

MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

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Recommendation of the Public Health Service

Advisory Committee on Immunization Practices

Rubella Vaccine

INTRODUCTION

Rubella is a common childhood exanthem but one that is often overlooked or misdiagnosed. Signs and symptoms vary, and the most common features — postauricular and suboccipital lymphadenopathy, arthralgia, and transient erythematous rash with low fever — may not be recognized as rubella. Moreover, subclinical infection occurs frequently. Transient polyarthralgia and polyarthritis sometimes accompany or follow rubella illness. These complications occur most frequently in women but are also observed in men and children. Central nervous system disorders and thrombocytopenia have been reported but are rare.

By far the most important consequences of rubella are the fetal anomalies that frequently result when rubella infection is acquired in early pregnancy, especially in the first trimester. Preventing infection of the fetus and the congenital rubella syndrome is a major objective of rubella immunization programs.

In the prevaccine era, most cases of rubella occurred in school-age children, particularly in the winter and spring. More recently, a higher proportion of cases have been seen in adolescents and young adults. In 1976, 60% of cases occurred in those 15 years of age and above. Approximately 80-90% of young adults in the United States have serologic evidence of post-infection immunity which appears to be long lasting. As with other viral diseases, re-exposure to natural rubella sometimes results in reinfection without clinical illness.

The only reliable evidence of rubella immunity is specific antibody, best determined by hemagglutination-inhibition (HI) antibody technique. Laboratories that regularly perform this test produce the most reliable results because of better standardization of reagents and procedures.

LIVE RUBELLA VIRUS VACCINE

Through 1976, more than 75 million doses of live attenuated rubella virus vaccine* were distributed in the United States. Vaccine available in this country is prepared in cell cultures and is administered by subcutaneous injection. A single dose induces antibodies in approximately 95% of

susceptible persons. Although titers are generally lower than those following rubella infection, vaccine-induced immunity protects against clinical illness from natural exposure.

Antibody levels have declined little during the more than 8 years of observation of children who were among the first to be immunized with rubella vaccine. Long-term, even life-long, protection against clinical rubella and viremia is expected.

Vaccine side effects, including rash and lymphadenopathy, occasionally occur in children. Joint pain, usually of the small peripheral joints, has been noted at a rate of 2-9%. Frank arthritis has been reported in less than 1%. Transient peripheral neuritic complaints, such as paresthesia and pain in the hands and feet, have also occurred but very uncommonly. Arthralgia and transient arthritis tend to be more frequent and more severe in susceptible women than in children. When joint symptoms or non-joint-associated pain and paresthesia do occur, they generally begin 2-10 weeks after immunization, persist for 1-3 days, and rarely recur. The persistent arthritic symptoms that have occasionally been described more likely represent coincidental disease than that resulting from vaccination.

Vaccinees may intermittently shed small amounts of virus from the pharynx 7-28 days after vaccination. However, there is no confirmed evidence in studies of more than 1,200 susceptible contacts that vaccine virus has been transmitted. This indicates the safety of vaccinating susceptible children whose mothers or other household members are pregnant.

Although vaccine is safe and protective for other adults and for children, it is *not* suitable for pregnant women because of the possible risk of fetal abnormality caused by the vaccine virus, which can cross the placenta and infect the fetus. Although the risk of teratogenicity should be much lower from the vaccine virus than from the wild virus, the theoretical risk remains. Infants born to more than 60 susceptible women who inadvertently received rubella vaccine during early pregnancy and continued their pregnancies to term did not have any recognizable malformations attributable to rubella.

Rubella reinfection without illness can occur in persons with low levels of antibody whether the antibodies resulted

*Official name: Rubella Virus Vaccine, Live

from vaccination or from natural rubella. With such reinfection, there has been no detectable viremia and little pharyngeal excretion of virus and no recognized risk for susceptible contacts. Further study is needed to define the clinical and epidemiologic significance of reinfection, but the apparent absence of viremia in reinfection suggests that immune women reinfected while pregnant would be unlikely to transmit virus to their fetuses.

VACCINE USAGE

General Recommendations

In addition to protection against rubella illness, vaccine-induced immunity in children prevents virus transmission and reduces or eliminates a major reservoir of rubella infection. Furthermore, vaccination of susceptible postpubertal females can provide specific protection for those at primary risk of rubella-induced fetal injury. With regard to regularly vaccinating adolescent or adult males, however, only in outbreaks of rubella in circumscribed populations is there an equivalent priority to vaccinating children and susceptible postpubertal females.

Dosage: A single dose of vaccine in the volume specified by the manufacturer should be administered subcutaneously. No booster is needed.

Age: Live rubella virus vaccine is recommended for all children at any age after 12 months. It should not be administered to younger infants because persisting maternal antibody may interfere with seroconversion. When given in

a combination vaccine including the measles antigen, the vaccine should be administered when a child is about 15 months of age to achieve the maximum rate of measles seroconversion. Children who have not received vaccine at the optimum age should be vaccinated as soon as possible. Because a history of rubella is not a reliable indicator of immunity, all children for whom vaccine is not contraindicated should be vaccinated.

Increased emphasis should be placed on vaccinating unimmunized prepubertal girls and susceptible adolescent and adult women. Because of the precautions which must apply, however, potential vaccinees in the postpubertal groups should be considered individually. They should receive vaccine *only* if they are not pregnant and if they agree to prevent pregnancy for 3 months after receiving vaccine. When practical, it should be shown by serologic testing that they are susceptible to rubella.

