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Current Trends

Arbovirus Disease — United States, 1993

During 1993, health departments from 20 states reported 78 cases of arboviral encephalitis to CDC. Of these, 55 (71%) were California encephalitis (CE). This report summarizes information about arboviral encephalitis in the United States during 1993.

California Encephalitis

During 1993, a total of 55 human CE cases were reported from 11 states, including Florida (one), Illinois (two), Indiana (two), Iowa (six), Minnesota (three), Mississippi (one fatal), Missouri (one fatal), North Carolina (three), Ohio (six), West Virginia (13), and Wisconsin (17). Patients ranged in age from 5 months to 22 years (mean: 7 years).

The Mississippi case occurred in a 5-year-old child from George County. Immunoglobulin M (IgM) antibody to several California (CAL) serogroup viruses was detected in serum and cerebrospinal fluid (CSF); neutralizing antibody against the same CAL serogroup viruses was detected in the serum but not in the CSF. The Mississippi State Health Department obtained blood samples from three family members and four neighbors of the child. Neutralizing antibody was detected in serum from four persons; in three persons, antibody titers to Jamestown Canyon virus were at least fourfold higher than other CAL serogroup viruses.

The Missouri case occurred in a 4-year-old resident of Stone County; La Crosse virus was recovered from brain tissue. The case in Florida was diagnosed by detection of IgM antibody titers to several CAL serogroup antigens in serum obtained 2 days after onset of illness and by positive IgM titers to multiple CAL group antigens in a convalescent-stage serum sample. Cases from other states were diagnosed as La Crosse virus infections.

St. Louis Encephalitis

During 1993, a total of 18 human cases of St. Louis encephalitis (SLE) were reported from five states. Five cases were reported in the Texas gulf coast area in two foci: two cases occurred in contiguous Galveston and Brazoria counties, and three occurred in Nueces County. North of the coastal area, single cases were reported from Harris County (Houston) and Denton County, north of Dallas-Fort Worth. Patients ranged in age from 19 to 84 years (mean: 40 years).

Arbovirus Disease — Continued

In Florida, two cases were reported from Lee County and three from contiguous Collier County. Patients ranged in age from 21 to 54 years. Three cases were reported in California, including two from San Bernardino County and one from Imperial County. Patients ranged in age from 19 to 64 years. In Colorado, one case was reported in an 11-year-old child in Arapahoe County. In Illinois, one case (in a person aged 33 years) was reported from Whiteside County and one from Cook County (in a person aged 69 years).

Eastern Equine Encephalomyelitis

During 1993, a total of five human cases of eastern equine encephalomyelitis (EEE) were reported from four states. Two cases—including one fatal—occurred in Michigan in persons aged 73 and 60 years. One case each was reported in George County, Mississippi (in a person aged 14 years), and Holmes County, Florida (in a person aged 23 years). A fatal case in Rhode Island occurred in a 14-year-old exposed during a recreational outing. Blood samples were obtained from 16 other participants in the outing; EEE IgM antibody was detected in one person who reported no recent illness.

Western Equine Encephalomyelitis and EEE in Domestic Animals

During 1993, 13 western equine encephalomyelitis (WEE) cases among horses were reported from 10 states: Arizona (three), Nebraska (two), and one each in California, Colorado, Idaho, North Dakota, Oklahoma, Oregon, Utah, and Wisconsin. WEE virus was isolated from a turkey in Merced County and from emus in Placer and Yuba counties, California, and from an emu in Arkansas.

A total of 88 EEE cases among horses were reported from 10 states: Florida (67 cases); South Carolina (four cases); three cases each from Georgia, Maryland, Michigan, and Virginia; Mississippi (two cases); and one case each from Indiana, Louisiana, and North Carolina. EEE was isolated from other species in Georgia (dog, chukar, quail, and emu), Maryland (pheasant), Mississippi (emu), North Carolina (emu), and South Carolina (emu).

Enzootic Arbovirus Activity

During 1993, enzootic arbovirus activity was reported from 15 states, including CE in Arizona, New York, and Texas; SLE in Arizona, California, Texas, Illinois, and Ohio; EEE in Alabama, Delaware, Massachusetts, Maryland, New Jersey, New York, and Rhode Island; and WEE in Arizona, California, Colorado, South Dakota, and Utah. Documented arbovirus activity was high in the Sacramento Valley in California based on isolates of WEE virus from *Culex tarsalis* mosquitoes and serologic conversions in sentinel chicken flocks; however, no cases were reported in humans or domestic animals.

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Arbovirus Disease — Continued

Editorial Note: In 1993, 19 states conducted arbovirus surveillance using virus isolation or antigen detection in mosquitoes and/or serologic assays in wild or sentinel birds. In collaboration with CDC, in 1993, six additional states initiated surveillance in response to the potential for increased mosquitoborne disease associated with flooding in the midwestern United States. These surveillance programs provide current information on arbovirus transmission and assist in characterizing levels of enzootic/epizootic activity associated with the risk of human disease.

The CE case in southeastern Mississippi in 1993 was the first reported from the state since 1967. In Missouri, where the other fatal CE case occurred, 12 CE cases have been reported since data collection began in 1963. The CE case in Florida was the first reported from that state since 1963 (*1*). Previous serosurveys have documented widespread infection with CAL serogroup viruses in the United States. However, because of the limited availability of serologic testing for infection with multiple CAL serogroup viruses, illness associated with CAL serogroup viruses may be underdiagnosed.

Although the pathogenic arboviruses in the continental United States usually cause sporadic disease in humans and/or domestic animals, they can cause severe epidemics and epizootics. Surveillance and identification of early seasonal enzootic transmission is important in detecting and controlling arbovirus outbreaks and reducing the risk for human disease through vector control and modification of human activity patterns.

Health-care providers should consider arboviruses in the differential diagnosis of all cases of aseptic meningitis and viral encephalitis, obtain appropriate specimens for serologic testing, and promptly report cases to state health departments. New rapid diagnostic assays that detect both virus-infected mosquitoes and human antiviral IgM antibodies have facilitated confirmation of virus activity.

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International Notes

Progress Toward Poliomyelitis Eradication — Socialist Republic of Vietnam, 1991–1993

In 1988, the World Health Organization (WHO) established the goal of global eradication of poliomyelitis by the year 2000 (*1*), and the Western Pacific Region (WPR) of WHO established the goal of regional eradication by 1995 (*2*). In 1990, the Socialist Republic of Vietnam (1993 population: 70.9 million; approximately 2 million births annually) endorsed this regional goal and enacted a National Plan of Action for eradication. This plan comprises three main strategies: 1) maintenance of high coverage with three doses of oral poliovirus vaccine (OPV) through routine vaccination; 2) supplemental vaccination with OPV, including National Immunization Days (NIDs) and outbreak-response vaccination; and 3) surveillance of acute flaccid paralysis (AFP) cases. This report summarizes the polio eradication effort in Vietnam during 1991–1993.

Poliomyelitis Eradication — Continued

Vaccination coverage of children aged <1 year who received three doses of OPV was 88.6% in 1992 and 90.1% in 1993, based on routine monthly reports of doses administered. These monthly reports may have overestimated true coverage because vaccination coverage surveys in April 1992 in six of 53 provinces (Dac Lac, Hanoi, Kien Giang, Nghe An, Quang Binh, and Song Be) estimated that coverage with three doses of OPV was 0–16% lower than reported by the doses-administered method.

During October–November 1991, supplemental OPV activities in selected areas of Vietnam resulted in the vaccination of 375,000 children aged <3 years in Hanoi and Ho Chi Minh City with two doses each of OPV. During October–November 1992, 1.25 million children aged <3 years received one dose of OPV in each of two separate vaccination rounds during Provincial Immunization Days in Hanoi, Ho Chi Minh City, and six provinces (Binh Dinh, Can Tho, Dong Nai, Hai Hung, Nam Ha, and Tien Giang). The first NIDs were conducted during November–December 1993 and enabled administration of two doses of OPV to 9.7 million children (85%–90% of vaccinated children were aged <5 years) (Figure 1); estimated coverage of children aged <5 years was 83%–88%. Vaccines were delivered from fixed sites or by outreach teams. In addition to OPV, all children aged 6–59 months received one dose of vitamin A; 202,000 children aged 9–23 months in selected areas received measles vaccine; and 1.1 million women of childbearing age each received two doses of tetanus toxoid.

