CENTERS FOR DISEASE CONTROL

May 31, 1985 / Vol. 34 / No. 21

MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

Epidemiologic Notes and Reports

Illnesses Possibly Associated with Smoking Clove Cigarettes

Between March 1984 and May 1985, 12 cases of severe illnesses possibly associated with smoking clove cigarettes were reported to CDC. Signs and symptoms reported in the 11 hospitalized patients included pulmonary edema, bronchospasm, and hemoptysis. Milder symptoms reported with clove cigarette use included nausea and vomiting, angina, increased incidence of respiratory tract infections, exacerbations of chronic bronchitis, increased incidence and severity of asthma attacks, dyspnea, chronic cough, and epistaxis. Blood-streaked sputum and mild hemoptysis have been reported with particular frequency. Following are two examples of reported severe illnesses possibly resulting from smoking clove cigarettes.

Case 1: On August 4, 1984, a 19-year-old white male athlete was admitted to a California hospital after the sudden onset of acute respiratory distress. Three weeks before he was admitted, he had noted 7-10 days of cough and yellow sputum, but he had been feeling well for the week before admission. On the night before admission, he smoked two clove cigarettes and fell asleep for 3 hours. He awoke short of breath and noted a fever to 39.3C (102.8 F). Fourteen hours later, he was admitted to the hospital in acute respiratory distress, with a pulse of 144/minute, respiratory rate of 48/minute, temperature of 39.3 C (100.8 F), and blood pressure of 138/74). Chest examination revealed a few scattered rhonchi and basilar rales, diminished breath sounds at the lung bases, and no dullness to percussion. A chest roentgenogram showed diffuse interstitial pulmonary edema with a small amount of pleural fluid. His room air arterial pO_2 was 56 mm Hg. His white blood count (WBC) was 21,500/cm^2, with 88% neutrophils, 10% bands, 1% lymphocytes, and 1% monocytes. Blood and sputum cultures were negative. He responded rapidly to intravenous corticosteroids, diuretics, and bronchodilators. No antibiotics were given. He was discharged 2 days later with a near-normal chest roentgenogram and no apparent sequelae. He had previously smoked clove cigarettes without adverse consequences.

Case 2: On December 6, 1984, a 16-year-old black Ethiopian male living in the United States for the past 12 years was admitted to a California hospital. He had been in good health until the night before admission, when he developed symptoms of an upper respiratory tract infection, fever, and nonproductive cough. The next day, he noted increasing dyspnea, nausea, and vomiting. By early evening, he was admitted to the hospital in severe respiratory distress, with a pulse of 124/minute, respiratory rate of 40/minute; and temperature of 38.1 C (100.6 F). Chest examination revealed rare rhonchi but no rales or wheezing. Chest roentgenogram showed bilateral diffuse interstitial infiltrates without pleural effusions. His room air arterial pO_2 was 47 mm Hg. His WBC was 30,200/cm^2, with 91% neutrophils, 6% bands, 2% lymphocytes, and 2% monocytes. Blood and sputum cultures were negative. He was first treated with broad-spectrum antibiotics for presumed infectious pneumonia of unknown etiology. Bilateral pleural

Clove Cigarettes—Continued

effusions developed over the ensuing 2 days, and diagnostic thoracentesis showed an exudative pleural fluid with a protein of 5.2 g/dl. The same day, it became known that he had smoked clove cigarettes the night before being hospitalized. Antibiotics were discontinued, and a course of intravenous corticosteroids was begun. He continued to improve and was discharged without sequelae. Both the pulmonary and infectious disease consultants believed the clinical course and laboratory findings were most consistent with a toxic rather than an infectious process.

Reported by FG Schechter, MD, Presbyterian Intercommunity Hospital, Whittier, P Hackett, MD, Q Rodriguez, MD, Northern Inyo Hospital, Bishop, AD Dauer, MD, NA Sagle, MD, University of Southern California, DK Houston, MD, LW Wilson, MD, Brotman Hospital, Los Angeles, JA Kerley, MD, B Sanger, MD, Coronado Hospital, Coronado, HM Lee, MD, WT Nishigaya, MD, Humana Hospital, West Anaheim, RE Perez, MD, University of California at Irvine, Orange, JW Stratton, MD, Epidemiological Studies Section, California Dept of Health Svcs; TL Guidotti, MD, University of Alberta, Edmonton, Alberta, Canada; G Churchill, MD, Wayne State University, Detroit, Michigan; M Tafeen, MD, Plantation Pediatric Group, Plantation, SH King, MD, JJ Sacks, MD, Acting State Epidemiologist, Florida Dept of Health and Rehabilitative Svcs; Div of Field Svcs, Epidemiology Program Office, Special Studies Br, Chronic Diseases Div, Center for Environmental Health, CDC.

Editorial Note: The passive reporting system through which these reports were received is useful for detecting rare and serious adverse effects occurring shortly after exposure to a possibly toxic substance, but it is not possible to establish the exact incidence or an etiologic relationship. In evaluating the relationship between common exposures and uncommon outcomes, clinicians and public health officials must maintain a high index of suspicion. With clove cigarettes, there is a disturbing pattern in the anecdotal reports of pulmonary illness in previously healthy young adults, temporally linked to clove cigarette smoking. This is especially true, since hemoptysis and pulmonary edema are biologically plausible effects of smoking clove cigarettes. Further toxicologic and epidemiologic data are needed to clarify the acute health effects, if any, of clove cigarettes in humans.

Since 1968, clove cigarettes have been imported into the United States from Indonesia. Sales in the United States have increased from 12 million in calendar year 1980 to 150 million in fiscal year 1984 (*1*). The cigarettes are sold throughout the United States. The majority of persons buying the cigarettes are between the ages of 17 and 30 years (*2*).

Clove cigarettes contain about 60%-70% tobacco and 30%-40% cloves. Exposure to tar, nicotine, and carbon monoxide is higher from clove cigarettes than from regular American cigarettes. In smoking machine tests, clove cigarettes averaged over twice as much tar, nicotine, and carbon monoxide delivery as moderate tar-containing American cigarettes (*3*). Also, in the United States, clove cigarette smoke is inhaled deeply and retained in the lungs.

Eugenol—the major active ingredient in cloves—has been used as a topical dental anesthetic for years. Although eugenol has caused dermal and mucosal hypersensitivity reactions in dental patients and occupationally exposed health-care workers (*2*), pulmonary toxicity has not been reported. Pharmacologic effects associated with eugenol include topical anesthesia, diminished smooth muscle activity, anticonvulsant activity, and cyclooxygenase inhibition. Although eugenol has not been shown to be mutagenic in the Ames assay or carcinogenic in laboratory animals, some of its metabolites are mutagenic.

Although a cause-and-effect relationship between clove cigarette smoking and the illnesses described in these patients is not proven, inhaling clove cigarette smoke may produce severe lung injury in a limited number of susceptible persons. Prodromal respiratory tract infections reported by persons who have become severely ill after smoking the cigarettes may contribute to the development of severe illness or may reflect repeated aspirations into an airway anesthetized by eugenol in clove cigarette smoke.

In addition to adverse health effects that may result from inhaled eugenol and pyrolyzed cloves, use of clove cigarettes may be changing the smoking patterns of American teenagers.

Clove Cigarettes—Continued

Some researchers have suggested that eugenol, which is present in substantial quantities in clove cigarette smoke (*4*), anesthetizes the backs of smokers' throats and tracheas, permitting deeper inhalation and possibly encouraging smoking in persons who might otherwise be dissuaded by the harshness of regular cigarettes. Whether the higher tar and nicotine content of clove cigarettes leads clove cigarette smokers to smoke higher tar American cigarettes is unknown (*2*).

In Indonesia, clove cigarettes are smoked by most adult males (*5*); health effects have not been systematically studied. In the United States, despite publicity in the popular press and an apparently large number of smokers, relatively few cases of severe illness linked to clove cigarettes have been reported.

Cloves are only one of hundreds of ingredients currently being added to cigarettes to manipulate cigarette flavor, aroma, and burning quality. The inhalation toxicology of cigarette additives has been infrequently studied.