Pregnancy

Pregnant women should not be given vaccine under any circumstances. If a pregnant woman is inadvertently vaccinated or if she becomes pregnant within 3 months of vaccination, she should be advised of the theoretical risk to the fetus.

When reliable laboratory services are available, there is merit in undertaking prenatal or antepartum screening for rubella susceptibility and, if appropriate, vaccination in the

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Table I. Summary—Cases of Specified Notifiable Diseases: United States

(Cumulative totals include revised and delayed reports through previous weeks)

DISEASE	46th WEEK ENDING		MEDIAN 1972-1976	CUMULATIVE, FIRST 46 WEEKS		
	November 19, 1977	November 20, 1976		November 19, 1977	November 20, 1976	MEDIAN 1972-1976
Aseptic meningitis	98	59	93	4,090	2,895	3,691
Brucellosis	1	3	2	193	264	172
Chickenpox	2,062	2,671	---	167,028	160,970	---
Diphtheria	—	2	3	75	135	167
Encephalitis	Primary	25	20	935	1,299	1,299
	Post-Infectious	5	8	179	246	246
Hepatitis, Viral	Type B	269	305	254	14,259	13,225
	Type A	516	506	885	26,948	29,443
	Type unspecified	188	151	---	8,050	7,181
Malaria	12	12	6	474	417	371
Measles (rubeola)	147	470	278	53,753	36,406	25,299
Meningococcal infections, total	Civilian	49	27	26	1,548	1,363
	Military	49	26	26	1,538	1,345
Mumps	357	532	966	18,072	35,407	51,965
Pertussis	89	22	---	1,560	848	---
Rubella (German measles)	118	138	161	19,343	11,392	15,584
Tetanus	3	—	3	60	59	86
Tuberculosis	525	633	---	26,764	29,075	---
Tularemia	1	1	1	146	125	125
Typhoid fever	5	6	9	354	372	372
Typhus, tick-borne (Rky. Mt. spotted fever)	5	9	5	1,077	861	749
Venereal Diseases:						
Gonorrhea	Civilian	19,507	20,119	---	884,872	894,662
	Military	373	549	---	23,692	26,094
Syphilis, primary and secondary	Civilian	378	465	---	18,132	21,347
	Military	7	8	---	268	307
Rabies in animals	50	49	49	2,720	2,664	2,664

Table II. Notifiable Diseases of Low Frequency: United States

	CUM.		CUM.
Anthrax:	—	Poliomyelitis, total:	11
Botulism: Montana 1	94	Paralytic: NYC 1	10
Congenital rubella syndrome:	14	Psittacosis:	58
Leprosy: Calif. 1, Hawaii 1	114	Rabies in man:	1
Leptospirosis: Pa. 1, Tenn. 1, Texas 1	45	Trichinosis: Pa. 1	99
Plague:	15	Typhus, murine: Texas 1	69

Table III
Cases of Specified Notifiable Diseases: United States
Weeks Ending November 19, 1977 and November 20, 1976 - 46th Week

