

HIV in Connecticut – 30 Years Later

In Connecticut, the first case of acquired immunodeficiency syndrome (AIDS) was diagnosed and reported to the DPH in 1981. The case-patient was a white male in his 30s with a history of having sex with other men and died in 1983. Thirty years later, human immunodeficiency virus (HIV) has become endemic in Connecticut with 19,377 total cases reported and 9,087 deaths. Although significant challenges remain, progress has been made in almost all areas of public health and clinical medicine: the causative agent has been identified and has become one of the most thoroughly studied viruses in history; clinical laboratory tests have been developed that can detect the virus within 2 weeks of infection; surveillance has confirmed that transmission is almost exclusively by sexual or parenteral exposure; perinatal transmission has been greatly reduced by the use of HIV testing during prenatal care and treatment of pregnant women; effective prevention strategies have been identified; and the development of antiretroviral medications has resulted in a dramatic increase in life expectancy.

The Connecticut Department of Public Health (DPH) has conducted public health surveillance for HIV since AIDS cases were made reportable in 1983 (1). In subsequent years, additional items have been made reportable: HIV infection (not AIDS) (2002), HIV specimens (used in incidence estimations) (2005), HIV viral load (2006), and HIV DNA sequences involved in resistance testing (2009). With these tools it is now possible to monitor a variety of HIV surveillance outcomes including the trend in newly diagnosed HIV infection cases (includes HIV and AIDS), prevalent HIV cases, incidence of HIV, progression from HIV to AIDS, the Health Resources and Services Administration (HRSA) definition of “in care”, community viral load, and the distribution of resistant HIV strains. It is also possible to match the HIV registry with other DPH registries including STD, hepatitis B and C, tumor registry, hospital discharge data, and vital statistics. This article gives an overview of several surveillance topics to demonstrate the progress that has been made in the understanding of HIV.

Trends in HIV diagnosis

From 2002 to 2009, the number of newly diagnosed cases of HIV infection decreased by over half (835 to 352 respectively), and was mainly due to an 82% decrease in reported intravenous drug user (IDU) cases. During the same time period, the number of cases with heterosexual risk (sexual contact with HIV-positive person of opposite sex) also declined (200 to 86 respectively). Although the number of cases with MSM (men who have sex with men) risk remained relatively constant (fluctuating between 141 and 219), because of the decrease in other risk groups, the proportion of MSM cases increased from 22.0% to 45.2%.

Of the 352 HIV infection cases diagnosed in 2009, 29.8% were white, 42.3% black, and 25.3% Hispanic; 75% were male. By age, 54.5% of cases were ≥ 40 years, 24.4% were 30-39, and 21.0% were < 30 . By risk group, 45.2% were MSM, 31.3% heterosexual, and 20.8% IDU. Hartford, Bridgeport, New Haven, Stamford, and Waterbury had more than 15 cases each. There were 14 towns and cities that had ≥ 6 cases, and 155 had < 6 cases (Figure 1, page 35).

HIV prevalence

There were 10,290 people reported living with HIV infection (PLWH) (292.5 per 100,000) at the end of 2009 (Table 1, page 34). HIV prevalence is disproportionately distributed in Connecticut with the rate in males twice as high as in females; 7.4 times higher in blacks than in whites; and 5.6 times higher in Hispanics than in whites. PLWH also tend to be older than the general population with 81.5% over the age of 40 (compared with 50% of the population). Only 5.8% of PLWH are under the age of 30 (compared with 38.6% of the population). IDU is the largest behavioral risk group in PLWH (43.2%). Heterosexual risk accounts for 26.7% of PLWH and 25.9% are MSM. HIV is also disproportionate by geography with the largest cities having the highest numbers and prevalence rates. Hartford (1,902), New Haven (1,500), and Bridgeport (1,276) have a combined 45.5% of all

PLWH but only 10.9% of the state's population. The combined prevalence rate in these three cities is 1,216/100,000, a rate 7.1 times higher than the combined rate in all other towns in Connecticut (179/100,000) (Figure 2, page 35).