In April 1985, New Mexico outlawed sales of clove cigarettes; Michigan has introduced legislation to ban clove cigarettes.

Additional cases of illness possibly associated with smoking clove cigarettes should be reported to CDC through state and local health departments.

References

1. Bruce M, Bureau of Alcohol, Tobacco and Firearms, U.S. Department of the Treasury. Personal communication based on census data for imports for consumption.
2. Guidotti, TL. Possible risks to health associated with clove cigarettes. Chronic Diseases in Canada (in press).
3. White SK, Henderson GM, Jenkins RA. Selected constituents in the smokes of two brands of Indonesian cigarettes sold in the United States: "tar," nicotine, carbon monoxide, and carbon dioxide. Oak Ridge, Tennessee: Tobacco Smoke Program, Oak Ridge National Laboratories, 1982 (Topical Report NCI/S&HP/ORNL #124).
4. Jenkins R, Oak Ridge National Laboratories. Personal communication.
5. The Indonesian kretek industry, domestic and export. Tobacco International 1983;185:59-66.

Current Trends

Tuberculosis — United States, 1984

In 1984, 22,255 cases of tuberculosis were reported to CDC, for a rate of 9.4 cases per 100,000 population. Compared with 1983, this is a 6.7% decrease in the number of cases reported and a decline of 7.8% in the case rate.

Case rates for the 50 states ranged from 21.0/100,000 in Hawaii to 1.0/100,000 in Wyoming (Table 1). The rate increased in eight states, remained unchanged in two, and decreased in 40.

The case rate for persons living in 57 cities with populations of 250,000 or more was 19.3/100,000—more than twice the national rate (Table 2). Urban rates ranged from 49.9/100,000 in Miami, Florida, to 2.3/100,000 in Omaha, Nebraska. Eight cities had rates at least three times the national rate: Miami, Florida; Newark, New Jersey; Atlanta, Georgia; San Francisco, California; Tampa, Florida; Oakland, California; Honolulu, Hawaii; and Washington, D.C.

In 1984, 1,236 tuberculosis cases were reported among children under 15 years of age, including 759 cases among children under 5 years of age; in 1983, there were 1,360 and 818 such cases, respectively.

Official tuberculosis mortality statistics for the United States are compiled by the National Center for Health Statistics. Final tuberculosis mortality data for 1982 show 1,807 deaths. This is a 6.7% decrease from 1981 in the number of deaths reported.

Reported by Div of Tuberculosis Control, Center for Prevention Svcs, CDC.

Tuberculosis — Continued

TABLE 1. Tuberculosis cases and case rates, by states — United States, 1984 and 1983

State	Tuberculosis cases		Case rate		Rank according to rate		Population
	1984	1983	1984	1983	1984	1983	(July 1, 1984)
United States	**22,255**	**23,846**	**9.4**	**10.2**	*	*	**236,158,000**
Alabama	565	522	14.2	13.2	5	11	3,990,000
Alaska	79	98	15.8	20.5	3	2	500,000
Arizona	273	264	8.9	8.9	19	22	3,053,000
Arkansas	315	414	13.4	17.8	8	3	2,349,000
California	3,306	3,469	12.9	13.8	9	7	25,622,000
Colorado	96	108	3.0	3.4	42	42	3,178,000
Connecticut	176	194	5.6	6.2	32	33	3,154,000
Delaware	57	65	9.3	10.7	18	17	613,000
District of Columbia†	189	202	30.3	32.4	*	*	623,000
Florida	1,335	1,457	12.2	13.6	13	9	10,976,000
Georgia	784	808	13.4	14.1	7	5	5,837,000
Hawaii	218	236	21.0	23.1	1	1	1,039,000
Idaho	28	35	2.8	3.5	43	40	1,001,000
Illinois	1,207	1,380	10.5	12.0	16	15	11,511,000
Indiana	383	411	7.0	7.5	27	27	5,498,000
Iowa	68	65	2.3	2.2	46	47	2,910,000
Kansas	77	76	3.2	3.1	40	44	2,438,000
Kentucky	510	523	13.7	14.1	6	6	3,723,000
Louisiana	377	439	8.4	9.9	20	19	4,462,000
Maine	35	39	3.0	3.4	41	43	1,156,000
Maryland	428	409	9.8	9.5	17	20	4,349,000
Massachusetts	376	389	6.5	6.7	29	30	5,798,000
Michigan	661	790	7.3	8.7	24	23	9,075,000
Minnesota	138	165	3.3	4.0	38	38	4,162,000
Mississippi	380	414	14.6	16.0	4	4	2,598,000
Missouri	354	399	7.1	8.0	25	26	5,008,000
Montana	33	47	4.0	5.8	36	35	824,000
Nebraska	30	25	1.9	1.6	48	49	1,606,000
Nevada	42	52	4.6	5.8	35	34	911,000
New Hampshire	27	38	2.8	4.0	44	39	977,000
New Jersey	790	809	10.5	10.8	15	16	7,515,000
New Mexico	112	116	7.9	8.3	23	24	1,424,000
New York	2,246	2,309	12.7	13.1	11	12	17,735,000
North Carolina	756	780	12.3	12.8	12	13	6,165,000
North Dakota	14	9	2.0	1.3	47	50	686,000
Ohio	528	519	4.9	4.8	33	37	10,752,000
Oklahoma	262	331	7.9	10.0	22	18	3,298,000
Oregon	156	182	5.8	6.8	30	28	2,674,000
Pennsylvania	836	972	7.0	8.2	26	25	11,901,000
Rhode Island	55	60	5.7	6.3	31	32	962,000
South Carolina	544	443	16.5	13.6	2	10	3,300,000
South Dakota	25	46	3.5	6.6	37	31	706,000
Tennessee	601	645	12.7	13.8	10	8	4,717,000
Texas	1,762	1,965	11.0	12.5	14	14	15,989,000
Utah	40	46	2.4	2.8	45	45	1,652,000
Vermont	8	11	1.5	2.1	49	48	530,000
Virginia	473	520	8.4	9.4	21	21	5,636,000
Washington	207	239	4.8	5.6	34	36	4,349,000
West Virginia	133	133	6.8	6.8	28	29	1,952,000
Wisconsin	155	164	3.3	3.5	39	41	4,766,000
Wyoming	5	14	1.0	2.7	50	46	511,000
American Samoa§	10	7	31.3	20.4	*	*	32,000
Guam§	54	48	50.9	45.4	*	*	106,000
Northern Mariana Is.§	58	74	363.2	441.0	*	*	15,970
Puerto Rico§	418	452	12.8	13.9	*	*	3,269,800
Trust Terr. Pacific Is.§	188	188	162.2	160.7	*	*	115,923
U.S. Virgin Is.§	4	2	4.0	2.0	*	*	100,000

*Not ranked.

†District of Columbia is not ranked with the states but is included in totals.

§Not included in totals.

Tuberculosis — Continued

TABLE 2. Tuberculosis cases and case rates for cities with populations of 250,000 or more — United States, 1984 and 1983

