CENTERS FOR DISEASE CONTROL

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Current Trends

Tetanus — United States, 1987 and 1988

During 1987 and 1988, state health departments reported 101 cases of tetanus to the *MMWR* (48 in 1987 and 53 in 1988). The average annual incidence rate for 1987–1988 was 0.02 per 100,000 U.S. population, compared with 0.39 per 100,000 in 1947, when national reporting began. Thirty-five states reported at least one case of tetanus, and 13 states reported cases in both years. Five of the 15 states reporting no cases were in the Rocky Mountain region, a geographic distribution previously noted (*1,2*).

Case report forms on 99 patients provided demographic data and information on immunization history, injury or other medical conditions, tetanus prophylaxis used in wound management, and outcome. Of the 99 patients, 50 were male. Based on patients with known race, the estimated average annual incidence rate for whites (64 cases) was 0.15 per million; for blacks (21 cases), 0.34 per million; and for all other races combined (12 cases), 0.85 per million.

Sixty-seven of the 99 patients were ≥50 years of age, and six were <20 years of age (Figure 1); incidence increased with age. No cases of neonatal tetanus were reported. Overall, the case-fatality rate was 21%.

Five patients reportedly received at least a primary series* of tetanus toxoid before disease onset (Table 1). Of these, two had received the last dose of tetanus toxoid 5–9 years before onset, and one person had received the last dose >20 years earlier; for two patients, the interval since the last dose was unknown. Of the six patients <20 years of age, two had not received any doses of tetanus toxoid, one had received one dose, and three had completed the primary series. Of the 93 patients ≥20 years of age, two were reported to have received at least three doses of tetanus toxoid, nine had received one or two doses, and 29 reported no prior doses of vaccine; for 53 patients, vaccination status was unknown.

Tetanus occurred after an identified acute injury in 74 persons. The most frequently reported acute injuries were puncture wounds (29%), lacerations (18%), and abrasions (13%). Most puncture wounds occurred after persons stepped on sharp objects such as nails and wood splinters. The injury site was a lower extremity in 41

*Primary immunization against tetanus consists of three doses of tetanus toxoid, assuming at least 1 month between the first and second doses and at least 6 months between the second and third doses (*3*).

Tetanus – Continued

(55%) cases, an upper extremity in 23 (31%) cases, the head or trunk in seven (9%) cases, and an unspecified site in three (4%) cases. Of the 61 patients whose circumstances of injury were known, 33% were injured indoors (three cases were associated with recent surgery), 41% during farming or gardening activities, and 26% in other outdoor settings. The youngest tetanus patient reported was a 2-year-old unvaccinated child whose hand had been injured by broken glass. The median incubation period for the 60 tetanus patients for whom a wound date and tetanus onset date were specified was 7 days. For five (8%) patients, the incubation period was >14 days; for 11 (18%), ≤3 days.

Of the 73 patients who developed tetanus following an acute wound, 31 (42%) had sought medical care for the injury. Tetanus toxoid was given as prophylaxis in wound management to 16 patients (52%); 13 (81%) of these received toxoid within 4 days of the injury. Based on the current recommendations of the Immunization Practices Advisory Committee (ACIP) for the use of tetanus and diphtheria toxoids (Td) and Tetanus Immune Globulin (TIG) (*3*) in wound management (Table 2), 14 of the 15

FIGURE 1. Age distribution of reported tetanus cases and average annual age-specific incidence rates per million population – United States, 1987 and 1988

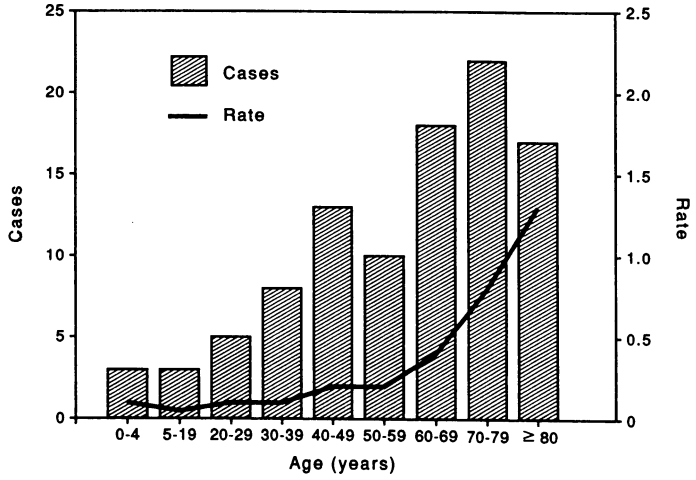

TABLE 1. Immunization status, by history, of persons with reported tetanus – United States, 1987 and 1988

Immunization status	No.	(%)
0 doses	31	(31.3)
1 dose	5	(5.1)
2 doses	5	(5.1)
3 doses	2	(2.0)
≥4 doses	3	(3.0)
Unknown	53	(53.5)
Total	**99**	**(100.0)**

Tetanus — Continued

patients who sought medical care for an acute injury but were not given Td should have received it.

Fourteen patients with acute wounds severe enough to have required prophylactic wound debridement were candidates for both Td and TIG (Table 2); eight (57%) received Td in the course of wound management, and none received TIG.

Fourteen cases were associated with chronic wounds or underlying medical conditions such as skin ulcers, abscesses, or gangrene. Ten of these occurred in patients with diabetes. A history of parenteral drug abuse was the only associated medical condition for six patients. No known acute injury, chronic wound, or other pre-existing medical condition was reported for four patients.

The median total TIG dosage used therapeutically after disease onset was 3500 international units (IU). Total TIG dosage ranged from 125 to 10,000 IU. Of the 85 patients who received TIG, 15 (18%) died. Of the 14 patients who did not receive TIG, five (36%) died.

For 78 patients, the type of tetanus was reported: 63 (81%) cases were generalized, nine (12%) were localized, and six (8%) were cephalic. Length of hospitalization was reported for 60 patients; the median duration was 15 days (range: 1–73 days). Of the 74 patients for whom the use or nonuse of assisted ventilation was reported, 48 (65%) required ventilation.

Reported by: State and territorial epidemiologists. Div of Immunization, Center for Prevention Svcs, CDC.

