# Washington State/Seattle-King County HIV/AIDS Epidemiology Report

## Summary Tables and Figures



## HIV/AIDS Epidemiology and Surveillance News



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Suggested citation: HIV/AIDS Epidemiology Unit, Public Health—Seattle & King County and the Infectious Disease and Reproductive Health Assessment Unit, Washington State Department of Health. HIV/AIDS Epidemiology Report, First Half 2006: Volume 68.

## Credits

This 68th edition of the HIV/AIDS Epidemiology report includes data through the end of June 2006. This report is produced jointly by Public Health – Seattle & King County and the Infectious Disease and Reproductive Health Assessment Unit, Washington State Department of Health. It is funded partly by a Centers for Disease Control and Prevention cooperative agreement for HIV/AIDS surveillance. We thank the medical providers caring for people with HIV/AIDS and the clinics and patients participating in epidemiologic projects. Their cooperation with public health department HIV/AIDS control efforts permit the collection of data included in this report. We also wish to acknowledge the outstanding assistance of our staff, including Faythe Crosby, Lexa Moongrace, and Mark Charonis (disease investigation), Laura Arnold and Sandy Hitchcock (data entry and quality assurance), Shirley Zhang and Jae Taylor (data management), and Amy Bauer and Alexia Exarchos (epidemiologists).

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Washington State Department of Health

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## HIV / AIDS Reporting Requirements

Detailed requirements for reporting of communicable disease including HIV/AIDS are described in the Washington Administrative Code (WAC), section 246-101, online http://apps.leg.wa.gov/WAC/default.aspx?cite=246-101

**Washington health care providers** are required to report all HIV infections, regardless of the date of the patient's initial diagnosis, to the health department. Providers are also required to report new diagnoses of AIDS in a person previously diagnosed with HIV infection. Local health department officials forward case reports to the State Department of Health. Names are never sent to the federal government.

**Laboratories** are required to report evidence of HIV infection (i.e. positive western blot assays, p24 antigen detection, viral culture, and nucleic acid detection), all HIV viral load tests (detectable or not), and all CD4 counts in the setting of HIV infection. If the laboratory cannot distinguish tests, such as CD4 counts, done due to HIV versus other diseases (such as cancer), the CD4 counts should be reported and the health department will investigate. However, laboratory reporting does not relieve health care providers of their duty to report as most of the critical information necessary for surveillance and follow-up is not available to labs.

For further information about HIV/AIDS reporting requirements, please call your local health department or the Washington State Department of Health at 1 (888) 367 5555. In King County call (206) 296-4645.

# Revisions to Reporting Requirements for HIV/AIDS in Washington State

On June 14th, 2006, the Washington State Board of Health voted unanimously to adopt changes to Washington Administrative Code 246-101, specifically chapters 246-101-201, 246-101-520 and 246-101-635. In summary, the rule revision:

- Expands current HIV laboratory test reporting to include all HIV laboratory test results;
- ***Requires*** the Department of Health (DOH) to retain names of asymptomatic HIV cases;
- ***Permits*** local health jurisdictions (LHJs) to retain the names of asymptomatic HIV cases; and
- Requires a report by December 2007 to the State Board of Health on impacts of the rule change.

In the chapters that pertain to LHJs (246-101-520) and DOH (246-101-635), language was added to describe security and confidentiality standards that must be met in order to retain names on paper and/or electronic records of those with asymptomatic HIV infection. These standards are taken from the Centers for Disease Control and Prevention's 2006 *Security and Confidentiality Guidelines*, which can be found at the following address:

http://www.cdc.gov/hiv/topics/surveillance/resources/guidelines/guidance/index.htm

In August, DOH assessed the needs for technical assistance related to security and confidentiality issues for those LHJs that decide to retain names for their asymptomatic HIV cases. As required by WAC, DOH will conduct a biennial review of system security measures at LHJs that are maintaining records by name.

These rule changes went into effect on ***September 1, 2006***. Reporting requirements will apply only to testing and diagnoses that are conducted in health care settings where patients register using their full names. Public Health continues to support the availability of anonymous HIV testing options (per RCW 70.20.400(3-b-i)). The changes do not impact the availability of anonymous HIV testing services. Positive tests diagnosed via anonymous services are not reportable under these new rules.

