CDC
CENTERS FOR DISEASE CONTROL

June 7, 1991 / Vol. 40 / No. 22

MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

The HIV/AIDS Epidemic: The First 10 Years

On June 5, 1981, the first cases of an illness subsequently defined as acquired immunodeficiency syndrome (AIDS) were reported by health-care providers in California and CDC (*1*). As of May 31, 1991, state and local health departments had reported to CDC 179,136 AIDS cases among persons of all ages in the United States. By the end of 1991, AIDS will be the second leading cause of death among men 25–44 years of age and is likely to be one of the five leading causes of death among women aged 15–44 years in the United States (*2*).

The World Health Organization estimates that 8–10 million adults and 1 million children worldwide are infected with human immunodeficiency virus (HIV), the etiologic agent of AIDS. By the year 2000, 40 million persons may be infected with HIV (*3*). More than 90% of these persons will reside in developing countries in sub-Saharan Africa, South and Southeast Asia, Latin America, and the Caribbean. In addition, during the 1990s, mothers or both parents of more than 10 million children will have died from HIV infection/AIDS.

AIDS will remain a major public health challenge worldwide in the 21st century. Education of all persons about AIDS to prevent transmission of HIV infection is critical to controlling this problem.

Reported by: Technical Information Activity, Div of HIV/AIDS, Center for Infectious Diseases, CDC.

References

1. CDC. *Pneumocystis* pneumonia—Los Angeles. MMWR 1981;30:250–2.
2. CDC. Mortality attributable to HIV infection/AIDS—United States, 1981–1990. MMWR 1991; 40:41–4.
3. World Health Organization. In point of fact. Geneva: World Health Organization, May 1991 (no. 74).

Current Trends

Update: Acquired Immunodeficiency Syndrome — United States, 1981–1990

In 1981, 189 cases of acquired immunodeficiency syndrome (AIDS), a newly recognized condition, were reported to CDC from 15 states and the District of Columbia; 76% of cases were reported from New York and California. Ninety-seven percent of cases reported were among men, 79% of whom reported being homosexual/bisexual (i.e., having had sex with other men); no cases were reported among children. In contrast, in 1990, more than 43,000 cases were reported, representing all states, the District of Columbia, and the U.S. territories; nearly two-thirds were reported from outside New York and California; more than 11% of adolescent and adult cases were in women; and nearly 800 cases were in children <13 years of age. These differences between 1981 and 1990 highlight the dramatic growth and increasing complexity of the AIDS epidemic. This report summarizes trends in the epidemiology of AIDS cases from 1981 through 1990 in the United States and updates AIDS cases in 1990.*

AIDS, 1981–1990

During the 1980s, the number of reported AIDS cases increased each year. Homosexual/bisexual men and intravenous (IV)-drug users (i.e., persons who report a history of injecting drugs) have accounted for the largest number of AIDS cases throughout the epidemic. The total number of AIDS cases and of cases in these categories increased most rapidly during the middle 1980s, with more moderate increases in the late 1980s (Figure 1a).

Reported AIDS cases associated with heterosexual transmission of human immunodeficiency virus (HIV) have been increasing steadily, with cases occurring more frequently among women than among men (Figure 1b). Similarly, cases in children associated with perinatal (mother-to-infant) HIV transmission have continued to increase (Figure 1c). The number of AIDS cases associated with blood or blood product transfusions has stabilized (Figure 1d).

AIDS, 1990

In 1990, 43,339 AIDS cases (17.2 per 100,000 population) were reported, accounting for more than one fourth (161,073) of all cases reported during 1981–1990. Homosexual/bisexual men and IV-drug users represented more than three fourths of reported cases (Table 1).

The number of cases reported per 100,000 population was higher for men, blacks and Hispanics, persons 30–39 and 40–49 years of age, and persons in the U.S. territories (primarily reflecting rates in Puerto Rico) and the Northeast region than for persons in other demographic groups or geographic areas (Table 1). Rates for reported cases among both women and men varied widely among states (Figure 2).

Women accounted for 11.5% of reported AIDS cases among adolescents and adults. Of the 4890 reported cases among adolescent and adult women in 1990, 2539 (51.9%) occurred among black women, 1236 (25.3%) among white women, and 1069 (21.9%) among Hispanic women. A history of IV-drug use was reported by 2329 (47.6%) women with AIDS. Heterosexual contact with a man infected with HIV or at

*Single copies of this article will be available free until June 7, 1992, from the National AIDS Information Clearinghouse, P. O. Box 6003, Rockville, MD 20850; telephone (800) 458-5231.

AIDS – Continued

high risk for HIV infection accounted for 1657 (33.9%) cases among women; 64.1% of these male sex partners were IV-drug users.

Comparison of AIDS Cases in 1989 and 1990

The number of AIDS cases in 1990 was compared with the number in 1989 by two approaches: 1) cases *reported* during these two periods and 2) cases *diagnosed* during these two periods and adjusted for reporting delays. Differences in the comparisons are due to the effect of cases reported in 1990 but diagnosed in earlier years and cases diagnosed in 1990 but not yet reported.

Based on year of report, the number of AIDS cases increased by 35,230 to 43,339 (23%) from 1989 to 1990; based on year of diagnosis, cases increased from 41,200 to 44,200 (7%) (Table 1). In both comparisons, the largest proportionate increases occurred among women, blacks and Hispanics, persons living in the South (excluding the U.S. territories), and persons exposed to HIV through heterosexual contact (Table 1). However, the largest increases in the numbers of reported cases occurred among whites and among homosexual/bisexual men (Table 1).

Reported by: Local, state, and territorial health departments. Div of HIV/AIDS, Center for Infectious Diseases, CDC.

Editorial Note: Since AIDS was first recognized and reported in 1981 (*1*), more than 179,000 persons with AIDS have been reported to public health departments in the United States. Of these, more than 113,000 (63%) are reported to have died. During this period, HIV infection has emerged as a leading cause of death among men and women <45 years of age and children 1–5 years of age in the United States (*2*).

The AIDS epidemic has expanded in scope and magnitude as HIV infection has affected different populations and geographic areas (*3,4*). Although homosexual/bisexual men continue to account for most AIDS cases, cases associated with IV-drug use are more common in several northeastern states (*5*). In 1990, the incidence of AIDS increased most rapidly among persons exposed to HIV through heterosexual contact. In addition, the rate of increase in AIDS cases was greatest in the South.

The total number of cases reported in 1990 represented an increase of more than 8000 cases from those reported in 1989, although the rate of increase in diagnosed cases was less than that for reported cases. When compared with diagnosed cases, the larger increase in reported cases may reflect more rapid reporting by health departments in 1990 to qualify for federal HIV-care funds. Assessment of reporting trends in 1991 should clarify these differences.

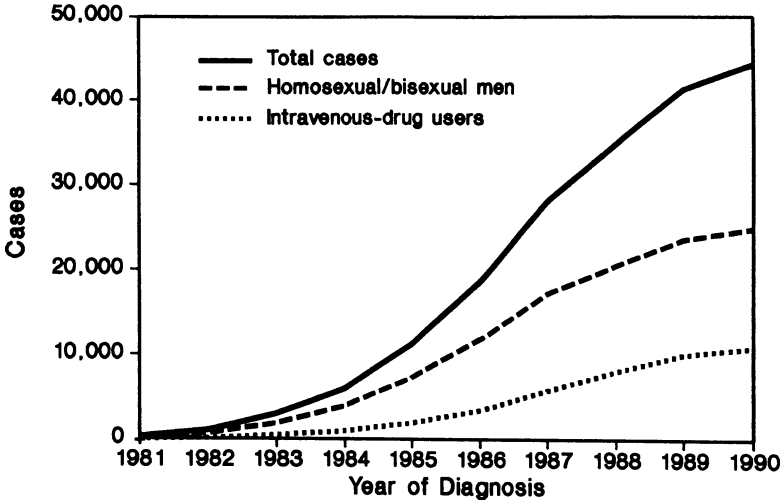
The slower rate of increase in AIDS cases diagnosed among homosexual/bisexual men than in earlier years may reflect a decline in the incidence of HIV infection among this group of men since the mid-1980s, as well as the effect of treatments that delay progression of HIV disease (*6*). Nonetheless, the increase in total diagnosed (1200) and reported cases (3847) from 1989 to 1990 was larger for these men than for persons who had other modes of HIV exposure.

Although the annual incidence of AIDS for persons who have received blood transfusions and persons with hemophilia has stabilized (Figure 1d), cases associated with these modes of HIV transmission continue to be diagnosed as a consequence of infections that occurred before screening of donated blood and heat treatment of clotting factors and because of the long period between infection with HIV and onset of AIDS. Although reported cases among transfusion recipients and persons with hemophilia increased, trends by year of diagnosis indicate that the number of such cases declined slightly or were relatively stable in 1990 (Table 1).