Editorial Note: The reported incidence rate of tetanus declined steadily between 1947 and 1976 (Figure 2). Since 1977, the incidence has continued to decline but at a slower rate. The decline has resulted from the widespread use of tetanus toxoid and improved wound management, including use of tetanus prophylaxis in emergency rooms. The 1990 Health Objectives for the Nation included a goal of <50 tetanus cases annually (*4*), a target achieved for the first time in 1987.

The nationwide tetanus surveillance system is a passive reporting system. However, because the clinical presentation of tetanus is distinct, it can be readily diagnosed and is hence more likely than many other diseases to be reported. Completeness of reporting of tetanus deaths to CDC was recently estimated at 40% (*5*), suggesting that the reported number of total tetanus cases is even further underreported. Although tetanus case report forms were completed on 98% of the

TABLE 2. Summary of Immunization Practices Advisory Committee recommendations for tetanus prophylaxis in routine wound management (*3*)

History of adsorbed tetanus toxoid (doses)	Clean minor wounds		All other wounds*	
	Td†	TIG	Td†	TIG
Unknown or <3 doses	Yes	No	Yes	Yes
≥3 doses§	No¶	No	No**	No

*Such as, but not limited to, wounds contaminated with dirt, feces, soil, or saliva; puncture wounds; avulsions; and wounds resulting from missiles, crushing, burns, or frostbite.

†For children <7 years of age, DTP (DT if pertussis vaccine is contraindicated). For persons ≥7 years of age, Td is preferred to tetanus toxoid alone.

§If only three doses of *fluid* toxoid have been received, a fourth dose of toxoid, preferably an adsorbed toxoid, should be given.

¶Yes, if >10 years since last dose.

**Yes, if >5 years since last dose.

Tetanus – Continued

cases reported to *MMWR* during 1987 and 1988, accuracy may have varied; for example, reports on immunization status were usually based on verbal history.

The epidemiology of reported tetanus in the United States during 1987 and 1988 was similar to that described previously for 1985 and 1986 (*2*). Tetanus remains a severe disease with a high case-fatality rate primarily among unimmunized and inadequately immunized adults.

Vaccination with a primary series of three doses of tetanus toxoid and booster doses every 10 years is highly effective in the prevention of tetanus (*6*). Acute wound-associated tetanus can be prevented by appropriate wound management, including active and/or passive immunization. Fifty-eight percent of tetanus patients with acute injuries did not seek medical care for their injuries; of those who did, 81% did not receive prophylaxis as recommended by ACIP guidelines. Of persons with injuries that can lead to tetanus, 1%–6% reportedly receive less than recommended prophylaxis (*7,8*). The only means of preventing tetanus not associated with acute wounds or tetanus in persons who do not seek medical care for their wounds is to ensure routine primary immunization and maintenance of immunization status.

In the United States, tetanus is primarily a disease of older adults. Thus, tetanus immunization efforts should be especially emphasized for persons aged ≥50 years. Health-care practitioners who provide services to adolescents and adults should take every opportunity to review the immunization status of patients and provide, when indicated, Td and other vaccines such as hepatitis B, influenza, pneumococcal polysaccharide, and measles-mumps-rubella (*9,10*). Maintenance of protection against tetanus (and diphtheria) after the primary series can be achieved by routinely scheduling booster doses of Td at mid-decade ages, e.g., 15 years, 25 years, and 35 years.

References

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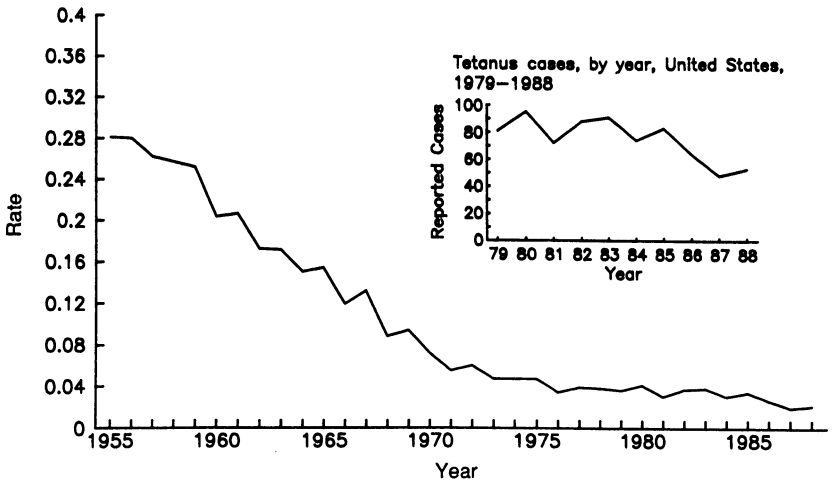
FIGURE 2. Tetanus rates per 100,000 population, by year – United States, 1955–1988



Tetanus — Continued

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Epidemiologic Notes and Reports

Surveillance of Shelters after Hurricane Hugo — Puerto Rico

On September 18, 1989, Hurricane Hugo struck the northeastern coast of Puerto Rico and left >75% of the island without electricity or water (*1*). An estimated 10,300 persons were displaced from their residences to temporary shelters. Because of the potential for outbreaks of infectious diseases (such as gastroenteritis) among shelter residents, the Puerto Rico Department of Health (PRDH) conducted active public health surveillance of the shelters from September 25 through October 3. The surveillance system was designed to 1) obtain information about the occurrence of infectious diseases; 2) determine the availability of shelter facilities such as water, toilets, electricity, and medical care; 3) monitor sanitation; 4) identify health-related topics about which to educate shelter residents; and 5) assist in resource allocation.

The PRDH divides Puerto Rico into eight administrative regions, six of which were affected by the hurricane. For this surveillance system, each region was assigned teams of public health professionals who reported daily to a supervisory regional epidemiologist, a regional medical director, and the PRDH Division of Epidemiology (DOE). Each team inspected eight shelters daily to provide health education and to assess overcrowding, the occurrence of infectious diseases, and the availability of water and toilet facilities. Potential infectious disease outbreaks were investigated by the regional epidemiologist, with assistance from the PRDH DOE. An infectious disease outbreak was defined as three or more cases of any disease reported on any day in one shelter or an attack rate >10% of a shelter's average population during a 5-day period. The director of DOE reviewed the teams' reports and reported to the Secretary of Health daily.

