

# X. The AIDS Epidemic in New York State

*Perry F. Smith, MD*  
*Jaromir Mikl, MSPH*  
*Sue Hyde, BS*  
*Dale L. Morse, MD, MS*

## **Introduction**

Surveillance for cases of acquired immunodeficiency syndrome (AIDS) has provided important information for characterizing and controlling the epidemic. Even before the human immunodeficiency virus (HIV) had been identified in 1983 and 1984,<sup>1,2</sup> AIDS surveillance demonstrated that gay men and intravenous drug users (IVDUs) bore a disproportionate share of the burden of disease.<sup>3</sup> Surveillance data provided the first information about the modes of transmission of HIV and were thus the basis for early recommendations to limit its spread.<sup>4</sup>

New York State reported some of the first AIDS cases and has the highest number of cases in the nation, mostly from New York City. This report describes the AIDS epidemic statewide and compares it with the epidemic in the rest of the nation. It also compares data from the state's Newborn HIV Seroprevalence Study with AIDS surveillance data for women.

## **Methods**

Both the New York State Department of Health (DOH) and New York City DOH maintain active surveillance for AIDS cases, including regular solicitation of reports from hospitals. New York City DOH staff investigate all cases reported within the city; New York State DOH staff investigate cases in New York State exclusive of New York City. Once a suspect case is identified, trained surveillance staff review the patient's medical records to collect demographic, risk-factor, and clinical information. Vital status is regularly updated by systematic review of death certificate reports and by encouraging hospitals to report deaths to surveillance staff.

Throughout the epidemic, all suspect cases have been evaluated according to

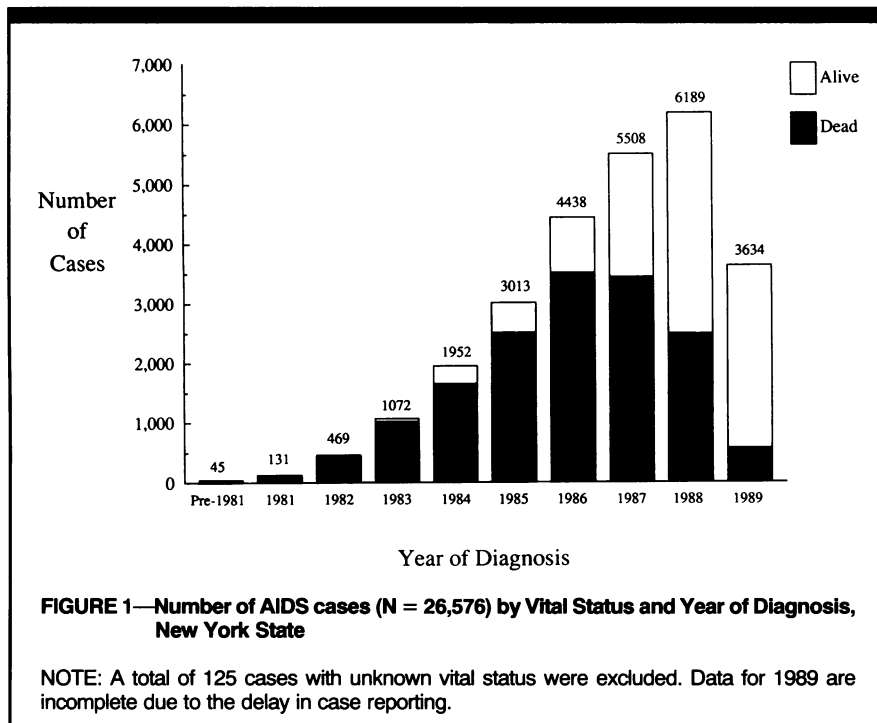
the national surveillance case definition, which has been expanded twice, in 1985 and 1987.<sup>3,5,6</sup> Each case was evaluated by the criteria current when the case was investigated. Cases meeting more than one definition were classified hierarchically according to the earliest definition that they met.

