CENTERS FOR DISEASE CONTROL

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Current Trends

Rubella and Congenital Rubella — United States, 1980-1983

RUBELLA

Although the incidence of reported rubella has fluctuated slightly over the past several years, a downward trend has been observed for most of the United States. A review of data for the period January 1, 1980, through September 24, 1983, indicates that if no sudden change in reporting patterns occurs, the final rubella incidence rate for 1983 should be at an all-time low.

In 1980, a total of 3,904 cases of rubella were reported to CDC; this represents an incidence of 1.7 cases per 100,000 population (Table 1). The 1981 incidence (0.9/100,000) was the lowest reported since rubella became a notifiable disease in 1966 (Figure 1); 2,077 cases were reported in 1981, a decline of 47% from the 1980 total. In 1982, 2,325 cases of rubella were reported in the United States (incidence 1.0/100,000)—a 12% increase over the

TABLE 1. Percentage distribution and estimated incidence rates* of reported rubella cases, by age group — United States, 1980-1982

Age group (years)	1980 No.	1980 %	1980 Rate	1981 No.	1981 %	1981 Rate	1982† No.	1982† %	1982† Rate	Percentage rate change 1980-1982
< 1	294§	10.0	11.0	287	17.1	9.9	177	8.5	5.4	−50.9
1-4	401§	13.6	4.1	339	20.3	3.2	249	12.0	2.0	−51.2
5-9	477	16.2	3.8	277	16.5	2.1	214	10.3	1.5	−60.5
10-14	390	13.2	2.8	153	9.1	1.0	155	7.4	1.0	−64.3
15-19	602	20.4	3.8	210	12.5	1.3	288	13.8	1.6	−57.9
20-24	438§	14.9	2.7	162	9.7	0.9	375	18.0	1.9	−29.6
25-29	165§	5.6	1.1	102	6.1	0.6	298	14.3	1.6	+45.4
≥ 30	177	6.0	0.2	144¶	8.6	0.2	327	15.7	0.3	+50.0
Total, known age	2,944	75.4	—	1,674	80.6	—	2,083	89.6	—	—
Total, unknown age	960	24.6	—	403	19.4	—	242	10.4	—	—
Total	3,904	100.0	1.7	2,077	100.0	0.9	2,325	100.0	1.0	−41.2

*Cases/100,000 population extrapolated from the age distribution of cases reported from 51 reporting areas in 1980-1982

†Provisional data

§Excludes Arizona

¶Excludes Illinois

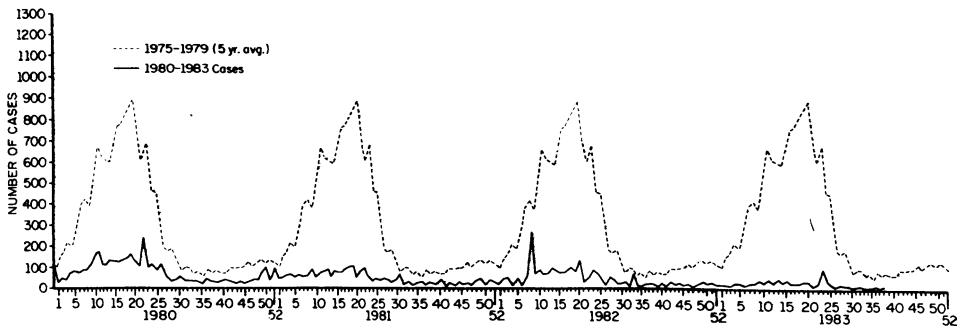
Rubella – Continued

1981 total. The increased occurrence in 1982 reflected an increase in cases of rubella in California, primarily among adolescent and young-adult populations and particularly in hospitals and universities. California, which reported almost three times as many cases in 1982 (1,437 cases) as in 1981 (533), accounted for 62% of all cases nationwide. In the rest of the nation, the number of reported rubella cases was 42% lower in 1982 than in 1981. In 1980, only one state reported no cases of rubella. Five states and the District of Columbia reported no cases in 1981, and seven states reported none in 1982. The number of counties reporting rubella declined from 676 (21.5% of all counties) in 1980, to 366 (15.7%) in 1981, to 494 (11.7%) in 1982.

During the first 38 weeks of 1983 (ending September 24, 1983), 791 cases were reported, a 61% decrease from the number reported during the same period in 1982. Sixteen states and the District of Columbia have reported no cases thus far in 1983, twice as many reporting areas as were free of rubella during the same period in 1982. Sixty percent of cases reported thus far in 1983 are from four reporting areas (California, Florida, New York City, Texas). Although the California cases alone currently account for 28% of the 1983 cases, rubella activity in California is down by 83% compared with 1982 figures from the same period.

The age-specific incidence rate of rubella in children under 15 years of age decreased over the past 3 years. While children under 5 years of age still had the highest overall incidence rate in 1982 (2.7 reported rubella cases per 100,000 population), they accounted for a lower proportion of all cases in 1982 (20%) than in 1981 (37%). In contrast, the incidence rate for those 15 years of age and older, noted to have been lower in 1981 (0.4/100,000) than in 1980 (1.0/100,000), increased somewhat in 1982 (0.8/100,000). Persons 15 years of age and older accounted for a much higher proportion of cases in 1982 (62%) than in 1981 (37%). Although between 1981 and 1982 the incidence rates increased for all age groups 15 years of age and older, the greatest increase occurred in the 25- to 29-year age group, which experienced almost a threefold increase in disease (Table 1). The increase in reported incidence rates for adolescents and young adults in 1982 over those reported in 1981 again reflects rubella activity in California; this state accounted for 74% of all 1982 cases in persons 15 years of age and older. If California cases are excluded, the incidence rates for persons 15 years of age and older decreased by 17% between 1981 and 1982. When rates for 1980 and 1982 are compared, age-specific incidence rates in 1982 were higher only for persons 25 years of age and older (a 50% increase); 1982 rates were lower for 15- to 24-year-olds.

FIGURE 1. United States: rubella incidence, 1975-1979 average, 1980-1983*



*Provisional data.

Rubella – Continued

CONGENITAL RUBELLA SYNDROME

Detailed reports of cases of congenital rubella syndrome (CRS), including clinical signs and laboratory results, are voluntarily submitted by local and state health departments to two different morbidity systems: the National Morbidity Reporting System (the reporting system for the MMWR) and the National Congenital Rubella Syndrome Registry (NCRSR), maintained at the Division of Immunization at CDC. Cases reported to the MMWR are reported without clinical and epidemiologic data and are counted by year of report. In contrast, cases reported to the NCRSR are classified according to specific criteria and are reported by year of birth.* Data for a given year are reported as provisional until at least 3 years have elapsed. According to the NCRSR, the incidence rates of confirmed and compatible CRS have declined substantially since 1979 (Figure 2). Fifty-five cases were reported in 1979, 14 were reported in 1980, and nine were reported in both 1981 and 1982. California reported seven of the nine cases in 1982 and is the only state that has reported cases in 1983 (three cases, all with estimated dates of conception in 1982). Almost all CRS cases continue to be reported within the first year of birth (*1*).

Reported by Surveillance and Investigations Section, Surveillance, Investigations, and Research Br, Div of Immunization, Center for Prevention Svcs, CDC.

