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MORBIDITY AND MORTALITY WEEKLY REPORT

Current Trends

The Effects of Smoking on Health

A World Health Organization (WHO) Expert Committee recently reaffirmed a statement released in 1970 concerning the effects of smoking cigarettes on health. It states that "smoking-related diseases are such important causes of disability and premature death in developed countries that the control of cigarette smoking could do more to improve health and prolong life in these countries than any single action in the whole field of preventive medicine" (*1*). The specific effects of smoking, as outlined by the WHO Committee, are summarized below.

Lung Cancer: The increase in lung cancer mortality in those countries where cigarette smoking has been widespread continues without interruption. In some countries, such as the United Kingdom and the United States, there is a leveling-off of mortality rates among men under 60 years of age, for whom cigarette consumption reached a plateau 20 years ago. In women, whose cigarette consumption has been rising rapidly in the past 30 years, lung cancer mortality continues to rise at an increasing rate. Mortality rates from lung cancer are 10 times greater in smokers than in persons who have never smoked. Cessation of smoking reduces this differential gradually so that after 10 years the mortality rate for these ex-smokers approaches that for persons who never smoked. This indicates that widespread cessation of smoking would rapidly reduce lung cancer mortality.

In the United States smoking was considered to be responsible for 68,000 of the estimated 84,000 lung cancer deaths in 1976. Lung cancer risks increase directly with the number of cigarettes smoked every day, total lifetime number of cigarettes smoked, and depth of inhalation. Lung cancer is also inversely related to age: the younger one starts smoking, the greater the risk of disease. The use of filter tips and low-tar content cigarettes has been shown to reduce slightly the risk of developing lung cancer; the risk is higher than that in nonsmokers, however.

Smokers with occupational exposures to asbestos and uranium have an increased risk of dying from lung cancer. Asbestos workers who smoke have 90 times the risk of developing lung cancer than nonsmoking, nonexposed persons. The risk of lung cancer among uranium miners who smoke is 4 times greater than for smokers who are not miners. The uranium and asbestos industries have only slightly increased lung cancer rates in nonsmokers.

Bronchitis and Emphysema: Extensive studies in a number of nations confirm that pulmonary function of cigarette smokers is impaired in every known respect when compared to nonsmokers. The prevalence of cough and expectoration in both men and women is closely related to the number of cigarettes smoked; these symptoms usually abate once a person stops smoking. Recurrent episodes of respiratory infection, associated with this excess secretion of mucus, are more frequent in cigarette smokers than in nonsmokers. Retrospective and prospective studies demonstrate that cigarette smoking is responsible for approximately 70% of chronic bronchitis and emphysema cases. Death rates from respiratory diseases are higher in smokers than in nonsmokers, accounting for about 25,000 deaths each year. When young patients stop smoking, pulmonary function may return to normal. Even in persons with moderately severe obstructive disease, stopping smoking may result in striking improvement in dyspnea and cough, with some improvement in ventilatory function.

Coronary Heart Disease: The most important specific effect that smoking cigarettes has on health is the development of premature coronary heart diseast (CHD). Cigarette smokers have a significantly higher risk of CHD morbidity and mortality. Long-term epidemiologic studies of healthy populations confirm that a cigarette smoker is more likely to have a myocardial infarction and to die from CHD than a nonsmoker. Cigarette smoking is one of the major risk factors for CHD and acts in combination with elevated blood pressure, elevated serum cholesterol, and other risk factors.

Heart disease caused 648,540 deaths in the United States in 1975. Cigarette smoking is considered responsible for approximately 25% of these deaths. Stopping smoking and controlling other risk factors can reduce morbidity and mortality of CHD.

Other Cancer: In addition to developing lung cancer, cigarette smokers have a significantly higher rate of cancer of the larynx, pharynx, oral cavity, esophagus, pancreas, and urinary bladder. Pipe and cigar smokers have elevated risk of developing cancer of the oral cavity, pharynx, larynx, and esophagus when compared to nonsmokers.

Pregnancy: Mothers who smoke cigarettes during the second and third trimesters of pregnancy have been found to have babies with a lower average birth weight than babies of nonsmoking mothers. This effect is probably the result of higher levels of carboxyhemoglobin in the fetal circulation. An increase in perinatal mortality has been observed in babies born to smoking mothers, particularly when other factors which affect perinatal mortality exist. Stopping smoking is recommended during pregnancy.

Effects of Smoking — Continued

Reported by the National Clearinghouse for Smoking and Health, Bur of Health Education, CDC.

Editorial Note: The National Clearinghouse for Smoking and Health (NCSH), Bureau of Health Education, CDC, was recently named an official WHO Collaborating Agency for Smoking and Health. The NCSH can provide additional details, upon request, on the health consequences of smoking; it will also supply materials designed to help those who wish to stop smoking.

Reference

1. World Health Organization: Smoking and Its Effects on Health (WHO Tech Rep No. 568). Geneva, 1975, p 8

Epidemiologic Notes and Reports

Fatal Malaria Due to Splenic Rupture — California

A 35-year-old man returned to the United States from Thailand on February 23, 1976, with a 3-day history of fever, chills, headache, myalgia, weakness, and anorexia. Ten days after the onset of his symptoms, he was admitted to a hospital in Los Angeles, California, where the diagnosis of malaria was made.

The patient had lived in Bangkok, Thailand, for the past 12 years, where he had had 3 previous episodes of malaria. He also gave a history of an exploratory laparotomy and splenectomy in the 1950s, following an auto accident.

An admission examination revealed a blood pressure of 100/60 and a pulse of 100 per minute without postural changes. The only abnormal physicial findings were a 30-centimeter midline surgical scar on the abdomen and a left upper quadrant fullness believed to be a prominent left lobe of the liver. Abnormal laboratory studies on admission included a hemoglobin of 10.6 gm/100 ml, a white cell count of 3,700/mm^3, and a platelet count of 50,000/mm^3. Further blood tests revealed a normal prothrombin time, normal partial thromboplastin time, and normal thrombin time. A peripheral blood smear showed trophozoites and gametocytes of *Plasmodium vivax*.

