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Epidemiologic Notes and Reports

Antibody to Human Immunodeficiency Virus in Female Prostitutes

Seroprevalence surveys for antibody to human immunodeficiency virus (HIV) in women with histories of prostitution have shown varying results since testing began in 1984. In sub-Saharan Africa, where HIV is thought to be transmitted primarily through heterosexual exposure (*1-3*), one (1%) of 98 prostitutes tested in Accra, Ghana (*4*), to 29 (88%) of 33 prostitutes in Ngoma, Rwanda (*5*), had HIV antibody (*3-7*). In Europe, where homosexual exposure and abuse of intravenous (IV) drugs are major risk factors for HIV infection (*8*), none of 50 prostitutes tested in London (*9*), none of 56 in Paris (*10*), and none of 399 in Nuremberg, West Germany (*11*), had antibody to HIV. However, 10 (71%) of 14 prostitutes who abused IV drugs in Pordenone, Italy (*12*), and 14 (78%) of 18 who abused IV drugs in Zurich, Switzerland (*13*), were infected. Seventeen (1%) of nearly 2,000 registered prostitutes in six West German cities were HIV-antibody positive; half of these infected women abused IV drugs (*14*). In Athens, Greece, 12 (6%) of 200 registered prostitutes were HIV-antibody positive; none abused IV drugs (*15*).

As of March 10, 1987, 2,159 women in the United States were reported to have met the CDC surveillance case definition for AIDS. The cumulative incidence of AIDS in black and Hispanic women was more than 10 times that for white women (*16*). Over 70% of these women reported with AIDS resided in New York, New Jersey, or Florida (*17*). Over half (51%) had abused IV drugs; 27% were sexual partners of men with AIDS or at risk for AIDS; and 10% had received transfusions of blood or blood products. No risk factors have as yet been reported for the remaining 12% (*18*).

To assess HIV-antibody prevalence and determine risk factors in U.S. prostitutes, CDC is collaborating with others in an ongoing, cross-sectional study of women who have engaged in prostitution in seven geographic areas: Atlanta, Colorado Springs, Las Vegas, Los Angeles, Miami, Newark-Jersey City-Paterson, and San Francisco. Some collaborators are recruiting primarily incarcerated women (Los Angeles and Miami). Others are recruiting primarily through sexually transmitted disease (STD) clinics (Colorado Springs and Las Vegas); methadone maintenance clinics (the three northern New Jersey cities); or outreach efforts, such as newspaper advertising, circulation of pamphlets, and direct contacts on the street (Atlanta and San Francisco). Study participants are not necessarily representative of all female prostitutes in these areas.

Antibody to HIV — Continued

For this study, prostitution is defined as the exchange of physical-sexual services for money or drugs. Any woman ≥18 years of age who has engaged in prostitution at least once since January 1, 1978, is eligible. Participation entails voluntary, informed consent; names and other personal identifiers are not recorded. Participants are interviewed for their medical histories and sexual and other exposures. They are also examined for signs of HIV infection and IV-drug abuse and are asked to provide 10 ml of blood for serologic testing. Serum is tested for HIV antibody by enzyme immunoassay and Western blot methods.

The analysis reported here has been restricted to the 835 study participants who were tested for HIV antibody and the 568 study participants for whom an interview form was submitted to CDC before March 10, 1987. The prevalence of HIV antibody in prostitutes so far tends to parallel the cumulative incidence of AIDS in women in the seven research sites (Table 1), suggesting that risk factors for AIDS in female prostitutes may be similar to those in other women living in these geographic areas. The prevalence of HIV antibody in prostitutes and the cumulative incidence of AIDS in women are highest in northern New Jersey and Miami. In southern Nevada, where only one woman has been reported with AIDS, none of 34 prostitutes have had HIV antibody.

In the seven areas, reported rates of AIDS were higher for black women (359.6/1,000,000) and Hispanic women (40.2/1,000,000) than for white (25.3/1,000,000) and other (Asian and Native American) women (16.2/1,000,000). Similarly, black and Hispanic prostitutes in these areas had a higher prevalence of HIV antibody (15%) than white and other prostitutes (7%) (odds ratio [OR] = 2.5; 95% confidence interval [CI] = 1.4-4.4).

Half the prostitutes interviewed in this multicenter collaborative study gave histories of IV-drug abuse; 47 (76%) of 62 with antibody to HIV have injected drugs (OR = 3.6; 95% CI = 2.0-6.7). IV-drug abuse is associated with HIV infection in prostitutes and with AIDS in women regardless of racial and ethnic background (Table 2).

Over 80% of prostitutes interviewed through January 1987 reported that at least one of their partners had used a condom. Husbands or boyfriends of the respondents were much less likely to use condoms during vaginal exposure than clients (16% as compared with 78%, p = 0.005). Twenty-two (4%) prostitutes reported condom use with each vaginal exposure

TABLE 1. HIV antibody in female prostitutes and reported AIDS cases in women — selected cities, United States, March 10, 1987

	Female prostitutes		Women with AIDS*	
	HIV-antibody positive/tested	Percent positive	No.	Cases/ 1,000,000†
Eastern United States				
Atlanta	1/92	(1.1)	8	12.5
Miami	47/252	(18.7)	100	145.3
Newark-Jersey City-Paterson	32/56	(57.1)	143	526.2
Western United States				
Colorado Springs	1/71	(1.4)	1	9.6
Las Vegas	0/34	(0.0)	1	16.0
Los Angeles	8/184	(4.3)	26	21.7
San Francisco	9/146	(6.2)	21	71.9

*Includes 45 women (≥16 years of age) from Miami and one from Newark who were born in countries where heterosexual transmission is believed to play a major role.

†Rate based on the number of females (≥16 years of age) reported as residing in the urban area or place of study (*26*).

Antibody to HIV — Continued

during the past 5 years. Eleven percent of 546 prostitutes with unprotected vaginal exposure were HIV-antibody positive; none of 22 prostitutes whose partners always used condoms were seropositive (p = 0.10 after controlling for IV-drug abuse).

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Editorial Note: The collaborative study reported here was designed to determine the prevalence of HIV infection in female prostitutes in selected U.S. cities and the risk factors for infection in these women. Seroprevalence in study participants so far has varied widely from city to city and tends to parallel the cumulative incidence of AIDS in women in these areas. The major risk factor for HIV infection in prostitutes appears to be IV-drug abuse. Women with unprotected vaginal exposures also appear to be at greater risk than those whose male partners always used condoms. When used properly and consistently with each sexual exposure, latex condoms should greatly reduce the sexual transmission of HIV (*7,11,19*).

Efforts to stop the spread of HIV infection in prostitutes and to their sexual partners require multiple approaches. These might include counseling and HIV-testing programs for individuals at risk for infection, additional control measures by local public health and law enforcement agencies, and the involvement of voluntary and other social service organizations.