AREA REPORTING	ASEPTIC MENIN- GITIS	BRUCEL- LOSIS	CHICKEN- POX	DIPHTHERIA		ENCEPHALITIS			HEPATITIS, VIRAL			MALARIA	
						Primary: Arthropod- borne and Unspecified		Post In- fectious	Type B	Type A	Type Unspecified		
						1977	1976	1977	1977	1977	1977		
UNITED STATES	98	1	2,062	-	75	25	20	5	269	516	188	12	474
NEW ENGLAND	5	-	297	-	-	-	1	-	14	15	9	-	25
Maine	-	-	24	-	-	-	-	-	-	-	1	-	1
New Hampshire*	-	-	-	-	-	-	-	-	-	-	-	-	3
Vermont	-	-	54	-	-	-	-	-	-	-	-	-	2
Massachusetts*	2	-	152	-	-	-	1	-	-	4	7	-	4
Rhode Island	2	-	6	-	-	-	-	-	4	5	-	-	5
Connecticut	1	-	61	-	-	-	-	-	10	6	1	-	10
MIDDLE ATLANTIC	12	-	157	-	5	1	5	1	31	32	15	4	110
Upstate New York	-	-	107	-	-	-	1	-	7	8	-	-	24
New York City	4	-	20	-	5	-	-	-	12	13	9	3	52
New Jersey*	7	-	NN	-	-	-	-	-	12	11	6	1	16
Pennsylvania*	1	-	30	-	-	1	4	1	NA	NA	NA	-	18
EAST NORTH CENTRAL	20	-	867	-	-	8	4	1	31	79	18	1	35
Ohio*	7	-	89	-	-	5	-	1	12	33	-	-	13
Indiana*	1	-	75	-	-	-	1	-	-	-	1	-	2
Illinois	1	-	100	-	-	-	-	-	3	7	9	-	2
Michigan	7	-	357	-	-	2	3	-	13	28	7	1	15
Wisconsin	4	-	246	-	-	1	-	-	3	14	1	-	3
WEST NORTH CENTRAL	1	-	144	-	1	-	-	-	23	14	13	-	35
Minnesota	-	-	1	-	-	-	-	-	-	-	-	-	12
Iowa*	-	-	80	-	-	-	-	-	2	-	-	-	1
Missouri	-	-	1	-	1	-	-	-	17	9	3	-	16
North Dakota*	-	-	2	-	-	-	-	-	-	-	-	-	1
South Dakota	-	-	11	-	-	-	-	-	-	-	-	-	1
Nebraska	-	-	14	-	-	-	-	-	1	3	-	-	-
Kansas	1	-	35	-	-	-	-	-	3	2	10	-	4
SOUTH ATLANTIC	17	-	172	-	-	1	4	3	51	77	21	4	92
Delaware	-	-	2	-	-	-	-	-	-	-	-	-	-
Maryland	2	-	7	-	-	-	1	-	13	9	3	1	22
District of Columbia*	-	-	-	-	-	-	-	-	-	-	-	-	6
Virginia	4	-	2	-	-	1	3	-	8	8	5	1	22
West Virginia	-	-	127	-	-	-	-	-	1	21	-	-	2
North Carolina*	5	-	NN	-	-	-	-	1	12	8	4	1	10
South Carolina*	-	-	6	-	-	-	-	-	2	1	-	-	-
Georgia*	-	-	-	-	-	-	-	-	5	8	-	-	8
Florida*	6	-	28	-	-	-	-	2	10	22	9	1	22
EAST SOUTH CENTRAL	9	-	70	-	-	10	1	-	23	23	3	-	11
Kentucky	2	-	69	-	-	-	-	-	3	3	-	-	4
Tennessee	4	-	NN	-	-	3	1	-	15	10	1	-	1
Alabama*	1	-	1	-	-	-	-	-	1	4	2	-	5
Mississippi*	2	-	-	-	-	7	-	-	4	6	-	-	1
WEST SOUTH CENTRAL	15	-	44	-	3	-	2	-	22	70	53	1	27
Arkansas	-	-	4	-	-	-	-	-	3	15	5	-	2
Louisiana	2	-	NN	-	-	-	1	-	8	12	12	-	2
Oklahoma	2	-	7	-	-	-	1	-	1	8	4	-	-
Texas*	11	-	33	-	3	-	-	-	10	35	32	1	23
MOUNTAIN	3	1	125	-	5	-	-	-	19	48	18	-	14
Montana	-	1	33	-	-	-	-	-	1	13	2	-	2
Idaho	-	-	69	-	-	-	-	-	-	3	1	-	-
Wyoming	-	-	-	-	-	-	-	-	-	-	-	-	2
Colorado	1	-	24	-	-	-	-	-	8	8	6	-	7
New Mexico	-	-	-	-	4	-	-	-	6	17	7	-	1
Arizona*	-	-	NN	-	1	-	-	-	4	7	2	-	2
Utah	1	-	2	-	-	-	-	-	-	-	-	-	-
Nevada	1	-	-	-	-	-	-	-	-	-	-	-	-
PACIFIC	16	-	186	-	61	5	3	-	55	158	38	2	125
Washington	2	-	175	-	55	1	2	-	2	14	5	-	5
Oregon	-	-	-	-	-	-	-	-	13	19	7	-	2
California*	12	-	-	-	4	4	1	-	40	91	24	2	112
Alaska	-	-	8	-	2	-	-	-	-	32	-	-	2
Hawaii	2	-	3	-	-	-	-	-	-	2	2	-	4
Guam*	NA	NA	NA	NA	-	NA	-	-	NA	NA	NA	NA	-
Puerto Rico	-	-	8	-	-	-	-	-	1	5	2	-	2
Virgin Islands	-	-	-	-	-	-	-	-	-	-	-	-	-

NN: Not notifiable

NA: Not available

*Delayed reports: Aseptic meningitis: N.J. +1, Ind. -1, Iowa +2, Ga. -1, Fla. +2, Ala. +1; Chickenpox: N.H. +1, Fla. +14, Calif. +29, Guam +11; Encephalitis, primary: N.J. +1, Ind. +16; Encephalitis, post: N.C. -1, Miss. +2, Hep. B: Mass. -1, Pa. +31, D.C. +6, S.C. -1, Fla. +1, Tex. -1, Ariz. -1, Guam +2; Hep. A: Mass. -5, Pa. +43, Ohio -1, N. Dak. +1, Guam +2; Hep. unsp: Mass. -5, Pa. +6, Ind. -1, Fla. +1, Tex. -1, Guam +1

Table III-Continued
 Cases of Specified Notifiable Diseases: United States
 Weeks Ending November 19, 1977 and November 20, 1976 - 46th Week