The patient was immediately started on a course of oral chloroquine phosphate (2.5 gm of salt or 1.5 gm of base) over a 48-hour period, and he rapidly became afebrile and asymptomatic. However, 4 days after admission he awoke with complaints of dizziness. While attempting to go to the bathroom, he fell and struck his head. The patient was found to have no detectable blood pressure. Approximately 8 minutes after the fall, he had a cardiopulmonary arrest; resuscitation efforts were unsuccessful. A limited autopsy showed a ruptured spleen weighing 1,600 grams, atypical in appearance, and 4 liters of blood in the peritoneal cavity.

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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	17th WEEK ENDING		MEDIAN	CUMULATIVE, FIRST 17 WEEKS		
	April 30, 1977	May 1, 1976	1972–1976	April 30, 1977	May 1, 1976	MEDIAN 1972–1976
Aseptic meningitis	49	24	34	595	584	584
Brucellosis	5	3	6	54	73	43
Chickenpox	6,469	6,142	---	103,992	97,089	---
Diphtheria	6	1	5	32	95	89
Encephalitis: Primary	11	16	18	191	252	272
Encephalitis: Post-Infectious	8	7	7	52	90	89
Hepatitis, Viral: Type B	319	228	177	5,169	4,639	3,136
Hepatitis, Viral: Type A	554	772	898	10,741	11,741	14,493
Hepatitis, Viral: Type unspecified	160	160		3,062	2,883	
Malaria	9	9	4	111	107	86
Measles (rubeola)	2,295	1,401	1,200	27,360	17,893	14,325
Meningococcal infections, total	37	39	30	744	663	579
Civilian	37	39	30	739	658	563
Military	–	–	–	5	5	16
Mumps	528	1,237	1,909	9,874	21,420	27,843
Pertussis	10	10	---	213	333	---
Rubella (German measles)	898	434	724	10,511	6,205	7,348
Tetanus	–	–	–	13	11	20
Tuberculosis	685	699	---	9,622	10,558	---
Tularemia	3	2	2	25	33	31
Typhoid fever	9	5	5	118	106	104
Typhus, tick-borne (Rky. Mt. spotted fever)	13	7	4	45	30	21
Venereal Diseases:						
Gonorrhea: Civilian	16,707	18,598	---	299,401	314,238	---
Gonorrhea: Military	346	661	---	8,595	9,579	---
Syphilis, primary and secondary: Civilian	351	394	---	7,016	8,413	---
Syphilis, primary and secondary: Military	4	5	---	101	125	---
Rabies in animals	82	86	86	843	820	965

Table II. Notifiable Diseases of Low Frequency: United States

	CUM.		CUM.
Anthrax:	–	Poliomyelitis, total:	2
Botulism: *Ohio 1	66	Paralytic:	2
Congenital rubella syndrome: Calif. 1	3	Psittacosis: *Calif. 4	22
Leprosy: NYC 1, Tex. 1	37	Rabies in man:	–
Leptospirosis:	13	Trichinosis: *	34
Plague:	1	Typhus, murine:	15

*Delayed reports: Botulism: Okla. 2 (1976); Psittacosis: Okla. 1 (1976); Trichinosis: Okla. 1, Ariz. delete 1 (1976)

Table III
Cases of Specified Notifiable Diseases: United States
Weeks Ending April 30, 1976 and May 1, 1977 – 17th Week