Persons who continue to engage in prostitution remain at risk for acquiring and transmitting HIV. Prostitutes and their consorts should be provided counseling services and voluntary testing for HIV antibody (*20-22*). Seronegative persons who continue to engage in prostitution should insist on the use of condoms to reduce their own chances of infection. Seropositive prostitutes should know that the only certain way of preventing sexual transmission of the virus is to abstain and not engage in prostitution. Seropositive persons who continue to engage in prostitution should insist on the use of condoms to prevent transmission of the

TABLE 2. Risk factors for HIV antibody in female prostitutes and for AIDS in women, by race or ethnic group — selected cities, United States, March 10, 1987

	Female prostitutes*		Women with AIDS†	
	HIV-antibody positive/tested	Percent positive	No.	Percent of total
Black or Hispanic				
IV-drug abuser	31/124	(25.0)	108	(43.0)
Other, unknown	12/156§	(7.7)	143	(57.0)
Total	43/280	(15.4)	251	(100.0)
White or other				
IV-drug abuser	16/157	(10.2)	26	(53.1)
Other, unknown	3/127¶	(2.4)	23	(46.9)
Total	19/284	(6.7)	49	(100.0)

*Analysis restricted to the 564 study participants (of 835 tested) who answered the question regarding IV-drug abuse.

†Includes 46 women who were born in countries where heterosexual transmission is believed to play a major role, who were reported to CDC as meeting the surveillance case definition for AIDS, and who were residents of one of the seven research sites.

§Odds ratio = 4.0; 95% confidence interval = 2.0-8.2.

¶Odds ratio = 4.7; 95% confidence interval = 1.3-16.5.

Antibody to HIV — Continued

virus to others. IV-drug abusers should be offered treatment for their addictions and warned not to share needles or syringes.

State and local governments are approaching the problem of HIV infection in prostitutes in a variety of ways. Since March 1986, the Nevada Board of Health has required prostitutes in county-licensed brothels to be tested for HIV antibody as a condition for employment and monthly thereafter. If a woman is seropositive, she is denied employment as a prostitute. Since October 1986, Florida has required convicted prostitutes to be tested for STDs, including HIV. It is a misdemeanor in Florida for anyone who has tested positive for HIV and has been informed of the result to engage in prostitution. In Atlanta, the Mayor's Task Force on Prostitution has recommended educational materials for prostitutes, clients, and law-enforcement officers as well as voluntary testing for STDs (including assays for HIV antibody) for everyone arrested for sexual offenses and their steady partners.

Traditionally, medical care, therapy for drug addiction, welfare benefits, and vocational rehabilitation have not been routinely offered to women apprehended for prostitution (*23-25*). Now some organizations are introducing innovative approaches to male, as well as female, prostitutes. The California Prostitutes Education Project attempts to warn prostitutes about the dangers of unprotected exposures and provides educational sessions on how to prevent infection. Children of the Night (Los Angeles), Covenant House (New York City), Orion House (Seattle), and other social-service organizations offer counseling and sanctuary to homeless adolescents, including those involved in prostitution. State and local health departments often work closely with these organizations to provide voluntary testing and treatment for STDs.

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Disseminated Gonorrhea Caused by Penicillinase-Producing *Neisseria gonorrhoeae* — Wisconsin, Pennsylvania

During the period August-September 1986, CDC received four reports of disseminated gonococcal infection (DGI) caused by penicillinase-producing *Neisseria gonorrhoeae* (PPNG).

Cases 1 and 2: A 28-year-old woman (Patient 1) was admitted to a Racine hospital on August 4, 1986, with a 1-week history of arthritis of the left knee with effusion. Synovial and cervical cultures were both positive for PPNG. She was treated for 2 days with intravenous penicillin. When the culture results became known, her therapy was changed to ceftriaxone, 500 mg once daily. Despite the change in therapy, the knee remained swollen. Even though the dosage of ceftriaxone was increased to 1 g every 12 hours, the knee had to be surgically drained on August 14. The woman recovered rapidly and was discharged 1 week later.

The index patient's only recent sexual partner (Patient 2) was examined on August 8. He had had urethritis for 1 week and a swollen, painful left wrist for 2 weeks. Nine days earlier, he had been treated for the wrist symptoms with a non-steroidal, anti-inflammatory agent. Upon examination, the patient had purulent urethritis and a tender, slightly swollen wrist. Urethral culture was positive for PPNG. The wrist was not cultured. He was treated intramuscularly with 2 g of spectinomycin and recovered completely.

Case 3: A 20-year-old woman seen in an emergency room in Philadelphia had had wrist pain for 1 week and pain in the right knee, left ankle, and the dorsum of the left hand for 3 days. On physical examination, she was febrile, had tenosynovitis of the extensor tendons of the left hand, and had effusion of the right knee and ankle. Arthrocentesis of the knee yielded purulent fluid which grew PPNG. A cervical culture was also positive for PPNG. Initially, she was treated intravenously with penicillin; therapy was changed to cefotaxime when culture results became available. She recovered completely.

Case 4: A 52-year-old woman seen in a Philadelphia emergency room had had pain in the right wrist and third finger of the left hand for 2 days. She was febrile, and the right wrist and proximal interphalangeal joint of the left third finger were swollen and tender. Arthrocentesis of the wrist yielded purulent fluid that grew PPNG. She was treated intravenously with penicillin. Therapy was changed to intravenous ceftriaxone when culture results became available. She recovered completely.

Neisseria gonorrhoeae — *Continued*

Antibiotic-susceptibility testing, auxotype, protein I serovar determination, and plasmid analysis of isolates from all patients were performed at CDC. All isolates were resistant to penicillin (minimum inhibitory concentration [MIC] 1-8 μg/ml), and all demonstrated moderate chromosomally mediated resistance to tetracycline (MIC range: 0.5-4.0 μg/ml) and to cefoxitin (MIC range: 0.5-2.0 μg/ml). All were sensitive to spectinomycin and ceftriaxone. All isolates were auxotype/serovar class Pro^-/IA-6, and all contained the 2.6 megaDalton (mDal) cryptic plasmid, the 3.2 mDal β-lactamase plasmid, and the 24.5 mDal conjugative plasmid. Despite the similarity of the isolates, suggestive of a clonal origin, no linkage could be demonstrated between the two Philadelphia patients or between either Philadelphia patient and the Wisconsin patients.

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

Disease	11th Week Ending			Cumulative, 11th Week Ending		
	Mar. 21, 1987	Mar. 15, 1986	Median 1982-1986	Mar. 21, 1987	Mar. 15, 1986	Median 1982-1986
Acquired Immunodeficiency Syndrome (AIDS)	332	352	N	4,107*	2,463*	N
Aseptic meningitis	95	89	89	920	914	875
Encephalitis: Primary (arthropod-borne & unspec)	16	24	24	152	184	184
Post-infectious	-	4	2	5	16	16
Gonorrhea: Civilian	13,642	15,732	16,470	171,752	173,722	173,722
Military	426	365	365	3,704	3,375	4,721
Hepatitis: Type A	562	452	452	5,085	4,828	4,828
Type B	576	513	508	4,996	5,018	4,956
Non A, Non B	62	77	N	575	669	N
Unspecified	71	107	161	696	1,114	1,114
Legionellosis	20	9	N	127	118	N
Leprosy	2	12	3	45	58	53
Malaria	9	12	12	134	141	139
Measles: Total†	57	249	81	473	860	289
Indigenous	49	245	N	386	821	N
Imported	8	3	N	87	36	N
Meningococcal infections: Total	74	75	75	812	708	708
Civilian	74	75	75	811	707	707
Military	-	-	-	1	1	1
Mumps	498	51	98	3,723	590	794
Pertussis	57	39	39	403	460	360
Rubella (German measles)	15	11	15	59	95	111
Syphilis (Primary & Secondary): Civilian	632	470	516	6,963	5,328	5,993
Military	1	6	5	47	50	63
Toxic Shock syndrome	9	7	N	58	58	N
Tuberculosis	440	449	434	3,819	3,794	3,985
Tularemia	1	2	1	17	15	17
Typhoid Fever	10	5	5	44	47	67
Typhus fever, tick-borne (RMSF)	-	-	1	8	9	10
Rabies, animal	102	102	108	758	934	934

