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MORBIDITY AND MORTALITY WEEKLY REPORT

Current Trends

Update: Acquired Immunodeficiency Syndrome — United States, 1981–1988

In 1988, state and local health departments reported 32,311 persons (28,432 men, 3296 women, and 583 children [<13 years of age]) diagnosed with illnesses that meet the CDC case definition for acquired immunodeficiency syndrome (AIDS) (*1*) in the United States and its territories. Excluding U.S. territories, these persons represent an annual incidence rate of 13.7 AIDS cases per 100,000 population: 31.2 cases per 100,000 men, 3.2 cases per 100,000 women, and 1.3 cases per 100,000 children.* During this period, blacks and Hispanics had the highest annual incidence rates per 100,000 population (34.9 and 28.9, respectively), followed by whites (9.6), Asians/Pacific Islanders (5.4), and American Indians/Alaskan Natives (2.2).

As of December 31, 1988, a total of 82,764 AIDS cases had been reported to CDC. The number of AIDS cases reported each year continues to increase; however, the rate of increase has steadily declined, except in 1987, when the revision of the case definition resulted in an abrupt increase in reported cases (Figure 1).

Impact of the 1987 revision of the AIDS case definition. In September 1987, the CDC AIDS case definition was revised for persons with laboratory evidence of human immunodeficiency virus (HIV) infection (e.g., positive HIV-antibody test) to include a broader spectrum of diseases characteristically found in persons with HIV infection and the presumptive diagnosis of selected diseases. The revision has markedly affected the distribution of reported cases. Of the 40,836 cases reported between September 1987 and December 1988, 11,966 (29%) met only the 1987 revision. Of these persons, 3949 (33%) had a presumptive diagnosis of *Pneumocystis carinii* pneumonia, 3904 (33%) had HIV wasting syndrome, 1781 (15%) had HIV dementia, 1639 (14%) had a presumptive diagnosis of esophageal candidiasis, and 737 (6%) had extrapulmonary tuberculosis (658 definitively diagnosed and 79 presumptively diagnosed). Compared with patients with illnesses meeting the pre-1985 (*2*) or the 1985 (*3*) case definitions, a higher proportion of patients reported since September 1987

*Based on 1980 census data.

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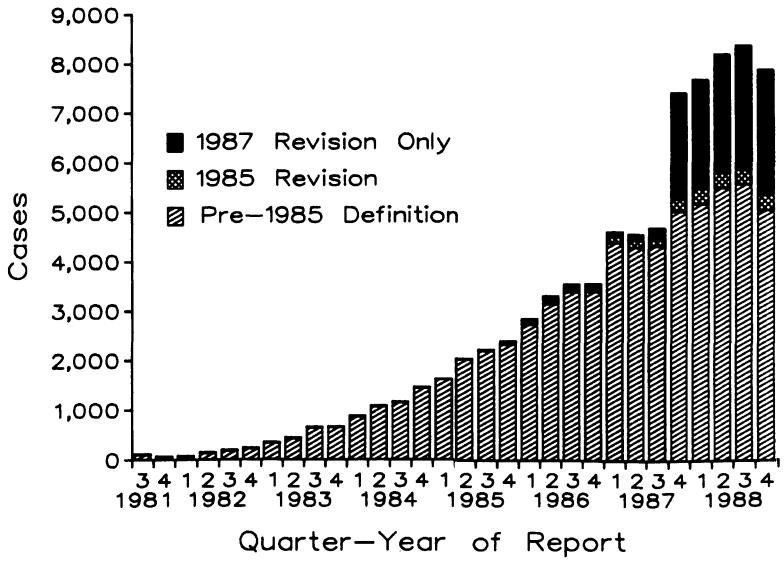
with illnesses meeting only the 1987 case definition were female (15% compared with 9%), black or Hispanic (34% and 21%, respectively, compared with 26% and 14%, respectively), or heterosexual intravenous-drug users (IVDUs) (35% compared with 18%). A lower proportion of those meeting only the 1987 case definition had a history of male homosexual/bisexual activity without IV-drug use (41% compared with 63%).

Geographic distribution. AIDS cases have been reported from all 50 states, the District of Columbia, and four U.S. territories. Annual incidence rates by state for 1988 varied from 0.6 cases per 100,000 persons in North Dakota to 38.9 per 100,000 in New York (Figure 2).

The geographic distribution of AIDS cases has shifted over time. Before 1984, the Mid-Atlantic region of the United States (New Jersey, New York, and Pennsylvania) reported 54% of all AIDS cases (52% of men and 73% of women with AIDS). In 1988, the Mid-Atlantic region reported only 32% of all AIDS cases (29% of men and 50% of women with AIDS) (Figure 3). Before 1984, 47% of all male patients with histories of homosexual/bisexual activity were reported from the Mid-Atlantic region; in 1988, 21% of these men were reported from the Mid-Atlantic region. The proportion who had histories of IV-drug use without homosexual activity from this region also decreased, from 85% to 59%. The proportion of all cases from all other regions increased during this period, except for the Pacific[†] region, which remained stable. Increases were greatest in the East North Central, South Atlantic, and West South Central regions.[†]

[†]The Pacific region consists of Alaska, California, Hawaii, Oregon, and Washington. The East North Central region consists of Illinois, Indiana, Michigan, Ohio, and Wisconsin. The South Atlantic region consists of Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, and West Virginia. The West South Central region consists of Arkansas, Louisiana, Oklahoma, and Texas.

FIGURE 1. AIDS cases, by quarter of report and case definition — United States, 1981–1988



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Men. Of the 82,764 AIDS cases reported to CDC as of December 31, 1988, 74,435 (90%) were in males ≥13 years of age. The mean age at the time of diagnosis was 37.0 years. A total of 61.0% were white (non-Hispanic); 23.7%, black (non-Hispanic); 14.5%, Hispanic; 0.6%, Asian/Pacific Islander; and 0.1%, American Indian/Alaskan Native. This distribution has remained stable over time, except for a decrease in the proportion of men who were white (from 64% in 1987 to 57% in 1988) and an increase in the proportion that was black and Hispanic (from 22% and 12%, respectively, in 1987 to 25% and 16% in 1988), reflecting the 1987 revision of the case definition. The cumulative incidence of AIDS between 1981 and 1988 was 3.0 times higher among black men and 2.8 times higher among Hispanic men than among white men.

FIGURE 2. AIDS incidence rates per 100,000 population — United States, 1988

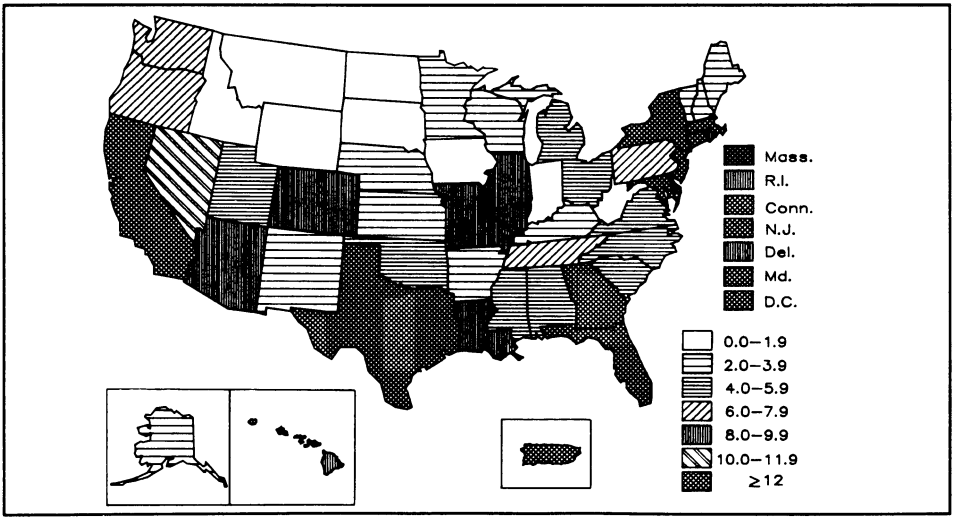
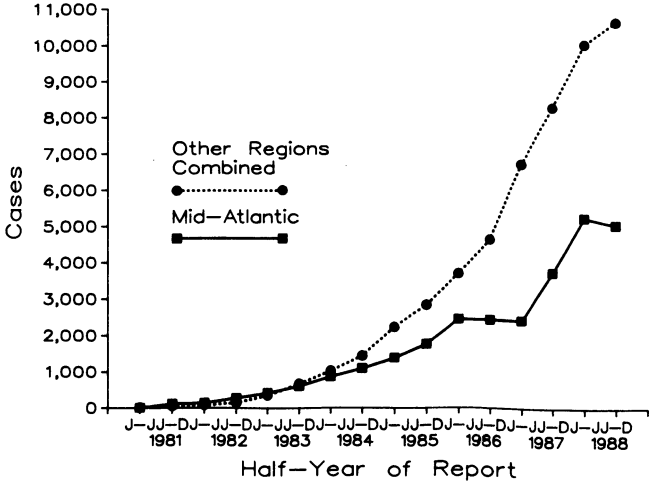