AREA REPORTING	ASEPTIC MENINGITIS	BRUCELLOSIS	CHICKENPOX	DIPHTHERIA		ENCEPHALITIS			HEPATITIS, VIRAL			MALARIA	
						Primary: Arthropod-borne and Unspecified		Post Infectious	Type B	Type A	Type Unspecified		
	1977	1977	1977	1977	CUM. 1977	1977	1976	1977	1977	1977	1977	1977	CUM. 1977
UNITED STATES	49	5	6,469	6	32	11	16	8	319	554	160	9	111
NEW ENGLAND	1	–	575	–	–	–	–	1	14	22	7	–	5
Maine	–	–	11	–	–	–	–	–	2	4	–	–	–
New Hampshire	–	–	7	–	–	–	–	–	1	3	–	–	–
Vermont	–	–	1	–	–	–	–	–	–	–	–	–	1
Massachusetts	–	–	199	–	–	–	–	1	–	2	7	–	2
Rhode Island	–	–	154	–	–	–	–	–	2	3	–	–	1
Connecticut	1	–	203	–	–	–	–	–	9	10	–	–	1
MIDDLE ATLANTIC	10	–	726	–	5	–	5	1	65	66	27	1	25
Upstate New York	–	–	419	–	–	–	2	1	–	14	6	–	6
New York City	3	–	135	–	5	–	2	–	31	21	9	1	14
New Jersey	6	–	NN	–	–	–	–	–	12	20	11	–	3
Pennsylvania	1	–	172	–	–	–	1	–	22	11	1	–	2
EAST NORTH CENTRAL	5	–	2,533	–	–	3	3	–	50	102	17	1	8
Ohio	1	–	105	–	–	2	1	–	11	25	–	–	4
Indiana	–	–	194	–	–	–	–	–	1	17	11	–	–
Illinois	1	–	763	–	–	–	–	–	21	19	1	–	1
Michigan	3	–	782	–	–	1	2	–	15	31	5	–	2
Wisconsin*	–	–	689	–	–	–	–	–	2	10	–	1	1
WEST NORTH CENTRAL	–	2	758	–	1	–	1	–	12	20	12	1	11
Minnesota	–	–	3	–	–	–	–	–	7	9	–	–	4
Iowa	–	–	293	–	–	–	–	–	–	2	–	–	–
Missouri*	–	1	14	–	1	–	1	–	4	8	5	1	5
North Dakota*	–	–	14	–	–	–	–	–	–	–	–	–	–
South Dakota	–	–	4	–	–	–	–	–	–	–	–	–	1
Nebraska	–	–	180	–	–	–	–	–	–	–	–	–	–
Kansas	–	1	250	–	–	–	–	–	1	1	7	–	1
SOUTH ATLANTIC	5	1	392	–	–	–	1	4	65	97	19	–	18
Delaware	–	–	5	–	–	–	–	–	1	3	–	–	–
Maryland	–	–	60	–	–	–	–	–	10	4	–	–	6
District of Columbia	–	–	–	–	–	–	–	–	–	–	–	–	1
Virginia	–	–	38	–	–	–	–	–	4	7	5	–	3
West Virginia	1	–	68	–	–	–	–	–	1	2	–	–	–
North Carolina	–	–	NN	–	–	–	–	–	–	4	–	–	4
South Carolina	1	–	7	–	–	–	1	–	7	4	1	–	–
Georgia	–	–	–	–	–	–	–	–	16	32	–	–	1
Florida	3	1	214	–	–	–	–	4	26	41	13	–	3
EAST SOUTH CENTRAL	2	–	108	–	–	4	2	–	11	24	2	–	3
Kentucky*	1	–	25	–	–	–	–	–	–	–	–	–	3
Tennessee	1	–	NN	–	–	4	2	–	6	5	1	–	–
Alabama*	–	–	68	–	–	–	–	–	3	8	1	–	–
Mississippi	–	–	15	–	–	–	–	–	2	11	–	–	–
WEST SOUTH CENTRAL	4	–	546	–	1	3	2	1	19	51	24	1	7
Arkansas*	–	–	8	–	–	1	–	–	–	4	–	–	–
Louisiana	1	–	NN	–	–	2	–	–	2	5	1	–	–
Oklahoma*	1	–	16	–	–	–	–	–	3	6	2	–	–
Texas*	2	–	522	–	1	–	2	1	14	36	21	1	7
MOUNTAIN	2	1	187	–	1	–	–	–	10	48	8	–	6
Montana*	–	–	19	–	–	–	–	–	–	1	–	–	–
Idaho	–	–	21	–	–	–	–	–	–	–	–	–	–
Wyoming*	–	–	–	–	–	–	–	–	–	–	1	–	1
Colorado	–	1	147	–	–	–	–	–	8	9	–	–	4
New Mexico*	2	–	–	–	–	–	–	–	1	8	–	–	–
Arizona*	–	–	NN	–	1	–	–	–	1	22	6	–	1
Utah	–	–	–	–	–	–	–	–	–	8	1	–	–
Nevada*	–	–	–	–	–	–	–	–	–	–	–	–	–
PACIFIC	20	1	644	6	24	1	2	1	73	124	44	5	28
Washington	1	–	590	6	23	–	–	–	3	10	3	–	–
Oregon	–	–	2	–	–	–	–	–	10	14	1	–	1
California*	11	1	–	–	–	–	1	1	60	97	40	5	23
Alaska	–	–	13	–	1	1	1	–	–	–	–	–	–
Hawaii	8	–	39	–	–	–	–	–	–	3	–	–	4
Guam*	NA	NA	NA	NA	–	NA	–	–	–	NA	NA	NA	–
Puerto Rico	NA	NA	NA	NA	–	NA	–	–	–	NA	NA	NA	–
Virgin Islands	–	–	–	–	–	–	–	–	–	–	–	–	–

NN: Not notifiable
NA: Not available
*Delayed reports: Asep. meng.: Ala. add 2, Okla. add 8 (1976), Guam add 1 (1977); Chickenpox: Ala. delete 73 (1976), N.Mex. add 2, Calif. add 55, Guam add 5 (1977); Enceph.: Wisc. add 2, Ky. delete 1 (1977); Hep. B: Ala. delete 8, Okla. delete 2, Wyo. delete 2, Ariz. delete 20 (1976), Tex. delete 1, Guam add 2 (1977); Hep. A: Ala. delete 4, Okla. add 2, Wyo. add 6, Ariz. add 32 (1976), N. Dak. add 1, Ark. add 8, Ida. delete 2, N.Mex. add 2, Nev. add 1, Guam add 3 (1977); Hep. unsp.: Ala. add 2, Okla. add 4, Wyo. delete 5, Ariz. delete 16 (1976) Ark. add 2, Tex. delete 2, Mont. delete 1, N.Mex. add 1, Guam add 4 (1977); Malaria: Mo. delete 1 (1977)

