CDC
CENTERS FOR DISEASE CONTROL

May 17, 1991 / Vol. 40 / No. 19

MMWR

MORBIDITY AND MORTALITY WEEKLY REPORT

Current Trends

Preliminary Analysis: HIV Serosurvey of Orthopedic Surgeons, 1991

Although occupational transmission of human immunodeficiency virus (HIV) and other bloodborne pathogens to health-care workers from patients has been well documented, data on HIV seroprevalence in health-care workers are limited. This report summarizes preliminary findings from a voluntary, anonymous HIV serosurvey among orthopedic surgeons, conducted by CDC in cooperation with the American Academy of Orthopaedic Surgeons (AAOS), at the AAOS annual meeting in Anaheim, California, during March 6–12, 1991.

All orthopedic surgeons registered for the meeting who were in postgraduate orthopedic surgical training programs, in practice, or retired from practice in the United States or Canada were invited to participate. Participants received pretest counseling, provided verbal informed consent, and completed an epidemiologic questionnaire to ascertain demographic and clinical practice characteristics, as well as the presence of nonoccupational risk factors for HIV infection.* Names or other personal identifiers were not collected. Blood specimens were screened for HIV antibody by enzyme immunoassay (EIA); specimens repeatedly reactive by EIA were evaluated by Western blot within 48 hours. HIV results and posttest counseling were provided anonymously to participants at the serosurvey site.

To assess the representativeness of serosurvey participants, characteristics of this group were compared with those of all orthopedic surgeons who had completed a questionnaire survey ("Orthopaedic Surgeon Survey") administered by AAOS in November 1990. This survey of demographic and clinical practice characteristics was

*Including receipt of blood transfusion during 1978–1985; receipt of clotting factor concentrate since 1977 for treatment of hemophilia or other coagulation disorder; male-male sexual contact at any time since 1977; intravenous-drug use since 1977; birth in Haiti or in central or east Africa; or sexual contact since 1977 with someone in one of the above groups. Participants were not asked which specific risk factor(s) applied to them.

HIV Serosurvey — Continued

mailed to the 20,625 orthopedic surgeons known to AAOS to be in training, in practice, or retired from practice in the United States and Canada; responses were received from 10,411 (50%) (AAOS, unpublished data).

Of 7121 orthopedists attending the AAOS annual meeting who were eligible for the serosurvey, 3420 (48%) participated. Based on the self-administered questionnaire, most participants were male (97%) and aged 30–54 years (75%). Compared with findings of the AAOS Orthopaedic Surgeon Survey, serosurvey participants were more likely to be in residency or fellowship training (18% vs. 14%); have trained or practiced in one or more geographic areas of high acquired immunodeficiency syndrome (AIDS) incidence[†] since 1977 (75% vs. 69%); have operated on one or more patients with known HIV infection (49% vs. 43%); have had a patient's blood contact their skin in the previous month (87% vs. 83%); and have sustained a percutaneous injury (e.g., needlestick or cut) from a sharp object contaminated with a patient's blood in the previous month (39% vs. 34%). Fifty-one percent of serosurvey participants had been tested previously for HIV.

Of the 3420 serosurvey participants, two were HIV seropositive (0.06%, upper limit 95% confidence interval [CI] = 0.18%). In addition, eight specimens were reactive by EIA but indeterminate by Western blot; based on further testing at CDC with investigational peptide EIAs and recombinant DNA antigen assays for HIV antibody, seven of the eight specimens were classified as HIV-antibody negative and one as indeterminate.

Each of the two HIV-seropositive participants reported nonoccupational risk factors for HIV infection; therefore, among the 108 surgeons reporting such risk factors, HIV seroprevalence was 1.9% (upper limit 95% CI = 5.7%). In comparison, of the 3267 participants not reporting nonoccupational HIV risk factors, none were HIV positive (upper limit 95% CI = 0.09%). Of the 45 participants who did not respond to the question on risk factors, none were HIV positive. The one surgeon whose serum tested indeterminate for HIV antibody did not report a nonoccupational risk.[§]

Both of the HIV-seropositive participants were male and reported having performed surgery on patients with risk factors for HIV infection. One of the two surgeons reported performing surgery on patients with known HIV infection or AIDS. Although they had both sustained percutaneous injuries in the previous year, neither reported an injury from a sharp object contaminated with the blood of a patient known to have HIV infection or AIDS. The surgeon with an indeterminate result, a man who had retired from clinical practice, reported never having operated on a patient with known HIV infection or AIDS or on a patient with risk factors for HIV infection or AIDS.

Although HIV testing of the serosurvey participants has been completed, testing for markers of hepatitis B and C virus infection is in progress. Additional analyses to assess representativeness of serosurvey participants and to characterize the nature and frequency of their occupational contact with blood are also under way.

Reported by: American Academy of Orthopaedic Surgeons Serosurvey Study Committee. AIDS Activity, Hospital Infections Program, and Laboratory Investigations Br, Div of HIV/AIDS, Center for Infectious Diseases, CDC.

[†]One of 26 U.S. metropolitan areas reporting the highest cumulative number of AIDS cases (*1*) or in Africa or the Caribbean.

[§]In general, among persons who are indeterminate for HIV antibody but without HIV risk factors, subsequent evaluation does not confirm HIV infection (*2,3*).

HIV Serosurvey — Continued

Editorial Note: The findings of this HIV serosurvey assist in evaluating the risk for occupationally acquired HIV infection in a subset of health-care workers with frequent occupational blood contact, including percutaneous injuries (*4–6*). Although these results may not be generalizable to all orthopedic surgeons, the findings do not indicate a high rate of previously undetected HIV infection among a large group of these surgeons, including those who trained or practiced in areas of high HIV/AIDS incidence.

This serosurvey has at least three limitations. First, orthopedic surgeons who attended the AAOS annual meeting and participated in this study may not have been representative of all orthopedic surgeons in the United States. However, preliminary analysis suggests that the likelihood of occupational HIV exposure was at least as high for serosurvey participants as for the more than 10,000 surgeons responding to the AAOS Orthopaedic Surgeon Survey. Second, HIV seroprevalence may have been underestimated if orthopedic surgeons who knew they were HIV positive declined to participate. Third, the reliance on self-reporting may have affected the accuracy of the data on nonoccupational risk factors for HIV infection.

The frequency of occupational blood contact and percutaneous injury reported by serosurvey participants and AAOS Orthopaedic Surgeon Survey respondents emphasizes the need for orthopedic surgeons and other health-care workers who are potentially exposed to blood and body fluids to continue to take appropriate precautions to prevent infection with HIV and other bloodborne pathogens. As previously recommended by CDC, such workers should receive hepatitis B vaccine, employ universal precautions, and receive appropriate counseling and follow-up after occupational exposure to HIV or hepatitis B virus (*7–10*). AAOS has developed additional recommendations for the prevention of HIV transmission during orthopedic surgery (*11–13*); copies are available from AAOS, 222 South Prospect Avenue, Park Ridge, IL 60068.

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HIV Serosurvey — Continued

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Topics in Minority Health

Pedestrian Fatalities — New Mexico, 1958–1987

Pedestrian fatalities constitute approximately one seventh of all traffic-related deaths in the United States (*1*). In addition to the disproportionate numbers of pedestrian fatalities that occur among children and the elderly, minority populations are at increased risk for pedestrian deaths (*2–4*). In New Mexico, approximately half the population are minority persons—primarily Hispanics and American Indians. Injury fatality rates for these groups are substantially higher than national rates, especially for the state's American Indians (*4,5*). This report summarizes an analysis by the University of New Mexico School of Medicine of pedestrian fatalities among New Mexico's American Indians, Hispanics, and non-Hispanic whites.

Vital records data on pedestrian fatalities for 1958–1987 were analyzed by major ethnic population, by gender, and by 5-year period. Pedestrian deaths included cases that met the *International Classification of Diseases* definitions (*6–8*) for motor vehicle traffic-related*, motor vehicle nontraffic-related, train-related, and other road vehicle-related pedestrian deaths. Ethnic classification was determined by the state's Bureau of Vital Statistics based on information from death certificates. Denominators for rate calculations were obtained from U.S. census data from 1960, 1970, and 1980; age-adjusted rates were standardized to the 1970 U.S. population.