An estimated 10,300 persons were housed in 161 temporary shelters; 113 (70%) shelters were in public schools, 38 (24%) in community centers, and 10 (6%) in churches. The number of persons housed per shelter ranged from five to 297 (mean: 64). The surveillance system monitored 158 shelters. On September 25, 9429 persons were housed in the shelters—20 (13%) of which lacked running water; on October 3, 7528 persons were housed in the shelters—all of which had running water. Three shelters were not monitored—one on the island of Culebra housing >100 persons and two on the main island housing <10 persons each.

Hurricane Hugo — Continued

From September 25 through September 29, five shelters reported a >10% incidence of gastroenteritis. However, investigation failed to confirm these outbreaks; reported information either could not be verified or potential cases did not meet the PRDH gastroenteritis case definition (i.e., three or more loose stools within a 24-hour period).

Outbreaks of head lice infestation were confirmed in 28 (18%) shelters; at least one case of lice was reported in each of 34 (22%) shelters. Outbreaks of influenza-like illness occurred in 18 (11%) shelters. Compared with persons housed in schools, those housed in community centers and churches were 4.2 and 3.4 times more likely, respectively, to have had an influenza-like illness.

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(Continued on page 47)

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

Disease	3rd Week Ending			Cumulative, 3rd Week Ending		
	Jan. 20, 1990	Jan. 21, 1989	Median 1985-1989	Jan. 20, 1990	Jan. 21, 1989	Median 1985-1989
Acquired Immunodeficiency Syndrome (AIDS)	459	U*	154	3,217	1,625	651
Aseptic meningitis	109	74	74	247	197	204
Encephalitis: Primary (arthropod-borne & unspec)	17	15	14	33	35	39
Post-infectious	1	1	1	5	5	1
Gonorrhea: Civilian	10,082	14,135	16,519	36,373	35,329	43,853
Military	153	207	245	452	483	677
Hepatitis: Type A	462	539	420	1,112	1,394	1,094
Type B	325	326	389	740	908	1,026
Non A, Non B	24	41	53	90	132	163
Unspecified	35	27	55	87	92	150
Legionellosis	20	24	9	44	45	40
Leprosy	3	-	4	6	7	9
Malaria	15	16	12	42	42	31
Measles: Total†	27	99	17	234	190	46
Indigenous	22	96	10	144	183	43
Imported	5	3	3	90	7	7
Meningococcal infections	64	51	55	135	117	142
Mumps	85	114	53	199	261	179
Pertussis	46	36	21	96	119	80
Rubella (German measles)	-	3	5	17	9	10
Syphilis (Primary & Secondary): Civilian	759	613	571	1,978	1,582	1,582
Military	2	6	3	6	17	10
Toxic Shock syndrome	9	5	4	17	13	13
Tuberculosis	377	303	252	860	844	679
Tularemia	-	2	2	3	5	5
Typhoid Fever	9	7	4	18	17	9
Typhus fever, tick-borne (RMSF)	1	-	-	3	3	3
Rabies, animal	55	62	62	120	158	177

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1990		Cum. 1990
Anthrax	-	Leptospirosis	-
Botulism: Foodborne	-	Plague	-
Infant	1	Poliomyelitis, Paralytic,§	-
Other	-	Psittacosis (N.C. 8)	12
Brucellosis	2	Rabies, human	-
Cholera	-	Tetanus (Ga. 1)	2
Congenital rubella syndrome	-	Trichinosis	3
Congenital syphilis, ages < 1 year	-		
Diphtheria	-		

*Because AIDS cases are not received weekly from all reporting areas, comparison of weekly figures may be misleading.
†Three of the 8 reported cases for this week were imported from a foreign country or can be directly traceable to a known internationally imported case within two generations.
§No cases of suspected poliomyelitis have been reported in 1990; none of the 13 suspected cases in 1989 have been confirmed to date. Nine of 14 suspected cases in 1988 were confirmed and all were vaccine-associated.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending January 20, 1990 and January 21, 1989 (3rd Week)

