses and deaths associated with salmonellosis occur among infants, the elderly, and immunocompromised persons (*8,9*), persons in these groups should not be served foods containing raw or undercooked eggs. In addition, hospitals, nursing homes, and commercial kitchens should use pasteurized egg products for all recipes requiring pooled eggs or lightly cooked eggs and should refrigerate all eggs and egg products.

On October 27, 1992, the USDA Agricultural Marketing Service published a proposed rule on requirements for storage and transport temperatures of eggs and for carton labeling aimed at increasing the safety of raw shell eggs nationwide.* The comment period for this proposed rule ended March 29, 1993; final regulations are pending and subject to revised legislation. In addition, on August 2, 1993, the USDA Animal and Plant Health Inspection Service (APHIS) published a proposed rule that would revise current USDA regulations concerning chicken infection caused by SE.† These proposed changes will improve control of the spread of SE in commercial egg-type chicken flocks and include a provision that allows identification of more than one flock as the probable source of eggs causing an SE outbreak. The comment period for this proposed rule has been extended to November 15, 1993. Additional information is available from Dr. John Mason, Director *Salmonella enteritidis* Control Program, Veterinary Services, APHIS, USDA, Room 205, Presidential Building, 6525 Belcrest Road, Hyattsville, MD 20782; telephone (301) 436-4363.

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Epidemiologic Notes and Reports

Morbidity Surveillance Following the Midwest Flood — Missouri, 1993

Heavy spring and summer rains during 1993 caused flooding by both the Mississippi and Missouri rivers and by streams in 84 of the 115 counties in Missouri; all 84 were declared federal disaster areas. The Mississippi River attained flood stage during July 15–August 2, and the Missouri River, during July 25–August 2; a total of 2,060,757 acres were submerged, and approximately 60,000 persons throughout Missouri were displaced (National Weather Service, unpublished data, 1993). At the request of the Missouri Department of Health, CDC provided assistance in implementing a surveillance system to monitor flood-related injuries and illnesses in the affected areas. This report presents preliminary findings of these surveillance efforts.

Routine public health surveillance in Missouri is based on active and passive surveillance systems for communicable, environmental, and occupational diseases. Because of public health concerns regarding the flood, additional surveillance systems were implemented during the impact and recovery phases of the flood and included 1) emergency shelter-based active surveillance to identify disease outbreaks or clusters of adverse health events (local communicable disease coordinators and other volunteers made daily phone calls to shelters to monitor flood-related injuries and illnesses and to obtain total daily census figures) and 2) hospital emergency department-based passive surveillance in 31 hospitals to identify flood-related injuries and illnesses.

The highest number of persons reported residing in shelters was 702 on July 28. The highest number of reported flood-related injuries and illnesses in shelters was 40 on July 26, when 510 persons resided in shelters. No acute disease outbreaks were identified by the active surveillance system during or after the flood.

Midwest Flood — Continued

Emergency departments used a standardized questionnaire to provide daily reports of visits for injuries and illnesses. During July 16–September 3, 524 flood-related conditions were reported through this system. Of these, 250 (47.7%) were injuries, 233 (44.5%) were illnesses, 39 (7.4%) were listed as "other," and two (0.4%) were listed as "unknown." A total of 234 patients were treated and released after initial presentation to a hospital emergency department; 32 were hospitalized. In 249 cases, the hospitals did not report the patients' final dispositions. Of the 250 reported injuries, the most common were sprains/strains (86 [34%]), lacerations (61 [24%]), "other injuries" (28 [11%]), and abrasions/contusions (27 [11%]). Of the 233 reported illnesses, the most frequently reported were gastrointestinal (40 [17%]), rashes/dermatitis (38 [16%]), heat-related (31 [13%]), and "other conditions" (47 [20%]).

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Editorial Note: The findings in this report are consistent with those in a previous report from Iowa that documented a substantial number of persons hospitalized for flood-related conditions (*1*). These findings underscore the importance of flood-related morbidity surveillance in assessing the need and planning for public health intervention measures.

The public health impact of floods and other disasters may reflect secondary effects of the disaster, such as population displacement and disruption of existing health services (*2*). In Missouri, although widespread flooding caused substantial population displacement, most persons displaced by the flood had access to health-care and medical services and to sanitary facilities throughout the impact phase. In addition, the findings of active surveillance at emergency shelters suggested that displaced persons were housed in shelters for only short periods and that they were able to secure temporary housing. During the recovery phase, most emergency shelters were not needed and were therefore closed.

In addition to guiding public health and health-care relief efforts, the findings in this report assisted public health officials in responding to public and media inquiries and will assist in planning surveillance strategies for future disasters. For example, the surveillance systems in Missouri were limited to shelters and emergency departments. However, to more accurately monitor flood-related morbidity in the future, surveillance will be expanded to include institutions and facilities that have been effective locations in previous flood disasters (e.g., relief agencies, outpatient medical clinics, disaster-assistance centers, state public health facilities, and physicians' offices) (*3*).

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Epidemiologic Notes and Reports

Human Rabies — New York, 1993

In August 1993, a fatal case of human rabies in an 11-year-old girl was reported to the New York State Department of Health; this was the first indigenously acquired fatal case diagnosed in New York in 39 years. This report summarizes the investigation of this case.

On July 5, the girl complained of pain in the knuckles on her left hand. During July 6–7, she had increasing pain that extended up to the left shoulder. On July 8, a pediatrician diagnosed musculoskeletal pain and bilateral ear effusions; a throat culture was obtained and amoxacillin was prescribed.

On July 9, the patient developed fever, severe muscle spasms of the left arm, difficulty walking, and hallucinations. On evaluation in an emergency department on July 10, she had fever (101.1 F [38.6 C]), otitis media in her left ear, nonexudative pharyngitis, and a maculopapular rash on the chest; there were no focal neurologic or meningeal signs. The throat culture obtained July 8 was positive for presumed streptococcus group A, and recurrent streptococcal pharyngitis and otitis media were diagnosed. She was treated with intravenous ceftriaxone, normal saline, and oral antipyretics and was discharged with a prescription for cefaclor.