During the 30-year period, substantial ethnic and gender differences in pedestrian fatality rates occurred among New Mexico's three predominant ethnic populations (Table 1). For all periods, overall rates were higher for males than for females and higher for American Indians than for other ethnic groups. Most (87.4%) of the pedestrian fatalities were attributed to motor vehicle traffic; 7.7% were motor vehicle nontraffic-related; 4.6% were train-related; and 0.3% were related to other road vehicles, such as horse-drawn wagons. Age-specific data for 1983–1987 indicate these pedestrian fatality rates were highest for American Indian men aged 35–44 years and, for each age group, greater for American Indian males than for other males (Figure 1).

Reported by: C Peek, CL Wiggins, TM Becker, MD, Univ of New Mexico School of Medicine, Albuquerque; A Ortiz, Bur of Vital Statistics, New Mexico Health Dept. Div of Injury Control, Center for Environmental Health and Injury Control, CDC.

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*A traffic-related injury was defined as an injury occurring on a roadway customarily open to the public.

Pedestrian Fatalities — Continued

Editorial Note: In New Mexico and nationwide, the injury burden is disproportionately greater for racial/ethnic minority groups (*2–5*). In New Mexico, for most American Indians and for a substantial percentage of Hispanics, the pedestrian fatality rates are higher because of rural residence (*9*), limited immediate access to emergency transportation, and exposure to roadways without designated pedestrian areas (*10*). In addition, pedestrians who are injured in rural locations are often struck at higher impact speeds, increasing the likelihood of death (*2*).

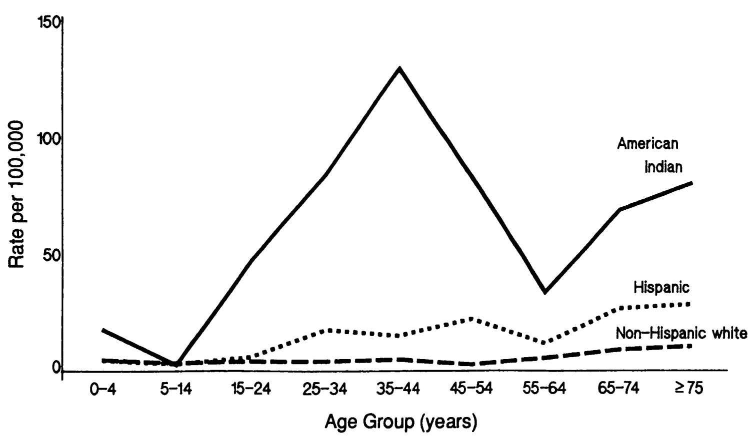
The vital statistics sources used for this assessment did not permit an examination of the role of alcohol-related injuries in New Mexico. However, for the United States in 1989, 32.7% of fatal pedestrian crashes involved pedestrians who were classified as legally intoxicated (blood alcohol concentration ≥0.1 g/dL) (*1*).

TABLE 1. Age-adjusted pedestrian fatality rates* for American Indians, Hispanics, and non-Hispanic whites, by 5-year period — New Mexico, 1958–1987

	5-Year period											
	1958–1962		1963–1967		1968–1972		1973–1977		1978–1982		1983–1987	
Category	No. cases	Rate	No. cases	Rate	No. cases	Rate	No. cases	Rate	No. cases	Rate	No. cases	Rate
Males												
American Indian	55	45.4	77	57.1	117	82.2	157	90.6	153	72.2	137	55.3
Hispanic	113	16.3	125	16.9	131	17.0	138	14.8	155	15.0	144	12.4
Other white	68	5.6	74	6.0	61	4.8	98	6.6	93	5.4	94	4.9
Females												
American Indian	16	13.1	29	19.5	30	18.2	38	16.4	53	21.5	33	12.2
Hispanic	36	3.9	32	3.6	34	4.2	44	4.4	39	3.4	48	3.9
Other white	30	2.3	21	1.6	34	2.5	42	2.8	34	1.9	46	2.3

*Per 100,000 persons, age-adjusted to the 1970 U.S. population.

FIGURE 1. Age-specific pedestrian fatality rates for males, by age group and race/ethnicity — New Mexico, 1983–1987



Pedestrian Fatalities — Continued

Other potential limitations in this assessment include: 1) ethnic misclassification (although this source of bias appears to be minimal in New Mexico [*11*]); 2) errors in assignment of pedestrian-associated deaths to other causes (i.e., late medical complications that could occur in the hospital as sequelae to the initial injury event); and 3) lack of information on road conditions, time of day of the incident, and other specific data that might indicate additional risks for pedestrians.

The findings in this analysis underscore the need for education and public health prevention strategies in New Mexico and other states to focus on minority populations. In addition, to plan effective interventions, reliable race/ethnicity data are needed to elucidate the role of risk factors, such as alcohol use, for motor vehicle-related injuries among minority populations. Because the injury burden in the United States disproportionately affects persons of lower socioeconomic status and because persons of lower socioeconomic status are disproportionately represented in minority groups, data systems used for injury surveillance and for targeting prevention efforts should include elements for race/ethnicity.

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Current Trends

Primary and Secondary Syphilis — United States, 1981–1990

Since 1985, the number of primary and secondary (P&S) syphilis cases reported in the United States has been increasing. In 1990, 50,223 cases were reported, a 9% increase from 1989. The incidence of 20 cases per 100,000 persons, a 75% increase from 1985, is the highest since 1949. This report summarizes the incidence of P&S syphilis during 1990 and provides comparison data from 1981–1990.

From 1985 through 1990, P&S syphilis rates for black men increased from 69 to 156 per 100,000 (126%), and for black women, from 35 to 116 per 100,000 (231%) (Figure 1). For non-Hispanic white men, the rate declined from 6 to 3 per 100,000.

Primary and Secondary Syphilis — Continued

Rates for American Indian/Alaskan Native men were higher than rates for white men, peaking at 21 per 100,000 in 1983 and decreasing to 9 per 100,000 in 1990. Although rates for American Indian/Alaskan Native women decreased, they were based on fewer than 100 cases per year.

In 1990, P&S syphilis rates were >7 per 100,000 persons in 26 states (Figure 2, page 321). From 1985 through 1990, rates increased in 25 of these 26 states; since 1989, rates have increased more than 40% in seven southern states: Alabama (55%), Arkansas (65%), Louisiana (67%), Mississippi (59%), North Carolina (45%), Tennessee (46%), and Virginia (47%) (Figure 3, page 321).

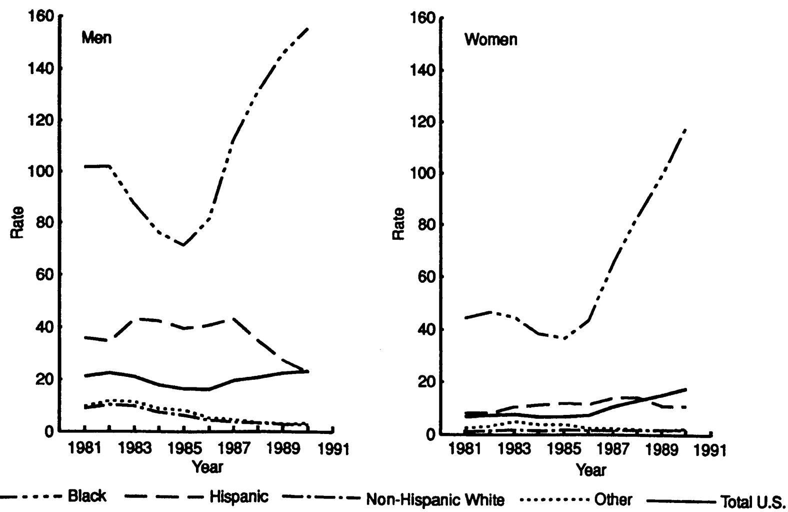
For most of the United States, the highest rates of P&S syphilis occurred in urban areas. In 1990, large cities with rates >100 per 100,000 persons were Atlanta (222 cases per 100,000 persons), Washington, D.C. (183), New Orleans (174), Newark (160), Memphis (158), Philadelphia (147), and Charlotte, North Carolina (102) (Table 1, page 322). Although rates continued to increase in several cities involved early (before 1988) in the epidemic, the largest increases from 1989 to 1990 occurred in areas not previously affected, including several cities in the midwest—Cincinnati (107%), Cleveland (235%), Columbus (293%), and Toledo (278%), Ohio; Milwaukee (153%), Wisconsin; and St. Louis (172%), Missouri.