Reporting Area	AIDS	Aseptic Meningitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1989	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990
UNITED STATES	3,217	247	33	5	36,373	35,329	1,112	740	90	87	44	6
NEW ENGLAND	146	25	3	-	1,376	1,221	19	57	2	4	1	-
Maine	8	1	-	-	12	25	-	-	-	1	-	-
N.H.	16	1	-	-	239	9	-	1	-	-	-	-
Vt.	-	2	-	-	5	4	1	-	-	-	-	-
Mass.	80	8	1	-	355	475	16	50	2	3	1	-
R.I.	1	12	-	-	60	85	2	5	-	-	-	-
Conn.	41	1	2	-	705	623	-	1	-	-	-	-
MID. ATLANTIC	1,320	51	1	-	3,806	4,365	157	104	12	1	8	2
Upstate N.Y.	245	13	1	-	522	156	21	22	3	-	3	-
N.Y. City	820	3	-	-	2,056	1,450	12	25	1	-	-	2
N.J.	142	-	-	-	721	530	29	13	6	-	3	-
Pa.	113	35	-	-	507	2,229	95	44	2	1	2	-
E.N. CENTRAL	192	40	4	1	7,591	6,795	49	77	8	6	11	-
Ohio	41	15	-	1	2,867	1,823	17	25	4	1	5	-
Ind.	23	-	-	-	823	522	1	1	-	1	-	-
Ill.	74	3	1	-	1,984	1,918	2	3	-	-	-	-
Mich.	44	22	3	-	1,775	1,882	25	41	4	4	4	-
Wis.	10	-	-	-	142	650	4	7	-	-	2	-
W.N. CENTRAL	72	9	1	-	1,855	1,376	27	9	2	-	-	-
Minn.	-	-	-	-	243	154	3	1	-	-	-	-
Iowa	1	-	1	-	225	90	13	3	1	-	-	-
Mo.	67	-	-	-	1,069	830	-	-	-	-	-	-
N. Dak.	-	-	-	-	6	8	1	-	-	-	-	-
S. Dak.	1	1	-	-	9	18	2	-	1	-	-	-
Nebr.	3	7	-	-	4	160	8	5	-	-	-	-
Kans.	-	1	-	-	299	116	-	-	-	-	-	-
S. ATLANTIC	687	37	12	-	11,043	9,824	124	143	13	6	7	-
Del.	11	2	-	-	134	130	3	1	-	-	-	-
Md.	109	13	3	-	1,189	997	75	29	1	1	2	-
D.C.	48	1	-	-	365	470	2	1	1	-	-	-
Va.	158	11	4	-	836	827	2	16	1	3	1	-
W. Va.	12	-	-	-	102	129	1	8	-	-	-	-
N.C.	55	7	4	-	2,178	1,438	18	38	8	-	2	-
S.C.	25	-	-	-	1,251	1,110	7	40	2	2	2	-
Ga.	13	-	1	-	2,579	1,683	10	8	-	-	-	-
Fla.	256	3	-	-	2,409	3,040	6	2	-	-	-	-
E.S. CENTRAL	77	15	4	-	3,050	3,326	23	66	7	1	7	-
Ky.	16	4	-	-	287	260	10	24	2	1	1	-
Tenn.	29	1	1	-	696	829	3	28	3	-	4	-
Ala.	17	7	3	-	1,362	1,288	10	14	2	-	2	-
Miss.	15	3	-	-	705	949	-	-	-	-	-	-
W.S. CENTRAL	101	4	-	1	2,741	3,731	53	28	1	1	3	3
Ark.	7	-	-	-	603	336	19	2	1	-	-	-
La.	59	1	-	-	581	500	6	14	-	-	1	-
Okla.	27	2	-	1	294	416	24	9	-	-	2	-
Tex.	8	1	-	-	1,263	2,479	4	3	-	1	-	3
MOUNTAIN	92	12	1	-	721	522	157	68	7	13	3	-
Mont.	-	-	-	-	8	10	2	3	-	-	-	-
Idaho	2	-	-	-	3	13	4	7	1	-	-	-
Wyo.	-	1	-	-	6	5	3	1	-	-	-	-
Colo.	38	-	-	-	150	46	-	3	-	3	-	-
N. Mex.	3	1	-	-	42	74	12	9	-	-	-	-
Ariz.	33	5	1	-	324	202	119	21	5	5	-	-
Utah	8	1	-	-	27	39	2	1	-	2	-	-
Nev.	8	4	-	-	161	133	15	23	1	3	3	-
PACIFIC	530	54	7	3	4,190	4,169	503	188	38	55	4	1
Wash.	81	-	-	-	403	378	20	7	1	-	-	-
Oreg.	20	-	-	-	155	159	53	20	3	1	-	-
Calif.	414	48	7	2	3,536	3,522	406	156	34	54	4	-
Alaska	3	-	-	-	84	92	2	2	-	-	-	-
Hawaii	12	6	-	1	12	18	22	3	-	-	-	1
Guam	1	-	-	-	2	8	1	-	-	1	-	-
P.R.	133	8	1	-	-	22	2	4	-	-	-	-
V.I.	1	-	-	-	27	21	-	-	-	-	-	-
Amer. Samoa	-	-	-	-	-	1	-	-	-	-	-	-
C.N.M.I.	-	-	-	-	-	6	-	-	-	-	-	-

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

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending January 20, 1990 and January 21, 1989 (3rd Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1990	1990	Cum. 1990	1990	Cum. 1990	Cum. 1989	Cum. 1990	1990	Cum. 1990	1990	Cum. 1990	Cum. 1989	1990	Cum. 1990	Cum. 1989
UNITED STATES	42	22	144	5	90	190	135	85	199	46	96	119	-	17	9
NEW ENGLAND	9	-	-	-	-	-	11	-	1	18	30	9	-	-	-
Maine	-	-	-	-	-	-	2	-	-	-	1	2	-	-	-
N.H.	-	-	-	-	-	-	-	-	1	-	-	5	-	-	-
Vt.	2	-	-	-	-	-	1	-	-	1	1	-	-	-	-
Mass.	5	-	-	-	-	-	6	-	-	17	28	-	-	-	-
R.I.	-	-	-	-	-	-	-	-	-	-	-	2	-	-	-
Conn.	2	-	-	-	-	-	2	-	-	-	-	-	-	-	-
MID. ATLANTIC	3	2	13	2	7	3	14	3	11	7	9	15	-	-	1
Upstate N.Y.	2	2	2	1§	1	-	3	-	3	3	3	-	-	-	1
N.Y. City	-	-	-	-	-	1	1	-	-	-	-	-	-	-	-
N.J.	-	-	-	-	-	2	4	-	-	-	-	14	-	-	-
Pa.	1	-	11	1§	6	-	6	3	8	4	6	1	-	-	-
E.N. CENTRAL	4	-	11	-	76	46	17	4	13	5	10	11	-	2	1
Ohio	2	-	-	-	-	45	5	-	-	-	-	1	-	-	-
Ind.	-	-	-	-	-	-	-	2	2	-	-	-	-	-	-
Ill.	-	-	-	-	-	-	5	-	2	-	-	3	-	2	-
Mich.	1	-	-	-	76	-	6	2	8	5	7	-	-	-	-
Wis.	1	-	11	-	-	1	1	-	1	-	3	7	-	-	1
W.N. CENTRAL	-	1	19	-	-	94	4	2	2	-	1	2	-	-	1
Minn.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Iowa	-	1	19	-	-	-	1	2	2	-	-	2	-	-	-
Mo.	-	-	-	-	-	94	-	-	-	-	-	-	-	-	1
N. Dak.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
S. Dak.	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Nebr.	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
Kans.	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
S. ATLANTIC	8	-	3	3	6	3	27	45	79	7	12	2	-	-	-
Del.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Md.	4	-	3	3†	5	2	4	41	56	5	5	-	-	-	-
D.C.	2	U	-	U	-	1	-	U	2	U	1	-	U	-	-
Va.	1	-	-	-	1	-	6	2	5	-	1	1	-	-	-
W. Va.	-	-	-	-	-	-	-	1	1	-	-	-	-	-	-
N.C.	1	-	-	-	-	-	5	1	6	-	3	1	-	-	-
S.C.	-	-	-	-	-	-	2	-	8	-	-	-	-	-	-
Ga.	-	-	-	-	-	-	3	-	-	2	2	-	-	-	-
Fla.	-	-	-	-	-	-	7	-	1	-	-	-	-	-	-
E.S. CENTRAL	1	-	5	-	-	1	4	9	15	-	7	1	-	-	-
Ky.	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
Tenn.	-	-	-	-	-	-	1	-	3	-	1	-	-	-	-
Ala.	1	-	-	-	-	1	1	1	2	-	6	1	-	-	-
Miss.	-	-	5	-	-	-	-	N	N	-	-	-	-	-	-
W.S. CENTRAL	-	-	-	-	-	-	3	10	38	4	5	-	-	-	-
Ark.	-	-	-	-	-	-	-	6	13	-	-	-	-	-	-
La.	-	-	-	-	-	-	-	-	8	-	1	-	-	-	-
Okla.	-	-	-	-	-	-	3	1	12	4	4	-	-	-	-
Tex.	-	-	-	-	-	-	-	3	5	-	-	-	-	-	-
MOUNTAIN	-	-	6	-	-	14	4	3	14	1	2	58	-	-	-
Mont.	-	-	-	-	-	13	3	-	-	-	-	-	-	-	-
Idaho	-	-	-	-	-	-	-	1	9	-	-	-	-	-	-
Wyo.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Colo.	-	-	-	-	-	-	-	1	1	1	1	3	-	-	-
N. Mex.	-	-	-	-	-	-	-	N	N	-	-	1	-	-	-
Ariz.	-	-	6	-	-	1	-	1	3	-	1	53	-	-	-
Utah	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Nev.	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-
PACIFIC	17	19	87	-	1	29	51	9	26	4	20	21	-	15	6
Wash.	-	-	-	-	-	-	2	1	1	-	-	1	-	-	-
Oreg.	1	-	-	-	-	-	5	N	N	-	1	-	-	-	-
Calif.	16	19	87	-	1	27	43	8	24	2	17	20	-	13	6
Alaska	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
Hawaii	-	-	-	-	-	2	-	-	1	2	2	-	-	2	-
Guam	-	U	-	U	-	-	-	U	-	U	-	1	U	-	-
P.R.	-	-	-	-	-	24	1	-	2	-	-	-	-	-	-
V.I.	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Amer. Samoa	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-
C.N.M.I.	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-

