CENTERS FOR DISEASE CONTROL

September 16, 1983 / Vol. 32 / No. 36

MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

Current Trends

Urine Testing for Detection of Marijuana: An Advisory

Within the past several years, two U.S. companies (SYVA Co., Palo Alto, California, and Roche Diagnostics, Nutley, New Jersey*) have introduced tests to detect traces of marijuana in urine. Concern about the effects of marijuana on a person's ability to perform such tasks as driving, flying, or operating machinery has prompted various governmental and industrial groups to establish policies about marijuana use, which often include chemical screening of biologic fluids. Until recently, testing of plasma has been the only means by which exposure to marijuana has been detected. Three years ago, however, the first urine-screening test became available to make such screening possible at moderate cost (SYVA).

The urine test is based on detection of 11-nor-Δ-9-tetrahydrocannabinol-9-carboxylic acid (9-carboxy-THC), a metabolite of Δ-9-THC, which is the primary pharmacologically active component of marijuana. Studies involving humans indicate that 80%-90% of the total dose of Δ-9-THC is excreted within 5 days—approximately 20% in urine and 65% in feces (*1*). Plasma concentrations of Δ-9-THC peak by the time a smoked dose is completed and usually fall to approximately 2 ng/ml within 4-6 hours. 9-carboxy-THC is detectable in plasma within minutes after a dose is smoked and remains in plasma considerably longer than THC itself. Urine from marijuana users contains quantities of 9-carboxy-THC in both free and conjugated form, as well as other cannabinoids (THC and its metabolites) detectable by the test.

When the manufacturer's instructions are followed, urine samples containing at least the stated detection level of 9-carboxy-THC will test positive at least 95% of the time. In a CDC field-test survey of 64 laboratories, those using the SYVA system for urine screening for cannabinoids had an incidence of 4% false-positive results (*2*); whether these errors were analytical or clerical in nature was not determined. The manufacturer states that any positive test result should be confirmed by an alternative method.

Only blood-sample measurements are likely to correlate with a person's degree of exposure (*3*); attempts to correlate urine concentration with impairment or time of dose are complicated by variations in individual metabolism, metabolite accumulation in the chronic user, and urine volume changes due to diet, exercise, and age. Therefore, a positive result by the urine cannabinoid test indicates only the likelihood of prior use. Smoking a single marijuana cigarette produces THC metabolites that are detectable for several days with the cannabinoid assay (*4*). THC can accumulate in body fat, creating higher excretion concentrations and longer detectability. If an affect on performance is the main reason for screening, the urine cannabinoid test result alone cannot indicate performance impairment or assess the degree of risk associated with the person's continuing to perform tasks. If a history of marijuana use is

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

Urine Testing for Marijuana — Continued

the major reason for screening, the urine test for cannabinoids should be able to detect prior use for up to 2 weeks in the casual user and possibly longer in the chronic user.

A chain of custody for the sample must be maintained by the testing laboratory, as well as during the steps that bring the sample to the laboratory. All urine samples positive by the cannabinoid assay need to be confirmed by an alternate method that is as sensitive as the screening test, a condition not always met. Methods employed for cannabinoid confirmation are gas chromatography (*5*), gas chromatography/mass spectrometry (*6*), and high performance liquid chromatography (*7*). Because of costs involved in more complex confirmatory procedures, confirmatory tests have not always been conducted to verify presumed positive test results. Since the screening tests are immunologically based and measure both conjugated and free forms of THC metabolites, any confirmatory procedure should either measure both forms or should include a hydrolysis step to increase analytical sensitivity. Confirmatory techniques may be specific for a particular THC metabolite, while the screening kits react with virtually all THC metabolites, a further complication in confirming screening results. SYVA markets two different cannabinoid assay kits with a twofold to fourfold difference in the amount of THC metabolite required to produce a positive test result. Regardless of which assay kit is used, test results should be interpreted by qualified personnel and positive results verified so that there is a very limited possibility of a false-positive result.

Reported by Div of Preclinical Research, Div of Epidemiology and Statistical Analysis, National Institute on Drug Abuse; Div of Technology Evaluation and Assistance, Laboratory Program Office, CDC.

Editorial Note: Marijuana is the most widely used illicit drug in the United States; an estimated 50 million people have tried it at least once (*8*). A recent U.S. Department of Defense survey showed that chronic marijuana use exceeded 30% among some members of the military. Although further study is needed on the long-term health effects of marijuana use, short-term effects include impaired motor coordination and perception, as well as slowed learning and decreased short-term memory (*9*).

Urine cannabinoid assays permitting extension of testing to nonlaboratory settings, such as industrial sites, probation offices, and schools have been developed. The relative ease with which the test can be performed encourages its use by nontechnical personnel.

Those who interpret data from laboratory or nonlaboratory settings should be aware of possible pitfalls in such testing (*10*). Whether test results are used for counseling or determining compliance with orders to desist from marijuana use, the laboratory must perform the test according to the manufacturer's recommendations, including confirmation of any positive test results. A recent report indicates that passive inhalation of marijuana smoke by a nonuser is not likely to produce a positive urine test result (*11*), but since some passive inhalation does occur, establishment of minimum sensitivity limits by a laboratory must be done cautiously.

References

1. Hunt AC, Jones RT. Tolerance and disposition of THC in man. Pharm Exp Ther 1980;215:135-44.
2. Hansen HJ, Lewis DS, Boone DJ. Marijuana analysis: results of a recent interlaboratory survey. Clin Chem 1981;27:1104.
3. Hawks RL. Developments in cannabinoid analyses of body fluids: implications of forensic applications. In: Agurell S, Dewey W, Willett RE, eds. The cannabinoids: chemical, pharmacologic and therapeutic aspects. New York: Academic Press, 1983 (in press).
4. Clark S, Turner J, Bastiani R. EMIT cannibinoid assay. (Clinical study no. 74, summary report). Palo Alto, Calif.: SYVA Co., 1980:17-8.
5. Whiting JD, Manders WW. Confirmation of a tetrahydrocannabinol metabolite in urine by gas chromatography. J Anal Tox 1982; 6:49-52.
6. Foltz RL, Hidy BJ. Quantitative analysis for Δ-9-THC, 11-hydroxy-Δ-9-THC, and 9-carboxy-Δ-9-THC in plasma using GC/CI-MS. In: Hawks R, ed. Analysis of cannabinoids. Research monograph 42. Rockville, Maryland: National Institute on Drug Abuse, 1982.
7. ElSohly MA, ElSohly HN, Jones AB. HPLC analysis of the major metabolite of Δ-9-tetrahydrocannabinol in urine. J Anal Tox 1983 (in press).