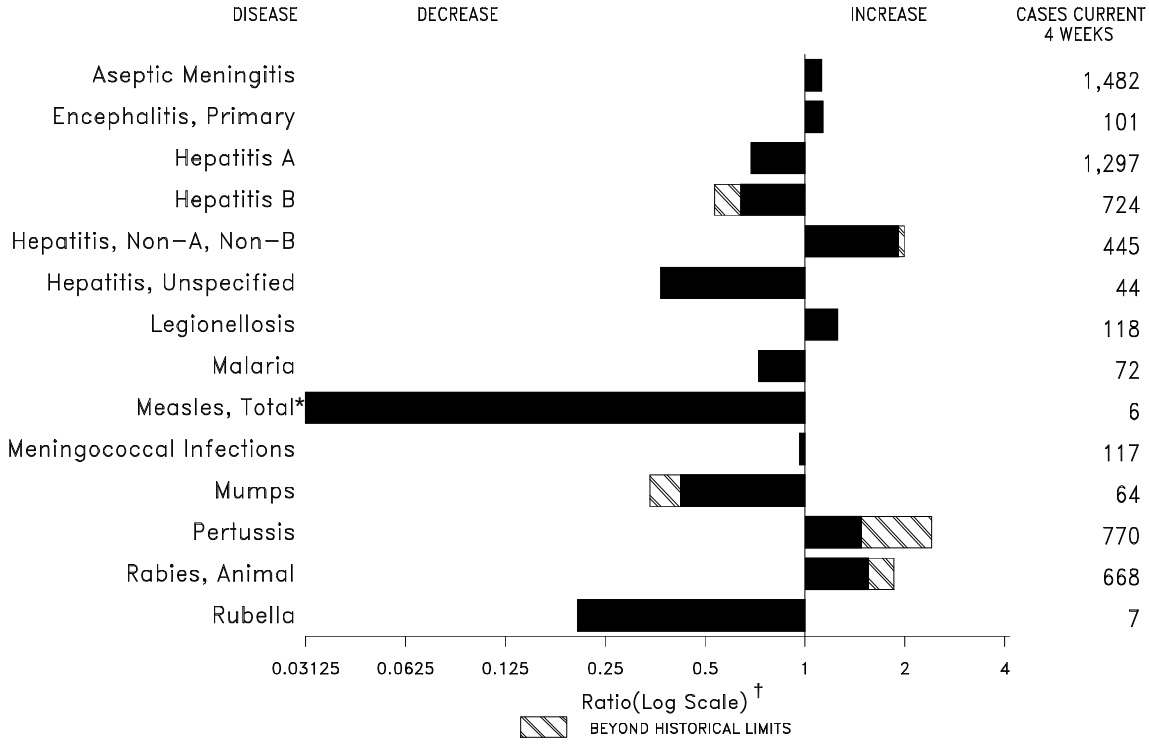
She subsequently would not drink, withdrew when offered a drink, and had difficulty swallowing oral secretions. On evaluation in a hospital emergency department on July 11, she had a temperature of 105.3 F (40.7 C), mild meningismus but no focal neurologic findings; a white blood cell (WBC) count was elevated at 13,300. A lumbar puncture revealed 23 WBCs per cubic millimeter (mm^3) (100% lymphocytes) and 1200 red blood cells per mm^3. Viral meningoencephalitis or meningococcal infection was diagnosed. She was treated with ceftriaxone and dexamethasone intravenously and transported by helicopter ambulance to a tertiary-care medical center.

On admission to the pediatric intensive-care unit, she was alert, oriented, and cooperative but agitated; her pupils were unequal but reactive. Acyclovir was added to her treatment regimen. The patient developed respiratory distress, hypertension, and tachycardia and was placed on mechanical ventilation; cardiac arrhythmias subsequently occurred, and she suffered nonreversible cardiac arrest.

An autopsy was performed on July 12; although unfixed brain tissue was not obtained for viral or bacterial diagnosis, cerebral edema was noted. During August 2–3, examination of routine histopathologic slides of brain tissue revealed encephalitis with severe involvement of the midbrain, pons and medulla, and possible Negri bodies. Culture of cerebrospinal fluid (CSF) obtained July 11 for rabies virus and tests of serum and CSF for rabies antibody were negative at the New York State Department of Health. However, specimens tested by the rabies fluorescent antibody technique (FA) indicated fluorescent inclusions in the brain stem, midbrain, and Purkinje cells of the cerebellum. Rabies diagnosis was confirmed at CDC by FA testing and histologic examination of formalin-fixed and paraffin-embedded tissue. The RNA extracted from formalin-fixed brain tissue was reverse transcribed and amplified by polymerase chain reaction. The nucleotide sequence identified a viral variant associated with rabies in insectivorous bats.

(Continued on page 805)

FIGURE I. Notifiable disease reports, comparison of 4-week totals ending October 16, 1993, with historical data — United States



* The large apparent decrease in reported cases of measles(total) reflects dramatic fluctuations in the historical baseline. (Ratio (log scale) for week forty-one is 0.01380).

† Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where thehatched area begins is based on the mean and two standard deviations of these 4-week totals.

TABLE I. Summary — cases of specified notifiable diseases, United States, cumulative, week ending October 16, 1993 (41st Week)

	Cum. 1993		Cum. 1993
AIDS*	83,485	Measles: imported	55
Anthrax	-	indigenous	205
Botulism: Foodborne	13	Plague	8
Infant	53	Poliomyelitis, Paralytic§	-
Other	2	Psittacosis	43
Brucellosis	70	Rabies, human	1
Cholera	16	Syphilis, primary & secondary	20,096
Congenital rubella syndrome	6	Syphilis, congenital, age < 1 year	1,493
Diphtheria	-	Tetanus	35
Encephalitis, post-infectious	137	Toxic shock syndrome	188
Gonorrhea	298,522	Trichinosis	10
Haemophilus influenzae (invasive disease)†	931	Tuberculosis	16,599
Hansen Disease	134	Tularemia	106
Leptospirosis	33	Typhoid fever	264
Lyme Disease	5,426	Typhus fever, tickborne (RMSF)	394

*Updated monthly; last update October 2, 1993.
†Of 884 cases of known age, 287 (32%) were reported among children less than 5 years of age.
§Two (2) cases of suspected poliomyelitis have been reported in 1993; 4 of the 5 suspected cases with onset in 1992 were confirmed; the confirmed cases were vaccine associated.
¶Reports through second quarter of 1993.