REPORTING AREA	MEASLES (Rubeola)			MENINGOCOCCAL INFECTIONS TOTAL			MUMPS		PERTUSSIS	RUBELLA		TETANUS
	1977	CUMULATIVE		1977	CUMULATIVE		1977	CUM. 1977	1977	1977	CUM. 1977	CUM. 1977
		1977	1976		1977	1976						
UNITED STATES	147	53,753	36,406	49	1,548	1,363	357	16,072	89	118	19,343	60
NEW ENGLAND	5	2,492	480	4	65	68	13	733	-	5	1,230	1
Maine	-	173	9	-	3	1	-	78	-	-	70	-
New Hampshire*	-	511	9	-	3	6	-	92	-	-	247	-
Vermont	-	294	127	-	6	5	-	8	-	-	65	-
Massachusetts*	4	639	37	2	20	21	2	130	-	2	390	-
Rhode Island	-	64	15	-	2	7	-	65	-	1	135	-
Connecticut*	1	811	283	2	31	28	8	357	-	2	323	1
MIDDLE ATLANTIC	15	8,433	7,140	8	223	199	29	1,392	9	13	6,082	5
Upstate New York	4	3,853	2,955	-	53	77	8	321	5	2	3,377	1
New York City	-	753	480	3	55	51	7	513	1	2	331	1
New Jersey	-	197	620	2	45	30	5	365	-	-	1,785	2
Pennsylvania	11	3,630	3,085	3	66	41	9	193	3	9	589	1
EAST NORTH CENTRAL ..	83	11,603	15,511	9	167	172	128	6,083	10	70	3,972	5
Ohio	2	1,861	579	3	64	68	30	739	7	4	1,136	1
Indiana	9	4,358	3,639	1	14	12	3	353	-	1	970	1
Illinois	26	1,841	1,718	1	25	20	17	1,130	3	1	340	1
Michigan	40	1,081	5,951	3	48	61	61	2,070	-	10	1,018	2
Wisconsin*	6	2,462	3,654	1	16	11	17	1,794	-	54	508	-
WEST NORTH CENTRAL ..	7	9,395	1,432	-	75	93	86	4,208	1	11	619	10
Minnesota	4	2,634	426	-	25	14	6	16	-	-	17	2
Iowa*	1	4,315	45	-	6	10	3	1,322	-	3	176	1
Missouri*	2	917	134	-	32	43	31	1,539	1	1	43	4
North Dakota	-	26	3	-	1	3	-	20	-	1	17	-
South Dakota	-	75	4	-	4	3	-	59	-	3	89	-
Nebraska	-	214	55	-	2	6	4	83	-	-	3	-
Kansas	-	1,214	765	-	5	14	42	1,169	-	3	274	3
SOUTH ATLANTIC	8	4,677	2,203	16	339	264	23	903	6	3	1,702	12
Delaware	-	22	130	-	7	9	3	143	-	-	27	-
Maryland	-	372	715	-	22	22	4	77	-	-	6	-
District of Columbia ..	-	14	13	1	1	3	-	6	-	-	-	-
Virginia	4	2,746	777	2	34	40	-	112	1	-	582	1
West Virginia	3	262	203	-	9	8	2	235	-	2	160	-
North Carolina*	-	65	17	4	74	50	3	69	-	-	447	-
South Carolina	-	156	4	1	36	36	2	16	2	-	230	-
Georgia*	-	768	3	2	55	29	7	33	3	1	57	1
Florida*	1	272	341	6	101	67	2	242	-	-	193	10
EAST SOUTH CENTRAL ..	2	2,016	909	3	159	126	21	999	6	2	1,949	5
Kentucky	-	1,191	754	-	32	23	4	116	3	1	86	1
Tennessee	2	799	138	1	42	53	11	594	3	1	1,744	2
Alabama	-	78	-	-	53	36	5	248	-	-	110	2
Mississippi	-	38	17	2	32	14	1	41	-	-	9	-
WEST SOUTH CENTRAL ..	10	2,159	833	4	292	200	21	1,626	4	2	824	12
Arkansas	-	29	18	2	18	14	8	126	3	-	3	2
Louisiana	-	80	279	2	134	36	-	56	1	-	27	3
Oklahoma	1	66	299	-	14	21	3	549	-	-	33	-
Texas	9	1,984	237	-	126	129	13	895	-	2	761	7
MOUNTAIN	1	2,542	5,204	2	36	39	3	623	2	2	386	2
Montana	1	1,163	286	1	5	5	-	12	-	1	17	1
Idaho	-	163	2,020	1	5	6	1	128	1	-	13	-
Wyoming	-	19	4	-	1	-	-	4	-	-	6	1
Colorado	-	504	348	-	1	6	1	274	1	-	241	-
New Mexico	-	256	16	-	10	4	1	106	-	-	11	-
Arizona	-	323	227	-	10	10	-	-	-	1	18	-
Utah	-	21	2,237	-	3	6	-	83	-	-	71	-
Nevada	-	93	66	-	1	2	-	16	-	-	9	-
PACIFIC	16	10,436	2,694	3	192	202	36	1,508	51	10	2,579	8
Washington	10	558	355	-	27	34	3	313	-	2	451	-
Oregon	1	367	173	-	17	17	9	280	44	-	118	-
California	5	9,416	2,154	2	113	126	18	853	7	8	1,595	8
Alaska	-	63	9	1	32	22	-	30	-	-	1	-
Hawaii	-	35	3	-	3	3	6	35	-	-	414	-
Guam*	NA	9	16	-	1	-	NA	6	NA	NA	11	-
Puerto Rico	6	1,002	459	-	1	5	14	848	2	-	35	10
Virgin Islands	-	14	17	-	-	1	-	189	-	-	2	-

NA: Not available

*Delayed reports: Measles: Wisc. -4; Men. inf.: Iowa +1, Ga. -3; Mumps: N.C. -6, Fla. +3, Guam +1; Pertussis: N.H. +1, Mo. +3, N.C. +7. Rubella: Mass. -1, Conn. -1

Table III-Continued
 Cases of Specified Notifiable Diseases: United States
 Weeks Ending November 19, 1977 and November 20, 1976 - 46th Week