TABLE II. Notifiable diseases of low frequency, United States

	Cum. 1987		Cum. 1987
Anthrax	-	Leptospirosis	6
Botulism: Foodborne	1	Plague	1
Infant (Tex. 2)	12	Poliomyelitis, Paralytic	-
Other	-	Psittacosis (Ariz. 1)	14
Brucellosis	13	Rabies, human	-
Cholera	-	Tetanus (S.C. 1, Nev. 1)	6
Congenital rubella syndrome	2	Trichinosis	10
Congenital syphilis, ages < 1 year	-	Typhus fever, flea-borne (endemic, murine) (Upstate N.Y. 1)	5
Diphtheria	2		

*1986 and 1987 AIDS case totals reflect the deletion of duplicate case reports. For some reporting areas the cumulative totals reported this week are lower than those reported last week.

†Seven of the 57 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 March 21, 1987 and March 15, 1986 (11th Week)

Reporting Area	AIDS*	Aseptic Meningitis	Encephalitis		Gonorrhea (Civilian)		Hepatitis (Viral), by type				Legionellosis	Leprosy
			Primary	Post-infectious			A	B	NA,NB	Unspecified		
	Cum 1987	1987	Cum 1987	Cum 1987	Cum 1987	Cum 1986	1987	1987	1987	1987	1987	Cum 1987
UNITED STATES	4,107	95	152	5	171,752	173,722	562	576	62	71	20	45
NEW ENGLAND	173	1	9	1	6,403	3,818	18	63	2	4	2	1
Maine	7	-	1	-	212	184	-	1	-	-	-	-
N H	6	-	-	-	95	116	1	6	1	-	1	-
Vt	2	-	2	-	42	62	-	-	-	-	1	-
Mass	103	-	3	-	2,389	1,583	4	50	-	3	-	1
R I	12	1	2	1	486	337	10	3	-	1	-	-
Conn	43	-	1	-	3,179	1,536	3	3	1	-	-	-
MID ATLANTIC	1,224	8	19	-	28,802	27,731	13	56	1	11	-	-
Upstate N Y	167	1	9	-	3,529	3,378	11	13	1	1	-	-
N Y City	717	3	4	-	15,864	15,907	2	43	-	10	-	-
N J	234	4	1	-	3,412	3,246	-	-	-	-	-	-
Pa	106	-	5	-	5,997	5,200	-	-	-	-	-	-
E N CENTRAL	179	13	43	-	19,069	25,111	40	40	5	6	11	1
Ohio	23	4	21	-	4,788	6,169	20	18	3	3	5	1
Ind	23	-	1	-	1,968	2,910	1	5	-	1	4	-
Ill	63	1	7	-	2,511	5,777	2	3	-	-	-	-
Mich	46	8	14	-	7,958	7,471	17	14	2	2	2	-
Wis	24	-	-	-	1,844	2,784	-	-	-	-	-	-
W N CENTRAL	88	2	4	-	7,050	7,676	31	15	2	2	1	-
Minn	16	-	1	-	1,178	1,074	1	2	1	-	-	-
Iowa	5	-	-	-	724	770	19	2	-	1	-	-
Mo	49	-	-	-	3,574	3,676	5	5	1	-	-	-
N Dak	-	-	-	-	75	78	-	-	-	-	-	-
S Dak	1	-	-	-	142	139	-	1	-	-	-	-
Nebr	4	1	2	-	396	567	2	3	-	-	1	-
Kans	13	1	1	-	961	1,372	4	2	-	1	-	-
S ATLANTIC	642	17	25	1	46,294	42,443	38	114	11	3	2	3
Del	9	-	1	-	650	728	5	1	1	-	-	-
Md	93	4	1	-	5,624	5,037	2	27	-	1	-	2
D C	96	1	-	-	2,851	3,168	3	1	-	-	-	-
Va	52	3	10	1	3,714	3,719	2	8	1	-	-	-
W Va	2	-	5	-	373	485	1	3	-	-	-	-
N C	30	3	7	-	6,807	6,858	4	16	4	1	1	-
S C	8	-	-	-	4,152	3,971	-	19	2	-	-	-
Ga	81	2	-	-	7,891	6,682	5	18	1	-	1	-
Fla	271	4	1	-	14,232	11,795	16	21	2	1	-	1
E S CENTRAL	21	19	8	2	12,799	14,806	3	28	1	-	-	-
Ky	14	-	2	1	1,294	1,721	-	-	1	-	-	-
Tenn	-	-	2	-	4,402	5,900	1	21	-	-	-	-
Ala	3	19	4	-	4,226	4,022	2	6	-	-	-	-
Miss	4	-	-	1	2,877	3,163	-	1	-	-	-	-
W S CENTRAL	445	4	13	1	19,438	21,734	40	36	4	11	-	4
Ark	10	-	-	1	1,921	1,974	-	-	-	-	-	-
La	62	-	2	-	4,164	3,783	3	7	1	-	-	-
Okla	16	1	5	-	2,111	2,493	4	5	-	1	-	-
Tex	357	3	6	-	11,242	13,484	33	24	3	10	-	4
MOUNTAIN	106	4	5	-	4,579	5,324	70	44	8	12	1	-
Mont	1	-	-	-	117	132	1	2	3	-	-	-
Idaho	2	-	-	-	159	183	1	4	-	-	-	-
Wyo	2	-	-	-	75	123	3	1	-	-	-	-
Colo	51	1	1	-	949	1,456	5	4	1	4	-	-
N Mex	11	-	1	-	446	595	5	3	-	-	-	-
Ariz	13	3	3	-	1,657	1,601	43	18	4	5	1	-
Utah	8	-	-	-	187	236	7	7	-	3	-	-
Nev	18	-	-	-	989	998	5	5	-	-	-	-
PACIFIC	1,229	27	26	-	27,318	25,079	309	180	28	22	3	36
Wash	44	-	3	-	1,732	2,019	69	36	3	2	-	2
Oreg	12	-	-	-	975	932	23	12	7	-	-	-
Calif	1,155	25	23	-	23,876	21,127	189	131	18	20	2	31
Alaska	3	-	-	-	483	719	12	1	-	-	-	-
Hawaii	15	2	-	-	252	282	16	-	-	-	1	3
Guam	-	1	-	-	50	7	-	1	-	-	-	-
P R	17	1	-	1	489	489	4	12	-	2	-	-
V I	-	-	-	-	50	47	-	-	-	-	-	-
Pac Trust Terr	-	-	-	-	80	12	-	-	-	3	-	17
Amer Samoa	-	-	-	-	24	8	2	2	-	-	-	-

N: Not notifiable U: Unavailable

*Refer to footnote regarding AIDS in Table I.