Special case ascertainment studies indicate that 75–85 percent of diagnosed AIDS cases in New York City are eventually reported,<sup>7</sup> as are more than 95 percent of patients discharged with AIDS-related diagnoses in New York State exclusive of New York City.<sup>8</sup>

Both the State and New York City DOH report their confirmed cases independently, without identifying information, to the Centers for Disease Control (CDC) for national surveillance. The New York State DOH also maintains a statewide computerized AIDS registry in which the state and city case files are merged.

For comparison with the statewide case data, the number of cases in the rest of the United States was determined from summary national AIDS surveillance data reported to CDC through November 1989.<sup>9</sup> For each subgroup comparison the number of cases reported statewide was subtracted from the corresponding national total. To ensure comparability between the statewide and national data, we selected all cases registered in New York State exclusive of New York City as of October 31, 1989, and all cases registered in New York City as of November 17, 1989—the final dates of data transfer for the national surveillance report.

Geographic classification of persons with AIDS was based on their residence at the time they met the national surveillance case definition, except for cases outside New York City before July 1989, where we used the residence at onset of symptoms. Cases were also classified as adults/



adolescents (>12 years old) or children (<13 years old) and by hierarchical exposure groups, according to the CDC system.<sup>9</sup>

As a measure of HIV transmission among adolescents, data for persons 20–24 years old were analyzed. Adults in this age group are likely to have been infected during adolescence because of the long median incubation period for AIDS, which studies suggest is about 10 years.<sup>10–12</sup> Cases among teenagers were not included in this analysis, since their infections may have occurred before adolescence.

AIDS incidence rates were calculated with official New York State population projections by age, sex, and geographic region for 1985.<sup>13</sup> For race-specific population estimates, we applied the racial distribution from the 1980 Census to the 1985 projections, since race-specific projections are not available.

For comparison with results of the Newborn HIV Seroprevalence Study,<sup>14</sup> we used the incidence of AIDS per 100,000 women of childbearing age (15–49 years) during 1988. From the Newborn HIV Seroprevalence Study, we used data for all births to mothers in this age group in 1988. The data were stratified by age, race/ethnicity, and geographic regions, according to urbanization and proximity to New York City, as described elsewhere.<sup>14</sup>

## Results

### Cases by Type of Definition

A total of 26,576 cases of AIDS were reported statewide by the cutoff dates for this report, accounting for 23 percent of the 115,158 cases reported nationally. Of these cases, 22,186 (83 percent) met the pre-1985 national surveillance case definition,<sup>3</sup> 592 (2 percent) met the 1985 definition,<sup>5</sup> and 3,798 (14 percent) met the expanded 1987 definition.<sup>6</sup> Of the 1987 definition cases, 47 percent had indicator diseases that were diagnosed definitively; the rest were diagnosed presumptively. Of 9,847 cases diagnosed in 1988 and 1989, 29 percent met only the 1987 case definition (13 percent definitive, 16 percent presumptive). Of the total 26,576 cases, 16,163 (61 percent) had *Pneumocystis carinii* pneumonia, and 3,505 (13 percent) had Kaposi's sarcoma.

### Incidence and Mortality

The number of AIDS cases diagnosed statewide has increased every year through 1988 (Figure 1). An estimated 90 percent of cases that are ultimately reported are included in the registry by 11 months after diagnosis (Dr. Lawrence Lessner, New York State Department of Health, personal communication). Because of this delay in reporting, the number of cases for 1989 is expected to exceed that for 1988 when reporting is complete.<sup>15</sup>

Of the 26,576 reported cases, 17,531 (66 percent) are known to have died as of the cutoff dates for this study. Thirteen percent of all cases died within one month of diagnosis. The case fatality rate is highest for cases with the longest follow-up: 90 percent of cases diagnosed before 1985. Of patients diagnosed before 1988, 80 percent have died (median survival time, 10.3 months).

### Geographic Distribution

New York City accounts for 22,231 (84 percent) of all statewide cases, although the percentage has dropped as the epidemic spread. Another 3,250 cases (12 percent) were reported among the general population from New York State exclusive of New York City and 1,095 (4 percent) among prisoners in the state correctional system.

The geographic distribution of cases in quartiles is shown in Figure 2. Cases among prisoners are excluded, because accurate information on their counties of residence was not available. Although cases are widely distributed throughout the state, they tend to concentrate in counties with major metropolitan areas (e.g., Albany, Erie, Monroe, and Onondaga), as well as in New York City and nearby counties.