TABLE II. Cases of selected notifiable diseases, United States, weeks ending October 16, 1993, and October 10, 1992 (41st Week)

Reporting Area	AIDS*	Aseptic Menin-gitis	Encephalitis		Gonorrhea		Hepatitis (Viral), by type				Legionel-losis	Lyme Disease
			Primary	Post-in-fectious			A	B	NA,NB	Unspeci-fied		
	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1992	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993
UNITED STATES	83,485	9,590	673	137	298,522	389,355	16,592	9,468	3,883	489	973	5,426
NEW ENGLAND	4,183	321	15	8	6,555	8,132	394	378	452	13	64	1,539
Maine	118	33	2	-	74	82	15	10	4	-	5	11
N.H.	83	43	-	2	47	94	33	87	370	3	4	56
Vt.	58	37	4	-	19	23	5	7	2	-	2	5
Mass.	2,210	130	7	4	2,373	2,933	188	210	68	10	35	157
R.I.	274	78	2	2	336	551	67	20	8	-	18	242
Conn.	1,440	-	-	-	3,706	4,449	86	44	-	-	-	1,068
MID. ATLANTIC	20,227	676	47	8	35,153	43,932	826	1,061	300	5	191	2,715
Upstate N.Y.	3,118	376	31	5	7,004	8,686	306	328	196	1	62	1,438
N.Y. City	10,941	104	1	-	9,906	15,873	177	121	1	-	3	3
N.J.	3,909	-	-	-	3,845	5,951	225	326	73	-	29	617
Pa.	2,259	196	15	3	14,398	13,422	118	286	30	4	97	657
E.N. CENTRAL	6,686	1,662	149	26	56,283	73,921	1,849	1,123	486	13	249	80
Ohio	1,286	580	54	4	17,604	21,993	235	151	32	-	131	34
Ind.	718	186	18	11	6,270	7,110	521	192	13	1	47	21
Ill.	2,423	369	30	3	13,587	24,310	592	207	59	5	12	8
Mich.	1,606	489	37	8	14,180	17,045	168	321	348	7	48	17
Wis.	653	38	10	-	4,642	3,463	333	252	34	-	11	-
W.N. CENTRAL	2,694	605	25	10	16,463	20,855	1,870	517	141	14	76	146
Minn.	579	75	7	-	1,931	2,399	344	58	8	4	1	57
Iowa	159	129	4	2	1,259	1,325	44	28	8	2	11	8
Mo.	1,466	179	2	8	9,546	11,665	1,172	364	102	8	21	38
N. Dak.	2	12	3	-	38	61	63	-	-	-	1	2
S. Dak.	22	19	5	-	193	145	16	-	-	-	-	-
Nebr.	164	21	1	-	476	1,338	163	14	8	-	35	4
Kans.	302	170	3	-	3,020	3,922	68	53	15	-	7	37
S. ATLANTIC	17,732	2,007	186	54	79,548	116,662	957	1,766	559	67	171	750
Del.	308	65	3	-	1,173	1,400	10	132	121	-	10	359
Md.	2,039	197	22	-	12,728	12,582	129	221	18	5	42	135
D.C.	1,181	33	-	-	3,596	4,787	9	35	1	-	13	2
Va.	1,273	238	36	6	9,400	13,073	110	111	29	31	6	63
W. Va.	66	25	94	-	503	682	20	32	27	-	3	41
N.C.	960	200	27	-	19,839	19,978	64	248	58	-	22	73
S.C.	1,269	24	-	-	8,570	8,878	17	41	3	1	18	9
Ga.	2,328	139	1	-	4,660	33,555	75	179	104	1	32	35
Fla.	8,308	1,086	3	48	19,079	21,727	523	767	198	29	25	33
E.S. CENTRAL	2,179	626	31	7	34,731	38,632	235	1,084	784	4	38	24
Ky.	275	263	10	6	3,786	3,797	89	71	10	-	14	7
Tenn.	897	152	8	-	9,564	12,336	69	920	760	3	16	14
Ala.	611	147	1	-	13,103	13,271	48	87	4	1	2	3
Miss.	396	64	12	1	8,278	9,228	29	6	10	-	6	-
W.S. CENTRAL	8,451	1,070	53	2	36,445	42,248	1,749	1,319	257	139	26	54
Ark.	327	56	1	-	6,964	6,109	44	49	4	2	3	2
La.	1,028	73	5	-	9,518	11,674	66	177	114	3	3	1
Okla.	648	1	7	-	3,313	4,323	140	248	92	10	11	20
Tex.	6,448	940	40	2	16,650	20,142	1,499	845	47	124	9	31
MOUNTAIN	3,375	570	25	4	8,697	9,959	3,180	470	268	68	59	21
Mont.	29	-	-	1	60	88	65	7	2	-	5	-
Idaho	58	10	-	-	136	90	196	39	-	3	1	2
Wyo.	33	6	-	-	67	46	11	25	88	-	6	9
Colo.	1,106	181	11	-	2,775	3,606	735	60	42	36	7	-
N. Mex.	267	111	4	2	743	746	297	173	86	3	5	2
Ariz.	1,136	154	8	-	3,180	3,416	1,163	73	13	12	12	-
Utah	231	40	1	-	268	272	606	41	24	13	8	3
Nev.	515	68	1	1	1,468	1,695	107	52	13	1	15	5
PACIFIC	17,958	2,053	142	18	24,647	35,014	5,532	1,750	636	166	99	97
Wash.	1,337	-	1	-	3,002	3,157	635	185	153	9	10	4
Oreg.	680	-	-	-	1,225	1,298	84	30	12	1	-	2
Calif.	15,586	1,929	136	18	19,453	29,609	4,139	1,507	458	153	80	90
Alaska	58	17	4	-	491	528	611	9	10	-	-	-
Hawaii	297	107	1	-	476	422	63	19	3	3	9	1
Guam	-	2	-	-	39	50	2	2	-	1	-	-
P.R.	2,338	47	-	-	402	192	72	329	76	2	-	-
V.I.	40	-	-	-	79	85	-	4	-	-	-	-
Amer. Samoa	-	-	-	-	37	37	16	-	-	-	-	-
C.N.M.I.	-	3	-	-	64	62	-	1	-	1	-	-

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

*Updated monthly; last update October 2, 1993.