Urine Testing for Marijuana – Continued

8. Fishburne PM, Abelson HI, Cisin I. National survey on drug abuse: main findings, 1979. Washington, D.C.: U.S. Government Printing Office, 1980. (HHS publication no. [ADM] 80-976).
9. Institute of Medicine. Marijuana and health. Washington, D.C.: National Academy Press, 1982:1-5.
10. McBay AJ, Dubowski KM, Finkle BS. Urine testing for marijuana use. JAMA (letter) 1983, 249:881.
11. Perez-Reyes M, Guiseppi SD, Mason AP, Davis KH. Passive inhalation of marijuana smoke and urinary excretion of cannabinoids. Clin Pharmacol Ther 1983; 34:36-41.

Epidemiologic Notes and Reports

Measles Among Children of Migrant Workers — Florida

A total of 93 clinical measles cases,* with rash onsets from January 1 through April 27, 1983, were reported from Dade County, Florida (Figure 1). Eighty-seven (93.5%) of these occurred among migrant workers and their dependents; 21 of these 87 resided in migrant-worker camps. The 93 cases occurred after an outbreak of over 200 cases in another part of Dade County (rash onsets September 10-December 3, 1982) (*1*).

The 1982 outbreak was concentrated in schoolchildren; the 1983 outbreak occurred principally among preschoolers—71 (76.3%) children under 5 years old. Complications from measles occurred principally in children under 5 years old. During the first 8 weeks of the outbreak, four of 36 children (11.1%) under 5 years old had otitis media and three (8.3%) had pneumonia. The highest complication rates occurred in infants under 15 months of age. Of these 22 infants, three (13.6%) developed otitis, and two (9.1%) had pneumonia. One child was hospitalized (a 2-week-old with pneumonia); no deaths occurred.

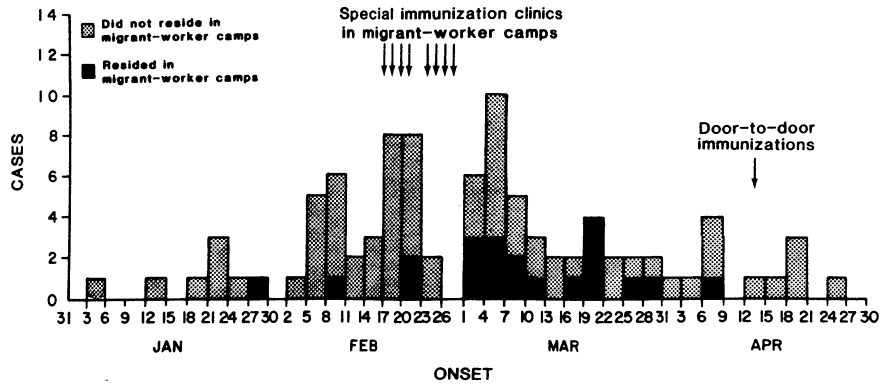
Two major chains of transmission were defined—one at a medical clinic and one in migrant-worker camps. Twelve (22.6%) of the 53 cases occurring in the first 8 weeks of the outbreak were believed to have been acquired at the medical clinic.

A door-to-door survey was conducted in all three affected migrant-worker camps in the county by bilingual teams from the Dade County Department of Public Health. In one camp, rosters from 244 of the 387 housing units were studied. Ninety-three percent of these units housed individuals under 26 years of age. Of 985 occupants identified, 649 (65.9%) had documented histories of vaccination or were over 20 years old.† Nineteen of the remaining

*Confirmed and probable cases.

† All persons born after 1956 were urged to be vaccinated in accordance with ACIP recommendations. For purposes of this analysis, the highest risk group for disease was considered persons 6 months to 19 years old.

FIGURE 1. Reported measles — Dade County, Florida, January 1-April 27, 1983



Measles – Continued

336 were under 6 months old—the minimum age of vaccination recommended for outbreak control (2)—leaving 317 persons at risk of disease, an average of 1.3 persons (317/244) per household.† Assuming the same average occupancy for homes that were not surveyed, an estimated 186 additional susceptibles were present. Special on-site immunization clinics delivered 264 vaccinations, providing vaccine to 52.4% of the estimated population at risk. Despite these clinics, transmission persisted (Figure 1). Door-to-door vaccinations were provided on April 14; transmission ended shortly afterward.

Reported by M Enriquez, MD, H Garcia, MD, A Kimbler, RA Morgan MD, Dade County Dept of Public Health, Miami; HT Janowski, MB Rothman, JL Velez, JJ Witte, MD, JJ Sacks, MD, Acting State Epidemiologist, Florida State Dept of Health and Rehabilitative Services; Office of Migrant Health, Bureau of Health Care Delivery and Assistance, Health Resources and Svcs Administration; Div of Field Svcs, Epidemiology Program Office; Div of Immunization, Center for Prevention Svcs, CDC.

Editorial Note: Although the source of this outbreak could not be identified, transmission may have occurred from the 1982 outbreak among schoolchildren in Dade County (*1*). Physician- and school-based reporting systems could have failed to detect the link between the two outbreaks because many of the cases in the 1983 outbreak occurred in preschoolers who often did not seek medical care. As in other outbreaks among preschoolers, transmission in the medical clinic played an important role in sustaining this outbreak (*2-4*).

(Continued on page 477)

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

Disease	36th Week Ending			Cumulative, 36th Week Ending		
	September 10, 1983	September 11, 1982	Median 1978-1982	September 10, 1983	September 11, 1982	Median 1978-1982
Aseptic meningitis	493	340	340	6,550	5,307	4,419
Encephalitis: Primary (arthropod-borne & unspec.)	64	66	65	996	908	735
Post-infectious	-	1	2	58	60	153
Gonorrhea: Civilian	17,189	17,664	18,384	610,261	655,787	677,783
Military	539	405	492	16,641	18,608	19,113
Hepatitis: Type A	353	440	535	14,639	15,348	19,113
Type B	438	410	345	15,673	14,718	11,993
Non A, Non B	76	50	N	2,319	1,598	N
Unspecified	153	135	197	5,330	5,890	6,917
Legionellosis	17	19	N	483	393	N
Leprosy	3	2	1	172	144	131
Malaria	29	22	23	543	750	750
Measles: Total	16	20	36	1,210	1,213	12,009
Indigenous	10	N	N	1,001	N	N
Imported	6	N	N	209	N	N
Meningococcal infections: Total*	26	32	32	2,047	2,212	1,962
Civilian	26	32	32	2,032	2,200	1,948
Military	-	-	-	15	12	14
Mumps	13	25	52	2,435	4,208	7,061
Pertussis	96	36	36	1,566	1,032	1,032
Rubella (German measles)	11	17	39	774	1,981	3,235
Syphilis (Primary & Secondary): Civilian	435	505	505	22,033	22,605	18,170
Military	7	13	7	281	295	224
Toxic-shock syndrome	8	N	N	282	N	N
Tuberculosis	398	475	470	15,995	17,329	18,594
Tularemia	12	8	8	230	171	147
Typhoid fever	10	2	7	277	273	334
Typhus fever, tick-borne (RMSF)	37	29	32	989	800	851
Rabies, animal	78	132	119	4,184	4,451	4,451