FIGURE 3. AIDS cases, by region and date of report — United States, 1981–1988



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Sixty-eight percent of men with AIDS had histories of homosexual/bisexual activity without IV-drug use, 17% had IV-drug use without homosexual/bisexual activity, and 8% had both homosexual activity and IV-drug use. Another 2% had histories of blood transfusion, 1% had hemophilia or other coagulation disorder, 1% had sex partners at increased risk for or known to be infected with HIV, 1% were born in countries with predominantly heterosexual transmission of HIV (*4*), and 3% had undetermined means of exposure to HIV. This distribution has remained stable, except for a decrease in the proportion of men with histories of homosexual/bisexual activity without IV-drug use (from 70% of those reported in 1987 to 63% of those reported in 1988) and an increase in the proportion with histories of IV-drug use and no homosexual/bisexual activity (from 14% in 1987 to 20% in 1988), again partially reflecting the 1987 revision of the case definition. This trend was most evident in the Mid-Atlantic region, where the proportion of homosexual/bisexual men without IV-drug use decreased from 54% to 46% and the proportion of heterosexual IVDUs increased from 34% to 41%. In addition, the proportion of all men with AIDS born in countries with predominantly heterosexual transmission of HIV decreased from 4% before 1984 to 1% in 1988. Black and Hispanic men with AIDS were more likely to have had histories of IV-drug use and less likely to have had histories of homosexual activity than white men (Table 1).

Women. As of December 31, 1988, 6983 AIDS cases have been reported among females ≥13 years of age, constituting 8% of all AIDS cases. This proportion increased from 8% of reported cases in 1987 to 10% of reported cases in 1988. The mean age at diagnosis was 35.7 years; 51.6% were black; 27.9%, white; 19.5%, Hispanic; 0.6%, Asian/Pacific Islander; and 0.2%, American Indian/Alaskan Native. This distribution has been relatively stable. The cumulative incidence of AIDS between 1981 and 1988 was 13.6 times higher among black women and 10.2 times higher among Hispanic women than among white women.

Among women with AIDS, 52% had histories of IV-drug use, 18% had sex partners with histories of IV-drug use, 7% had sex partners otherwise at increased risk for or known to be infected with HIV, 11% had histories of blood transfusion, 4% were born in countries with predominantly heterosexual transmission of HIV (*4*), and 8% had undetermined means of exposure. The proportion of women with AIDS who had sex partners at increased risk for HIV rose from 15% before 1984 to 26% in 1988, and the proportion born in countries with predominantly heterosexual transmission decreased from 11% to 3%. Black and Hispanic women with AIDS were more likely than white women to have had histories of IV-drug use or histories of sex with IVDUs (Table 1).

Children. As of December 31, 1988, 1346 AIDS patients <13 years of age had been reported to CDC. Of these, 55% were male. Eighty-two percent of pediatric patients were <5 years of age at diagnosis, and 40% were <1 year of age. Racial distribution among pediatric patients was similar to that among women with AIDS: 52.5% were black; 23.9%, white; 22.9%, Hispanic; 0.5%, Asian/Pacific Islander; and 0.2%, American Indian/Alaskan Native. Among pediatric patients, 78% are presumed to have acquired HIV infection perinatally from their mothers, 13% from blood transfusion, and 6% from blood products used to treat hemophilia. Four percent had undetermined means of exposure to HIV. Of those infected from their mothers, maternal risk factors included IV-drug use (54%), sex with an IVDU (19%), sex with a man otherwise at increased risk for or infected with HIV (7%), birth in a country with predominantly

TABLE 1. Adult and pediatric AIDS patients*, by exposure category, race/ethnic group, and sex — United States, 1981–1988

Category	Total	Percent								
					Heterosexual contact					
		Homosexual, non-IVDU†	IVDU	Homosexual and IVDU	Sex with IVDU	Sex with person at risk (non-IVDU)	Transfusion recipient	Coagulation disorder	Other risk factor	NIR§
White										
Adult										
Male	45,359	81	5	8	<1	<1	2	1	<1	2
Female	1,948	–	40	–	12	13	26	1	<1	8
Pediatric	321	–	22¶	–	10**	8††	29	19	9	3
Black										
Adult										
Male	17,618	45	34	8	1	<1	1	<1	5	4
Female	3,604	–	58	–	17	5	4	<1	8	7
Pediatric	707	–	47¶	–	15**	4††	5	1	23	5
Hispanic										
Adult										
Male	10,773	48	37	8	<1	<1	1	1	<1	5
Female	1,360	–	54	–	29	5	5	<1	<1	7
Pediatric	308	–	50¶	–	21**	4††	11	4	6	4
Asian/Pacific Islander										
Adult										
Male	440	82	2	2	<1	<1	6	2	<1	6
Female	42	–	19	–	10	19	36	<1	<1	17
Pediatric	6§§									
American Indian/ Alaskan Native										
Adult										
Male	75	61	9	17	<1	<1	1	4	<1	7
Female	12§§									
Pediatric	2§§									

*Adult = person ≥13 years old; pediatric = person <13 years old.
†Intravenous-drug user.
§NIR = no identified risk factor.
¶Mother with history of IV-drug use.
**Mother with history of sex with IVDU.
††Mother with history of sex with person at risk for HIV (other than IVDU).
§§Small numbers make calculations of percentages of limited value.

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heterosexual transmission (11%), and transfusion (2%). The mothers' risk factors were not reported in 7%. The proportion of perinatally infected children whose mothers had sex partners at increased risk for or infected with HIV (including IVDUs) rose from 11% of all pediatric cases before 1985 to 21% in 1988; the proportion of those whose mothers were born in countries with predominantly heterosexual transmission decreased from 22% to 7%. Black and Hispanic pediatric patients were more likely to have had mothers with histories of IV-drug use or of sex with IVDUs than were white children (Table 1).

Patients with no identified risk factor. AIDS patients initially reported as having undetermined means of exposure to HIV are investigated by local or state health officials for a possible means of exposure. Overall, 2706 (3%) reported AIDS cases fall into this category; this percentage has remained stable, except for an increase to 5% in 1988. This greater proportion of patients with no identified risk factor in the most recent reporting periods reflects the large number of cases still under investigation. Of all AIDS patients initially reported to CDC with undetermined means of exposure, 83% have been reclassified into a known exposure category when follow-up information was obtained. Therefore, many of the persons reported in 1988 with no identified risk factor will be reclassified after additional information becomes available.

In general, patients with no identified risk factor are not characteristic of the U.S. population: 79% are male, 39% are white (compared with 80% of the U.S. population), and 90% are 20–59 years of age (compared with 54% of the U.S. population). Of the 2706 patients currently listed as having undetermined means of exposure, investigations were not completed for 11% due to death, 4% due to refusal to be interviewed, and 2% due to loss to follow-up. Of the remaining 2231 patients, 1892 are under investigation, and 339 had no risk factor identified after investigation. Among the latter, many had histories of a sexually transmitted disease other than AIDS and/or reported sexual contact with prostitutes and may have been at increased risk for HIV infection because of sexual activity. Investigations have revealed no evidence of new modes of transmission of HIV.

Mortality. Fifty-six percent of all AIDS patients (56% of adults/adolescents and 55% of children) and 85% of those diagnosed before 1986 are reported to have died. The actual case-fatality rate is higher due to incomplete reporting of deaths. In 1987, HIV infection/AIDS ranked 15th among leading causes of death in the United States (*5*) and seventh among all causes of years of potential life lost (*6*). Deaths occurring in 1987 among persons with AIDS that were reported to CDC represented 9% of all deaths among persons 25–34 years of age and 7% of all deaths among persons 35–44 years of age.

Reported by: Local, state, and territorial health departments. AIDS Program, Center for Infectious Diseases, CDC.

Editorial Note: National surveillance of AIDS encompasses severe diseases thought to be highly specific for HIV infection. CDC first outlined a surveillance case definition in 1982 (*7*), which was modified in 1983 (*2*). As knowledge about HIV infection increased, other severe and commonly occurring manifestations of HIV infection were included in the case definition in 1985 (*3*) and again in 1987 (*1*). Additions included disseminated histoplasmosis, chronic isosporiasis, and certain non-Hodgkins lymphomas (1985 revision) and extrapulmonary tuberculosis, HIV encephalopathy, HIV wasting syndrome, multiple or recurrent bacterial infections (in children

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only), and presumptively diagnosed *Pneumocystis carinii* pneumonia and esophageal candidiasis (1987 revision). In both instances, the revision applied to patients with laboratory evidence (e.g., positive antibody test) for HIV infection. The number of AIDS cases increased 3%–4% as a result of the 1985 revision. The 1987 revision has had an even greater effect. Studies in selected groups and areas suggest that the number of cases may increase as much as 22% among homosexual men (*8*) and persons with hemophilia (*9*) and even more among pediatric patients (*10*). Therefore, the increase in the number of cases reported in 1987 and 1988 reflect, at least in part, the revision of the case definition. The long-term effects of the revised case definition on surveillance trends are not clear-cut because 1) HIV testing and the revised case definition are not used uniformly in all populations, 2) diagnostic practices for specific AIDS-indicator diseases may be changing, and 3) some patients with illnesses initially meeting only the 1987 case definition may eventually develop illnesses meeting the previous case definition.