Table III-Continued
Cases of Specified Notifiable Diseases: United States
Weeks Ending April 30, 1976 and May 1, 1977 – 17th 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	2,295	27,360	17,893	37	744	663	528	9,874	10	898	10,511	13
NEW ENGLAND	80	1,318	164	1	36	30	9	443	1	61	508	–
Maine	–	3	3	1	3	–	–	30	–	9	22	–
New Hampshire*	11	336	3	–	3	2	1	67	–	1	87	–
Vermont	12	248	–	–	3	2	–	5	–	4	57	–
Massachusetts*	40	367	2	–	9	8	3	79	–	12	190	–
Rhode Island	–	6	14	–	–	4	1	35	–	18	31	–
Connecticut	17	358	142	–	18	14	4	227	1	17	121	–
MIDDLE ATLANTIC	348	3,688	3,955	9	107	82	34	619	–	384	2,929	–
Upstate New York	146	1,146	1,517	1	29	31	6	104	–	242	1,686	–
New York City	17	161	182	3	21	20	8	247	–	10	172	–
New Jersey	7	84	395	2	25	12	14	160	–	101	891	–
Pennsylvania	178	2,297	1,861	3	32	19	6	108	–	31	180	–
EAST NORTH CENTRAL	395	6,028	7,038	2	71	85	214	3,482	–	134	2,269	–
Ohio	4	327	242	–	29	34	21	483	–	25	594	–
Indiana	210	2,978	1,359	–	7	4	16	196	–	39	685	–
Illinois	142	739	652	–	8	9	98	491	–	14	176	–
Michigan	39	624	2,623	2	19	32	29	1,153	–	37	567	–
Wisconsin*	–	1,360	2,162	–	8	6	50	1,159	–	19	247	–
WEST NORTH CENTRAL	392	5,177	383	1	49	48	109	2,470	–	16	323	2
Minnesota	108	1,029	138	–	18	11	–	3	–	–	9	–
Iowa	194	2,811	8	–	2	8	58	1,141	–	6	117	–
Missouri*	71	530	6	–	21	12	24	586	–	1	28	1
North Dakota	1	5	1	–	1	1	–	7	–	1	2	–
South Dakota	18	28	1	–	4	2	1	56	–	–	–	–
Nebraska	–	85	40	–	–	3	5	24	–	–	1	–
Kansas	–	689	189	1	3	11	21	653	–	8	166	1
SOUTH ATLANTIC	359	1,787	1,132	4	159	132	21	382	3	64	1,100	4
Delaware	–	19	111	–	2	2	3	70	–	–	16	–
Maryland	148	276	530	–	11	10	2	25	–	3	3	–
District of Columbia	–	1	3	–	–	2	–	5	–	–	–	–
Virginia*	79	906	155	–	9	12	4	46	1	20	346	1
West Virginia	5	68	111	–	8	4	7	99	–	6	66	–
North Carolina	3	29	–	1	41	23	1	18	2	6	356	–
South Carolina	–	116	2	2	16	24	–	9	–	–	152	–
Georgia	111	334	–	1	29	13	–	8	–	3	44	–
Florida	13	38	220	–	43	42	4	102	–	26	117	3
EAST SOUTH CENTRAL	32	654	427	3	82	50	30	494	2	67	1,503	1
Kentucky	7	176	408	–	19	9	1	68	–	2	35	1
Tennessee	21	403	5	–	22	20	16	276	1	45	1,408	–
Alabama*	4	59	–	–	25	15	10	134	–	20	57	–
Mississippi	–	16	14	3	16	6	3	16	1	–	3	–
WEST SOUTH CENTRAL	99	1,497	462	7	136	107	30	813	4	39	514	3
Arkansas	–	1	–	–	7	3	2	13	–	–	1	–
Louisiana	–	56	114	2	44	14	1	29	–	–	9	1
Oklahoma*	1	46	223	1	5	17	1	313	–	1	22	–
Texas*	98	1,394	125	4	80	73	26	458	4	38	482	2
MOUNTAIN	90	1,488	3,310	5	22	24	27	418	–	11	262	–
Montana*	56	890	149	–	2	2	1	3	–	–	7	–
Idaho	2	30	1,405	–	1	1	–	77	–	2	2	–
Wyoming*	–	1	–	–	1	–	NA	–	NA	NA	2	–
Colorado	17	372	134	–	1	10	25	206	–	8	199	–
New Mexico*	2	10	8	4	9	1	–	77	–	1	7	–
Arizona	12	111	203	–	6	6	–	–	–	–	–	–
Utah	–	5	1,393	1	1	4	–	53	–	–	41	–
Nevada	1	69	18	–	1	–	1	2	–	–	4	–
PACIFIC	500	5,723	1,022	5	82	105	54	753	–	122	1,103	3
Washington	24	325	91	–	11	18	14	167	–	14	264	–
Oregon	2	114	44	–	7	9	7	147	–	5	63	–
California	472	5,220	885	2	49	72	33	414	–	103	770	3
Alaska	–	56	–	3	14	4	–	17	–	–	–	–
Hawaii	2	8	2	–	1	2	–	8	–	–	6	–
Guam*	NA	3	6	–	–	1	NA	1	NA	NA	3	–
Puerto Rico	NA	288	81	–	–	2	NA	242	NA	NA	13	3
Virgin Islands	–	9	4	–	–	–	–	143	–	–	–	–

NA: Not available

*Delayed reports: Measles: Okla. delete 2 (1976), N. Hamp. add 7, Mass. delete 7, Wisc. delete 5, Mo. delete 2, Va. delete 1, Tex. delete 3, Mont. delete 6 (1977); Men. Inf.: Ala. add 1 (1976); Mumps: Okla. add 29 (1976), N.Mex. add 2 (1977); Rubella: Okla. delete 4, Wyo. add 1 (1976), N.Hamp. add 48, Guam add 1 (1977)

Table III-Continued
Cases of Specified Notifiable Diseases: United States
Weeks Ending April 30, 1976 and May 1, 1977 — 17th Week