The NIDs involved participation of 200,000 volunteers in 10,000 communes, 30,000 health workers, national political leaders, local governments, community organizations, religious leaders, medical staff, police officers, military personnel, and teachers. In the 1–2 weeks before the NIDs, lists of eligible children were compiled in most provinces and letters of appointment issued to parents during house-to-house visits by health workers. The NIDs were preceded by intensive mass media publicity, including daily national and local television and radio broadcasts, newspaper reports, posters, and loudspeaker announcements. The central and provincial governments contributed approximately $1.2 million for campaign activities. Vaccines were supplied by Rotary International, the United Nations Children's Fund, the Australian International Development Assistance Bureau, the Japan International Cooperation Agency, the Canadian International Development Agency, SmithKline Beecham Biologicals* (Rixensart, Belgium), and Pasteur-Merieux Serums and Vaccines (Lyon, France).

In 1992, 677 cases of AFP were reported in 42 (79%) of 53 provinces and in 184 (33%) of 552 districts; 557 cases were confirmed as polio based on standard WHO criteria. In 1993, the number of reported cases of AFP decreased to 641; of these, 425 were confirmed as polio (including 75 by type 1 wild poliovirus isolation) (provisional data). During 1993, there was no characteristic summertime seasonal increase in confirmed polio cases in the six provinces where 1992 Provincial Immunization Days were conducted (Figure 2).

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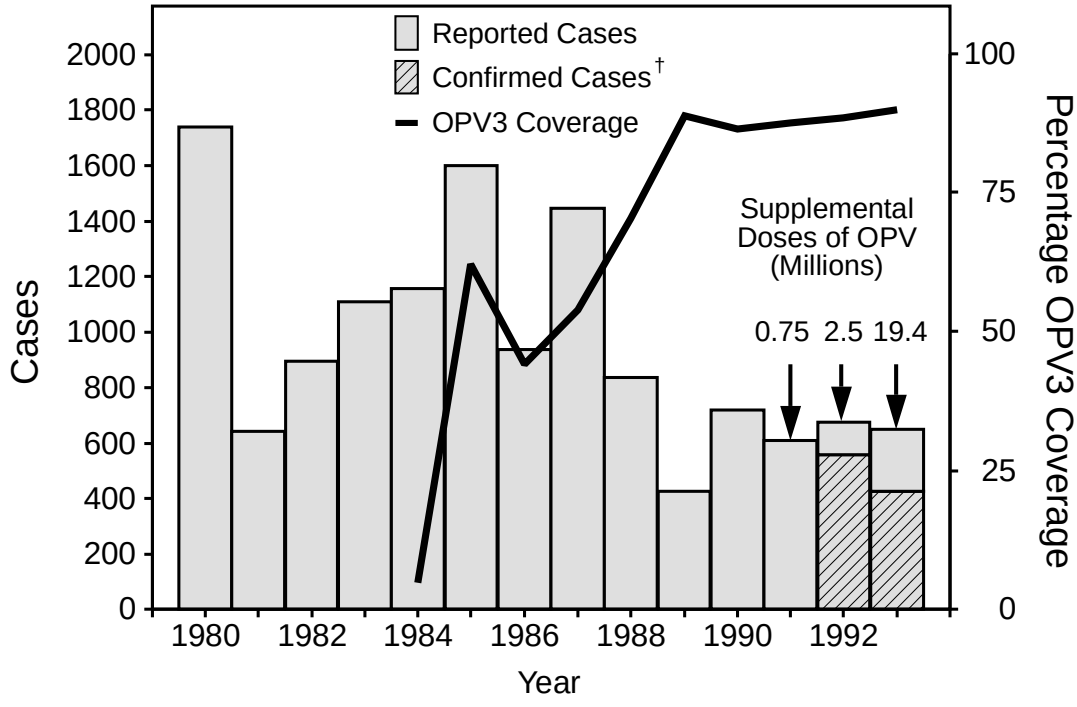
*Use of trade names and commercial sources is for identification only and does not imply endorsement by the Public Health Service or the U.S. Department of Health and Human Services.

Poliomyelitis Eradication — Continued

FIGURE 1. Number of cases of poliomyelitis, routine vaccination coverage with three doses of oral poliovirus vaccine (OPV3), and supplemental doses of vaccine administered, by year — Socialist Republic of Vietnam, 1980–1993*



*Data for 1993 are provisional.

†Confirmed cases met the standard World Health Organization definition (first applied in Vietnam in 1992) of 1) laboratory-confirmed wild poliovirus infection, 2) residual paralysis at 60 days, 3) death, or 4) no follow-up investigation at 60 days. Reported cases refers to persons who had acute flaccid paralysis.

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Editorial Note: Among member countries of the WPR, Vietnam had the second highest reported incidence of polio in 1992 and 1993 (after Cambodia), resulting in 557 (29%) of the 1912 confirmed cases reported in the WPR in 1992 and 425 (35%) of the 1228 confirmed cases reported in 1993 (provisional data). Although the increased OPV coverage through routine vaccination has resulted in a substantial decrease in the incidence of polio in Vietnam, supplemental vaccination activities are warranted for three reasons: 1) routine vaccination with three OPV doses has not been successful in interrupting wild poliovirus transmission in most countries with endemic polio; 2) outbreaks of polio in Vietnam could occur following the accumulation of susceptible persons during years of reduced incidence; and 3) NIDs that deliver two OPV doses

Poliomyelitis Eradication — Continued

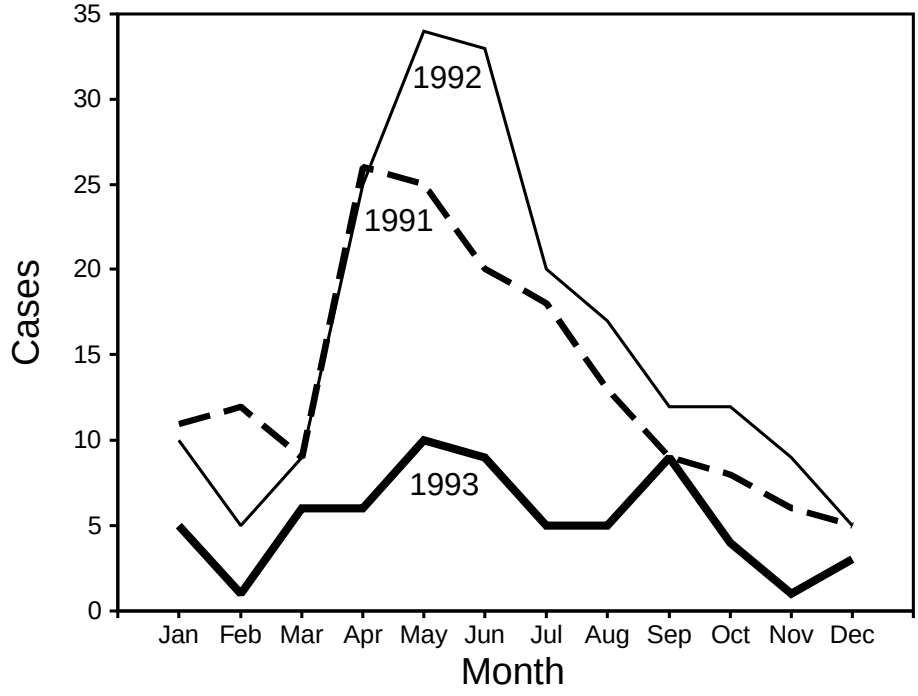
at 1–2-month intervals to all children aged <5 years have been successful in interrupting wild poliovirus transmission in the Western Hemisphere (*3*).

The decrease in the number of reported AFP cases in Vietnam in 1993 primarily reflects a decrease in reported cases in the six provinces in which immunization days were conducted for children aged <3 years in 1992. This pattern is consistent with findings in China that, under certain circumstances, supplemental OPV vaccination targeting children aged <3 or <4 years, rather than <5 years, may be sufficient to reduce or interrupt wild poliovirus transmission.

The incidence of polio in Vietnam has been highest in the southern provinces of the Mekong Delta region, which border provinces in Cambodia where the incidence is also high. Preliminary genotype studies indicate that type 1 polioviruses circulating in the Mekong Delta region of southern Vietnam and Cambodia are closely related and represent a common virus reservoir; isolates from northern Vietnam constitute a separate reservoir (CDC, unpublished data, 1993). Because population movement across the border is extensive, supplemental vaccination activities in Cambodia will be critical to reduce the risk of cross-border importations and to interrupt wild poliovirus circulation in the WPR.

The apparent elimination of wild poliovirus infections in the Americas and the substantial progress in the WPR demonstrate the feasibility of achieving eradication in WPR and other regions of the world (*4*). Each of the five countries with endemic polio in the WPR have adopted the 1995 eradication goal and are conducting or planning to

FIGURE 2. Number of confirmed cases of poliomyelitis, by month and year — six selected provinces, Socialist Republic of Vietnam, 1991*–1993†



*Because procedures to confirm cases were not applied in Vietnam until 1992, the number of reported cases of acute flaccid paralysis is presented for 1991.
†Data for 1993 are provisional.