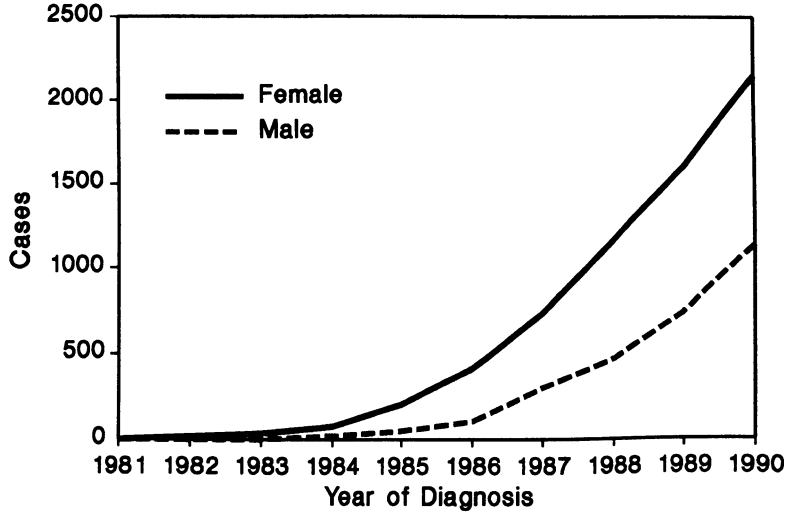
AIDS — Continued

FIGURE 1. AIDS cases, by year of diagnosis — United States, 1981–1990*

a. Total cases, cases among homosexual/bisexual men†, and cases among women and heterosexual men reporting intravenous (IV)-drug use



b. Cases among persons reporting heterosexual contact with persons with, or at high risk for, HIV infection

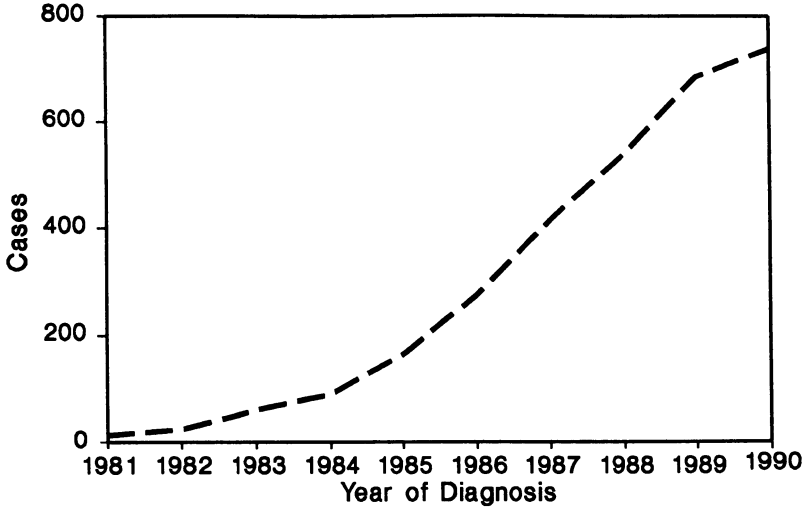


*Based on cases reported through March 1991 and adjusted for reporting delays.
†Excludes IV-drug users.

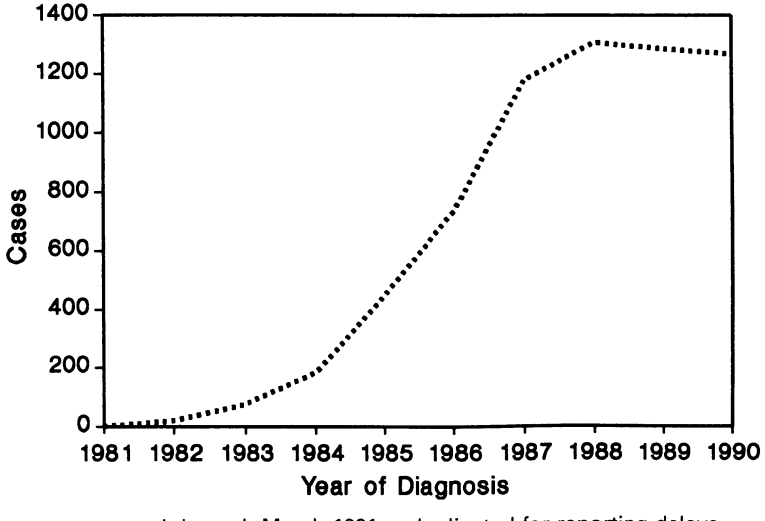
AIDS – Continued

FIGURE 1. AIDS cases, by year of diagnosis – United States, 1981–1990* – Continued

c. Perinatally acquired pediatric AIDS cases



d. Cases among recipients of transfusions of blood or blood products



*Based on cases reported through March 1991 and adjusted for reporting delays.

AIDS — Continued

TABLE 1. Characteristics of reported persons with AIDS and percent change in cases, by year of report and year of diagnosis — United States, 1989 and 1990

Category	1990 Reported cases No.	(%)	Rate*	1989 Reported cases	% change 1989–1990 Reported	Diagnosed†
Sex						
Male	38,082	(87.9)	30.9	31,282	21.7	5.9
Female	5,257	(12.1)	4.1	3,948	33.2	17.4
Age (yrs)						
0–4	622	(1.4)	3.3	533	16.7	2.3
5–9	120	(0.3)	0.6	89	34.8	33.0
10–19	208	(0.5)	0.6	149	39.6	17.0
20–29	8,338	(19.2)	19.7	6,992	19.3	5.9
30–39	19,722	(45.5)	46.8	16,260	21.3	4.7
40–49	10,026	(23.1)	33.5	7,640	31.2	13.6
50–59	3,013	(7.0)	13.4	2,518	19.7	4.1
⩾60	1,290	(3.0)	3.1	1,049	23.0	13.5
Race/Ethnicity§						
White	22,342	(51.6)	11.8	18,661	19.7	2.5
Black	13,186	(30.4)	42.5	10,336	27.6	12.0
Hispanic	7,322	(16.9)	31.9	5,829	25.6	13.3
Asian/Pacific Islander	260	(0.6)	3.8	239	8.8	−8.8
American Indian/ Alaskan Native	71	(0.2)	4.0	63	12.7	23.1
Region						
Northeast	13,572	(31.3)	26.7	10,710	26.7	−2.2
Midwest	4,068	(9.4)	6.8	3,491	16.5	12.7
South	14,331	(33.1)	16.8	11,010	30.2	14.9
West	9,624	(22.2)	18.2	8,511	13.1	3.3
U.S. territories	1,744	(4.0)	46.2	1,508	15.6	31.0
HIV exposure category						
Male homosexual/ bisexual contact	23,738	(54.8)	—	19,891	19.3	5.2
History of intravenous-drug use						
Women and heterosexual men	10,018	(23.1)	—	8,089	23.8	7.9
Male homosexual/ bisexual contact	2,295	(5.3)	—	2,214	3.7	−2.7
Persons with hemophilia						
Adult/adolescent	340	(0.8)	—	289	17.6	−2.9
Child	31	(0.1)	—	25	24.0	16.7
Transfusion recipients						
Adult/adolescent	866	(2.0)	—	777	11.5	−1.0
Child	39	(0.1)	—	40	−2.5	−2.6
Heterosexual contacts	2,289	(5.3)	—	1,631	40.3	40.9
Born pattern II country¶	422	(1.0)	—	379	11.3	−10.1
Perinatal	681	(1.6)	—	565	20.5	7.8
No identified risk	2,620	(6.0)	—	1,330	—	—
Total	**43,339**	**(100.0)**	**17.2**	**35,230**	**23.0**	**7.2**