AIDS incidence is highest in the most populous metropolitan areas in the United States. Standard metropolitan statistical areas (SMSAs) with >1 million residents comprise 41% of the U.S. population but accounted for 75% of U.S. AIDS cases between 1981 and December 1988. This distribution of cases, however, is changing, as reflected in the decrease in the proportion of cases reported from the Mid-Atlantic region. The proportion of AIDS cases from SMSAs with ≤500,000 population increased from 12% before 1986 to 19% in 1988. Such findings are important in the development of prevention strategies and suggest that HIV prevention activities should be conducted in areas with smaller populations, as well as in large metropolitan areas.

Blacks and Hispanics continue to be disproportionately represented among AIDS patients, particularly among those who were IVDUs or sex partners or children of IVDUs. In 1988, the annual incidence rate of AIDS cases associated with IV-drug use was 11.5 times higher among blacks and 8.8 times higher among Hispanics than among whites (*11*). This difference was even more dramatic in the Northeast. Although the racial/ethnic distribution of IVDUs in the United States is unknown, a 1982 National Institute on Drug Abuse survey of drug-abuse treatment centers suggests that a disproportionate number of IVDUs attending treatment clinics in high AIDS-incidence areas were black or Hispanic (*12*). Furthermore, HIV seroprevalence rates are higher among black and Hispanic IVDUs than among white IVDUs (*13,14*), except on the West Coast. These findings emphasize the need for community-based HIV prevention programs in areas with a high prevalence of drug use, especially among minorities. These programs should include HIV educational programs and counseling and testing facilities in drug-treatment centers, sexually transmitted disease clinics, tuberculosis clinics, jails and prisons, and health-care facilities.

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Tuberculosis and Human Immunodeficiency Virus Infection: Recommendations of the Advisory Committee for the Elimination of Tuberculosis (ACET)

INTRODUCTION

Tuberculosis (TB) and other mycobacterioses are well-recognized complications of immunosuppression. In the 1980s, the epidemic of human immunodeficiency virus (HIV) infection and its resulting immunosuppression in large numbers of persons have increased the incidence of mycobacterial diseases (*1*). Disseminated *Mycobacterium avium* complex (MAC) disease has become an important medical problem; MAC is the most common mycobacterial species isolated from persons with acquired immunodeficiency syndrome (AIDS). Of particular public health concern, however, is the increasing number of persons with disease caused by *M. tuberculosis* (*2–5*). HIV infection appears to be an important risk factor for TB. Moreover, TB is one of the few respiratory diseases occurring in HIV-infected persons that is transmissible, curable, and preventable. The Advisory Committee for Elimination of Tuberculosis (ACET) is concerned that the further spread of HIV infection among populations with a high prevalence of tuberculous infection may result in dramatic increases in TB unless appropriate control measures outlined in this statement are successfully implemented.

EPIDEMIOLOGY

The contribution of HIV-related TB morbidity to total national TB morbidity is not precisely known, but HIV infection appears to have had a substantial impact in some areas (*6,7*). Matching reported TB cases with the AIDS case registries in 43 states and

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11 localities reveals that 4% of AIDS cases appear on the TB registries (CDC, unpublished data). In Florida, 10% of AIDS patients had histories of TB (*8*); in New York City, 5% of adult and adolescent AIDS patients (*9*); in Connecticut, 5% (*10*); and at a university hospital in New Jersey, 21% (*4*). In San Juan, Puerto Rico, 11% of autopsied AIDS patients had TB (*11*), and at a New York City hospital, 4% of autopsied AIDS patients had previously undiagnosed TB (*12*).

Some data on HIV seroprevalence among TB patients have also been accumulated. In San Francisco, 29% of non-Asian adult TB patients 18–65 years of age were infected with HIV (*13*). In Seattle, a combined 23% of black and white adult TB patients 20–50 years of age were HIV-infected (*14*).

Evidence for an association between HIV infection and TB comes from several studies. Of 279 HIV-infected methadone-maintenance patients in New York City, 12 had histories of TB; none of the 240 patients not infected with HIV had histories of TB (*15*). In another cohort of methadone-maintenance clients with documented positive tuberculin skin test reactions, 14% of HIV-infected persons and none of the HIV-negative clients developed TB during a 2-year period (*16*). In Kinshasa, Zaire, a study of 500 decedents who were serologically tested postmortem showed that 16% of HIV-infected persons and 2% of HIV-negative persons had TB diagnosed ante mortem by smear (*17*).

An association between TB and AIDS is particularly striking among groups with a high prevalence of both tuberculous and HIV infections, e.g., intravenous-drug users (IVDUs) (*4,18*) and Haitians (*2,5*). However, HIV-related TB is not restricted to IVDUs and Haitians (*2,5,19*). It has been reported in homosexual and bisexual men and sexual contacts of bisexual men and in one person with transfusion-associated AIDS (*19,20*). Demographically, minority populations in some areas have been at particular risk of HIV-associated TB. Detailed demographic information obtained from registry matching in New York City, Florida, and Newark, New Jersey, revealed that blacks and Hispanics accounted for 80%, 90%, and 100%, respectively, of the TB/AIDS cases (*4,8,9*).

The finding that TB often precedes other opportunistic diseases constituting the national surveillance definition of AIDS (*2,3*) was confirmed in two large studies in Florida and New York City (*8,9*). In Florida, 62 (57%) of the 109 AIDS patients with histories of TB developed TB >1 month before the diagnosis of AIDS (*8*). In New York City, TB was diagnosed a median of 2 months before the AIDS diagnosis among 258 persons with both diagnoses for whom such information was available (*9*). These findings suggest that latent, subclinical tuberculous infection may often progress to clinical TB early in the course of HIV-induced immunosuppression and that AIDS patients known to have developed TB may represent only a small proportion of total HIV-associated TB morbidity. Additional evidence for this possibility was gathered in Miami, where 22 (31%) of 71 consecutively tested TB patients had HIV infection, but only two met the pre-1987 case definition for AIDS (*21*). Similar serosurveys have not been reported from other areas, but TB clinics are included in HIV serosurveys being implemented in 30 metropolitan areas. This information will help determine the nationwide impact of the HIV epidemic on the incidence of TB.

CLINICAL FEATURES

The diagnosis of TB usually precedes or coincides with the diagnosis of AIDS but may follow it (*2,3,8–10,18*). The clinical presentation of TB in an HIV-infected person may differ from that in persons with relatively normal cellular immunity who develop

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reactivation TB. Apical pulmonary disease with cavitation, a classic finding in immunologically normal persons, is less common. Patients may present with infiltrates in any lung zone, often associated with mediastinal and/or hilar lymphadenopathy (*22*). Extrapulmonary disease occurs in 40%–75% of patients, often in the presence of pulmonary disease (*2,4,8,9*). Lymphatic and hematogenous TB are especially common among persons with HIV infection (*2,4*). Central nervous system (CNS) involvement, including brain abscesses, has been reported (*23*) and may be especially difficult to diagnose when it occurs in conjunction with other opportunistic CNS infections such as toxoplasmosis (*24*). Other unusual clinical presentations have also been reported (*1*).