Poliomyelitis Eradication — Continued

conduct NIDs in 1994 and 1995 (*5,6*). The success of the first NIDs in Vietnam resulted from the combination of strong political and financial commitment from the highest levels of government, a successful social mobilization and information campaign, and coordination among donor agencies to supply adequate quantities of vaccine.

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Current Trends

Rubella and Congenital Rubella Syndrome — United States, January 1, 1991–May 7, 1994

Following a resurgence of rubella and congenital rubella syndrome (CRS) during 1989–1991, the reported number of rubella cases during 1992 and 1993 was the lowest ever recorded. However, outbreaks of rubella have continued to occur, indicating the need for intensified and sustained efforts to reach the goal of eliminating indigenous rubella and CRS in the United States by 1996. This report summarizes surveillance for rubella and CRS from January 1, 1991, through May 7, 1994. Information is based on cases reported to the National Notifiable Disease Surveillance System (NNDSS) and a telephone survey of 28 areas reporting rubella to obtain verification and information on age, laboratory confirmation, and vaccination status of persons with rubella reported in 1993.

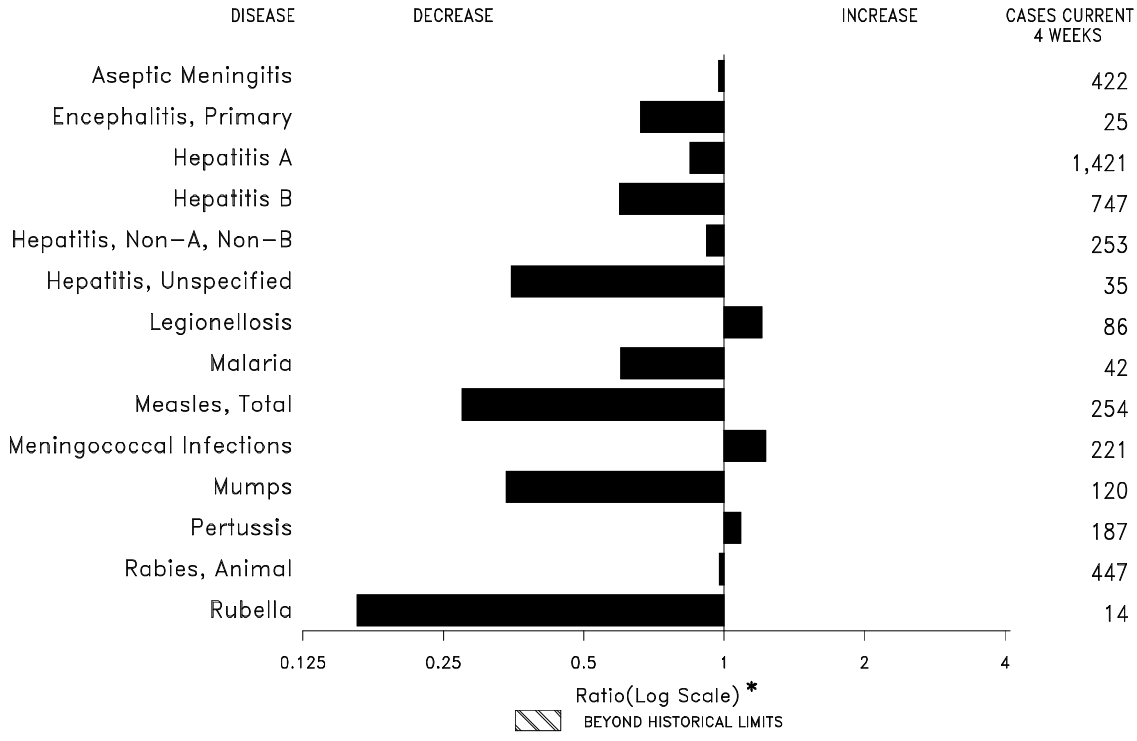
Rubella

Following an all-time low of 225 cases reported in 1988, the incidence of rubella increased in 1989 and peaked in 1991 with 1401 reported cases (Figure 1, page 397) (*1*). In 1992, a new low of 160 cases was reported, followed by an increase to 190 reported cases (provisional total) in 1993.

In 1991, 33 states, New York City, and the District of Columbia reported rubella cases; six states, each reporting 25 or more cases, together accounted for 91% of all cases reported (Figure 2, page 398). California accounted for 267 (19%) reported cases. Outbreaks among members of religious communities that traditionally refuse vaccination resulted in large increases in cases reported from Michigan, New York, Ohio, Pennsylvania, and Tennessee and accounted for at least 900 (89%) of the 1007 cases reported in these states during 1991.

(Continued on page 397)

FIGURE I. Notifiable disease reports, comparison of 4-week totals ending May 28, 1994, with historical data — United States



*Ratio of current 4-week total to mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where 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 May 28, 1994 (21st Week)

	Cum. 1994		Cum. 1994
AIDS*	32,466	Measles: imported	117
Anthrax	-	indigenous	398
Botulism: Foodborne	24	Plague	2
Infant	25	Poliomyelitis, Paralytic[§]	-
Other	7	Psittacosis	12
Brucellosis	29	Rabies, human	-
Cholera	9	Syphilis, primary & secondary	8,695
Congenital rubella syndrome	3	Syphilis, congenital, age < 1 year	-
Diphtheria	-	Tetanus	14
Encephalitis, post-infectious	40	Toxic shock syndrome	94
Gonorrhea	145,311	Trichinosis	24
Haemophilus influenzae (invasive disease)[†]	516	Tuberculosis	7,831
Hansen Disease	41	Tularemia	9
Leptospirosis	12	Typhoid fever	139
Lyme Disease	1,360	Typhus fever, tickborne (RMSF)	60

*Updated monthly; last update May 24, 1994.
[†]Of 472 cases of known age, 139 (29%) were reported among children less than 5 years of age.
[§]No cases of suspected poliomyelitis have been reported in 1994; 3 cases of suspected poliomyelitis have been reported in 1993; 4 of the 5 suspected cases with onset in 1992 were confirmed; the confirmed cases were vaccine associated.

TABLE II. Cases of selected notifiable diseases, United States, weeks ending May 28, 1994, and May 29, 1993 (21st Week)