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending October 16, 1993, and October 10, 1992 (41st Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1993	1993	Cum. 1993	1993	Cum. 1993	Cum. 1992	Cum. 1993	1993	Cum. 1993	1993	Cum. 1993	Cum. 1992	1993	Cum. 1993	Cum. 1992
UNITED STATES	897	-	205	-	55	2,174	1,869	11	1,281	230	4,339	2,302	2	168	140
NEW ENGLAND	69	-	57	-	5	65	101	-	8	9	621	186	-	1	6
Maine	2	-	2	-	-	4	7	-	-	-	19	11	-	1	1
N.H.	6	-	2	-	-	13	13	-	-	5	231	45	-	-	-
Vt.	1	-	30	-	1	-	6	-	-	1	68	9	-	-	-
Mass.	34	-	14	-	3	21	55	-	2	-	234	85	-	-	-
R.I.	2	-	-	-	1	21	1	-	2	-	6	1	-	-	4
Conn.	24	-	9	-	-	6	19	-	4	3	63	35	-	-	1
MID. ATLANTIC	132	-	11	-	6	205	220	1	99	20	548	138	-	54	10
Upstate N.Y.	46	-	-	-	2	111	98	-	34	8	223	87	-	10	7
N.Y. City	24	-	5	-	2	56	19	-	2	-	7	11	-	22	-
N.J.	40	-	6	-	2	38	37	-	12	-	51	40	-	16	3
Pa.	22	-	-	-	-	-	66	1	51	12	267	-	-	6	-
E.N. CENTRAL	61	-	16	-	7	60	293	1	195	26	956	483	-	6	9
Ohio	13	-	5	-	3	6	84	-	66	20	336	60	-	1	-
Ind.	3	-	1	-	-	20	49	-	3	2	101	31	-	1	-
Ill.	31	-	5	-	-	17	82	-	50	-	252	40	-	1	8
Mich.	14	-	5	-	1	13	49	1	61	4	81	11	-	2	1
Wis.	-	-	-	-	3	4	29	-	15	-	186	341	-	1	-
W.N. CENTRAL	28	-	1	-	2	11	121	1	44	72	440	191	-	1	8
Minn.	8	-	-	-	-	10	7	-	2	63	254	33	-	-	-
Iowa	3	-	-	-	-	1	24	1	9	5	35	5	-	-	3
Mo.	7	-	1	-	-	-	47	-	25	-	111	92	-	1	1
N. Dak.	2	-	-	-	-	-	3	-	5	-	3	13	-	-	-
S. Dak.	2	-	-	-	-	-	3	-	-	-	8	14	-	-	-
Nebr.	4	-	-	-	-	-	10	-	2	4	13	10	-	-	-
Kans.	2	-	-	-	2	-	27	-	1	-	16	24	-	-	4
S. ATLANTIC	244	-	17	-	13	125	346	2	379	81	469	136	-	9	18
Del.	2	-	1	-	-	1	13	-	5	-	14	7	-	2	-
Md.	36	-	-	-	4	16	43	-	67	3	117	23	-	2	5
D.C.	11	U	-	U	-	-	5	U	1	U	11	1	U	-	-
Va.	25	-	-	-	4	15	38	-	25	-	52	10	-	-	-
W. Va.	2	-	-	-	-	-	12	1	16	-	9	7	-	-	1
N.C.	94	-	-	-	-	24	58	-	197	21	92	35	-	-	-
S.C.	5	-	-	-	-	29	31	-	15	51	64	10	-	-	7
Ga.	15	-	-	-	-	3	77	-	14	2	32	14	-	-	-
Fla.	54	-	16	-	5	37	69	1	39	4	78	29	-	5	5
E.S. CENTRAL	25	-	1	-	-	461	120	-	46	3	257	26	-	1	1
Ky.	4	-	-	-	-	444	20	-	-	-	29	1	-	-	-
Tenn.	10	-	-	-	-	-	35	-	13	2	161	7	-	1	1
Ala.	6	-	1	-	-	-	38	-	22	1	56	15	-	-	-
Miss.	5	-	-	-	-	17	27	-	11	-	11	3	-	-	-
W.S. CENTRAL	22	-	8	-	3	1,102	186	3	183	1	147	199	-	17	7
Ark.	3	-	-	-	-	-	19	-	4	-	10	14	-	-	-
La.	3	-	1	-	-	-	34	-	17	-	9	8	-	1	-
Okla.	4	-	-	-	-	11	25	-	11	1	86	28	-	1	-
Tex.	12	-	7	-	3	1,091	108	3	151	-	42	149	-	15	7
MOUNTAIN	30	-	5	-	1	35	150	1	59	5	349	338	-	9	7
Mont.	2	-	-	-	-	-	13	-	-	-	7	7	-	-	-
Idaho	1	-	-	-	-	-	11	-	5	-	109	41	-	2	1
Wyo.	-	-	-	-	-	1	3	-	2	-	1	-	-	-	-
Colo.	18	-	2	-	1	29	30	-	16	5	117	56	-	-	1
N. Mex.	5	-	-	-	-	2	5	N	N	-	36	89	-	-	-
Ariz.	-	-	2	-	-	3	70	-	13	-	48	110	-	2	2
Utah	1	-	-	-	-	-	11	-	4	-	27	33	-	4	1
Nev.	3	-	1	-	-	-	7	1	19	-	4	2	-	1	2
PACIFIC	286	-	89	-	18	110	332	2	268	13	552	605	2	70	74
Wash.	27	-	-	-	-	10	61	-	10	-	59	188	-	-	6
Oreg.	4	-	-	-	-	3	23	N	N	1	18	39	-	3	1
Calif.	248	-	78	-	7	56	222	2	229	12	458	345	2	39	44
Alaska	1	-	-	-	2	9	13	-	8	-	5	13	-	1	-
Hawaii	6	-	11	-	9	32	13	-	21	-	12	20	-	27	23
Guam	1	U	2	U	-	10	1	U	6	U	-	-	U	-	3
P.R.	-	-	224	-	-	339	8	-	3	-	6	12	-	-	-
V.I.	-	-	-	-	-	-	-	-	4	-	-	-	-	-	-
Amer. Samoa	-	U	1	U	-	-	-	U	1	U	2	6	U	-	-
C.N.M.I.	-	-	-	-	1	2	-	-	12	-	1	1	-	-	-

*For measles only, imported cases include both out-of-state and international importations.
N: Not notifiable U: Unavailable † International § Out-of-state

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending October 16, 1993, and October 10, 1992 (41st Week)