DIAGNOSIS

These unusual clinical features emphasize the importance of considering a diagnosis of TB in persons with known or possible HIV infection and a diagnosis of HIV infection in persons with TB. Persons who provide care to HIV-infected persons must be informed of the frequently uncharacteristic presentation of TB in this group

(Continued on page 243)

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

Disease	14th Week Ending			Cumulative, 14th Week Ending		
	April 8, 1989	April 9, 1988	Median 1984-1988	April 8, 1989	April 9, 1988	Median 1984-1988
Acquired Immunodeficiency Syndrome (AIDS)	752	U*	274	8,714	8,418	3,213
Aseptic meningitis	68	65	75	1,033	1,091	1,120
Encephalitis: Primary (arthropod-borne & unspec)	13	10	15	148	185	221
Post-infectious	1	1	2	21	20	24
Gonorrhea: Civilian	10,743	11,682	14,156	174,252	181,397	218,760
Military	120	234	246	2,962	3,374	4,523
Hepatitis: Type A	593	485	420	8,916	6,735	6,116
Type B	490	442	535	5,395	5,542	6,551
Non A, Non B	44	50	93	586	691	907
Unspecified	56	38	85	708	567	1,209
Legionellosis	11	13	11	234	229	175
Leprosy	1	11	7	36	50	60
Malaria	15	5	14	263	175	180
Measles: Total†	323	28	70	2,359	541	713
Indigenous	309	26	61	2,224	491	622
Imported	14	2	8	135	50	91
Meningococcal infections	84	70	70	962	1,003	974
Mumps	78	147	104	1,463	1,469	1,142
Pertussis	20	60	44	456	628	495
Rubella (German measles)	1	1	11	62	59	104
Syphilis (Primary & Secondary): Civilian	687	710	460	10,878	9,971	7,667
Military	4	-	4	81	58	58
Toxic Shock syndrome	5	6	6	88	87	87
Tuberculosis	322	314	438	4,901	4,783	5,052
Tularemia	-	5	3	13	25	23
Typhoid Fever	9	1	4	97	91	67
Typhus fever, tick-borne (RMSF)	3	1	3	25	18	18
Rabies, animal	81	102	116	1,047	980	1,210

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1989		Cum. 1989
Anthrax	-	Leptospirosis	35
Botulism: Foodborne	6	Plague	-
Infant	3	Poliomyelitis, Paralytic	-
Other	3	Psittacosis (Fla. 1)	25
Brucellosis	6	Rabies, human	-
Cholera	-	Tetanus	11
Congenital rubella syndrome	1	Trichinosis (Mass. 4)	7
Congenital syphilis, ages <1 year	-		
Diphtheria	-		

*Because AIDS cases are not received weekly from all reporting areas, comparison of weekly figures may be misleading.
†Ten of the 323 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 April 8, 1989 and April 9, 1988 (14th Week)

Reporting Area	AIDS	Aseptic Meningitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1988	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989
UNITED STATES	8,714	1,033	148	21	174,252	181,397	8,916	5,395	586	708	234	36
NEW ENGLAND	432	42	4	1	4,916	5,494	192	291	27	27	18	3
Maine	24	1	1	-	84	129	4	13	3	1	3	-
N.H.	9	1	-	-	57	84	27	19	5	2	-	-
Vt.	3	-	-	-	20	44	7	15	2	-	-	-
Mass.	260	18	1	1	1,854	1,962	73	186	11	20	12	3
R.I.	21	14	-	-	420	467	5	27	2	2	3	-
Conn.	115	8	2	-	2,481	2,808	76	31	4	2	-	-
MID. ATLANTIC	2,412	155	19	2	25,291	28,005	1,247	874	58	82	60	2
Upstate N.Y.	378	58	9	1	4,429	3,453	300	195	19	3	20	1
N.Y. City	1,182	24	1	1	10,650	12,650	99	285	11	65	6	-
N.J.	583	-	9	-	3,835	4,029	157	166	13	5	5	-
Pa.	269	73	-	-	6,377	7,873	691	228	15	9	29	1
E.N. CENTRAL	769	145	50	-	30,184	28,742	450	616	45	18	65	-
Ohio	126	40	15	-	7,882	6,935	112	171	7	2	40	-
Ind.	169	44	16	-	2,079	2,334	25	104	5	2	13	-
Ill.	326	4	2	-	9,198	7,839	177	67	3	7	-	-
Mich.	117	51	13	-	8,926	9,233	101	197	19	7	8	-
Wis.	31	6	4	-	2,099	2,401	35	77	11	-	4	-
W.N. CENTRAL	201	40	4	1	7,712	7,181	261	166	14	3	6	-
Minn.	46	5	-	1	788	999	24	36	2	2	2	-
Iowa	23	8	2	-	613	505	21	14	4	-	2	-
Mo.	107	12	-	-	4,694	4,052	143	94	3	1	-	-
N. Dak.	2	3	-	-	35	54	2	7	2	-	-	-
S. Dak.	3	2	1	-	74	153	2	3	3	-	-	-
Nebr.	9	3	1	-	476	448	42	7	-	-	2	-
Kans.	11	7	-	-	1,032	970	27	5	-	-	-	-
S. ATLANTIC	1,733	228	21	4	48,884	50,279	701	1,108	87	107	32	-
Del.	35	7	1	-	798	731	17	44	-	1	3	-
Md.	239	23	3	-	5,523	5,197	161	203	13	12	10	-
D.C.	137	5	-	-	3,105	3,380	2	5	1	-	-	-
Va.	156	50	10	-	4,297	3,666	47	74	13	58	1	-
W. Va.	8	2	3	-	384	417	7	23	2	1	-	-
N.C.	104	31	-	1	7,018	7,754	144	300	32	-	8	-
S.C.	85	6	-	-	4,410	3,582	11	131	2	4	2	-
Ga.	296	19	1	-	9,486	9,519	104	113	7	4	2	-
Fla.	673	85	3	3	13,863	16,033	208	215	17	27	6	-
E.S. CENTRAL	215	112	11	1	14,902	13,990	78	385	48	1	5	-
Ky.	41	31	3	1	1,329	1,176	34	106	18	-	1	-
Tenn.	45	12	-	-	4,837	4,565	15	205	9	-	3	-
Ala.	66	57	8	-	4,899	4,958	22	68	20	1	1	-
Miss.	63	12	-	-	3,837	3,291	7	6	1	-	-	-
W.S. CENTRAL	742	64	14	1	19,023	20,804	999	470	38	166	12	7
Ark.	24	3	-	-	1,907	1,854	63	22	2	2	1	-
La.	137	6	1	-	4,023	4,488	67	70	4	-	3	-
Okla.	35	12	5	-	1,740	1,834	118	49	8	8	6	-
Tex.	546	43	8	1	11,353	12,628	751	329	24	156	2	7
MOUNTAIN	244	34	4	1	3,541	3,887	1,384	350	66	66	14	1
Mont.	1	-	-	-	53	110	13	14	1	-	2	1
Idaho	6	-	-	-	64	91	57	23	5	2	-	-
Wyo.	6	-	-	-	34	62	7	1	-	-	-	-
Colo.	64	9	1	1	653	994	199	60	23	36	2	-
N. Mex.	22	4	-	-	371	381	157	58	12	1	-	-
Ariz.	60	16	2	-	1,392	1,343	757	121	12	23	6	-
Utah	16	4	1	-	134	177	85	23	8	3	3	-
Nev.	69	1	-	-	840	729	109	50	5	1	1	-
PACIFIC	1,966	213	21	10	19,799	23,015	3,604	1,135	203	238	22	23
Wash.	196	-	-	-	1,650	1,929	724	180	49	11	2	1
Oreg.	61	-	-	-	779	829	598	103	26	6	1	-
Calif.	1,687	200	19	10	17,002	19,742	1,938	839	123	219	18	18
Alaska	4	-	2	-	258	299	304	12	5	2	1	-
Hawaii	18	13	-	-	110	216	40	1	-	-	-	4
Guam	-	-	-	-	-	42	-	-	-	-	-	-
P.R.	402	31	1	-	254	406	28	61	5	4	-	3
V.I.	15	-	-	-	166	102	-	4	-	-	-	-
Amer. Samoa	-	-	-	-	-	16	-	-	-	-	-	-
C.N.M.I.	-	-	-	-	-	14	-	-	-	-	-	-