In some cities where the incidence increased early in the epidemic, rates have begun to decline. For example, in New York City the rate in 1990 declined 15% after a peak of 68 per 100,000 in 1988. Similar declines occurred in Portland (65%), Miami (51%), and San Diego (10%) following peak rates in 1988. From 1987 through 1990, P&S syphilis rates in Los Angeles decreased 56%, from 52 to 23 per 100,000.

Through 1988, the epidemic affected population centers primarily on the east, west, and gulf coasts. From 1989 to 1990, rates declined in several of these areas, while in the midwest and south-central region rates increased (Figure 3).

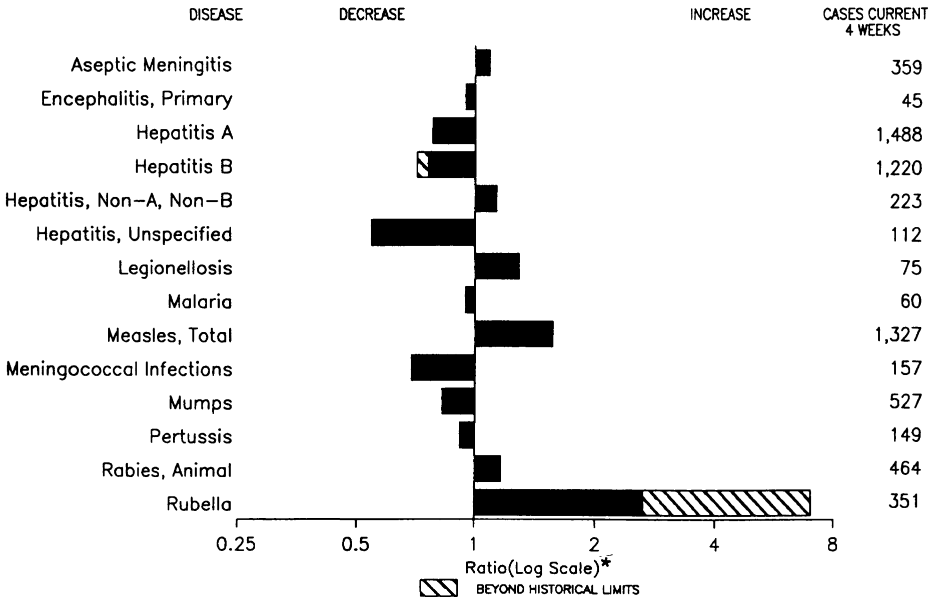
(Continued on page 321)

FIGURE 1. Trends in race- and gender-specific incidence rates* of primary and secondary syphilis — United States, 1981–1990



*Per 100,000 population.

FIGURE I. Notifiable disease reports, comparison of 4-week totals ending May 11, 1991, with historical data — United States



*Ratio of current 4-week total to the mean of 15 4-week totals (from previous, comparable, and subsequent 4-week periods for the past 5 years). The point where the hatched area begins is based on the mean and two standard deviations of these 4-week totals.

TABLE I. Summary — cases of specified notifiable diseases, United States, cumulative, week ending May 11, 1991 (19th Week)

	Cum. 1991		Cum. 1991
AIDS	14,729	Measles: imported	61
Anthrax	-	indigenous	4,317
Botulism: Foodborne	6	Plague	-
Infant	18	Poliomyelitis, Paralytic*	-
Other	4	Psittacosis	38
Brucellosis	18	Rabies, human	-
Cholera	8	Syphilis, primary & secondary	15,399
Congenital rubella syndrome	10	Syphilis, congenital, age < 1 year	11
Diphtheria	1	Tetanus	10
Encephalitis, post-infectious	27	Toxic shock syndrome	128
Gonorrhea	204,249	Trichinosis	8
Haemophilus influenzae (invasive disease)	1,352	Tuberculosis	7,170
Hansen Disease	38	Tularemia	24
Leptospirosis	26	Typhoid fever	108
Lyme Disease	1,421	Typhus fever, tickborne (RMSF)	29

*No cases of suspected poliomyelitis have been reported in 1991; none of the 6 suspected cases in 1990 have been confirmed to date. Five of the 13 suspected cases in 1989 were confirmed and all were vaccine associated.

TABLE II. Cases of selected notifiable diseases, United States, weeks ending May 11, 1991, and May 12, 1990 (19th Week)

Reporting Area	AIDS	Aseptic Meningitis	Encephalitis		Gonorrhea		Hepatitis (Viral), by type				Legionellosis	Lyme Disease
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1990	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991
UNITED STATES	14,729	1,798	210	27	204,249	248,553	9,141	5,861	1,081	521	405	1,421
NEW ENGLAND	649	88	11	-	5,320	6,648	207	307	41	13	32	57
Maine	22	4	3	-	44	99	6	8	2	-	-	-
N.H.	16	7	-	-	128	84	17	9	4	-	1	4
Vt.	8	18	1	-	16	25	9	3	3	-	-	1
Mass.	348	28	5	-	2,182	2,576	114	239	25	11	29	36
R.I.	31	24	-	-	424	385	32	13	5	2	2	15
Conn.	224	7	2	-	2,526	3,479	29	35	2	-	-	1
MID. ATLANTIC	3,991	212	18	7	24,564	34,472	679	485	101	12	116	1,066
Upstate N.Y.	591	114	8	5	4,488	4,964	417	225	62	6	41	849
N.Y. City	2,051	9	-	-	8,935	14,801	25	6	-	-	3	-
N.J.	929	-	-	-	3,873	5,676	113	129	20	-	15	217
Pa.	420	89	10	2	7,268	9,031	124	125	19	6	57	-
E.N. CENTRAL	1,060	313	54	6	38,531	47,519	1,028	711	142	24	76	68
Ohio	244	104	15	2	12,084	14,378	165	179	76	10	42	41
Ind.	87	38	6	1	3,972	3,697	160	83	1	1	6	-
Ill.	450	57	11	3	11,437	14,776	411	89	16	1	2	-
Mich.	197	104	20	-	9,044	11,486	140	228	41	12	19	27
Wis.	82	10	2	-	1,994	3,182	152	132	8	-	7	-
W.N. CENTRAL	437	131	10	3	10,199	12,877	1,047	245	128	12	18	9
Minn.	92	25	5	-	1,029	1,638	142	24	10	2	4	2
Iowa	32	29	-	1	680	967	25	16	6	2	2	5
Mo.	242	53	3	2	6,291	7,552	249	166	108	5	6	-
N. Dak.	4	-	-	-	23	58	22	3	2	1	-	-
S. Dak.	1	4	2	-	134	76	432	2	-	-	3	-
Nebr.	28	7	-	-	668	625	143	17	1	-	3	-
Kans.	38	13	-	-	1,374	1,961	34	17	1	2	-	2
S. ATLANTIC	3,373	449	39	9	61,424	69,490	648	1,301	164	111	66	69
Del.	27	8	1	-	846	1,140	6	21	3	2	-	12
Md.	354	50	4	-	6,318	6,897	130	178	31	6	16	30
D.C.	240	12	-	-	3,746	4,309	39	44	1	1	-	-
Va.	287	78	10	-	5,876	6,482	71	86	9	82	4	10
W. Va.	12	2	1	-	443	495	9	28	1	4	-	3
N.C.	160	44	14	-	11,462	11,505	78	226	71	-	9	8
S.C.	106	12	-	-	4,632	5,829	20	303	16	2	7	1
Ga.	476	38	6	1	15,772	15,469	67	162	11	-	7	2
Fla.	1,711	205	3	8	12,329	17,364	228	253	21	14	23	3
E.S. CENTRAL	389	103	10	-	18,488	20,613	83	496	139	3	25	43
Ky.	63	23	2	-	1,843	2,409	10	68	5	2	13	14
Tenn.	114	26	4	-	7,154	6,859	53	369	128	-	6	22
Ala.	128	37	4	-	4,604	6,568	19	56	6	1	6	7
Miss.	84	17	-	-	4,887	4,777	1	3	-	-	-	-
W.S. CENTRAL	1,346	153	17	1	23,015	26,010	1,305	646	31	77	16	28
Ark.	57	27	2	-	2,420	3,375	126	43	1	2	2	9
La.	260	24	4	-	5,400	4,818	58	90	1	3	5	-
Okla.	71	1	3	-	2,343	2,308	131	91	15	8	4	18
Tex.	958	101	8	1	12,852	15,509	988	422	14	64	5	1
MOUNTAIN	391	67	10	1	4,137	5,288	1,580	371	55	77	30	4
Mont.	10	2	-	-	34	61	53	31	3	4	1	-
Idaho	8	-	-	-	63	39	30	31	-	-	2	-
Wyo.	6	-	-	-	43	73	75	5	-	-	-	3
Colo.	157	21	2	1	1,096	1,457	200	55	15	11	6	-
N. Mex.	38	8	-	-	394	452	490	76	7	25	1	-
Ariz.	74	18	8	-	1,579	2,033	476	76	8	31	10	-
Utah	19	8	-	-	129	163	118	18	10	6	4	-
Nev.	79	10	-	-	799	1,010	138	79	12	-	6	1
PACIFIC	3,093	282	41	-	18,571	25,636	2,564	1,299	280	192	26	77
Wash.	182	-	4	-	1,612	2,416	244	190	65	9	1	-
Oreg.	80	-	-	-	733	901	145	127	47	4	1	-
Calif.	2,758	255	35	-	15,712	21,674	2,094	947	157	178	23	77
Alaska	8	8	2	-	273	458	69	11	9	1	-	-
Hawaii	65	19	-	-	241	187	12	24	2	-	1	-
Guam	1	-	-	-	-	96	-	-	-	-	-	-
P.R.	490	103	-	1	238	347	44	156	49	21	-	-
V.I.	3	-	-	-	222	169	-	4	-	-	-	-
Amer. Samoa	-	-	-	-	-	43	-	-	-	-	-	-
C.N.M.I.	-	-	-	-	-	83	-	-	-	-	-	-