Reporting Area	Syphilis (Primary & Secondary)		Toxic-Shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1993	Cum. 1992	Cum. 1993	Cum. 1993	Cum. 1992	Cum. 1993	Cum. 1993	Cum. 1993	Cum. 1993
UNITED STATES	20,096	27,044	188	16,599	17,822	106	264	394	7,108
NEW ENGLAND	297	528	13	405	388	-	25	5	1,250
Maine	5	5	3	29	19	-	-	-	-
N.H.	26	35	3	9	15	-	2	-	104
Vt.	1	1	1	5	6	-	-	-	22
Mass.	111	269	5	222	213	-	17	5	514
R.I.	12	24	1	46	23	-	-	-	-
Conn.	142	194	-	94	112	-	6	-	610
MID. ATLANTIC	1,830	3,700	30	3,719	4,212	1	55	26	2,689
Upstate N.Y.	166	284	15	359	570	1	11	6	2,052
N.Y. City	881	2,094	1	2,192	2,419	-	26	-	-
N.J.	250	457	-	634	737	-	14	10	358
Pa.	533	865	14	534	486	-	4	10	279
E.N. CENTRAL	2,850	4,120	39	1,503	1,770	4	31	13	96
Ohio	899	645	12	253	254	-	7	9	5
Ind.	277	220	1	169	145	1	1	1	10
Ill.	844	1,884	6	651	912	2	16	1	18
Mich.	472	766	20	361	391	1	6	2	16
Wis.	358	605	-	69	68	-	1	-	47
W.N. CENTRAL	1,282	1,208	12	377	424	34	2	18	292
Minn.	61	76	2	50	120	-	-	1	38
Iowa	57	39	5	40	34	-	-	7	64
Mo.	1,050	907	2	196	190	14	2	7	17
N. Dak.	1	1	-	5	8	-	-	-	51
S. Dak.	1	-	-	12	18	16	-	2	38
Nebr.	10	24	-	17	16	1	-	-	8
Kans.	102	161	3	57	38	3	-	1	76
S. ATLANTIC	5,280	7,335	22	3,242	3,327	3	41	181	1,662
Del.	90	168	1	38	40	-	1	1	122
Md.	286	518	1	301	300	-	8	11	493
D.C.	269	305	-	134	89	-	-	-	14
Va.	513	587	6	309	292	-	4	9	315
W. Va.	12	15	-	62	73	-	-	6	76
N.C.	1,470	1,990	3	424	434	2	2	107	81
S.C.	779	998	-	322	323	-	-	10	133
Ga.	875	1,433	2	591	686	-	3	30	379
Fla.	986	1,321	9	1,061	1,090	1	23	7	49
E.S. CENTRAL	3,070	3,445	11	1,034	1,112	4	7	53	178
Ky.	267	133	3	302	305	1	2	8	17
Tenn.	770	930	4	150	283	2	2	32	72
Ala.	668	1,205	2	393	326	1	3	4	89
Miss.	1,365	1,177	2	189	198	-	-	9	-
W.S. CENTRAL	4,698	4,873	2	1,889	2,065	42	5	87	506
Ark.	612	707	-	148	159	26	-	7	28
La.	2,049	1,987	-	-	155	-	1	1	5
Okla.	327	301	2	125	124	13	1	75	63
Tex.	1,710	1,878	-	1,616	1,627	3	3	4	410
MOUNTAIN	193	290	12	395	469	12	10	11	156
Mont.	1	7	-	15	-	5	-	1	22
Idaho	-	1	1	10	19	-	-	-	6
Wyo.	7	3	-	4	-	3	-	9	19
Colo.	59	52	2	32	46	-	5	1	26
N. Mex.	24	36	1	46	64	1	2	-	9
Ariz.	82	142	1	181	204	-	2	-	55
Utah	8	8	5	23	65	2	1	-	4
Nev.	12	41	2	84	71	1	-	-	15
PACIFIC	596	1,545	47	4,035	4,055	6	88	-	279
Wash.	49	72	7	203	229	1	6	-	-
Oreg.	55	37	-	81	106	2	1	-	-
Calif.	478	1,424	40	3,507	3,462	3	78	-	262
Alaska	8	4	-	42	50	-	-	-	17
Hawaii	6	8	-	202	208	-	3	-	-
Guam	2	3	-	31	58	-	-	-	-
P.R.	412	282	-	185	200	-	-	-	36
V.I.	35	54	-	2	3	-	-	-	-
Amer. Samoa	-	-	-	2	-	-	1	-	-
C.N.M.I.	3	6	-	28	50	-	-	-	-

U: Unavailable

TABLE III. Deaths in 121 U.S. cities,* week ending October 16, 1993 (41st Week)