REPORTING AREA	TUBERCULOSIS		TULA-REMLIA	TYPHOID FEVER		TYPHUS-FEVER TICK-BORNE (RMSF)		VENEREAL DISEASES (Civilian Cases Only)						RABIES IN ANIMALS
	1977	CUM. 1977	CUM. 1977	1977	CUM. 1977	1977	CUM. 1977	GONORRHEA		SYPHILIS (Pri. & Sec.)		CUM. 1977		
								CUMULATIVE		CUMULATIVE				
								1977	1976	1977	1976			
UNITED STATES	525	26,764	146	5	354	5	1,077	19,507	884,872	894,662	378	18,132	21,347	2,720
NEW ENGLAND	25	994	2	-	19	-	10	591	23,889	25,219	18	718	732	47
Maine	-	76	-	-	-	-	-	55	1,797	2,156	1	27	21	32
New Hampshire*	-	25	-	-	1	-	-	33	1,000	764	-	4	10	1
Vermont	1	33	-	-	-	-	-	23	600	634	-	7	9	-
Massachusetts	14	558	2	-	13	-	5	283	10,128	11,903	9	497	525	8
Rhode Island	3	84	-	-	3	-	3	27	1,885	1,786	-	8	17	-
Connecticut*	7	218	-	-	2	-	2	173	8,479	7,976	8	175	150	6
MIDDLE ATLANTIC	63	4,315	3	1	68	3	77	1,871	92,238	102,435	81	2,582	3,555	102
Upstate New York	7	754	3	-	8	-	41	453	15,991	16,871	13	245	210	59
New York City	17	1,356	-	-	27	-	2	756	35,734	44,791	49	1,623	2,254	-
New Jersey	18	1,081	-	1	22	-	11	97	16,236	15,959	11	337	506	28
Pennsylvania	21	1,124	-	-	11	3	23	565	24,277	24,814	8	377	585	15
EAST NORTH CENTRAL ..	69	4,137	3	-	32	-	37	3,278	140,715	140,707	29	1,838	1,857	134
Ohio	19	713	1	-	10	-	17	902	37,462	35,120	9	430	443	-
Indiana	10	478	-	-	3	-	2	452	13,164	13,731	2	141	97	9
Illinois	-	1,606	-	-	6	-	16	933	45,387	48,703	7	943	984	41
Michigan	31	1,151	-	-	12	-	2	753	32,424	30,671	7	225	231	6
Wisconsin	9	189	2	-	1	-	-	238	12,278	12,512	4	99	102	78
WEST NORTH CENTRAL ..	21	894	26	-	22	-	33	1,093	46,305	47,063	2	399	406	684
Minnesota	-	184	-	-	5	-	-	270	8,315	8,277	-	129	91	244
Iowa	3	83	-	-	-	-	1	148	5,421	5,921	-	40	41	116
Missouri	13	366	23	-	12	-	18	360	19,194	18,694	2	157	161	52
North Dakota	-	27	-	-	1	-	-	17	863	734	-	-	-	108
South Dakota	1	45	2	-	-	-	2	36	1,401	1,400	-	9	5	120
Nebraska	-	35	1	-	1	-	1	72	3,936	3,965	-	24	33	3
Kansas*	4	134	-	-	3	-	11	190	7,175	8,072	-	40	75	41
SOUTH ATLANTIC	116	5,830	11	4	60	2	574	4,617	217,520	218,701	111	4,925	6,411	328
Delaware*	-	54	-	-	-	-	3	58	3,003	3,082	-	19	61	2
Maryland	13	831	2	-	4	-	75	535	26,785	28,380	3	300	510	-
District of Columbia ..	8	301	-	-	1	-	-	423	14,354	14,878	10	494	504	-
Virginia	15	667	2	1	9	-	153	560	22,776	23,365	22	487	616	5
West Virginia	2	213	-	-	5	-	5	81	2,967	2,762	-	3	22	9
North Carolina*	25	952	2	-	4	1	219	757	32,878	31,511	4	659	1,157	13
South Carolina	13	536	2	-	4	-	53	465	20,603	20,568	7	220	330	33
Georgia*	10	786	3	-	14	1	65	988	41,975	41,729	30	1,101	968	194
Florida*	30	1,490	-	3	19	-	1	750	52,179	52,426	35	1,642	2,243	72
EAST SOUTH CENTRAL ..	73	2,508	9	-	11	-	170	1,690	78,073	78,847	21	712	816	74
Kentucky	18	654	3	-	5	-	43	343	10,700	10,404	8	101	115	28
Tennessee	38	788	5	-	2	-	100	427	30,813	31,389	4	228	271	35
Alabama	7	616	1	-	1	-	19	351	21,369	22,066	4	150	171	11
Mississippi*	10	450	-	-	3	-	8	569	15,191	14,988	5	233	259	-
WEST SOUTH CENTRAL ..	79	3,149	72	-	30	-	158	2,887	111,911	112,530	39	2,621	2,557	719
Arkansas	6	334	49	-	7	-	53	240	8,589	10,433	-	62	93	106
Louisiana*	4	562	1	-	1	-	6	263	16,787	16,253	10	620	525	22
Oklahoma	6	268	12	-	2	-	71	292	10,873	10,994	3	72	87	225
Texas*	63	1,985	10	-	20	-	28	2,092	75,662	74,850	26	1,867	1,852	366
MOUNTAIN	6	744	14	-	27	-	13	864	35,846	36,663	3	410	536	178
Montana	-	48	1	-	-	-	6	47	1,889	1,816	-	5	11	45
Idaho*	1	29	-	-	-	-	4	51	1,643	2,001	-	12	22	-
Wyoming	-	18	1	-	-	-	2	17	835	739	-	5	5	1
Colorado	1	104	3	-	8	-	1	214	9,329	9,248	1	110	126	57
New Mexico	1	143	-	-	-	-	-	150	5,280	6,585	-	111	128	19
Arizona	2	315	3	-	13	-	-	202	9,892	10,827	2	142	192	45
Utah	-	34	6	-	5	-	-	58	2,160	2,013	-	10	20	11
Nevada	1	53	-	-	1	-	-	125	4,818	3,434	-	15	32	-
PACIFIC	73	4,193	6	-	85	-	5	2,616	138,375	132,497	74	3,927	4,477	454
Washington	NA	272	-	-	2	-	-	294	10,874	11,128	NA	216	150	2
Oregon	6	162	1	-	3	-	1	154	9,511	9,880	-	127	96	7
California	55	3,160	5	-	78	-	4	2,050	110,769	105,256	73	3,524	4,129	408
Alaska	-	76	-	-	-	-	-	83	4,347	3,862	-	25	22	37
Hawaii	12	523	-	-	2	-	-	35	2,874	2,371	1	35	80	-
Guam*	NA	49	-	NA	1	NA	-	NA	179	302	NA	2	2	-
Puerto Rico	15	352	-	-	7	-	-	22	2,811	2,385	28	484	539	49
Virgin Islands	1	2	-	-	-	-	-	6	190	214	-	9	48	-