### Gender

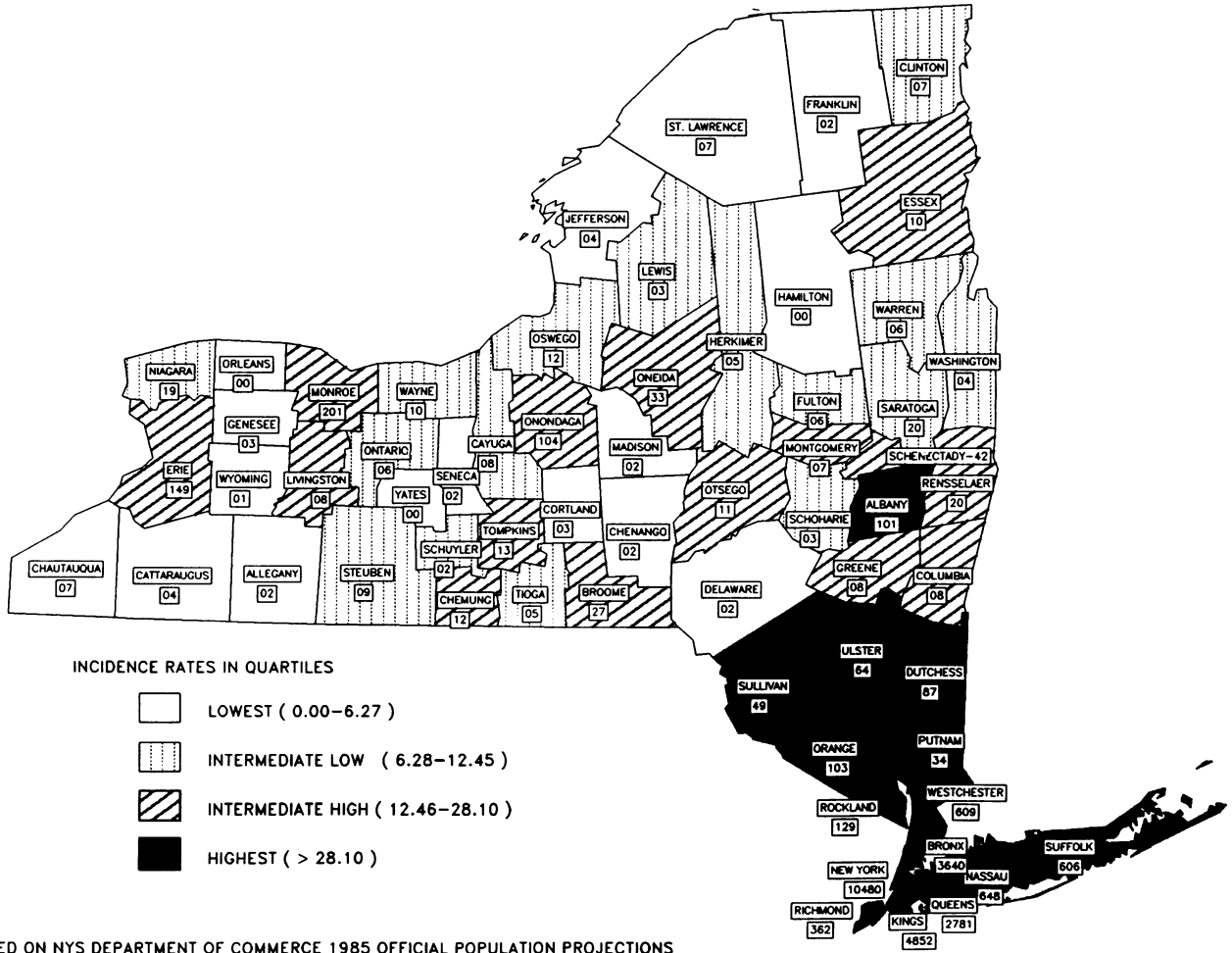
Males account for 22,482 (87 percent) of the statewide adult/adolescent cases (Table X-1). There is no difference in gender distribution between cases in New York City and New York State exclusive of New York City. The male case predominance reflects the large number of cases among men with a history of homosexual/bisexual contact. However, this percentage is lower than that for the rest of the United States, because New York State has a disproportionately high number of women who contracted AIDS by intravenous drug use.