Reporting Area	AIDS*	Aseptic Menin-gitis	Encephalitis		Gonorrhea		Hepatitis (Viral), by type				Legionel-losis	Lyme Disease
			Primary	Post-in-fectious			A	B	NA,NB	Unspeci-fied		
	Cum. 1994	Cum. 1994	Cum. 1994	Cum. 1994	Cum. 1994	Cum. 1993	Cum. 1994	Cum. 1994	Cum. 1994	Cum. 1994	Cum. 1994	Cum. 1994
UNITED STATES	32,466	1,979	208	40	145,311	158,450	7,893	4,469	1,704	158	580	1,360
NEW ENGLAND	1,245	68	6	2	3,226	3,230	130	181	59	14	20	169
Maine	46	7	1	-	38	35	12	7	-	-	-	-
N.H.	28	4	-	1	-	21	4	12	8	-	-	7
Vt.	19	5	-	-	8	13	1	-	-	-	-	1
Mass.	638	24	4	-	1,194	1,155	60	138	40	13	16	68
R.I.	104	28	1	1	184	155	12	3	11	1	4	23
Conn.	410	-	-	-	1,802	1,851	41	21	-	-	-	70
MID. ATLANTIC	9,386	152	20	6	15,581	17,842	435	411	207	2	63	873
Upstate N.Y.	856	81	11	1	3,627	3,347	210	148	102	-	21	637
N.Y. City	5,924	9	1	-	5,850	5,414	56	39	-	-	-	2
N.J.	1,728	-	-	-	1,840	2,368	116	139	89	-	9	97
Pa.	878	62	8	5	4,264	6,713	53	85	16	2	33	137
E.N. CENTRAL	2,663	328	58	10	28,714	32,092	735	449	131	2	171	18
Ohio	479	86	17	1	9,618	8,547	268	82	9	-	78	14
Ind.	333	58	2	-	3,225	3,158	136	82	4	-	53	3
Ill.	1,310	54	21	3	6,680	11,473	173	77	25	1	5	-
Mich.	409	125	17	6	6,854	6,358	102	143	93	1	27	1
Wis.	132	5	1	-	2,337	2,556	56	65	-	-	8	-
W.N. CENTRAL	736	137	8	1	7,720	8,605	374	242	79	4	58	19
Minn.	198	13	1	-	1,298	1,052	81	28	6	-	-	7
Iowa	30	43	-	-	582	677	14	14	7	3	21	1
Mo.	315	42	-	-	4,295	4,784	171	171	57	1	25	8
N. Dak.	18	1	2	-	7	20	1	-	-	-	2	-
S. Dak.	9	-	1	-	45	90	15	2	-	-	-	-
Nebr.	41	5	3	1	-	476	37	11	3	-	8	-
Kans.	125	33	1	-	1,493	1,506	55	16	6	-	2	3
S. ATLANTIC	7,007	469	34	14	40,949	42,962	512	1,082	341	14	159	205
Del.	97	2	-	-	729	537	8	12	19	-	1	40
Md.	541	68	7	1	7,388	6,718	71	146	13	5	41	54
D.C.	595	14	-	-	3,045	2,131	10	16	-	-	4	1
Va.	517	59	11	5	5,318	4,813	54	47	17	2	3	22
W. Va.	10	8	-	-	292	245	4	10	15	-	1	5
N.C.	556	62	15	-	10,045	10,052	47	123	27	-	10	27
S.C.	554	12	-	-	4,836	3,878	12	17	3	-	6	2
Ga.	872	16	1	-	-	4,660	22	422	151	-	67	49
Fla.	3,265	228	-	8	9,296	9,928	284	289	96	7	26	5
E.S. CENTRAL	834	132	19	1	17,471	16,352	188	471	322	1	27	12
Ky.	147	44	8	1	1,778	1,846	84	41	12	-	4	6
Tenn.	235	23	7	-	5,204	4,197	59	397	303	1	13	5
Ala.	245	47	4	-	6,416	6,289	27	33	7	-	7	1
Miss.	207	18	-	-	4,073	4,020	18	-	-	-	3	-
W.S. CENTRAL	3,242	176	12	1	16,284	17,733	1,182	504	160	40	13	30
Ark.	97	9	-	-	2,698	2,197	21	9	3	-	4	-
La.	474	9	2	-	4,905	4,691	66	76	43	1	-	-
Okla.	111	-	-	-	496	1,504	104	123	87	-	8	19
Tex.	2,560	158	10	1	8,185	9,341	991	296	27	39	1	11
MOUNTAIN	1,052	61	4	-	3,462	4,605	1,610	212	169	15	35	4
Mont.	13	-	-	-	38	20	11	11	2	-	13	-
Idaho	24	1	-	-	28	70	134	34	39	1	-	1
Wyo.	11	-	-	-	33	34	9	7	54	-	2	-
Colo.	420	12	1	-	1,036	1,499	129	11	15	4	3	-
N. Mex.	69	7	-	-	423	386	474	87	32	5	1	3
Ariz.	284	25	-	-	1,160	1,644	577	20	6	3	1	-
Utah	60	4	-	-	132	144	178	18	15	-	3	-
Nev.	171	12	3	-	612	808	98	24	6	2	12	-
PACIFIC	6,301	456	47	5	11,904	15,029	2,727	917	236	66	34	30
Wash.	401	-	-	-	1,199	1,608	152	33	28	-	5	-
Oreg.	269	-	-	-	354	577	148	19	3	1	-	-
Calif.	5,519	380	46	4	9,725	12,413	2,321	839	200	63	26	30
Alaska	19	12	1	-	332	196	86	6	-	-	-	-
Hawaii	93	64	-	1	294	235	20	20	5	2	3	-
Guam	1	6	-	-	51	48	8	-	-	4	2	-
P.R.	903	15	-	-	205	227	30	118	38	3	-	-
V.I.	12	-	-	-	10	47	-	1	-	-	-	-
Amer. Samoa	-	-	-	-	14	11	4	-	-	-	-	-
C.N.M.I.	-	-	-	-	21	33	2	-	-	-	-	-

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

*Updated monthly; last update May 24, 1994.

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending May 28, 1994, and May 29, 1993 (21st Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1994	1994	Cum. 1994	1994	Cum. 1994	Cum. 1993	Cum. 1994	1994	Cum. 1994	1994	Cum. 1994	Cum. 1993	1994	Cum. 1994	Cum. 1993
UNITED STATES	340	17	398	-	117	123	1,294	24	569	37	1,162	1,191	1	146	90
NEW ENGLAND	27	1	8	-	14	55	70	1	11	14	121	266	1	101	1
Maine	1	-	1	-	3	-	12	-	3	-	2	7	-	-	1
N.H.	3	-	-	-	-	-	5	-	4	2	34	63	-	-	-
Vt.	1	-	-	-	1	31	1	-	-	5	15	42	-	-	-
Mass.	10	-	-	-	8	15	29	-	-	3	56	135	-	100	-
R.I.	4	1	4	-	2	1	-	-	1	-	3	3	1	1	-
Conn.	8	-	3	-	-	8	23	1	3	4	11	16	-	-	-
MID. ATLANTIC	42	2	107	-	9	12	112	2	50	6	251	172	-	8	27
Upstate N.Y.	14	1	11	-	-	1	41	2	13	3	99	61	-	8	4
N.Y. City	6	1	4	-	-	3	8	-	-	2	36	7	-	-	15
N.J.	15	-	88	-	9	8	29	-	4	-	6	33	-	-	7
Pa.	7	-	4	-	-	-	34	-	33	1	110	71	-	-	1
E.N. CENTRAL	39	-	17	-	39	7	195	6	100	4	163	251	-	8	2
Ohio	6	-	6	-	-	2	50	5	27	2	66	73	-	-	1
Ind.	10	-	-	-	1	-	37	-	6	2	33	21	-	-	-
Ill.	11	-	5	-	38	5	68	-	39	-	23	48	-	3	-
Mich.	11	-	3	-	-	-	22	1	25	-	23	16	-	5	-
Wis.	1	-	3	-	-	-	18	-	3	-	18	93	-	-	1
W.N. CENTRAL	18	1	78	-	41	3	92	-	28	-	48	78	-	-	1
Minn.	5	-	-	-	-	-	8	-	4	-	20	39	-	-	-
Iowa	4	-	-	-	-	-	12	-	7	-	4	1	-	-	-
Mo.	7	-	77	-	40	1	42	-	14	-	13	19	-	-	1
N. Dak.	-	-	-	-	-	-	-	-	1	-	2	3	-	-	-
S. Dak.	-	-	-	-	-	-	6	-	-	-	-	1	-	-	-
Nebr.	1	-	-	-	1	-	8	-	2	-	3	4	-	-	-
Kans.	1	1	1	-	-	2	16	-	-	-	6	11	-	-	-
S. ATLANTIC	76	-	6	-	1	21	224	7	95	4	153	98	-	5	6
Del.	3	-	-	-	-	-	-	-	-	-	-	1	-	-	2
Md.	33	-	1	-	1	4	15	-	20	1	51	33	-	-	1
D.C.	7	-	-	-	-	-	2	-	-	-	3	1	-	-	-
Va.	9	-	1	-	-	1	30	1	24	-	15	9	-	-	-
W. Va.	-	-	-	-	-	-	9	-	3	-	2	3	-	-	-
N.C.	2	-	-	-	-	-	37	-	26	-	44	14	-	-	-
S.C.	2	-	-	-	-	-	9	1	6	-	8	5	-	-	-
Ga.	8	-	1	-	-	-	49	-	6	-	10	9	-	-	-
Fla.	12	-	3	-	-	16	73	5	10	3	20	23	-	5	3
E.S. CENTRAL	9	-	28	-	-	-	88	1	12	2	80	50	-	-	-
Ky.	2	-	-	-	-	-	22	1	2	-	52	9	-	-	-
Tenn.	4	-	28	-	-	-	22	-	4	-	13	24	-	-	-
Ala.	2	-	-	-	-	-	38	-	-	2	14	13	-	-	-
Miss.	1	-	-	-	-	-	6	-	6	-	1	4	-	-	-
W.S. CENTRAL	13	-	7	-	5	1	156	3	141	2	38	30	-	7	12
Ark.	-	-	-	-	1	-	24	-	-	2	6	2	-	-	-
La.	1	-	-	-	1	1	20	1	13	-	5	4	-	-	1
Okla.	2	-	-	-	-	-	12	-	21	-	20	11	-	4	1
Tex.	10	-	7	-	3	-	100	2	107	-	7	13	-	3	10
MOUNTAIN	13	13	118	-	1	2	92	-	23	2	75	66	-	3	5
Mont.	-	-	-	-	-	-	2	-	-	-	3	-	-	-	-
Idaho	2	-	-	-	-	-	12	-	4	-	25	7	-	1	1
Wyo.	-	-	-	-	-	-	5	-	1	-	-	1	-	-	-
Colo.	3	-	12	-	1	2	11	-	1	-	17	26	-	-	-
N. Mex.	2	-	-	-	-	-	10	N	N	1	8	16	-	-	-
Ariz.	1	-	-	-	-	-	37	-	5	1	13	9	-	-	1
Utah	4	13	106	-	-	-	11	-	6	-	9	7	-	2	2
Nev.	1	-	-	-	-	-	4	-	5	-	-	-	-	-	1
PACIFIC	103	-	29	-	7	22	265	4	109	3	233	180	-	14	36
Wash.	3	-	-	-	-	-	18	-	3	-	12	18	-	-	-
Oreg.	7	-	-	-	-	-	44	N	N	-	22	-	-	-	1
Calif.	83	-	29	-	5	7	196	4	96	3	195	152	-	12	16
Alaska	-	-	-	-	-	-	2	-	2	-	-	3	-	1	1
Hawaii	10	-	-	-	2	15	5	-	8	-	4	7	-	1	18
Guam	-	U	181	U	-	2	-	U	3	U	-	-	U	1	-
P.R.	-	-	13	-	-	222	6	-	2	-	1	1	-	-	-
V.I.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Amer. Samoa	-	U	-	U	-	1	-	U	1	U	1	2	U	-	-
C.N.M.I.	1	U	26	U	-	1	-	U	-	U	-	-	U	-	-