TABLE III. (Cont'd.) Cases of specified notifiable diseases, United States, weeks ending March 21, 1987 and March 15, 1986 (11th Week)

Reporting Area	Malaria	Measles (Rubeola)					Menin-gococcal Infections	Mumps		Pertussis			Rubella		
		Indigenous		Imported *		Total									
	Cum 1987	1987	Cum 1987	1987	Cum 1987	Cum 1986	Cum 1987	1987	Cum 1987	1987	Cum 1987	Cum 1986	1987	Cum 1987	Cum 1986
UNITED STATES	134	49	386	8	87	860	812	498	3,723	57	403	460	15	59	95
NEW ENGLAND	12	-	1	-	5	9	76	-	9	4	11	30	-	-	1
Maine	-	-	-	-	-	-	5	-	-	-	-	2	-	-	-
N.H.	-	-	-	-	-	-	7	-	6	-	1	11	-	-	1
Vt.	-	-	1	-	5	-	6	-	1	1	3	1	-	-	-
Mass.	6	-	-	-	-	9	39	-	1	-	3	8	-	-	-
R.I.	4	-	-	-	-	-	7	-	-	-	-	1	-	-	-
Conn.	2	-	-	-	-	-	12	-	1	3	4	7	-	-	-
MID ATLANTIC	7	3	49	1	31	366	56	5	54	11	47	62	1	1	22
Upstate N.Y.	3	-	4	-	8	3	35	-	15	10	34	39	-	-	14
N.Y. City	1	-	42	-	6	29	5	-	-	-	-	3	-	-	5
N.J.	1	3	3	1 †	2	334	-	5	21	1	2	5	1	1	3
Pa.	2	-	-	-	15	-	16	-	18	-	11	15	-	-	-
E.N. CENTRAL	2	22	54	-	4	182	110	301	2,283	3	54	119	5	12	5
Ohio	2	-	-	-	4	-	40	-	32	-	19	52	-	-	-
Ind.	-	-	-	-	-	-	12	66	277	-	-	9	-	-	-
Ill.	-	22	31	-	-	94	17	223	1,276	-	3	17	5	11	2
Mich.	-	-	23	-	-	-	37	9	355	2	15	11	-	1	2
Wis.	-	-	-	-	-	85	4	3	343	1	17	30	-	-	1
W.N. CENTRAL	4	-	1	-	1	52	43	58	293	1	24	28	-	-	4
Minn.	3	-	-	-	-	-	11	38	158	-	3	12	-	-	-
Iowa	-	-	-	-	-	-	3	16	100	-	2	4	-	-	-
Mo.	1	-	1	-	1	-	12	1	6	-	10	3	-	-	1
N. Dak.	-	-	-	-	-	-	1	-	-	-	1	2	-	-	-
S. Dak.	-	-	-	-	-	-	1	1	11	-	1	-	-	-	-
Nebr.	-	-	-	-	-	-	1	-	-	-	-	1	-	-	-
Kans.	-	-	-	-	-	52	14	2	18	1	7	6	-	-	3
S. ATLANTIC	21	-	3	-	-	95	149	5	31	12	103	97	1	6	1
Del.	1	-	-	-	-	-	4	-	-	-	-	8	-	-	-
Md.	4	-	-	-	-	4	13	1	7	-	-	20	-	1	-
D.C.	3	-	-	-	-	-	3	-	-	-	-	-	-	-	-
Va.	3	-	-	-	-	-	25	-	1	2	30	8	-	-	-
W. Va.	-	-	-	-	-	-	-	3	9	2	22	1	-	-	-
N.C.	3	-	-	-	-	-	18	-	2	7	44	11	-	-	-
S.C.	1	-	-	-	-	78	13	-	1	-	-	2	-	-	-
Ga.	2	-	-	-	-	1	29	-	1	-	5	35	-	-	-
Fla.	4	-	3	-	-	12	44	1	10	1	2	12	1	5	1
E.S. CENTRAL	1	-	-	-	-	-	48	91	571	-	6	11	-	2	1
Ky.	-	-	-	-	-	-	7	-	110	-	1	1	-	2	1
Tenn.	-	-	-	-	-	-	17	91	460	-	-	2	-	-	-
Ala.	-	-	-	-	-	-	20	-	1	-	3	8	-	-	-
Miss.	1	-	-	-	-	-	4	-	-	-	2	-	-	-	-
W.S. CENTRAL	8	-	5	-	1	42	62	6	299	8	31	18	-	-	17
Ark.	1	-	-	-	-	21	2	-	184	-	2	-	-	-	-
La.	-	-	-	-	-	-	7	2	43	-	2	2	-	-	-
Okla.	2	-	-	-	1	-	11	N	N	8	27	16	-	-	-
Tex.	5	-	5	-	-	21	42	4	72	-	-	-	-	-	17
MOUNTAIN	4	4	47	-	12	37	26	16	85	8	34	56	1	2	-
Mont.	-	-	-	-	2	1	-	-	-	-	-	-	-	-	-
Idaho	1	-	-	-	-	-	1	-	1	-	11	13	-	-	-
Wyo.	-	-	-	-	-	-	-	-	-	-	2	-	1	1	-
Colo.	-	-	-	-	-	2	8	1	8	-	11	10	-	-	-
N. Mex.	-	4	47	-	9	13	2	N	N	-	1	8	-	-	-
Ariz.	1	-	-	-	1	21	13	15	71	8	8	19	-	-	-
Utah	-	-	-	-	-	-	-	-	4	-	1	6	-	1	-
Nev.	2	-	-	-	-	-	2	-	1	-	-	-	-	-	-
PACIFIC	75	20	226	7	33	77	242	16	98	10	93	39	7	36	44
Wash.	3	-	-	- §	-	24	32	3	16	-	14	17	-	-	-
Oreg.	1	-	1	6 §	26	2	14	N	N	3	12	2	-	1	-
Calif.	69	19	224	1 §	6	41	192	13	73	5	45	18	7	33	44
Alaska	2	-	-	-	-	-	2	-	3	-	2	1	-	-	-
Hawaii	-	1	1	-	1	10	2	-	6	2	20	1	-	2	-
Guam	-	-	1	-	-	1	2	1	4	-	-	-	-	-	1
P.R.	-	-	139	-	-	4	1	-	1	-	8	2	-	1	-
V.I.	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Pac. Trust Terr.	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-
Amer. Samoa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

*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 March 21, 1987 and March 15, 1986 (11th Week)