Editorial Note: The goal of rubella vaccination programs is to prevent congenital rubella infection.† The vaccination strategy adopted by the United States in 1969, the year rubella vaccine was licensed, was aimed at controlling rubella in preschool and young school-aged children, the known reservoirs for rubella transmission. The intention was to thereby prevent exposure of susceptible, pregnant females to rubella virus (*2*). Accordingly, the primary target group for vaccine was children of both sexes. Secondary emphasis was placed on vaccinating susceptible adolescents and young adults, especially women. By 1977, vaccination of children 12 months of age and older had resulted in marked declines in reported rubella incidence in children and had interrupted the characteristic 6- to 9-year rubella epidemic cycle; however, this vaccination strategy had less effect on rubella incidence in persons 15 and over (i.e., childbearing age for women) (Table 2). Approximately 10%-20% of this latter population continued to be susceptible (*3-5*), a proportion similar to that of prevaccine years (*6*). Most importantly, reported endemic CRS continued at a low but constant level (*7*). When this problem was recognized, public health authorities targeted other groups for vaccination. Increased efforts were made to vaccinate junior and senior high school students and enforce rubella immunization requirements for school entry (*8*). Also, all susceptible military recruits began to receive rubella vaccine (*9*).

Published accounts of rubella outbreaks in hospitals have caused concern about the need to screen and/or vaccinate susceptible personnel (*10,11*). A number of states have considered requiring proof of rubella immunity for college entrance (*12*). These factors, combined with the 1977 Childhood Immunization Initiative and the 1978 Measles Elimination Initiative (which encouraged use of combined measles and rubella vaccine), have led to decreases in reported rubella cases in all age groups.

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*A confirmed case has at least one defect in A or B and laboratory confirmation of rubella infection. A compatible case has any two complications listed in A or one from A and one from B.

A. Cataracts/congenital glaucoma (either or both count as one); congenital heart disease, loss of hearing, pigmentary retinopathy.

B. Purpura, splenomegaly, jaundice (with onset beginning within 24 hours of birth), microcephaly, mental retardation, meningoencephalitis, radiolucent bone disease.

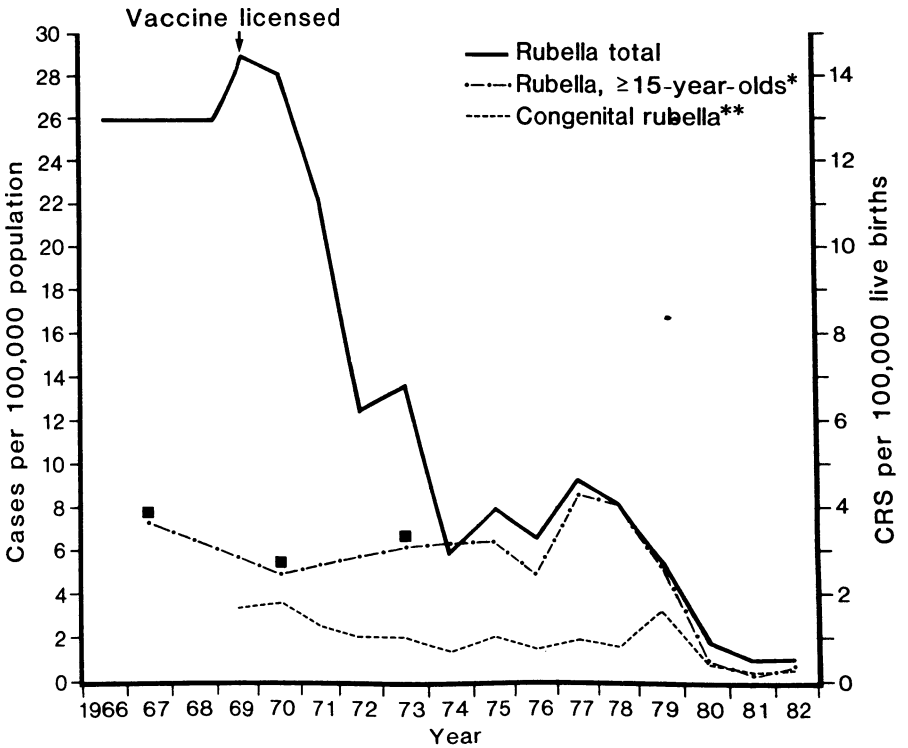
†Intrauterine infection that can result in miscarriages, abortions, stillbirths, and CRS in infants. Congenital rubella syndrome refers to infants born with defects secondary to intrauterine infection or who manifest symptoms or signs of intrauterine infection sometime after birth.

Rubella – Continued

The number of doses of rubella vaccine administered in the public sector to persons 15 years of age and older doubled between 1978 and 1981. By 1981, incidence rates for adolescents and young adults were lower than those for young children (Tables 1 and 2). Compared with rates for prevaccine years, by 1981 the overall reported incidence of rubella had declined by 96%, with a 90% or larger decrease in cases in all age groups. Predictably, the number of reported CRS cases started to decline further (Figure 2).

Although the increase in reported rubella incidence in older individuals in 1982 was not reported nationwide, outbreaks in this population can still occur. Until the susceptibility rate of postpubertal women is effectively lowered, CRS will continue to occur, each case at an estimated lifetime expenditure of $221,600 (*13*). While CRS will eventually be eliminated as currently young, vaccinated cohorts enter the childbearing years, the process is slow and costly in human life and health resources. Only nine CRS cases were reported in 1982; however, this figure represents only an estimated one-tenth of the total case count (*14*). The

FIGURE 2. Incidence rate of reported rubella cases and congenital rubella cases, United States, 1966-1982



*Includes proration of ≥ 15-year-olds with unknown ages.

**Rate per 100,000 births of confirmed and compatible cases of congenital rubella syndrome (CRS), by year of birth. Reporting for recent years is provisional, as cases may not be diagnosed until later in childhood.

■ Average annual U.S. estimate of rubella incidence in ≥ 15-year-olds, based on data from Illinois, Massachusetts, and New York City for the 3-year periods, 1966-1968, 1969-1971, and 1972-1974. Age-specific data were not available for U.S. totals until 1975.

Rubella – Continued

only effective means to rapidly eliminate CRS is to intensify efforts to vaccinate susceptible, postpubertal individuals.

Immunizing this population, especially women of childbearing age, will require a multifaceted approach (*15*). Some recommended activities include: (1) making the general public and health-care providers more aware of the dangers of rubella infection; (2) ensuring that patients are vaccinated as part of routine medical and gynecologic care; (3) ensuring vaccination of all women visiting family planning clinics; (4) ensuring vaccination of unimmunized women immediately after they undergo childbirth, miscarriage, or abortion; (5) vaccinating susceptible women identified by premarital serology; (6) vaccinating hospitalized women before discharge; (7) requiring proof of immunity (a positive serologic test or documented rubella vaccination) for college entry; and (8) requiring proof of immunity for all hospital personnel who might be exposed to patients with rubella or who might have contact with pregnant patients. These strategies, along with continued immunization of all school-aged children, will hasten the elimination of rubella and CRS in the United States.