REPORTING AREA	TUBERCULOSIS		TULAREMIA	TYPHOID FEVER		TYPHUS-FEVER TICK-BORNE (RMSF)		VENEREAL DISEASES (Civilian Cases Only) GONORRHEA			SYPHILIS (Pri. & Sec.)			RABIES IN ANIMALS
	1977	CUM. 1977	CUM. 1977	1977	CUM. 1977	1977	CUM. 1977	1977	CUMULATIVE 1977	CUMULATIVE 1976	1977	CUMULATIVE 1977	CUMULATIVE 1976	CUM. 1977
UNITED STATES	685	9,622	25	9	118	13	45	16,707	299,401	314,238	351	7,016	8,413	843
NEW ENGLAND	20	347	1	–	6	–	–	348	7,775	8,608	20	264	242	12
Maine	1	27	–	–	–	–	–	24	616	722	1	8	8	11
New Hampshire	–	8	–	–	–	–	–	18	305	222	–	1	3	–
Vermont	2	17	–	–	–	–	–	16	202	182	–	4	2	–
Massachusetts	10	185	1	–	4	–	–	149	3,428	4,090	18	200	176	–
Rhode Island	1	22	–	–	1	–	–	40	591	582	–	3	10	–
Connecticut	6	88	–	–	1	–	–	101	2,633	2,810	1	48	43	1
MIDDLE ATLANTIC	95	1,528	–	1	22	–	2	1,646	32,836	33,655	47	1,002	1,412	12
Upstate New York	16	238	–	–	3	–	2	291	4,859	5,549	10	93	92	8
New York City	31	511	–	1	9	–	–	760	14,488	14,454	26	626	918	–
New Jersey	23	387	–	–	8	–	–	113	4,995	5,327	5	133	184	4
Pennsylvania	25	392	–	–	2	–	–	482	8,494	8,325	6	150	218	–
EAST NORTH CENTRAL	63	1,554	2	–	13	–	–	1,884	43,875	50,639	28	767	783	25
Ohio	4	236	1	–	5	–	–	122	10,718	12,276	14	199	183	–
Indiana*	9	178	–	–	–	–	–	76	3,757	4,728	1	52	42	1
Illinois	20	592	–	–	1	–	–	697	14,854	18,571	7	401	411	4
Michigan	26	483	–	–	7	–	–	703	10,213	10,406	4	79	102	3
Wisconsin*	4	65	1	–	–	–	–	286	4,333	4,658	2	36	45	17
WEST NORTH CENTRAL	28	326	3	–	8	–	2	958	15,652	15,877	7	155	156	190
Minnesota	2	63	–	–	1	–	–	180	2,792	2,988	2	50	36	71
Iowa	2	29	–	–	–	–	–	96	1,908	2,039	2	13	18	34
Missouri	15	139	2	–	4	–	1	440	6,616	6,184	3	57	61	15
North Dakota	–	9	–	–	–	–	–	24	276	234	–	–	–	25
South Dakota*	2	15	1	–	–	–	–	15	416	460	–	1	2	32
Nebraska	–	13	–	–	–	–	–	156	1,318	1,362	–	16	13	–
Kansas	7	58	–	–	3	–	1	47	2,326	2,610	–	18	26	13
SOUTH ATLANTIC	162	2,198	8	–	16	3	15	4,607	72,560	75,840	120	2,045	2,507	87
Delaware	–	16	–	–	–	–	–	48	891	1,066	–	13	21	–
Maryland	13	324	1	–	–	–	–	700	9,151	10,476	5	132	218	–
District of Columbia	6	107	–	–	–	–	–	296	5,001	5,226	21	231	204	–
Virginia	11	231	–	–	5	2	4	506	7,656	8,252	12	202	214	2
West Virginia	6	87	–	–	3	–	–	68	988	970	–	1	14	3
North Carolina*	49	396	2	–	1	–	8	649	10,668	10,959	17	298	499	2
South Carolina	19	215	2	–	–	1	1	404	6,703	7,405	11	93	134	–
Georgia	11	244	3	–	–	–	2	785	14,084	13,764	17	368	343	62
Florida	47	578	–	–	7	–	–	1,151	17,418	17,722	37	707	860	18
EAST SOUTH CENTRAL	59	837	1	–	1	4	9	1,503	26,076	28,086	7	217	349	31
Kentucky*	10	194	1	–	–	–	1	72	3,438	3,569	1	22	53	10
Tennessee	21	280	–	–	–	4	7	637	10,514	10,962	4	66	144	15
Alabama*	15	224	–	–	1	–	1	413	7,240	7,928	1	43	65	6
Mississippi	13	139	–	–	–	–	–	381	4,884	5,627	1	86	87	–
WEST SOUTH CENTRAL	121	1,110	6	1	3	6	17	1,947	38,534	42,540	55	961	925	333
Arkansas*	19	127	3	–	–	–	1	96	2,909	3,876	2	21	29	32
Louisiana*	29	226	–	–	–	–	–	198	5,360	6,183	5	194	189	4
Oklahoma*	8	101	1	–	–	5	11	248	3,611	3,959	5	24	38	123
Texas	65	656	2	1	3	1	5	1,405	26,654	28,522	43	722	669	174
MOUNTAIN	26	258	3	5	13	–	–	720	12,287	12,368	11	150	239	20
Montana	3	12	1	–	–	–	–	44	628	614	–	–	3	10
Idaho	–	15	–	–	–	–	–	27	590	669	–	3	10	–
Wyoming	NA	5	–	NA	–	NA	–	11	319	286	–	12	5	–
Colorado	10	43	2	–	6	–	–	207	3,188	3,082	4	44	61	–
New Mexico	3	44	–	–	–	–	–	82	1,792	2,430	6	30	66	–
Arizona	4	115	–	2	3	–	–	180	3,451	3,443	1	52	72	10
Utah	6	12	–	3	4	–	–	42	735	687	–	4	8	–
Nevada	–	12	–	–	–	–	–	127	1,584	1,157	–	5	14	–
PACIFIC	111	1,464	1	2	36	–	–	3,094	49,806	46,625	56	1,455	1,800	133
Washington	NA	60	–	–	1	–	–	314	3,760	3,874	NA	49	45	–
Oregon	5	64	–	–	2	–	–	157	3,675	3,348	3	48	51	–
California*	83	1,106	1	2	32	–	–	2,370	39,638	37,178	48	1,334	1,668	124
Alaska	6	22	–	–	–	–	–	166	1,651	1,310	4	10	6	9
Hawaii	17	212	–	–	1	–	–	87	1,082	915	1	14	30	–
Guam*	NA	19	–	NA	1	NA	–	NA	80	148	NA	1	1	–
Puerto Rico	NA	106	–	NA	2	NA	–	NA	902	898	NA	178	177	10
Virgin Islands	–	1	–	–	–	–	–	–	48	93	–	1	28	–

NA: Not available

*Delayed reports: TB: Ala. add 4 (1976), Wisc. add 8, N.Car. delete 1, Ky. delete 1, Guam add 2 (1977); RMSF: Okla. delete 5 (1976); GC: Ind. delete 511, Calif. delete 1302 (1976), S.Dak. delete 1, Ala. add 106, La. delete 14, Guam add 3 (1977); Syphilis: Ind. delete 5, Calif. delete 87 (1976), Wisc. delete 2, Ark. add 1, La. delete 6 (1977); An. rabies: Wisc. add 3 (1977)

Table IV
Deaths in 121 United States Cities*
Week Ending April 30, 1977 – 17th Week