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1983		Cum. 1983
Anthrax	-	Plague	27
Botulism: Foodborne	13	Poliomyelitis: Total	4
Infant (Tex. 1)	42	Paralytic	4
Other	-	Psittacosis (N.Y. City 1, Tex. 2)	89
Brucellosis (Mich. 1, Fla. 1, Ark. 1, Okla. 1, Calif. 1)	139	Rabies, human	2
Cholera	1	Tetanus (Md. 1, Va. 1, Calif. 1)	52
Congenital rubella syndrome	16	Trichinosis	26
Diphtheria (Ark. 1)	1	Typhus fever, flea-borne (endemic, murine) (Tex. 7)	40
Leptospirosis (Okla. 1)	36		

*Two of the 16 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 September 10, 1983 and September 11, 1982 (36th week)

Reporting Area	Aseptic Meningitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy	Malaria
		Primary	Post-infectious			A	B	NA,NB	Unspecified			
	1983	Cum. 1983	Cum. 1983	Cum. 1983	Cum. 1982	1983	1983	1983	1983	1983	Cum. 1983	Cum. 1983
UNITED STATES	493	996	58	610,261	655,787	353	438	76	153	17	172	543
NEW ENGLAND	22	40	-	15,676	15,720	5	21	3	15	4	3	26
Maine	2	-	-	776	786	-	5	1	-	-	-	1
N.H.	2	5	-	501	541	1	1	-	-	-	2	-
Vt.	1	1	-	306	300	-	-	-	-	-	-	1
Mass.	4	19	-	6,659	7,083	1	5	-	15	-	-	12
R.I.	3	-	-	843	1,064	2	3	-	-	4	-	3
Conn.	10	15	-	6,591	5,946	1	7	2	-	-	1	9
MID ATLANTIC	41	83	5	77,974	81,201	74	72	4	16	-	23	76
Upstate N.Y.	17	19	-	12,254	13,110	5	8	-	1	-	-	22
N.Y. City	3	10	-	31,379	33,645	26	3	-	3	-	22	20
N.J.	-	16	-	14,655	15,000	7	35	4	12	-	-	22
Pa.	21	38	5	19,686	19,446	36	26	-	-	-	1	12
E.N. CENTRAL	118	329	18	83,744	93,879	27	42	4	9	2	5	40
Ohio	23	94	7	22,437	25,271	8	12	-	-	2	1	6
Ind.	45	123	1	8,906	10,943	8	13	1	9	-	-	2
Ill.	-	17	7	20,806	26,812	3	5	1	-	-	2	15
Mich.	50	68	-	23,847	22,447	8	12	2	-	-	2	14
Wis.	-	27	3	7,748	8,406	-	-	-	-	-	-	3
W.N. CENTRAL	31	78	7	28,049	31,051	8	16	3	2	2	5	21
Minn.	-	19	1	4,018	4,439	4	4	-	1	-	4	6
Iowa	5	45	-	3,211	3,255	-	-	2	-	1	-	3
Mo.	22	10	-	13,331	14,831	1	8	1	1	1	-	2
N. Dak.	-	-	-	301	416	-	-	-	-	-	-	2
S. Dak.	-	-	2	758	846	3	-	-	-	-	-	1
Nebr.	-	3	-	1,813	1,904	-	4	-	-	-	-	1
Kans.	4	1	4	4,617	5,360	-	-	-	-	-	1	6
S. ATLANTIC	88	144	15	159,568	171,994	28	85	15	14	3	9	79
Del.	2	-	-	2,861	2,740	2	2	-	-	-	-	1
Md.	14	17	-	20,312	21,553	3	17	7	2	1	1	13
D.C.	-	-	-	10,842	9,687	-	2	-	-	-	-	13
Va.	14	34	2	14,223	13,520	1	6	1	2	-	1	13
W. Va.	7	22	-	1,665	1,924	3	1	-	1	-	-	1
N.C.	30	31	-	24,460	27,320	1	7	-	4	-	-	3
S.C.	9	2	-	15,138	16,643	-	6	1	-	-	-	5
Ga.	3	6	1	31,760	33,791	9	21	-	1	-	1	8
Fla.	9	32	12	38,307	44,816	9	23	6	4	2	6	22
E.S. CENTRAL	69	47	1	51,347	57,083	28	33	3	-	-	-	7
Ky.	10	9	-	6,035	7,646	17	8	1	-	-	-	-
Tenn.	7	12	-	21,103	22,431	9	17	2	-	-	-	-
Ala.	47	22	-	15,836	17,037	1	2	-	-	-	-	5
Miss.	5	4	1	8,373	9,969	1	6	-	-	-	-	2
W.S. CENTRAL	39	119	2	87,397	89,512	71	32	2	71	1	22	52
Ark.	3	6	-	6,745	7,480	3	1	1	6	1	-	1
La.	1	14	-	17,031	15,946	7	10	1	1	-	1	8
Okla.	17	26	1	10,084	9,990	18	3	-	11	-	-	10
Tex.	18	73	1	53,537	56,096	43	18	-	53	-	21	33
MOUNTAIN	23	43	4	19,545	22,170	24	12	6	5	3	12	23
Mont.	-	-	-	824	907	2	-	-	-	-	-	-
Idaho	-	-	-	830	1,050	1	1	-	-	-	-	2
Wyo.	1	2	-	514	659	-	-	-	-	-	-	1
Colo.	19	23	-	5,490	5,992	6	1	1	3	1	2	8
N. Mex.	2	1	-	2,411	2,919	3	4	1	-	-	-	5
Ariz.	-	8	4	5,555	5,790	7	6	4	1	1	9	4
Utah	-	9	-	925	1,060	1	-	-	-	1	1	3
Nev.	1	-	-	2,996	3,793	4	-	-	1	-	-	-
PACIFIC	62	113	6	86,961	93,177	88	125	36	21	2	93	219
Wash.	12	11	1	6,667	7,745	6	9	6	2	1	14	8
Oreg.	-	-	2	4,672	5,392	20	2	2	-	-	1	8
Calif.	40	95	3	71,580	75,963	61	106	27	19	1	54	202
Alaska	-	-	-	2,316	2,291	1	3	-	-	-	-	-
Hawaii	10	7	-	1,726	1,786	-	5	1	-	-	24	1
Guam	U	-	-	74	104	U	U	U	U	U	-	2
P.R.	U	-	1	1,752	1,956	U	U	U	U	U	-	2
V.I.	U	-	-	172	193	U	U	U	U	U	-	-
Pac. Trust Terr.	U	-	-	-	338	U	U	U	U	U	-	-