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

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending April 8, 1989 and April 9, 1988 (14th Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported*		Total									
	Cum. 1989	1989	Cum. 1989	1989	Cum. 1989	Cum. 1988	Cum. 1989	1989	Cum. 1989	1989	Cum. 1989	Cum. 1988	1989	Cum. 1989	Cum. 1988
UNITED STATES	263	309	2,224	14	135	541	962	78	1,463	20	456	628	1	62	59
NEW ENGLAND	16	2	21	-	5	2	73	1	12	1	13	72	-	-	-
Maine	-	-	-	-	-	-	8	-	-	-	4	11	-	-	-
N.H.	1	1	1	-	-	-	9	1	9	-	5	21	-	-	-
Vt.	-	-	-	-	-	-	4	-	-	-	-	1	-	-	-
Mass.	11	-	-	-	3	1	34	-	2	-	-	31	-	-	-
R.I.	3	1	18	-	2	-	1	-	-	-	2	1	-	-	-
Conn.	1	-	2	-	-	1	17	-	1	1	2	7	-	-	-
MID. ATLANTIC	40	2	62	10	50	137	109	3	48	-	37	17	-	2	4
Upstate N.Y.	8	-	4	10†	36	2	40	2	15	-	18	6	-	1	1
N.Y. City	13	2	17	-	13	17	19	-	-	-	1	1	-	1	1
N.J.	7	-	32	-	1	-	14	-	11	-	14	2	-	-	1
Pa.	12	-	9	-	-	118	36	1	22	-	4	8	-	-	1
E.N. CENTRAL	12	71	211	2	37	42	99	3	132	1	23	66	-	4	20
Ohio	5	49	112	1§	35	3	54	-	8	-	1	16	-	-	-
Ind.	1	-	-	-	-	-	12	-	14	-	10	24	-	-	-
Ill.	3	22	99	-	-	28	9	-	51	-	-	3	-	3	16
Mich.	1	-	-	1§	1	11	17	3	50	1	7	13	-	-	4
Wis.	2	-	-	-	1	-	7	-	9	-	5	10	-	1	-
W.N. CENTRAL	3	6	153	-	1	-	25	5	233	1	13	33	-	1	-
Minn.	2	-	-	-	-	-	6	-	-	-	-	4	-	-	-
Iowa	-	-	-	-	-	-	-	-	10	-	6	14	-	-	-
Mo.	1	-	132	-	-	-	5	1	34	-	5	5	-	1	-
N. Dak.	-	-	-	-	-	-	-	-	-	-	-	6	-	-	-
S. Dak.	-	-	-	-	-	-	4	-	-	1	1	2	-	-	-
Nebr.	-	-	-	-	-	-	9	1	2	-	-	-	-	-	-
Kans.	-	6	21	-	1	-	1	3	187	-	1	2	-	-	-
S. ATLANTIC	50	1	111	-	7	126	160	13	234	1	39	56	-	1	1
Del.	1	-	-	-	-	-	1	-	-	-	-	3	-	-	-
Md.	11	-	5	-	5	2	27	1	127	-	4	10	-	1	-
D.C.	3	-	-	-	2	-	7	10	45	-	-	-	-	-	-
Va.	8	-	-	-	-	50	21	-	33	-	3	7	-	-	-
W. Va.	1	-	-	-	-	6	6	1	6	1	9	-	-	-	-
N.C.	9	-	103	-	-	1	23	-	7	-	13	21	-	-	-
S.C.	1	-	-	-	-	-	13	1	7	-	-	-	-	-	-
Ga.	3	-	-	-	-	-	24	-	1	-	4	10	-	-	-
Fla.	13	1	3	-	-	67	38	-	8	-	6	5	-	-	1
E.S. CENTRAL	3	-	2	-	-	6	31	3	63	-	22	8	-	-	-
Ky.	-	-	1	-	-	-	19	-	9	-	-	-	-	-	-
Tenn.	-	-	-	-	-	-	2	2	18	-	7	6	-	-	-
Ala.	2	-	1	-	-	-	8	1	5	-	15	-	-	-	-
Miss.	1	-	-	-	-	6	2	N	N	-	-	2	-	-	-
W.S. CENTRAL	14	171	1,352	-	19	9	71	42	543	-	16	29	-	8	3
Ark.	-	-	-	-	-	-	3	1	55	-	4	5	-	-	2
La.	-	3	4	-	-	-	14	20	167	-	4	2	-	3	-
Okla.	1	-	23	-	-	8	6	-	122	-	8	22	-	-	1
Tex.	13	168	1,325	-	19	1	48	21	199	-	-	-	-	5	-
MOUNTAIN	10	-	13	2	9	109	28	3	58	15	224	239	-	2	2
Mont.	-	-	12	-	1	-	1	-	1	-	-	1	-	1	-
Idaho	2	-	-	-	1	-	-	-	5	1	21	208	-	-	-
Wyo.	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
Colo.	1	-	-	-	1	109	10	-	5	-	16	4	-	-	1
N. Mex.	1	-	-	2§	6	-	1	N	N	-	4	2	-	-	-
Ariz.	2	-	1	-	-	-	15	-	40	13	178	13	-	-	-
Utah	-	-	-	-	-	-	1	1	3	1	4	9	-	-	-
Nev.	3	-	-	-	-	-	-	2	4	-	1	1	-	1	1
PACIFIC	115	56	299	-	7	110	366	5	140	1	69	108	1	44	29
Wash.	3	-	-	-	1	-	30	1	11	-	13	21	-	-	-
Oreg.	4	-	-	-	-	1	27	N	N	-	2	1	-	-	-
Calif.	106	56	298	-	3	107	306	4	123	1	52	63	1	41	26
Alaska	2	-	-	-	-	-	2	-	-	-	-	3	-	-	-
Hawaii	-	U	1	U	3	2	1	U	6	U	2	20	U	3	3
Guam	-	U	-	U	-	1	-	U	-	U	-	-	U	-	1
P.R.	-	10	174	-	-	104	2	-	1	-	2	3	1	3	-
V.I.	-	-	-	-	-	-	-	1	4	-	-	-	-	-	-
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 III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending April 8, 1989 and April 9, 1988 (14th Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum. 1989	Cum. 1988	Cum. 1989	Cum. 1989	Cum. 1988	Cum. 1989	Cum. 1989	Cum. 1989	Cum. 1989
UNITED STATES	10,878	9,971	88	4,901	4,783	13	97	25	1,047
NEW ENGLAND	426	283	2	106	83	-	9	-	1
Maine	3	5	2	3	3	-	-	-	-
N.H.	1	2	-	4	-	-	-	-	-
Vt.	-	-	-	1	-	-	-	-	-
Mass.	140	115	-	55	51	-	4	-	-
R.I.	11	11	-	18	7	-	4	-	-
Conn.	271	150	-	25	22	-	1	-	1
MID. ATLANTIC	2,273	1,950	13	1,026	961	1	24	3	145
Upstate N.Y.	206	131	1	73	162	-	2	1	2
N.Y. City	1,139	1,303	1	625	452	-	19	-	-
N.J.	375	218	4	157	169	-	1	-	-
Pa.	553	298	7	171	178	1	2	2	143
E.N. CENTRAL	421	300	16	560	567	1	7	1	17
Ohio	30	29	7	97	104	-	1	1	-
Ind.	17	17	4	40	62	-	1	-	-
Ill.	185	150	-	253	220	-	2	-	2
Mich.	173	96	5	148	146	-	3	-	3
Wis.	16	8	-	22	35	1	-	-	12
W.N. CENTRAL	87	60	20	135	138	3	4	1	101
Minn.	6	6	5	28	24	-	1	-	34
Iowa	13	6	3	26	13	-	2	1	-
Mo.	38	34	3	47	66	3	1	-	8
N. Dak.	1	1	-	3	3	-	-	-	6
S. Dak.	-	-	3	7	13	-	-	-	32
Nebr.	15	7	5	6	4	-	-	-	8
Kans.	14	6	1	18	15	-	-	-	13
S. ATLANTIC	3,935	3,544	9	1,029	1,037	1	7	13	344
Del.	47	46	-	7	11	-	-	-	9
Md.	204	189	-	86	89	-	1	1	86
D.C.	246	161	-	45	48	-	2	-	2
Va.	150	118	1	91	120	1	1	-	75
W. Va.	4	1	-	24	27	-	-	-	21
N.C.	220	224	4	95	52	-	2	11	-
S.C.	202	165	1	100	109	-	-	1	57
Ga.	837	552	2	141	168	-	-	-	56
Fla.	2,025	2,088	1	440	413	-	1	-	38
E.S. CENTRAL	692	527	1	430	403	1	1	2	98
Ky.	18	18	-	115	112	1	1	2	49
Tenn.	253	198	-	96	100	-	-	-	24
Ala.	256	163	1	131	120	-	-	-	25
Miss.	165	148	-	88	71	-	-	-	-
W.S. CENTRAL	1,420	1,089	4	552	560	3	6	1	176
Ark.	103	55	-	70	55	1	-	-	23
La.	317	194	-	61	92	-	1	-	-
Okla.	22	42	2	54	54	2	-	1	25
Tex.	978	798	2	367	359	-	5	-	128
MOUNTAIN	210	194	7	129	117	1	1	1	39
Mont.	-	2	-	4	-	-	-	-	23
Idaho	-	-	1	3	-	-	-	-	-
Wyo.	1	-	-	-	-	-	-	-	5
Colo.	36	28	-	2	19	1	-	1	-
N. Mex.	7	17	1	24	27	-	-	-	8
Ariz.	60	53	4	64	56	-	1	-	2
Utah	8	7	-	14	-	-	-	-	-
Nev.	98	87	1	18	15	-	-	-	1
PACIFIC	1,414	2,024	16	934	917	2	38	3	126
Wash.	52	67	1	53	51	-	-	-	-
Oreg.	84	75	-	33	32	-	-	-	-
Calif.	1,270	1,869	14	794	777	2	37	3	77
Alaska	3	4	-	12	10	-	-	-	49
Hawaii	5	9	1	42	47	-	1	-	-
Guam	-	-	-	-	7	-	-	-	-
P.R.	130	175	-	60	54	-	-	-	13
V.I.	1	1	-	1	3	-	-	-	-
Amer. Samoa	-	-	-	-	3	-	-	-	-
C.N.M.I.	-	1	-	-	6	-	-	-	-

U: Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending April 8, 1989 (14th Week)