Reporting Area	Syphilis (Civilian) (Primary & Secondary)		Toxic-shock Syndrome	Tuberculosis		Tula-remia	Typhoid Fever	Typhus Fever (Tick-borne) (RMSF)	Rabies, Animal
	Cum 1987	Cum 1986	1987	Cum 1987	Cum 1986	Cum 1987	Cum 1987	Cum 1987	Cum 1987
UNITED STATES	6,963	5,328	9	3,819	3,794	17	44	8	758
NEW ENGLAND	100	117	2	88	113	-	3	-	-
Maine	1	7	-	10	12	-	-	-	-
N H	1	6	1	3	7	-	-	-	-
Vt	1	5	-	2	6	-	-	-	-
Mass	54	61	-	24	51	-	3	-	-
R I	-	5	1	7	5	-	-	-	-
Conn	43	33	-	42	32	-	-	-	-
MID ATLANTIC	1,140	734	-	713	755	-	5	-	90
Upstate N Y	33	38	-	122	108	-	2	-	8
N Y City	788	421	-	341	376	-	-	-	-
N J	128	145	-	119	136	-	3	-	1
Pa	191	130	-	131	135	-	-	-	81
E N CENTRAL	100	193	2	472	512	1	8	-	19
Ohio	16	28	1	96	78	1	3	-	-
Ind	14	26	1	37	61	-	1	-	-
Ill	35	96	-	182	228	-	1	-	12
Mich	26	30	-	143	115	-	2	-	-
Wis	9	13	-	14	30	-	1	-	7
W N CENTRAL	35	57	1	113	93	6	3	-	149
Minn	4	8	-	24	20	-	1	-	39
Iowa	6	4	-	8	11	2	-	-	47
Mo	19	30	-	65	46	4	2	-	7
N Dak	-	2	-	1	2	-	-	-	22
S Dak	3	-	-	4	2	-	-	-	22
Nebr	2	8	-	3	3	-	-	-	2
Kans	1	5	1	8	9	-	-	-	10
S ATLANTIC	2,336	1,540	-	776	732	2	5	1	213
Del	21	10	-	2	9	1	-	-	-
Md	139	98	-	68	45	-	-	-	52
D C	75	81	-	26	33	-	-	-	12
Va	58	108	-	77	59	1	-	-	80
W Va	1	3	-	25	30	-	1	-	13
N C	138	129	-	85	98	-	1	-	-
S C	142	157	-	79	97	-	-	1	7
Ga	373	256	-	88	88	-	-	-	37
Fla	1,389	698	-	326	273	-	3	-	12
E S CENTRAL	458	354	1	270	358	2	1	3	49
Ky	3	23	-	88	87	1	-	-	35
Tenn	222	164	-	-	102	-	1	2	-
Ala	119	123	1	123	127	-	-	-	14
Miss	114	44	-	59	42	1	-	1	-
W S CENTRAL	964	1,143	1	398	448	5	2	3	105
Ark	46	51	-	34	39	1	-	-	30
La	159	189	-	63	107	-	-	-	3
Okla	29	37	-	52	41	4	1	3	1
Tex	730	866	1	249	261	-	1	-	71
MOUNTAIN	134	143	-	96	81	1	1	-	47
Mont	7	2	-	8	5	-	-	-	27
Idaho	1	1	-	13	4	-	-	-	-
Wyo	-	-	-	-	-	-	-	-	12
Colo	23	44	-	-	2	-	-	-	-
N Mex	11	17	-	20	19	-	1	-	-
Ariz	70	61	-	47	37	1	-	-	8
Utah	2	3	-	1	4	-	-	-	-
Nev	20	15	-	7	10	-	-	-	-
PACIFIC	1,696	1,047	2	893	702	-	16	1	86
Wash	12	26	1	40	44	-	-	-	-
Oreg	42	25	-	22	29	-	-	-	-
Calif	1,638	986	1	770	583	-	15	1	85
Alaska	2	-	-	18	12	-	-	-	1
Hawaii	2	10	-	43	34	-	1	-	-
Guam	1	1	-	2	-	-	-	-	-
P R	200	179	-	49	58	-	-	-	12
V I	2	-	-	1	-	-	-	-	-
Pac Trust Terr	38	-	-	25	3	-	3	-	-
Amer Samoa	2	-	-	-	-	-	-	-	-

U Unavailable

TABLE IV. Deaths in 121 U.S. cities,* week ending March 21, 1987 (11th Week)