Among children there is a slightly higher proportion of cases among males, but the gender distribution differs little from the rest of the United States (Table X-2).

### Age

The age distribution of adult/adolescent cases statewide is similar to that in the rest of the United States, with nearly 90 percent of cases occurring among persons 20–49 years old (Table X-1).

Among children, New York State has 604 reported cases statewide and accounts for 31 percent of all such cases in the United States (Table X-2). Of these pediatric patients, 534 (88 percent) were



**FIGURE 2—Cumulative number of AIDS Cases and Incidence per 100,000 Population since the beginning of the Epidemic, by County or Borough of Residence, New York State**

NOTE: Cases among New York State prison inmates were excluded. Cumulative incidence was based on New York State Department of Commerce population projections for 1985.

residents of New York City. Compared with the rest of the United States a greater proportion of cases occurred among children under five years old, reflecting the greater proportion of children infected perinatally in this state.

**Race/Ethnicity**

Whereas Blacks and Hispanics account for 37 percent of adult/adolescent cases in the rest of the United States, they account for nearly 60 percent of such cases statewide (Table X-1). This difference reflects the large percentage of Black and Hispanic cases in New York City (62 percent) and in state prisons (85 percent). In New York State exclusive of New York City, Blacks and Hispanics account for 37 percent of cases.

The statewide cumulative incidence rate (per 100,000 population) from the beginning of the epidemic among adult/adolescent males is several times higher among Blacks (901) and Hispanics (1,029) than among Whites (183) (Table X-3). For females, the racial/ethnic disparity is even greater (Table X-4).

Of children with AIDS, nearly 90 percent statewide are Black or Hispanic, compared to 72 percent in the rest of the United States (Table X-2).

**Exposure Groups**

The AIDS epidemic among adults and adolescents has primarily affected two exposure groups: men with a history of homosexual/bisexual contact, and IV-

DUs. The epidemic curve for gay men has leveled off or declined in recent years (Figure 3).

In 1988, for the first time, more cases were diagnosed among IVDUs than among gay men statewide. The percentage of cases among IVDUs is greater statewide (39 percent) than in the rest of the United States (16 percent) (Table X-1). Of the 1,095 prisoners with AIDS, 957 (87 percent) gave a history of intravenous drug use without homosexual/bisexual contact. Even when prisoners are excluded, the percentage of cases with a history of intravenous drug use is still higher in New York City (36 percent) and in New York State exclusive of New York City (35 percent) than in the rest of the United States (16 percent). The percentage of

TABLE X-1—Distribution of AIDS Cases among Adults/Adolescents (Age 13 and Older) in New York State and in the Rest of the United States

Demographic Variables	New York State		United States (Excluding New York State)	
	Number	(%)	Number	(%)
<b>Sex</b>				
Males	22,482	(86.6)	80,360	(92.0)
Females	3,490	(13.4)	6,879	(8.0)
<b>Age Group (years)</b>				
13–19	65	(0.3)	382	(0.4)
20–29	4,568	(17.6)	18,930	(21.7)
30–39	12,737	(49.0)	40,437	(46.4)
40–49	6,010	(23.1)	18,337	(21.0)
50+	2,592	(10.0)	9,157	(10.5)
<b>Race/Ethnicity</b>				
White	10,185	(39.2)	54,008	(61.9)
Black	8,729	(33.6)	21,758	(24.9)
Hispanic	6,753	(26.0)	10,655	(12.2)
Other	163	(0.6)	685	(0.8)
Unknown	142	(0.5)	133	(0.2)
<b>Exposure Category</b>				
Male Homosexual/Bisexual Contact	11,995	(46.2)	56,572	(64.8)
Intravenous (IV) Drug Use	10,120	(39.0)	13,602	(15.6)
Male Homosexual/Bisexual Contact and IV Drug Use	1,137	(4.4)	6,786	(7.8)
Hemophilia/Coagulation Disorder	61	(0.2)	986	(1.1)
Heterosexual Contact	1,390	(5.4)	4,067	(4.7)
Sex with Person at Risk for AIDS	903	(3.5)	2,951	(3.4)
Born in Pattern II Country*	487	(1.9)	1,116	(1.3)
Receipt of Blood Transfusion, Blood Components, or Tissue	267	(1.0)	2,501	(2.9)
Other/Undetermined	1,002	(3.9)	2,725	(3.1)