REPORTING AREA	ALL CAUSES: ALL AGES	ALL CAUSES: 65 Years and Over	ALL CAUSES: 45-64 Years	ALL CAUSES: 25-44 Years	ALL CAUSES: Under 1 Year	Pneumonia and Influenza ALL AGES
NEW ENGLAND	659	441	152	27	21	34
Boston, Mass.	214	133	51	13	9	14
Bridgeport, Conn.	32	24	6	–	1	1
Cambridge, Mass.	22	14	6	1	–	2
Fall River, Mass.	31	25	5	1	–	1
Hartford, Conn.	67	45	15	1	2	2
Lowell, Mass.	28	19	8	1	–	2
Lynn, Mass.	22	17	4	1	–	–
New Bedford, Mass.	18	13	4	1	–	–
New Haven, Conn.	46	29	8	3	5	–
Providence, R.I.	59	33	20	3	3	3
Somerville, Mass.	9	4	5	–	–	–
Springfield, Mass.	31	21	8	1	–	3
Waterbury, Conn.	28	21	5	1	–	5
Worcester, Mass.	52	43	7	–	1	1
MIDDLE ATLANTIC	2,779	1,745	687	171	104	137
Albany, N. Y.	42	29	5	1	4	1
Allentown, Pa.	23	13	9	–	1	3
Buffalo, N. Y.	115	81	26	5	2	11
Camden, N. J.	36	16	14	–	4	1
Elizabeth, N. J.	25	14	11	–	–	1
Erie, Pa.	25	15	9	1	–	1
Jersey City, N. J.	40	25	10	5	–	–
Newark, N. J.	51	20	16	4	5	5
New York City, N. Y.	1,430	902	344	102	42	52
Paterson, N. J.	33	18	11	2	2	2
Philadelphia, Pa.	395	237	102	26	23	25
Pittsburgh, Pa.	192	122	46	10	10	14
Reading, Pa.	39	24	12	2	–	1
Rochester, N. Y.	116	76	20	7	8	8
Schenectady, N. Y.	22	15	6	–	–	–
Scranton, Pa.	45	32	12	–	–	3
Syracuse, N. Y.	67	49	11	5	2	3
Trenton, N. J.	25	16	7	1	1	1
Utica, N. Y.	28	24	4	–	–	2
Yonkers, N. Y.	30	17	12	–	–	3
EAST NORTH CENTRAL	2,243	1,318	596	144	101	61
Akron, Ohio	46	39	4	2	1	–
Canton, Ohio	38	24	8	1	1	3
Chicago, Ill.	540	291	162	41	25	13
Cincinnati, Ohio	145	88	37	7	7	3
Cleveland, Ohio	190	105	56	14	7	6
Columbus, Ohio	142	74	40	10	10	3
Dayton, Ohio	108	60	37	5	3	2
Detroit, Mich.	308	177	83	23	13	9
Evansville, Ind.	39	26	8	–	3	1
Fort Wayne, Ind.	41	21	8	6	3	4
Gary, Ind.	18	8	3	4	1	2
Grand Rapids, Mich.	54	39	7	4	4	–
Indianapolis, Ind.	149	84	46	7	8	–
Madison, Wis.	35	20	4	6	3	4
Milwaukee, Wis.	118	77	35	1	3	2
Peoria, Ill.	32	25	5	1	–	–
Rockford, Ill.	30	22	6	1	–	–
South Bend, Ind.	37	32	2	1	1	4
Toledo, Ohio	113	68	31	6	6	5
Youngstown, Ohio	60	38	14	4	2	–
WEST NORTH CENTRAL	704	446	166	30	35	24
Des Moines, Iowa	56	35	17	3	–	1
Duluth, Minn.	25	19	4	1	–	2
Kansas City, Kans.	25	12	6	4	–	–
Kansas City, Mo.	114	77	25	6	2	2
Lincoln, Nebr.	27	20	4	2	1	1
Minneapolis, Minn.	94	57	20	2	8	3
Omaha, Nebr.	60	36	14	3	3	–
St. Louis, Mo.	142	97	27	1	14	4
St. Paul, Minn.	71	43	23	3	1	1
Wichita, Kans.	90	50	26	5	6	10

REPORTING AREA	ALL CAUSES: ALL AGES	ALL CAUSES: 65 Years and Over	ALL CAUSES: 45–64 Years	ALL CAUSES: 25–44 Years	ALL CAUSES: Under 1 Year	Pneumonia and Influenza ALL AGES
SOUTH ATLANTIC	1,157	670	323	76	50	41
Atlanta, Ga.	148	75	41	15	8	6
Baltimore, Md.	248	148	71	15	7	7
Charlotte, N. C.	50	37	6	6	–	2
Jacksonville, Fla.	75	49	17	2	5	3
Miami, Fla.	88	42	32	6	1	–
Norfolk, Va.	62	36	20	3	3	2
Richmond, Va.	67	31	21	2	11	4
Savannah, Ga.	43	18	16	5	2	5
St. Petersburg, Fla.	75	55	14	2	4	4
Tampa, Fla.	72	49	15	2	4	4
Washington, D. C.	197	111	61	16	3	4
Wilmington, Del.	32	19	9	2	2	–
EAST SOUTH CENTRAL	685	409	172	47	21	28
Birmingham, Ala.	125	69	36	7	6	5
Chattanooga, Tenn.	68	40	13	8	–	5
Knoxville, Tenn.	32	17	13	1	–	1
Louisville, Ky.	131	82	28	4	8	6
Memphis, Tenn.	150	94	32	14	3	6
Mobile, Ala.	51	28	17	2	1	–
Montgomery, Ala.	24	17	5	1	1	1
Nashville, Tenn.	104	62	28	10	2	4
WEST SOUTH CENTRAL	1,395	709	411	125	84	40
Austin, Tex.	47	29	9	7	–	6
Baton Rouge, La.	49	21	17	7	3	2
Corpus Christi, Tex.	39	23	12	1	–	5
Dallas, Tex.	167	80	56	12	12	2
El Paso, Tex.	47	27	7	4	5	1
Fort Worth, Tex.	87	44	19	10	5	–
Houston, Tex.	424	190	137	47	22	4
Little Rock, Ark.	77	38	21	7	8	5
New Orleans, La.	121	69	33	9	9	–
San Antonio, Tex.	167	89	51	13	10	2
Shreveport, La.	70	42	17	4	7	3
Tulsa, Okla.	100	57	32	4	3	10
MOUNTAIN	495	304	115	28	24	14
Albuquerque, N. Mex.	44	19	15	3	3	–
Colorado Springs, Colo.	43	27	7	3	4	2
Denver, Colo.	99	57	28	5	5	2
Las Vegas, Nev.	20	9	6	3	–	3
Ogden, Utah	12	8	3	–	1	–
Phoenix, Ariz.	133	89	27	9	3	2
Pueblo, Colo.	20	15	3	1	1	4
Salt Lake City, Utah	43	24	11	–	4	1
Tucson, Ariz.	81	56	15	4	3	–
PACIFIC	1,529	934	386	113	44	45
Berkeley, Calif.	11	9	1	–	1	1
Fresno, Calif.	74	40	22	4	2	–
Glendale, Calif.	18	16	2	–	–	1
Honolulu, Hawaii	59	36	15	4	4	2
Long Beach, Calif.	110	62	36	11	–	5
Los Angeles, Calif.	410	243	99	46	8	15
Oakland, Calif.	77	47	13	8	6	–
Pasadena, Calif.	33	23	5	–	2	1
Portland, Oreg.	132	77	40	6	5	4
Sacramento, Calif.	61	38	15	4	1	3
San Diego, Calif.	124	78	32	5	6	4
San Francisco, Calif.	144	90	32	13	4	2
San Jose, Calif.	49	32	10	6	–	1
Seattle, Wash.	153	91	47	4	4	3
Spokane, Wash.	47	31	12	2	–	3
Tacoma, Wash.	27	21	5	–	1	–
TOTAL	11,646	6,976	3,008	761	484	424
Expected Number	11,604	7,082	3,007	730	371	441