N: Not notifiable U: Unavailable C.N.M.I.: Commonwealth of the Northern Mariana Islands

TABLE II.(Cont'd.) Cases of selected notifiable diseases, United States, weeks ending May 11, 1991, and May 12, 1990 (19th Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1991	1991	Cum. 1991	1991	Cum. 1991	Cum. 1990	Cum. 1991	1991	Cum. 1991	1991	Cum. 1991	Cum. 1990	1991	Cum. 1991	Cum. 1990
UNITED STATES	333	183	4,317	8	61	8,377	905	142	1,796	30	750	1,103	15	568	322
NEW ENGLAND	26	2	16	-	4	138	64	-	11	3	106	134	-	1	4
Maine	1	-	-	-	-	27	4	-	-	-	12	4	-	-	-
N.H.	2	-	-	-	-	8	6	-	3	-	12	10	-	1	1
Vt.	1	-	5	-	-	1	10	-	-	-	3	5	-	-	-
Mass.	14	-	5	-	2	5	34	-	-	3	71	106	-	-	-
R.I.	5	-	-	-	-	30	-	-	2	-	-	-	-	-	1
Conn.	3	2	6	-	2	67	10	-	6	-	8	9	-	-	2
MID. ATLANTIC	36	111	2,551	-	2	714	94	6	154	1	75	280	4	191	2
Upstate N.Y.	11	-	1	-	-	258	53	1	57	1	48	224	2	175	1
N.Y. City	3	100	1,000	-	-	93	2	-	-	-	-	-	-	-	-
N.J.	17	-	252	-	1	83	16	-	48	-	1	14	-	-	-
Pa.	5	11	1,298	-	1	280	23	5	49	-	26	42	2	16	1
E.N. CENTRAL	25	8	59	1	5	2,725	126	2	163	1	143	268	-	162	16
Ohio	6	-	-	-	1	210	42	-	32	-	65	48	-	147	-
Ind.	1	-	-	1†	1	311	8	-	5	1	28	38	-	1	-
Ill.	9	-	24	-	-	1,129	40	-	70	-	23	99	-	3	14
Mich.	8	8	33	-	-	357	28	2	49	-	19	33	-	11	-
Wis.	1	-	2	-	3	718	8	-	7	-	8	50	-	-	2
W.N. CENTRAL	13	-	18	-	2	356	49	-	61	-	51	32	-	8	1
Minn.	3	-	3	-	2	118	10	-	5	-	16	-	-	4	-
Iowa	3	-	15	-	-	21	3	-	13	-	4	4	-	3	-
Mo.	4	-	-	-	-	60	21	-	16	-	19	22	-	1	-
N. Dak.	1	-	-	-	-	-	1	-	-	-	1	1	-	-	1
S. Dak.	-	-	-	-	-	15	1	-	-	-	1	1	-	-	-
Nebr.	-	-	-	-	-	97	3	-	3	-	4	1	-	-	-
Kans.	2	-	-	-	-	45	10	-	24	-	6	3	-	-	-
S. ATLANTIC	72	3	270	-	9	510	167	71	660	15	53	100	-	11	12
Del.	1	1	20	-	-	9	1	1	3	-	-	2	-	-	-
Md.	25	-	115	-	-	65	19	9	138	-	7	25	-	8	1
D.C.	4	-	-	-	-	8	-	-	17	-	-	13	-	1	1
Va.	10	-	18	-	3	49	13	2	25	4	9	9	-	-	-
W. Va.	1	-	-	-	-	6	5	1	12	-	6	9	-	-	-
N.C.	2	-	1	-	-	4	40	30	116	-	7	18	-	-	-
S.C.	5	-	12	-	-	3	22	19	198	-	-	4	-	-	-
Ga.	8	-	-	-	-	18	35	7	19	10	16	13	-	-	-
Fla.	16	2	104	-	6	348	32	2	132	1	8	7	-	2	10
E.S. CENTRAL	4	-	4	-	-	63	63	1	94	-	21	38	-	80	1
Ky.	1	-	-	-	-	3	26	-	-	-	-	-	-	-	-
Tenn.	1	-	4	-	-	27	17	-	77	-	10	16	-	80	1
Ala.	2	-	-	-	-	8	20	1	4	-	11	20	-	-	-
Miss.	-	-	-	-	-	25	-	-	13	-	-	2	-	-	-
W.S. CENTRAL	20	12	12	5	10	1,145	68	14	212	1	18	17	-	1	1
Ark.	1	-	-	-	5	11	13	-	35	-	-	1	-	1	1
La.	4	-	-	-	-	10	16	-	12	1	8	2	-	-	-
Okla.	1	-	-	-	-	132	8	-	6	-	10	14	-	-	-
Tex.	14	12	12	5†	5	992	31	14	159	-	-	-	-	-	-
MOUNTAIN	12	13	287	1	12	418	39	24	117	5	108	92	-	1	24
Mont.	1	-	-	-	-	1	5	-	-	-	-	3	-	-	13
Idaho	1	-	-	-	2	20	7	-	5	-	18	12	-	-	7
Wyo.	-	-	-	-	-	7	1	-	3	-	3	-	-	-	-
Colo.	3	-	1	-	1	59	8	24	49	3	53	49	-	-	3
N. Mex.	1	3	87	1§	5	76	5	N	N	1	15	6	-	-	-
Ariz.	5	3	180	-	-	134	9	-	42	-	8	13	-	-	-
Utah	1	4	6	-	4	2	-	-	11	-	10	5	-	-	-
Nev.	-	3	13	-	-	119	4	-	7	1	1	4	-	1	1
PACIFIC	125	34	1,100	1	17	2,308	235	24	324	4	175	142	11	113	261
Wash.	9	-	1	-	3	156	31	8	81	-	48	32	-	-	-
Oreg.	3	-	15	1§	6	138	27	N	N	-	28	15	-	-	-
Calif.	109	34	1,082	-	7	1,933	170	16	226	2	68	79	11	111	255
Alaska	-	-	-	-	1	78	6	-	7	1	5	-	-	-	-
Hawaii	4	-	2	-	-	3	1	-	10	1	26	16	-	2	6
Guam	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-
P.R.	1	12	38	-	1	808	15	-	8	1	13	4	-	1	-
V.I.	-	U	-	U	-	2	-	U	5	U	-	-	U	-	-
Amer. Samoa	-	U	-	U	-	-	-	U	-	U	-	-	U	-	-
C.N.M.I.	-	U	-	U	-	-	-	U	-	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 II.(Cont'd.) Cases of selected notifiable diseases, United States, weeks ending May 11, 1991, and May 12, 1990 (19th Week)