City	Tuberculosis cases		Case rate		Rank according to rate		Population estimates
	1984	1983	1984	1983	1984	1983	(1984)
Albuquerque, N.M.	20	25	4.5	7.0	56	54	444,300
Atlanta, Ga.	177	191	40.2	43.8	3	3	440,000
Austin, Tex.	36	33	9.4	8.8	46	51	385,000
Baltimore, Md.	173	148	22.9	19.7	14	18	755,800
Birmingham, Ala.	69	74	24.1	26.2	11	11	286,400
Boston, Mass.	125	137	22.2	24.3	15	14	563,000
Buffalo, N.Y.	43	50	12.7	14.8	38	33	339,900
Charlotte, N.C.	41	45	12.2	13.7	39	39	334,800
Chicago, Ill.	752	871	25.0	29.0	10	10	3,005,100
Cincinnati, Ohio	50	60	13.2	15.6	36	28	380,100
Cleveland, Ohio	113	88	20.2	15.3	19	29	558,900
Columbus, Ohio	37	43	6.5	7.6	53	52	570,600
Dallas, Tex.	162	215	16.8	22.6	28	16	962,600
Denver, Colo.	38	49	7.5	9.8	50	48	508,800
Detroit, Mich.	233	286	20.5	25.1	18	12	1,138,700
El Paso, Tex.	63	66	13.3	14.0	35	37	475,300
Ft. Worth, Tex.	73	76	17.7	18.7	24	19	412,600
Fresno, Cal.	51	57	19.2	22.6	20	17	265,200
Honolulu, Hawaii	118	135	30.6	35.3	7	6	385,400
Houston, Tex.	489	517	26.9	29.4	9	9	1,816,900
Indianapolis, Ind.	74	102	10.7	14.4	42	34	692,200
Jacksonville, Fla.	82	82	14.4	14.8	30	32	571,400
Kansas City, Mo.	44	43	9.9	9.6	45	49	445,200
Long Beach, Cal.	67	60	17.8	16.1	22	26	375,500
Los Angeles, Cal.	663	769	21.3	25.0	16	13	3,108,400
Louisville, Ky.	52	47	17.4	15.7	25	27	298,700
Memphis, Tenn.	89	89	13.6	13.6	33	41	655,600
Miami, Fla.	191	225	49.9	58.4	1	1	383,000
Milwaukee, Wisc.	44	65	6.9	10.5	52	45	636,300
Minneapolis, Minn.	27	40	7.4	11.0	51	44	364,200
Nashville, Tenn.	82	75	17.8	16.3	23	25	459,900
Newark, N.J.	141	159	44.2	49.9	2	2	318,900
New Orleans, La.	121	99	21.2	17.5	17	22	571,500
New York, N.Y.	1,630	1,651	23.1	23.3	13	15	7,071,000
Norfolk, Va.	44	37	17.0	13.9	27	38	259,500
Oakland, Cal.	110	110	31.3	31.7	6	8	351,600
Oklahoma City, Okla.	47	55	10.6	13.4	44	42	443,600
Omaha, Nebr.	9	12	2.3	3.8	57	56	395,000
Philadelphia, Pa.	239	297	14.4	17.8	31	21	1,656,300
Phoenix, Ariz.	90	87	10.7	10.3	43	46	841,200
Pittsburgh, Pa.	44	65	10.8	15.3	41	30	407,000
Portland, Ore.	67	67	18.0	18.4	21	20	371,500
Sacramento, Cal.	72	42	23.7	14.4	12	35	303,400
St. Louis, Mo.	66	57	15.2	13.6	29	40	433,200
St. Paul, Minn.	22	27	8.2	10.1	48	47	268,800
San Antonio, Tex.	98	136	11.7	16.4	40	24	838,700
San Diego, Cal.	129	131	13.5	14.2	34	36	953,900
San Francisco, Cal.	270	303	38.2	42.9	4	4	706,900
San Jose, Cal.	119	101	17.4	15.0	26	31	683,800
Seattle, Wash.	64	85	13.1	17.4	37	23	490,300
Tampa, Fla.	88	100	31.9	36.5	5	5	275,500
Toledo, Ohio	18	9	5.1	2.5	55	57	350,600
Tucson, Ariz.	51	47	14.2	13.1	32	43	359,900
Tulsa, Okla.	37	34	9.4	9.3	47	50	393,000
Virginia Beach, Va.	18	19	6.0	6.7	54	55	298,600
Washington, D.C.	189	202	30.3	32.4	8	7	623,000
Wichita, Kans.	23	20	8.0	7.1	49	53	288,700
Total (57 cities)	**8,084**	**8,715**	**19.3**	**21.0**	*	*	**41,975,200**
San Juan-San Juan Municipio, P.R.	84	81	19.0	18.3	*	*	441,100

*Not ranked.

Tuberculosis—Continued

Editorial Note: The 6.7% decrease in new reported tuberculosis cases in 1984 continues the downward trend noted for 1982 and 1983. Contributing factors include: (1) the participation of almost all states in a new national case reporting system requiring more accurate verification of cases and (2) a decline in the actual number of indigenous cases. During the past 3 years, health departments have implemented expanded outreach programs in high-incidence areas to ensure complete treatment of diagnosed cases and to strengthen contact investigation and follow-up activities.

When antituberculosis drugs were first introduced over 35 years ago, there was hope that the disease would soon be eliminated in the United States, even though over 100,000 new active cases and about 40,000 deaths from tuberculosis were reported annually. Given the current rate of decline, the elimination of tuberculosis appears unlikely before the year 2100. Over 20,000 new cases and 1,800 deaths still occur each year. Transmission of infection also continues, as evidenced by the continued occurrence of hundreds of cases in young children, most of whom are under 5 years of age. An accelerated rate of decline must be achieved if tuberculosis is to be fully controlled in this century.

Control of tuberculosis has been hampered by a number of factors. Unfortunately, many public and private sector health-care providers do not consider tuberculosis a problem. This

(Continued on page 307)

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

Disease	21st Week Ending			Cumulative, 21st Week Ending		
	May 25, 1985	May 26, 1984	Median 1980-1984	May 25, 1985	May 26, 1984	Median 1980-1984
Acquired Immunodeficiency Syndrome (AIDS)	154	92	N	2,816	1,528	N
Aseptic meningitis	82	89	80	1,450	1,580	1,580
Encephalitis: Primary (arthropod-borne & unspec.)	7	16	16	343	326	326
Post-infectious	1	4	4	54	42	42
Gonorrhea: Civilian	10,940	16,081	16,081	314,290	323,107	374,545
Military	295	464	406	7,545	8,318	10,952
Hepatitis: Type A	314	350	434	8,362	8,355	9,143
Type B	327	435	420	9,815	9,960	8,445
Non A, Non B	49	82	N	1,620	1,519	N
Unspecified	75	82	152	2,138	1,935	3,398
Legionellosis	11	10	N	209	206	N
Leprosy	5	7	6	133	92	89
Malaria	14	17	18	284	294	343
Measles: Total*	47	84	84	1,111	1,417	1,417
Indigenous	43	82	N	819	1,276	N
Imported	4	2	N	292	141	N
Meningococcal infections: Total	32	54	57	1,209	1,413	1,413
Civilian	32	54	57	1,206	1,410	1,410
Military	-	-	1	3	3	6
Mumps	56	41	170	1,629	1,506	2,289
Pertussis	7	19	29	503	843	442
Rubella (German measles)	10	28	70	205	337	1,239
Syphilis (Primary & Secondary): Civilian	296	548	578	9,821	11,351	12,133
Military	6	7	9	75	142	150
Toxic Shock syndrome	6	7	N	152	195	N
Tuberculosis	360	427	483	7,953	8,314	9,967
Tularemia	5	8	6	33	47	49
Typhoid fever	1	3	7	105	130	146
Typhus fever, tick-borne (RMSF)	7	12	32	69	98	143
Rabies, animal	58	115	131	1,941	1,997	2,642

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1985		Cum. 1985
Anthrax	-	Leptospirosis	9
Botulism: Foodborne	2	Plague	1
Infant	17	Poliomyelitis: Total	1
Other	-	Paralytic	1
Brucellosis (Va. 1 Ga. 1, Tex. 2, N. Mex. 1)	37	Psittacosis (Upstate N.Y. 1, N.Y. City 1, Fla. 1)	51
Cholera	-	Rabies, human	-
Congenital rubella syndrome	-	Tetanus (Mo. 1)	22
Congenital syphilis, ages < 1 year	52	Trichinosis (Tex. 1)	29
Diphtheria	2	Typhus fever, flea-borne (endemic, murine)	1

*Three of the 47 reported cases for this week were 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 May 25, 1985 and May 26, 1984 (21st Week)