N: Not notifiable U: Unavailable

TABLE III. (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending September 10, 1983 and September 11, 1982 (36th week)

Reporting Area	Measles (Rubeola)					Menin-gococcal Infections	Mumps			Pertussis			Rubella		
	Indigenous		Imported*		Total										
	1983	Cum. 1983	1983	Cum. 1983	Cum. 1982	Cum. 1983	1983	Cum. 1983	Cum. 1982	1983	Cum. 1983	Cum. 1982	1983	Cum. 1983	Cum. 1982
UNITED STATES	10	1,001	6	209	1,213	2,047	13	2,435	4,208	96	1,566	1,032	11	774	1,981
NEW ENGLAND	-	2	-	14	13	100	2	99	162	3	49	41	1	12	14
Maine	-	-	-	-	-	8	-	16	38	-	4	4	-	-	-
N.H.	-	-	-	3	2	3	-	19	14	-	6	4	-	3	8
Vt.	-	-	-	-	2	7	-	14	7	-	7	2	-	3	-
Mass.	-	2	-	3	3	33	1	24	70	2	26	19	1	6	2
R.I.	-	-	-	-	-	8	-	12	15	-	5	10	-	-	1
Conn.	-	-	-	8	6	41	1	14	18	1	1	2	-	-	3
MID ATLANTIC	1	70	-	24	155	341	2	196	265	20	305	199	-	135	96
Upstate N.Y.	-	1	-	8	109	109	1	76	61	1	94	78	-	26	47
N.Y. City	1	43	-	12	38	63	-	33	45	2	47	29	-	86	31
N.J.	-	26	-	1	4	55	-	33	38	1	18	18	-	3	17
Pa.	-	-	-	3	4	114	1	54	121	16	146	74	-	20	1
E.N. CENTRAL	8	575	-	56	75	377	-	1,183	2,246	12	324	225	-	108	175
Ohio	-	72	-	13	1	114	-	539	1,556	3	108	62	-	2	-
Ind.	-	385	-	4	2	45	-	33	37	8	44	15	-	23	27
Ill.	8	116	-	33	24	109	-	123	253	-	102	97	-	46	65
Mich.	-	2	-	5	48	66	-	420	296	1	26	18	-	15	48
Wis.	-	-	-	1	-	43	-	68	104	-	44	33	-	22	35
W.N. CENTRAL	-	-	5	6	49	113	1	140	540	5	97	56	5	36	56
Minn.	-	-	-	-	-	16	-	27	418	3	36	23	1	7	5
Iowa	-	-	-	-	-	12	-	36	31	1	6	5	-	-	-
Mo.	-	-	-	1	2	56	-	21	9	-	14	14	-	-	38
N. Dak.	-	-	-	-	-	4	-	-	-	-	1	-	-	-	-
S. Dak.	-	-	-	-	-	4	-	-	1	1	7	5	-	-	1
Nebr.	-	-	-	-	3	1	-	2	-	-	-	1	-	-	-
Kans.	-	-	5 † §	5	44	20	1	54	81	-	33	8	4	29	12
S. ATLANTIC	-	163	-	31	41	432	-	160	241	3	187	183	-	92	75
Del.	-	-	-	-	-	10	-	8	10	-	3	5	-	-	1
Md.	-	6	-	4	3	43	-	24	25	-	14	43	-	3	34
D.C.	-	-	-	-	1	5	-	-	-	-	-	1	-	-	-
Va.	-	10	-	13	14	60	-	30	33	-	45	19	-	2	12
W. Va.	-	-	-	-	3	2	-	39	88	-	7	5	-	-	1
N.C.	-	-	-	1	-	85	-	9	12	2	23	26	-	10	1
S.C.	-	-	-	4	-	45	-	8	15	-	13	16	-	1	1
Ga.	-	8	-	-	-	69	-	42	13	-	54	31	-	11	11
Fla.	-	139	-	9	20	113	-	-	45	1	28	37	-	65	14
E.S. CENTRAL	-	1	-	5	7	126	-	47	47	2	24	41	-	11	44
Ky.	-	-	-	1	1	27	-	21	15	1	10	5	-	10	26
Tenn.	-	-	-	-	6	43	-	21	18	1	6	22	-	-	2
Ala.	-	1	-	4	-	38	-	2	8	-	4	5	-	1	-
Miss.	-	-	-	-	-	18	-	3	6	-	4	9	-	-	16
W.S. CENTRAL	-	39	1 †	35	42	219	4	206	169	35	322	70	1	106	94
Ark.	-	5	1 †	8	-	17	-	2	6	1	17	3	-	-	1
La.	-	-	-	25	2	44	-	45	6	-	6	9	-	9	1
Okla.	-	1	-	-	26	26	-	-	-	32	237	5	-	-	3
Tex.	-	33	-	2	14	132	4	159	157	2	62	53	1	97	89
MOUNTAIN	-	-	-	3	14	79	-	98	85	7	162	58	1	31	76
Mont.	-	-	-	-	-	15	-	2	3	-	1	1	-	5	5
Idaho	-	-	-	-	-	6	-	6	4	4	15	11	-	8	6
Wyo.	-	-	-	-	1	2	-	-	2	-	6	2	1	4	7
Colo.	-	-	-	2	8	25	-	12	16	1	100	16	-	-	6
N. Mex.	-	-	-	-	-	6	-	-	-	-	10	6	-	-	6
Ariz.	-	-	-	1	5	16	-	68	35	-	14	21	-	6	14
Utah	-	-	-	-	-	8	-	6	19	2	16	1	-	7	21
Nev.	-	-	-	-	-	1	-	4	6	-	-	-	-	1	11
PACIFIC	1	151	-	35	817	260	4	306	453	9	96	159	3	243	1,351
Wash.	-	1	-	4	39	36	-	38	61	3	16	20	-	12	37
Oreg.	-	7	-	2	6	38	-	-	-	-	6	27	-	13	6
Calif.	1	142	-	27	767	177	4	241	377	2	68	84	3	216	1,296
Alaska	-	-	-	2	1	2	-	12	6	4	4	-	-	1	5
Hawaii	-	1	-	-	4	7	-	15	9	-	2	28	-	1	7
Guam	U	1	U	1	6	1	U	-	3	U	-	-	U	-	2
P.R.	U	89	U	-	102	11	U	111	54	U	9	20	U	4	8
V.I.	U	-	U	5	-	-	U	-	3	U	-	-	U	2	1
Pac. Trust Terr.	U	-	U	-	-	-	U	-	5	U	-	-	U	-	-