Reporting Area	All Causes, By Age (Years)						P&I** Total
	All Ages	≥65	45-64	25-44	1-24	<1	
NEW ENGLAND	658	464	124	43	8	19	53
Boston, Mass.	165	106	34	15	5	5	19
Bridgeport, Conn.	54	38	11	5	-	-	6
Cambridge, Mass.	29	22	6	1	-	-	5
Fall River, Mass.	26	20	4	-	-	2	-
Hartford, Conn.	60	35	19	3	-	3	3
Lowell, Mass.	28	22	6	-	-	-	1
Lynn, Mass.	14	9	3	2	-	-	3
New Bedford, Mass.	35	28	6	1	-	-	3
New Haven, Conn.	54	39	6	5	2	2	2
Providence, R.I.	46	33	10	2	1	-	1
Somerville, Mass.	7	6	-	1	-	-	-
Springfield, Mass.	50	35	9	2	-	4	2
Waterbury, Conn.	32	22	5	4	-	1	4
Worcester, Mass.	58	49	5	2	-	2	4
MID ATLANTIC	2,990	1,988	614	254	54	80	173
Albany, N.Y.	47	31	12	3	1	-	2
Allentown, Pa.	12	9	3	-	-	-	-
Buffalo, N.Y.	128	96	22	4	1	5	15
Camden, N.J.	45	32	8	4	-	1	2
Elizabeth, N.J.	33	22	6	3	2	-	1
Erie, Pa.†	50	32	13	3	-	2	7
Jersey City, N.J.	40	19	13	6	-	2	2
N.Y. City, N.Y.	1,570	1,020	326	161	36	27	68
Newark, N.J.	43	15	14	10	-	4	2
Paterson, N.J.	30	13	9	1	1	6	1
Philadelphia, Pa.	512	336	104	38	10	24	30
Pittsburgh, Pa.†	79	51	21	4	1	2	4
Reading, Pa.	37	30	6	1	-	-	3
Rochester, N.Y.	127	104	16	4	-	3	7
Schenectady, N.Y.	24	19	3	1	1	-	2
Scranton, Pa.†	34	27	5	2	-	-	3
Syracuse, N.Y.	78	57	18	2	-	1	9
Trenton, N.J.	39	27	8	2	1	1	5
Utica, N.Y.	28	22	3	2	-	1	4
Yonkers, N.Y.	34	26	4	3	-	1	6
E.N. CENTRAL	2,452	1,611	495	183	77	86	109
Akron, Ohio	48	38	7	2	-	1	-
Canton, Ohio	46	34	9	2	1	-	2
Chicago, Ill.§	564	362	125	45	10	22	16
Cincinnati, Ohio	172	111	39	7	8	7	17
Cleveland, Ohio	164	92	36	28	6	2	3
Columbus, Ohio	160	106	30	10	4	10	6
Dayton, Ohio	129	91	21	9	7	1	3
Detroit, Mich.	249	143	54	22	14	16	6
Evansville, Ind.	23	16	5	2	-	-	-
Fort Wayne, Ind.	58	42	12	2	2	-	6
Gary, Ind.	32	20	6	4	2	-	-
Grand Rapids, Mich.	79	56	14	7	1	1	11
Indianapolis, Ind.	205	124	46	14	9	12	10
Madison, Wis.	26	20	3	2	-	1	-
Milwaukee, Wis.	149	112	22	7	2	6	4
Peoria, Ill.	43	28	11	-	2	2	4
Rockford, Ill.	56	42	7	5	-	2	10
South Bend, Ind.	54	40	7	4	2	1	5
Toledo, Ohio	124	78	33	7	5	1	6
Youngstown, Ohio	71	56	8	4	2	1	-
W.N. CENTRAL	814	568	166	41	20	19	52
Des Moines, Iowa	69	45	17	4	2	1	4
Duluth, Minn.	24	18	3	-	2	1	1
Kansas City, Kans.	31	21	7	2	1	-	-
Kansas City, Mo.	136	77	40	7	6	6	12
Lincoln, Nebr.	39	32	6	-	1	-	4
Minneapolis, Minn.	153	112	29	9	2	1	15
Omaha, Nebr.	78	54	18	4	2	-	5
St. Louis, Mo.	148	98	34	10	2	4	-
St. Paul, Minn.	70	57	7	2	1	3	2
Wichita, Kans.	66	54	5	3	1	3	9
S. ATLANTIC	1,311	812	307	111	35	40	61
Atlanta, Ga.	178	103	49	18	5	3	5
Baltimore, Md.	228	141	57	12	10	8	12
Charlotte, N.C.	80	45	25	4	2	4	2
Jacksonville, Fla.	103	68	21	7	5	2	7
Miami, Fla.	106	61	23	17	3	2	-
Norfolk, Va.	68	36	17	8	1	6	5
Richmond, Va.	95	73	12	6	-	4	8
Savannah, Ga.	59	41	9	7	2	-	6
St. Petersburg, Fla.	100	77	18	3	2	-	1
Tampa, Fla.	72	40	19	5	2	1	6
Washington, D.C.	188	101	50	23	3	10	9
Wilmington, Del.	34	26	7	1	-	-	-
E.S. CENTRAL	758	495	159	46	29	29	45
Birmingham, Ala.	116	66	27	7	7	9	3
Chattanooga, Tenn.	52	33	15	2	1	1	2
Knoxville, Tenn.	67	44	16	3	1	3	6
Louisville, Ky.	117	78	24	4	6	5	9
Memphis, Tenn.	132	90	25	10	4	3	18
Mobile, Ala.	83	61	14	4	2	2	2
Montgomery, Ala.	62	42	13	4	2	1	-
Nashville, Tenn.	129	81	25	12	6	5	5
W.S. CENTRAL	1,346	829	277	129	56	55	71
Austin, Tex.	69	43	14	6	4	2	5
Baton Rouge, La.	29	20	7	1	1	-	2
Corpus Christi, Tex.	38	30	6	1	1	-	1
Dallas, Tex.	192	116	40	21	6	9	8
El Paso, Tex.	65	39	14	3	4	5	2
Fort Worth, Tex.	86	53	8	18	7	-	4
Houston, Tex.§	309	177	74	34	13	11	7
Little Rock, Ark.	96	59	23	4	5	5	9
New Orleans, La.	121	65	24	19	4	9	-
San Antonio, Tex.	187	123	40	9	8	7	20
Shreveport, La.	71	47	14	7	1	2	7
Tulsa, Okla.	83	57	13	6	2	5	6
MOUNTAIN	703	440	157	63	24	19	36
Albuquerque, N.Mex.	93	53	21	13	3	3	10
Colo. Springs, Colo.	39	28	8	3	-	-	7
Denver, Colo.	112	71	27	10	2	2	3
Las Vegas, Nev.	91	57	23	8	2	1	4
Ogden, Utah	17	12	4	-	-	1	3
Phoenix, Ariz.	175	109	38	14	9	5	3
Pueblo, Colo.	27	23	2	2	-	-	3
Salt Lake City, Utah	48	23	11	1	7	6	-
Tucson, Ariz.	101	64	23	12	1	1	3
PACIFIC	2,115	1,403	405	173	64	59	135
Berkeley, Calif.	25	16	6	2	-	1	3
Fresno, Calif.	49	37	7	5	-	-	5
Glendale, Calif.	24	15	7	-	1	-	1
Honolulu, Hawaii	84	56	16	7	2	3	6
Long Beach, Calif.	175	128	30	4	3	10	24
Los Angeles, Calif.	647	408	122	73	24	10	16
Oakland, Calif.	69	46	15	3	2	3	4
Pasadena, Calif.	29	18	5	2	-	4	2
Portland, Oreg.	155	111	27	6	9	2	12
Sacramento, Calif.	152	102	31	11	4	4	13
San Diego, Calif.	154	104	27	8	6	9	19
San Francisco, Calif.	165	116	23	17	3	6	6
San Jose, Calif.	139	85	39	11	2	2	9
Seattle, Wash.	142	88	32	16	4	2	6
Spokane, Wash.	57	41	8	6	2	-	7
Tacoma, Wash.	49	32	10	2	2	3	2
TOTAL	13,147††	8,610	2,704	1,043	367	406	735

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

** Pneumonia and influenza.

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

†† Total includes unknown ages.

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

Neisseria gonorrhoeae — *Continued*

Editorial Note: DGI, a serious complication of gonorrhea, is estimated to occur in 0.5%-1.0% of all gonococcal infections. Tenosynovitis and septic arthritis are the two most common clinical syndromes (*1*).

Published reviews have reported that DGI is predominantly caused by organisms which are extremely susceptible to antibiotics and are more likely to be nutritionally fastidious, requiring arginine, hypoxanthine, and uracil for growth ($A^-H^-U^-$ auxotype) (*2-4*). This may have led to the mistaken impression that antibiotic-resistant strains of *N. gonorrhoeae* do not cause DGI.

Cases of DGI caused by PPNG are being reported more frequently (*5-7*). There have also been reports of DGI caused by gonococci with chromosomally mediated resistance to penicillin (*8*). Furthermore, in a recent, large prospective study, DGI isolates were no more susceptible to antibiotics than isolates from localized anogenital gonorrhea (*9*).

Patients with DGI caused by resistant gonococcal strains should be hospitalized and treated with ceftriaxone (1-2 g/day intravenously) until signs and symptoms resolve. Daily outpatient therapy with either ceftriaxone (250 mg intramuscularly) or an oral regimen defined either by in-vitro susceptibility tests should follow, for at least 1 week of antimicrobial therapy. When an infection does not respond to appropriate antimicrobial therapy, surgical drainage should be considered.

Less than 50% of synovial-fluid cultures in gonococcal arthritis are positive. Therefore, antibiotic-resistant *N. gonorrhoeae* should be considered in culture-negative, clinically diagnosed cases of gonococcal arthritis that do not respond to standard antimicrobial therapy.