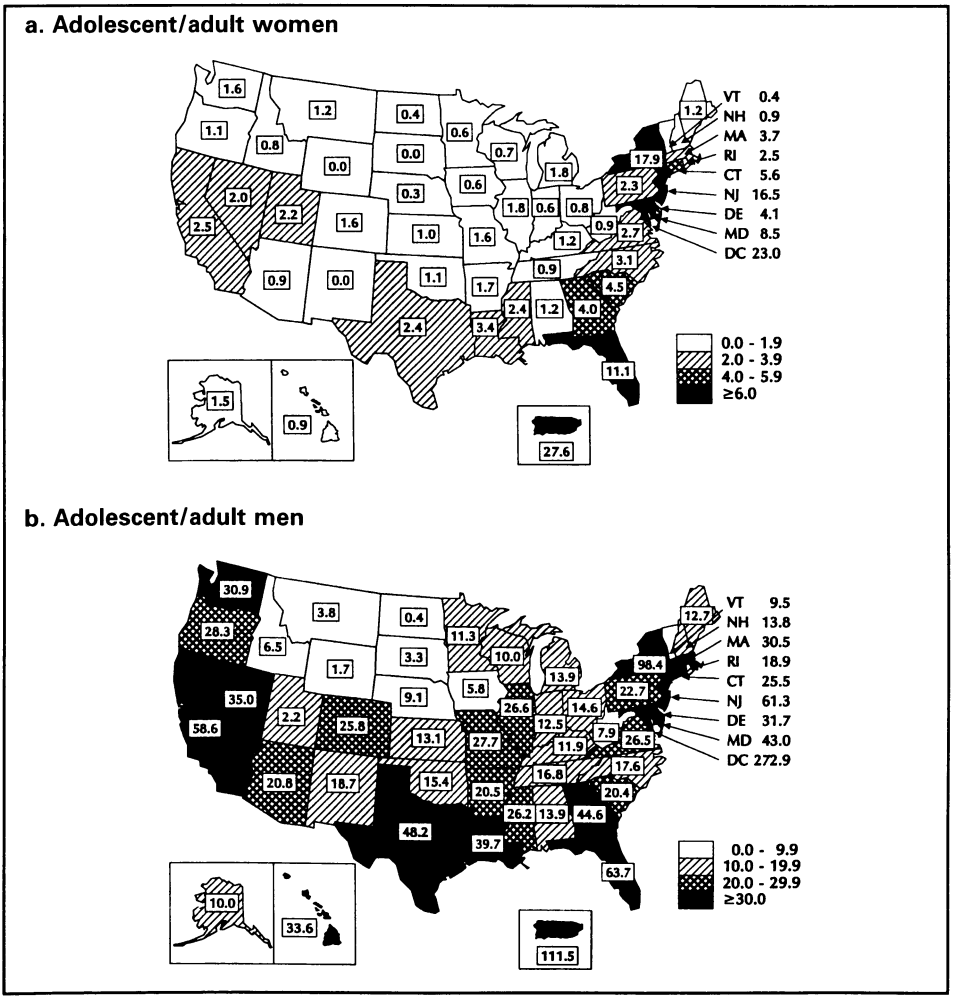
*Per 100,000 population.
†Diagnosed cases adjusted for estimated delays in reporting.
§Excludes persons with unspecified race/ethnicity.
¶Persons born in countries where heterosexual transmission predominates.

AIDS — Continued

The need for services for HIV-infected persons is growing even more rapidly than indicated by trends in AIDS surveillance. The number of reported AIDS cases reflects illness among a substantially larger population of HIV-infected persons. However, antiretroviral therapies and other advances in care can delay the onset of AIDS among asymptomatic persons and lengthen the survival of those with AIDS. Other HIV-infected persons are ill but have not yet developed AIDS. The increasing diversity of the HIV/AIDS epidemic will further stress the ability of health-care systems to provide preventive and therapeutic services to HIV-infected persons.

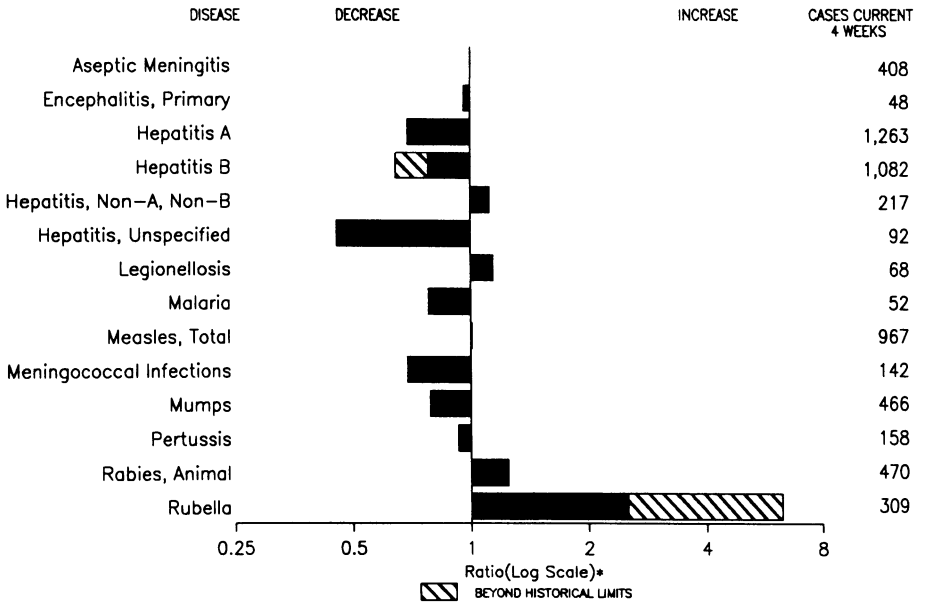
(Continued on page 369)

FIGURE 2. Rate of reported AIDS cases* among adolescents and adults, by sex and state of residence — United States, 1990



*Per 100,000 population.

FIGURE I. Notifiable disease reports, comparison of 4-week totals ending June 1, 1991, with historical data — United States



*Ratio of current 4-week total to the mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where the hatched 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 June 1, 1991 (22nd Week)

	Cum. 1991		Cum. 1991
AIDS	17,893	Measles: imported	88
Anthrax	-	indigenous	5,603
Botulism: Foodborne	7	Plague	-
Infant	18	Poliomyelitis, Paralytic*	-
Other	4	Psittacosis	43
Brucellosis	21	Rabies, human	-
Cholera	11	Syphilis, primary & secondary	17,901
Congenital rubella syndrome	11	Syphilis, congenital, age < 1 year	12
Diphtheria	1	Tetanus	11
Encephalitis, post-infectious	29	Toxic shock syndrome	137
Gonorrhea	235,769	Trichinosis	8
Haemophilus influenzae (invasive disease)	1,479	Tuberculosis	8,764
Hansen Disease	57	Tularemia	30
Leptospirosis	29	Typhoid fever	127
Lyme Disease	1,955	Typhus fever, tickborne (RMSF)	73

*No cases of suspected poliomyelitis have been reported in 1991; none of the 6 suspected cases in 1990 have been confirmed to date. Five of the 13 suspected cases in 1989 were confirmed and all were vaccine associated.

TABLE II. Cases of selected notifiable diseases, United States, weeks ending June 1, 1991, and June 2, 1990 (22nd Week)