\*Includes persons presumed to have become HIV-infected through heterosexual contact because they were born in countries where heterosexual transmission is believed to be the major mode of transmission.<sup>9</sup>

cases among non-IVDU men with a history of homosexual/bisexual contact was similar in New York City (49 percent) and New York State exclusive of New York City (44 percent).

The third most common exposure group is persons at risk for AIDS because of heterosexual contact. A slightly higher percentage of cases is in this category statewide than in the rest of the United States (5.4 vs 4.7 percent) (Table X-1). This category contains two subgroups: persons who report heterosexual contact with a person at risk for AIDS, and persons who are presumed to have become HIV-infected through heterosexual contact because they were born in countries where heterosexual transmission is believed to be the major mode of transmission, the so-called Pattern II countries.<sup>9</sup> Of the 1,390 statewide cases of heterosexual contact, 903 (65 percent) reported contact, and 487 (35 percent) were from Pattern II countries. Of the 903 cases with reported contact, 757 (84 percent) reported having sex with an IVDU.

The distribution of exposure categories varied by race/ethnicity and gender. Of all cases among White males, 78 percent were attributed solely to homosexual/bisexual contact, in contrast to 35 percent of Black and Hispanic males (Table X-3). Intravenous drug use was the leading exposure category for both Black (49 percent) and Hispanic (55 percent) males. Among females there was less variation, although heterosexual contact accounted for a larger percentage of cases among Blacks (27 percent) and Hispanics (34 percent) than among Whites (23 percent) (Table X-4). Overall the leading exposure categories for females were intravenous drug use (62 percent) and heterosexual contact with a person at risk for AIDS (25 percent). Of the 864 females in the latter group, 729 (84 percent) reported having sex with an IVDU.

Statewide, 91 percent of children with AIDS were classified as acquiring their infection from their mothers (perinatally), compared with 76 percent in the rest of the United States (Table X-2). This dif-

ference is largely due to the majority (59 percent) of pediatric cases statewide whose mothers used intravenous drugs.

### AIDS among Young Adults

Statewide 867 AIDS cases were reported among persons 20–24 years old, of whom 251 (29 percent) were White, 298 (34 percent) were Black, and 309 (36 percent) were Hispanic; the remaining nine were of other or unknown race/ethnicity. The leading exposure groups for these cases were male homosexual/bisexual contact, 403 (46 percent); intravenous drug use, 248 (29 percent); male homosexual/bisexual contact and intravenous drug use, 40 (5 percent); heterosexual contact with an intravenous drug user, 64 (7 percent); and born in a Pattern II country, 29 (3 percent). The remaining 83 cases were attributed to other exposure categories.

### Comparison of AIDS Data with Newborn HIV Seroprevalence

Two measures of HIV infection among women are shown in Table X-5: the incidence of AIDS per 100,000 women in 1988, and the rate of HIV seropositivity among women giving birth in 1988, based on data from the Newborn HIV Seroprevalence Study. The absolute rates of these measures varied because of the different events they reflect: onset of severe HIV disease and prevalence of infection among women giving birth. However, both measures showed comparable trends. The highest rates occurred among persons 20–39 years old, Blacks, Hispanics, and women residing in New York City. Both rates declined with distance from New York City. The only disproportionate trend was among persons 15–19 years old: a disproportionately lower rate of AIDS per 100,000 women relative to the older groups, compared with the HIV seropositivity rates from the newborn study.