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	655	457	120	56	13	9	51
Boston, Mass.	178	107	43	17	5	6	17
Bridgeport, Conn.	41	27	7	5	1	1	4
Cambridge, Mass.	25	20	3	1	1	-	1
Fall River, Mass.	23	22	1	-	-	-	-
Hartford, Conn.	56	38	8	6	2	2	-
Lowell, Mass.	24	15	8	1	-	-	2
Lynn, Mass.	14	13	1	-	-	-	1
New Bedford, Mass.	23	18	3	2	-	-	-
New Haven, Conn.	44	28	8	8	-	-	-
Providence, R.I.	71	52	14	5	-	-	12
Somerville, Mass.	3	3	-	-	-	-	-
Springfield, Mass.	63	49	7	4	3	-	5
Waterbury, Conn.	37	24	10	3	-	-	1
Worcester, Mass.	53	41	7	4	1	-	8
MID. ATLANTIC	2,568	1,630	538	282	62	52	128
Albany, N.Y.	42	26	12	4	-	-	6
Allentown, Pa.	33	29	3	-	1	-	2
Buffalo, N.Y.	100	71	20	5	3	1	2
Camden, N.J.	32	16	9	6	-	1	1
Elizabeth, N.J.	31	21	7	3	-	-	5
Erie, Pa.§	33	23	7	1	-	2	3
Jersey City, N.J.	50	36	8	2	-	4	1
New York City, N.Y.	1,395	862	304	180	31	18	60
Newark, N.J.	68	26	20	18	2	2	3
Paterson, N.J.	34	17	6	9	2	-	-
Philadelphia, Pa.	295	181	56	27	14	15	12
Pittsburgh, Pa.§	100	71	19	4	2	3	8
Reading, Pa.	22	19	2	1	-	-	4
Rochester, N.Y.	138	106	24	7	1	-	16
Schenectady, N.Y.	25	13	7	4	1	-	-
Scranton, Pa.§	22	17	3	2	-	-	-
Syracuse, N.Y.	90	58	22	5	3	2	4
Trenton, N.J.	37	23	7	2	-	4	1
Utica, N.Y.	21	15	2	2	2	-	-
Yonkers, N.Y.	U	U	U	U	U	U	U
E.N. CENTRAL	2,174	1,399	407	206	111	51	127
Akron, Ohio	43	32	8	1	1	1	-
Canton, Ohio	37	22	11	4	-	-	3
Chicago, Ill.	342	132	76	60	64	10	13
Cincinnati, Ohio	120	84	20	10	3	3	17
Cleveland, Ohio	164	101	26	23	3	11	3
Columbus, Ohio	177	122	37	12	2	4	10
Dayton, Ohio	119	87	21	7	-	4	4
Detroit, Mich.	297	186	59	31	18	3	9
Evansville, Ind.	47	36	9	2	-	-	3
Fort Wayne, Ind.	57	43	12	2	-	-	3
Gary, Ind.	20	14	2	2	2	-	-
Grand Rapids, Mich.	63	42	9	5	4	3	5
Indianapolis, Ind.	209	134	40	21	9	5	20
Madison, Wis.	39	28	8	2	1	-	1
Milwaukee, Wis.	117	89	16	9	1	2	9
Peoria, Ill.	34	28	6	-	-	-	6
Rockford, Ill.	65	48	14	1	1	1	9
South Bend, Ind.	59	47	8	4	-	-	5
Toledo, Ohio	111	85	15	6	2	3	6
Youngstown, Ohio	54	39	10	4	-	1	1
W.N. CENTRAL	730	537	104	47	24	18	41
Des Moines, Iowa	63	48	8	4	2	1	5
Duluth, Minn.	32	24	4	2	2	-	2
Kansas City, Kans.	9	6	3	-	-	-	1
Kansas City, Mo.	119	92	15	7	4	1	4
Lincoln, Nebr.	43	37	5	1	-	-	5
Minneapolis, Minn.	148	113	18	9	3	5	7
Omaha, Nebr.	68	43	10	6	5	4	2
St. Louis, Mo.	132	99	17	9	3	4	6
St. Paul, Minn.	57	41	8	5	3	-	7
Wichita, Kans.	59	34	16	4	2	3	2

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
S. ATLANTIC	1,197	718	252	140	42	42	52
Atlanta, Ga.	169	92	40	25	8	4	7
Baltimore, Md.	129	77	27	19	3	3	7
Charlotte, N.C.	88	55	20	8	3	2	4
Jacksonville, Fla.	124	81	27	12	1	3	8
Miami, Fla.	98	51	18	25	4	-	-
Norfolk, Va.	58	41	10	6	-	1	1
Richmond, Va.	85	52	15	9	-	9	4
Savannah, Ga.	31	17	6	1	3	4	5
St. Petersburg, Fla.	51	35	11	2	3	-	4
Tampa, Fla.	145	93	36	9	3	2	10
Washington, D.C.	189	97	39	24	14	14	2
Wilmington, Del.	30	27	3	-	-	-	-
E.S. CENTRAL	619	390	130	56	21	22	26
Birmingham, Ala.	83	50	19	9	3	2	2
Chattanooga, Tenn.	31	19	11	1	-	-	1
Knoxville, Tenn.	89	60	16	10	-	3	5
Lexington, Ky.	61	30	20	4	3	4	3
Memphis, Tenn.	158	109	25	15	7	2	6
Mobile, Ala.	56	36	9	5	1	5	3
Montgomery, Ala.	40	20	10	5	3	2	1
Nashville, Tenn.	101	66	20	7	4	4	5
W.S. CENTRAL	1,346	823	245	136	88	53	61
Austin, Tex.	50	34	9	4	2	1	4
Baton Rouge, La.	52	29	11	3	4	5	-
Corpus Christi, Tex.	52	40	7	3	1	1	1
Dallas, Tex.	160	88	33	22	9	8	4
El Paso, Tex.	79	58	10	7	2	2	2
Ft. Worth, Tex.	85	60	10	8	2	5	4
Houston, Tex.	348	187	79	51	19	11	29
Little Rock, Ark.	74	49	16	4	4	1	2
New Orleans, La.	118	47	12	9	36	14	-
San Antonio, Tex.	160	112	28	18	-	2	8
Shreveport, La.	76	53	11	5	6	1	3
Tulsa, Okla.	92	66	19	2	3	2	4
MOUNTAIN	751	510	129	71	25	16	45
Albuquerque, N.M.	97	60	14	14	4	5	2
Colo. Springs, Colo.	38	28	5	1	1	3	5
Denver, Colo.	95	65	20	7	3	-	7
Las Vegas, Nev.	130	81	31	14	4	-	6
Ogden, Utah	21	14	3	3	1	-	-
Phoenix, Ariz.	152	96	24	19	7	6	13
Pueblo, Colo.	20	19	1	-	-	-	-
Salt Lake City, Utah	80	62	12	4	1	1	6
Tucson, Ariz.	118	85	19	9	4	1	6
PACIFIC	1,639	1,065	290	204	43	36	90
Berkeley, Calif.	18	9	4	5	-	-	2
Fresno, Calif.	42	28	8	4	-	2	2
Glendale, Calif.	19	14	4	1	-	-	-
Honolulu, Hawaii	79	55	16	7	-	1	3
Long Beach, Calif.	70	46	11	7	4	2	1
Los Angeles, Calif.	368	218	71	56	15	7	12
Pasadena, Calif.	28	22	-	4	-	2	1
Portland, Oreg.	107	69	19	14	2	3	7
Sacramento, Calif.	178	119	32	18	6	3	16
San Diego, Calif.	93	59	15	14	1	4	6
San Francisco, Calif.	153	79	31	37	4	2	6
San Jose, Calif.	164	116	26	16	6	-	14
Santa Cruz, Calif.	36	28	6	2	-	-	2
Seattle, Wash.	133	87	32	8	4	2	2
Spokane, Wash.	66	49	9	3	-	5	6
Tacoma, Wash.	85	67	6	8	1	3	10
TOTAL	11,679¶	7,529	2,215	1,198	429	299	621

*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.

U: Unavailable.