Reporting Area	AIDS	Aseptic Meningitis	Encephalitis		Gonorrhea		Hepatitis (Viral), by type				Legionellosis	Lyme Disease
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1990	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991
UNITED STATES	17,893	2,126	252	29	235,769	286,423	10,452	6,776	1,264	593	470	1,955
NEW ENGLAND	783	106	12	-	5,949	7,543	242	348	44	19	38	71
Maine	22	7	3	-	54	101	8	8	2	-	-	-
N.H.	20	8	-	-	134	88	17	13	4	-	2	6
Vt.	8	23	1	-	17	26	12	3	3	-	1	1
Mass.	445	31	6	-	2,453	2,893	127	276	26	17	33	39
R.I.	37	30	-	-	504	449	46	13	7	2	2	18
Conn.	251	7	2	-	2,787	3,986	32	35	2	-	-	7
MID. ATLANTIC	5,054	251	20	8	28,111	40,682	869	586	129	12	135	1,489
Upstate N.Y.	648	124	9	6	5,381	5,937	452	256	79	6	44	1,068
N.Y. City	2,802	35	-	-	10,141	17,706	166	57	3	-	13	-
N.J.	1,110	-	-	-	4,342	6,506	120	137	27	-	17	220
Pa.	494	92	11	2	8,247	10,533	131	136	20	6	61	201
E.N. CENTRAL	1,233	358	69	6	43,703	54,000	1,213	808	173	28	88	82
Ohio	243	118	23	2	13,743	16,186	177	196	94	11	45	45
Ind.	109	43	8	1	4,567	4,504	186	91	1	1	9	4
Ill.	580	64	14	3	13,146	16,784	505	111	21	1	2	-
Mich.	219	120	21	-	9,803	12,916	154	263	49	15	22	33
Wis.	82	13	3	-	2,444	3,610	191	147	8	-	10	-
W.N. CENTRAL	464	150	10	3	11,687	14,968	1,140	292	154	12	21	10
Minn.	108	29	5	-	1,144	1,845	149	26	10	2	4	2
Iowa	40	34	-	1	799	1,128	30	17	6	2	3	6
Mo.	242	57	3	2	7,094	8,760	288	199	134	5	8	-
N. Dak.	4	-	-	-	23	63	25	3	2	1	-	-
S. Dak.	1	4	2	-	150	87	456	2	-	-	3	-
Nebr.	28	8	-	-	838	780	151	20	1	-	3	-
Kans.	41	18	-	-	1,639	2,305	41	25	1	2	-	2
S. ATLANTIC	4,350	516	49	10	71,122	80,002	740	1,488	191	130	77	102
Del.	34	8	1	-	993	1,309	6	22	3	3	1	13
Md.	442	52	6	-	7,111	8,275	142	212	35	11	16	45
D.C.	263	12	-	-	4,224	5,101	44	54	1	1	-	-
Va.	331	87	13	1	7,202	7,566	78	93	10	91	7	19
W. Va.	17	2	1	-	500	579	10	29	1	5	-	5
N.C.	219	56	18	-	13,359	13,530	84	249	80	-	10	10
S.C.	136	14	-	-	5,160	6,526	24	323	16	3	8	1
Ga.	595	42	6	1	18,184	17,888	80	205	18	-	8	5
Fla.	2,313	243	4	8	14,389	19,228	272	301	27	16	27	4
E.S. CENTRAL	476	131	15	-	21,828	23,490	102	583	155	3	25	51
Ky.	78	33	3	-	2,233	2,744	14	67	5	2	11	17
Tenn.	148	26	8	-	8,395	7,183	65	445	142	-	7	25
Ala.	156	50	4	-	5,602	7,954	22	68	8	1	7	9
Miss.	94	22	-	-	5,598	5,609	1	3	-	-	-	-
W.S. CENTRAL	1,743	200	25	1	27,213	30,300	1,474	784	34	86	17	30
Ark.	71	29	3	-	2,996	3,795	149	51	1	3	3	10
La.	300	31	6	-	6,279	5,767	65	117	3	4	5	-
Okla.	71	1	3	-	2,759	2,622	146	100	15	8	4	19
Tex.	1,301	139	13	1	15,179	18,116	1,114	516	15	71	5	1
MOUNTAIN	500	72	10	1	4,822	6,041	1,762	419	65	86	38	4
Mont.	14	2	-	-	44	74	53	31	3	4	1	-
Idaho	9	-	-	-	67	44	37	32	-	-	2	-
Wyo.	6	-	-	-	46	82	75	5	-	-	-	3
Colo.	192	23	2	1	1,291	1,653	241	59	20	14	7	-
N. Mex.	46	9	-	-	481	525	526	89	7	26	1	-
Ariz.	90	19	8	-	1,805	2,337	543	86	11	36	14	-
Utah	48	8	-	-	151	181	131	24	10	6	4	-
Nev.	95	11	-	-	937	1,145	156	93	14	-	9	1
PACIFIC	3,290	342	42	-	21,334	29,397	2,910	1,468	319	217	31	116
Wash.	232	-	4	-	1,812	2,709	279	218	75	11	1	-
Oreg.	94	-	-	-	854	1,108	171	142	53	5	1	-
Calif.	2,876	309	36	-	18,060	24,784	2,373	1,069	180	200	27	116
Alaska	9	8	2	-	319	518	74	15	9	1	-	-
Hawaii	79	25	-	-	289	278	13	24	2	-	2	-
Guam	1	-	-	-	-	111	-	-	-	-	-	-
P.R.	726	117	-	1	280	386	48	189	56	25	-	-
V.I.	4	-	-	-	222	189	-	4	-	-	-	-
Amer. Samoa	-	-	-	-	-	48	-	-	-	-	-	-
C.N.M.I.	-	-	-	-	-	92	-	-	-	-	-	-

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

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending June 1, 1991, and June 2, 1990 (22nd Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1991	1991	Cum. 1991	1991	Cum. 1991	Cum. 1990	Cum. 1991	1991	Cum. 1991	1991	Cum. 1991	Cum. 1990	1991	Cum. 1991	Cum. 1990
UNITED STATES	392	214	5,603	7	88	10,378	1,025	107	2,188	26	871	1,263	24	864	462
NEW ENGLAND	27	2	30	-	10	189	73	1	16	10	155	151	-	2	5
Maine	1	-	-	-	-	27	6	-	-	5	42	4	-	-	-
N.H.	2	-	-	-	-	8	6	-	3	-	12	10	-	1	1
Vt.	1	-	5	-	-	1	10	-	1	-	3	6	-	-	-
Mass.	14	-	9	-	8	5	38	-	-	5	89	122	-	1	-
R.I.	5	-	2	-	-	30	-	-	3	-	-	-	-	-	1
Conn.	4	2	14	-	2	118	13	1	9	-	9	9	-	-	3
MID. ATLANTIC	55	108	3,032	-	2	788	109	6	170	1	83	288	14	454	2
Upstate N.Y.	13	-	2	-	-	258	58	3	65	1	56	230	12	436	1
N.Y. City	17	75	1,250	-	-	128	7	-	-	-	-	-	-	-	-
N.J.	20	-	353	-	1	120	21	-	49	-	1	16	-	-	-
Pa.	5	33	1,427	-	1	282	23	3	56	-	26	42	2	18	1
E.N. CENTRAL	28	-	64	-	6	2,917	143	5	201	2	151	313	-	162	27
Ohio	7	-	-	-	1	210	49	-	46	-	63	56	-	147	-
Ind.	2	-	-	-	1	353	8	-	5	2	36	41	-	1	-
Ill.	9	-	24	-	-	1,191	41	-	77	-	23	116	-	3	16
Mich.	9	-	38	-	-	425	37	5	63	-	19	33	-	11	9
Wis.	1	-	2	-	4	738	8	-	10	-	10	67	-	-	2
W.N. CENTRAL	15	2	24	-	2	486	58	1	67	2	54	43	1	14	5
Minn.	4	2	6	-	2	160	11	-	6	-	16	6	-	5	1
Iowa	3	-	15	-	-	23	4	-	14	1	6	4	1	5	3
Mo.	4	-	-	-	-	67	23	-	18	1	20	27	-	4	-
N. Dak.	1	-	-	-	-	-	1	-	-	-	1	1	-	-	1
S. Dak.	-	-	-	-	-	22	2	-	-	-	1	1	-	-	-
Nebr.	-	-	-	-	-	100	3	-	3	-	4	1	-	-	-
Kans.	3	-	3	-	-	114	14	1	26	-	6	3	-	-	-
S. ATLANTIC	78	39	363	2	15	638	188	46	824	3	67	109	-	10	12
Del.	1	-	21	-	-	11	1	-	3	-	-	2	-	-	-
Md.	25	23	142	-	-	105	20	11	159	-	11	28	-	6	1
D.C.	4	-	-	-	-	15	4	1	20	-	-	13	-	1	1
Va.	12	1	19	-	3	66	16	1	34	1	11	9	-	-	-
W. Va.	1	-	-	-	-	6	8	2	15	-	6	9	-	-	-
N.C.	2	11	30	2†§	2	12	40	24	152	1	12	20	-	-	-
S.C.	5	-	12	-	-	3	22	4	280	-	-	5	-	-	-
Ga.	10	-	10	-	4	19	40	-	19	-	16	13	-	-	-
Fla.	18	4	129	-	6	401	37	3	142	1	11	10	-	3	10
E.S. CENTRAL	6	-	5	-	-	69	77	2	137	-	27	58	-	83	1
Ky.	1	-	-	-	-	4	30	-	-	-	-	-	-	-	-
Tenn.	2	-	5	-	-	30	23	2	115	-	13	28	-	83	1
Ala.	3	-	-	-	-	9	24	-	5	-	14	26	-	-	-
Miss.	-	-	-	-	-	26	-	-	17	-	-	4	-	-	-
W.S. CENTRAL	22	14	26	2	12	1,530	75	7	236	1	21	19	-	1	1
Ark.	3	-	-	-	5	29	14	-	36	1	2	1	-	1	1
La.	4	-	-	-	-	10	19	1	14	-	8	4	-	-	-
Okla.	1	-	-	-	-	141	9	-	6	-	11	14	-	-	-
Tex.	14	14	26	2†§	7	1,350	33	6	180	-	-	-	-	-	-
MOUNTAIN	13	49	499	-	15	476	45	33	178	1	115	106	2	4	61
Mont.	1	-	-	-	-	1	5	-	-	-	-	5	-	-	13
Idaho	1	42	129	-	2	20	7	1	6	-	18	23	2	2	25
Wyo.	-	-	-	-	-	10	1	-	3	-	3	-	-	-	-
Colo.	4	-	1	-	4	70	9	13	67	1	59	49	-	-	3
N. Mex.	1	6	106	-	5	90	6	N	N	-	15	7	-	-	-
Ariz.	5	-	222	-	-	134	13	19	80	-	8	13	-	-	18
Utah	1	1	26	-	4	4	-	-	12	-	10	5	-	-	1
Nev.	-	-	15	-	-	147	4	-	10	-	2	4	-	2	1
PACIFIC	148	-	1,560	3	26	3,285	257	6	359	6	198	176	7	134	348
Wash.	13	-	1	-	3	205	35	1	83	1	52	43	-	-	-
Oreg.	3	-	28	-	12	172	32	N	N	1	29	17	-	1	1
Calif.	128	-	1,529	-	7	2,825	183	5	257	4	86	99	7	131	340
Alaska	-	-	-	-	1	79	6	-	7	-	5	-	-	-	-
Hawaii	4	-	2	3†	3	4	1	-	12	-	26	17	-	2	7
Guam	-	U	-	U	-	1	-	U	-	U	-	-	U	-	-
P.R.	1	7	62	-	1	808	15	-	8	-	14	5	-	1	-
V.I.	-	U	-	U	-	7	-	U	5	U	-	-	-	-	-
Amer. Samoa	-	U	-	U	-	11	-	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 II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending June 1, 1991, and June 2, 1990 (22nd Week)