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

TABLE III. (Cont.'d). Cases of specified notifiable diseases, United States, weeks ending September 10, 1983 and September 11, 1982 (36th week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1983	Cum. 1982	1983	1983	Cum. 1983	Cum. 1983	Cum. 1983	Cum. 1983	Cum. 1983
UNITED STATES	22,033	22,605	8	398	15,995	230	277	989	4,184
NEW ENGLAND	463	384	-	16	463	4	10	6	23
Maine	15	3	-	-	27	-	-	-	6
N.H.	17	4	-	-	30	-	-	1	2
Vt.	1	2	-	-	9	-	-	-	1
Mass.	283	256	-	12	250	3	8	2	9
R.I.	16	19	-	3	31	1	-	-	-
Conn.	131	100	-	1	116	-	2	3	5
MID ATLANTIC	2,771	3,119	2	55	2,833	1	47	24	191
Upstate N.Y.	195	342	-	6	459	1	7	6	64
N.Y. City	1,662	1,849	-	24	1,133	-	16	1	-
N.J.	543	427	1	17	616	-	18	8	20
Pa.	371	501	1	8	625	-	6	9	107
E.N. CENTRAL	1,099	1,389	3	53	2,122	2	45	70	377
Ohio	312	209	2	17	331	-	12	43	47
Ind.	89	135	-	6	229	-	2	6	2[illegible]
Ill.	474	766	1	22	915	1	22	14	19[illegible]
Mich.	162	211	-	6	537	1	9	6	11
Wis.	62	68	-	2	110	-	-	1	9[illegible]
W.N. CENTRAL	266	387	1	2	488	70	9	47	63[illegible]
Minn.	106	79	1	-	104	-	2	-	10[illegible]
Iowa	13	21	-	1	41	-	-	-	158
Mo.	99	231	-	-	235	53	6	23	87
N. Dak.	2	7	-	1	6	-	-	1	62
S. Dak.	11	1	-	-	32	4	-	5	96
Nebr.	11	11	-	-	20	6	-	2	57
Kans.	24	37	-	-	50	7	1	16	67
S. ATLANTIC	5,902	6,145	-	78	3,278	13	42	414	1,389
Del.	25	14	-	-	26	-	-	4	5
Md.	364	339	-	7	268	5	7	37	571
D.C.	265	338	-	3	130	-	3	-	1
Va.	409	419	-	11	345	1	9	54	502
W. Va.	19	21	-	1	97	-	2	11	99
N.C.	555	493	-	8	484	6	3	168	17
S.C.	375	365	-	12	296	-	1	71	21
Ga.	1,091	1,262	-	5	610	1	2	65	152
Fla.	2,799	2,894	-	31	1,022	-	15	4	21
E.S. CENTRAL	1,514	1,544	-	40	1,442	17	7	83	287
Ky.	103	80	-	16	354	1	3	18	67
Tenn.	417	411	-	9	447	11	1	43	165
Ala.	606	584	-	12	374	-	1	18	55
Miss.	388	469	-	3	267	5	2	4	-
W.S. CENTRAL	5,807	5,796	-	75	1,917	97	37	332	811
Ark.	140	145	-	6	223	60	2	32	136
La.	1,213	1,330	-	11	253	3	3	1	21
Okla.	148	123	-	4	172	27	2	212	86
Tex.	4,306	4,198	-	54	1,269	7	30	87	568
MOUNTAIN	468	569	-	13	424	21	8	11	169
Mont.	7	3	-	-	34	5	1	5	66
Idaho	6	24	-	-	23	2	-	2	9
Wyo.	10	15	-	-	10	4	-	2	8
Colo.	116	158	-	-	54	3	1	-	18
N. Mex.	127	141	-	2	84	3	1	-	7
Ariz.	117	119	-	10	174	1	3	-	32
Utah	17	15	-	-	27	2	1	1	5
Nev.	68	94	-	1	18	1	1	1	24
PACIFIC	3,743	3,272	2	66	3,028	5	72	2	304
Wash.	127	113	-	-	154	2	3	-	2
Oreg.	98	79	-	-	124	2	3	-	1
Calif.	3,460	2,992	2	58	2,544	1	64	2	286
Alaska	10	9	-	-	42	-	-	-	15
Hawaii	48	79	-	8	164	-	2	-	-
Guam	-	1	U	U	3	-	-	-	-
P.R.	499	482	U	U	334	-	-	-	40
V.I.	16	24	U	U	2	-	-	-	-
Pac. Trust Terr.	-	-	U	U	-	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending September 10, 1983 (36th week)