Estimating the prevalence of HIV in MSM

Although prevalence rates have not previously been calculated for behavioral risk groups because the denominators are unknown, CDC has recently released an estimate that 4% (95% Confidence Interval (CI), 2.8%-5.3%) of males over the age of 12 have had sex with males in the last five years (2). Using this estimate, 55,000 males in this age range in Connecticut are MSM. Since 2,261 HIV-positive PLWH are MSM, an estimated 4.1% of MSM in Connecticut are HIV-positive (4,100/100,000).

Table 1. Persons reported living with HIV infection, Connecticut, 2009.

Characteristic	N	%	Rate ^a	(95% CI)
Total	10,290	100.0	292.5	(286.8 - 298.1)
Sex				
Male	6,769	65.8	394.1	(384.7 - 403.5)
Female	3,521	34.2	195.5	(189.1 - 202.0)
Race/ethnicity				
Black	3,344	32.5	1,009.1	(974.9 - 1,043.3)
Hispanic	3,318	32.2	763.7	(737.7 - 789.7)
White	3,496	34.0	135.8	(131.3 - 140.3)
Other ^b	132	1.3	74.4	(61.7 - 87.1)
Age group ^c				
<20	97	0.9	10.6	(8.5 - 12.7)
20-29	481	4.7	108.4	(98.7 - 118.1)
30-39	1,328	12.9	310.1	(293.4 - 326.7)
40-49	3,588	34.9	653.0	(631.6 - 674.4)
50-59	3,516	34.2	700.5	(677.3 - 723.6)
60+	1,280	12.4	188.3	(178.0 - 198.6)
Transmission category				
MSM	2,261	22.0	--	--
IDU (male)	2,537	24.7	--	--
IDU (female)	1,303	12.7	--	--
MSM/IDU	187	1.8	--	--
Heterosexual contact (male)	734	7.1	--	--
Heterosexual contact (female)	1,548	15.0	--	--
Other ^d	1,720	16.7	--	--

^aper 100,000 population (2009 population estimates). ^bOther race includes race groups with small proportions and multi-race. ^cAge group is age in 2009. ^dOther risk groups include groups with small proportions and risk not reported.

Late testers

High proportions of newly diagnosed HIV infection cases have AIDS at their initial diagnosis suggesting that they are 'late' in disease progression. In 2009, 38.1% of cases met the criteria for AIDS at diagnosis and an additional 9.6% became AIDS by 12 months after diagnosis.

Community viral load

With the reporting of all HIV viral load (VL) test results comes the opportunity to calculate 'Community Viral Load' (CVL)(3), the mean VL for a defined population. HIV cases whose most recent VL test were during January 2008-July 2011 were used to calculate the Connecticut CVL. Overall, 8,228 most recent VL test results were reported with 69.5% at suppressed (<200) levels. The mean was 15,272 (Figure 3, page 36).

Entry into care

HRSA, the federal agency that administers the Ryan White Care Program, requires states to annually report the proportion of cases of HIV that receive medical care. Being in HIV care is defined as having an HIV viral load or CD4 test, or having received medication for HIV at least once in the previous twelve months. With the implementation of HIV viral load reporting, DPH uses this test result as the marker for receiving HIV care. During 2010, 70% of PLWH were defined as in-care using this method.

HIV incidence

The DPH participates in the national HIV Incidence project, providing remnant HIV specimens for incidence testing (4). Results from the 2011 estimation indicate the number of HIV infections in Connecticut was 418 (95% CI: 238-597) in 2006, 475 (292- 659) in 2007, 350 (168-533) in 2008, and 402 (168-637) in 2009 with no discernible trend. Due to small cell sizes in the estimation process, there are large confidence intervals around these estimates.