Reporting Area	Syphilis (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1991	Cum. 1990	Cum. 1991	Cum. 1991	Cum. 1990	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991
UNITED STATES	17,901	20,855	137	8,764	9,079	30	127	73	2,311
NEW ENGLAND	479	798	6	214	201	-	10	2	8
Maine	-	5	3	-	-	-	1	-	-
N.H.	12	37	1	-	3	-	-	-	1
Vt.	1	1	-	3	2	-	-	-	-
Mass.	235	296	2	121	106	-	9	1	-
R.I.	22	6	-	20	30	-	-	-	-
Conn.	209	453	-	70	60	-	-	1	7
MID. ATLANTIC	3,104	4,600	21	2,048	2,140	-	25	-	690
Upstate N.Y.	103	372	11	142	199	-	6	-	261
N.Y. City	1,457	2,033	1	1,264	1,261	-	10	-	-
N.J.	662	724	-	371	364	-	7	-	329
Pa.	882	1,471	9	271	316	-	2	-	100
E.N. CENTRAL	1,930	1,397	25	904	833	1	11	2	41
Ohio	271	236	16	128	120	-	2	2	5
Ind.	55	19	-	58	58	-	-	-	2
Ill.	873	513	4	486	432	-	3	-	8
Mich.	535	457	5	192	191	1	5	-	6
Wis.	196	172	-	40	32	-	1	-	20
W.N. CENTRAL	297	192	29	226	224	7	2	5	328
Minn.	36	43	7	41	39	-	2	-	122
Iowa	25	23	6	30	27	-	-	-	68
Mo.	193	92	7	107	106	7	-	3	6
N. Dak.	-	1	-	2	9	-	-	-	33
S. Dak.	1	1	1	16	6	-	-	-	70
Nebr.	7	6	1	8	13	-	-	-	8
Kans.	35	26	7	22	24	-	-	2	21
S. ATLANTIC	5,407	6,533	13	1,572	1,684	3	22	34	591
Del.	67	77	1	14	23	-	-	-	65
Md.	447	500	-	152	142	-	6	2	219
D.C.	334	409	-	85	63	-	1	-	5
Va.	458	387	3	156	152	-	4	1	123
W. Va.	14	7	-	37	31	-	1	-	28
N.C.	815	775	7	175	203	1	-	20	-
S.C.	648	338	-	168	193	-	-	5	48
Ga.	1,299	1,622	-	290	247	1	4	6	88
Fla.	1,325	2,418	2	495	630	1	6	-	15
E.S. CENTRAL	1,967	1,733	7	659	697	3	1	10	75
Ky.	37	32	3	125	171	1	1	3	19
Tenn.	700	680	3	226	178	2	-	3	18
Ala.	699	556	1	160	222	-	-	4	38
Miss.	531	465	-	148	126	-	-	-	-
W.S. CENTRAL	3,257	3,338	4	962	1,115	11	5	18	329
Ark.	229	226	2	86	110	6	-	1	17
La.	1,046	1,007	-	68	166	-	1	-	4
Okla.	75	100	2	61	86	5	-	17	95
Tex.	1,907	2,005	-	747	753	-	4	-	213
MOUNTAIN	250	389	17	221	190	4	5	1	71
Mont.	2	-	-	-	10	3	-	1	12
Idaho	3	6	-	3	5	-	-	-	1
Wyo.	1	1	-	2	3	1	-	-	43
Colo.	39	26	2	6	6	-	1	-	-
N. Mex.	14	20	5	21	40	-	-	-	1
Ariz.	171	267	4	131	91	-	3	-	12
Utah	4	4	6	25	12	-	-	-	-
Nev.	16	65	-	33	23	-	1	-	2
PACIFIC	1,210	1,875	15	1,958	1,995	1	46	1	178
Wash.	54	207	1	129	117	1	-	-	-
Oreg.	32	63	-	41	51	-	2	1	1
Calif.	1,117	1,584	14	1,679	1,718	-	43	-	173
Alaska	3	7	-	21	21	-	-	-	3
Hawaii	4	14	-	88	88	-	1	-	1
Guam	-	1	-	-	22	-	-	-	-
P.R.	210	153	-	71	43	-	5	-	18
V.I.	52	1	-	1	4	-	-	-	-
Amer. Samoa	-	-	-	-	11	-	-	-	-
C.N.M.I.	-	1	-	-	22	-	-	-	-

U: Unavailable

TABLE III. Deaths in 121 U.S. cities,* week ending June 1, 1991 (22nd Week)