NA: Not available

*Delayed reports: TB: Kans. -1, Dela. -1, N.C. +7, Fla. -7, Guam +1; Typhoid fever: N.H. -1, Ga. -9, Miss. -1; RMSF: Conn. +1, Miss. +1, Idaho +1. GC: La. -15, Guam +13; Syphilis: La. -2, Texas -1.

Table IV
Deaths in 121 United States Cities*
Week Ending November 19, 1977 - 46th Week

REPORTING AREA	ALL CAUSES					Pneumonia and Influenza ALL AGES	REPORTING AREA	ALL CAUSES					Pneumonia and Influenza ALL AGES
	ALL AGES	65 Years and Over	45-64 Years	25-44 Years	Under 1 Year			ALL AGES	65 Years and Over	45-64 Years	25-44 Years	Under 1 Year	
NEW ENGLAND	748	486	183	40	22	31	SOUTH ATLANTIC	1,173	667	323	75	53	38
Boston, Mass.	253	151	63	18	11	9	Atlanta, Ga.	136	65	46	11	6	2
Bridgeport, Conn.	30	23	5	1	1	3	Baltimore, Md.	265	149	74	18	11	8
Cambridge, Mass.	29	21	8	-	-	3	Charlotte, N. C.	64	38	16	4	3	2
Fall River, Mass.	39	29	7	1	1	-	Jacksonville, Fla.	71	43	16	6	6	3
Hartford, Conn.	68	43	18	3	2	2	Miami, Fla.	109	67	27	5	3	1
Lowell, Mass.	32	21	9	2	-	2	Norfolk, Va.	56	31	16	1	6	2
Lynn, Mass.	19	11	8	-	-	1	Richmond, Va.	80	47	24	5	1	6
New Bedford, Mass.	24	19	5	-	-	3	Savannah, Ga.	45	23	13	6	-	3
New Haven, Conn.	42	26	10	2	2	-	St. Petersburg, Fla.	79	62	11	2	4	2
Providence, R.I.	65	40	17	5	3	2	Tampa, Fla.	75	42	19	3	6	7
Somerville, Mass.	12	8	4	-	-	-	Washington, D. C.	128	65	39	10	6	-
Springfield, Mass.	44	29	12	3	-	3	Wilmington, Del.	65	35	22	4	1	2
Waterbury, Conn.	28	17	9	2	-	1	EAST SOUTH CENTRAL	705	416	181	40	38	30
Worcester, Mass.	63	48	8	3	2	2	Birmingham, Ala.	109	61	33	10	3	3
MIDDLE ATLANTIC	2,887	1,836	719	175	76	186	Chattanooga, Tenn.	43	29	10	1	1	3
Albany, N. Y.	64	36	14	8	2	-	Knoxville, Tenn.	28	20	7	1	-	8
Allentown, Pa.	36	23	9	3	-	5	Louisville, Ky.	104	51	31	9	7	8
Buffalo, N. Y.	133	80	37	6	4	14	Memphis, Tenn.	176	111	40	6	15	5
Camden, N. J.	53	31	18	2	-	1	Mobile, Ala.	55	34	10	3	4	3
Elizabeth, N. J.	45	31	10	2	1	1	Montgomery, Ala.	45	28	14	2	1	2
Erie, Pa.	34	23	10	1	-	-	Nashville, Tenn.	145	82	39	8	7	6
Jersey City, N. J.	61	37	15	5	4	3	WEST SOUTH CENTRAL	1,238	700	325	95	69	42
Newark, N. J.	73	40	15	10	4	1	Austin, Tex.	47	36	6	4	-	5
New York City, N. Y.	1,379	898	330	86	34	59	Baton Rouge, La.	42	21	12	3	2	4
Paterson, N. J.	46	29	10	3	2	-	Corpus Christi, Tex.	18	12	3	1	1	1
Philadelphia, Pa.	293	171	80	22	9	34	Dallas, Tex.	161	90	45	9	14	4
Pittsburgh, Pa.	259	153	80	10	4	27	El Paso, Tex.	43	22	10	6	3	7
Reading, Pa.	38	32	6	-	-	4	Fort Worth, Tex.	95	51	25	9	5	-
Rochester, N. Y.	160	112	35	7	2	25	Houston, Tex.	270	134	77	32	15	3
Schenectady, N. Y.	21	16	4	1	-	2	Little Rock, Ark.	64	35	20	4	5	4
Scranton, Pa.	27	20	6	-	1	-	New Orleans, La.	179	100	50	11	7	2
Syracuse, N. Y.	79	49	20	1	8	3	San Antonio, Tex.	148	85	39	7	11	6
Trenton, N. J.	35	17	11	5	1	2	Shreveport, La.	88	57	24	4	2	1
Utica, N. Y.	26	22	2	1	-	2	Tulsa, Okla.	83	57	14	5	4	5
Yonkers, N. Y.	25	16	7	2	-	3	MOUNTAIN	575	343	135	44	30	30
EAST NORTH CENTRAL	2,489	1,446	689	153	90	57	Albuquerque, N. Mex.	60	35	11	9	2	10
Akron, Ohio	54	33	15	1	1	-	Colorado Springs, Colo.	40	24	10	2	1	4
Canton, Ohio	38	26	8	-	1	2	Denver, Colo.	119	63	30	12	12	6
Chicago, Ill.	538	298	155	43	22	8	Las Vegas, Nev.	37	28	6	3	-	3
Cincinnati, Ohio	193	109	59	7	8	2	Ogden, Utah	17	8	8	-	-	2
Cleveland, Ohio	195	112	55	18	6	1	Phoenix, Ariz.	158	93	40	7	11	-
Columbus, Ohio	186	116	40	10	7	8	Pueblo, Colo.	18	14	2	2	-	4
Dayton, Ohio	123	75	33	6	2	3	Salt Lake City, Utah	49	35	6	5	2	1
Detroit, Mich.	309	160	93	28	15	6	Tucson, Ariz.	77	43	22	4	2	-
Evansville, Ind.	44	29	13	-	-	4	PACIFIC	1,737	1,114	421	98	50	44
Fort Wayne, Ind.	52	38	10	-	1	1	Berkeley, Calif.	19	10	5	3	-	1
Gary, Ind.	30	11	13	3	-	1	Fresno, Calif.	85	60	13	4	6	10
Grand Rapids, Mich.	47	28	10	3	3	3	Glendale, Calif.	31	24	6	1	-	-
Indianapolis, Ind.	171	88	55	9	8	1	Honolulu, Hawaii	59	31	16	5	6	3
Madison, Wis.	47	26	18	1	1	4	Long Beach, Calif.	89	64	21	3	1	2
Milwaukee, Wis.	135	91	33	7	3	2	Los Angeles, Calif.	533	320	149	36	15	13
Peoria, Ill.	52	31	14	2	4	2	Oakland, Calif.	61	35	19	3	2	-
Rockford, Ill.	47	27	12	4	1	7	Pasadena, Calif.	28	23	1	4	-	1
South Bend, Ind.	44	26	11	1	2	-	Portland, Ore.	117	81	24	5	-	1
Toledo, Ohio	118	73	30	6	5	2	Sacramento, Calif.	88	50	27	4	3	1
Youngstown, Ohio	66	49	12	4	-	-	San Diego, Calif.	143	90	30	4	4	4
WEST NORTH CENTRAL	838	516	215	41	34	24	San Francisco, Calif.	188	127	41	10	4	2
Des Moines, Iowa	70	44	20	3	1	2	San Jose, Calif.	61	46	12	1	1	1
Duluth, Minn.	21	16	5	-	-	3	Seattle, Wash.	137	92	33	6	5	1
Kansas City, Kans.	31	19	7	4	-	2	Spokane, Wash.	52	35	12	4	1	2
Kansas City, Mo.	142	84	35	7	9	2	Tacoma, Wash.	46	26	12	5	2	2
Lincoln, Nebr.	31	23	7	-	-	3	TOTAL	12,390	7,524	3,191	761	462	484
Minneapolis, Minn.	131	77	35	7	6	3	Expected Number	11,449	7,001	2,948	726	379	387
Omaha, Nebr.	117	68	34	6	4	-							
St. Louis, Mo.	170	106	43	9	7	5							
St. Paul, Minn.	71	50	17	2	-	2							
Wichita, Kans.	54	29	12	4	7	4							