*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 January 20, 1990 and January 21, 1989 (3rd Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1990	Cum. 1989	Cum. 1990	Cum. 1990	Cum. 1989	Cum. 1990	Cum. 1990	Cum. 1990	Cum. 1990
UNITED STATES	1,978	1,582	17	860	844	3	18	3	120
NEW ENGLAND	115	96	2	6	14	-	-	-	-
Maine	-	-	-	-	1	-	-	-	-
N.H.	23	-	-	1	3	-	-	-	-
Vt.	-	-	-	-	-	-	-	-	-
Mass.	24	41	1	-	2	-	-	-	-
R.I.	-	2	-	1	2	-	-	-	-
Conn.	68	53	1	4	6	-	-	-	-
MID. ATLANTIC	398	277	2	266	186	1	6	-	29
Upstate N.Y.	3	-	-	1	7	-	4	-	1
N.Y. City	308	73	-	228	142	-	-	-	-
N.J.	80	82	-	12	16	1	2	-	19
Pa.	7	122	2	25	21	-	-	-	9
E.N. CENTRAL	76	46	4	79	79	-	1	-	3
Ohio	22	3	3	4	20	-	1	-	-
Ind.	1	3	-	-	1	-	-	-	-
Ill.	37	30	-	68	35	-	-	-	-
Mich.	4	6	1	-	20	-	-	-	-
Wis.	12	4	-	7	3	-	-	-	3
W.N. CENTRAL	16	21	1	22	26	-	-	-	13
Minn.	5	1	-	8	7	-	-	-	12
Iowa	3	3	-	1	4	-	-	-	-
Mo.	8	8	-	6	7	-	-	-	-
N. Dak.	-	-	-	1	3	-	-	-	-
S. Dak.	-	-	-	2	3	-	-	-	-
Nebr.	-	9	1	4	1	-	-	-	-
Kans.	-	-	-	-	1	-	-	-	1
S. ATLANTIC	801	589	-	77	129	1	1	1	45
Del.	8	4	-	1	-	-	-	-	2
Md.	53	34	-	24	5	-	1	-	18
D.C.	-	41	-	-	9	-	-	-	-
Va.	46	25	-	13	23	-	-	-	12
W. Va.	1	-	-	2	4	-	-	-	-
N.C.	93	25	-	-	13	1	-	1	1
S.C.	68	40	-	24	27	-	-	-	8
Ga.	205	140	-	4	8	-	-	-	4
Fla.	327	280	-	9	40	-	-	-	-
E.S. CENTRAL	114	93	1	28	50	-	-	1	3
Ky.	-	2	-	17	21	-	-	-	2
Tenn.	-	-	-	-	-	-	-	1	-
Ala.	54	55	1	11	24	-	-	-	1
Miss.	60	36	-	-	5	-	-	-	-
W.S. CENTRAL	234	213	-	30	30	-	-	-	13
Ark.	20	19	-	19	4	-	-	-	1
La.	117	48	-	-	7	-	-	-	-
Okla.	11	2	-	-	-	-	-	-	4
Tex.	86	144	-	11	19	-	-	-	8
MOUNTAIN	19	11	3	10	20	1	-	-	2
Mont.	-	-	-	-	-	-	-	-	1
Idaho	1	-	-	-	-	-	-	-	-
Wyo.	-	-	1	-	-	-	-	-	-
Colo.	4	2	-	-	-	-	-	-	-
N. Mex.	-	-	1	5	8	1	-	-	1
Ariz.	13	5	1	3	10	-	-	-	-
Utah	1	4	-	-	-	-	-	-	-
Nev.	-	-	-	2	2	-	-	-	-
PACIFIC	205	236	4	342	310	-	10	1	12
Wash.	-	18	-	14	10	-	-	-	-
Oreg.	3	9	-	4	7	-	-	-	-
Calif.	202	209	4	315	285	-	10	1	9
Alaska	-	-	-	-	3	-	-	-	3
Hawaii	-	-	-	9	5	-	-	-	-
Guam	-	1	-	1	2	-	-	-	-
P.R.	-	-	-	-	-	-	-	-	9
V.I.	-	1	-	-	-	-	-	-	-
Amer. Samoa	-	-	-	-	-	-	-	-	-
C.N.M.I.	-	1	-	-	-	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending January 20, 1990 (3rd Week)