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

TABLE II. (Cont'd.) Cases of selected notifiable diseases, United States, weeks ending May 28, 1994, and May 29, 1993 (21st Week)

Reporting Area	Syphilis (Primary & Secondary)		Toxic-Shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1994	Cum. 1993	Cum. 1994	Cum. 1994	Cum. 1993	Cum. 1994	Cum. 1994	Cum. 1994	Cum. 1994
UNITED STATES	8,695	11,155	94	7,831	8,339	9	139	60	2,394
NEW ENGLAND	85	184	1	150	163	-	12	4	740
Maine	4	2	-	-	7	-	-	-	-
N.H.	-	18	-	7	7	-	-	-	84
Vt.	-	-	-	2	3	-	-	-	62
Mass.	32	78	1	69	85	-	8	4	293
R.I.	6	6	-	16	26	-	1	-	5
Conn.	43	80	-	56	35	-	3	-	296
MID. ATLANTIC	504	1,128	17	1,405	1,750	-	38	-	289
Upstate N.Y.	63	94	8	93	252	-	6	-	79
N.Y. City	260	587	-	913	1,040	-	23	-	-
N.J.	86	167	-	277	187	-	9	-	133
Pa.	95	280	9	122	271	-	-	-	77
E.N. CENTRAL	1,126	1,921	20	789	847	-	26	8	14
Ohio	470	496	8	110	120	-	2	3	-
Ind.	103	163	2	68	84	-	1	1	2
Ill.	298	777	4	403	433	-	14	2	3
Mich.	141	286	6	189	177	-	3	2	5
Wis.	114	199	-	19	33	-	6	-	4
W.N. CENTRAL	500	719	13	199	176	5	-	3	71
Minn.	22	39	1	44	20	-	-	-	8
Iowa	21	34	6	15	14	-	-	1	29
Mo.	427	569	3	92	99	5	-	-	7
N. Dak.	-	2	-	2	4	-	-	-	2
S. Dak.	-	-	-	9	7	-	-	2	9
Nebr.	-	10	2	9	8	-	-	-	-
Kans.	30	65	1	28	24	-	-	-	16
S. ATLANTIC	2,462	2,915	6	1,618	1,827	-	23	36	765
Del.	12	60	-	-	16	-	1	-	11
Md.	94	155	-	132	157	-	5	-	235
D.C.	105	163	-	41	70	-	1	-	2
Va.	301	258	1	132	176	-	2	2	166
W. Va.	8	1	-	41	33	-	-	-	34
N.C.	752	796	1	196	175	-	-	11	82
S.C.	297	457	-	167	157	-	-	1	73
Ga.	528	521	-	357	321	-	1	20	154
Fla.	365	504	4	552	722	-	13	2	8
E.S. CENTRAL	1,533	1,374	1	369	536	-	1	4	49
Ky.	92	121	-	132	141	-	1	-	3
Tenn.	399	320	1	1	114	-	-	3	-
Ala.	289	343	-	169	189	-	-	-	46
Miss.	753	590	-	67	92	-	-	1	-
W.S. CENTRAL	2,037	2,225	-	890	702	2	6	5	330
Ark.	213	266	-	105	70	2	-	2	14
La.	780	980	-	-	-	-	2	-	41
Okla.	15	148	-	94	65	-	1	2	17
Tex.	1,029	831	-	691	567	-	3	1	258
MOUNTAIN	125	100	4	175	197	1	6	-	30
Mont.	1	1	-	9	5	-	-	-	-
Idaho	2	-	1	6	5	-	-	-	-
Wyo.	-	2	-	2	1	-	-	-	9
Colo.	62	29	1	1	29	-	2	-	-
N. Mex.	6	17	-	27	18	1	-	-	1
Ariz.	26	39	-	94	91	-	1	-	19
Utah	5	2	2	-	9	-	1	-	-
Nev.	23	10	-	36	39	-	2	-	1
PACIFIC	323	589	32	2,236	2,141	1	27	-	106
Wash.	19	25	-	90	110	-	2	-	-
Oreg.	16	28	-	45	39	1	-	-	-
Calif.	285	532	29	1,961	1,853	-	24	-	78
Alaska	2	2	-	27	22	-	-	-	28
Hawaii	1	2	3	113	117	-	1	-	-
Guam	1	1	-	18	25	-	1	-	-
P.R.	117	230	-	33	82	-	-	-	35
V.I.	21	20	-	-	2	-	-	-	-
Amer. Samoa	-	-	-	2	1	-	1	-	-
C.N.M.I.	1	2	-	15	13	-	1	-	-

U: Unavailable

TABLE III. Deaths in 121 U.S. cities,* week ending May 28, 1994 (21st Week)

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	631	451	92	61	8	19	63
Boston, Mass.	182	118	34	18	2	10	33
Bridgeport, Conn.	29	24	3	-	2	-	2
Cambridge, Mass.	35	29	4	2	-	-	2
Fall River, Mass.	25	20	2	2	1	-	1
Hartford, Conn.	55	40	6	6	-	3	1
Lowell, Mass.	25	22	3	-	-	-	4
Lynn, Mass.	19	14	4	1	-	-	3
New Bedford, Mass.	20	11	4	5	-	-	1
New Haven, Conn.	34	21	6	4	1	2	-
Providence, R.I.	49	36	5	8	-	-	4
Somerville, Mass.	9	6	1	2	-	-	1
Springfield, Mass.	43	34	4	3	1	1	2
Waterbury, Conn.	40	30	5	4	1	-	3
Worcester, Mass.	66	46	11	6	-	3	6
MID. ATLANTIC	2,566	1,647	497	320	50	52	107
Albany, N.Y.	36	27	3	3	1	2	1
Allentown, Pa.	26	18	7	-	1	-	-
Buffalo, N.Y.	100	56	20	18	2	4	1
Camden, N.J.	39	26	8	4	1	-	-
Elizabeth, N.J.	15	8	5	-	-	2	-
Erie, Pa.§	49	41	6	2	-	-	5
Jersey City, N.J.	53	35	13	4	1	-	-
New York City, N.Y.	1,368	851	271	193	26	27	47
Newark, N.J.	61	24	20	14	3	-	3
Paterson, N.J.	27	10	3	13	-	1	-
Philadelphia, Pa.	370	243	77	35	9	6	23
Pittsburgh, Pa.§	67	45	13	6	1	2	8
Reading, Pa.	19	16	1	2	-	-	1
Rochester, N.Y.	123	89	18	11	5	-	9
Schenectady, N.Y.	25	17	5	3	-	-	1
Scranton, Pa.§	23	20	1	-	-	2	1
Syracuse, N.Y.	86	66	13	2	-	5	4
Trenton, N.J.	28	19	2	6	-	1	1
Utica, N.Y.	21	15	5	1	-	-	-
Yonkers, N.Y.	30	21	6	3	-	-	2
E.N. CENTRAL	1,731	1,167	338	134	47	45	89
Akron, Ohio	83	57	13	8	2	3	2
Canton, Ohio	43	30	11	1	-	1	4
Chicago, Ill.	U	U	U	U	U	U	U
Cincinnati, Ohio	84	58	17	5	3	1	7
Cleveland, Ohio	140	91	29	16	3	1	4
Columbus, Ohio	128	85	27	9	3	4	6
Dayton, Ohio	119	88	20	8	-	3	6
Detroit, Mich.	216	127	46	24	7	12	5
Evansville, Ind.	57	40	12	3	2	-	3
Fort Wayne, Ind.	50	38	6	3	3	-	3
Gary, Ind.	24	9	6	4	2	3	2
Grand Rapids, Mich.	52	35	11	1	4	1	8
Indianapolis, Ind.	217	140	46	16	6	9	9
Madison, Wis.	56	37	11	7	-	1	5
Milwaukee, Wis.	119	94	17	4	-	4	8
Peoria, Ill.	63	42	16	4	1	-	1
Rockford, Ill.	56	38	6	8	4	-	2
South Bend, Ind.	49	33	13	3	-	-	5
Toledo, Ohio	110	82	19	6	2	1	8
Youngstown, Ohio	65	43	12	4	5	1	1
W.N. CENTRAL	698	524	77	58	22	17	33
Des Moines, Iowa	53	45	5	3	-	-	1
Duluth, Minn.	35	26	7	2	-	-	2
Kansas City, Kans.	45	32	4	7	-	2	1
Kansas City, Mo.	70	56	7	4	2	1	-
Lincoln, Nebr.	33	25	4	4	-	-	1
Minneapolis, Minn.	146	117	3	12	8	6	11
Omaha, Nebr.	82	56	17	6	1	2	4
St. Louis, Mo.	117	77	17	11	7	5	9
St. Paul, Minn.	52	41	6	4	-	1	2
Wichita, Kans.	65	49	7	5	4	-	2