Reporting Area	All Causes, By Age (Years)						P&I** Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	597	388	135	48	13	13	40
Boston, Mass.	176	97	45	19	6	9	19
Bridgeport, Conn.	41	29	10	1	1	-	2
Cambridge, Mass.	28	24	4	-	-	-	1
Fall River, Mass.	29	25	4	-	-	-	1
Hartford, Conn.	43	24	10	7	1	1	1
Lowell, Mass.	13	10	1	-	2	-	1
Lynn, Mass.	18	10	4	4	-	-	1
New Bedford, Mass.	33	24	8	1	-	-	-
New Haven, Conn.	32	15	9	7	-	1	1
Providence, R.I.	45	27	12	5	-	1	4
Somerville, Mass.	8	8	-	-	-	-	1
Springfield, Mass.	35	22	11	2	-	-	1
Waterbury, Conn.	35	27	7	-	1	-	1
Worcester, Mass.	61	46	10	2	2	1	6
MID. ATLANTIC	2,192	1,420	466	189	70	46	101
Albany, N.Y.	42	30	5	2	4	1	-
Allentown, Pa.	16	14	2	-	-	-	-
Buffalo, N.Y.	96	64	17	7	5	3	7
Camden, N.J.	34	19	8	4	2	1	3
Elizabeth, N.J.	24	13	7	3	1	-	1
Erie, Pa.†	34	29	5	-	-	-	3
Jersey City, N.J.	39	24	8	5	2	-	-
N.Y. City, N.Y.	1,253	818	247	127	38	23	46
Newark, N.J.	58	27	17	9	3	2	6
Paterson, N.J.	24	11	9	1	-	3	2
Philadelphia, Pa.†	202	132	53	10	5	2	10
Pittsburgh, Pa.†	59	34	19	4	1	1	2
Reading, Pa.	27	21	5	1	-	-	3
Rochester, N.Y.	116	73	24	9	4	6	8
Schenectady, N.Y.	26	17	7	1	-	1	1
Scranton, Pa.†	17	14	3	-	-	-	2
Syracuse, N.Y.	66	33	22	5	3	3	1
Trenton, N.J.	17	9	5	1	2	-	1
Utica, N.Y.	21	20	1	-	-	-	5
Yonkers, N.Y.	21	18	2	-	-	-	-
E.N. CENTRAL	1,957	1,229	463	120	70	75	51
Akron, Ohio	46	29	8	3	2	4	-
Canton, Ohio	43	33	9	-	-	1	3
Chicago, Ill	495	299	123	41	18	14	13
Cincinnati, Ohio	105	69	28	3	4	1	8
Cleveland, Ohio	131	71	36	10	8	6	4
Columbus, Ohio	133	81	35	10	3	4	3
Dayton, Ohio	104	60	32	6	2	4	1
Detroit, Mich.	240	153	50	19	10	8	3
Evansville, Ind.	47	30	7	2	5	3	-
Fort Wayne, Ind.	46	33	8	3	1	1	2
Gary, Ind.	12	6	3	3	-	-	1
Grand Rapids, Mich.	43	29	6	2	4	2	2
Indianapolis, Ind.	127	76	32	5	5	9	1
Madison, Wis.	24	19	3	-	-	2	1
Milwaukee, Wis.	111	67	35	2	4	3	1
Peoria, Ill.	28	13	3	5	2	5	3
Rockford, Ill.	39	29	9	1	-	-	1
South Bend, Ind.	39	33	4	1	1	-	-
Toledo, Ohio	82	53	18	3	1	7	4
Youngstown, Ohio	62	46	14	1	-	1	-
W.N. CENTRAL	579	389	124	32	20	13	22
Des Moines, Iowa	25	19	5	1	-	-	1
Duluth, Minn.	23	17	4	-	-	2	-
Kansas City, Kans.	25	15	9	-	1	-	1
Kansas City, Mo.	98	53	30	8	5	1	3
Lincoln, Nebr.	32	26	3	2	-	1	4
Minneapolis, Minn.	84	57	15	6	3	3	2
Omaha, Nebr.	62	41	16	2	3	-	1
St. Louis, Mo.	132	87	25	9	6	5	6
St. Paul, Minn.	43	37	5	1	-	-	-
Wichita, Kans.	55	37	12	3	2	1	4
S. ATLANTIC	989	587	247	92	36	27	37
Atlanta, Ga.	116	77	27	6	5	1	3
Baltimore, Md.	158	86	42	23	4	3	3
Charlotte, N.C.	49	23	14	6	2	4	4
Jacksonville, Fla.	96	64	20	6	4	2	3
Miami, Fla.	94	42	30	14	8	-	1
Norfolk, Va.	48	25	15	3	1	4	4
Richmond, Va.	53	30	14	6	2	1	3
Savannah, Ga.	48	29	11	6	1	1	3
St. Petersburg, Fla.	82	67	10	1	2	2	4
Tampa, Fla.	53	32	11	6	1	3	1
Washington, D.C.	153	83	47	13	4	6	7
Wilmington, Del.	39	29	6	2	2	-	1
E.S. CENTRAL	586	375	137	33	20	21	27
Birmingham, Ala.	87	60	15	4	2	6	2
Chattanooga, Tenn.	40	21	11	5	2	1	1
Knoxville, Tenn.	41	33	5	2	1	-	-
Louisville, Ky.	82	46	25	1	4	6	5
Memphis, Tenn.	145	90	39	7	3	6	8
Mobile, Ala.	69	45	13	5	4	2	6
Montgomery, Ala.	30	20	5	3	2	-	2
Nashville, Tenn.	92	60	24	6	2	-	3
W.S. CENTRAL	944	526	258	84	46	30	34
Austin, Tex.	27	15	10	1	1	-	2
Baton Rouge, La.	34	22	11	-	1	-	2
Corpus Christi, Tex.	69	42	19	4	3	1	-
Dallas, Tex.	146	71	44	19	4	8	-
El Paso, Tex.	38	26	7	2	2	1	3
Fort Worth, Tex.	83	51	23	6	3	-	3
Houston, Tex.	196	88	62	25	14	7	4
Little Rock, Ark.	51	37	10	2	-	2	3
New Orleans, La.	97	45	35	6	7	4	-
San Antonio, Tex.	114	73	22	9	6	4	10
Shreveport, La.	36	20	7	5	2	2	2
Tulsa, Okla.	53	36	8	5	3	1	5
MOUNTAIN	571	354	127	40	22	28	21
Albuquerque, N.Mex.	69	44	13	8	3	1	2
Colo. Springs, Colo.	32	19	5	3	1	4	3
Denver, Colo.	106	65	24	6	6	5	4
Las Vegas, Nev.	66	27	28	5	4	2	-
Ogden, Utah	15	13	1	-	1	-	-
Phoenix, Ariz.	135	82	32	9	3	9	3
Pueblo, Colo.	18	9	7	2	-	-	1
Salt Lake City, Utah	58	41	8	1	3	5	2
Tucson, Ariz.	72	54	9	6	1	2	6
PACIFIC	1,498	943	340	103	63	48	85
Berkeley, Calif.	18	12	4	1	-	1	2
Fresno, Calif.	45	28	11	3	2	1	3
Glendale, Calif.	4	4	-	-	-	-	1
Honolulu, Hawaii	72	48	15	6	2	1	7
Long Beach, Calif.	95	60	25	7	3	-	9
Los Angeles, Calif.	516	332	105	39	23	17	15
Oakland, Calif.	50	34	8	2	4	2	4
Pasadena, Calif.	38	-	30	1	3	4	3
Portland, Oreg.	80	56	13	5	2	4	3
Sacramento, Calif.	41	27	11	1	1	1	3
San Diego, Calif.	95	59	25	5	6	-	8
San Francisco, Calif.	106	71	21	8	3	3	2
San Jose, Calif.	155	93	33	13	5	10	16
Seattle, Wash.	102	65	24	5	4	4	3
Spokane, Wash.	48	34	6	5	3	-	5
Tacoma, Wash.	33	20	9	2	2	-	1
TOTAL	9,913††	6,211	2,297	741	360	301	418

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

** Pneumonia and influenza

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

†† Total includes unknown ages.