Reporting Area	AIDS	Aseptic Meningitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum. 1985	1985	Cum. 1985	Cum. 1985	Cum. 1985	Cum. 1984	1985	1985	1985	1985	1985	Cum. 1985
UNITED STATES	2,816	82	343	54	314,290	323,107	314	327	49	75	11	133
NEW ENGLAND	87	2	11	-	9,608	9,280	10	37	4	10	-	3
Maine	4	-	-	-	368	345	1	4	-	-	-	-
N.H.	-	-	3	-	202	258	-	-	-	-	-	-
Vt.	-	-	-	-	104	157	1	-	1	-	-	-
Mass.	51	1	8	-	3,583	3,736	7	23	1	9	-	3
R.I.	3	-	-	-	716	593	-	4	1	-	-	-
Conn.	29	1	-	-	4,635	4,191	1	6	1	1	-	-
MID ATLANTIC	1,138	10	52	2	44,705	44,443	19	35	8	3	-	11
Upstate N.Y.	139	7	18	2	6,485	6,810	10	10	5	1	-	-
N.Y. City	760	3	3	-	21,062	18,998	1	2	-	-	-	11
N.J.	169	-	13	-	8,225	7,201	8	23	3	2	-	-
Pa.	70	U	18	-	8,933	11,434	U	U	U	U	U	-
E.N. CENTRAL	120	8	79	12	45,077	43,829	15	48	2	1	8	3
Ohio	24	5	29	4	11,544	11,619	5	9	1	-	-	2
Ind.	4	-	12	1	4,122	5,333	2	6	-	1	7	-
Ill.	55	-	10	5	12,676	9,361	1	8	-	-	-	-
Mich.	24	3	23	-	12,879	12,514	7	25	1	-	1	1
Wis.	13	-	5	2	3,856	5,002	-	-	-	-	-	-
W.N. CENTRAL	32	3	27	3	15,860	15,258	18	12	3	-	1	-
Minn.	5	1	12	1	2,341	2,154	4	5	-	-	-	-
Iowa	3	-	9	-	1,667	1,772	3	1	1	-	1	-
Mo.	19	1	-	-	7,475	7,211	4	1	2	-	-	-
N. Dak.	-	-	-	1	107	159	-	-	-	-	-	-
S. Dak.	-	-	-	-	293	411	6	1	-	-	-	-
Nebr.	1	-	1	-	1,439	1,103	-	-	-	-	-	-
Kans.	4	1	5	1	2,538	2,448	1	4	-	-	-	-
S. ATLANTIC	380	15	36	15	68,938	82,790	26	66	10	11	2	3
Del.	7	2	1	-	1,517	1,422	-	-	-	-	-	-
Md.	42	2	10	1	11,122	9,501	1	4	2	1	-	1
D.C.	51	1	-	-	5,652	5,946	2	2	-	1	-	-
Va.	25	1	6	4	7,131	7,704	1	7	-	-	-	-
W. Va.	1	-	2	-	973	1,020	-	-	-	-	-	-
N.C.	21	1	14	-	13,006	13,175	1	10	2	2	-	1
S.C.	4	-	3	-	8,641	7,747	1	2	-	-	-	-
Ga.	68	1	-	-	-	16,391	2	16	1	-	-	-
Fla.	161	7	-	10	20,896	19,884	18	25	5	7	2	1
E.S. CENTRAL	25	12	12	4	27,453	27,495	5	30	4	2	-	-
Ky.	9	2	4	-	3,040	3,333	3	6	-	-	-	-
Tenn.	4	1	4	-	10,924	11,262	2	9	-	2	-	-
Ala.	11	8	4	4	8,862	8,879	-	11	3	-	-	-
Miss.	1	1	-	-	4,627	4,021	-	4	1	-	-	-
W.S. CENTRAL	211	19	35	1	43,926	44,598	84	38	5	35	-	12
Ark.	2	-	1	1	4,261	3,959	-	-	-	-	-	1
La.	39	1	1	-	9,769	9,846	-	8	-	-	-	1
Okla.	2	-	11	-	4,563	4,741	9	2	-	1	-	-
Tex.	168	18	22	-	25,333	26,052	75	28	5	34	-	10
MOUNTAIN	37	10	12	3	10,184	10,264	83	52	7	13	-	1
Mont.	-	-	-	-	299	467	1	-	-	-	-	-
Idaho	-	-	-	-	340	485	8	2	1	-	-	-
Wyo.	-	1	1	-	257	318	-	-	-	-	-	-
Colo.	12	3	4	-	3,194	2,957	6	2	-	4	-	-
N. Mex.	4	1	-	-	1,201	1,158	13	14	-	1	-	-
Ariz.	16	4	2	-	2,819	2,760	47	26	5	5	-	-
Utah	2	1	5	3	424	534	-	1	1	2	-	-
Nev.	3	-	-	-	1,650	1,585	8	7	-	1	-	1
PACIFIC	786	3	79	14	48,539	45,150	54	9	6	-	-	100
Wash.	41	3	8	-	3,331	3,221	11	4	2	-	-	23
Oreg.	13	-	-	-	2,547	2,587	42	2	4	-	-	2
Calif.	715	U	71	14	40,692	37,391	U	U	U	U	U	66
Alaska	2	-	-	-	1,209	1,172	-	-	-	-	-	-
Hawaii	15	-	-	-	760	779	1	3	-	-	-	9
Guam	-	U	-	-	42	99	U	U	U	U	U	-
P.R.	32	1	3	1	1,444	1,396	2	10	3	4	-	2
V.I.	2	-	-	-	193	202	2	1	-	1	-	-
Pac. Trust Terr.	-	U	-	-	146	-	U	U	U	U	U	20