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TABLE 2. Percentage distribution and incidence rates* of reported rubella cases,† by age group – Illinois, Massachusetts, and New York City, 1966-1968,§ 1975-1977,§ and 1980-1981§

Age group (years)	1966-1968¶ No.	%	Rate	1975-1977 No.	%	Rate	1980-1981 No.	%	Rate	Percentage rate change 1966-1981
< 5	1,294	21.6	63.3	160	9.8	9.8	81	30.0	4.9	−92.2
5-9	2,304	38.5	101.3	233	14.2	11.6	65	24.0	3.9	−96.2
10-14	1,020	17.0	44.0	229	13.9	11.2	45	16.6	2.4	−94.5
15-19	759	12.7	35.7	634	38.7	27.4	31	11.4	1.4	−96.1
≥ 20	610	10.2	3.7	384	23.4	2.3	49	18.1	0.3	−91.9
Total	5,987	100.0	24.3	1,640	100.0	6.7	271	100.1	1.1	−95.5

*Reported number of cases per 100,000 population

†Cases of unknown age excluded

§Yearly averages

¶Represents prevaccine years

Rubella – Continued

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Epidemiologic Notes and Reports

Group C Streptococcal Infections Associated with Eating Homemade Cheese — New Mexico

Between July 25 and September 9, 1983, 16 cases of invasive group C streptococcal infection were identified in northern New Mexico. The group C streptococcus was isolated from the blood of 15 patients and the pericardial fluid of one patient. The organism isolated from

(Continued on page 515)

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

Disease	39th Week Ending			Cumulative, 39th Week Ending		
	October 1, 1983	October 2, 1982	Median 1978-1982	October 1, 1983	October 2, 1982	Median 1978-1982
Aseptic meningitis	530	343	343	8,219	6,445	5,652
Encephalitis: Primary (arthropod-borne & unspec.)	60	66	58	1,215	1,109	896
Post-infectious	-	-	1	63	63	163
Gonorrhea: Civilian	16,390	20,102	21,532	666,127	716,809	745,038
Military	419	536	425	18,123	20,307	20,491
Hepatitis: Type A	456	489	611	15,946	16,849	20,934
Type B	424	447	360	17,035	16,070	13,229
Non A, Non B	64	55	N	2,503	1,747	N
Unspecified	178	235	235	5,854	6,518	7,635
Legionellosis	7	8	N	518	452	N
Leprosy	2	3	11	187	156	154
Malaria	35	26	26	618	838	838
Measles: Total*	48	9	24	1,284	1,279	12,206
Indigenous	40	N	N	1,065	N	N
Imported	8	N	N	219	N	N
Meningococcal infections: Total	30	34	34	2,142	2,328	2,066
Civilian	30	34	34	2,127	2,315	2,051
Military	-	-	-	15	13	15
Mumps	49	45	61	2,541	4,332	7,229
Pertussis	74	40	40	1,744	1,154	1,154
Rubella (German measles)	9	9	28	800	2,033	3,321
Syphilis (Primary & Secondary): Civilian	589	600	607	24,083	24,663	19,903
Military	7	6	10	304	324	245
Toxic-shock syndrome	8	N	N	304	N	N
Tuberculosis	520	582	585	17,519	18,988	20,196
Tularemia	4	12	4	247	196	167
Typhoid fever	12	4	16	313	298	374
Typhus fever, tick-borne (RMSF)	17	27	27	1,073	867	942
Rabies, animal	97	116	116	4,500	4,838	4,838

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1983		Cum. 1983
Anthrax	-	Plague	34
Botulism: Foodborne	14	Poliomyelitis: Total	4
Infant	47	Paralytic	4
Other	-	Psittacosis (Kans. 1)	94
Brucellosis (Mo. 1, Va. 1, Calif. 1)	149	Rabies, human	2
Cholera	1	Tetanus (Minn. 1, W.Va. 1, N.C. 1, Ariz. 1)	62
Congenital rubella syndrome (Ark. 1)	18	Trichinosis	27
Diphtheria	3	Typhus fever, flea-borne (endemic, murine) (Tex. 1)	42
Leptospirosis	37		

*One of the 48 reported cases for this week was imported from a foreign country or can be directly traceable to a known internationally imported case within two generations.

TABLE III. Cases of specified notifiable diseases, United States, weeks ending October 1, 1983 and October 2, 1982 (39th week)

Reporting Area	Aseptic Meningitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy	Malaria
		Primary	Post-infectious			A	B	NA,NB	Unspecified			
	1983	Cum. 1983	Cum. 1983	Cum. 1983	Cum. 1982	1983	1983	1983	1983	1983	Cum. 1983	Cum. 1983
UNITED STATES	530	1,215	63	666,127	716,809	456	424	64	178	7	187	618
NEW ENGLAND	14	49	-	17,310	17,316	14	36	5	22	-	3	28
Maine	1	-	-	837	886	-	-	-	-	-	-	1
N.H.	-	5	-	553	584	-	1	-	-	-	2	-
Vt.	-	1	-	335	325	3	-	-	-	-	-	1
Mass.	5	22	-	7,326	7,905	5	11	-	22	-	-	13
R.I.	-	1	-	959	1,147	2	2	-	-	-	-	4
Conn.	8	20	-	7,300	6,469	4	22	5	-	-	1	9
MID ATLANTIC	94	97	5	84,572	88,869	71	42	3	16	-	24	82
Upstate N.Y.	45	25	-	13,513	14,751	9	2	2	3	-	-	26
N.Y. City	19	10	-	33,980	36,324	32	12	-	5	-	23	21
N.J.	-	16	-	15,836	16,166	14	12	-	7	-	-	22
Pa.	30	46	5	21,243	21,628	16	16	1	1	-	1	13
E.N. CENTRAL	176	430	20	92,423	103,532	57	42	8	19	3	6	49
Ohio	41	141	9	25,196	27,636	29	5	3	8	-	1	7
Ind.	12	157	1	9,236	12,415	7	12	-	3	1	-	7
Ill.	-	17	7	23,576	29,789	3	-	1	2	-	2	16
Mich.	123	83	-	25,863	24,493	18	25	4	6	2	3	14
Wis.	-	32	3	8,552	9,199	-	-	-	-	-	-	5
W.N. CENTRAL	41	93	9	31,051	33,922	16	24	2	4	-	6	24
Minn.	-	19	1	4,457	4,915	6	2	2	-	-	4	6
Iowa	8	50	-	3,528	3,571	-	4	-	2	-	-	3
Mo.	25	19	-	14,785	16,173	1	14	-	-	-	1	5
N. Dak.	-	-	-	333	447	-	-	-	-	-	-	2
S. Dak.	-	-	2	821	913	5	-	-	-	-	-	1
Nebr.	1	4	-	2,004	2,001	-	1	-	2	-	-	1
Kans.	7	1	6	5,123	5,902	4	3	-	-	-	1	6
S. ATLANTIC	87	179	15	173,559	188,859	26	74	10	10	1	9	101
Del.	1	-	-	3,143	2,983	-	6	-	-	-	-	1
Md.	25	18	-	22,412	23,643	4	24	2	2	1	1	19
D.C.	-	-	-	11,872	10,986	-	1	-	-	-	-	15
Va.	17	41	2	15,812	14,832	3	7	3	3	-	1	22
W. Va.	2	38	-	1,912	2,122	1	2	-	-	-	-	1
N.C.	19	36	-	26,876	29,754	2	8	-	3	-	-	3
S.C.	5	4	-	16,306	18,343	4	3	-	-	-	-	5
Ga.	-	7	1	34,202	37,501	-	-	-	-	-	1	9
Fla.	18	35	12	41,024	48,695	12	23	5	2	-	6	26
E.S. CENTRAL	29	56	1	55,698	62,188	33	36	2	1	-	-	11
Ky.	22	12	-	6,626	8,403	27	7	1	-	-	-	1
Tenn.	5	16	-	23,082	24,497	3	17	1	1	-	-	-
Ala.	-	22	-	16,781	18,330	2	4	-	-	-	-	6
Miss.	2	6	1	9,209	10,958	1	8	-	-	-	-	4
W.S. CENTRAL	23	130	2	95,680	98,456	96	37	-	75	2	26	54
Ark.	1	6	-	7,602	8,174	-	2	-	-	-	-	1
La.	1	17	-	18,525	17,598	24	12	-	5	1	1	8
Okla.	7	25	1	10,995	10,842	18	5	-	4	1	-	10
Tex.	14	82	1	58,558	61,842	54	18	-	66	-	25	35
MOUNTAIN	15	54	4	21,465	24,165	39	20	9	8	1	12	24
Mont.	-	2	-	889	994	1	-	-	-	1	-	-
Idaho	-	1	-	948	1,174	5	-	-	-	-	-	2
Wyo.	-	2	-	556	704	1	-	-	-	-	-	1
Colo.	10	30	-	6,004	6,559	6	4	2	1	-	2	8
N. Mex.	3	1	-	2,629	3,156	3	3	1	-	-	-	5
Ariz.	1	8	4	6,119	6,315	15	8	4	7	-	9	5
Utah	-	10	-	1,025	1,178	1	-	1	-	-	1	3
Nev.	1	-	-	3,295	4,085	7	5	1	-	-	-	-
PACIFIC	51	127	7	94,369	99,502	104	113	25	23	-	101	245
Wash.	5	12	1	7,152	8,492	3	3	1	-	-	15	11
Oreg.	-	-	3	5,063	5,977	18	5	2	2	-	1	9
Calif.	37	107	3	77,788	80,638	82	104	22	20	-	57	224
Alaska	1	-	-	2,509	2,490	-	-	-	-	-	-	-
Hawaii	8	8	-	1,857	1,905	1	1	-	1	-	28	1
Guam	U	-	-	87	106	U	U	U	U	U	-	2
P.R.	8	1	1	1,893	2,090	19	14	-	10	-	-	2
V.I.	U	-	-	188	210	U	U	U	U	U	-	-
Pac. Trust Terr.	U	-	-	-	338	U	U	U	U	U	-	-