*Contributed by Maria Courogen, MPH*

## Table 1: Surveillance of reported[1] HIV/AIDS cases, deaths, and people living with HIV/AIDS—reported as of 6/30/2006—King County, other Washington Counties, all Washington State, and U.S.

| | | Adult/Adolescent | | Pediatric[3] | |
|---|---|---|---|---|---|
| | | HIV | AIDS[2] | HIV or AIDS | Total |
| **King County** | New cases reported in 1st half 2006 | 130 | 111 | 4 | 245 |
| | Cumulative Cases | 2,719 | 7,321 | 33 | 10,073 |
| | Cumulative Deaths | 109 | 4,096 | 9 | 4,214 |
| | Persons Living (prevalent cases) | 2,610 | 3,225 | 24 | **5,859** |
| **Other Counties** | New cases reported in 1st half 2006 | 87 | 85 | 1 | 173 |
| | Cumulative Cases | 1,449 | 4,129 | 38 | 5,616 |
| | Cumulative Deaths | 83 | 2,157 | 12 | 2,252 |
| | Persons Living (prevalent cases) | 1,366 | 1,972 | 26 | **3,364** |
| **Washington State** | New cases reported in 1st half 2006 | 217 | 196 | 5 | 418 |
| | Cumulative Cases | 4,168 | 11,450 | 71 | 15,689 |
| | Cumulative Deaths | 192 | 6,253 | 21 | 6,466 |
| | Persons Living (prevalent cases) | 3,976 | 5,197 | 50 | **9,223** |
| **United States[4]** | Estimated Cases as of 12/31/2003 | | | | |
| | Cumulative Cases | 216,486 | 920,566 | 13,998 | 1,151,050 |
| | Cumulative Deaths | 1,913 | 518,567 | 6,916 | 527,396 |
| | Persons Living (prevalent cases) | 214,573 | 401,999 | 7,082 | **623,654** |

1. An estimated 11,000 to 13,000 people live in Washington with HIV infection including AIDS. These include the 9,223 prevalent cases reported above. In King County, there are an estimated 7,200 to 8,400 people living with HIV infection including AIDS. These include the 5,859 prevalent cases reported above. The difference between the estimated cases and the reported prevalent cases include three groups:
   A. People diagnosed with AIDS but not yet reported (probably fewer than 5% of total AIDS reports).
   B. People diagnosed with HIV infection but not yet reported.
   C. People infected with HIV but not yet diagnosed or reported (perhaps 25% of total HIV estimate).
2. New AIDS counts include cases previously reported as HIV without AIDS.
3. Pediatric cases are under age 13 at the time of diagnosis with HIV or AIDS.
4. U.S. data for people with HIV infection not AIDS are based upon reports from states and areas with confidential, named-based HIV infection reporting. Washington is not included in those counts at this time.

# Table 2: Cumulative HIV/AIDS case counts and deaths by resident county and AIDSNet region at diagnosis—reported as of 6/30/2006—Washington State

| | | Cumulative Cases | Deaths | | Presumed Living | | | |
|---|---|---|---|---|---|---|---|---|
| | | | No. | (%)[1] | HIV | AIDS | Total | (Total %)[2] |
| | Adams | 6 | 1 | (17) | 1 | 4 | 5 | (0.1) |
| | Asotin | 20 | 7 | (35) | 3 | 10 | 13 | (0.1) |
| | Columbia | 5 | 4 | (80) | 0 | 1 | 1 | (0.0) |
| | Ferry | 7 | 6 | (86) | 0 | 1 | 1 | (0.0) |
| | Garfield | 1 | 0 | (0) | 1 | 0 | 1 | (0.0) |
| | Lincoln | 4 | 2 | (50) | 0 | 2 | 2 | (0.0) |
| | Okanogan | 33 | 9 | (27) | 7 | 17 | 24 | (0.3) |
| | Pend Orielle | 8 | 5 | (63) | 0 | 3 | 3 | (0.0) |
| | Spokane | 632 | 289 | (46) | 134 | 209 | 343 | (3.7) |
| | Stevens | 25 | 10 | (40) | 6 | 9 | 15 | (0.2) |
| | Walla Walla | 60 | 29 | (48) | 6 | 25 | 31 | (0.3) |
| | Whitman | 16 | 4 | (25) | 1 | 11 | 12 | (0.1) |
| **Region 1** | **Subtotal** | **817** | **366** | **(45)** | **159** | **292** | **451** | **(4.9)** |
| | Benton | 108 | 38 | (35) | 26 | 44 | 70 | (0.8) |
| | Chelan | 53 | 23 | (43) | 15 | 15 | 30 | (0.3) |
| | Douglas | 4 | 2 | (50) | 2 | 0 | 2 | (0.0) |
| | Franklin | 69 | 17 | (25) | 19 | 33 | 52 | (0.6) |
| | Grant | 41 | 20 | (49) | 9 | 12 | 21 | (0.2) |
| | Kittitas | 22 | 9 | (41) | 4 | 9 | 13 | (0.1) |
| | Klickitat | 14 | 6 | (43) | 5 | 3 | 8 | (0.1) |
| | Yakima | 216 | 80 | (37) | 47 | 89 | 136 | (1.5) |
| **Region 2** | **Subtotal** | **527** | **195** | **(37)** | **127** | **205** | **332** | **(3.6)** |
| | Island | 73 | 34 | (47) | 14 | 25 | 39 | (0.4) |
| | San Juan | 24 | 11 | (46) | 6 | 7 | 13 | (0.1) |
| | Skagit | 85 | 36 | (42) | 22 | 27 | 49 | (0.5) |
| | Snohomish | 877 | 332 | (38) | 208 | 337 | 545 | (5.9) |
| | Whatcom | 205 | 82 | (40) | 51 | 72 | 123 | (1.3) |
| **Region 3** | **Subtotal** | **1,264** | **495** | **(39)** | **301** | **468** | **769** | **(8.3)** |
| **Region 4** | **King** | **10,073** | **4,214** | **(42)** | **2,629** | **3,230** | **5,859** | **(63.5)** |
| | Kitsap | 283 | 116 | (41) | 75 | 92 | 167 | (1.8) |
| | Pierce | 1,415 | 586 | (41) | 383 | 446 | 829 | (9.0) |
| **Region 5** | **Subtotal** | **1,698** | **702** | **(41)** | **458** | **538** | **996** | **(10.8)** |
| | Clallam | 76 | 33 | (43) | 19 | 24 | 43 | (0.5) |
| | Clark | 577 | 215 | (37) | 160 | 202 | 362 | (3.9) |
| | Cowlitz | 129 | 52 | (40) | 38 | 39 | 77 | (0.8) |
| | Grays Harbor | 75 | 33 | (44) | 16 | 26 | 42 | (0.5) |
| | Jefferson | 32 | 17 | (53) | 7 | 8 | 15 | (0.2) |
| | Lewis | 51 | 26 | (51) | 9 | 16 | 25 | (0.3) |
| | Mason | 98 | 23 | (23) | 22 | 53 | 75 | (0.8) |
| | Pacific | 26 | 11 | (42) | 8 | 7 | 15 | (0.2) |
| | Skamania | 7 | 5 | (71) | 0 | 2 | 2 | (0.0) |
| | Thurston | 236 | 79 | (33) | 60 | 97 | 157 | (1.7) |
| | Wahkiakum | 3 | 0 | (0) | 1 | 2 | 3 | (0.0) |
| **Region 6** | **Subtotal** | **1,310** | **494** | **(38)** | **340** | **476** | **816** | **(8.8)** |
| **Total** | | **15,689** | **6,466** | **(41)** | **4,014** | **5,209** | **9,223** | **(100.0)** |