### Discussion

AIDS has become a major cause of morbidity and mortality statewide. It is the leading cause of death among men 30–49 years old and women 20–39 years old in New York City, as well as among persons 30–39 years old in minority racial/ethnic groups in New York State exclusive of New York City.<sup>15</sup>

Statewide the effect of the AIDS epidemic among IVDUs is apparent in its increasing toll on racial minorities, women, and children. Transmission of HIV by contaminated needles has dispro-



**TABLE X-2—Distribution of AIDS Cases among Children (Age 12 and Under) in New York State and in the Rest of the United States**

Demographic Variables	New York State		United States (Excluding New York State)	
	Number	(%)	Number	(%)
<i>Sex</i>				
Males	320	(53.0)	740	(55.1)
Females	284	(47.0)	603	(44.9)
<i>Age Group (years)</i>				
<5	531	(87.9)	1,071	(79.7)
5-12	73	(12.1)	272	(20.3)
<i>Race/Ethnicity</i>				
White	62	(10.3)	363	(27.0)
Black	334	(55.3)	693	(51.6)
Hispanic	205	(33.9)	272	(20.3)
Other	1	(0.2)	12	(0.9)
Unknown	2	(0.3)	3	(0.2)
<i>Exposure Category</i>				
Mother at Risk for AIDS	550	(91.1)	1,022	(76.1)
Intravenous (IV) Drug Use	359	(59.4)	449	(33.4)
Sex with IV Drug User	112	(18.5)	210	(15.6)
Sex with Other Person at Risk for AIDS/HIV	17	(2.8)	104	(7.7)
Born in Pattern II Country*	47	(7.8)	120	(8.9)
Receipt of Blood Transfusion, Blood Components, or Tissue	3	(0.5)	30	(2.2)
Has HIV Infection, Risk Not Specified	12	(2.0)	109	(8.1)
Receipt of Blood Transfusion, Blood Components, or Tissue	19	(3.1)	189	(14.1)
Hemophilia/Coagulation Disorder	4	(0.7)	100	(7.5)
Undetermined	31	(5.1)	32	(2.4)

\*See Table 1.

portionately affected Blacks and Hispanics. Both intravenous drug use and heterosexual transmission from IVDUs have caused a greater proportion of cases among women here than in the rest of the nation, and these women have transmitted HIV perinatally to a large number of children.

AIDS surveillance data have complemented the information provided by the HIV seroprevalence studies. Whereas seroprevalence studies provide timely information on the number, geographic distribution, and changing characteristics of HIV infected persons, information from AIDS surveillance provides detailed information on each reported case since the beginning of the epidemic. AIDS surveillance data show patterns similar to those from the Newborn HIV Seroprevalence Study except for one age-group difference. Where the Newborn Seroprevalence Study shows an alarming rate of HIV infection among women 15-19 years old, surveillance data show that they have a low incidence of AIDS. This finding appears to reflect the long incubation period for AIDS. AIDS case data for persons 20-24 years old statewide suggest that HIV transmission among adolescents has occurred more frequently among Blacks and Hispanics than among Whites and that sexual contact (both homosexual and heterosexual) has been the leading risk behavior.

**TABLE X-3—AIDS Cases among Male Adults/Adolescents by Exposure Category and Race/Ethnicity, and Cumulative Incidence per 100,000 Males, Age 15 Years and Older, in New York State**

Exposure Category	White		Black		Hispanic		Total*	
	Number	(%)	Number	(%)	Number	(%)	Number	(%)
Male Homosexual/Bisexual Contact	7,428	(77.6)	2,408	(34.8)	1,986	(34.8)	11,994	(53.4)
Intravenous (IV) Drug Use	1,365	(14.3)	3,418	(49.3)	3,129	(54.8)	7,965	(35.4)
Male Homosexual/Bisexual Contact and IV Drug Use	391	(4.1)	423	(6.1)	317	(5.6)	1,137	(5.1)
Hemophilia/Coagulation Disorder	45	(0.5)	4	(0.1)	7	(0.1)	56	(0.2)
Heterosexual Contact	17	(0.2)	375	(5.4)	4	(0.1)	398	(1.8)
Sex with Person at Risk for AIDS	17	(0.2)	17	(0.2)	4	(0.1)	39	(0.2)
Born in Pattern II Country**	0	(0)	358	(5.2)	0	(0)	359	(1.6)
Receipt of Blood Transfusion, Blood Components, or Tissue	119	(1.2)	25	(0.4)	20	(0.4)	168	(0.7)
Other/Undetermined	206	(2.2)	275	(4.0)	247	(4.3)	760	(3.4)
<b>Total</b>	<b>9,571</b>	<b>(100.0)</b>	<b>6,928</b>	<b>(100.0)</b>	<b>5,710</b>	<b>(100.0)</b>	<b>22,478</b>	<b>(100.0)</b>
Cumulative Incidence per 100,000***	183.1		901.1		1,028.9		336.2	

\*Included in the total are 149 cases whose race/ethnicity is American Indian, Alaskan Native, Asian, or Pacific Islander and 120 whose race/ethnicity is unknown.