N: Not notifiable U: Unavailable

TABLE III. (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending October 1, 1983 and October 2, 1982 (39th week)

Reporting Area	Measles (Rubeola)					Menin-gococcal Infections	Mumps			Pertussis			Rubella		
	Indigenous		Imported*		Total										
	1983	Cum. 1983	1983	Cum. 1983	Cum. 1982	Cum. 1983	1983	Cum. 1983	Cum. 1982	1983	Cum. 1983	Cum. 1982	1983	Cum. 1983	Cum. 1982
UNITED STATES	40	1,065	8	219	1,279	2,142	49	2,541	4,332	74	1,744	1,154	9	800	2,033
NEW ENGLAND	-	2	-	14	14	110	2	106	169	1	56	46	-	13	16
Maine	-	-	-	-	-	8	-	16	41	-	4	4	-	-	-
N.H.	-	-	-	3	3	3	-	21	16	1	7	4	-	4	10
Vt.	-	-	-	-	2	7	-	14	7	-	8	2	-	3	-
Mass.	-	2	-	3	3	37	1	26	72	-	31	20	-	6	2
R.I.	-	-	-	-	-	9	-	13	15	-	5	11	-	-	1
Conn.	-	-	-	8	6	46	1	16	18	-	1	5	-	-	3
MID ATLANTIC	-	70	7	33	158	359	2	205	273	8	324	228	-	135	99
Upstate N.Y.	-	1	2 §†	11	109	114	1	78	63	1	102	90	-	26	49
N.Y. City	-	43	5 §	18	41	68	-	33	46	4	51	33	-	86	32
N.J.	-	26	-	1	4	55	1	36	40	-	19	21	-	3	17
Pa.	-	-	-	3	4	122	-	58	124	3	152	84	-	20	1
E.N. CENTRAL	34	627	-	56	77	390	11	1,205	2,274	9	369	253	2	111	180
Ohio	-	72	-	13	1	116	1	541	1,566	7	127	74	-	2	-
Ind.	-	396	-	4	2	46	-	35	37	-	48	17	-	23	27
Ill.	34	157	-	33	24	118	5	129	260	1	110	103	1	47	66
Mich.	-	2	-	5	50	67	5	429	303	1	33	22	1	16	49
Wis.	-	-	-	1	-	43	-	71	108	-	51	37	-	23	38
W.N. CENTRAL	-	-	1	7	49	122	-	141	562	3	105	60	1	39	58
Minn.	-	-	-	-	-	18	-	27	437	2	40	25	-	8	5
Iowa	-	-	-	-	-	13	-	37	32	-	6	6	-	-	-
Mo.	-	-	-	1	2	62	-	21	10	-	15	14	-	-	38
N. Dak.	-	-	-	-	-	4	-	-	-	-	1	-	-	-	-
S. Dak	-	-	-	-	-	4	-	-	1	-	7	5	-	-	1
Nebr.	-	-	-	-	3	1	-	2	-	-	-	1	-	-	-
Kans.	-	-	1 §	6	44	20	-	54	82	1	36	9	1	31	14
S. ATLANTIC	1	170	-	31	42	443	7	175	255	4	205	211	1	94	77
Del.	-	-	-	-	-	11	-	8	12	-	3	6	-	-	1
Md.	-	6	-	4	3	43	3	29	29	-	17	51	-	3	34
D.C.	-	-	-	-	1	5	-	-	-	-	-	1	-	-	-
Va.	-	10	-	13	14	64	1	31	34	-	46	24	1	3	12
W. Va.	-	-	-	-	3	2	2	44	90	2	9	7	-	-	1
N.C.	-	-	-	1	-	86	-	10	13	-	26	34	-	10	1
S.C.	-	-	-	4	-	46	1	10	16	-	13	16	-	1	1
Ga.	-	8	-	-	-	72	-	43	16	-	56	34	-	11	12
Fla.	1	146	-	9	21	114	-	-	45	2	35	38	-	66	15
E.S. CENTRAL	-	1	-	5	7	132	1	49	49	1	27	45	-	14	45
Ky.	-	-	-	1	1	27	-	21	16	-	11	5	-	13	27
Tenn.	-	-	-	-	6	44	1	23	19	-	6	24	-	-	2
Ala.	-	1	-	4	-	39	-	2	8	-	5	5	-	1	-
Miss.	-	-	-	-	-	22	-	3	6	1	5	11	-	-	16
W.S. CENTRAL	-	39	-	35	48	225	4	214	182	24	357	85	2	110	104
Ark.	-	5	-	8	-	17	-	2	7	-	17	3	-	-	1
La.	-	-	-	25	2	44	-	45	6	-	7	18	-	9	1
Okla.	-	1	-	-	27	27	-	-	-	19	256	5	-	-	3
Tex.	-	33	-	2	19	137	4	167	169	5	77	59	2	101	99
MOUNTAIN	-	-	-	3	21	85	15	119	90	17	190	59	2	34	77
Mont.	-	-	-	-	-	16	-	2	3	-	1	1	2	7	5
Idaho	-	-	-	-	-	6	-	6	4	-	15	11	-	8	6
Wyo.	-	-	-	-	1	2	-	-	2	-	6	3	-	4	7
Colo.	-	-	-	2	8	29	14	28	17	13	118	16	-	1	6
N. Mex.	-	-	-	-	-	7	-	-	-	-	12	6	-	-	6
Ariz.	-	-	-	1	12	16	1	72	38	4	22	21	-	6	14
Utah	-	-	-	-	-	8	-	6	20	-	16	1	-	7	21
Nev.	-	-	-	-	-	1	-	5	6	-	-	-	-	1	12
PACIFIC	5	156	-	35	863	276	7	327	478	7	111	167	1	250	1,377
Wash.	-	1	-	4	40	39	-	40	64	-	16	20	-	12	38
Oreg.	-	7	-	2	12	41	-	-	-	1	7	27	-	13	6
Calif.	5	147	-	27	805	187	7	258	395	6	81	92	1	223	1,321
Alaska	-	-	-	2	1	2	-	13	8	-	4	-	-	1	5
Hawaii	-	1	-	-	5	7	-	16	11	-	3	28	-	1	7
Guam	U	1	U	1	6	1	U	1	5	U	-	-	U	-	2
P.R.	-	94	-	-	113	11	1	115	61	-	11	21	-	4	11
V.I.	U	-	U	5	-	-	U	-	3	U	-	-	U	2	1
Pac. Trust Terr.	U	-	U	-	-	-	U	-	5	U	-	-	U	-	-