*By place of occurrence and week of filing certificate. Excludes fetal deaths.

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Rubella — continued

immediate postpartum period. Furthermore, routine premarital serology for rubella immunity would enhance efforts to identify susceptible females prior to their first pregnancy.

Outbreak Management

To prevent the spread of rubella in outbreaks, susceptibles at risk should be vaccinated promptly. If serologic screening cannot be performed without delay, it may be advisable to vaccinate women at risk of exposure without waiting for serologic screening. Under these conditions, only women who are not known to be pregnant and who agree to prevent conception for 3 months should be vaccinated. A blood specimen should be taken at the time of vaccination and stored for later analysis. Should the woman already be or become pregnant in the next 3 months the prevaccination specimen can be assayed for rubella antibody to determine prevaccination susceptibility to rubella.

Use of Vaccine Following Exposure

There is no evidence that live rubella virus vaccine given after exposure will prevent illness or that vaccinating an individual incubating rubella is harmful. Since a single exposure may not result in infection, post-exposure vaccination could protect an individual in the event of future exposure.

Use of Immune Serum Globulin Following Exposure

Immune serum globulin (ISG) given after exposure to rubella will not prevent infection or viremia with rubella virus, but it may modify or suppress symptoms. The routine use of ISG for post-exposure prophylaxis of rubella in early pregnancy is not recommended. (Infants with congenital rubella have been born to women who were given ISG shortly after exposure.) The only time when ISG might be used is when rubella occurs in a woman who would not consider termination of pregnancy under any circumstances. Serologic testing for evidence of rubella immunity is of value if exposure during early pregnancy is suspected; then it is often helpful in recommending a course of action.