Reporting Area	All Causes, By Age (Years)						P&I† Total
	All Ages	≥65	45-64	25-44	1-24	<1	
S. ATLANTIC	1,349	832	282	144	33	58	80
Atlanta, Ga.	164	92	42	20	5	5	4
Baltimore, Md.	251	153	59	27	5	7	31
Charlotte, N.C.	97	55	26	14	-	2	6
Jacksonville, Fla.	126	83	30	6	5	2	7
Miami, Fla.	71	44	14	10	-	3	1
Norfolk, Va.	51	32	9	5	3	2	4
Richmond, Va.	71	50	12	7	2	-	4
Savannah, Ga.	41	29	3	3	1	5	2
St. Petersburg, Fla.	54	44	4	1	1	4	3
Tampa, Fla.	168	123	31	10	2	2	16
Washington, D.C.	245	120	51	40	8	26	2
Wilmington, Del.	10	7	1	1	1	-	-
E.S. CENTRAL	742	487	142	66	22	25	49
Birmingham, Ala.	122	73	25	16	3	5	5
Chattanooga, Tenn.	71	51	10	7	1	2	3
Knoxville, Tenn.	82	63	14	4	-	1	8
Lexington, Ky.	81	46	23	7	5	-	10
Memphis, Tenn.	149	103	22	15	1	8	14
Mobile, Ala.	55	37	11	2	4	1	3
Montgomery, Ala.	55	37	7	5	3	3	1
Nashville, Tenn.	127	77	30	10	5	5	5
W.S. CENTRAL	1,352	835	292	146	60	19	81
Austin, Tex.	66	39	9	10	3	5	2
Baton Rouge, La.	42	20	15	5	2	-	1
Corpus Christi, Tex.	52	37	9	3	3	-	3
Dallas, Tex.	183	106	38	26	11	2	3
El Paso, Tex.	67	42	11	9	4	1	10
Ft. Worth, Tex.	83	56	19	4	2	2	4
Houston, Tex.	382	215	94	48	21	4	29
Little Rock, Ark.	75	47	17	7	4	-	7
New Orleans, La.	U	U	U	U	U	U	U
San Antonio, Tex.	192	134	31	17	6	4	10
Shreveport, La.	103	65	28	8	1	1	5
Tulsa, Okla.	107	74	21	9	3	-	7
MOUNTAIN	695	430	137	83	23	22	45
Albuquerque, N.M.	81	53	12	10	2	4	-
Colo. Springs, Colo.	39	25	9	3	1	1	4
Denver, Colo.	116	64	29	17	4	2	9
Las Vegas, Nev.	107	68	22	15	2	-	5
Ogden, Utah	21	15	3	1	1	1	5
Phoenix, Ariz.	192	109	38	22	10	13	16
Pueblo, Colo.	16	13	2	1	-	-	2
Salt Lake City, Utah	U	U	U	U	U	U	U
Tucson, Ariz.	123	83	22	14	3	1	4
PACIFIC	1,658	1,091	286	179	48	46	95
Berkeley, Calif.	U	U	U	U	U	U	U
Fresno, Calif.	95	63	16	7	2	7	7
Glendale, Calif.	33	24	6	2	-	-	1
Honolulu, Hawaii	60	41	11	4	-	4	5
Long Beach, Calif.	U	U	U	U	U	U	U
Los Angeles, Calif.	691	442	125	88	27	2	33
Pasadena, Calif.	20	12	5	1	-	2	-
Portland, Oreg.	129	82	25	12	6	4	3
Sacramento, Calif.	U	U	U	U	U	U	U
San Diego, Calif.	169	118	19	22	5	5	12
San Francisco, Calif.	U	U	U	U	U	U	U
San Jose, Calif.	157	108	30	11	2	6	20
Santa Cruz, Calif.	U	U	U	U	U	U	U
Seattle, Wash.	167	102	30	22	4	9	2
Spokane, Wash.	50	37	6	3	1	3	2
Tacoma, Wash.	87	62	13	7	1	4	10
TOTAL	11,422¶	7,464	2,143	1,191	313	303	642

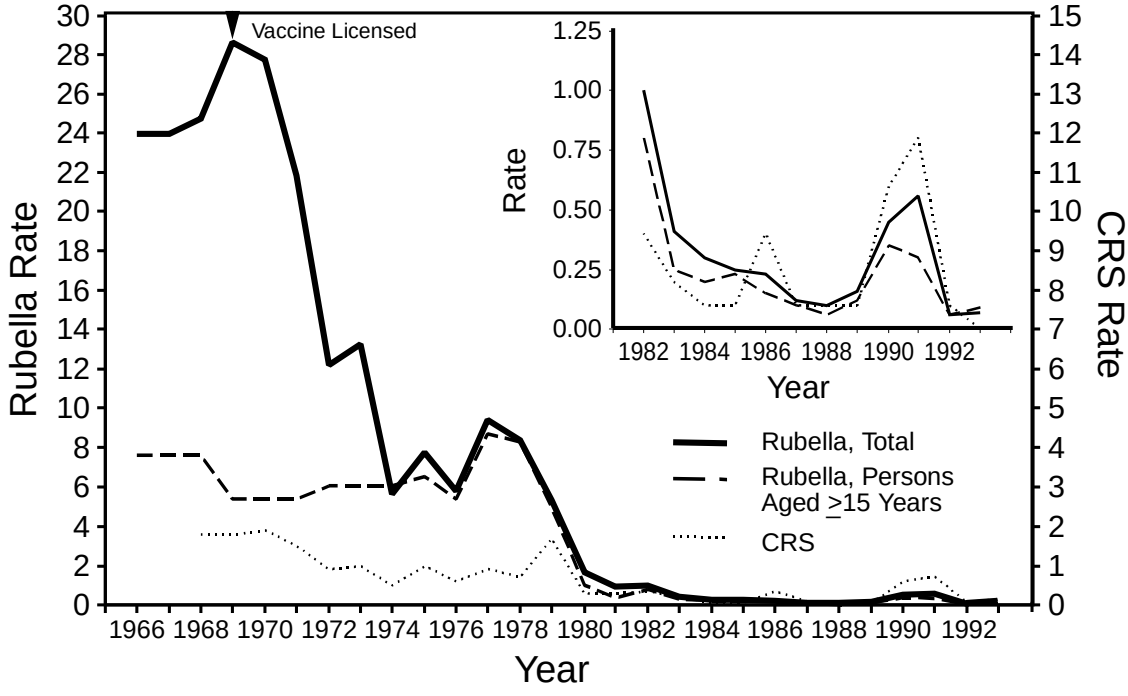
*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.
†Pneumonia and influenza.
§Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.
¶Total includes unknown ages.
U: Unavailable.

Rubella — Continued

Cases were reported from 27 states and three territories in 1992 and from 24 states and New York City in 1993. As of May 7, 1994, a provisional total of 134 rubella cases has been reported from 11 states and Guam.

Age-specific data were available from NNDSS for 1991 and 1992 for all states except California and, in 1993, for all states (Table 1). In 1991, 52% of cases were reported among persons aged 5–19 years and 28% among adults aged ≥20 years. The distribution in 1991 reflected outbreaks that occurred in religious communities in which unvaccinated children and young adults congregated in schools and other settings

FIGURE 1. Incidence rates of rubella* and congenital rubella syndrome (CRS)† — United States, 1966–1993



*Cases reported to the National Notifiable Disease Surveillance System per 100,000 population.
†Cases reported to the National CRS Registry per 100,000 live births.