Reporting Area	Syphilis (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1991	Cum. 1990	Cum. 1991	Cum. 1991	Cum. 1990	Cum. 1991	Cum. 1991	Cum. 1991	Cum. 1991
UNITED STATES	15,399	17,788	128	7,170	7,797	24	108	29	1,899
NEW ENGLAND	419	708	6	185	184	-	9	1	5
Maine	-	5	3	-	-	-	1	-	-
N.H.	10	34	1	-	3	-	-	-	1
Vt.	1	1	-	1	2	-	-	-	-
Mass.	209	254	2	100	101	-	8	1	-
R.I.	16	2	-	20	29	-	-	-	-
Conn.	183	412	-	64	49	-	-	-	4
MID. ATLANTIC	2,681	3,849	20	1,644	1,914	-	15	-	564
Upstate N.Y.	103	275	11	111	185	-	5	-	214
N.Y. City	1,292	1,824	-	999	1,134	-	2	-	-
N.J.	580	568	-	309	323	-	6	-	250
Pa.	706	1,182	9	225	272	-	2	-	100
E.N. CENTRAL	1,692	1,207	25	804	711	1	11	-	29
Ohio	222	184	16	111	95	-	2	-	4
Ind.	47	11	-	50	45	-	-	-	-
Ill.	822	462	4	440	373	-	3	-	6
Mich.	425	395	5	167	168	1	5	-	3
Wis.	176	155	-	36	30	-	1	-	16
W.N. CENTRAL	263	158	26	194	178	5	2	2	272
Minn.	27	38	7	35	31	-	2	-	94
Iowa	23	18	5	29	21	-	-	-	51
Mo.	170	76	6	87	83	5	-	2	6
N. Dak.	-	1	-	2	9	-	-	-	25
S. Dak.	1	1	1	13	4	-	-	-	70
Nebr.	7	4	1	8	11	-	-	-	8
Kans.	35	20	6	20	19	-	-	-	18
S. ATLANTIC	4,711	5,517	12	1,306	1,422	2	21	18	479
Del.	57	72	1	12	16	-	-	-	60
Md.	385	428	-	118	122	-	5	1	170
D.C.	303	334	-	77	51	-	1	-	5
Va.	402	305	3	111	123	-	4	-	99
W. Va.	11	6	-	34	25	-	1	-	25
N.C.	701	654	6	144	177	1	-	13	-
S.C.	562	308	-	148	163	-	-	2	37
Ga.	1,135	1,266	-	253	215	-	4	2	71
Fla.	1,155	2,144	2	409	530	1	6	-	12
E.S. CENTRAL	1,607	1,526	6	388	616	2	-	3	62
Ky.	32	26	3	103	147	1	-	1	17
Tenn.	586	634	3	42	178	1	-	-	18
Ala.	576	464	-	127	192	-	-	2	27
Miss.	413	402	-	116	99	-	-	-	-
W.S. CENTRAL	2,726	2,861	4	748	922	9	5	5	275
Ark.	194	179	2	68	91	4	-	-	14
La.	872	876	-	68	129	-	1	-	3
Okla.	57	90	2	42	75	5	-	5	82
Tex.	1,603	1,716	-	570	627	-	4	-	176
MOUNTAIN	218	327	14	193	148	4	4	-	61
Mont.	1	-	-	-	10	3	-	-	11
Idaho	3	5	-	2	3	-	-	-	1
Wyo.	1	1	-	2	1	1	-	-	36
Colo.	25	25	2	6	6	-	-	-	-
N. Mex.	13	18	5	9	31	-	-	-	1
Ariz.	155	228	3	120	67	-	3	-	11
Utah	4	3	4	25	10	-	-	-	-
Nev.	16	47	-	29	20	-	1	-	1
PACIFIC	1,082	1,635	15	1,708	1,702	1	41	-	152
Wash.	54	180	1	116	106	1	-	-	-
Oreg.	28	49	-	35	51	-	2	-	1
Calif.	993	1,388	14	1,467	1,447	-	38	-	147
Alaska	3	6	-	20	20	-	-	-	3
Hawaii	4	12	-	70	78	-	1	-	1
Guam	-	1	-	-	15	-	-	-	-
P.R.	170	150	-	71	29	-	3	-	15
V.I.	74	1	-	1	3	-	-	-	-
Amer. Samoa	-	-	-	-	11	-	-	-	-
C.N.M.I.	-	-	-	-	21	-	-	-	-

U: Unavailable

TABLE III. Deaths in 121 U.S. cities,* week ending May 11, 1991 (19th Week)