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	≥65	45-64	25-44	1-24	<1	Total
NEW ENGLAND	678	477	119	54	7	21	84
Boston, Mass.	185	112	33	26	2	12	36
Bridgeport, Conn.	44	32	9	1	1	1	4
Cambridge, Mass.	30	23	7	-	-	-	4
Fall River, Mass.	33	30	2	1	-	-	2
Hartford, Conn.	62	40	14	6	2	-	4
Lowell, Mass.	26	19	5	2	-	-	3
Lynn, Mass.	17	15	1	1	-	-	1
New Bedford, Mass.	34	31	2	1	-	-	4
New Haven, Conn.	36	26	7	2	-	1	4
Providence, R.I.	54	35	11	3	1	4	3
Somerville, Mass.	7	6	-	1	-	-	-
Springfield, Mass.	42	24	12	5	1	-	9
Waterbury, Conn.	47	37	7	2	-	1	7
Worcester, Mass.	61	47	9	3	-	2	3
MID. ATLANTIC	2,643	1,801	458	258	57	68	164
Albany, N.Y.	63	41	10	5	1	6	2
Allentown, Pa.	25	23	-	2	-	-	-
Buffalo, N.Y.	120	83	24	8	3	2	12
Camden, N.J.	43	30	11	-	2	-	1
Elizabeth, N.J.	25	16	7	1	1	-	2
Erie, Pa.†	39	35	2	1	-	1	3
Jersey City, N.J.	75	57	10	5	1	2	1
N.Y. City, N.Y.	1,400	919	230	186	34	31	65
Newark, N.J.	87	38	21	16	3	9	7
Paterson, N.J.	30	22	4	2	-	2	6
Philadelphia, Pa.	295	207	59	14	7	8	23
Pittsburgh, Pa.†	31	24	3	1	1	2	1
Reading, Pa.	28	22	4	1	1	-	6
Rochester, N.Y.	128	96	25	6	-	1	15
Schenectady, N.Y.	26	24	2	-	-	-	2
Scranton, Pa.†	28	22	5	1	-	-	2
Syracuse, N.Y.	110	75	24	5	2	3	7
Trenton, N.J.	30	20	7	3	-	-	4
Utica, N.Y.	25	21	3	1	-	-	1
Yonkers, N.Y.	35	26	7	-	1	1	4
E.N. CENTRAL	2,268	1,514	475	160	46	72	101
Akron, Ohio	44	33	8	1	1	1	-
Canton, Ohio	52	42	7	2	1	-	3
Chicago, Ill.§	564	362	125	45	10	22	16
Cincinnati, Ohio	120	82	22	8	2	6	13
Cleveland, Ohio	175	109	36	18	6	6	4
Columbus, Ohio	134	91	26	7	4	5	1
Dayton, Ohio	116	81	21	9	3	2	10
Detroit, Mich.	239	138	59	25	8	9	7
Evansville, Ind.	50	41	6	2	-	1	3
Fort Wayne, Ind.	53	35	10	3	1	4	2
Gary, Ind.	11	6	3	2	-	-	2
Grand Rapids, Mich.	93	65	22	2	2	2	2
Indianapolis, Ind.	179	107	48	15	2	7	4
Madison, Wis.	32	22	6	2	2	-	1
Milwaukee, Wis.	128	91	29	6	-	2	7
Peoria, Ill.	39	28	6	3	1	1	3
Rockford, Ill.	55	39	10	3	1	2	10
South Bend, Ind.	34	25	7	2	-	-	3
Toledo, Ohio	97	72	19	3	2	1	6
Youngstown, Ohio	53	45	5	2	-	1	4
W.N. CENTRAL	736	530	128	41	22	15	55
Des Moines, Iowa	72	47	16	3	5	1	5
Duluth, Minn.	24	21	2	1	-	-	2
Kansas City, Kans.	29	18	7	1	1	2	3
Kansas City, Mo.	112	78	19	9	5	1	14
Lincoln, Nebr.	37	25	6	2	3	1	4
Minneapolis, Minn.	160	115	32	9	-	4	13
Omaha, Nebr.	83	63	12	3	2	3	5
St. Louis, Mo.	144	112	18	8	6	-	9
St. Paul, Minn.	57	37	12	5	-	3	-
Wichita, Kans.§	18	14	4	-	-	-	-

Reporting Area	All Causes, By Age (Years)						P&I**
	All Ages	≥65	45-64	25-44	1-24	<1	Total
S. ATLANTIC	1,288	799	273	128	52	36	77
Atlanta, Ga.	193	102	52	21	7	11	10
Baltimore, Md.	194	128	42	19	5	-	20
Charlotte, N.C.	67	40	13	9	3	2	3
Jacksonville, Fla.	110	73	19	9	6	3	4
Miami, Fla.	85	46	24	12	3	-	1
Norfolk, Va.	66	44	8	6	6	2	6
Richmond, Va.	87	54	20	10	1	2	7
Savannah, Ga.	52	33	13	4	1	1	5
St. Petersburg, Fla.	85	70	10	3	-	2	2
Tampa, Fla.	110	70	19	11	6	4	11
Washington, D.C.	202	108	50	22	13	9	8
Wilmington, Del.	37	31	3	2	1	-	-
E.S. CENTRAL	855	571	179	62	23	20	83
Birmingham, Ala.	139	91	20	13	7	8	3
Chattanooga, Tenn.	65	50	9	4	1	1	12
Knoxville, Tenn.	104	71	23	6	2	2	13
Louisville, Ky.	78	47	21	6	2	2	8
Memphis, Tenn.	219	148	50	14	5	2	26
Mobile, Ala.	72	51	14	5	2	-	8
Montgomery, Ala.	34	24	6	4	-	-	2
Nashville, Tenn.	144	89	36	10	4	5	11
W.S. CENTRAL	1,772	1,101	372	183	58	57	83
Austin, Tex.	55	38	9	6	-	2	2
Baton Rouge, La.	34	18	7	5	3	1	-
Corpus Christi, Tex.§	48	35	10	2	-	1	1
Dallas, Tex.	137	78	35	12	7	5	6
El Paso, Tex.	92	54	24	9	1	4	12
Fort Worth, Tex	108	71	18	9	5	5	10
Houston, Tex.§	734	436	169	89	24	16	18
Little Rock, Ark.	75	51	9	4	5	5	7
New Orleans, La.§	135	82	26	17	7	3	-
San Antonio, Tex.	168	101	41	16	4	6	15
Shreveport, La.	72	57	6	7	1	1	7
Tulsa, Okla.	114	80	18	7	1	8	5
MOUNTAIN	715	481	126	60	24	24	41
Albuquerque, N. Mex.	94	69	15	5	3	2	4
Colo. Springs, Colo.	48	33	9	2	3	1	7
Denver, Colo.	89	61	13	10	3	2	6
Las Vegas, Nev.	92	57	22	7	5	1	10
Ogden, Utah	23	16	5	1	-	1	-
Phoenix, Ariz.	174	100	32	22	8	12	4
Pueblo, Colo.	10	10	-	-	-	-	2
Salt Lake City, Utah	55	34	9	6	1	5	-
Tucson, Ariz.§	130	101	21	7	1	-	8
PACIFIC	1,891	1,259	332	176	59	51	115
Berkeley, Calif.	22	14	6	2	-	-	1
Fresno, Calif.	57	38	10	5	2	2	3
Glendale, Calif.	22	18	-	3	1	-	3
Honolulu, Hawaii	86	56	17	4	3	6	5
Long Beach, Calif.	79	48	19	4	5	3	9
Los Angeles Calif.	434	270	80	50	14	6	16
Oakland, Calif.§	95	61	19	9	3	3	5
Pasadena, Calif.	41	28	4	4	1	4	3
Portland, Oreg.	181	135	23	15	4	4	10
Sacramento, Calif.	138	93	28	10	4	3	16
San Diego, Calif.	147	92	25	17	8	5	15
San Francisco, Calif.	170	106	29	27	3	5	8
San Jose, Calif.	155	110	28	10	5	2	10
Seattle, Wash.	149	102	26	12	4	5	3
Spokane, Wash.	74	56	10	3	2	3	6
Tacoma, Wash.	41	32	8	1	-	-	2
TOTAL	12,846††	8,533	2,462	1,122	348	364	803

*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 available 4 weeks.

TB and HIV – Continued

so that the diagnosis is not overlooked. Failure to diagnose and manage TB appropriately can result in the death of the patient and infection of contacts, including other patients and health-care personnel.

To establish the diagnosis, a variety of specimens, including respiratory secretions, bronchial washings, gastric lavage, lung tissue, pleural fluid, lymph node tissue, bone marrow, blood, urine, stool, brain biopsy, and cerebrospinal fluid, may need to be obtained for mycobacterial culture. Specimens must be examined microscopically, but the inability to demonstrate acid-fast bacilli and the absence of granuloma formation does not exclude the diagnosis of TB (*4,19*).