N: Not notifiable U: Unavailable

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending May 25, 1985 and May 26, 1984 (21st Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported *		Total									
	Cum. 1985	1985	Cum. 1985	1985	Cum. 1985	Cum. 1984	Cum. 1985	1985	Cum. 1985	1985	Cum. 1985	Cum. 1984	1985	Cum. 1985	Cum. 1984
UNITED STATES	284	43	819	4	292	1,417	1,209	56	1,629	7	503	843	10	205	337
NEW ENGLAND	13	2	15	1	85	85	58	2	34	1	30	16	-	6	15
Maine	1	-	-	-	-	-	2	-	5	-	2	-	-	-	1
N.H.	-	-	-	-	-	35	5	-	5	-	16	3	-	2	-
Vt.	-	-	-	-	-	4	8	-	2	-	2	8	-	-	-
Mass.	9	1	14	-	82	36	11	-	15	-	4	4	-	4	14
R.I.	1	-	-	-	-	-	9	-	3	1	4	1	-	-	-
Conn.	2	1	1	1†	3	10	23	2	4	-	2	-	-	-	-
MID ATLANTIC	48	3	76	1†	19	77	199	4	176	2	53	56	4	48	106
Upstate N.Y.	17	3	38	1†	9	16	84	3	100	1	22	36	-	8	79
N.Y. City	14	-	23	-	5	52	25	-	14	-	9	2	4	21	17
N.J.	5	-	2	-	5	5	34	1	23	1	2	4	-	7	10
Pa.	12	U	13	U	-	4	56	U	39	U	20	14	U	12	-
E.N. CENTRAL	15	-	155	-	123	513	216	18	663	-	63	228	-	19	52
Ohio	3	-	-	-	42	3	69	-	194	-	15	37	-	-	2
Ind.	1	-	-	-	1	3	31	-	25	-	11	152	-	-	1
Ill.	1	-	75	-	66	153	44	11	133	-	9	16	-	5	28
Mich.	9	-	35	-	14	338	51	7	255	-	8	12	-	13	14
Wis.	1	-	45	-	-	16	21	-	56	-	20	11	-	1	7
W.N. CENTRAL	7	-	1	-	4	1	61	-	48	-	47	71	-	10	22
Minn.	1	-	-	-	2	1	16	-	1	-	11	6	-	1	1
Iowa	1	-	-	-	-	-	7	-	7	-	3	3	-	-	-
Mo.	2	-	-	-	2	-	27	-	8	-	9	14	-	-	-
N. Dak.	1	-	-	-	-	-	-	-	1	-	6	-	-	2	3
S. Dak.	1	-	-	-	-	-	1	-	-	-	1	1	-	-	-
Nebr.	-	-	-	-	-	-	2	-	-	-	-	2	-	-	-
Kans.	1	-	1	-	-	-	8	-	31	-	17	45	-	7	18
S. ATLANTIC	38	-	146	-	6	21	231	3	131	1	109	60	1	28	17
Del.	-	-	-	-	-	-	5	-	1	-	-	-	-	-	-
Md.	10	-	16	-	4	9	28	2	18	1	30	4	-	1	1
D.C.	3	-	-	-	1	-	6	-	-	-	-	-	-	-	-
Va.	8	-	15	-	1	2	33	-	21	-	3	7	-	1	-
W. Va.	1	-	26	-	-	-	4	1	43	-	-	6	1	9	-
N.C.	4	-	1	-	-	-	32	-	8	-	8	17	-	-	-
S.C.	-	-	-	-	-	-	25	-	6	-	-	2	-	2	-
Ga.	2	-	8	-	-	-	38	-	12	-	38	6	-	4	2
Fla.	10	-	80	-	-	10	60	-	22	-	30	18	-	11	14
E.S. CENTRAL	4	-	-	-	-	3	56	-	12	-	6	5	-	1	5
Ky.	1	-	-	-	-	1	4	-	1	-	1	1	-	1	1
Tenn.	-	-	-	-	-	2	19	-	10	-	1	2	-	-	-
Ala.	2	-	-	-	-	-	19	-	-	-	2	-	-	-	1
Miss.	1	-	-	-	-	-	14	-	1	-	2	2	-	-	3
W.S. CENTRAL	21	8	74	2	8	285	110	6	182	-	56	217	2	19	6
Ark.	-	-	-	-	-	-	10	-	4	-	9	10	-	1	3
La.	-	2	9	-	-	-	18	-	2	-	2	3	-	-	-
Okla.	1	-	-	-	-	5	22	N	N	-	45	195	-	1	-
Tex.	20	6	65	2†§	8	280	60	6	176	-	-	9	2	17	3
MOUNTAIN	12	28	273	-	24	114	58	22	165	3	28	57	-	3	11
Mont.	-	2	123	-	17	-	3	-	6	-	3	16	-	-	-
Idaho	-	-	-	-	1	-	-	-	5	-	-	1	-	1	1
Wyo.	-	-	-	-	-	-	5	-	2	-	-	3	-	-	2
Colo.	4	-	-	-	5	-	16	-	14	1	10	20	-	-	2
N. Mex.	4	-	1	-	1	87	8	N	N	-	4	5	-	1	-
Ariz.	3	26	149	-	-	-	17	15	77	-	5	8	-	1	-
Utah	-	-	-	-	-	27	7	-	2	2	6	2	-	-	6
Nev.	1	-	-	-	-	-	2	7	59	-	-	2	-	-	-
PACIFIC	126	2	79	-	23	318	220	1	218	-	111	133	3	71	103
Wash.	10	-	1	-	-	81	37	1	13	-	18	17	-	2	1
Oreg.	5	-	3	-	-	-	23	N	N	-	16	9	-	2	-
Calif.	94	U	70	U	19	235	153	U	194	U	72	44	U	44	100
Alaska	2	-	-	-	-	-	5	-	2	-	2	-	1	1	-
Hawaii	15	2	5	-	4	2	2	-	9	-	3	63	2	22	2
Guam	-	U	10	U	-	84	-	U	3	U	-	-	U	1	2
P.R.	-	-	46	-	-	1	7	4	74	-	2	-	-	9	4
V.I.	-	-	4	-	6	-	-	-	3	-	-	-	-	-	-
Pac. Trust Terr.	-	U	-	U	-	-	-	U	3	U	-	-	U	-	-

*For measles only, imported cases includes both out-of-state and international importations.

N: Not notifiable U: Unavailable †International §Out-of-state

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending May 25, 1985 and May 26, 1984 (21st Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1985	Cum. 1984	1985	Cum. 1985	Cum. 1984	Cum. 1985	Cum. 1985	Cum. 1985	Cum. 1985
UNITED STATES	9,821	11,351	6	7,953	8,314	33	105	69	1,941
NEW ENGLAND	220	229	1	268	240	-	6	1	4
Maine	7	2	-	19	12	-	-	-	-
N.H.	3	2	-	7	16	-	-	-	-
Vt.	-	1	-	4	3	-	-	-	-
Mass.	116	138	1	166	131	-	5	1	1
R.I.	6	8	-	21	18	-	-	-	-
Conn.	88	78	-	51	60	-	1	-	3
MID ATLANTIC	1,347	1,572	-	1,447	1,543	1	16	-	144
Upstate N.Y.	103	135	-	239	240	-	6	-	37
N.Y. City	850	946	-	743	637	1	4	-	-
N.J.	275	288	-	161	325	-	5	-	7
Pa.	119	203	U	304	341	-	1	-	100
E.N. CENTRAL	486	533	-	1,009	1,089	-	9	7	52
Ohio	61	110	-	182	231	-	2	6	10
Ind.	36	62	-	117	115	-	3	-	6
Ill.	264	154	-	427	440	-	1	-	9
Mich.	103	173	-	228	236	-	2	1	4
Wis.	22	34	-	55	67	-	1	-	23
W.N. CENTRAL	105	186	3	208	219	11	3	1	349
Minn.	26	49	-	40	34	1	3	-	65
Iowa	14	10	-	31	29	-	-	-	77
Mo.	46	101	1	96	100	9	-	-	18
N. Dak.	-	2	-	2	5	-	-	1	37
S. Dak.	4	-	-	10	8	-	-	-	109
Nebr.	5	8	1	10	14	1	-	-	18
Kans.	10	16	1	19	29	-	-	-	25
S. ATLANTIC	2,479	3,476	1	1,687	1,748	5	11	26	537
Del.	16	10	-	15	23	1	-	-	-
Md.	158	231	-	154	205	-	2	3	276
D.C.	147	129	-	75	58	-	-	-	-
Va.	134	180	-	142	158	-	2	3	73
W. Va.	4	9	-	42	64	-	-	1	9
N.C.	274	344	-	209	280	4	1	13	2
S.C.	301	326	-	193	204	-	-	4	32
Ga.	-	601	-	269	230	-	-	1	76
Fla.	1,445	1,646	1	588	526	-	6	1	69
E.S. CENTRAL	866	703	-	695	766	2	2	7	100
Ky.	32	45	-	120	171	-	-	-	12
Tenn.	253	192	-	225	241	2	-	3	23
Ala.	282	253	-	240	247	-	2	4	63
Miss.	299	213	-	110	107	-	-	-	2
W.S. CENTRAL	2,434	2,655	1	855	906	5	6	23	387
Ark.	126	81	-	87	101	1	-	4	63
La.	420	509	-	115	123	-	-	-	8
Okla.	69	76	-	111	93	4	-	17	51
Tex.	1,819	1,989	1	542	589	-	6	2	265
MOUNTAIN	301	270	-	207	200	7	5	3	159
Mont.	1	1	-	24	10	2	-	1	86
Idaho	3	11	-	11	9	-	-	1	-
Wyo.	4	3	-	4	-	-	-	1	3
Colo.	73	61	-	27	23	1	4	-	1
N. Mex.	36	37	-	38	45	2	1	-	2
Ariz.	167	110	-	91	84	-	-	-	67
Utah	3	8	-	6	16	2	-	-	-
Nev.	14	39	-	6	13	-	-	-	-
PACIFIC	1,583	1,727	-	1,577	1,603	2	47	1	209
Wash.	51	60	-	95	81	-	-	-	1
Oreg.	36	50	-	55	64	1	-	-	-
Calif.	1,464	1,582	U	1,303	1,343	1	46	1	208
Alaska	1	3	-	51	28	-	-	-	-
Hawaii	31	32	-	73	87	-	1	-	-
Guam	2	-	U	10	22	-	-	-	-
P.R.	331	358	-	128	167	-	1	-	14
V.I.	1	6	-	1	3	-	-	-	-
Pac. Trust Terr.	13	-	U	16	-	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending May 25, 1985 (21st Week)