Measles – Continued

To minimize the risk of transmission, it is important to separate potentially infectious children from others in waiting rooms (*2*). In this outbreak, the clinic staff established a triage system at the facility. It was recommended that children who arrived with symptoms compatible with the prodrome of measles be isolated from other patients. Staff also reviewed the immunity status of other clinic patients and vaccinated susceptible patients from 6 months to 25 years old.

The Immunization Practices Advisory Committee (ACIP) recommends routine measles vaccination at 15 months of age (*5*). However, in this outbreak, a substantial proportion of cases (47.3%) occurred among infants under 15 months of age. Because the risk of complications is high among such infants, the ACIP also recommends that, during outbreaks, infants as young as 6 months of age may be vaccinated when exposure to measles is likely. Infants under 12 months old should receive single-antigen measles vaccine rather than measles-rubella (MR) or measles-mumps-rubella (MMR) vaccines, because rubella and mumps vaccines are not recommended for that group. To ensure protection against measles, such infants should be revaccinated when they are about 15 months old.

The recommendation to vaccinate at a younger age is made in consideration of the risk of measles complications in such infants and the benefit of vaccination, as well as the possible risk that some persons vaccinated before 11 months of age may have less predictable immune responses to measles vaccine when revaccinated on or after their first birthdays. After revaccination, approximately half the infants who fail to seroconvert initially will develop persistent hemagglutination inhibition (HI) antibody; the remaining half will not develop sustained levels of HI antibody. However, all such children, whether HI-antibody negative or positive, have antibody detectable by a sensitive plaque neutralization test (*6*). There is no evidence to suggest that such children are susceptible to measles.

Immune globulin (IG) may also be used to prevent or modify measles in infants (*5*). However, IG should not be used in an attempt to control outbreaks. IG may be especially indicated for susceptible household contacts of measles patients (particularly if under 1 year of age). The recommended dose is 0.25 ml/kg (0.11 ml/lb) of body weight (maximum dose, 15 ml), intramuscular, within 6 days of exposure. Measles vaccine should be given about 3 months later when the passive measles antibodies should have disappeared (if the child is then about 15 months old).

Because a majority of the cases in this outbreak occurred among migrant workers and their dependents, control was difficult. Special clinics in the camps reached an estimated 52% of the targeted population, but transmission persisted. Higher immunization levels were probably needed to interrupt transmission. In future outbreaks in the migrant population, it may be necessary to consider door-to-door immunizations early in the outbreak.

Rapid case-reporting systems are necessary in areas with migrant populations because migrant workers and their dependents may reside only transiently in any one location. Prompt follow-up and control measures should be instituted within 48 hours of a case report. Following this outbreak, no transmission occurred to other migrant populations in the United States. CDC and the Office of Migrant Health, Bureau of Health Care Delivery and Assistance, Health Resources and Services Administration, recommend that all migrant workers and their dependents have documentation of immunity to measles.[§] Standard immunization records of the type issued by state health departments should be filled out and given to patients at the time of vaccination to avoid repeated doses at subsequent locations.

[§]For persons 15 months of age or older and born after 1956, a written record showing date of vaccination with live measles vaccine on or after the first birthday, or a documented history of physician-diagnosed measles. During certain outbreaks, the minimum age for vaccination has been lowered to 6 months of age or older, with revaccination at 15 months of age or older of children who were vaccinated before their first birthdays.

Measles – Continued

References

1. CDC. Outbreak of measles following an imported case—Florida. MMWR 1982;31:657-9.
2. CDC. Imported measles with subsequent airborne transmission in a pediatrician's office—Michigan. MMWR 1983; 32:401-3.
3. CDC. Measles—Texas. MMWR 1981;30:209-11.
4. CDC. Measles in medical settings—United States. MMWR 1981;30:125-6.
5. Immunization Practices Advisory Committee. Measles prevention. MMWR 1982;31:217-24, 229-31.
6. Wilkins J, Wehrle PF. Additional evidence against measles vaccine administration to infants less than 12 months of age: altered immune response following active/passive immunization. J Pediatr 1979;94:865-9.

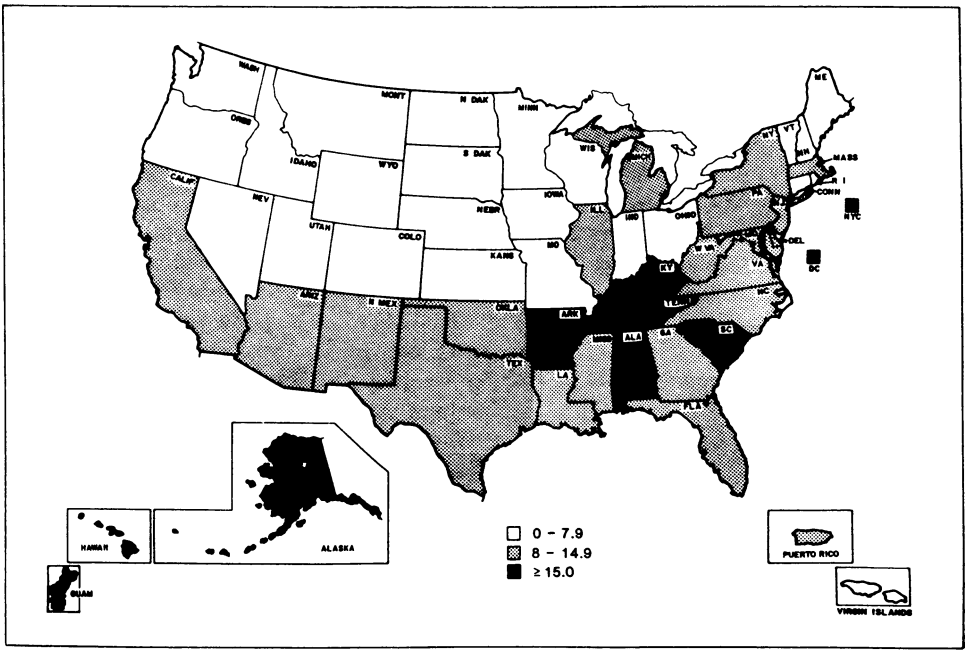
Current Trends

Tuberculosis — United States, 1982

In 1982, 25,520 cases of tuberculosis (TB) were reported to CDC, for a case rate of 11.0 per 100,000 population. Compared with 1981, this represents a 6.8% decrease in the number of cases reported and a decline of 7.6% in the case rate (Table 1).