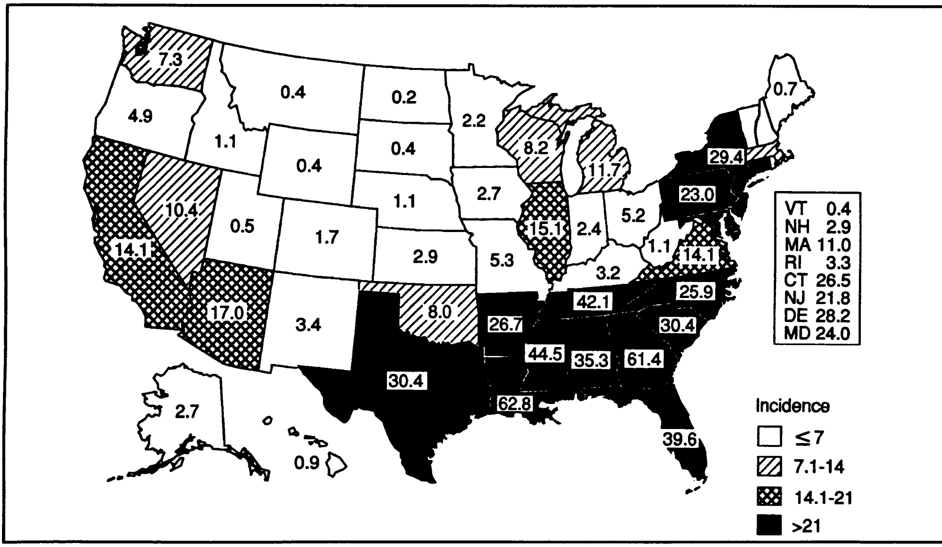
Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	≥65	45-64	25-44	1-24	<1	Total
NEW ENGLAND	594	426	105	38	15	10	38
Boston, Mass.	132	85	28	8	6	5	12
Bridgeport, Conn.	36	31	4	1	-	-	3
Cambridge, Mass.	26	20	3	2	1	-	3
Fall River, Mass.	24	20	3	1	-	-	-
Hartford, Conn.	56	36	12	5	2	1	1
Lowell, Mass.	31	22	6	-	1	2	1
Lynn, Mass.	21	17	4	-	-	-	-
New Bedford, Mass.	25	22	3	-	-	-	-
New Haven, Conn.	48	32	9	6	1	-	3
Providence, R.I.	62	38	16	7	1	-	5
Somerville, Mass.	5	3	-	2	-	-	-
Springfield, Mass.	39	31	5	2	-	1	3
Waterbury, Conn.	33	23	8	1	1	-	3
Worcester, Mass.	56	46	4	3	2	1	4
MID. ATLANTIC	2,639	1,689	507	299	64	80	160
Albany, N.Y.	50	42	4	2	1	1	7
Allentown, Pa.	25	17	8	-	-	-	-
Buffalo, N.Y.	139	100	27	8	2	2	8
Camden, N.J.	40	20	5	10	3	2	3
Elizabeth, N.J.	31	20	5	6	-	-	-
Erie, Pa.†	34	20	12	-	1	1	3
Jersey City, N.J.	26	17	5	3	1	-	1
New York City, N.Y.	1,337	810	269	188	27	43	69
Newark, N.J.	84	38	14	21	3	8	12
Paterson, N.J.	42	31	5	6	-	-	2
Philadelphia, Pa.	395	253	71	36	20	15	21
Pittsburgh, Pa.†	83	52	20	4	4	3	5
Reading, Pa.	39	29	8	2	-	-	5
Rochester, N.Y.	100	78	16	4	-	2	9
Schenectady, N.Y.	33	27	5	1	-	-	1
Scranton, Pa.†	35	27	3	3	1	1	2
Syracuse, N.Y.	84	61	19	2	1	1	8
Trenton, N.J.	23	16	5	1	-	1	1
Utica, N.Y.	15	11	4	-	-	-	1
Yonkers, N.Y.	24	20	2	2	-	-	2
E.N. CENTRAL	2,179	1,334	443	207	124	71	96
Akron, Ohio	75	52	19	3	1	-	-
Canton, Ohio	36	26	4	1	1	4	4
Chicago, Ill.	500	197	121	93	71	18	19
Cincinnati, Ohio	115	84	23	6	2	-	10
Cleveland, Ohio	151	89	37	16	7	2	3
Columbus, Ohio	193	119	43	17	9	5	2
Dayton, Ohio	91	65	19	3	2	2	4
Detroit, Mich.	205	120	37	22	11	15	6
Evansville, Ind.	44	35	6	2	1	-	2
Fort Wayne, Ind.	57	41	11	2	3	-	3
Gary, Ind.	8	4	2	-	1	1	-
Grand Rapids, Mich.	57	41	12	2	-	2	3
Indianapolis, Ind.	171	113	34	11	4	9	6
Madison, Wis.	49	33	7	6	1	2	4
Milwaukee, Wis.	140	104	22	7	1	6	15
Peoria, Ill.	32	24	5	1	1	1	3
Rockford, Ill.	54	43	8	2	1	-	1
South Bend, Ind.	36	26	6	1	2	1	1
Toledo, Ohio	96	71	18	4	2	1	9
Youngstown, Ohio	69	47	9	8	3	2	1
W.N. CENTRAL	730	516	132	43	18	21	21
Des Moines, Iowa	68	47	12	2	2	5	3
Duluth, Minn.	25	20	3	1	-	1	1
Kansas City, Kans.	18	13	2	2	1	-	1
Kansas City, Mo.	123	81	29	7	4	2	4
Lincoln, Nebr.	13	9	4	-	-	-	-
Minneapolis, Minn.	153	113	24	13	2	1	2
Omaha, Nebr.	88	60	19	3	1	5	2
St. Louis, Mo.	114	80	18	9	2	5	2
St. Paul, Minn.	68	52	10	3	2	1	5
S. ATLANTIC	1,181	716	255	124	43	42	60
Atlanta, Ga.	159	83	38	22	9	7	9
Baltimore, Md.	160	110	33	10	3	4	9
Charlotte, N.C.	79	42	20	10	4	3	1
Jacksonville, Fla.	123	86	17	10	7	2	10
Miami, Fla.	105	57	30	18	-	-	-
Norfolk, Va.	54	35	12	4	2	1	2
Richmond, Va.	79	48	19	7	4	1	4
Savannah, Ga.	50	35	10	4	1	-	7
St. Petersburg, Fla.	83	62	14	4	1	2	2
Tampa, Fla.	129	85	32	6	4	2	14
Washington, D.C.	143	61	26	29	8	19	2
Wilmington, Del.	17	12	4	-	-	1	-
E.S. CENTRAL	769	489	159	76	30	14	52
Birmingham, Ala.	129	64	23	25	13	4	8
Chattanooga, Tenn.	49	36	8	2	2	1	1
Knoxville, Tenn.	94	55	31	6	-	2	6
Louisville, Ky.	108	73	19	10	2	4	5
Memphis, Tenn.	202	131	45	20	6	-	15
Mobile, Ala.	92	64	17	7	2	1	9
Montgomery, Ala.§	U	U	U	U	U	U	U
Nashville, Tenn.	95	66	16	6	5	2	8
W.S. CENTRAL	1,396	867	291	152	57	28	91
Austin, Tex.	60	36	18	3	3	-	6
Baton Rouge, La.	35	25	6	3	1	-	4
Corpus Christi, Tex.	50	35	8	3	3	1	2
Dallas, Tex.	186	113	36	24	8	5	9
El Paso, Tex.	77	49	14	5	6	3	4
Ft. Worth, Tex.	78	50	16	8	2	2	4
Houston, Tex.	420	224	100	63	24	8	33
Little Rock, Ark.	55	37	10	3	2	3	3
New Orleans, La.	99	61	21	14	1	2	-
San Antonio, Tex.	167	116	31	16	2	2	11
Shreveport, La.	79	55	19	2	2	1	12
Tulsa, Okla.	90	66	12	8	3	1	3
MOUNTAIN	750	490	159	65	22	14	45
Albuquerque, N.M.	84	56	13	13	1	1	3
Colo. Springs, Colo.	45	31	9	4	1	-	4
Denver, Colo.	113	70	25	10	4	4	13
Las Vegas, Nev.	110	69	28	7	4	2	3
Ogden, Utah	22	12	7	2	-	1	1
Phoenix, Ariz.	187	114	47	15	8	3	2
Pueblo, Colo.	34	24	3	6	1	-	6
Salt Lake City, Utah	33	21	8	2	1	1	3
Tucson, Ariz.	122	93	19	6	2	2	10
PACIFIC	1,997	1,289	362	219	68	47	137
Berkeley, Calif.	18	14	3	1	-	-	2
Fresno, Calif.	138	84	28	14	3	9	10
Glendale, Calif.	29	21	2	4	2	-	2
Honolulu, Hawaii	73	48	10	10	3	2	4
Long Beach, Calif.	75	52	13	7	3	-	11
Los Angeles, Calif.	542	331	99	69	28	5	15
Oakland, Calif.§	U	U	U	U	U	U	U
Pasadena, Calif.	33	25	4	4	-	-	3
Portland, Oreg.	142	104	22	7	5	3	10
Sacramento, Calif.	177	110	45	16	2	4	26
San Diego, Calif.	154	100	25	16	7	5	17
San Francisco, Calif.	159	86	34	34	2	3	6
San Jose, Calif.	147	103	19	12	3	10	15
Seattle, Wash.	158	103	29	17	7	2	4
Spokane, Wash.	66	45	15	2	-	4	9
Tacoma, Wash.	86	63	14	6	3	-	3
TOTAL	12,235††	7,816	2,413	1,223	441	327	700

*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.
§Report for this week is unavailable (U).

Primary and Secondary Syphilis — Continued

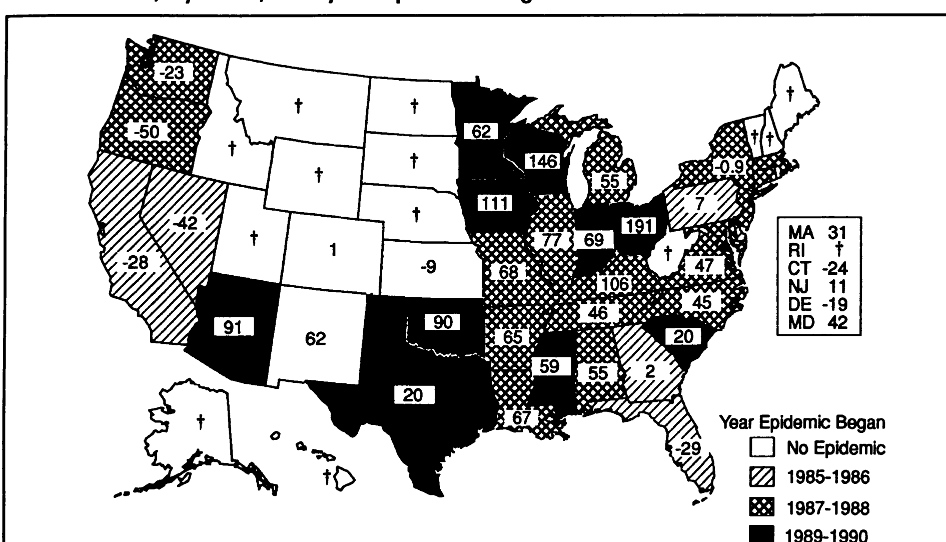
Reported by: Participating city and state health depts and STD control programs. Surveillance and Information Systems Br, Clinical Research Br, Div of STD/HIV Prevention, Center for Prevention Svcs, CDC.