Reporting Area	All Causes, By Age (Years)						P&I** Total
	All Ages	≥65	45-64	25-44	1-24	<1	
	18	406	132	47	14	19	51
	63	93	40	16	3	11	23
	46	30	11	3	2	-	-
	18	12	4	2	-	-	2
	25	16	8	1	-	-	1
	53	32	13	4	1	3	3
	22	13	5	4	-	-	-
	14	10	3	-	1	-	-
	20	12	5	2	1	-	1
	52	34	8	7	1	2	3
	68	54	12	-	2	-	9
	12	11	-	-	-	1	-
	41	26	8	3	2	2	2
	38	27	9	2	-	-	4
	46	36	6	3	1	-	3
	91	1,661	526	192	50	62	120
Albany, N.Y.	56	37	10	5	2	2	2
Allentown, Pa.	16	13	3	-	-	-	-
Buffalo, N.Y.	104	68	25	3	2	6	5
Camden, N.J.	40	24	11	2	2	1	2
Elizabeth, N.J.	17	14	2	1	-	-	3
Erie, Pa.†	40	23	12	2	1	2	2
Jersey City, N.J.	44	32	9	1	1	1	1
N.Y. City, N.Y.	1,348	892	276	128	23	29	53
Newark, N.J.	65	31	17	10	3	4	3
Paterson, N.J.	29	13	6	4	1	5	3
Philadelphia, Pa.	305	207	69	15	9	5	21
Pittsburgh, Pa.†	63	43	16	1	1	2	3
Reading, Pa.	28	20	4	4	-	-	1
Rochester, N.Y.	113	82	23	5	1	2	10
Schenectady, N.Y.	23	15	5	3	-	-	-
Scranton, Pa.†	33	24	7	1	-	1	1
Syracuse, N.Y.	85	58	19	3	3	2	-
Trenton, N.J.	31	22	7	1	1	-	1
Utica, N.Y.	25	22	3	-	-	-	4
Yonkers, N.Y.	26	21	2	3	-	-	5
E.N. CENTRAL	2,095	1,472	341	138	56	85	91
Akron, Ohio	62	42	12	3	-	5	-
Canton, Ohio	33	23	6	2	2	-	4
Chicago, Ill.§	553	462	11	26	16	37	16
Cincinnati, Ohio	138	96	27	8	3	4	18
Cleveland, Ohio	164	96	42	16	4	6	10
Columbus, Ohio	78	48	17	5	-	8	1
Dayton, Ohio	104	79	22	3	-	-	-
Detroit, Mich.	241	153	44	28	7	7	6
Evansville, Ind.	45	32	10	2	1	-	1
Fort Wayne, Ind.	35	22	9	2	-	2	1
Gary, Ind.	10	6	2	2	-	-	1
Grand Rapids, Mich.	25	12	3	8	1	1	1
Indianapolis, Ind.	130	79	42	5	1	3	3
Madison, Wis.	38	22	9	3	2	2	4
Milwaukee, Wis.	112	76	20	8	4	4	7
Peoria, Ill.	54	37	13	3	1	-	5
Rockford, Ill.	42	33	5	1	1	2	1
South Bend, Ind.	53	43	6	1	1	2	5
Toledo, Ohio	111	72	27	5	5	2	6
Youngstown, Ohio	67	39	14	7	7	-	1
W.N. CENTRAL	749	499	162	41	26	21	29
Des Moines, Iowa	71	46	21	2	1	1	3
Duluth, Minn.	30	18	8	-	2	2	-
Kansas City, Kans.	37	23	13	1	-	-	1
Kansas City, Mo.	113	74	25	8	3	3	6
Lincoln, Nebr.	36	25	7	3	1	-	2
Minneapolis, Minn.	78	47	14	3	7	7	2
Omaha, Nebr.	98	69	22	4	3	-	6
St. Louis, Mo.	144	102	25	9	3	5	2
St. Paul, Minn.	53	46	1	3	2	1	-
Wichita, Kans.	89	49	26	8	4	2	7
S. ATLANTIC	1,260	840	269	79	30	39	52
Atlanta, Ga.	133	71	41	14	4	3	4
Baltimore, Md.	216	137	55	12	6	6	8
Charlotte, N.C.	67	40	17	8	1	1	2
Jacksonville, Fla.	94	51	32	5	4	2	8
Miami, Fla.	115	69	31	11	2	2	-
Norfolk, Va.	55	31	13	4	2	5	2
Richmond, Va.	72	40	22	5	1	4	7
Savannah, Ga.	60	45	13	2	-	-	5
St. Petersburg, Fla.	123	98	16	4	1	4	8
Tampa, Fla.	60	31	17	5	2	3	3
Washington, D.C.§	235	211	2	6	7	8	5
Wilmington, Del.	30	16	10	3	-	1	-
E.S. CENTRAL	690	435	161	44	32	18	44
Birmingham, Ala.	113	74	24	8	5	2	3
Chattanooga, Tenn.	42	26	11	3	2	-	11
Knoxville, Tenn.	77	45	22	4	4	2	4
Louisville, Ky.	86	49	24	4	3	6	2
Memphis, Tenn.	145	97	30	12	5	1	10
Mobile, Ala.	63	44	10	6	3	-	4
Montgomery, Ala.	38	24	9	2	2	1	-
Nashville, Tenn.	126	76	31	5	8	6	10
W.S. CENTRAL	1,199	686	291	112	44	65	49
Austin, Tex.	41	20	12	7	2	-	4
Baton Rouge, La.	36	25	6	4	-	1	1
Corpus Christi, Tex.	42	29	8	4	1	-	3
Dallas, Tex.	167	95	39	22	5	6	7
El Paso, Tex.	61	33	15	7	3	3	3
Fort Worth, Tex.	98	60	19	8	4	6	5
Houston, Tex.	302	166	71	29	13	23	7
Little Rock, Ark.	61	34	17	6	1	3	4
New Orleans, La.	110	60	27	8	9	6	1
San Antonio, Tex.	164	97	42	13	4	8	8
Shreveport, La.	55	36	16	1	-	2	2
Tulsa, Okla.	62	31	19	3	2	7	4
MOUNTAIN	594	373	133	45	23	20	31
Albuquerque, N.Mex.	64	35	18	8	1	2	3
Colo. Springs, Colo.	27	17	6	2	2	-	4
Denver, Colo.	96	57	29	5	4	1	1
Las Vegas, Nev.	78	50	19	7	2	-	11
Ogden, Utah	20	17	2	1	-	-	-
Phoenix, Ariz.	147	91	31	12	7	6	4
Pueblo, Colo.	18	13	4	-	1	-	-
Salt Lake City, Utah	46	23	8	5	5	5	-
Tucson, Ariz.	98	70	16	5	1	6	8
PACIFIC	2,014	1,362	419	146	51	34	126
Berkeley, Calif.	20	13	6	-	-	1	-
Fresno, Calif.	42	31	8	2	1	-	8
Glendale, Calif.	33	28	2	2	-	1	2
Honolulu, Hawaii	57	34	13	5	3	2	2
Long Beach, Calif.	92	63	20	5	2	2	2
Los Angeles, Calif.	676	466	138	49	20	2	23
Oakland, Calif.	72	48	14	6	3	1	5
Pasadena, Calif.	24	14	5	1	2	2	2
Portland, Oreg.	122	88	27	4	2	1	4
Sacramento, Calif.	133	92	27	9	1	4	13
San Diego, Calif.	143	96	30	13	3	1	22
San Francisco, Calif.	158	100	34	14	4	5	6
San Jose, Calif.	165	104	31	22	3	5	23
Seattle, Wash.	146	94	38	7	3	4	3
Spokane, Wash.	68	49	13	3	-	3	8
Tacoma, Wash.	63	42	13	4	4	-	3
TOTAL	11,710††	7,734	2,434	844	326	363	593

*Mortality data in this table are voluntarily reported from 121 cities in the United States, most of which have populations of 100,000 or more. A death is reported by the place of its occurrence and by the week that the death certificate was filed. Fetal deaths are not included.

** Pneumonia and influenza.

† Because of changes in reporting methods in these 3 Pennsylvania cities, these numbers are partial counts for the current week. Complete counts will be available in 4 to 6 weeks.

††Total includes unknown ages.

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

Tuberculosis—Continued

perception has been fostered in part by the closing of tuberculosis sanatoriums and the institution of outpatient treatment programs.