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

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The editor welcomes accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials. Send reports to: Center for Disease Control, Attn.: Editor, Morbidity and Mortality Weekly Report, Atlanta, Georgia 30333.

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Malaria — Continued

Editorial Note: Although serious complications and fatalities from malaria are most frequently associated with *P. falciparum* infections, this case illustrates the potentially serious morbidity of *P. vivax* infection. Splenomegaly occurs commonly in malaria (*1*), but rupture of the spleen occurs only rarely (*2,3*). When rupture occurs, it usually follows an episode of acute *P. vivax* malaria. In such cases, trauma and coagulation abnormalities (particularly thrombocytopenia) may be contributing factors. Mortality is high in the absence of rapid diagnosis and surgical intervention.

In this instance splenomegaly and splenic rupture went unsuspected because of the patient's reported past history of splenectomy. Both trauma and thrombocytopenia appeared as possible contributing factors.

It is not possible to determine whether the patient's history was correct, in which case he had an accessory spleen. The latter are not rare; in one study they were found in 10% of 3,000 routine autopsies (*4*).

References

1. Heineman HS: The clinical syndrome of malaria in the U.S. Arch Intern Med 129:607-616, 1972
2. Howard WA, Krotoski W, Slonim M, Contacos P: Spontaneous splenic rupture in vivax malaria: Case report. Milit Med 138:32-35, 1973
3. Martelo OJ, Smoller M, Saladin T, Campbell F: Malaria in American soldiers. Arch Intern Med 123:383-387, 1969
4. Halpert B, Györkey F: Lesions observed in accessory spleens of 311 patients. Am J Clin Path 32:165-168, 1959

Measles — Ohio

Licking County, Ohio (population: 113,000), reported 411 cases of measles from October 1, 1976 to January 5, 1977. Of these, 31 (7.5%) were reported by private physicians, 340 (82.7%) by schools, and 32 (7.8%) by both; 8 more (2.0%) were uncovered during an epidemiologic investigation of 3 affected schools.

The outbreak appeared to begin in a rural junior-senior high school in the northern part of the county. Eventually it involved 35 of the 57(61.4%) schools, with the greatest school measles attack rates approaching 10%. Peak incidence occurred during the week of November 19-25. Of the 411 cases, 57.5% were in persons 10 years of age or older (Table 1). Only 3.2% of cases were reported in preschoolers.

TABLE 1. Age distribution of reported measles cases, Licking County, Ohio, October 1, 1976 — January 7, 1977.

Age Group	No. Cases	%
0-4	13	3.2
5-9	113	27.5
10-14	155	37.8
15-19	77	18.8
20+	4	1.0
Unknown	49	11.9
Total	**411**	**100.0**

An intensive epidemiologic investigation of vaccine efficacy was conducted in 3 elementary schools that had a total of 85 reported cases — 74 of which were clinically consistent with measles. Attack rates of clinically confirmed measles were 5.0% or higher in all of these schools. Vaccination status, including, if immunized, the exact age by month, was available on 70 of the 74 cases and on 443 of the 498 well children who were not immunized at the school clinics during the outbreak.

The highest measles attack rate (69.4%) occurred in unvaccinated children (Table 2). High attack rates were also seen in persons immunized before they were 12 months old. While the measles attack rate in persons immunized at 12 months of age was higher than for those immunized at 14 months or later, the difference was not statistically significant. The highest risk of developing measles occurred in children who were either unimmunized or immunized prior to 12 months of age.

TABLE 2. Measles attack rates by age at time of immunization for 70 cases of measles in 3 elementary schools, Licking County, Ohio.

Age at vaccination	Ill	Well	AR (%)	Relative Risk
Unvaccinated	34	15	69.4	18.8
<11 Months	16	36	30.8	8.3
11 Months	4	12	25.0	6.8
12 Months	3	45	6.3	1.7
13 Months	1	24	4.0	1.1
≥14 Months	12	311	3.7	1.0

$P < 0.0001$
X^2 due to linear trend

The lowest vaccine efficacy* rates occurred in persons immunized prior to 12 months of age. Children immunized when they were 13 or 14 months old had higher vaccine efficacy rates than did those immunized when they were 12 months of age; however, the differences were not statistically significant (Table 3).