FIGURE 2. Incidence rates* of primary and secondary syphilis, by state — United States, 1990



*Per 100,000 population.

FIGURE 3. Percent change in incidence rates* of primary and secondary syphilis from 1989 to 1990, by state, and year epidemic began in each state — United States



*Per 100,000 population.

†States reporting fewer than 50 cases per year during 1985–1990 were excluded.

Primary and Secondary Syphilis — Continued

Editorial Note: Since the current P&S syphilis epidemic began in 1986, the most notable trends have been 1) the substantial increase in cases involving black heterosexuals, 2) changes in geographic distribution, and 3) the association of the epidemic with crack cocaine use.

For non-Hispanic white men, the decline in incidence has been attributed to decreased transmission among homosexual men (*1*). In contrast, for blacks, the epidemic has been sustained through heterosexual transmission (*2*). Differences in risk for syphilis between racial/ethnic groups and regions may be attributed in part to private/public access to care, reporting practices, and/or case ascertainment. For example, blacks may be more likely to obtain care from publicly funded sexually transmitted disease (STD) clinics, where reporting is often more complete than reporting from other sources; however, such differences in reporting are unlikely to fully account for the large increase among blacks.

Three factors have contributed to the increase in the current syphilis epidemic. First, syphilis transmission has increased among medically hard-to-reach groups, such as crack cocaine users and other drug users. Cocaine use and the environment in which cocaine is used and exchanged appear to promote high-risk sexual behaviors, such as sex with multiple anonymous partners in exchange for drugs

TABLE 1. Incidence rates* of primary and secondary syphilis in 1989 and 1990 and percent change from 1989 to 1990 — 25 U.S. cities†

City	Incidence rates 1989	Incidence rates 1990	% change
Atlanta, Ga.	205	222	+8
Birmingham, Ala.	48	60	+25
Boston, Mass.	28	50	+78
Charlotte, N.C.	69	102	+48
Chicago, Ill.	29	51	+76
Dallas, Tex.	70	63	−10
Detroit, Mich.	48	76	+58
Houston, Tex.	44	64	+45
Jacksonville, Fla.	102	70	−31
Jersey City, N.J.	59	59	0
Memphis, Tenn.	134	158	+18
Miami, Fla.	67	52	−22
Milwaukee, Wis.	15	38	+153
Nashville, Tenn.	23	66	+187
Newark, N.J.	146	160	+10
New Orleans, La.	164	174	+6
New York City, N.Y.	59	58	−2
Oakland, Calif.	49	37	−24
Philadelphia, Pa.	125	147	+18
Richmond, Va.	75	76	+1
Rochester, N.Y.	80	63	−20
San Francisco, Calif.	32	52	+63
St. Petersburg, Fla.	55	42	−24
Tampa, Fla.	76	43	−43
Washington, D.C.	146	183	+26

*Per 100,000 population.

†Of 63 cities with a population of more than 200,000 and for which data were available, these cities had the highest incidence rates of syphilis in 1990. For some cities, incidence rates are those of the county or counties in which the city is located.

Primary and Secondary Syphilis — Continued

(*3,4*). In these settings, sex partners are difficult to locate for diagnosis and treatment by STD-control programs (*5*). Second, persons in groups at increased risk for syphilis may not have access to health care, know when or how to seek appropriate health care, or consider health care a high priority. Third, declines in socioeconomic and education levels in certain populations (e.g., persons of lower income levels who live in an inner-city environment) have been associated with increased unemployment, drug use, prostitution, and family disruption—conditions conducive to the spread of syphilis (*6*).

Surveillance and epidemiologic data can assist STD-control programs in their syphilis-control efforts. For example, data collected from patient interviews conducted at jails and detention centers or sites frequented by syphilis patients can be used to identify persons at increased risk for syphilis (*7*). However, the cost and effectiveness of these strategies in reducing the incidence and prevalence of syphilis must be rigorously evaluated.

Control measures may be more effective when they are supported by the affected communities and complemented by accessible clinical care. In addition, strengthened local, state, and national surveillance systems are essential to improved understanding of the current syphilis epidemic and for evaluation of intervention strategies.

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Epidemic Early Syphilis — Escambia County, Florida, 1987 and July 1989–June 1990

In Escambia County, Florida, the average number of early syphilis cases reported per quarter increased from 15 in 1987 to 75 in 1990 (Figure 1). To identify potential reasons for this epidemic, the Florida Department of Health and Rehabilitative Services and CDC used patient interview records to compare characteristics of patients with syphilis diagnosed before and during the epidemic. This report summarizes the characteristics of 82 patients diagnosed and treated from January through December 1987 (the preepidemic period) and 256 patients diagnosed and treated from July 1989 through June 1990 (the epidemic period).

Persons with cases reported during the epidemic were older than persons with cases reported before the epidemic (median age: 29 vs. 25 years, $p<0.05$, Kruskal-Wallis test) and less likely to be employed (32% vs. 54%, $p<0.01$). In addition, the proportion of patients who were black increased from 79% to 90% ($p<0.05$). Although the proportion of men among those infected changed only slightly (56% vs. 52%), the proportion of homosexual men decreased from 17% to 3% ($p<0.01$).

Epidemic Early Syphilis — Continued

Regular syphilis screening at the county jail began in 1984. From the preepidemic period to the epidemic period, the proportion of cases detected through these screenings increased from 6% to 26% ($p<0.01$). Of the 73 epidemic-period cases detected in the jail, 34 (47%) were primary or secondary syphilis, the stages during which sexual transmission most likely occurs.

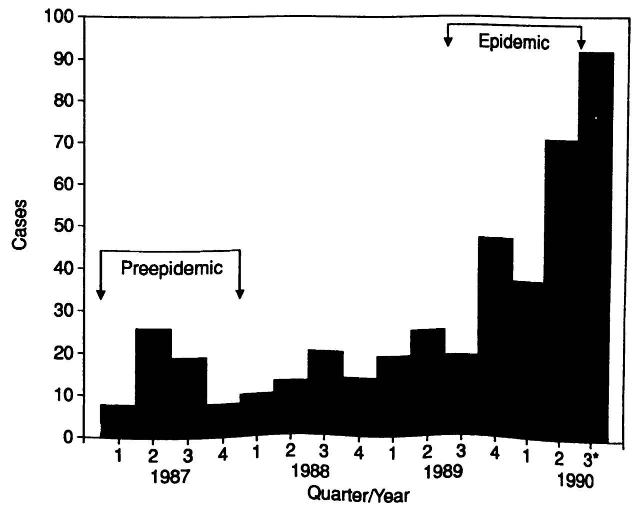
Information on drug use was available for all cases from the preepidemic period and for 71% of those from the epidemic period. Of persons diagnosed with syphilis during the preepidemic period, 11% reported cocaine use; none reported crack use. In comparison, 35% of persons diagnosed with syphilis during the epidemic period for whom drug use information was available reported cocaine use ($p<0.01$); 94% of cocaine users reported crack use. In addition, crack users named more sex partners than did nonusers (2.8 vs. 1.5, $p<0.05$), and were more likely to report having exchanged sex for money or drugs (54% vs. 1%, $p<0.01$) and having had multiple anonymous sex partners (32% vs. 2%, $p<0.01$).

In October 1990, to identify new cases of syphilis, screenings were done at five "crack trees" (i.e., locations where crack was used or sold). Of 38 persons who consented to testing, six had serum specimens that were rapid-plasma-reagin–reactive. Among persons with positive specimens, four had been treated recently for syphilis. The other two were located for treatment: one was treated for early latent syphilis, and one had serologic evidence of reinfection or treatment failure.

Reported by: PA Moncrief, JE Wroten, Florida State STD Program; JJ Witte, MD, RS Hopkins, MD, State Epidemiologist, Florida Dept of Health and Rehabilitative Svcs. Div of STD/HIV Prevention, Center for Prevention Svcs, CDC.