Rates for the 50 states ranged from 25.4/100,000 in Hawaii to 2.0/100,000 in Wyoming. The rate increased in 13 states, remained unchanged in two, and decreased in 35 states and the District of Columbia (Figure 2). The rate among persons living in 56 cities of more than 250,000 population was 22.1/100,000—twice the national rate and 5.6% less than the rate for the same cities in 1981. Urban rates ranged from 61.4/100,000 in Miami, Florida, to 3.8/100,000 in Omaha, Nebraska. The rate increased in 21 of the country's 56 largest cities. Eight cities had rates at least three times the national rate: Miami, Florida; Newark, New

FIGURE 2. Tuberculosis case rates per 100,000 population, by state — United States, 1982



Tuberculosis — Continued

Jersey; San Francisco, California; Houston, Texas; Atlanta-Fulton County, Georgia; Washington, D.C.; Chicago, Illinois; and Honolulu, Hawaii.

Of the 25,520 TB cases reported in 1982, *Mycobacterium tuberculosis* was isolated in

TABLE 1. Tuberculosis cases and rates, by state — United States, 1982 and 1981

State	Tuberculosis cases		Case rate		Rank according to rate		Population July 1, 1982
	1982	1981	1982	1981	1982	1981	
United States	25,520	27,373	11.0	11.9	—§	—	231,534,000
Alabama	631	640	16.0	16.3	7	9	3,943,000
Alaska	96	83	21.9	20.1	2	1	438,000
Arizona	300	342	10.5	12.2	21	21	2,860,000
Arkansas	412	381	18.0	16.6	3	7	2,291,000
California	3,606	4,520	14.6	18.7	9	3	24,724,000
Colorado	113	122	3.7	4.1	41	44	3,045,000
Connecticut	155	171	4.9	5.5	36	34	3,153,000
Delaware	55	71	9.1	11.9	23	22	602,000
District of Columbia*	228	239	36.1	37.9	—	—	631,000
Florida	1,467	1,553	14.1	15.3	11	12	10,416,000
Georgia	830	928	14.7	16.6	8	6	5,639,000
Hawaii	252	197	25.4	20.1	1	2	994,000
Idaho	31	11	3.2	1.1	45	50	965,000
Illinois	1,653	1,528	14.4	13.3	10	15	11,448,000
Indiana	399	374	7.3	6.8	31	32	5,471,000
Iowa	73	88	2.5	3.0	47	47	2,905,000
Kansas	92	120	3.8	5.0	39	38	2,408,000
Kentucky	605	596	16.5	16.3	4	10	3,667,000
Louisiana	471	534	10.8	12.4	19	18	4,362,000
Maine	57	52	5.0	4.6	35	41	1,133,000
Maryland	540	621	12.7	14.6	16	13	4,265,000
Massachusetts	503	504	8.7	8.7	26	29	5,781,000
Michigan	864	931	9.5	10.1	22	24	9,109,000
Minnesota	157	188	3.8	4.6	40	40	4,133,000
Mississippi	333	401	13.1	15.8	14	11	2,551,000
Missouri	390	431	7.9	8.7	28	30	4,951,000
Montana	37	35	4.6	4.4	37	42	801,000
Nebraska	32	32	2.0	2.0	49	49	1,586,000
Nevada	67	45	7.6	5.3	29	35	881,000
New Hampshire	33	34	3.5	3.6	43	46	951,000
New Jersey	804	927	10.8	12.5	18	17	7,438,000
New Mexico	122	152	9.0	11.4	25	23	1,359,000
New York	2,268	2,223	12.8	12.6	15	16	17,659,000
North Carolina	806	981	13.4	16.5	12	8	6,019,000
North Dakota	16	31	2.4	4.7	48	39	670,000
Ohio	621	657	5.8	6.1	33	33	10,791,000
Oklahoma	335	381	10.5	12.3	20	20	3,177,000
Oregon	194	206	7.3	7.8	30	31	2,649,000
Pennsylvania	1,080	1,048	9.1	8.8	24	28	11,865,000
Rhode Island	34	49	3.5	5.1	42	37	958,000
South Carolina	513	541	16.0	17.1	6	4	3,203,000
South Dakota	36	66	5.2	9.6	34	25	691,000
Tennessee	747	778	16.1	16.9	5	5	4,651,000
Texas	2,045	2,015	13.4	13.6	13	14	15,280,000
Utah	51	64	3.3	4.2	44	43	1,554,000
Vermont	13	27	2.5	5.2	46	36	516,000
Virginia	672	670	12.2	12.3	17	19	5,491,000
Washington	301	401	7.1	9.5	32	26	4,245,000
West Virginia	162	181	8.3	9.3	27	27	1,948,000
Wisconsin	208	192	4.4	4.0	38	45	4,765,000
Wyoming	10	11	2.0	2.2	50	48	502,000
American Samoa†	4	6	12.1	18.1	—	—	33,100
Guam†	49	47	46.3	44.4	—	—	105,800
Northern Mariana Is.†	75	26	443.8	154.2	—	—	16,900
Puerto Rico†	473	553	14.8	17.3	—	—	3,196,500
Trust Terr. Pacific Is.†	209	86	178.6	73.5	—	—	117,000
U.S. Virgin Is.†	0	4	n.c.¶	3.3	—	—	125,000

*District of Columbia is not ranked with the states but is included in totals.
†Not included in totals.
§(—) Not ranked.
¶(n.c.) No cases.

Tuberculosis — Continued

19,050. The proportion of culture-positive cases increased from 70.5% of total cases in 1981 to 74.6% in 1982.

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

Editorial Note: From 1968 through 1978, the average annual decrease in TB cases in the United States was 5.6%. From 1979 through 1981, when there was a large influx of Southeast Asian refugees, the average annual decline was only 1.4%. The 6.8% decrease in the number of cases in 1982 may indicate that the previous downward trend has resumed. This may be explained in part by the smaller number of refugee arrivals in 1982. Another factor that may have influenced the reported morbidity figures for 1982 is the implementation of a new individual case-reporting system that requires more accurate verification of cases before they are counted. In January 1982, 20 additional areas began using the new system, which is being phased in over several years.

Despite the decline in the number of cases reported in 1982, TB persists as a public health problem. Transmission of infection continues, as evidenced by the continued occurrence of disease in young children. It is estimated that more than 10 million persons in this country are infected with tubercle bacilli. They have a lifelong risk of developing disease, unless given preventive treatment. Cases will continue to occur in this group for years to come, and additional cases will occur in new residents of this country who come from areas of the world where TB incidence and infection rates are much higher than in the United States.

State and local health departments are responsible for ensuring the control of TB at the community level. Currently, 40,000-45,000 persons on health department registers require treatment and follow-up for TB. Each year, over 200,000 persons exposed to new cases must be examined, and many of these should receive preventive treatment. TB control has been complicated by the global emergence of organisms resistant to antituberculosis drugs, and community outbreaks of drug-resistant disease continue to occur in the United States.

HHS Publication No. (CDC) 83-8017