*For measles only, imported cases includes both out-of-state and international importations. U: Unavailable †International §Out-of-state

TABLE III. (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending October 1, 1983 and October 2, 1982 (39th week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1983	Cum. 1982	1983	1983	Cum. 1983	Cum. 1983	Cum. 1983	Cum. 1983	Cum. 1983
UNITED STATES	24,083	24,663	8	520	17,519	247	313	1,073	4,500
NEW ENGLAND	508	428	-	22	500	4	11	6	30
Maine	18	4	-	-	27	-	-	-	8
N.H.	18	5	-	-	31	-	-	1	4
Vt.	1	2	-	1	10	-	-	-	1
Mass.	313	285	-	7	259	3	9	2	11
R.I.	16	19	-	6	41	1	-	-	-
Conn.	142	113	-	8	132	-	2	3	6
MID ATLANTIC	3,083	3,379	2	106	3,127	1	55	25	207
Upstate N.Y.	221	367	-	12	525	1	7	6	68
N.Y. City	1,850	2,008	-	46	1,227	-	19	2	-
N.J.	609	461	-	8	659	-	23	8	24
Pa.	403	543	2	40	716	-	6	9	115
E.N. CENTRAL	1,206	1,508	3	76	2,381	3	49	79	412
Ohio	336	228	1	10	376	-	13	43	51
Ind.	90	156	-	10	267	-	3	14	28
Ill.	525	831	1	30	1,017	1	23	14	220
Mich.	188	220	1	22	598	1	10	7	15
Wis.	67	73	-	4	123	1	-	1	98
W.N. CENTRAL	295	417	-	17	549	78	9	51	657
Minn.	114	90	-	9	113	-	2	-	116
Iowa	18	24	-	1	48	-	-	-	161
Mo.	109	244	-	6	274	54	6	25	90
N. Dak.	2	7	-	-	6	-	-	1	66
S. Dak.	11	1	-	-	32	8	-	5	96
Nebr.	12	11	-	-	20	8	-	3	59
Kans.	29	40	-	1	56	8	1	17	69
S. ATLANTIC	6,513	6,703	-	111	3,580	13	50	449	1,501
Del.	28	17	-	2	49	-	-	4	5
Md.	453	362	-	13	294	5	8	40	613
D.C.	284	367	-	5	146	-	3	-	1
Va.	439	455	-	9	361	1	13	60	537
W. Va.	20	22	-	-	106	-	2	12	104
N.C.	622	539	-	-	511	6	4	187	20
S.C.	411	403	-	16	328	-	2	77	25
Ga.	1,172	1,401	-	32	677	1	2	65	174
Fla.	3,084	3,137	-	34	1,108	-	16	4	22
E.S. CENTRAL	1,670	1,712	-	15	1,543	17	8	99	307
Ky.	125	98	-	-	377	1	3	22	69
Tenn.	462	484	-	-	465	11	1	47	169
Ala.	656	633	-	11	408	-	1	23	69
Miss.	427	497	-	4	293	5	3	7	-
W.S. CENTRAL	6,271	6,429	1	81	2,102	102	44	349	860
Ark.	151	158	-	14	252	63	2	36	147
La.	1,324	1,448	-	21	286	3	3	1	27
Okla.	161	138	1	9	196	28	2	223	87
Tex.	4,635	4,685	-	37	1,368	8	37	89	599
MOUNTAIN	511	608	1	7	459	23	12	13	194
Mont.	7	4	-	-	41	5	1	6	66
Idaho	7	24	-	-	23	2	-	2	13
Wyo.	10	16	-	1	11	5	-	2	11
Colo.	124	170	1	1	57	3	1	-	20
N. Mex.	142	149	-	2	89	3	1	-	9
Ariz.	123	129	-	-	185	1	7	1	33
Utah	20	19	-	-	30	3	1	1	8
Nev.	78	97	-	3	23	1	1	1	34
PACIFIC	4,026	3,479	1	85	3,278	6	75	2	332
Wash.	127	124	-	3	189	2	3	-	2
Oreg.	111	88	-	4	139	2	3	-	1
Calif.	3,719	3,176	1	74	2,726	2	67	2	314
Alaska	12	10	-	-	42	-	-	-	15
Hawaii	57	81	-	4	182	-	2	-	-
Guam	-	1	U	U	4	-	-	-	-
P.R.	648	547	-	-	363	-	-	-	46
V.I.	16	25	U	U	2	-	-	-	-
Pac. Trust Terr.	-	-	U	U	-	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending October 1, 1983 (39th week)