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	≥65	45-64	25-44	1-24	<1	Total
NEW ENGLAND	564	402	94	45	13	10	35
Boston, Mass.	160	101	31	18	5	5	14
Bridgeport, Conn.	32	23	3	4	-	2	-
Cambridge, Mass.	23	16	5	2	-	-	3
Fall River, Mass.	40	35	2	3	-	-	-
Hartford, Conn.	51	33	13	5	-	-	-
Lowell, Mass.	20	14	3	2	1	-	3
Lynn, Mass.	13	10	3	-	-	-	-
New Bedford, Mass.	19	15	2	2	-	-	-
New Haven, Conn.	41	29	7	2	2	1	2
Providence, R.I.	34	27	5	1	1	-	4
Somerville, Mass.	7	5	2	-	-	-	-
Springfield, Mass.	39	30	4	3	2	-	2
Waterbury, Conn.	30	22	5	3	-	-	3
Worcester, Mass.	55	42	9	-	2	2	4
MID. ATLANTIC	2,176	1,404	409	225	73	65	106
Albany, N.Y.	43	32	5	1	4	1	2
Allentown, Pa.	30	21	4	2	3	-	2
Buffalo, N.Y.	94	61	23	5	2	3	4
Camden, N.J.	27	14	6	4	-	3	-
Elizabeth, N.J.	30	22	4	3	-	1	-
Erie, Pa.†	34	29	3	2	-	-	2
Jersey City, N.J.	41	25	7	4	2	3	1
New York City, N.Y.	1,152	709	209	157	43	34	43
Newark, N.J.§	U	U	U	U	U	U	U
Paterson, N.J.	21	15	3	2	1	-	-
Philadelphia, Pa.	303	201	62	20	6	14	26
Pittsburgh, Pa.†	57	37	13	4	3	-	3
Reading, Pa.	37	26	8	1	1	1	4
Rochester, N.Y.	104	69	26	5	3	1	7
Schenectady, N.Y.	29	21	5	3	-	-	4
Scranton, Pa.†	34	30	3	1	-	-	2
Syracuse, N.Y.	74	44	15	7	5	3	3
Trenton, N.J.	27	17	7	2	-	1	1
Utica, N.Y.	20	17	3	-	-	-	1
Yonkers, N.Y.	19	14	3	2	-	-	1
E.N. CENTRAL	1,812	1,108	363	169	98	74	78
Akron, Ohio	56	40	11	3	1	1	-
Canton, Ohio	30	26	2	2	-	-	1
Chicago, Ill.	373	155	80	69	53	16	9
Cincinnati, Ohio	118	80	24	8	4	2	12
Cleveland, Ohio	129	80	29	7	3	10	5
Columbus, Ohio	141	89	28	15	4	5	6
Dayton, Ohio	108	74	20	9	3	2	5
Detroit, Mich.	189	97	41	25	12	14	3
Evansville, Ind.	30	21	7	1	-	1	2
Fort Wayne, Ind.	57	40	11	2	2	2	2
Gary, Ind.	15	8	3	4	-	-	-
Grand Rapids, Mich.	59	41	14	2	1	1	3
Indianapolis, Ind.	119	73	25	6	5	10	7
Madison, Wis.	35	20	9	2	3	1	3
Milwaukee, Wis.	109	85	19	4	1	-	13
Peoria, Ill.	45	35	4	2	2	2	1
Rockford, Ill.	48	36	8	1	1	2	-
South Bend, Ind.	39	27	8	2	1	1	3
Toledo, Ohio	112	81	20	5	2	4	3
Youngstown, Ohio§	U	U	U	U	U	U	U
W.N. CENTRAL	639	454	101	44	21	18	31
Des Moines, Iowa	75	55	10	4	4	2	5
Duluth, Minn.	21	14	6	1	-	-	1
Kansas City, Kans.	33	26	3	4	-	-	-
Kansas City, Mo.	92	63	15	6	4	4	7
Lincoln, Nebr.	12	11	1	-	-	-	-
Minneapolis, Minn.	143	98	23	15	3	4	4
Omaha, Nebr.	73	49	16	5	2	1	1
St. Louis, Mo.	103	70	19	5	3	6	3
St. Paul, Minn.	33	27	2	1	3	-	8
S. ATLANTIC	1,173	678	281	130	48	36	45
Atlanta, Ga.	152	82	44	18	4	4	2
Baltimore, Md.	173	96	46	22	3	6	13
Charlotte, N.C.	121	65	33	11	9	3	1
Jacksonville, Fla.	121	76	29	9	5	2	5
Miami, Fla.	90	49	20	16	3	2	-
Norfolk, Va.	44	21	15	5	-	3	-
Richmond, Va.	78	43	23	5	2	5	2
Savannah, Ga.	60	45	6	6	3	-	5
St. Petersburg, Fla.	56	41	8	3	2	2	-
Tampa, Fla.	126	90	22	9	5	-	15
Washington, D.C.	129	53	31	24	12	9	2
Wilmington, Del.	23	17	4	2	-	-	-
E.S. CENTRAL	728	466	142	73	29	18	49
Birmingham, Ala.	109	73	17	13	2	4	6
Chattanooga, Tenn.	62	44	13	2	2	1	4
Knoxville, Tenn.	79	37	21	14	5	2	9
Louisville, Ky.	77	50	14	12	1	-	2
Memphis, Tenn.	165	111	25	16	10	3	14
Mobile, Ala.	101	57	25	8	6	5	4
Montgomery, Ala.	34	24	8	1	1	-	-
Nashville, Tenn.	101	70	19	7	2	3	10
W.S. CENTRAL	1,196	695	257	143	58	43	75
Austin, Tex.	67	41	12	9	1	4	8
Baton Rouge, La.	17	4	6	3	-	4	-
Corpus Christi, Tex.	53	40	4	4	2	3	4
Dallas, Tex.	167	95	34	21	10	7	4
El Paso, Tex.	64	45	12	5	2	-	9
Ft. Worth, Tex.	96	51	26	6	7	6	4
Houston, Tex.	333	166	83	52	24	8	23
Little Rock, Ark.	57	34	16	5	-	2	3
New Orleans, La.	95	46	20	18	7	4	-
San Antonio, Tex.	150	102	28	14	4	2	10
Shreveport, La.	30	21	5	3	-	1	4
Tulsa, Okla.	67	50	11	3	1	2	6
MOUNTAIN	629	427	107	55	18	22	32
Albuquerque, N.M.	67	52	4	8	2	1	3
Colo. Springs, Colo.	50	38	7	3	2	-	2
Denver, Colo.	79	48	15	11	1	4	8
Las Vegas, Nev.	96	60	23	7	1	5	4
Ogden, Utah	22	15	3	3	-	1	3
Phoenix, Ariz.	138	91	23	14	5	5	2
Pueblo, Colo.	23	20	2	-	-	1	1
Salt Lake City, Utah	40	24	8	2	4	2	2
Tucson, Ariz.	114	79	22	7	3	3	7
PACIFIC	1,634	1,066	298	183	46	34	92
Berkeley, Calif.	18	7	8	3	-	-	1
Fresno, Calif.	36	25	8	1	2	-	6
Glendale, Calif.	18	12	4	1	1	-	1
Honolulu, Hawaii	78	52	13	9	2	2	8
Long Beach, Calif.	85	50	15	11	3	6	4
Los Angeles, Calif.	432	273	79	54	16	5	12
Oakland, Calif.§	U	U	U	U	U	U	U
Pasadena, Calif.	25	17	2	6	-	-	-
Portland, Oreg.	113	78	18	11	2	4	2
Sacramento, Calif.	130	92	24	10	2	2	10
San Diego, Calif.	119	81	12	21	2	1	13
San Francisco, Calif.	144	91	25	23	3	2	2
San Jose, Calif.	145	91	33	12	4	5	14
Seattle, Wash.	171	111	35	15	6	4	6
Spokane, Wash.	50	34	11	2	1	2	5
Tacoma, Wash.	70	52	11	4	2	1	8
TOTAL	10,551††	6,700	2,052	1,067	404	320	543

*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.

§Report for this week is unavailable (U).

AIDS — Continued

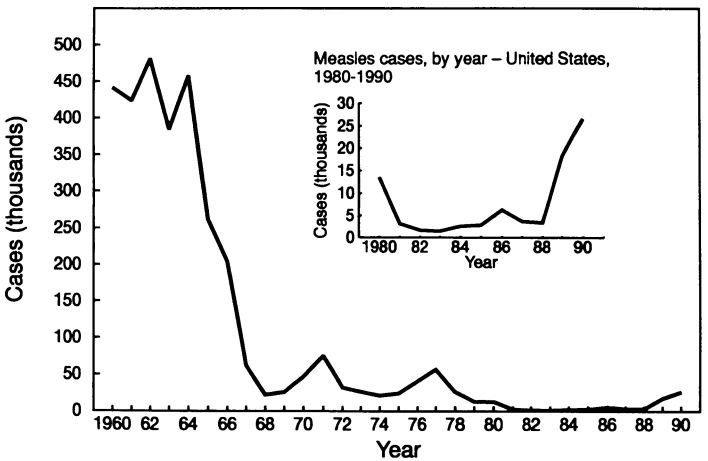
References
1. CDC. *Pneumocystis* pneumonia–Los Angeles. MMWR 1981;30:250–2.
2. CDC. Mortality attributable to HIV infection/AIDS—United States, 1981–1990. MMWR 1991; 40:41–4.
3. CDC. National HIV seroprevalence surveys, summary of results, data from serosurveillance activities through 1989. Atlanta: US Department of Health and Human Services, Public Health Service, CDC, September 1990.
4. Gardner LI, Brundage JF, Burke DS, et al. Evidence for spread of the human immunodeficiency virus into low prevalence areas of the United States. J Acquir Immune Defic Syndr 1989;2:521–32.
5. CDC. Update: acquired immunodeficiency syndrome associated with intravenous-drug use—United States, 1988. MMWR 1989;38:165–70.
6. Rosenberg PS, Gail MH, Schrager LK, et al. National AIDS incidence trends and the extent of zidovudine therapy in selected demographic and transmission groups. J Acquir Immune Defic Syndr 1991;4:392–401.

Measles — United States, 1990

As of May 10, 1991, local and state health departments reported a provisional total of 27,672* measles cases in the United States for 1990—a 52.1% increase over the 18,193 cases reported for 1989 (*1*) (Figure 1)—and 89 suspected measles-associated deaths. Cases were reported from 49 states and the District of Columbia. The overall incidence rate in 1990 was 11.1 cases per 100,000 population. This report summarizes epidemiologic features of measles cases reported for 1990 and compares findings with cases reported for 1989.

*As of December 31, 1990, a total of 26,520 cases had been officially reported to CDC. Through May 10, 1991, CDC's Division of Immunization, Center for Prevention Services, had received reports of 1152 additional cases reported to have occurred in 1990, for a provisional total of 27,672 cases. The final total may differ slightly.

FIGURE 1. Measles cases, by year — United States, 1960–1990*



*1990 provisional data

Measles — Continued

Characteristics

In 1990, children <5 years of age accounted for 48.1% of measles cases, compared with 36.6% of cases in 1989 (Table 1). Persons ≥20 years of age accounted for 22.5% of all reported cases in 1990, compared with 17.0% in 1989.

Estimated incidence rates were higher in 1990 than in 1989 for all age groups, except 15- to 19-year-olds. The largest increases in incidence rates were among children <1 year of age (137.6%) and adults ≥25 years of age (130.0%). The highest incidence rates were among children aged <1 year (119.3 per 100,000) and 1–4 years (58.3 per 100,000).

Information on race/ethnicity was available for 11,083 (40.1%) cases reported from 34 states and the District of Columbia (no race/ethnicity information was available for cases reported from the other 15 states, including California). Of these, 6192 (55.9%) occurred among non-Hispanic whites; 2472 (22.3%), non-Hispanic blacks; 2082 (18.8%), Hispanics; and 337 (3.0%), other racial or ethnic groups. Incidence rates were highest for Hispanics (29.5 cases per 100,000 population) and blacks (12.3 per 100,000) and lowest for non-Hispanic whites (5.2 per 100,000).

Importations from other countries accounted for 377 (1.4%) cases; an additional 188 (0.7%) cases were epidemiologically linked within two generations of transmission to imported cases. Of the 377 cases, 249 (66.0%) were acquired in Mexico, and 95 (25.2%) in other Central American, South American, or Caribbean countries.