In 1986, 16,608 PPNG infections were reported to CDC (*10*), a 90% increase from 1985. As the incidence of PPNG and other resistant strains increases, there is likely to be an increase in the incidence of DGI caused by antibiotic-resistant *N. gonorrhoeae.*

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Pertussis Surveillance — United States, 1984 and 1985

During the period 1984-1985, a provisional total of 5,865 pertussis cases was reported to the *MMWR* (2,276 in 1984, 3,589 in 1985*), for an average crude incidence rate of 1.2 cases/100,000 total population (0.96/100,000 in 1984 and 1.5/100,000 in 1985*). This is a 33% increase over the average rate reported for 1982 and 1983 (0.9/100,000). Pertussis cases were reported from all 50 states and New York City, with the highest average annual attack rates reported in Oklahoma (6.9/100,000), New Hampshire (6.4/100,000), Alaska (5.8/100,000), Wisconsin (5.2/100,000), Indiana (4.4/100,000), and Maryland (4.4/100,000). Age-specific attack rates were highest among children < 1 year of age and declined with increasing age (Figure 1). The incidence of reported pertussis in all age groups has increased since 1981. However, the greatest increases have been in persons ≥15 years of age. From 1981 to 1985, a 13-fold increase in incidence from 0.02/100,000 to 0.25/100,000 was observed for persons ≥20 years of age.

Supplemental case report forms† were received on 5,145 patients with onsets of illness during this 2-year period, representing 88% of the total number of cases reported by state health departments to the *MMWR*. In contrast, report forms were received on 77% of the pertussis patients reported to the *MMWR* in 1982 and 1983.

Individual case report forms were analyzed on 4,728 patients from all 50 states and New York City§. The states submitting the largest number of case report forms were Indiana (449), Oklahoma (423), Texas (412), Wisconsin (411), and Washington (364). The age distribution of pertussis patients whose forms were received was similar to that of patients with known ages reported to the *MMWR*, suggesting that the forms received were representative of the total reported cases (Table 3).

*Provisional data.

†Supplemental case report forms are submitted by state health departments on a portion of cases reported to the *MMWR*. The forms contain information on age, sex, vaccine status, date of onset of symptoms, complications, and laboratory confirmation.

§During 1984 and 1985, the Multicenter Pertussis Surveillance Project (MCPSP) conducted active case surveillance in and around Denver, Colorado; Milwaukee, Wisconsin; Baltimore, Maryland; and Oklahoma County, Oklahoma. Elsewhere within the United States, routine passive surveillance was the only means of identifying pertussis cases. To preserve comparability with previous reporting trends, MCPSP areas were excluded from the analysis reported here.

TABLE 3. Age distribution of patients of known age with reported pertussis cases — United States, 1984 and 1985

Age groups	Cases			
	Reported to *MMWR*		Report forms received	
	No.	(%)	No.	(%)
< 1 year	2,493	(42.5)	2,269	(48.0)
1-4 years	1,351	(23.0)	1,000	(21.2)
5-9 years	491	(8.4)	413	(8.7)
10-14 years	367	(6.3)	292	(6.2)
≥15 years	968	(16.5)	745	(15.8)
Unknown	195	(3.3)	9	(0.2)
Total	**5,865**	**(100.0)**	**4,728**	**(100.0)**

*Excludes Multicenter Pertussis Surveillance Project reporting areas.

Pertussis Surveillance — Continued

Laboratory confirmation was reported for 3,317 (70%) patients; 20% of these were confirmed by both culture and direct fluorescent antibody (DFA) testing of nasopharyngeal secretions; 19%, by culture only; and 61%, by DFA only. Fifty percent (2,328) of patients had onsets of cough during the months of June through September. Patients with cases reported to the surveillance systems tended to have classic clinical symptoms. Whoop was described in 47% of patients (53% of those 0-4 years old and 44% of those 5-9 years old). Paroxysms were reported in 79% of patients; apnea was reported in 35%.

Rates of hospitalization and other complications were highest in children <6 months old and declined with increasing age (Table 4). Death was reported in 19 (0.4%) patients, 18 of

FIGURE 1. Incidence of reported cases of pertussis by age group — United States, 1979-1985

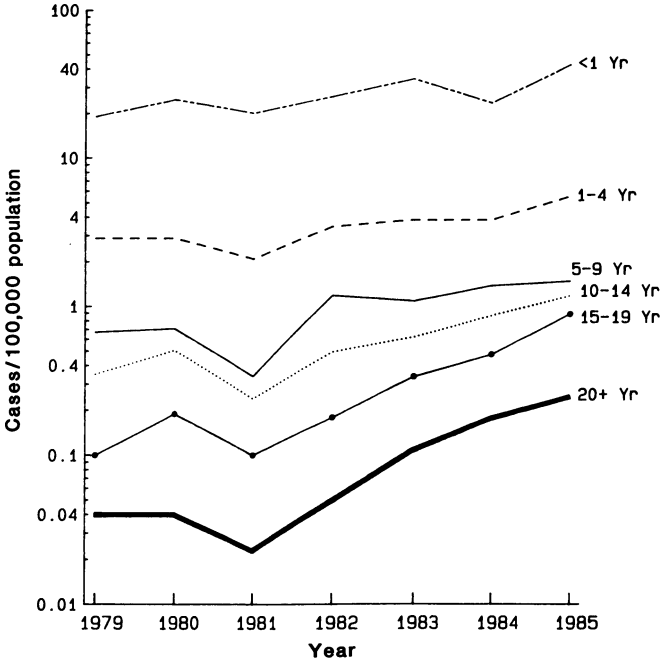

TABLE 4. Percentage of pertussis patients hospitalized and percentage with complications, by selected age groups — United States, 1984 and 1985

Selected ages	No.	Hospitalized No.	Hospitalized (%)	Complication: Pneumonia* No.	Pneumonia* (%)	Seizures No.	Seizures (%)	Encephalopathy No.	Encephalopathy (%)
<6 months	1,771	1,302	(74.0)	347	(20.0)	46	(2.6)	14	(0.8)
6-11 months	498	294	(59.0)	92	(19.0)	15	(3.0)	2	(0.4)
1-4 years	1,000	232	(23.0)	96	(25.0)	15	(1.5)	3	(0.3)
5-9 years	413	33	(8.0)	14	(3.5)	4	(1.0)	3	(0.7)
10-14 years	292	16	(5.4)	6	(2.1)	0	(0.0)	0	(0.0)
>14 years	745	43	5.8)	18	(2.4)	1	(0.1)	0	(0.0)
All ages†	**4,728**	**1,921**	**(41.0)**	**574**	**(12.0)**	**81**	**(1.7)**	**22**	**(0.5)**

*X-ray confirmed.

†Includes patients of all ages and nine patients of unknown ages.

Pertussis Surveillance — Continued

whom were ≤6 months of age. The case-fatality ratio in this age group was 1%. Thirteen of the deaths occurred in patients with pneumonia, two of whom also had encephalopathy.

Based on age criteria derived from the Immunization Practices Advisory Committee (ACIP) recommendations concerning diphtheria, tetanus toxoids, and pertussis vaccine (DTP), children are appropriately immunized for their age if they have received one dose by 3 months of age, two doses by 5 months of age, three doses by 7 months of age, and four doses by 19 months of age (*1*). Of 1,504 patients 7 months through 6 years old with known vaccine status, 70% were not appropriately immunized, and 55% had not received at least three doses of vaccine—the minimum number considered necessary for adequate vaccine protection against pertussis. Thirty-one percent had not received any doses. Additionally, 405 (51%) of the 795 reported patients 3-6 months of age with known vaccine status were not appropriately immunized with DTP vaccine for their age.