Reporting Area	All Causes, By Age (Years)						P&I** Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	687	451	152	51	17	16	39
Boston, Mass.	190	100	55	23	4	8	13
Bridgeport, Conn.	40	25	12	-	3	-	4
Cambridge, Mass.	35	22	9	4	-	-	3
Fall River, Mass.	30	24	5	1	-	-	2
Hartford, Conn.	83	59	12	6	3	3	-
Lowell, Mass.	21	16	3	2	-	-	-
Lynn, Mass.	17	14	3	-	-	-	-
New Bedford, Mass.	22	19	2	1	-	-	-
New Haven, Conn.	53	35	8	5	3	2	3
Providence, R.I.	52	36	11	4	-	1	1
Somerville, Mass.	6	5	1	-	-	-	-
Springfield, Mass.	46	32	14	-	-	-	5
Waterbury, Conn.	34	25	6	2	1	-	3
Worcester, Mass.	58	39	11	3	3	2	5
MID. ATLANTIC	2,399	1,611	513	162	54	59	86
Albany, N.Y.	50	35	10	2	1	2	-
Allentown, Pa.	20	16	4	-	-	-	-
Buffalo, N.Y.	128	85	29	7	4	3	13
Camden, N.J.	41	21	9	9	1	1	1
Elizabeth, N.J.	34	24	9	1	-	-	2
Erie, Pa.†	43	33	7	3	-	-	1
Jersey City, N.J.	45	32	9	2	2	-	1
N.Y. City, N.Y.	1,330	885	278	96	30	41	33
Newark, N.J.	74	36	20	13	4	1	3
Paterson, N.J.	25	16	7	1	-	1	-
Philadelphia, Pa.†	152	99	39	7	2	5	9
Pittsburgh, Pa.†	60	39	15	5	-	1	3
Reading, Pa.	33	24	7	1	-	1	4
Rochester, N.Y.	120	93	19	3	4	1	7
Schenectady, N.Y.	31	20	7	2	2	-	2
Scranton, Pa.†	26	20	5	-	-	1	2
Syracuse, N.Y.	93	66	17	6	3	1	2
Trenton, N.J.	44	27	15	2	-	-	2
Utica, N.Y.	24	19	4	-	1	-	-
Yonkers, N.Y.	26	21	3	2	-	-	1
E.N. CENTRAL	2,141	1,396	493	133	56	63	63
Akron, Ohio	57	36	11	6	2	2	-
Canton, Ohio	43	28	14	1	-	-	1
Chicago, Ill.	461	297	97	39	22	6	16
Cincinnati, Ohio	159	103	44	4	2	6	8
Cleveland, Ohio	164	95	44	8	4	13	2
Columbus, Ohio	135	82	31	10	4	8	4
Dayton, Ohio	103	72	27	1	2	1	3
Detroit, Mich.	234	133	56	32	5	8	7
Evansville, Ind.	42	30	10	1	-	1	1
Fort Wayne, Ind.	59	39	16	3	-	1	2
Gary, Ind.	7	3	3	1	-	-	-
Grand Rapids, Mich.	79	61	9	4	-	5	1
Indianapolis, Ind.	159	91	48	7	5	8	1
Madison, Wis.	40	24	9	6	1	-	2
Milwaukee, Wis.	134	96	31	3	2	2	4
Peoria, Ill.	28	16	11	1	-	-	1
Rockford, Ill.	45	31	9	2	3	-	1
South Bend, Ind.	44	35	8	-	1	-	3
Toledo, Ohio §	87	82	-	2	1	2	2
Youngstown, Ohio	61	42	15	2	2	-	4
W.N. CENTRAL	721	487	143	31	26	33	32
Des Moines, Iowa	68	46	13	5	3	1	1
Duluth, Minn.	27	20	4	-	2	1	2
Kansas City, Kans.	31	18	8	3	2	-	1
Kansas City, Mo.	123	78	31	4	3	6	3
Lincoln, Nebr.	32	24	2	2	2	2	1
Minneapolis, Minn.	90	55	16	6	4	9	3
Omaha, Nebr.	78	57	13	1	2	5	3
St. Louis, Mo.	136	95	31	5	3	2	7
St. Paul, Minn.	72	51	11	2	4	4	2
Wichita, Kans.	64	43	14	3	1	3	9
S. ATLANTIC	1,081	638	251	100	36	56	32
Atlanta, Ga.	127	63	36	14	4	10	2
Baltimore, Md.	180	102	47	19	4	8	3
Charlotte, N.C.	76	43	21	7	3	2	-
Jacksonville, Fla.	95	60	18	10	4	3	2
Miami, Fla.	112	71	21	9	3	8	3
Norfolk, Va.	46	30	6	6	1	3	3
Richmond, Va.	63	36	22	2	1	2	2
Savannah, Ga.	47	27	10	2	4	4	2
St. Petersburg, Fla.	81	67	10	2	1	1	5
Tampa, Fla.	54	33	8	7	4	2	2
Washington, D.C.	162	79	47	21	5	10	7
Wilmington, Del.	38	27	5	1	2	3	1
E.S. CENTRAL	661	405	175	34	23	24	20
Birmingham, Ala.	100	53	29	5	5	8	1
Chattanooga, Tenn.	48	29	15	2	1	1	-
Knoxville, Tenn.	44	32	9	1	1	1	2
Louisville, Ky.	100	59	28	9	-	4	5
Memphis, Tenn.	137	90	34	5	6	2	5
Mobile, Ala.	49	28	12	3	4	2	2
Montgomery, Ala.	42	26	11	3	1	1	2
Nashville, Tenn.	141	88	37	6	5	5	3
W.S. CENTRAL	1,178	678	305	91	56	48	34
Austin, Tex.	75	52	13	6	2	2	3
Baton Rouge, La.	38	20	8	3	3	4	-
Corpus Christi, Tex.	36	23	11	1	1	-	3
Dallas, Tex.	185	102	52	16	12	3	3
El Paso, Tex.	48	25	12	4	5	2	2
Fort Worth, Tex.	78	48	20	5	1	4	4
Houston, Tex.	215	111	59	23	15	7	3
Little Rock, Ark.	52	27	17	4	1	3	1
New Orleans, La.	136	76	43	10	3	4	2
San Antonio, Tex.	148	89	38	10	5	6	12
Shreveport, La.	80	47	16	2	6	9	1
Tulsa, Okla.	87	58	16	7	2	4	-
MOUNTAIN	615	380	141	44	26	24	32
Albuquerque, N.Mex.	71	40	17	5	5	4	4
Colo. Springs, Colo.	38	23	8	4	1	2	8
Denver, Colo.	96	64	22	7	1	2	1
Las Vegas, Nev.	64	38	15	6	3	2	4
Ogden, Utah	29	20	4	1	1	3	3
Phoenix, Ariz.	145	83	36	13	9	4	4
Pueblo, Colo.	24	15	8	-	1	-	-
Salt Lake City, Utah	58	36	12	4	-	6	2
Tucson, Ariz.	90	61	19	4	5	1	6
PACIFIC	1,708	1,100	370	115	63	59	80
Berkeley, Calif.	14	10	2	2	-	-	-
Fresno, Calif.	66	43	11	3	4	5	9
Glendale, Calif.	27	21	-	5	1	-	2
Honolulu, Hawaii	57	30	20	2	2	3	4
Long Beach, Calif.	90	62	18	4	5	1	4
Los Angeles, Calif.	525	334	121	39	19	12	14
Oakland, Calif.	86	49	23	6	3	5	2
Pasadena, Calif.	35	21	5	5	3	1	1
Portland, Oreg.	105	74	19	3	6	3	3
Sacramento, Calif.	62	35	17	4	2	4	3
San Diego, Calif.	129	77	33	10	5	4	12
San Francisco, Calif.	131	85	29	10	1	6	6
San Jose, Calif.	142	99	26	8	6	2	11
Seattle, Wash.	139	98	22	11	3	5	3
Spokane, Wash.	43	24	13	1	1	4	6
Tacoma, Wash.	57	38	11	2	2	4	-
TOTAL	11,191††	7,146	2,543	761	357	382	418

* 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 4 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

†† Total includes unknown ages.

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

Streptococcal Infections – Continued

14 of the patients has been identified as a group C β-hemolytic streptococcus—species *Streptococcus zooepidemicus*; the species of the remaining two isolates have not yet been determined. Ages of the 16 patients ranged from 19 to 89 years (median 74); 10 were male. All patients were Hispanic.

In general, the clinical syndrome was characterized by fever, chills, and vague constitutional symptoms. However, five patients had localized signs of infection, including pneumonia, endocarditis and meningitis, pericarditis, and abdominal pain that led to a cholecystectomy for one patient and an appendectomy for another patient. Two patients with multiple underlying medical problems died.