HIV resistance

The DPH also participates in the Variants Atypical and Resistant HIV Surveillance (VARHS) project and collects the DNA sequence in the *pol* region of the HIV genome for newly diagnosed cases that receive the test within 3 months of diagnosis. Since 2009, when the project was begun, 374 sequences have been selected for analysis. Of these, 68 (18.2%) were resistant strains with 60 (16.0%) resistant in one class, 5 (1.3%) in 2 classes and 3 (0.8%) in 3 classes of medication.

Figure 1. Newly diagnosed HIV infection cases (N=352),
Connecticut, 2009
(as of December 31, 2010)

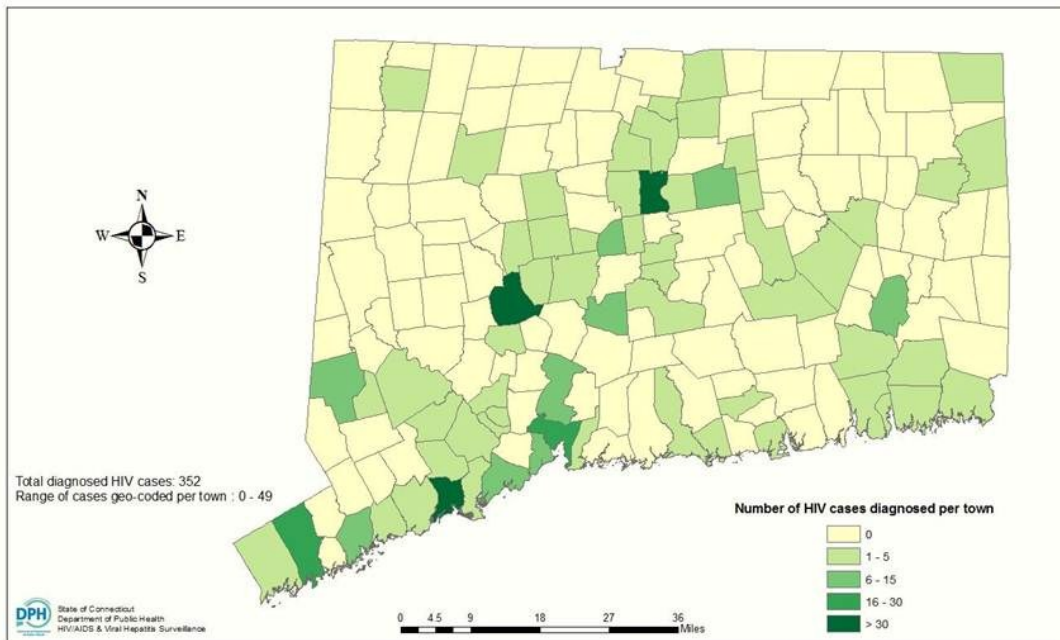


Figure 2. Prevalent HIV infection cases (N=10,290),
Connecticut, 2009
(as of December 31, 2010)