\*\*See Table 1.

\*\*\*Incidence was calculated as the cumulative number of AIDS cases among males, age 15 years and older, since the beginning of the epidemic, divided by estimates for the male population, age 15 years and older, by race/ethnicity in 1985. (See text for details.)

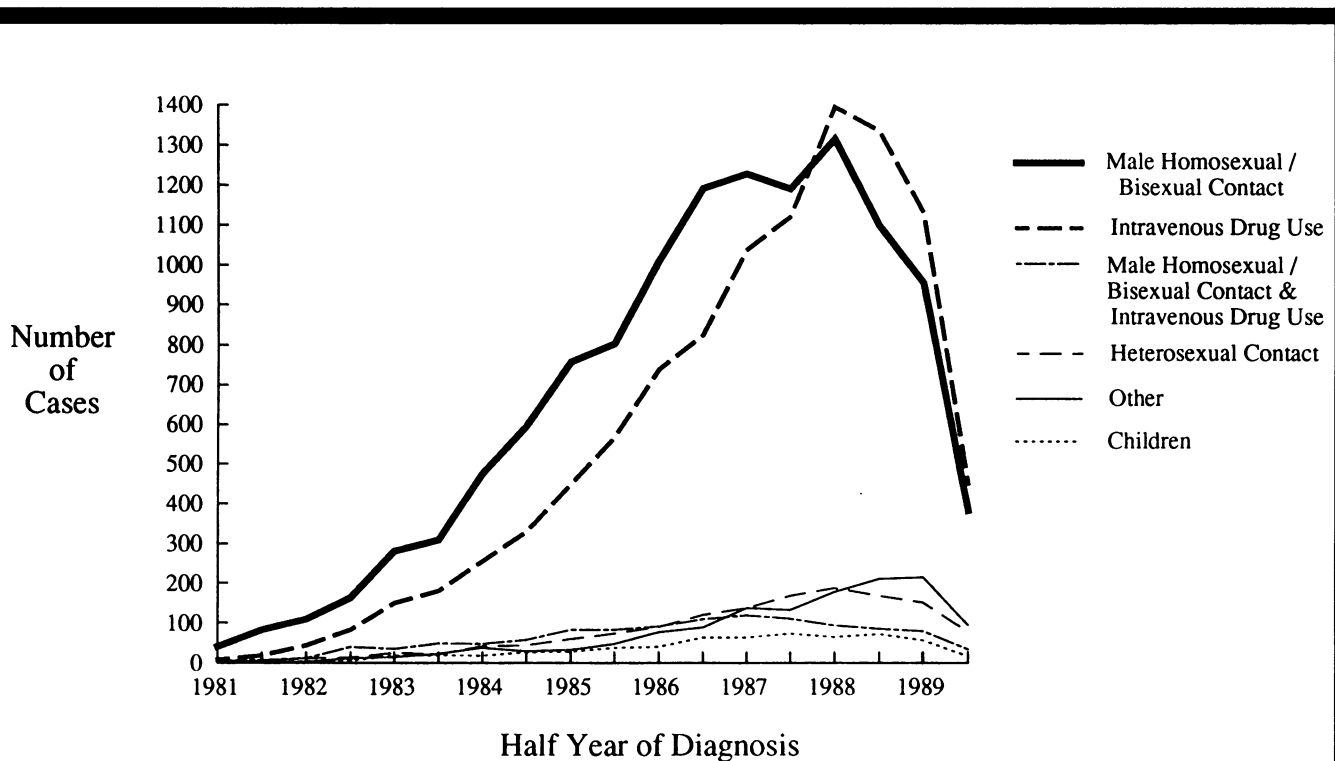
**TABLE X-4—AIDS Cases among Female Adults/Adolescents by Exposure Category and Race/Ethnicity, and Cumulative Incidence per 100,000 Females, Aged 15 Years and Older, in New York State**