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	≥65	45-64	25-44	1-24	<1	Total
NEW ENGLAND	738	543	124	40	15	16	79
Boston, Mass.	179	120	32	16	3	8	27
Bridgeport, Conn.	55	39	10	3	3	-	3
Cambridge, Mass.	24	22	1	-	1	-	-
Fall River, Mass.	40	35	1	3	1	-	2
Hartford, Conn.	61	45	11	3	-	2	5
Lowell, Mass.	33	23	5	3	1	1	4
Lynn, Mass.	23	15	8	-	-	-	2
New Bedford, Mass.	28	25	3	-	-	-	2
New Haven, Conn.	71	48	13	6	1	3	9
Providence, R.I.	45	32	10	1	-	2	4
Somerville, Mass.	6	5	1	-	-	-	1
Springfield, Mass.	56	39	12	5	-	-	7
Waterbury, Conn.	40	35	3	-	2	-	5
Worcester, Mass.	77	60	14	-	3	-	8
MID. ATLANTIC	3,117	2,107	571	290	78	71	204
Albany, N.Y.	60	39	11	5	1	4	4
Allentown, Pa.	22	19	3	-	-	-	1
Buffalo, N.Y.	108	76	20	6	3	3	6
Camden, N.J.	50	27	14	-	7	2	-
Elizabeth, N.J.	14	13	1	-	-	-	-
Erie, Pa.†	60	56	4	-	-	-	9
Jersey City, N.J.	88	54	20	7	2	5	8
N.Y. City, N.Y.	1,626	1,086	295	189	34	22	85
Newark, N.J.	128	62	29	23	7	7	12
Paterson, N.J.	36	24	7	3	-	2	2
Philadelphia, Pa.	394	246	95	26	16	11	20
Pittsburgh, Pa.†	93	72	12	4	3	2	4
Reading, Pa.	29	22	4	2	1	-	7
Rochester, N.Y.	114	91	17	4	-	2	17
Schenectady, N.Y.	33	23	6	3	1	-	3
Scranton, Pa.†	31	19	7	5	-	-	1
Syracuse, N.Y.	129	100	16	5	2	6	12
Trenton, N.J.	50	37	5	5	-	3	7
Utica, N.Y.	28	24	3	-	1	-	2
Yonkers, N.Y.	24	17	2	3	-	2	4
E.N. CENTRAL	2,700	1,875	509	181	47	88	194
Akron, Ohio	30	25	4	1	-	-	3
Canton, Ohio	42	34	3	2	3	-	7
Chicago, Ill.§	564	362	125	45	10	22	16
Cincinnati, Ohio	210	145	38	19	3	5	33
Cleveland, Ohio	163	108	38	8	1	8	8
Columbus, Ohio	265	186	42	21	4	12	13
Dayton, Ohio	123	88	20	10	1	4	15
Detroit, Mich.	287	181	50	32	10	14	15
Evansville, Ind.	58	48	6	2	1	1	2
Fort Wayne, Ind.	58	43	13	1	1	-	3
Gary, Ind.	14	7	4	3	-	-	1
Grand Rapids, Mich.	76	52	16	3	3	2	8
Indianapolis, Ind.	218	152	47	11	3	5	7
Madison, Wis.	41	31	4	2	2	2	5
Milwaukee, Wis.	171	123	34	8	3	3	11
Peoria, Ill.	70	57	10	2	-	1	12
Rockford, Ill.	63	45	14	3	1	-	11
South Bend, Ind.	68	52	6	3	1	6	8
Toledo, Ohio§	107	80	22	3	-	2	11
Youngstown, Ohio§	72	56	13	2	-	1	5
W.N. CENTRAL	776	587	118	43	11	17	40
Des Moines, Iowa	61	50	8	2	-	1	1
Duluth, Minn.	35	28	6	1	-	-	2
Kansas City, Kans.	9	8	-	-	-	1	-
Kansas City, Mo.	149	110	25	7	5	2	15
Lincoln, Nebr.	30	24	3	3	-	-	5
Minneapolis, Minn.	102	75	16	7	2	2	7
Omaha, Nebr.	91	65	18	6	1	1	9
St. Louis, Mo.	221	171	25	13	3	9	-
St. Paul, Minn.	60	44	12	3	-	1	1
Wichita, Kans.	18	12	5	1	-	-	-
S. ATLANTIC	1,514	933	301	187	51	41	110
Atlanta, Ga.	187	116	36	26	6	3	8
Baltimore, Md.	290	182	63	32	7	6	24
Charlotte, N.C.	113	73	23	11	3	3	18
Jacksonville, Fla.	132	84	23	9	12	4	9
Miami, Fla.	229	123	42	47	9	7	2
Norfolk, Va.	82	54	18	5	3	2	13
Richmond, Va.	86	49	25	6	2	4	9
Savannah, Ga.	57	37	13	3	1	3	7
St. Petersburg, Fla.	91	74	6	4	2	5	12
Tampa, Fla.	83	49	16	16	1	1	4
Washington, D.C.§	132	68	29	27	5	3	3
Wilmington, Del.	32	24	7	1	-	-	1
E.S. CENTRAL	987	678	199	61	28	20	84
Birmingham, Ala.	113	87	15	6	2	3	3
Chattanooga, Tenn.	106	78	23	4	-	1	16
Knoxville, Tenn.	119	89	21	8	1	-	11
Louisville, Ky.	161	107	35	9	6	4	11
Memphis, Tenn.	250	165	59	13	9	4	22
Mobile, Ala.	20	12	5	2	1	-	-
Montgomery, Ala.§	57	44	8	2	2	1	3
Nashville, Tenn.	161	96	33	17	7	7	18
W.S. CENTRAL	2,223	1,453	462	190	58	59	174
Austin, Tex.	85	54	18	9	3	1	9
Baton Rouge, La.	76	52	17	3	3	1	9
Corpus Christi, Tex.	80	58	16	5	-	1	13
Dallas, Tex.	332	235	54	26	5	12	23
El Paso, Tex.	90	64	15	8	2	1	7
Fort Worth, Tex	143	108	22	5	1	7	15
Houston, Tex.§	734	436	169	89	24	16	18
Little Rock, Ark.	89	49	25	6	4	5	8
New Orleans, La.	167	91	43	14	9	10	-
San Antonio, Tex.	220	151	49	13	5	2	42
Shreveport, La.	61	46	9	3	1	1	11
Tulsa, Okla.	146	109	25	9	1	2	19
MOUNTAIN	906	639	163	58	29	16	94
Albuquerque, N. Mex.	98	71	15	8	1	2	4
Colo. Springs, Colo.	49	37	6	2	4	-	12
Denver, Colo.	162	110	37	11	3	1	9
Las Vegas, Nev.	182	126	40	10	4	2	21
Ogden, Utah	24	21	2	1	-	-	5
Phoenix, Ariz.	168	112	28	14	7	7	22
Pueblo, Colo.	37	29	5	-	2	1	7
Salt Lake City, Utah	48	34	7	4	2	1	2
Tucson, Ariz.	138	99	23	8	6	2	12
PACIFIC	2,129	1,447	367	196	44	64	164
Berkeley, Calif.	16	12	4	-	-	-	-
Fresno, Calif.	87	61	12	8	1	5	13
Glendale, Calif.	30	24	5	-	1	-	1
Honolulu, Hawaii	83	64	13	4	-	2	16
Long Beach, Calif.	101	62	18	12	4	5	8
Los Angeles Calif.	496	328	83	60	12	5	23
Oakland, Calif.	76	44	17	8	3	4	5
Pasadena, Calif.	28	15	5	3	1	4	1
Portland, Oreg.	219	166	30	11	2	10	13
Sacramento, Calif.	155	103	39	8	2	3	18
San Diego, Calif.	133	96	20	10	6	-	17
San Francisco, Calif.	180	105	27	34	3	9	7
San Jose, Calif.	201	143	36	12	5	5	17
Seattle, Wash.	168	106	33	17	3	9	5
Spokane, Wash.	91	70	12	6	1	2	10
Tacoma, Wash.	65	48	13	3	-	1	10
TOTAL	15,090††	10,262	2,814	1,246	361	392	1,143