Another problem that hampers control efforts for state and local health departments—which have the major responsibility for controlling this disease in the community—is noncompliance with prescribed therapy. Most patients require a minimum of 9 months' treatment, with monthly monitoring for drug toxicity, compliance, and response to therapy. Many patients are unwilling or unable to complete a self-administered course of therapy and may require directly observed therapy or other special assistance from the health department. An estimated 34,000 persons in health department registers are currently under medical supervision for tuberculosis, and each year, an estimated 200,000 persons exposed to new cases must be examined. Many of these persons, as well as other high-risk individuals, are placed on isoniazid preventive treatment for up to 12 months and also require monthly monitoring for drug toxicity and compliance.

A third obstacle to the effective control of tuberculosis is the emergence of tuberculosis organisms that are resistant to antituberculosis drugs, especially isoniazid and streptomycin. Such resistance is relatively more common among persons from Asia, Africa, and Central and South America. However, the problem of drug resistance is not limited to the foreign-born. Community outbreaks of drug-resistant tuberculosis have occurred in Mississippi (*1*), Montana (*2*), New York, and more recently, Massachusetts and North Carolina.

Preventing the majority of new tuberculosis cases is difficult to achieve in a short period of time with currently available technology. An estimated 10 million persons in this country are infected with tubercle bacilli and carry a life-long risk of developing tuberculosis. Even if health departments could identify all the infected individuals in the country who are at high risk of developing disease and provide them with preventive therapy, tuberculosis would still continue to occur in some infected individuals over the age of 35 years for whom preventive therapy is not recommended because the risk of isoniazid toxicity outweighs the benefits of therapy.

An acceleration of the decline can be achieved with: (1) full implementation of existing prevention and control methodology; (2) development of new treatment, diagnostic, and prevention technologies; and (3) rapid implementation of these new technologies in all areas of the country as they are developed.

CDC, state and local health departments, and other public agencies and organizations will continue to work together to achieve the first step. In June 1985, a small group of scientists will meet in Pittsfield, Massachusetts, to explore obstacles to tuberculosis elimination and to identify feasible new technologies that could be developed and used to accelerate the elimination of tuberculosis. This effort is sponsored by the U.S. Public Health Service, including CDC and the National Institutes of Health, the American Thoracic Society, and the Pittsfield Antituberculosis Association. Within the next few months, CDC will also identify a group of outside experts who will advise on the further development and implementation of a tuberculosis elimination plan. Successful accomplishment of the three action steps could bring about the elimination of tuberculosis in the United States a century earlier than is now projected.

References

1. Reves R, Blakey D, Snider DE, Jr, Farer LS. Transmission of multiple drug-resistant tuberculosis: report of a school and community outbreak. Am J Epidemiol 1981;113:423-35.
2. CDC. Interstate outbreak of drug-resistant tuberculosis involving children—California, Montana, Nevada, Utah. MMWR 1983;32:516-8.

Measles — United States, 1984

During 1984, a provisional total of 2,534 cases of measles was reported in the United States (incidence rate 1.1 per 100,000 population) (Figure 1). This is a 69.3% increase over the 1,497 cases reported during 1983 (0.7/100,000). A total of 2,079 cases (82.0%) was reported from seven states—Texas, 602 (29.0%); Michigan, 465 (22.4%); California, 330 (15.9%); Illinois, 182 (8.8%); Washington, 172 (8.3%); New York, 165 (7.9%); and Hawaii, 163 (7.8%).

Although the overall incidence rate increased, the number of states reporting measles decreased during 1984, compared with 1983. Fifteen states reported no measles cases (indigenous or imported), compared to 12 states and the District of Columbia during the same period in 1983. Nine states were free of measles during both 1983 and 1984. In 1984, 193 (6.1%) of the nation's 3,139 counties reported measles cases, compared with 137 (4.4%) during 1983 (Table 3).

Two hundred twenty-two cases (8.8%) were associated with international or out-of-state importations, an average of 5.4 cases per week, compared with 334 cases during the same period in 1983 (*1*).

During 1984, detailed information was provided to CDC's Division of Immunization on 2,543 cases. The differences between this number and the 2,534 cases reported to the *MMWR* reflect delays in reporting.

Of 2,543 cases, 2,491 (98.0%) met the clinical case definition,* and 1,036 (40.7%) were serologically confirmed. Seasonality continued to be observed, with most onsets of rash occurring from week 9 through week 21, peaking at week 14 (134 cases) (Figure 2).

The age distribution of reported measles cases changed from 1983 to 1984 (Table 4). In 1983, the highest incidence rates were reported for preschoolers. In contrast, the rates for 1984 were highest for children 10-14 years of age; preschoolers (under 5 years of age) were the next most frequent group. Of the 622 preschoolers who had measles in 1984, 168 (27.0%) were under 12 months of age; 127 (20.4%) were 12-14 months of age; 41 (6.6%) were 15 months; and 286 (46.0%) were 16 months to 4 years of age. Persons 12-14 months of age accounted for 5.0% of the 2,543 cases.

Of the 2,543 measles patients, 1,184 (46.6%) had been vaccinated; 999 (39.3%) had been vaccinated on or after the first birthday; and 185 (7.3%) had been vaccinated before the first birthday (Table 5). A total of 1,359 (53.4%) patients were either unvaccinated or of unknown vaccination status.

*Defined as fever 38.3 C (101 F) or higher, if measured, generalized rash of 3 days duration or longer, and at least one of the following: cough, coryza, and/or conjunctivitis.

TABLE 3. Incidence rates* of measles cases and numbers of states and counties without measles — United States, 1983 and 1984

	1983	1984*
No. cases	1,497	2,534
Incidence rate†	0.7	1.1
No. states without measles	12	15
No. counties without measles	3,002 (95.6%)	2,946 (93.9%)

*Provisional data.

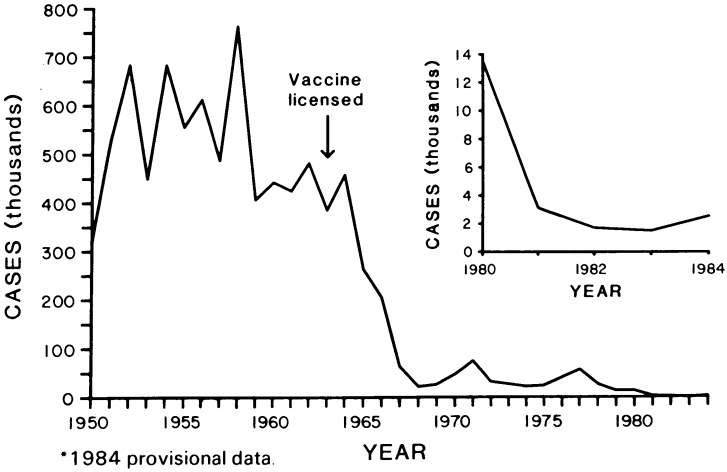
†Per 100,000 population.

Measles—Continued

Of the 2,543 cases, 874 (34.4%) were classified as preventable† (*1*) (Table 6). The highest proportion of preventable cases occurred among persons who were not of school age. More than 75% of the cases among children 16 months to 4 years and adults 20-24 years of age were preventable. Although more than half of the preventable cases occurred among persons 5-19 years of age, only 30.2% of cases occurring in that age group were considered pre-

†A case is considered preventable if measles illness occurs in a U.S. citizen: (1) at least 16 months of age; (2) born after 1956; (3) lacking adequate evidence of immunity to measles (documented receipt of live measles vaccine on or after the first birthday and at least 2 weeks before onset of illness or a physician-diagnosed measles disease or laboratory evidence of immunity); (4) without a medical contraindication to receiving vaccine; and (5) with no religious or philosophical exemption under state law.

FIGURE 1. Reported measles cases — United States, 1950-1984*



*1984 provisional data.

TABLE 4. Age distribution and estimated incidence rates* of reported measles cases† — United States, 1983 and 1984

Age (yrs.)	1983 (52 weeks)§ No.	(%)	Rate	1984¶ No.	(%)	Rate
0-4	451	(31.5)	2.6	622	(24.5)	3.5
5-9	160	(11.2)	1.0	283	(11.1)	1.8
10-14	195	(13.6)	1.1	679	(26.7)	3.8
15-19	382	(26.7)	2.1	650	(25.6)	3.4
20-24	163	(11.4)	0.8	173	(6.8)	0.1
≥ 25	80	(5.6)	0.1	136	(5.3)	0.1
Total, age known	**1,431**	**(95.6)**	—	**2,543**	**(100.0)**	—
Total, age unknown	66	(4.4)	—	—	—	—
Total	**1,497**	**(100.0)**	**0.6**	**2,543**	**(100.0)**	**1.1**

*Incidence rate equals cases per 100,000 population extrapolating cases with known age to total reported cases.