A Mantoux tuberculin skin test with 5 tuberculin units (TU) of tuberculin purified protein derivative (PPD) should be administered as a diagnostic aid, although some persons with HIV infection may have falsely negative reactions because of immunosuppression (*2,3*). The severity of immunosuppression and the development of AIDS is related to the duration of HIV infection. Furthermore, the proportion of HIV-infected persons with TB who have negative tuberculin skin test reactions is related to the length of time between the diagnoses of TB and AIDS. In Florida, the proportion of TB patients with positive tuberculin skin tests progressively decreased with decreasing time between the two diagnoses. All five patients in whom TB was diagnosed ≥2 years before the diagnosis of AIDS had positive reactions when TB was diagnosed, 27 (63%) of 43 who had TB diagnosed 1–24 months before the AIDS diagnosis had positive reactions, and seven (33%) of 21 in whom TB was diagnosed simultaneously with or after AIDS had positive tuberculin reactions (CDC/Florida Department of Health and Rehabilitative Services, unpublished data). In New York City, of 23 AIDS patients known to have developed TB and for whom information on the size of the tuberculin reaction was available, seven had no induration, one had a 1–4-mm induration, two had a 5–9-mm induration, and 13 had a ≥10-mm induration (CDC/New York City Department of Health, unpublished data). Because HIV infection causes immunosuppression and the risk for TB is high in persons with both tuberculous and HIV infection, *as a general guideline, tuberculin reactions of >5-mm induration should be considered indicative of tuberculous infection in an HIV-infected person.*

TREATMENT

Anti-TB chemotherapy as described below should be started whenever acid-fast bacilli are seen in a specimen from the respiratory tract of a person with HIV infection or from a person at increased risk for HIV infection whose HIV-antibody status is unknown and who declines to be tested. Because it is impossible to distinguish TB from MAC disease by any criterion other than culture (which often takes several weeks), and because of the individual and public health implications of TB, it is important to treat such patients with a regimen that is effective against *M. tuberculosis.* As a general rule, persons with TB and HIV infection respond well to standard anti-TB drugs (*2,4,19*), but data on clinical and bacteriologic response in these patients are limited. Longitudinal studies will help clarify the long-term outcome of these patients.

To achieve cure, the treatment period may need to be longer than the standard regimens used for TB patients without HIV infection. When HIV infection is known or suspected, the recommended drugs and dosages for adults are isoniazid, 300 mg/day, and rifampin, 600 mg/day (or 450 mg for patients weighing ≤50 kg), and pyrazinamide, 20–30 mg/kg/day, during the first 2 months of therapy. Patients treated with

TB and HIV — Continued

rifampin who are on methadone should have the methadone dosage increased to avoid withdrawal symptoms resulting from the interaction between the two drugs (*25*). Ethambutol, 25 mg/kg/day, should be added to the initial treatment regimen for patients with CNS or disseminated TB or when isoniazid resistance is suspected. The continuation phase should always include at least isoniazid and rifampin. Drug susceptibility tests should be performed routinely, and the treatment regimen should be revised accordingly if resistance to any of the drugs in the regimen is found. *Treatment should be continued for a minimum of 9 months and for at least 6 months beyond documented culture conversion as evidenced by three negative cultures.* In the absence of definitive data on benefits and risks, some experts suggest that, in persons with concomitant tuberculous and HIV infections, isoniazid therapy should be continued for the person's lifetime (*26*). If either isoniazid or rifampin is not or cannot be included in the regimen, therapy should last a minimum of 18 months and for at least 12 months after culture conversion. After completion of therapy, patients should be followed closely, and bacteriologic examinations should be repeated if signs of TB recur.

Compliance with therapy is sometimes poor. Supervised, directly administered ambulatory therapy is successful in noncompliant patients (*27*) and should be initiated if noncompliance is anticipated or suspected.

Monitoring for symptoms of toxicity to anti-TB drugs may be difficult in persons with AIDS, who frequently have similar symptoms due to HIV infection, other drugs, or other conditions. At least one study has reported a higher incidence of adverse reactions to anti-TB drugs in AIDS patients (*28*).

CONTACT INVESTIGATION

Persons with pulmonary TB, including those with AIDS or HIV infection, are potentially infectious until a satisfactory clinical and bacteriologic response to therapy is achieved. All cases must be reported immediately to the local health department so that standard procedures for TB contact investigation can be followed (*29*).

In one investigation carried out by the New York City Department of Health, prevalence of tuberculin positivity (21%) among contacts of pulmonary TB patients who also had, or later developed, AIDS was not substantially different from that among contacts of comparable pulmonary TB patients with no diagnosis of AIDS (30%) (CDC/New York City Department of Health, unpublished data). It is not known how much of this high cumulative prevalence of infection represents transmission by these index patients and how much represents prior background prevalence, but these data indicate that TB patients with HIV infection must be considered potential transmitters of *M. tuberculosis*.

INFECTION CONTROL

Published recommendations for preventing transmission of HIV infection and tuberculous infection to health-care workers should be followed (*30–34*). Because health-care workers' risk of exposure to blood during tuberculin skin testing or injecting medication is low, wearing gloves during these procedures to prevent HIV transmission is not routinely recommended. However, used needles should not be recapped and should be disposed of according to published guidelines (*31*). Recommendations for glove use during drawing of blood (e.g., for liver-function testing) have been published (*31*); whether to use gloves routinely during phlebotomy requires consideration of several factors.

TB and HIV – Continued

TB should be considered in the differential diagnosis of persons with HIV infection and unexplained pulmonary symptoms, and appropriate precautions should be followed. These precautions, termed AFB isolation, are most important during and immediately after procedures that may induce coughing, such as bronchoscopy, sputum collection, aerosol induction of sputum, and administration of aerosolized medications, such as pentamidine. In clinical situations where airborne exposure of staff or other patients is likely, such procedures should be carried out in rooms or booths with negative air pressure in relation to adjacent rooms or hallways and with air exhausted directly to the outside and away from intake sources. The number of air exchanges per hour in the room or booth should be sufficient to remove infectious organisms during the time between patients. Ultraviolet lights are also useful in killing airborne tubercle bacilli (*33,34*). Special care should be taken to prevent inhalation of tubercle bacilli by HIV-infected persons.

Home health-care workers, hospice volunteers, paramedics, and others who care for persons with AIDS in areas where tuberculous infection is also prevalent should be aware of the symptoms of TB, the airborne nature of its transmission, and the appropriate precautions for their particular setting. Workers who have regular contact with TB patients should participate in a TB screening program (*29,33*). Consultation on methods to reduce transmission of TB is available from state and local health department TB-control programs.

EXAMINING PERSONS WITH TB OR TUBERCULOUS INFECTION FOR HIV INFECTION

All persons with TB or tuberculous infection need to be assessed for HIV infection because the medical management of TB and tuberculous infection must be altered in the presence of HIV infection. TB patients who are infected with HIV may also develop *Pneumocystis carinii* pneumonia, cytomegalovirus pneumonitis, and other pulmonary manifestions of HIV infection as their immunosuppression progresses. Assessing these patients' responses to anti-TB therapy and evaluating new infiltrates may be especially difficult. Because the differential diagnosis and medical management of pulmonary infiltrates varies greatly between normal and immunosuppressed persons, knowledge of patients' HIV status is crucial for appropriate medical management. Providing these persons with the benefits of HIV education and counseling and providing the opportunity for HIV testing may enhance HIV prevention and control efforts. All persons with TB or tuberculous infection can benefit from receiving information about reducing their risk of acquiring or transmitting HIV infection. TB patients who are infected with HIV will also benefit by being monitored for early diagnosis of opportunistic infections and other manifestations of HIV infection. Previously published guidelines for counseling and testing and notification of sex partners and those who share needles with HIV-infected persons should be followed (*35*).

All patients diagnosed with TB should be offered counseling and HIV-antibody testing. Particular emphasis should be placed on offering counseling and HIV-antibody testing to persons with extrapulmonary TB and persons with TB in the age groups in which most HIV infections have been found. Although there are probably some geographic areas and population groups in which most persons with TB are not likely to have HIV infection, data on the prevalence of HIV infection among TB patients in the United States are too limited to be useful in defining such populations. Furthermore, even if such data were available, there is no assurance that these populations will remain free of HIV infection in the future. Monitoring the prevalence

TB and HIV — Continued

of HIV infection among persons with TB is one method for detecting the spread of HIV infection into new areas and population groups and of assuring the appropriate management of TB in the HIV-infected patient.

While the occurrence of clinical TB may be an indication of immunosuppression related to HIV infection, the presence of a positive tuberculin skin test in a person without clinical manifestations of disease does *not* imply a higher likelihood of HIV infection. Nevertheless, *behaviors* that are associated with an increased risk or prevalence of HIV infection should be routinely sought in persons with positive tuberculin skin test reactions. If HIV infection is considered a possibility, counseling and HIV-antibody testing should be strongly encouraged.* Because HIV infection is one of the strongest known risk factors for the progression of latent tuberculous infection to TB, *the presence of HIV infection in a person with a positive tuberculin skin test is an indication for preventive therapy regardless of that person's age.* Preventive therapy should be started only after excluding active pulmonary or extrapulmonary TB.