A case-control study was undertaken to identify possible risk factors for contracting group C streptococcal infections. Patients and controls were matched for age, sex, ethnicity, and neighborhood of residence. Some of the possible risk factors investigated included underlying illnesses, immunosuppressive medications, animal exposure, group activities, restaurants visited, and food items consumed. Initial questionnaires identified eating "queso blanco," a homemade white cheese, as the only risk factor associated with illness (10 of 15 case patients versus 7 of 45 controls, $p < 0.001$). During subsequent discussions, four of the five patients who did not report in the case-control study that they had eaten the homemade cheese later remembered that they had consumed the cheese before the onset of illness. Thus, only one patient did not recall having eaten the cheese before becoming ill.

The sole source of the homemade cheese consumed by the patients was an ungraded, small (seven cows), family dairy farm in northern New Mexico. At the farm, the cheese was made from raw cows' milk and was not subsequently aged. It was distributed to several stores in northern New Mexico within 24-48 hours after preparation in the family kitchen. Milk samples from the cows and cheese samples from the stores were obtained for microbiologic analysis. Group C β-hemolytic streptococci, species *S. zooepidemicus*, have been isolated from multiple samples of each.

Public health control measures included closing the dairy operation, removing the cheese from the stores, and advising the public to dispose of any "queso blanco" purchased from the stores that sold the implicated product. No new cases of group C streptococcal infections have been identified since these interventions were implemented.

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Editorial Note: Group C streptococci are a common cause of infection in several animal species but are generally considered to be a rare cause of infection in humans (*1*). Of the four species of group C streptococci, *S. equisimilis* has been reported to cause most human illnesses, including bacteremia, endocarditis, meningitis, pneumonia, epiglottitis, puerperal sepsis, and wound infections. However, *S. zooepidemicus* has been associated with two outbreaks of pharyngitis and nephritis in Europe (*2,3*). While pharyngitis was not a part of the clinical syndrome in the outbreak reported here, it is too early to tell if poststreptococcal glomerulonephritis will develop.

In both of the European outbreaks, unpasteurized milk was suspected as the source of infection. The outbreak reported here is the first epidemic of group C streptococcal infections in the United States and is the first such reported outbreak in which the vehicle—cheese made from unpasteurized cows' milk—has been epidemiologically implicated. Although *S. zooepidemicus* and *S. equisimilis* are rarely reported causes of mastitis in cows, the cause of

Streptococcal Infections – Continued

this outbreak was contaminated milk from cows with mammary infections due to *S. zooepidemicus*.

Because few laboratories routinely determine the species of group C streptococci, the number of human infections due to *S. zooepidemicus* is not known. Furthermore, group C streptococci may be mistakenly identified as group A strains if only bacitracin susceptibility testing is done to differentiate group A streptococci from other β-hemolytic streptococci. It is impractical for clinical laboratories to routinely determine the serogroup and species of all β-hemolytic streptococci isolated from all sites. However, serogroups of β-hemolytic streptococci and species of group C strains isolated from blood and other normally sterile sites should be identified if further information is to be gained about the epidemiology of such infections.

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Interstate Outbreak of Drug-Resistant Tuberculosis Involving Children — California, Montana, Nevada, Utah

As of September 30, six cases of tuberculosis (TB) and an additional 53 persons with significant reactions* to the tuberculin skin test have been identified in an outbreak of TB in California, Montana, Nevada, and Utah.

In November 1982, a 19-month-old child in Missoula, Montana, was diagnosed as having TB based on hilar adenopathy on chest radiograph and a significant tuberculin skin test reaction. The child's only known contact with a person having a history of TB was with a 30-year-old woman who was a close family friend and the child's babysitter.

The woman submitted to diagnostic evaluation in February 1983. Her chest film showed a 5-cm right apical cavity. A sputum culture yielded *Mycobacterium tuberculosis*; 50% of the organisms were resistant to isoniazid (INH). Subsequently, this patient's husband was found to have a large lesion in the right pleura and was sputum-culture positive for *M. tuberculosis* sensitive to INH. *M. tuberculosis* isolates from both the woman and her husband were identified as phage type 2 (7, 12, 13).

The woman had many social contacts. Besides working as a babysitter and having part-time jobs that brought her into frequent contact with the public, she was extremely active in a variety of church, community, and school activities. As part of the investigation, over 1,000 persons have been skin tested in Montana. These include over 200 persons who had identifiable contact with the woman, as well as over 500 persons who belonged to groups potentially exposed to her.

Three other cases were identified. All were in children 3-4 years of age who had significant tuberculin skin test reactions and pulmonary infiltrates and/or respiratory symptoms. For these three cases, the exposure to the woman was either through babysitting or family visits.

*A significant reaction to the tuberculin skin test is one accepted by the American Thoracic Society and CDC as indicating tuberculous infection (*1*). In this outbreak, reactions of ≥ 5 mm induration among contacts of a patient with tuberculosis were considered to be significant.

Tuberculosis -- Continued

All patients are being treated with multiple drugs to which the INH-resistant organisms are susceptible.

To date, 37 reactors (persons with significant tuberculin skin test reactions) have been identified in Montana. Of these, 31 had identifiable contact with the 30-year-old woman. The remaining six reactors had contact with the other cases. All reactors are taking rifampin as preventive therapy. Nine other reactors in Nevada and Utah and one reactor in California have been identified, all among relatives and friends of the woman. Contacts have also been identified in Illinois, Oklahoma, Washington, and Wyoming; to date none of these contacts who have been skin tested have shown a significant reaction.

Investigation of the woman's medical history revealed that in January 1979 in Nevada, she had been diagnosed as having TB; at the time, she had a 3-cm right apical cavity and a sputum culture that yielded *M. tuberculosis* sensitive to INH. She was treated with INH and ethambutol. After diagnosis of her illness, an additional 11 persons in Utah and Nevada were identified as having significant tuberculin skin test reactions; all reactors were relatives or friends of the woman. Eight months after diagnosis, she moved to Missoula, Montana, with a 3-month supply of medicine. However, she did not complete her course of treatment.

Of the six cases in the outbreak, four patients (67%) are under 15 years of age. Of the 53 reactors who have also been identified, 25 (47%) are under 15 years of age. Thus, nearly half (29/59) of the infected persons are children.

Still pending is an analysis to determine reactor rates for persons in different exposure categories and reactor rates by duration of exposure to the presumed source of infection.

Reported by HA Renteln, MD, J Chin, MD, State Epidemiologist, California Dept of Health Svcs; Y Bradford, H Ezell, B Finley, D Lang, E Montgomery, W Newcomer, M Taylor, J Veleber, Missoula City-County Health Dept, D Bean, B Desonia, E Kelly, R Nelson, R Paulsen, F Sweeney, J Gedrose, State Epidemiologist, Montana State Dept of Health and Environmental Sciences; J Brophy, C Hess, D Knesek, M Meador, G Reynolds, MD, Acting State Epidemiologist, Nevada State Dept of Human Resources; D Forster-Burke, MA Miller, Tooele County Health Dept, E Butler, B Holmes, BL Larson, A Nelson, RE Johns Jr, MD, State Epidemiologist, Utah State Dept of Health; Div of Tuberculosis Control, Center for Prevention Svcs, CDC.

Editorial Note: This outbreak has several important facets. The first is that of drug resistance. While it is difficult to pinpoint the reason why INH resistance developed in the woman presumed to be the source of infection, probably the most important factor was that the patient failed to complete her treatment. Patients being treated for TB should be carefully monitored for compliance until the recommended course of therapy is completed.