†Provisional data.

§Total cases reported to the *MMWR* in 1983.

¶Total cases reported to CDC's Division of Immunization, 1984.

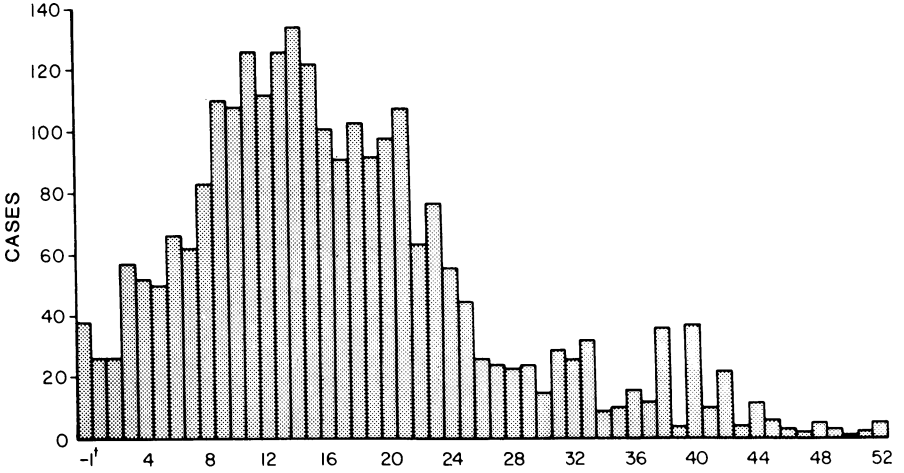
Measles—Continued

ventable. The proportion of preventable cases in this age group increased progressively with increasing age.

Of the 1,669 persons who had nonpreventable measles, 336 (20.1%) were too young for routine vaccination (under 16 months of age) (Table 7). Eighty-six (5.2%) were born before 1957; vaccination is not ordinarily recommended for this group. Of the 1,247 persons 16 months to 27 years of age who acquired measles, 992 (79.6%) had been vaccinated on or after the first birthday; 24 (1.9%) had prior physician-diagnosed measles; 57 (4.6%) were international importations and were not U.S. citizens (an additional 94 importations occurred among U.S. citizens returning from abroad); and 120 (9.6%) had exemptions under state law. In addition, 54 (4.3%) persons—recruits at Great Lakes Naval Training Station—were considered immune because they had positive results on an indirect immunoperoxidase assay for measles antibody before their illness.

Reported by Div of Immunization, Center for Prevention Services, CDC.

FIGURE 2. Reported measles cases*, by week of rash onset — United States, 1984



*Twelve with unknown onset.

†Rash onset in 1983.

TABLE 5. Reported measles cases, by age at most recent vaccination — United States, 1984*

Age at vaccination	Cases	
	No.	(%)
< 12 mos.	185	(7.3)
12-14 mos.	344	(13.5)
15 mos.	52	(2.0)
16 mos.-4 yrs.	387	(15.2)
5-9 yrs.	166	(6.5)
10-14 yrs. .	36	(1.4)
15-19 yrs.	8	(0.3)
≥ 20 yrs.	2	(0.1)
> 12 mos.†	4	(0.2)
Unvaccinated or unknown	1,359	(53.4)
Total	**2,543**	**(100.0)**

*Provisional data.

†Unknown age at vaccination, definitely greater than 12 months.

Measles—Continued

Editorial Note: Although the number of reported measles cases in 1984 has increased from 1983, it is still far lower than the number in the prevaccine era (1950-1962), when an average of more than 525,000 cases was reported annually. Despite the increased occurrence of measles during 1984, its geographic distribution is restricted and focal.

Preventable cases represent a failure to fully implement existing recommendations for measles prevention, and maximal efforts should be directed toward eliminating these cases. By eliminating the preventable cases with current strategies, it should be possible to substantially reduce the number of cases, both preventable and nonpreventable, since the source of many nonpreventable cases is a person with preventable measles.

Although there have been changes in the relative ranking of age groups affected, the actual numbers of cases are small, and it is not possible to draw definitive conclusions about

TABLE 6. Number of measles cases and preventability, by age group — United States, 1984*

Age group	No. cases	No. preventable (%)	No. nonpreventable (%)
≤ 15 mos.	336	0 (0%)	336 (100.0%)
16 mos.-4 yrs	286	210 (73.4%)	76 (26.6%)
5-9 yrs.	283	69 (24.4%)	214 (75.6%)
10-14 yrs.	679	180 (26.5%)	499 (73.5%)
15-19 yrs.	650	238 (36.6%)	412 (63.4%)
20-24 yrs.	173	135 (78.0%)	38 (22.0%)
25-29 yrs.	75	42 (56.0%)	33 (44.0%)
≥ 30 yrs.	61	0 (0%)	61 (100.0%)
Total	**2,543**	**874 (34.4%)**	**1,669 (65.6%)**

*Provisional data.

TABLE 7. Reasons measles cases were classified as nonpreventable — United States, 1984*

Causes of nonpreventability	No. cases (%)		Percentage of total cases†
1. Persons < 16 months of age (too young for routine vaccination)		336 (20.1%)	13.2%
2. Born before 1957 (vaccination is not routinely recommended)		86 (5.2%)	3.4%
3. Persons 16 months to 27 years		1,247 (74.7%)	49.0%
a. Adequately vaccinated (on or after the first birthday)	992 (79.6%)		
b. Prior M.D. diagnosis	24 (1.9%)		
c. International importations (non-U.S. citizens)	57 (4.6%)		
d. Exemptions	120 (9.6%)		
1. Medical	8 (6.6%)		
2. Religious	30 (25.0%)		
3. Philosophical	77 (64.2%)		
4. Nonspecified	5 (4.2%)		
e. Laboratory evidence of immunity	54 (4.3%)		
Total		**1,669 (100.0%)**	**65.6%**

*Provisional data.

†2,543 cases.

Measles—Continued

their importance. School-aged children still comprise the majority of preventable cases, and further efforts need to be directed at ensuring that all children covered by state school immunization laws are adequately immunized. Persons who are younger or older represent a more complex problem. Preschoolers who are not in licensed day-care facilities are not reached by existing regulations. Every effort should be made to identify and vaccinate these young children whenever they come in contact with the health-care system. Young adults are perhaps the most susceptible cohort, with estimates of 5%-15% susceptibility in this age group (*2*). Universities and state health officials need to continue to develop and implement regulations that will ensure immunity for college students and other congregations of young adults (*3*).

References

1. CDC. Classification of measles cases and categorization of measles elimination programs. MMWR 1982;31:707-11.
2. Amler RW, Kim-Farley RJ, Orenstein WA, Doster SW, Bart KJ. Measles on campus. J Am Coll Health 1983;32:53-7.
3. American College Health Association. Statement of immunization policy. November 25, 1983:1-3.

Epidemiologic Notes and Reports

Reported Measles Cases — United States, Past 4 Weeks

The following states have reported measles during the past 4 weeks: Arizona, California, Colorado, Connecticut, Florida, Illinois, Louisiana, Maryland, Massachusetts, Michigan, Montana, New Jersey, New Mexico, upstate New York, North Carolina, Ohio, Oregon, Pennsylvania, Texas, Virginia, West Virginia, and Wisconsin; New York City has also reported measles.

Director, Centers for Disease Control
James O. Mason, M.D., Dr.P.H.
Director, Epidemiology Program Office
Carl W. Tyler, Jr., M.D.

Editor
Michael B. Gregg, M.D.
Assistant Editor
Karen L. Foster, M.A.

☆U.S. Government Printing Office: 1985-746-149/10055 Region IV

HHS Publication No. (CDC) 85-8017