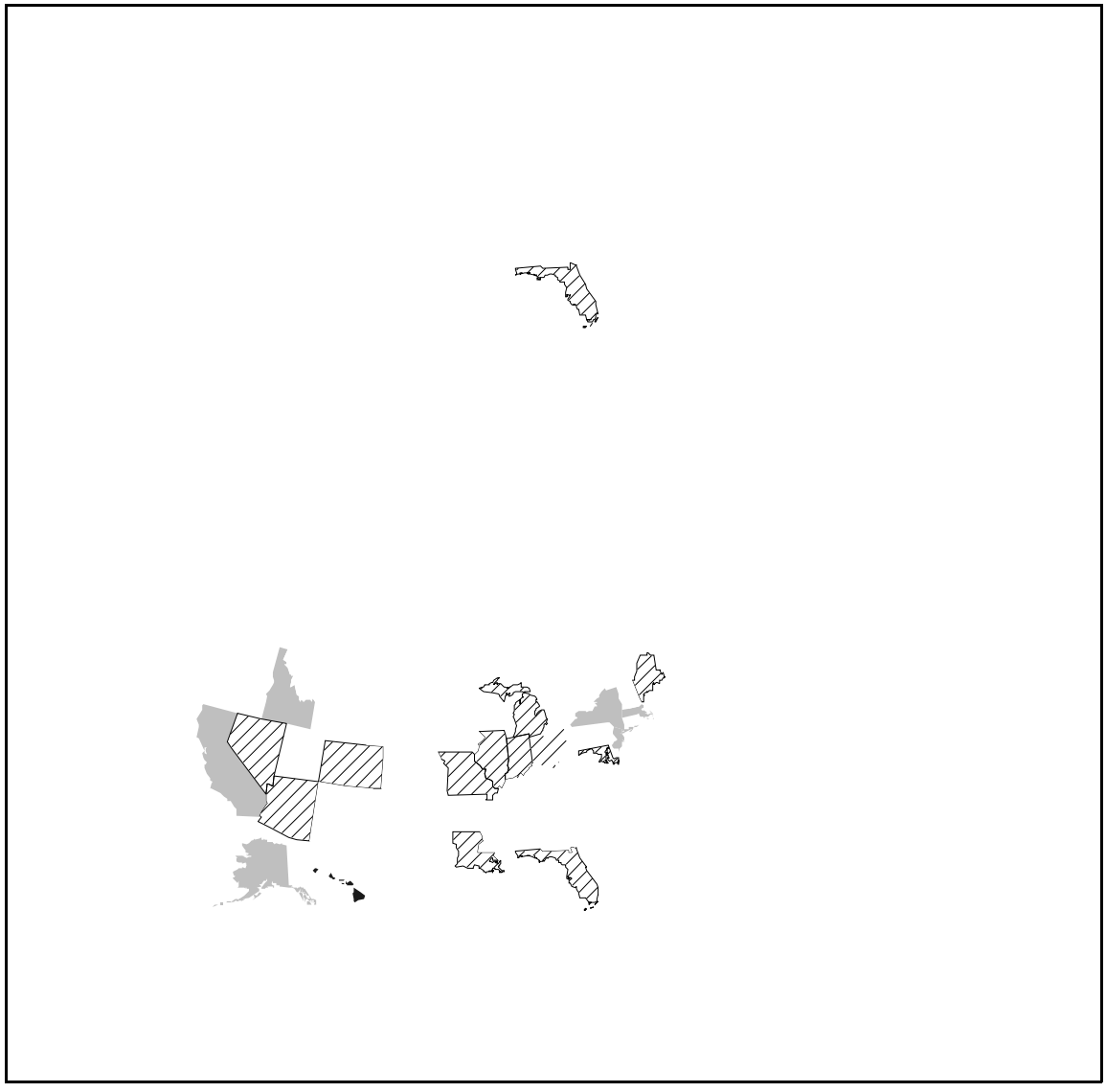
TABLE 1. Age distribution of persons with reported rubella and estimated incidence rates* — United States, 1991–1993

Age group (yrs)	1991			1992			1993		
	No.	(%)	Rate	No.	(%)	Rate	No.	(%)	Rate
<1	32	(2.9)	0.8	8	(7.8)	0.2	13	(7.0)	0.3
1– 4	193	(17.5)	1.3	16	(15.6)	0.1	16	(8.6)	0.1
5–19	573	(51.9)	1.1	29	(28.1)	<0.1	41	(21.9)	0.1
20–29	210	(19.0)	0.5	20	(19.4)	<0.1	58	(31.0)	0.1
≥30	96	(8.7)	<0.1	30	(29.1)	<0.1	59	(31.5)	<0.1
Known age	1104	(100.0)	—	103	(100.0)	—	187	(100.0)	—
Unknown age	297	—	—	57	—	—	3	—	—
Total	**1401**	**—**	**0.6**	**160**	**—**	**0.1**	**190**	**—**	**0.1**

*Cases per 100,000 population, 1990 U.S. Census.

where they were in close contact. In comparison, in 1992 and 1993, 49%–63% of cases occurred among persons aged ≥20 years; in addition, the proportion of cases among persons aged ≥30 years increased by more than threefold over that in 1991. In each year, 16%–23% of cases occurred among children aged <5 years.

In 1991, Hispanics and Asians/Pacific Islanders together accounted for 33 (3%) of 1028 cases in persons with known race/ethnicity. In comparison, in 1992, Asians/Pacific Islanders accounted for 27 (39%) of 70 cases with known race, and Hispanics accounted for 14 (19%) of 73 cases with known ethnicity. In 1993, Asians/Pacific Islanders accounted for 31 (29%) of 108 cases with known race, and Hispanics accounted for 39 (22%) of 176 cases with known ethnicity.



Rubella — Continued

Outbreaks identified during 1993–1994 primarily have involved persons in prisons, colleges, and work settings. During 1993, outbreaks were identified in six areas: California (an adult class and a prison); New Jersey, New York City, and New York State (work settings); Texas (a college); and Massachusetts (community and a prison). The outbreak that began in Massachusetts in 1993 is ongoing; through May 7, 1994, a total of 99 cases had been reported in prisons, homeless shelters, a psychiatric facility, and a community including persons who immigrated from areas that do not routinely vaccinate against rubella (e.g., most central and south American countries). An outbreak in 1994 in a college in Oklahoma has involved four international students who were unvaccinated.

Data on vaccination status of persons with rubella are not routinely collected in NNDSS and were not available for 1991 and 1992. Vaccination status of persons with rubella reported in 1993 was determined by the telephone survey. Of the 190 persons with reported rubella, 13 were not eligible for vaccination (aged <1 year). Vaccination status was known for 97 (55%) of the remaining 177 persons; of these, 52 (54%) were unvaccinated, 39 (40%) reported vaccination or specified receipt of one dose, and six (6%) reported receipt of two doses of vaccine. Among persons with reported rubella in 1993, 127 (67%) had clinical diagnosis confirmed by a laboratory, eight (4%) had a clinical diagnosis and were epidemiologically linked to another person with rubella, and 27 (14%) had a clinical diagnosis only; method of ascertainment was unknown for 28 (15%).

Congenital Rubella Syndrome

Information about CRS was based on data from the National CRS Registry maintained by CDC's National Immunization Program (*1,2*). The incidence of CRS paralleled the rise and decline of rubella from 1989 to 1993 (Figure 1).

During 1991, 31 indigenous cases of confirmed and compatible CRS were reported in the United States (Table 2); 20 (65%) of these occurred in Pennsylvania. A survey to determine the risk for CRS among infants born to Amish mothers residing in one county in Pennsylvania in 1991 indicated the rate of CRS was 14 per 1000 live births, compared with 0.006 for the U.S. total population (*3*). During 1992, five cases of CRS were reported in the United States, including two in Pennsylvania and three in California. No indigenous CRS was reported among infants born in 1993; three cases reported in 1994 are pending confirmation. Eight imported cases of CRS were reported among infants born during 1991–1993 (with exposure in Mexico [five cases], Germany [two], and Poland [one]).

Reported by: State and territorial epidemiologists. Div of Surveillance and Epidemiology, Epidemiology Program Office; Epidemiology and Surveillance Div, National Immunization Program, CDC.

Editorial Note: The incidence of rubella among persons aged ≥20 years has declined dramatically since licensure of rubella vaccine and since the 1980s, when increased emphasis was placed on vaccinating adolescents and adults, particularly women of childbearing age (*4*). However, many persons in this age group—particularly women of childbearing age—remain susceptible (*5*).