Of note was the fact that both the woman and her husband had the same *M. tuberculosis* phage type, while only the woman had INH-resistant organisms. Her husband may have been infected before her organisms became resistant. Although only the woman has bacteriologically confirmed INH-resistant TB, there is a high probability that the four children with TB were infected with INH-resistant organisms. Therefore, they were placed on therapy with a combination of drugs to which the INH-resistant organisms are sensitive.

Since there is also a relatively high probability that reactors without disease have been infected with INH-resistant organisms, these individuals have been given rifampin as preventive therapy. Although the efficacy of preventive therapy with rifampin has not been demonstrated in controlled trials, the results of a study using the Delphi technique and decision analysis to determine the choice of preventive treatment for INH-resistant tuberculous infection support the use of rifampin (*2*). This outbreak is the largest in which rifampin has been used as an alternative regimen to prevent TB.

Another notable aspect of this outbreak is the large number of infected children, including four with TB and 25 reactors. This illustrates that TB in children is still a problem in this country.

Tuberculosis — Continued

A final aspect of this outbreak is the interstate transmission of tuberculous infection. Infected persons have been identified in four states; contacts have been identified in eight. Since transmission occurred across state lines, efficient communication between local, state, regional, and federal health authorities has been an essential part of efforts to control the outbreak.

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Neonatal Gonococcal Ophthalmia — California

A case of neonatal gonococcal ophthalmia has been reported to CDC from San Diego, California. The ophthalmia occurred even though the neonate received ocular prophylaxis with erythromycin.

In late June, a male infant, of normal weight for gestational age, was born to a primiparous mother after a full-term, uncomplicated pregnancy. The mother had received prenatal care at a local health center since the end of the first trimester. She had been seen nine times during the pregnancy. Specimens for VDRL and gonorrhea cultures had been obtained in February 1983; both tests were reported as negative. The father had been seen at the clinic of a naval air station, diagnosed as having gonorrhea, and treated 9 days before the infant's birth. The mother was not contacted for either evaluation or treatment at that time.

One day before delivery, the mother visited the health center with uterine contractions but was not considered to be in active labor. A yellow-green, slightly odorous discharge was noted at the vaginal introitus. Cultures were taken, and she was referred to the affiliated hospital, with a diagnosis of possible rupture of membranes. No antibiotics were administered.

She was admitted on the following day to the obstetric ward in active labor, with spontaneous rupture of membranes and a copious green vaginal discharge. Two hours later, an internal fetal monitor was applied. Six hours and 35 minutes later, a lightly meconium-stained infant was delivered vaginally, vertex posterior presentation. Apgar scores were 6 at 1 minute and 9 at 5 minutes. The infant's eyes were treated with erythromycin ophthalmic ointment about 5 minutes after delivery. The newborn examination was described as normal.

Approximately 24 hours after birth, the results of the cultures obtained from the mother the day before delivery were reported as positive for a gram-negative, oxidase-positive organism, eventually confirmed as *Neisseria gonorrhoeae.* The mother was treated with procaine penicillin, 4.8 million units intramuscularly (IM) and probenecid 1 g orally. Blood and cerebrospinal fluid for culture were obtained from the infant, and he was treated with 200,000 units of benzathine penicillin (50,000 units/kg). Both cultures were subsequently negative. At 2 days of age, the infant developed a copious yellowish discharge from both eyes, along with ocular swelling and redness. Gram-stain smear of the exudate revealed gram-negative diplococci, subsequently confirmed as *N. gonorrhoeae,* β-lactamase negative. He was treated with aqueous penicillin, 50,000 units/kg intravenously (IV), for 7 days. In addition, his eyes were washed with saline every 30 minutes to 1 hour, and tetracycline eye ointment was instilled after each saline irrigation. The infant's eyes gradually improved over the next 2-3 days. Topical therapy was maintained for 5 days. Examination by an ophthal-

Ophthalmia – Continued

mologist revealed no corneal damage. The infant was subsequently seen as an outpatient; he had no apparent eye damage. One week after delivery, the mother was readmitted for endometritis culture-positive for *N. gonorrhoeae*, β-lactamase negative, demonstrating the severity of her infection. She responded to treatment with IV antibiotics.

Reported by R Coen, MD, Dept of Pediatrics, University of California at San Diego, Venereal Disease Control Unit, Infectious Disease Section, California Dept of Health Svcs; Operational Research Br, Div of Venereal Disease Control, Center for Prevention Svcs, CDC.

Editorial Note: This is the first case brought to the attention of CDC of gonococcal ophthalmia caused by nonpenicillinase-producing *N. gonorrhoeae* that occurred despite the use of erythromycin ophthalmic ointment. Recent reports have shown that penicillinase-producing *N. gonorrhoeae* can cause gonococcal ophthalmia despite prophylaxis with erythromycin or with silver nitrate (*1*).

Several risk factors associated with this case may have reduced the efficacy of prophylactic use of erythromycin ointment. Prolonged rupture of membranes is more frequently associated with gonococcal ophthalmia than with other forms of ophthalmia (*2*). The interval between rupture of membranes and delivery may have been anywhere from 7 to 24 hours. The description of "yellow-green, slightly odorous discharge" on the day before the delivery is compatible with an established infection. The lower 1 minute Apgar score and light meconium staining noted after birth may have indicated mild distress before delivery, suggesting that an infection was already present. The incubation period of gonorrhea in neonates is 1-5 days. Therefore, the newborn examination within 24 hours after birth would not normally be expected to detect an early infection. In fact, documented cases of gonococcal eye infection have occurred even with minimal inflammatory responses (*3*).

Prophylaxis against ophthalmia with either silver nitrate or erythromycin ointment is not adequate for treatment of an already established gonococcal infection. In one study (*2*), 44 of 46 cases of gonococcal ophthalmia occurred despite silver nitrate prophylaxis. Investigators in this study also found that chlamydia ophthalmia was the most common specific type of ophthalmia neonatorum in their study, occurring in 86 of 302 cases. Silver nitrate is not effective prophylaxis for chlamydia ophthalmia, but erythromycin ophthalmic ointment has been proven to prevent that disease (*4*).

In this case, gonococcal ophthalmia developed despite the use of topical erythromycin ointment and IM benzathine penicillin. Current CDC recommendations are to treat infants born to mothers with gonococcal infection with aqueous crystalline penicillin G (*5*): 50,000 units IM or IV for full-term infants, or 20,000 units IM or IV for low-birth-weight infants. Documentation of prenatal care, cultures done during pregnancy, circumstances around labor and delivery, knowledge of the incidence of gonococcal infection in the local population, and other factors may help to delineate the choice of agents to be used under high-risk circumstances. The Division of Venereal Disease Control, CDC, encourages reporting of any known cases of neonatal gonococcal ophthalmia for further evaluation of the efficacy of the current recommendations for prophylaxis.

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Notice to Readers

Relocation of CDC's Division of Hepatitis and Viral Enteritis

CDC's Division of Hepatitis and Viral Enteritis, Center for Infectious Diseases, has moved its operation from Phoenix, Arizona, to Atlanta, Georgia. Epidemiologic assistance and consultation were transferred to Atlanta on August 29, 1983. The new telephone number is (404) 321-2342 (FTS 236-2342).

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The data in this report are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday.

The editor welcomes accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials. Such reports and any other matters pertaining to editorial or other textual considerations should be addressed to: ATTN: Editor, *Morbidity and Mortality Weekly Report*, Centers for Disease Control, Atlanta, Georgia 30333.

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