Precautions and Contraindications

Live rubella virus vaccine is contraindicated during pregnancy. (See "Pregnancy," above.) It should not be given: during severe febrile illness; to persons with congenital immunodeficiency; to those with leukemia, lymphoma, or generalized malignancy; or to those receiving immunosuppressive therapy. (See ACIP General Recommendations on Immunization, in MMWR 25:349-355, 1976 for details.)

SURVEILLANCE

Accurate diagnosis and reporting of rubella, congenital rubella syndrome, and vaccine complications are of great importance in assessing the control of rubella and its complications. Furthermore, all cases of birth defects suspected of being related to rubella should be thoroughly investigated and reported to state health departments.

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*International Notes***Legionnaires' Disease — England**

From July through October 1977, an increased number of patients with severe pneumonia were admitted to a teaching hospital in Nottingham, England. Three of the patients died. Serum specimens from 6 of the cases were forwarded to CDC for testing for Legionnaires' disease by the indirect fluorescent-antibody technique. In 2 of the 6, a 4-fold rise in antibody titer was demonstrated; 3 additional cases had titers of 1:128, 1:256, and 1:1024 in specimens taken during convalescence. The 3 men and 2 women with

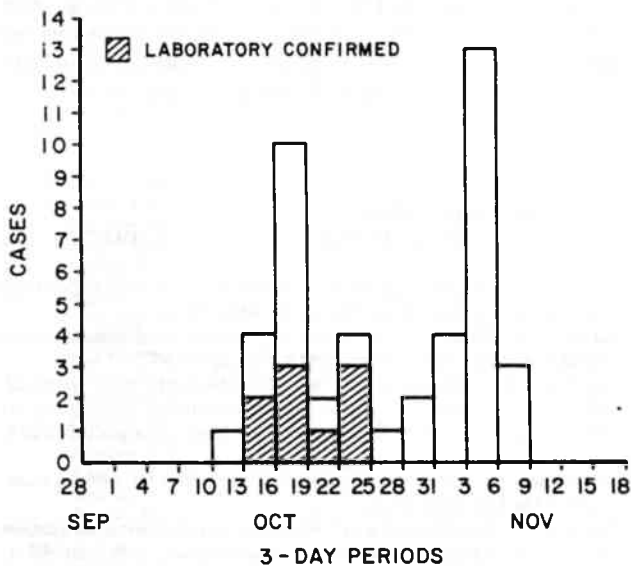
serologic evidence of Legionnaires' disease, 4 of whom survived, ranged in age from 32 to 63; 1 had chronic bronchitis, and 1 had a history of rheumatic fever in childhood. The 5 seropositive patients smoked cigarettes heavily. No common source of infection has been identified.

Reported by AD Macrae, MD, FRCP, MJ Lewis, MD, Dip Bact, Public Health Laboratory, Nottingham; Communicable Disease Surveillance Centre, London.

*Epidemiologic Notes and Reports***Rubella Outbreak on a College Campus — Wisconsin**

In the period October 12-November 9, 1977, 45 cases of rash illness consistent with rubella were reported to the Student Health Service of Marquette University, Milwaukee, Wisconsin (Figure 1). Rubella virus has been isolated from the pharynx of 8 students, and another student had a 4-fold rise in hemagglutination (HI) antibody titers to rubella.

FIGURE 1. Rubella cases in a Wisconsin college, by date of onset of rash*



*omits 1 case on whom date of onset was unknown

Signs and symptoms in the reported cases were: rash (100%), adenopathy (91%), pharyngitis (76%), fever ≥ 37.4 C (≥ 99 F) (71%), headache (51%), conjunctivitis (47%), and photophobia and joint complaints (44% each). Males and females experienced the joint signs and symptoms with equal frequency. Two males noted bilateral testicular tenderness. Five of 30 students complained of pruritus at the onset of rash.

Forty-four of the 45 cases occurred in undergraduate

students, an attack rate of 6/1000. Rates were equal in males and females and were not significantly different among the 4 classes. The attack rate in students living in campus dormitories, however, was twice as high as that in those living off campus (8/1000 versus 4/1000).

More than 1,000 students have been vaccinated in a rubella immunization program, currently underway on campus, prompted by the recent cases. Vaccine was given to all males requesting it. However, because previous testing of the university's junior and senior nursing students had revealed a 90% prevalence of antibodies to rubella, initially all women were not vaccinated. Rather, vaccine was offered only to those found to be serologically negative. When it became apparent that the outbreak was continuing and that only 70-85% of the women who had come to the clinic had detectable antibodies, all female students requesting it were vaccinated after appropriate counseling regarding avoidance of pregnancy. Each woman's blood specimen was frozen in the event that serologic tests would later be useful (1).

Reported by HI Dobbs, MD, Student Health Service, Marquette University, Milwaukee; C Panagis, MD, J Antonmattei, MD, J Sedmak, PhD, H Wisniewski, PhD, Milwaukee Health Dept; J Berg, H Bostrom, I Imm, M Pierce, HG Skinner, MD, State Epidemiologist, Wisconsin Dept of Health and Social Services; Immunization Div, Bur of State Services, CDC.

Editorial Note: Since college campuses are recognized potential sites of rubella outbreaks (2,3), ideally all susceptible females should be identified and vaccinated before they enter college. Colleges and universities should consider requiring serologic screening of all incoming female students at the time of preadmission physical examinations. Susceptible, non-pregnant females should be vaccinated against rubella at a time when pregnancy will be avoided for the ensuing 3 months.

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