Human Rabies — Continued

The patient lived in a heavily wooded area of the Catskill Mountains and had no history of foreign travel. She had no known history of contact with a bat, and examination of her home and outbuildings on the property revealed no evidence of bat infestation. She had been active outdoors, and her family kept horses, dogs, cats, rabbits, hamsters, and gerbils as pets; none of these pets had died with clinical signs consistent with rabies or disappeared. A survey of all neighbors on the same road indicated that no pets had died with clinical signs consistent with rabies or disappeared during the preceding 6 months.

As a result of close contact with the patient and/or her secretions, rabies postexposure prophylaxis was administered to 55 persons, including eight family members, three friends, 35 health-care workers, five members of the autopsy team, three transport personnel, and one mortician.

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Editorial Note: Human rabies in the United States is uncommon, primarily because of canine rabies-control programs and access to improved human rabies biologicals. Since 1980, 16 human rabies cases have been reported in the United States. Of these, seven were acquired from exposure outside the United States; for nine of the 16 cases, no definitive history of exposure was identified. Potential reasons for the failure of public health authorities to establish definitive exposures include unrecognized exposure, communication (i.e., language) barriers, and memory loss and impaired speech because of encephalitis at presentation.

Rabies is not usually diagnosed when patients initially receive medical evaluation. Since 1980, of the 16 persons with rabies diagnosed in the United States, rabies was diagnosed postmortem in nine. In addition, six cases of human-to-human transmission were diagnosed postmortem among recipients of transplanted corneas, whose donors died of an illness unrecognized as rabies (*1*).

Although rabies occurs rarely in the United States, it should be considered in the differential diagnosis of any acute progressive encephalitis of unknown etiology. In the absence of a clear history of animal exposure, the diagnosis of rabies may be difficult because of the nonspecific nature of initial clinical presentation. In addition to encephalitis, other manifestations suggestive of rabies in the case described in this report included paresthesia, hydrophobia, and copious salivation. Antemortem diagnosis of human rabies is possible through laboratory analysis of CSF, serum, saliva, and biopsy of nuchal skin or brain tissue. Although an early suspicion of rabies does not alter the prognosis, it may permit both institution of measures to reduce the number of persons exposed to rabies during patient care and identification of persons who are candidates for postexposure prophylaxis. Consultation with state and federal health officials is recommended for human rabies evaluation.

The case in this report is the sixth since 1980 in which insectivorous bats were implicated. A definite history of exposure through a bat's bite was identified for only one of the six cases, while contact with a bat was associated with two additional cases; for three cases, the nature of exposure was not determined, but bat rabies variants were identified by molecular typing.

Human Rabies — Continued

Bat rabies is enzootic in the United States, and cases have been reported from all of the 48 contiguous states (*2*). The rabies virus variant identified in this case, and in three of the other five occurring since 1980, is associated with the silver-haired bat (*Lasionycteris noctivagans*), a solitary, migratory species, with a preferred habitat of old-growth forest. This species is infrequently submitted for rabies diagnosis. For example, of 7047 bats submitted for rabies diagnosis and identified to species in New York from 1988 through 1992, 25 (0.4%) were *L. noctivagans*; of these, two were rabid (C. Trimarchi, New York State Department of Health, unpublished data, 1993). The rabies virus variant associated with this species (identified in 11 of 12 isolates from silver-haired bats) was rarely found in other bats (five [2.1%] of 238 samples tested) or in terrestrial mammals (five [0.7%] of 700 samples).

Exposure to potentially rabid animals (e.g., paralyzed bats) should be avoided. Postexposure prophylaxis is recommended for all persons bitten or scratched by such animals and for nonbite exposures involving contamination of lesions or mucous membranes with saliva or other potentially infectious materials (*3*). Bat bites may be more difficult to recognize than those inflicted by terrestrial animals. Treatment should be considered for any physical contact with bats when bite or mucous membrane contact cannot be excluded. Because reduction of bat populations is neither feasible nor desirable as a means for controlling rabies in bats, efforts to prevent this problem should be directed toward the exclusion of bats from human dwellings to minimize direct contact with humans and companion animals. In addition, all dogs and cats in the 48 contiguous states and Alaska should have a current rabies vaccination (*4*).

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Current Trends

Pregnancy Outcomes Following Systemic Prenatal Acyclovir Exposure — June 1, 1984–June 30, 1993

Herpes infections are common among women of reproductive age (i.e., aged 15–44 years) (*1*). Acyclovir (Zovirax®*), an antiviral drug effective in the treatment of herpes simplex infection, was approved by the Food and Drug Administration (FDA) in 1984. Since its approval, the effects of acyclovir on human pregnancies have not been determined. However, inadvertent pregnancy exposures to acyclovir were expected to occur among women in whom treatment had been indicated for preexisting herpes simplex infections. Some physicians have reported intentional use of acyclovir during

*Use of trade names and commercial sources is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

Systemic Prenatal Acyclovir Exposure — Continued

pregnancy for treatment of life-threatening herpes simplex infection.[†] To assess the outcomes of pregnancies exposed to acyclovir, the Acyclovir in Pregnancy Registry was established on June 1, 1984, by the manufacturer, in collaboration with CDC. This report summarizes data on pregnancies reported to the registry through June 30, 1993.

The registry is managed by the Burroughs Wellcome Co. (Research Triangle Park, North Carolina)—the manufacturer of the drug—with oversight from an advisory committee with representation from CDC, a county health agency, and Burroughs Wellcome Co.; committee members have expertise in sexually transmitted diseases, teratology, epidemiology, and pharmacology. Reports to the registry have been received from physicians, other health professionals, and persons using the drug. A prenatal exposure to acyclovir is defined as inadvertent or intentional use of oral or intravenous acyclovir at any time during pregnancy. Information is obtained from mailed questionnaires (primarily to obstetricians) regarding pregnancy dates; maternal risk factors; dose, length, and indication of acyclovir therapy; and pregnancy outcome. Telephone contacts are used to clarify or obtain additional information about pregnancy outcomes.

Birth defects identified up to the first year of life are included in the registry, but for most reports, defects are generally identified during the neonatal period. The registry considers any report of an exposure, whether written or oral, to be a registered case even if the initial report provided insufficient baseline data to allow for adequate follow-up (e.g., an estimated date of delivery or medical chart number).