Exposure Category	White		Black		Hispanic		Total*	
	Number	(%)	Number	(%)	Number	(%)	Number	(%)
Intravenous (IV) Drug Use	368	(60.2)	1,141	(63.4)	633	(60.7)	2,155	(61.8)
Hemophilia/Coagulation Disorder	2	(0.3)	1	(0.1)	0	(0)	3	(0.1)
Heterosexual Contact	142	(23.2)	488	(27.1)	352	(33.7)	992	(28.4)
Sex with Person at Risk for AIDS Born in Pattern II Country**	0	(0)	128	(7.1)	0	(0)	128	(3.7)
Receipt of Blood Transfusion, Blood Components, or Tissue	56	(9.2)	27	(1.5)	12	(1.2)	97	(2.8)
Other/Undetermined	43	(7.0)	143	(7.9)	46	(4.4)	242	(6.9)
<b>Total</b>	<b>611</b>	<b>(100.0)</b>	<b>1,800</b>	<b>(100.0)</b>	<b>1,043</b>	<b>(100.0)</b>	<b>3,489</b>	<b>(100.0)</b>
Cumulative Incidence per 100,000***	10.5		185.5		160.0		46.0	

\*Included in the total are 13 cases whose race/ethnicity is American Indian, Alaskan Native, Asian, or Pacific Islander and 22 whose race/ethnicity is unknown.

\*\*See Table 1.

\*\*\*Incidence was calculated as the cumulative number of AIDS cases among females, age 15 years and older, since the beginning of the epidemic, divided by estimates for the female population, age 15 years and older, by race/ethnicity in 1985. (See text for details.)



**FIGURE 3—Number of AIDS cases among adult/adolescent exposure groups and among children by half-year of diagnosis, New York State**

NOTE: Data for 1989 are incomplete due to the delay in case reporting.

The New York State DOH continues to monitor information from AIDS surveillance and the HIV seroprevalence studies to better address the needs of those already infected and to plan interventions that will limit the spread of HIV.

**Summary**

New York State has reported more AIDS cases (26,576) through November 1989 than any other state, accounting for 23 percent of all reported cases in the nation at the time. New York City has

reported 22,231 (84 percent) of the state-wide cases. The epidemiology of AIDS in New York State has been easily influenced by the large number of cases among IVUDUs. Whereas intravenous drug use accounts for 16 percent of adult/adolescent cases in the rest of the nation,

**TABLE X-5—Comparison of the Number and Incidence of Female AIDS Cases with HIV Seroprevalence among Women Giving Birth by Age Group, Race/Ethnicity, and Geographic Region in New York State 1988**

Characteristics	Number of Cases and Incidence of AIDS per 100,000 Women in 1988		Prevalence (per 100,000 Births) of HIV Seropositivity among Women Giving Birth in 1988** (N = 271,843)
	No.	Incidence*	
Age Group (years)			
15-19	3	0.4	430
20-29	230	14.8	650
30-39	523	37.1	670
40-49	144	13.7	360
Race/Ethnicity			
White	145	4.0	120
Black	466	77.2	1,790
Hispanic	278	68.6	1,250
Other/Unknown	11	13.0	340
Geographic Region			
New York City	776	40.3	1,190
New York City Vicinity	80	7.9	260
Mid-Hudson Valley	13	5.8	220
Upstate Urban	24	3.5	130
Upstate Rural	7	0.8	80
Total	900	19.1	630

\*Based on the number of AIDS cases among women ages 15-49 years and the 1985 population projections for women of this age group in New York State.  
\*\*Based on newborn HIV seroprevalence testing.

it accounts for 39 percent of the cases in New York State. Intravenous drug use is the leading exposure category among racial minorities, with a disproportionately high rate of cases among Blacks and Hispanics. The epidemic among women and children has also been severe, resulting from intravenous drug use by women, heterosexual transmission from drug users to women, and perinatal transmission to their children. □

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