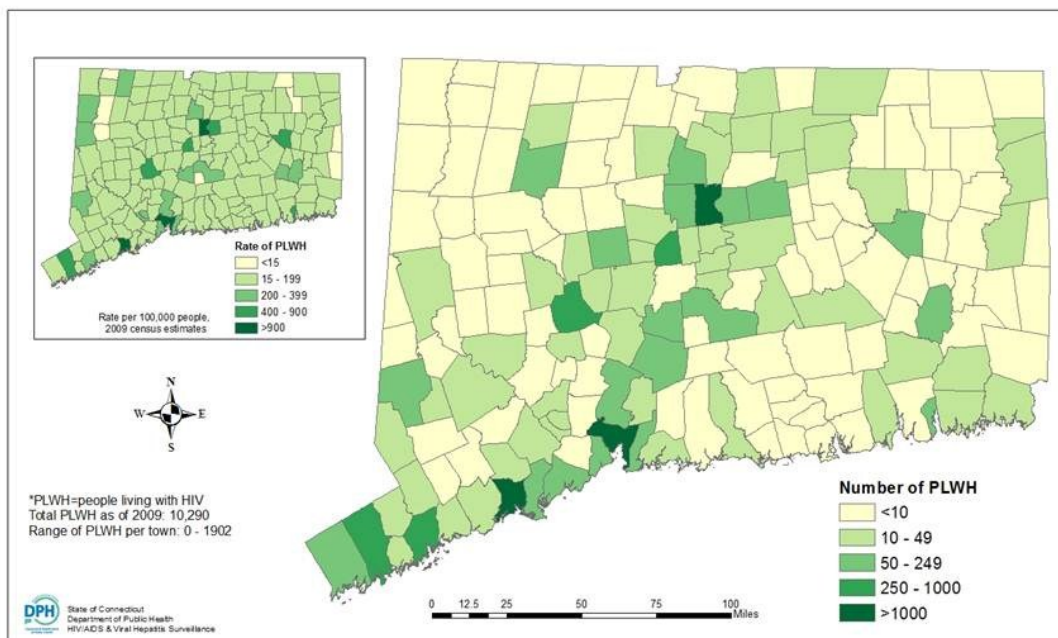


Figure 3. Distribution of most recent HIV VL test results reported during 2008 - July 2011, Connecticut, 2011

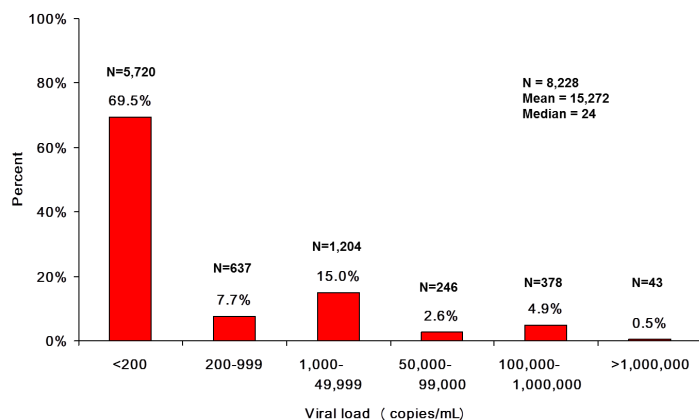


Table 2. HIV infection case definition is based on stage of disease, 2011.

Stage	CD4 lab results	Previous designation
Stage 1	≥ 500	HIV (not AIDS)
Stage 2	200 – 499	HIV (not AIDS)
Stage 3	<200	AIDS
Stage unknown	No CD4 information	HIV (not AIDS)

HIV surveillance will remain a critical component of the public health response to HIV and will need to continue to perform the traditional functions of public health surveillance. Increasingly, with new tools at its disposal, surveillance will be able to expand its role, providing a broad range of population-based information and identifying individual cases that might benefit from additional follow-up. These cases could include those who have not entered into medical care or have left care; have a subsequent diagnosis of an STD; have high viral load results; or, who meet the criteria for AIDS. Linking surveillance information to prevention and care providers will enable services to be targeted to those cases that most need them.

Future directions

The HIV infection case definition was modified in 2008 to include case classifications based on the level of CD4 cells in the blood (5). A CD4 count of ≥ 500 is defined as Stage 1, 200-499 as Stage 2, and <200 as Stage 3 (formerly designated as AIDS) (Table 2). Implementing this case definition in Connecticut will require reporting of all CD4 levels (currently only CD4 laboratory findings of <200 or <14% are reportable).

Reported by

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Editorial

As an illness individually experienced, AIDS started as an acute, infectious disease in the 1980s and was redefined as a chronic infectious disease in the 1990s. As an illness collectively experienced, AIDS in Connecticut started as an outbreak or epidemic in the 1980s, was redefined as an emerging infectious disease in the 1990s, and has become an endemic disease in the 21st Century. From a public policy perspective, HIV disease now has more in common with endemic infectious diseases than with epidemic infectious diseases.

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