Outbreaks

A total of 240 outbreaks, involving from five to 7514 persons, accounted for 87.0% of the cases. Outbreaks affecting predominantly preschool-aged children involved 19,827 (71.7%) cases; school-aged persons, 2842 (10.3%) cases; and postschool-aged persons, 1376 (5.0%) cases. The largest outbreaks involved predominantly preschool-aged children and occurred in Los Angeles (7514 cases); Dallas (2331); New York City (1108); San Diego (1049); and Bakersfield/Kern County, California (1011). These outbreaks accounted for 47.0% of all cases reported for 1990.

Vaccination Status

Vaccination status was known for 27,632 (99.9%) patients. Of these, 5100 (18.4%) were known to have been vaccinated on or after their first birthday (Table 2); approximately 71.4% of these persons were 5–19 years of age. Of the 22,532 (81.4%) persons who were unvaccinated or inadequately vaccinated (i.e., vaccinated before

TABLE 1. Age distribution and estimated incidence rates* of measles — United States, 1989 and 1990†

	1989			1990			
Age group (yrs)	No.	(%)	Rate	No.	(%)	Rate	% rate change
<1	1,982	(10.9)	50.2	4,706	(17.0)	119.3	+137.6
1–4	4,668	(25.7)	31.5	8,617	(31.1)	58.2	+84.8
5–9	1,757	(9.7)	9.6	2,657	(9.6)	14.6	+52.1
10–14	2,208	(12.1)	13.0	2,263	(8.2)	13.4	+ 3.1
15–19	4,403	(24.2)	24.7	3,128	(11.3)	17.6	−28.7
20–24	1,578	(8.7)	8.4	2,539	(9.2)	13.6	+61.9
≥25	1,511	(8.3)	1.0	3,668	(13.3)	2.3	+130.0
Unknown	86	(0.5)	—	94	(0.3)	—	
Total	**18,193**	**(100.0)**	**7.3**	**27,672**	**(100.0)**	**11.1**	**+52.1**

*Cases per 100,000 population.
†1990 provisional data.

Measles — Continued

their first birthday), routine vaccination was indicated for 12,268 (54.4% [44.3% of total†]). Almost 40% of these vaccine-eligible persons were children 16 months to 4 years of age. Measles occurred in 8698 (31.4% of total) persons for whom routine vaccination was not indicated, of whom 7257 (83.4%) were children <16 months of age. Of the 1566 persons (5.7% of total) who were unvaccinated for other reasons, 1424 (90.9%) were persons with religious or philosophic exemption to vaccination.

Complications of Measles

Complications were reported in 6274 (22.7%) cases, including diarrhea in 2606 (9.4%), otitis media in 1829 (6.6%), pneumonia in 1803 (6.5%), and encephalitis in 36 (0.1%). Hospitalization was reported for 5844 (21.1%) persons.

Deaths

A provisional total of 89 measles-associated deaths were reported, for a death-to-case ratio of 3.2 deaths per 1000 reported cases. Deaths were reported from 15 states. Forty-nine (55.1%) deaths occurred among children <5 years of age, including 15 (16.9%) children <12 months of age and 13 (14.6%) children 5–19 years of age. The other 27 (30.3%) deaths occurred among adults ≥20 years of age. Eighty-one (91.0%) suspected measles-associated deaths occurred among unvaccinated persons.

Reported by: Div of Immunization, Center for Prevention Svcs, CDC.

Editorial Note: The provisional total of 27,672 measles cases reported in 1990 is the largest number reported since 1977. Cases were reported from every state except North Dakota; however, 61% of all cases were reported by two states, California (12,479 cases) and Texas (4403 cases).

†Unvaccinated persons ≥16 months of age without medical contraindications or religious exemption to vaccination. This represents a minimal estimate, because the Immunization Practices Advisory Committee (ACIP) recommends that the routine age for the first dose of measles vaccine be lowered from 15 months to 12 months in areas with high risk for measles among preschool-aged children (*2*).

TABLE 2. Classification of measles cases — United States, 1990*

Classification	No.	% of total
Unvaccinated	**22,532**	**81.4**
Vaccine indicated	12,268	44.3
Vaccine not routinely indicated	8,698	31.4
Persons <16 mos. of age	7,257	26.2
Persons born before 1957	1,160	4.2
Laboratory immunity/physician diagnosis	14	<0.1
Medical exemption	267	1.0
Other	1,566	5.7
Non-U.S. citizen	142	0.5
Religious/philosophic exemption	1,424	5.1
Appropriately vaccinated†	**5,100**	**18.4**
Subtotal	**27,632**	**99.9**
Unknown	**40**	**0.1**
Total	**27,672**	**100.0**

*Provisional data.
†Vaccinated with live measles vaccine on or after the first birthday.

Measles — Continued

In addition to increases in the United States, increases in the occurrence of measles during 1989–1990 were reported by many other countries of the Western Hemisphere, including Canada, El Salvador, Guatemala, Honduras, Jamaica, Mexico, and Nicaragua. Although the cause of this hemispherewide trend in measles activity is unknown, it has increased the likelihood that measles will be imported into and exported from the United States.

The change in age distribution of measles patients noted in 1989 (*3*) continued in 1990. For the first time since detailed information on the ages of reported patients became available in 1973, the proportion of cases among children <5 years of age in 1990 exceeded the proportion among school-aged children.

The 89 deaths in 1990 are the largest number reported in a single year since 1971 (90 deaths and 75,290 reported cases) and the highest death-to-case ratio documented in the past 30 years. Although the reasons for these increases have not yet been defined, probable contributing factors include underreporting of less severe cases (particularly from areas experiencing large outbreaks) and the shift of the predominant age of reported cases to children <5 years and persons ≥20 years (groups at higher risk for complications) (*4*).

Failure to vaccinate children at the appropriate age was the major factor contributing to the resurgence of measles in the United States in 1989–1990 (National Vaccine Advisory Committee, unpublished data, 1991). Surveys in areas experiencing measles outbreaks indicate that as few as 50% of children have been vaccinated against measles by their second birthday (*5*), and that black and Hispanic children are less likely to be age-appropriately vaccinated than are white children (*6*).

Prevention of measles outbreaks among preschool-aged children will require intensive efforts to increase age-appropriate vaccination levels among inner-city preschool-aged children. Strategies that should improve immunization levels include: 1) reducing barriers to vaccination (e.g., increasing the number of clinic hours when vaccines are given and the availability of walk-in vaccination services); 2) taking advantage of all opportunities to vaccinate (e.g., simultaneous use of multiple vaccines whenever possible, and excluding from vaccination only persons with valid contraindications); 3) using innovative vaccine delivery techniques, such as vaccination in hospital emergency departments; and 4) increasing the number of children who return for vaccination at the appropriate age by improving follow-up and recall systems. CDC is supporting demonstration projects to examine the feasibility of assessing immunization status and facilitating vaccination of children participating in entitlement programs (e.g., Women, Infants, and Children program and Aid to Families with Dependent Children).

References

1. CDC. Summary of notifiable diseases, United States, 1989. MMWR 1989;38(54).
2. ACIP. Measles prevention: recommendations of the Immunization Practices Advisory Committee (ACIP). MMWR 1989;38(no. S-9).
3. CDC. Measles—United States, 1989, and first 20 weeks 1990. MMWR 1990;39:353–5,361–3.
4. Atkinson WL, Markowitz LE. Measles and measles vaccine. Seminars in Pediatric Infectious Diseases 1991;2:100–7.
5. CDC. Measles vaccination levels among selected groups of preschool-aged children—United States. MMWR 1991;40:36–9.
6. CDC. Update: measles outbreak—Chicago, 1989. MMWR 1990;39:317–9,325–6.

Epidemiologic Notes and Reports

Tuberculosis Transmission Along the U.S.-Mexican Border — 1990

In April 1990, a physician in Mexico diagnosed miliary tuberculosis (TB) in a 6-month-old girl (patient 1) and referred the child for therapy at a health center in Ciudad Juarez, Chihuahua. After the child received treatment for 1 month with isoniazid (INH), rifampin (RIF), and streptomycin, her parents sought health care for her in the United States. When evaluated at the El Paso City-County Health District Tuberculosis Clinic, she had a 4-week history of fevers, cough, and weight loss; examination revealed a low-grade fever (99.8 F [37.7 C]) and a diffuse miliary infiltrate of the lungs on the chest radiograph. A Mantoux tuberculin skin test was positive (10 mm of induration). Multiple gastric aspirate smears for acid-fast bacilli (AFB) were negative; however, cultures were positive for *Mycobacterium tuberculosis*, which was susceptible to all drugs tested. The patient improved on continued therapy with INH, RIF, and streptomycin.