Ninety-five percent of the 4,544 persons with known antibiotic status received antibiotic therapy. Seventy-five percent (3,236) of patients with known antibiotic type received erythromycin; 19% (813) received ampicillin/amoxicillin; and 6% (247) received other types of antibiotics. Of those treated with erythromycin, 68% started therapy within 14 days of the onset of cough; 85%, within 21 days; and 91%, within 28 days.

Reported by: State and Territorial Epidemiologists. Div of Immunization, Center for Prevention Svcs, CDC.

Editorial Note: The supplemental pertussis surveillance system was introduced in 1979, with the cooperation of the Council of State and Territorial Epidemiologists, to provide additional information on pertussis epidemiology, health impact, and vaccine and antibiotic usage and efficacy. Since its introduction, state participation has progressively increased, as witnessed by the increasing percentage of patients who have been reported both to the *MMWR* and to the supplemental pertussis surveillance system. Individual case report forms were submitted on 20% of patients in 1979, compared with 88% in 1985.

While the crude annual incidence rate of pertussis reported to the *MMWR* increased three fold from 1981 to 1985 (0.5/100,000 to 1.5/100,000), it is still <3% of the average annual pertussis incidence rate reported during the prevaccine era, 1922-1948. The age-specific incidence of pertussis for all age groups increased during this period. Most notably, persons ≥20 years of age showed a marked increase in pertussis incidence throughout the period.

The overall increase in reported cases of pertussis may represent an actual increase, a reporting artifact, or a combination of both. Reporting may have improved because of: 1) an increase in awareness of disease by both professional and lay persons, 2) an increase in awareness by physicians that pertussis can occur in adult patients, 3) an increase in diagnostic capability of laboratories, and 4) an increase in case investigations by health departments. The current contribution of each of these factors to the increase in incidence of reported cases is unknown.

The supplemental pertussis surveillance system and the MMWR receive reports on a disproportionate number of pertussis patients who are hospitalized or laboratory-confirmed or have classic clinical disease. While reporting of non-pertussis cases as pertussis may be a problem, the fact that substantial proportions of cases have laboratory confirmation and classic clinical manifestations means such a reporting error is not likely to be a major problem. However, like other passive surveillance, pertussis surveillance suffers from low sensitivity because of underdiagnosis and underreporting. This is further complicated because, among the states, there is no uniform case definition or laboratory criteria for diagnosing and reporting pertussis. As of 1984, only 40% of states had established a case definition for the diagnosis of pertussis; 50% did not count physician-diagnosed cases if laboratory studies were not done; and 60% did not report physician-diagnosed cases if laboratory studies were done but were negative (*2*). Nevertheless, the pertussis surveillance systems provide estimates of the minimum incidence of pertussis, the maximum rates of disease complications, and the health

Pertussis Surveillance — Continued

impact of pertussis. They also provide comparisons of trends in disease epidemiology and the use of prevention and control measures.

Most of the cases could potentially have been prevented by proper vaccination. Studies have shown repeatedly that pertussis vaccine has been highly effective in preventing disease (*3*). As in previous years, almost 70% of pertussis patients 3 months to 6 years of age were not appropriately immunized with DTP, and a third of all patients 7 months to 6 years of age had not received any vaccine.

Serious neurologic illnesses requiring hospitalization attributable to pertussis vaccine are rare. Final analysis of a comprehensive case-control study has estimated that the risk of such illnesses is 1 in 140,000 doses administered (*4*). An earlier analysis had estimated this risk at 1/110,000 doses (*5*). In contrast, final analysis of the case-control study found that the risk of serious neurologic illness following pertussis disease was 1/11,000 pertussis cases (*4*). Repeated evaluations have shown that the benefits of vaccine outweigh the risks (*6, 7*). Therefore, both the ACIP and the American Academy of Pediatrics continue to recommend the routine use of DTP vaccine.

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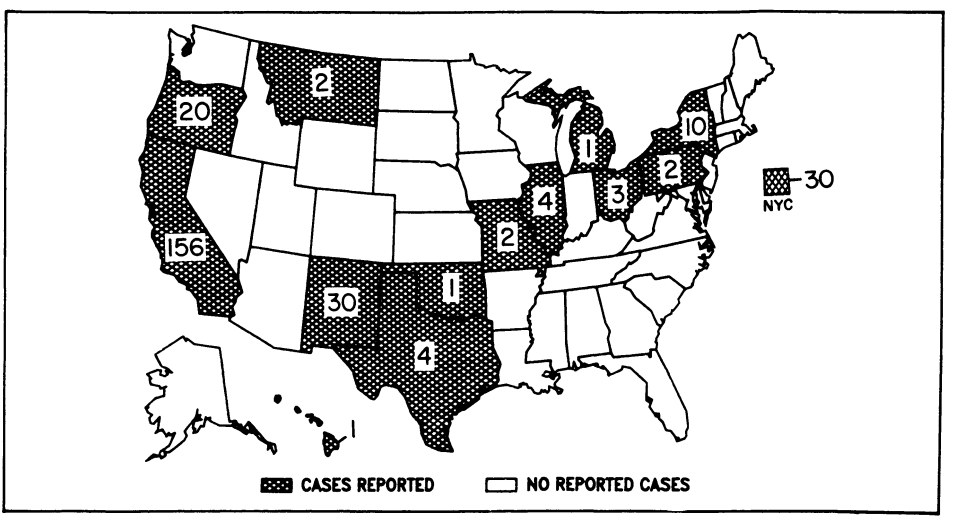
FIGURE I. Reported measles cases — United States, weeks 07-10, 1987

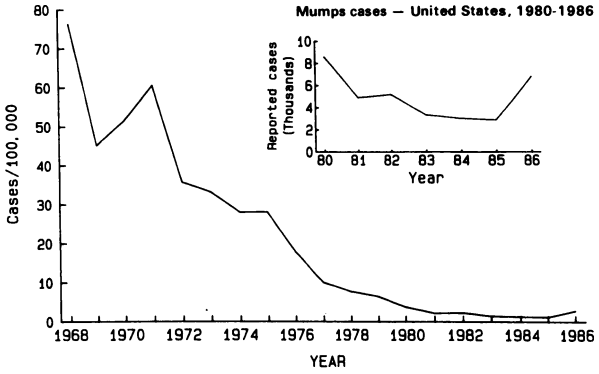


Erratum: Vol.36, No.10

p. 151 The following paragraph should have appeared as the second paragraph in the article entitled "Mumps — United States, 1985-1986":

In 1986, a provisional total of 6,807 mumps cases (2.8 cases/100,000 population) was reported. This is more than double the number of cases reported in 1985. It marked the first increase in reported mumps since 1982 and was the highest number of reported cases since 1980 (Figure 1). Nevertheless, it represented a 95.6% decrease from 1968.

FIGURE 1. Mumps incidence rates — United States, 1968-1986*



*1986 provisional data.

"Mumps — United States, 1985-1986" can be obtained in its entirety from the Division of Immunization, Center for Prevention Services, CDC, Atlanta, Georgia, 30333.

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