Persons with positive skin test reactions and factors that put them at high risk for HIV infection who decline to be tested for HIV antibody should also be considered at increased risk for developing TB. At this time, isoniazid preventive therapy should be considered for such persons on an individual basis. However, as more data become available on the prevalence of HIV infection among various population groups in different geographic areas, more definitive recommendations may be issued. Such persons should be followed closely; the patients' ability and willingness to participate in the follow-up are factors that influence the decision to provide isoniazid preventive therapy.

Some HIV-infected persons and persons who decline testing but are at high risk for HIV infection might be considered at increased risk of developing TB even if their tuberculin skin tests are negative. Thus, preventive therapy might be considered for those persons with clinical or laboratory evidence of severe immunosuppression who are from developing countries where the prevalence of tuberculous infection is very high, who have a history of close contact with an infected person, who previously have had a positive tuberculin skin test reaction, or who have a radiographic abnormality consistent with past TB.

EXAMINING HIV-INFECTED PERSONS (AND PERSONS AT RISK FOR HIV INFECTION) FOR THE PRESENCE OF TB AND TUBERCULOUS INFECTION

HIV-infected persons, with or without AIDS or other HIV-related disease, should be given a Mantoux skin test with 5 TU tuberculin, PPD. Although false-negative results may occur in these persons because of HIV-induced immunosuppression, positive tuberculin reactions are clinically meaningful. If the skin test reaction shows ≥5-mm induration, a chest radiograph should be obtained, and the patient should be

*Based on seroprevalence studies, behaviors that place a person at risk for HIV infection include IV-drug use and male homosexual contact. Other factors that increase the risk for HIV infection in adults include having received blood or clotting factor concentrate between 1978 and 1985 and having had sexual relations at any time since 1978 with 1) a person known to be infected with HIV or to have AIDS, 2) a man who has had sexual contact with another man, 3) prostitutes, 4) IVDUs, or 5) persons born in countries where most transmission of HIV is thought to occur through heterosexual sexual contact. Risk factors for HIV infection in infants and children include 1) parents, especially the mother, with HIV infection or any of the adult risk factors, and 2) receipt of blood or clotting factor concentrates between 1978 and 1985.

TB and HIV — Continued

examined for evidence of extrapulmonary TB. If abnormalities are noted, additional diagnostic studies for TB should be undertaken. Persons with clinical AIDS or other HIV-related disease should receive a chest radiograph and be examined for evidence of extrapulmonary TB, regardless of the skin test reaction.

Some population groups may have a substantially higher prevalence of HIV infection than the total population (e.g., clients in drug-treatment programs and inmates of correctional institutions). Health-care providers should routinely provide tuberculin skin testing for persons in these settings even if counseling and HIV-antibody testing are not routinely offered or such testing is refused.

PREVENTIVE THERAPY FOR TUBERCULOUS INFECTION

Because preventive therapy with isoniazid reduces the incidence of TB in a variety of populations with tuberculous infection, any person, regardless of age, who is HIV-infected and who has a positive tuberculin skin test reaction (≥5-mm induration) should be offered isoniazid preventive therapy unless it is medically contraindicated. The recommended duration is a minimum of 12 months, but, analogous to considerations for the treatment of TB in AIDS patients (*26*), some experts have suggested prolongation of isoniazid preventive therapy beyond 12 months. Although it is not known whether isoniazid prevents TB in HIV-infected persons as effectively as in other groups, the usually positive response to standard chemotherapy in HIV-infected persons with TB suggests that isoniazid preventive therapy would also be effective.

Because of the particularly high risk for TB in persons with both HIV and tuberculous infection, ensuring completion of at least 12 months of preventive therapy is crucial.

PREVENTION AND CONTROL OF TB IN DRUG-TREATMENT PROGRAMS FOR IVDUs

IVDUs require special consideration because they are at high risk for tuberculous as well as HIV infection. Tuberculin skin test surveys among heroin addicts in New York City showed that the prevalence of tuberculous infection in this population was considerably higher than in the city-wide population, even after adjustment for age, race, and economic status (*36*). Even before the HIV epidemic, opiate-dependent patients in New York City had a higher prevalence of TB than did nondependent patients (*37*).

HIV infection among IVDUs is responsible for much of the HIV-associated increase in TB in New York City and New Jersey (*4,9*). Matching TB and AIDS registries in New York City revealed that 57% of the patients with both TB and AIDS were IVDUs (*9*).

Isoniazid preventive therapy for tuberculin-positive IVDUs provides an opportunity to prevent many TB cases, especially in the setting of drug-treatment programs, where compliance issues can be addressed. Federal regulations require tuberculin skin testing of IVDUs before admission to a treatment program (*38*). The recommended technique is the intradermal (Mantoux) test with 5 TU tuberculin PPD. Given the substantial risk for TB in this group and the potential for its prevention, drug-treatment programs should perform a skin test and record the diameter of induration on each new enrollee and on others already enrolled who have not been previously tested. Persons with a tuberculin skin test of ≥5-mm induration should be further evaluated for clinical TB and, if disease is present, treated according to current guidelines. Counseling and HIV-antibody testing should be carried out for all consenting persons with ≥5-mm induration on their tuberculin skin test, all persons with a past or present history of IV-drug use, and their sex partners (*35*).

TB and HIV — Continued

If there is no clinical, radiographic, or laboratory evidence of TB, isoniazid preventive therapy should be recommended for all HIV-infected persons regardless of age with a tuberculin reaction of ≥5-mm induration. *Isoniazid preventive therapy should also be recommended for all other IVDUs with a tuberculin reaction of >10-mm induration regardless of age.* The rationale for this recommendation is based on epidemiologic studies of HIV seroprevalence among IVDUs. Although in some geographic areas the seroprevalence of HIV is still low in IVDUs, this should not be considered a stable situation. Studies of previously collected blood samples from IVDUs indicate the potential for very rapid spread of the virus within the group. The prevalence of HIV infection among IVDUs in Manhattan, Edinburgh (Scotland), and Italy had increased to 40% 3–4 years after the virus was first introduced into the group (*39*). Consequently, TB and HIV prevention programs are urgently needed for IVDUs, even in areas where the current HIV seroprevalence is very low. To ensure compliance, isoniazid therapy should preferably be fully supervised and administered (daily or on a twice-weekly basis) by the drug-treatment program staff, if possible at the same time the person is seen for treatment of IV-drug abuse. Patients who discontinue treatment before completing at least 6 months of uninterrupted preventive therapy should be restarted on preventive therapy after reenrollment into the treatment program. Drug-treatment programs should work closely with health department TB programs in their jurisdictions for assistance in carrying out these screening and prevention recommendations.

BCG VACCINATION OF HIV-INFECTED PERSONS

The benefits and risks of BCG vaccination of HIV-infected persons remain largely undocumented. However, disseminated *M. bovis* (BCG) disease was reported in one person with AIDS and Kaposi's sarcoma who was given a BCG vaccination, presumably to "stimulate" his immune system (*40*). The ACET agrees with the recommendation of the World Health Organization that BCG should not be administered to persons with HIV infection in countries where the risk of infection is low, such as in the United States (*41*).

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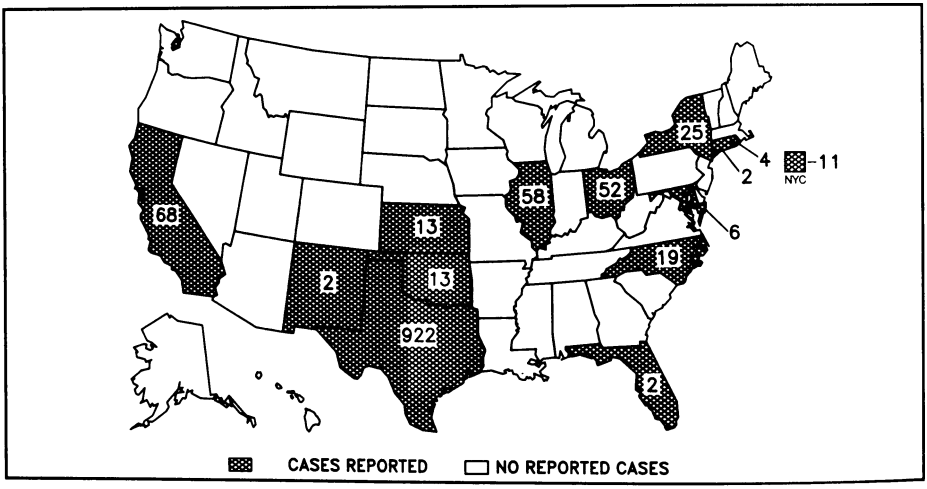
FIGURE I. Reported measles cases — United States, Weeks 10–13, 1989



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