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

**Pneumonia and influenza.

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

††Total includes unknown ages.

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

Hurricane Hugo – Continued

Editorial Note: Before impending hurricanes and other potential disasters, many persons are reluctant to evacuate to shelters. In Puerto Rico, evacuation posed few problems, and the benefits of evacuation far outweighed the risks of residing in shelters. (The three persons who died during the impact phase of Hurricane Hugo had repeatedly refused to evacuate to shelters [*1*; CDC, unpublished data]). The PRDH surveillance did not detect or document serious disease outbreaks or other public health problems in the shelters; moreover, only a few minor health problems were identified in the shelters.

The difference in risk for certain infectious diseases between persons housed in schools and persons housed in community centers and churches was not related to the number of persons per shelter or to overcrowding. One possible explanation for this difference was the use of multiple small rooms for housing persons at schools rather than the use of one large room at community centers and churches. The head lice infestation may have reflected endemic occurrence detected only incidentally by this surveillance system.

The PRDH shelter surveillance system resulted in several public health interventions: provision of portable toilets to shelters that needed them; delivery of potable water to shelters that lacked drinking water; education of shelter residents about personal hygiene; and treatment of persons with head lice infestations. In addition, data from the surveillance system were useful in assessing and dispelling rumors that circulated the day after the hurricane about outbreaks of infectious diseases (including cholera) in the shelters, as well as ensuring that basic sanitary services and potable water were provided efficiently. Public health surveillance in large shelters, such as that established by the PRDH after Hurricane Hugo and after torrential rains in 1985 (*2*), should be part of the public health emergency response to disasters.

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Pseudomonas aeruginosa Corneal Infection Related to Mascara Applicator Trauma – Georgia

On January 11, 1989, a 47-year-old woman in Georgia scratched her left eye with a mascara applicator and subsequently had onset of progressive pain, light sensitivity, redness, and swelling of the eye. Examination by a physician on January 12 revealed a corneal abrasion; gentamicin ointment was instilled, and the eye was patched. Three days after onset, ophthalmologic consultation documented severely impaired vision and a corneal abscess in the patient's left eye, and the patient was admitted for treatment. Gram stain of corneal scrapings revealed gram-negative rods. Culture of the corneal scrapings and of a sample of the patient's mascara grew *Pseudomonas aeruginosa* with identical antibiotic susceptibility patterns.

Following inpatient therapy, including subconjunctival gentamicin, the infection resolved; however, on discharge from the hospital, a dense inflammatory corneal

Pseudomonas aeruginosa — *Continued*

infiltrate was present. Subsequently, diffuse neovascularization of the cornea developed; vision in the patient's eye has not improved.

Reported by: LA Wilson, MD, Emory Univ, Atlanta; RK Sikes, DVM, State Epidemiologist, Georgia Dept of Human Resources. Meningitis and Special Pathogens Br, Div of Bacterial Diseases, Center for Infectious Diseases, CDC.

Editorial Note: Only nine cases of *P. aeruginosa* eye infections associated with mascara applicator trauma and mascara contamination have been reported (*1–3*). New mascara is rarely contaminated with bacteria but can become contaminated with *P. aeruginosa* and other bacteria after use (*4,5*).

The case described here demonstrates the rapidity with which *P. aeruginosa* infection can progress and the severity of residual damage. Ophthalmologists and other health-care workers who evaluate patients with eye complaints should be aware of mascara applicator trauma as a potential risk factor for infection. Prompt ophthalmologic consultation should be obtained for suspected *P. aeruginosa* corneal infections.

Further efforts are needed to delineate the epidemiology of *Pseudomonas* corneal infections related to mascara contamination. When the medical history suggests that antecedent mascara application may be associated with corneal infection, health-care workers should consider culturing the mascara of affected patients. Suspected cases should be reported through state health departments to the Meningitis and Special Pathogens Branch, Division of Bacterial Diseases, Center for Infectious Diseases, CDC, Mailstop C09, Atlanta, GA 30333; telephone (404) 639-3687.

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Aspergillus Endophthalmitis in Intravenous-Drug Users — Kentucky

Since May 1989, three cases of *Aspergillus* endophthalmitis, a potential cause of irreversible vision loss, have been reported in Louisville, Kentucky. All three patients were intravenous-drug users (IVDUs).

The patients—ages 40, 32, and 24 years—had onsets of illness in May, August, and September, respectively. Two were male. Except for IV-drug use, no risk factors for this fungal endophthalmitis were identified. All three patients were seronegative for antibody to human immunodeficiency virus. Infection was unilateral in each patient and responded to treatment with amphotericin B and flucytosine following vitrectomy. All patients had some degree of permanent vision loss. In each case, diagnosis was made by culture of specimens obtained at vitrectomy; each culture grew *Aspergillus flavus*. None of the patients had systemic or other localized signs of infection.