From June 1, 1984, through June 30, 1993, 811 prospective reports of women with a pregnancy exposure to acyclovir were received from 18 countries[§]; 210 (26%) women were lost to follow-up. For 132 (63%) of the 210 reports, attempts to obtain follow-up information did not yield a response from the health-care professional who reported; for 64 (30%), the pregnancy outcome was unknown to the reporter because the patient did not remain under the reporter's care; and for 11 (5%), the reporting health-care professional had left the practice/institution from which the original report was received. The reason for loss to follow-up could not be determined for two (1%) reports, and the patient refused to allow release of medical information at the time of follow-up for one (<1%) report.

Of the 601 (74%) women for whom pregnancy outcome data were obtained (Table 1), 456 (76%) were being treated for herpes simplex virus; 120 (20%), for varicella-zoster virus; and 25 (4%), for other or unspecified conditions. Pregnancy exposures for 425 women occurred during the first trimester. Outcomes of these pregnancies were legal induced abortions (67 [16%]), spontaneous abortions (47 [11%]), and live-born infants without birth defects (298 [70%]). Of the 311 live-born

[†] CDC's *1993 Sexually Transmitted Diseases Treatment Guidelines* state that the safety of systemic acyclovir therapy among pregnant women has not beenestablished. In the presence of life-threatening maternal herpes simplex virus infections (e.g. disseminated infection that includes encephalitis, pneumonitis, and/or hepatitis), acyclovir administered intravenously is indicated. Among pregnant women without life-threatening disease, systemic acyclovir treatment should not be used for recurrences nor should it be used as suppressive therapy near term (or other times during pregnancy) to prevent reactivation (*2*).

[§] Australia, Bermuda, Canada, Czech Republic, Finland, France, Germany, Greece, Ireland, Malaysia, New Zealand, Oman, South Africa, Spain, Sweden, the Netherlands, the United Kingdom, and the United States.

Systemic Prenatal Acyclovir Exposure — Continued

infants exposed to acyclovir during the first trimester, 13 (4%) had a birth defect. The birth defects reported were heterogeneous, and no specific pattern was noted.

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Editorial Note: Based on comparisons with birth defects surveillance data maintained by CDC, the registry findings summarized in this report indicate no increased risk for birth defects among infants born to women exposed to acyclovir during pregnancy (*3*). Human teratogens often cause a recognizable pattern of birth defects; in this cohort of exposed pregnancies, no pattern of birth defects was noted. Therefore, the findings in this report should assist in counseling women regarding prenatal exposure to acyclovir while surveillance continues. Potential limitations of this and other registries include differential reporting of outcomes, losses to follow-up, underreporting, and small sample size. Although, the current sample size of the registry is sufficient to detect a teratogenic risk of twofold over the 3% baseline rate of birth defects, it is not yet sufficient to detect smaller increases in risk if they exist.

Acyclovir is available as a prescription medication and is used most commonly in its oral form to treat genital herpes; it is also used to treat primary varicella (chickenpox) and varicella zoster (shingles). Among users of oral acyclovir in the United States, an estimated 30%–50% are women aged 15–44 years. All formulations of acyclovir are assigned FDA pregnancy category C status¶, which indicates that safety in human pregnancies has not been determined; therefore, the drug should not be used during pregnancy unless the potential benefit justifies the potential risk to the fetus. As with most drugs, no formal testing has been performed in pregnant women.

¶Pregnancy category C indicates that the risk associated with drug exposure to the fetus is unclear because human studies are lacking, and animal studies are either positive for fetal risk or lacking. However, potential benefits may justify the potential risk. FDA's pegnancy categories are based on the degree to which available information has ruled out risk to the fetus. Ratings range from "A," for drugs that have been tested for teratogenicity under controlled conditions without showing evidence of damage to the fetus, to "D" for drugs that are teratogenic but have no safer alternatives. An "X" rating is reserved for drugs that should never be used during pregnancy.

TABLE 1. Acyclovir exposure during pregnancy, by earliest trimester of exposure and outcome — June 1, 1984–June 30, 1993

Outcome	Earliest trimester of exposure			Total
	First	Second	Third	
Birth defects	13	1	2	**16**
No birth defects				
Live births	298	68	104	**470**
Spontaneous fetal losses	47	0	1	**48**
Legal induced abortions	67	0	0	**67**
Total	**425**	**69**	**107**	**601**

Systemic Prenatal Acyclovir Exposure — Continued

The registry described in this report is an effective collaboration involving the manufacturer, public health and health-care professionals, and federal agencies to evaluate the potential risk of new drugs for which inadvertent pregnancy exposures are likely to occur. A similar registry has been recently established for antiretroviral drugs used in the treatment of persons infected with human immunodeficiency virus.

This registry continues to register pregnancy exposures to acyclovir; health-care providers are encouraged to report such exposures to the registrar ([800] 722-9292, extension 58465 [from the United States] or [919] 315-8465 [from other countries]). Copies of the updated registry report are available from the same telephone numbers. Written reports and requests should be addressed to Acyclovir in Pregnancy Registry, Burroughs Wellcome Co., 3030 Cornwallis Road, Research Triangle Park, NC 27709.

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Notice to Readers

Availability of Food Safety Information for Nursing Home Directors, Food Service Workers, and Persons with AIDS

A Food and Drug Administration (FDA)/CDC educational packet on food safety for nursing home directors and food service workers, "Handle with Care" (stock no. PB92-780857), is available from the National Technical Information Service, telephone (800) 553-6847. A public information pamphlet on *Salmonella enteritidis* is available from CDC's Foodborne and Diarrheal Diseases Branch, Division of Bacterial and Mycotic Diseases, National Center for Infectious Diseases, Mailstop C-09, 1600 Clifton Road, NE, Atlanta, GA 30333. A CDC/FDA videotape, "Eating Defensively: Food Safety Advice for Persons with AIDS," is available from the CDC National AIDS Clearinghouse, telephone (800) 458-5231.

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The article "Handwashing and Glove Use in a Long-Term–Care Facility—Maryland, 1992," stated that no national guidelines exist for infection-control practices in long-term–care facilities (LTCFs). However, the Association for Practitioners in Infection Control, Inc., a national organization of infection-control practitioners, has written guidelines for infection prevention and control in LTCFs and for the use of topical antimicrobial agents (*1,2*). The guideline for infection prevention and control underscores the need for handwashing and glove use but does not recommend a specific policy for determining when handwashing or glove use is necessary in long-term–care settings. The guideline for use of topical antimicrobial agents suggests a ranking scheme that

Clarification — Continued

could be used in LTCFs and other health-care settings to determine when handwashing and/or glove use are needed.

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