The outbreaks that have occurred since 1991 indicate the ongoing transmission of rubella and underscore the potential risk for CRS. The outbreaks in 1991 occurred primarily among religious groups that remain unvaccinated (*3,6*). Since 1992, outbreaks

Rubella — Continued

have occurred in settings where young adults congregate, particularly among persons in specific racial/ethnic groups (e.g., Asians/Pacific Islanders and Hispanics) who often are unvaccinated. Some of these outbreaks also have been associated with transmission of cases acquired outside the United States.

Limited or absent efforts in some countries to vaccinate against rubella also poses a risk for rubella exposure and transmission and of CRS in the United States. For example, in 1993, 27 of 28 reported cases in Hawaii were imported. In the outbreak in Massachusetts that started in 1993, two of the early cases were in persons who had immigrated from Brazil. The outbreak later spread to a community in Boston including immigrants from areas that do not routinely vaccinate against rubella. Since 1989, 14 infants were born in the United States to mothers infected in other countries, including 10 of the 14 whose mothers were from Mexico, where persons are not routinely vaccinated against rubella.

The findings in this report indicate that achieving the goal of eliminating indigenous rubella and CRS in the United States by 1996 will require improving control strategies that target young adults (*7*). Strategies include 1) increasing vaccination coverage in children; 2) implementing laws requiring all students receive two doses of measles-mumps-rubella vaccine; 3) encouraging health-care providers to take advantage of every opportunity to vaccinate susceptible adolescents and adults; 4) adopting prematriculation vaccination requirements in colleges; 5) initiating prevention and control programs in correctional institutions; 6) encouraging persons in religious groups who do not seek health care to accept vaccination; and 7) targeting special vaccination programs toward young adults who are likely to be unvaccinated and to have contact with persons infected with rubella from countries that do not routinely vaccinate against rubella.

CDC, in collaboration with state and local health departments, is planning enhanced surveillance to better define the epidemiology of rubella and CRS. Additional information that will be collected for each rubella case includes serologic confirmation, vaccination status, location of exposure (i.e., indigenous or imported), and

TABLE 2. Number of cases and incidence rates* of congenital rubella syndrome (CRS)† reported to the National CRS Registry — United States, 1969–1993§

Year	No. cases	Incidence rate	Year	No. cases	Incidence rate
1969	62	1.7	1982	13	0.4
1970	67	1.8	1983	7	0.2
1971	44	1.2	1984	2	<0.1
1972	32	1.0	1985	2	<0.1
1973	30	1.0	1986	13	0.4
1974	22	0.7	1987	3	<0.1
1975	32	1.0	1988	2	<0.1
1976	22	0.7	1989	1	<0.1
1977	29	0.9	1990	25	0.6
1978	30	0.9	1991	31	0.8
1979	57	1.6	1992	5	0.1
1980	14	0.4	1993	0	0
1981	10	0.3			

*Per 100,000 live births.
†Confirmed and compatible cases reported by year of birth.
§Excluded are the following imported cases: 1984 (one), 1985 (one), 1986 (two), 1987 (three), 1988 (two), 1990 (six), 1991 (two), 1992 (five), and 1993 (one).

Rubella — Continued

transmission setting. This information will be used to design more effective prevention strategies for rubella and CRS.

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International Notes

Invasive Group A Streptococcal Infections — United Kingdom, 1994

On May 27, 1994, the Communicable Disease Surveillance Center in England reported that six persons in Gloucestershire had disease characteristic of invasive group A streptococcal infection (GAS) with necrotizing fasciitis. Three patients died. Patients ranged in age from 46 to 68 years. Group A streptococcal isolates from blood or joint fluid from five patients were typed by the Public Health Laboratory Service *Streptococcus* Reference Laboratory. Four different types were identified (M1 [2], M3, M5, and M-nontypable).

Since 1992, the total number of laboratory reports of systemic GAS in England and Wales has remained stable; during the first 16 weeks of 1994, a total of 200 blood isolates were reported, compared with 212 and 200 during the first 16 weeks of 1993 and 1992, respectively.

Adapted from: Communicable Disease Report *1994;4(21). Reported by: Div of Bacterial and Mycotic Diseases, National Center for Infectious Diseases, CDC.*

Editorial Note: The report from the United Kingdom underscores the potential for severe disease associated with GAS. GAS is associated with a broad spectrum of complications in humans, the most common being streptococcal pharyngitis. Serious invasive disease, which occurs less commonly, is defined by isolation of the bacteria from usually sterile sites and is associated with case-fatality rates of 10%–20%. One form of invasive GAS, necrotizing fasciitis, is characterized by destruction of muscle and fat tissue.

Based on extrapolation of incidence rates determined by active surveillance in four states during 1989–1991, 10,000–15,000 cases of invasive GAS occurred annually in the United States; necrotizing fasciitis occurred in 5%–10% of patients (case-fatality rate: 28%) (CDC, unpublished data, 1992). These findings were consistent with a retrospective review of all invasive GAS in Pima County, Arizona, during 1986–1990; in this review, necrotizing fasciitis was identified in 6.5% of infections (*1*). Interest in necrotiz-

Group A Streptococcal Infections — Continued

ing fasciitis as a serious manifestation of invasive GAS increased in 1989 following a report of 20 patients with group A streptococcal toxic-shock syndrome, of whom 11 had necrotizing fasciitis (*2*); a subsequent case definition for this syndrome included necrotizing fasciitis as one component (*3*). Since 1991, there has been no active surveillance for invasive GAS in the United States; although passive surveillance exists, this disease is not reportable in most states.

Development of invasive GAS appears to be facilitated by the presence of specific virulent strains and predisposing host factors. To evaluate the role of strain characteristics, CDC examined group A streptococcal isolates from surveillance for postulated virulence factors including M-type, protease activity, and pyrogenic exotoxin production (*4*). Protease activity was significantly associated with necrotizing fasciitis; M-type 1 infection also was associated with protease activity. These findings suggest that certain group A streptococcal strains are more likely to cause necrotizing fasciitis when infection occurs. Other reports suggest that the risk for invasive GAS is associated with the presence of surgical or nonsurgical wounds, diabetes mellitus, and other underlying medical problems.

Rapid treatment is necessary to reduce the risk for death, and penicillin remains the treatment of choice for GAS. Although penicillin resistance has never been identified in group A *Streptococcus*, some strains are resistant to erythromycin (which is recommended as therapy in penicillin-allergic patients). In addition to antibiotics, surgical intervention is usually needed in cases of necrotizing fasciitis. The occurrence of the cluster of necrotizing fasciitis in England and the recent recognition of a streptococcal toxic-shock syndrome underscore the potential for group A streptococci to cause severe illness and new clinical syndromes and the need to monitor clinical manifestations and changes in the epidemiology of these infections (*5*).

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Monthly Immunization Table

To track progress toward achieving the goals of the Childhood Immunization Initiative (CII), CDC publishes monthly a tabular summary of the number of cases of all diseases preventable by routine childhood vaccination reported during the previous month and year-to-date (provisional data). In addition, the table compares provisional data with final data for the previous year and highlights the number of reported cases among children aged ≤5 years, who are the primary focus of CII. Data in the table are derived from CDC's National Notifiable Diseases Surveillance System.

Number of reported cases of diseases preventable by routine childhood vaccination — United States, April 1994 and January–April 1993 and January–April 1994*

Disease	No. cases, April 1994	Total cases		No. cases among children aged <5 years†	
		1993	1994	1993	1994
Congenital rubella syndrome (CRS)	0	**5**	**3**	3	3
Diphtheria	0	**0**	**0**	0	0
Haemophilus influenzae§	106	**474**	**374**	161	110
Hepatitis B¶	1103	**3935**	**3682**	39	51
Measles	173	**103**	**272**	48	66
Mumps	146	**580**	**439**	99	52
Pertussis	212	**960**	**991**	548	541
Poliomyelitis, paralytic**	—	**—**	**—**	—	—
Rubella	48	**65**	**132**	12	11
Tetanus	3	**8**	**12**	0	1

*Data for 1993 are final and for 1994 are provisional.
†For 1993 and 1994, age data were available for 84% or more cases, except for 1993 age data for congenital rubella syndrome (CRS), which were available for 60% of cases.
§Invasive disease; *H. influenzae* serotype is not routinely reported to the National Notifiable Diseases Surveillance System.
¶Because most hepatitis B virus infections among infants and children aged <5 years are asymptomatic (although likely to become chronic), acute disease surveillance does not reflect the incidence of this problem in this age group or the effectiveness of hepatitis B vaccination in infants.
**No cases of suspected poliomyelitis have been reported in 1994; three cases of suspected poliomyelitis have been reported in 1993. Four of the five suspected cases with onset in 1992 were confirmed; the confirmed cases were vaccine associated.

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