Editorial Note: In a crack-related syphilis epidemic, partner notification efforts may be hampered by the anonymity of sexual encounters. An example of a strategy designed to locate infected persons in a crack-using population is targeted syphilis screening in locations where crack users are likely to be (e.g., crack trees or crack

FIGURE 1. Early syphilis cases, by quarter of report — Escambia County, Florida, 1987–1990



*Includes reports for July and August only.

Epidemic Early Syphilis — Continued

houses). A recent effort to screen persons for syphilis at crack houses in Philadelphia determined that at least 12% of those tested had untreated syphilis (*1*). The effectiveness of this approach may be increased by on-site treatment and partner notification interviews. Screening programs in the Escambia County jail and elsewhere (*2*) represent an additional potential approach to identifying persons with untreated syphilis.

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Epidemiologic Notes and Reports

Outbreaks of Diarrheal Illness Associated with Cyanobacteria (Blue-Green Algae)-Like Bodies — Chicago and Nepal, 1989 and 1990

Recent reports have described the detection of cyanobacteria (blue-green algae)-like bodies (CLB) in the stools of persons with a prolonged syndrome of diarrhea, anorexia, and fatigue (*1–3*). In each of these reports, affected persons either were immunocompromised or had recently traveled to tropical countries. During 1989 and 1990, the first three reported outbreaks of this CLB-associated syndrome occurred in immunocompetent populations, affecting at least 150 persons. This report summarizes investigations of these outbreaks, which occurred in Chicago in 1990 and in Kathmandu, Nepal, in 1989 and 1990.

Chicago, 1990

On July 9, 1990, the infectious diseases department at a hospital in Chicago was notified that several staff physicians had onset of diarrhea on July 7–8. In general, manifestations included a 1-day prodrome of malaise and low-grade fever, followed by explosive watery diarrhea, anorexia, severe abdominal cramping, nausea, and occasional vomiting. Remission of diarrhea usually occurred after 3–4 days, but was followed by a cycle of relapses and remissions lasting up to 4 weeks. During remissions, patients noted continued malaise and anorexia, sometimes accompanied by constipation.

From July 10 through August 7, stool specimens were obtained from 20 ill persons (17 house staff physicians and three other employees). Cultures were negative for *Salmonella, Shigella, Campylobacter, Yersinia,* and *Vibrio,* and ova and parasites were not detected. However, direct and acid-fast stain microscopic examination of stool specimens from nine of the house staff physicians and one of the other employees revealed the presence of CLB. By the ninth week after onset of illness, CLB were not detected in seven patients for whom follow-up stool examinations were done. An epidemiologic investigation implicated exposure to a contaminated water supply as the source of infection. Based on this finding, the hospital implemented corrective measures.

Cyanobacteria — Continued

The Illinois Department of Public Health laboratory and laboratories at seven nearby hospitals conducted surveillance for CLB by performing acid-fast stains on all stool specimens submitted from August 6 through 27. CLB were detected in stool specimens from two patients not involved in the hospital outbreak. One had symptoms typical of CLB-associated illness; the other could not be located for questioning. No other clusters of CLB-associated diarrhea were identified.

Kathmandu, Nepal, 1989

From May through November 1989, physicians at a clinic in Kathmandu, Nepal, that serves expatriates identified more than 50 persons with a syndrome of prolonged watery diarrhea (100%), fatigue (90%), and anorexia (86%). CLB were identified in the stool samples of all persons. Duration of illness ranged from 4 to 107 days (mean: 43 days). Of the patients subsequently available for follow-up interviews, 34 received a total of 78 courses of antibiotics, including norfloxacin, tinidazole, and quinacrine; 14 received no treatment. The mean duration of illness was similar in both groups. Patients ranged in age from 1 to 67 years. Five persons became ill within 2–11 days of arrival in Nepal. No other cases were identified until May 1990 (*4*).

Kathmandu, Nepal, 1990

From May 16 through October 2, 1990, CLB were identified in stool specimens obtained from 85 patients at the same clinic in Kathmandu. Of 72 patients who were interviewed, at least 95% had watery, nonbloody diarrhea. The median duration of diarrhea was 17 days, with a median of seven stools per day at the peak of illness. Diarrhea was accompanied by fatigue in 97% of the patients and anorexia in 87%; the severity of symptoms varied during the course of illness.

Analysis of samples of water from various sources, raw vegetables, and cow manure detected CLB on one head of lettuce from which a patient had eaten 2 days before onset of illness. Analysis of 184 stool samples submitted by Nepali citizens to local hospitals at the end of the outbreak period detected CLB in six (3%).

Reported by: F Kocka, PhD, C Peters, E Dacumos, E Azarcon, MEd, C Kallick, MD, Chicago; C Langkop, MSPH, RJ Martin, DVM, BJ Francis, MD, State Epidemiologist, Illinois Dept of Public Health. MT Cohen, MD, J Robertson, MD, DR Shlim, MD, P Fabian, MD, R Rajah, Ciwec Clinic, Kathmandu, Nepal. Div of Immunologic, Oncologic, and Hematologic Diseases, and Enteric Diseases Br, Div of Bacterial and Mycotic Diseases, Center for Infectious Diseases; Div of Field Epidemiology, Epidemiology Program Office, CDC.

Editorial Note: Cyanobacteria (blue-green algae) are a diverse collection of primitive unicellular to multicellular photosynthetic bacteria usually found in water or very moist environments (*5*). In environments rich in nutrients, some may grow without light (*6*). The CLB are so named because they possess some morphologic and reproductive characteristics similar to those of the order Chroococcales of cyanobacteria (*7*). However, CLB do not have all of the characteristics of any known cyanobacteria type (*7*).

CLB may be visualized in wet mounts by light microscopy; when fresh unpreserved stools are used, CLB appear as nonrefractile, hyaline cysts, 8–9 μm in diameter (*3*). Intact cysts contain a greenish spherical mass 6–7 μm in diameter composed of a hollow cluster of refractile, membrane-bound globules containing a clear material that resembles a lipid. In preserved stools, the contents of the cysts appear as granules of irregular shape and size. CLB are refractory to most commonly used laboratory stains. However, with the modified acid-fast stain, CLB may stain deep

Cyanobacteria — Continued

mottled red or pink; some resist staining and appear as glassy, membranous cysts. Under ultraviolet light, CLB autofluoresce strongly, appearing as bright blue circles.

CLB may be a new human diarrheal pathogen, capable of causing prolonged diarrheal illness in immunocompromised and immunocompetent persons. Since 1986, the organism has been identified in the stools of patients who have lived in or visited the United States, the Caribbean islands, Central and South America, Southeast Asia, and Eastern Europe (*7*). The CLB-associated clinical syndrome (acute onset of intermittent prolonged watery diarrhea, accompanied by anorexia) reported in these three outbreaks are similar to those described in previous case reports (*1–3*). The association of the outbreaks in both years with the beginning of warmer temperatures suggests a possible seasonal factor.

The precise role, if any, of CLB in the pathogenesis of diarrheal illness has not been documented. Investigations are in progress to determine the extent to which the presence of CLB in stool specimens may be associated with illness and to determine possible modes of transmission, reservoirs, and other characteristics of the organism. CLB should be considered when assessing patients with unexplained prolonged diarrheal illness. CDC's Enteric Diseases Branch, Division of Bacterial and Mycotic Diseases, Center for Infectious Diseases (telephone [404] 639-3753) is interested in receiving reports of identification of CLB in stool specimens; reports may be made through state health departments.

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The *Morbidity and Mortality Weekly Report* is prepared by the Centers for Disease Control, Atlanta, Georgia, and is available on a paid subscription basis from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, (202) 783-3238.

The data in this report are provisional, based on weekly reports to CDC by state health departments. The reporting week concludes at close of business on Friday; compiled data on a national basis are officially released to the public on the succeeding Friday. Accounts of interesting cases, outbreaks, environmental hazards, or other public health problems of current interest to health officials, as well as matters pertaining to editorial or other textual considerations should be addressed to: Editor, *Morbidity and Mortality Weekly Report*, Mailstop C-08, Centers for Disease Control, Atlanta, Georgia 30333; telephone (404) 332-4555.

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HHS Publication No. (CDC) 91-8017

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