Investigation of contacts of patient 1 revealed that her 13-year-old aunt (patient 2), who lived in the same household, had been diagnosed with TB in March 1990 and was being treated at a health center in Ciudad Juarez. A chest radiograph of patient 2 showed extensive cavitary infiltrates in the upper lobes of both lungs. A Mantoux tuberculin skin test with 5 tuberculin units (TU) was positive (12 mm of induration). Although multiple sputum specimens collected in May were AFB smear negative, one culture was positive for *M. tuberculosis*. Treatment included INH, RIF, and pyrazinamide (PZA).

Investigation of contacts of patient 1 also identified TB in her 21-year-old aunt (patient 3) who was living in the same household. Patient 3 had had fever, cough, and left pleuritic chest pain for 3 weeks (from April 21 through May 14); a chest radiograph revealed free fluid in the left hemithorax. A 5 TU Mantoux tuberculin skin test was positive (21 mm of induration). Even though multiple sputum specimens were negative on smear and culture, patient 3 improved on therapy with INH, RIF, and PZA.

Nine other members of the extended family of the three patients lived in households in the same small apartment complex; each of these persons had reactions of at least 15 mm induration to a tuberculin skin test. Although none had evidence of current active disease, all were placed on INH preventive therapy.

Public health officials in the United States determined that the only contacts of patient 1 who resided in the United States were her parents. In both parents, skin testing induced reactions of >15 mm induration; however findings were normal on both chest radiograph and physical examination. Both parents were placed on INH preventive therapy. The only contact of patient 3 who resided in the United States was a young adult male; his tuberculin skin test was negative.

The health department also skin tested 12 other family members who did not reside in the same apartment complex as the three case-patients. Although two had skin test reactions of >10 mm of induration, neither had evidence of disease. They were placed on INH preventive therapy. Repeat skin testing of those who had not been reactive during the previous 3 months did not identify additional reactors.

During the 4-month period that preceded initiation of treatment of patient 2, she had attended a school in Ciudad Juarez, usually remaining the entire day in one classroom with 40 other students and two staff members. Of these contacts, skin

Tuberculosis — Continued

testing was positive (≥10 mm induration) in 12 (28.6%) persons, including 10 students and the two faculty members. Each of the students had a scar suggestive of previous BCG vaccination in the right deltoid area. None of the staff had evidence of current TB disease. Students with ≥5 mm induration were referred to private physicians and the public clinic in Ciudad Juarez for follow-up.

Reported by: JA Perez Rubalcaba, MD, Ciudad Juarez, Chihuahua, Mexico. MA Escobedo, MD, L Nickey, MD, El Paso City-County Health District; D Simpson, MD, M Kelley, MD, Bur of Disease Control and Epidemiology, Texas Dept of Health. HH Ortega, MD, Pan American Health Organization Field Office, El Paso, Texas. Div of Tuberculosis Elimination, Center for Prevention Svcs, CDC.

Editorial Note: The findings described in this report underscore four concerns regarding TB in children and the elimination of TB in the United States. First, the occurrence of TB or tuberculous infection in infants or young children has particularly untoward ramifications: children who are untreated or inadequately treated are at increased risk for serious complications (e.g., miliary disease or tuberculous meningitis) (*1*). TB or tuberculous infection in infants or young children is also a priori evidence of recent transmission of infection and strongly suggests infectious TB in a community member who requires treatment. The detection of tuberculous infection in an infant or young child should immediately prompt health-care providers and public health officials to initiate appropriate therapy for the patient and conduct a contact investigation to identify a source case and any other infected persons.

Second, the identification of an infectious source case with close contacts who are young children should prompt an immediate contact investigation. In this report, patient 2 was the probable source of infection for patient 1. Patient 2 had been symptomatic for several months before the onset of illness in patient 1; had had cavitary pulmonary disease; and, after 3 months of therapy, had sputum cultures that remained positive.

Third, this report illustrates the importance of conducting TB contact investigations in "concentric circles"—the practice of first examining higher risk contacts, then continuing to examine lower risk contacts until the prevalence of infection approximates that in a demographically similar population not recently exposed to infectious TB (*3*). In this investigation, the high prevalence of infection among household members required a more extensive investigation in the community. The extensive use of BCG vaccination complicated the interpretation of tuberculin skin tests among school classmates of patient 2, since tuberculin reactions due to BCG vaccination cannot be reliably distinguished from those caused by *M. tuberculosis* infection (*4*). However, because patient 2 was clearly infectious, reactions of ≥5 mm among her classmates were considered as positive and an indication for both further examination and consideration for INH preventive therapy (*5*).

Fourth, this report illustrates the importance of the cooperative efforts required to prevent and control TB in a border area, such as metropolitan El Paso/Ciudad Juarez. To effectively control this problem, the health departments in El Paso and Ciudad Juarez cooperated extensively in the contact investigation.

To foster further cooperative planning and intervention efforts, CDC is assisting the Texas Department of Health in establishing a TB control demonstration project in metropolitan El Paso/Cuidad Juarez. The project may serve as a model for other border communities.

Tuberculosis — Continued

References

1. Abernathy RS. Tuberculosis in children: still a public health threat. Journal of Respiratory Diseases 1987;(Feb):67–87.
2. Wallgren A. The time-table of tuberculosis. Tubercle 1948;29:245–51.
3. American Thoracic Society/CDC. Control of tuberculosis. Am Rev Respir Dis 1983;128:336–42.
4. Snider DE Jr. Bacille Calmette-Guérin vaccinations and tuberculin tests. JAMA 1985;253: 3438–9.
5. CDC. The use of preventive therapy for tuberculous infection in the United States: recommendations of the Advisory Committee for the Elimination of Tuberculosis. MMWR 1990; 39:(no. RR-8)9–12.

Notice to Readers

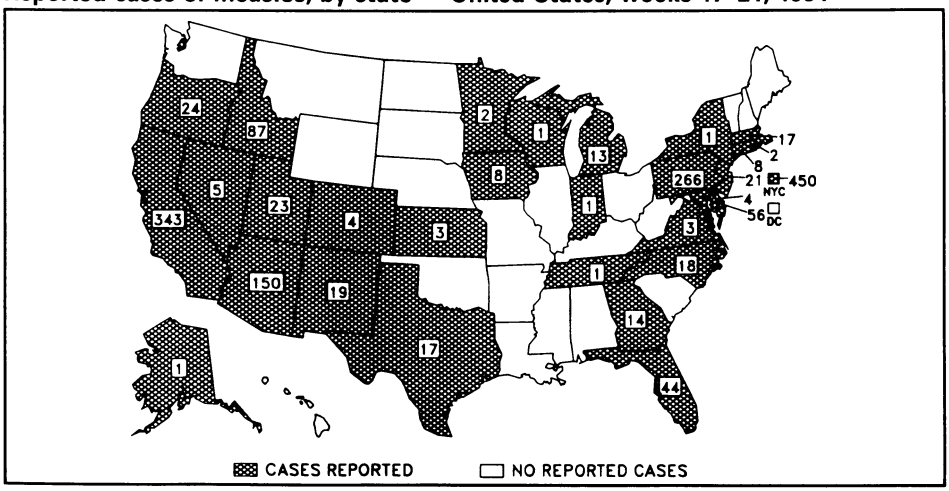
Sixth National Conference on Chronic Disease Prevention and Control

CDC, the Association of State and Territorial Health Officials, and the Association of State and Territorial Chronic Disease Program Directors will cosponsor the Sixth National Conference on Chronic Disease Prevention and Control, "Making Prevention a Reality," October 22–24, 1991, in Washington, D.C.

The conference will emphasize interactions among federal, state, and local health departments; voluntary health agencies; and professional organizations. Topics will include legislative issues in chronic disease prevention; action for achieving the national health objectives for the year 2000; epidemiology; women's health issues; breast and cervical cancer control; behavioral research; academic and public health agency linkages; and state experiences in community-based heart disease prevention. Two workshops will address techniques for working with legislatures and working with the media. Abstracts are being solicited for oral presentations and poster sessions.

The deadline for abstracts is June 21, 1991. Additional information is available from the Center for Chronic Disease Prevention and Health Promotion, Mailstop K-43, CDC, Atlanta, GA 30333; telephone (404) 488-5390 or FTS 236-5390; FAX (404) 488-5962.

Reported cases of measles, by state — United States, weeks 17–21, 1991



The *Morbidity and Mortality Weekly Report* is prepared by the Centers for Disease Control, Atlanta, Georgia, and is available on a paid subscription basis from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, (202) 783-3238.

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. Accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials, as well as matters pertaining to editorial or other textual considerations should be addressed to: Editor, *Morbidity and Mortality Weekly Report*, Mailstop C-08, Centers for Disease Control, Atlanta, Georgia 30333; telephone (404) 332-4555.

☆U.S. Government Printing Office: 1991-531-130/42009 Region IV

HHS Publication No. (CDC) 91-8017