Two of the patients lived in the same apartment complex. The third lived approximately 1 mile away. Each denied any contact with the others. Common

Aspergillus *Endophthalmitis — Continued*

IV-injection practices included diluting drugs with tap water and filtering this mix through cotton or cigarette filters. All patients injected cocaine and a combination of pentazocine and tripelennamine.

Reported by: CC Barr, MD, A Walsh, Humana University Hospital, B Wainscott, MD, Jefferson County Health Dept, Louisville; R Finger, MD, Acting State Epidemiologist, Dept for Health Svcs, Kentucky Cabinet for Human Resources. Div of Field Svcs, Epidemiology Program Office, CDC.

Editorial Note: Fungal endophthalmitis is a recognized complication of IV-drug use (*1*). Infection results from hematogenous spread after nonsterile injection (*2*). Fungal endophthalmitis can develop slowly over weeks and occurs more frequently with *Candida* than with *Aspergillus* (*3*). Other risk factors associated with *Aspergillus* endophthalmitis include the use of antibiotics, corticosteroids, and immunosuppressive therapy (*3*). Vision loss can be limited in some patients by aggressive antibiotic and surgical treatment (*4*).

Because *Aspergillus* species are ubiquitous molds and the patients reported here used common injection practices, the source of infection is difficult to determine. However, one possible explanation for the geographic and temporal clustering of these cases is a contaminated drug supply. Physicians should consider the diagnosis of fungal endophthalmitis in IVDUs with signs of intraocular infection.

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Update: Influenza Activity — United States, 1989–90

Widespread influenza-like illness activity* for the 1989–90 influenza season was first reported the week ending December 16, 1989, in Montana and Utah. Four states (Mississippi, Montana, Texas, and Utah) reported widespread activity during the week ending December 30, and 10 states reported widespread activity during the week ending January 6, 1990. For the week ending January 13, 10 states reported widespread activity, 19 reported regional activity, and 22 reported sporadic activity (Figure 1).

Visits to approximately 110 sentinel family practice physicians in 43 states for treatment of influenza-like illnesses have similarly increased, accounting for 9.5%, 8.8%, and 10.3% of all visits during the weeks ending December 30, January 6, and January 13, respectively, compared with a mean of 4.9% during the 4 weeks ending December 23. Approximately 3% of all patients seen by sentinel physicians for treatment of influenza-like illness have required hospitalization. Persons ≥65 years of age are more likely to be hospitalized for influenza-like illness or complications than are persons <65 years of age (13.7% vs. 2.0%).

*Levels of activity are: 1) *Sporadic*—sporadically occurring influenza-like illness or culture-confirmed influenza, with no outbreaks detected; 2) *Regional*—outbreaks of influenza-like illness or culture-confirmed influenza in counties having a combined population of <50% of the state's total population; 3) *Widespread*—outbreaks of influenza-like illness or culture-confirmed influenza in counties having a combined population of ≥50% of the state's total population.

Influenza — Continued

Influenza A(H3N2) continues to be the predominant influenza strain, accounting for approximately 98% of the 335 isolates subtyped and reported to CDC so far this season. Influenza has been isolated in patients from all age groups. Culture-confirmed outbreaks of influenza A(H3N2) in nursing home residents have been reported from seven states. Since December 15, outbreaks of respiratory illness in 68 (21%) of 329 Connecticut nursing homes have been reported to the state health department; influenza A viruses have been isolated from patients at six of these nursing homes.

In the 121 cities that report death certificate data regularly to CDC, 7.6% of deaths were associated with pneumonia and influenza for the week ending January 13. This percentage exceeds the epidemic threshold of 6.7% for the first time this influenza season.

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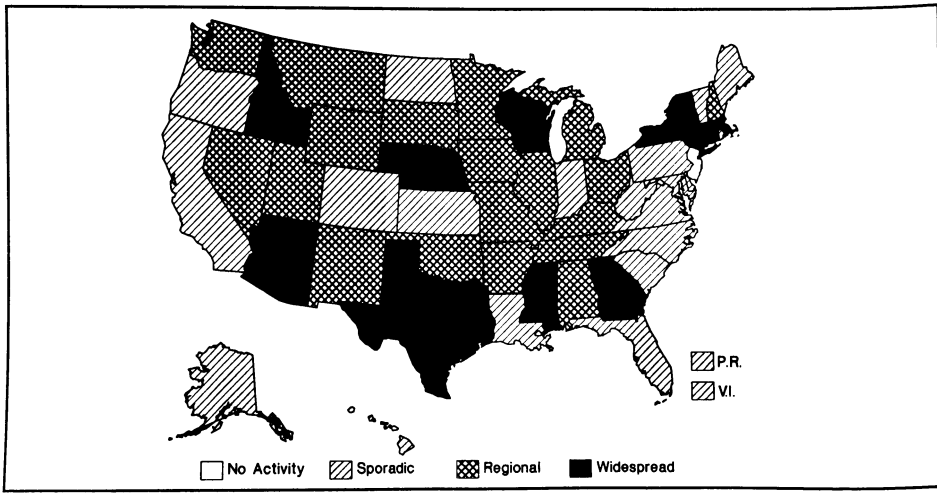
Editorial Note: During influenza A outbreaks in nursing homes and other chronic-care facilities, the combined use of influenza vaccination and amantadine prophylaxis and treatment of both residents and employees may shorten the duration and severity of the outbreak (*1–3*). However, amantadine-resistant influenza viruses can emerge when amantadine is used for treatment (*4–6*). The frequency with which resistant isolates emerge and the extent of transmission of these viruses remain unknown; however, there is no evidence to suggest that amantadine-resistant viruses are more virulent or more transmissible than amantadine-sensitive viruses (*5*). Thus, the use of amantadine remains an appropriate outbreak-control measure.

In closed populations such as nursing homes, ill persons who are receiving amantadine as treatment should be separated, whenever possible, from persons receiving amantadine as prophylaxis against influenza. The continued occurrence of

FIGURE 1. Influenza activity — United States, week ending January 13, 1990



Influenza — Continued

influenza-like illness in an institution where amantadine is being used, and isolation of influenza viruses from persons who are receiving amantadine, should be reported through the state health department to CDC.

References

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The data in this report are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday. The editor welcomes accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials. Such reports and any other matters pertaining to editorial or other textual considerations should be addressed to: Editor, *Morbidity and Mortality Weekly Report*, Centers for Disease Control, Atlanta, Georgia 30333; telephone (404) 332-4555.

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