TABLE 3. Vaccine efficacy by age at time of immunization, Licking County, Ohio.

Age	Vaccine Efficacy (%)
<11 Months	55.6
11 Months	64.0
12 Months	90.9
13 Months	94.2
≥14 Months	94.7

Measles control clinics were evaluated in 2 of the 3 schools, using immunization data from school records. Health authorities had recommended that all children who had not had measles or measles immunization or had been immunized prior to 12 months of age should be vaccinated in the control clinics. Record reviews revealed that, based on those recommendations, immunization had been necessary for only 46 (20.3%) of the 227 children vaccinated. The study also found that 22 (32.4%) of the 68 school children who were unvaccinated or immunized prior to 12 months of age did not get immunized at their school clinics.

Reported by M Chaconas, Newark City Health Dept; F Benner, RN, MPH, Licking County Health Dept; H Butler, TJ Halpin, MD, MPH, State Epidemiologist, A Payton, S Sharp, K Sullivan, Ohio Dept of Health; Field Services Div, Bur of Epidemiology, and Immunization Div, Bur of State Services, CDC.

Editorial Note: Recent evidence, predominantly from antibody prevalence determinations, indicates that persons immunized at 12 months of age have lower seroconversion rates and measles antibody prevalence than those immunized a month or more later (*1,2,3*). These findings prompted a change in 1976 in the recommended age for routine immunization from 12 months to 15 months (*4*). However, evaluation of clinical vaccine efficacy in outbreaks in persons immunized at 12 versus 15 months of age had not been performed at the time.

In this outbreak the number of persons, either ill or well,

*Vaccine efficacy = $\frac{\text{rate in unvaccinated} - \text{rate in vaccinated}}{\text{rate in unvaccinated}}$

Measles – Continued

immunized at 12 or 13 months of age is small. Thus, the failure to demonstrate significant differences in vaccine efficacy between these groups and persons immunized at 15 months of age or later may be due to the small sample size rather than the actual absence of such differences. However, the measured vaccine efficacies in these 3 schools suggest that the slightly higher failure rate in persons immunized at 12 months of age played little role.

This study supports the current ACIP recommendations that persons immunized at 12 months of age need not routinely be reimmunized. Further studies with larger numbers are necessary to evaluate fully this problem, however. This outbreak also confirms that vaccine efficacy in persons immunized prior to 12 months of age is low, thus supporting the current ACIP recommendations (*4*) to reimmunize such persons. Finally, this study demonstrates that the reported proportion of vaccine failures may be a misleading index of vaccine effectiveness. At least 36 of the 74 (48.6%) cases in this outbreak were documented vaccine failures; however, vaccine efficacy for those immunized at 12 months of age or later was 90% or higher.

References

1. Krugman S: Present status of measles and rubella immunization in the United States: A medical progress report. J Pediatr 90:1-12, 1977
2. Yeager AS, Davis JH, Ross LA: Measles immunization, successes and failures. JAMA 237:347-351, 1977
3. Shasby DM, Shope TC, Downs H, Herrmann KL, Polkowski J: Epidemic measles in a highly vaccinated population. N Engl J Med 296:585-589, 1977
4. MMWR 25:359-365, 1976

Follow-up on Legionnaires' Disease – Pennsylvania

Antimicrobial susceptibility of the agent of Legionnaires' disease has been evaluated by protection studies in embryonated hens' eggs and *in vitro* by agar dilution(MMWR 26 [12,14], 1977). This preliminary report by the Pennsylvania Department of Health examines the effectiveness of erythromycin in the only animal model of the disease.

Ten male Hartley strain guinea pigs, each weighing 600 grams, were given by intraperitoneal inoculation a lethal dose of a bacillus isolated from a confirmed Legionnaires' disease case. The isolate had previously been shown to be antigenically similar to reference strains of the Legionnaires' disease agent (MMWR 26 [12], 1977).

Inoculated animals became ill with fever and prostration usually within 24 hours of infection. At the first sign of fever in one group of ill animals, treatment was begun with erythromycin gluceptate in various doses (Ilotycin[R] Gluceptate, USP, Dista Products Co., Div. of Eli Lilly & Co.).* The drug was given intradermally once daily in dosages of 7.5 mg, 15 mg, and 25 mg per animal per day for 7 days. Two animals received each of the 3 dosages. A group of 4 infected animals not treated with the drug served as positive controls.

The animals were monitored with daily rectal temperatures and clinical examinations. Every inoculated animal that did not receive erythromycin died within 96 hours of infection. All treated guinea pigs recovered and remained healthy 15 days after inoculation. Sera from convalescent animals were found to have antibody to the isolate in indirect fluorescent antibody tests.

Reported by P Nash, PhD, V Pidcoe, DrPH, K Schectman, L Sideman, Pennsylvania Dept of Health; Special Pathogens Br, Bacterial Diseases Div, Bur of Epidemiology, CDC.

Editorial Note: From 3 previous sources of information – review of hospital charts of cases, *in vitro* determination of antimicrobial susceptibility, and protection studies employing embryonated hens' eggs – evidence had been accumulated that erythromycin might be an effective drug against the Legionnaires' disease bacillus. These *in vivo* experiments in which ill guinea pigs responded to therapy with erythromycin are consistent with the previous findings.

*Use of trade names is for identification only and does not constitute endorsement by the PHS, U.S. Dept. HEW.

Current Trends

Influenza – United States

While Alaska has been reporting recent outbreaks of influenza-like illness in isolated island populations in the Aleutians and the Bering Sea, and Oregon has reported an institutional outbreak beginning April 22, influenza activity is generally declining in the United States.

Isolates resembling A/Texas/1/77, identified at CDC, have now been made from sporadic cases of influenza in Arizona and California. During the week ending April 22, New Jersey reported its first isolate of A/Victoria/3/75 this year.

Reported by the State Epidemiologists from Alaska, Arizona, California, New Jersey, and Oregon, and the National Influenza Immunization Program, CDC.

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