1. Percent of county cases who have died (row %).
2. Percent of total presumed living cases in Washington State (column %).

## Table 3: Demographic characteristics of people presumed living with HIV/ AIDS—reported as of 6/30/2006—King County, other Washington Counties, all Washington, State, and U.S.

| | King County | | Other Counties | | Washington State | | Estimated U.S.AIDS[1] | |
|---|---|---|---|---|---|---|---|---|
| | No. | (%) | No. | (%) | No. | (%) | No. | (%) |
| **Sex** | | | | | | | | |
| Male | 5,295 | (90) | 2,706 | (80) | 8,001 | (87) | 315,147 | (78) |
| Female | 564 | (10) | 658 | (20) | 1,222 | (13) | 90,779 | (22) |
| **Age Group at HIV diagnosis** | | | | | | | | |
| Under 13 | 26 | (0) | 30 | (1) | 56 | (1) | 3,927 | (1) |
| 13-19 | 114 | (2) | 95 | (3) | 209 | (2) | not available | |
| 20-29 | 1,699 | (29) | 1,021 | (30) | 2,720 | (29) | not available | |
| 30-39 | 2,727 | (44) | 1,247 | (37) | 3,803 | (41) | not available | |
| 40-49 | 1,159 | (20) | 719 | (21) | 1,878 | (20) | not available | |
| 50-59 | 265 | (5) | 202 | (6) | 467 | (5) | not available | |
| 60 and over | 40 | (1) | 50 | (1) | 90 | (1) | not available | |
| Unknown Age | 0 | (0) | 0 | (0) | 0 | (0) | not available | |
| **Race/Ethnicity** | | | | | | | | |
| White[2] | 4,102 | (70) | 2,427 | (72) | 6,529 | (71) | 146,544 | (36) |
| Black[2] | 935 | (16) | 399 | (12) | 1,334 | (14) | 172,278 | (42) |
| Hispanic | 530 | (9) | 343 | (10) | 873 | (9) | 80,263 | (20) |
| Asian & Pacific Islander[2] | 148 | (3) | 124 | (4) | 299 | (3) | 3,826 | (1) |
| *Asian [2,3]* | *138* | *(2)* | 81 | *(2)* | *219* | *(2)* | *N/A* | |
| *Native Hawaiian & Other PI [2,3]* | *10* | *(0)* | 12 | *(0)* | *22* | *(0)* | *N/A* | |
| Native American or Alaskan Native[2] | 84 | (1) | 78 | (2) | 162 | (2) | 1,498 | (0) |
| Multiple Race[2,3] | 35 | (1) | 3 | (0) | 38 | (0) | N/A | |
| Unknown Race | 25 | (0) | 21 | (1) | 46 | (0) | 1,517 | (0) |
| **HIV Exposure Category** | | | | | | | | |
| Male-male sex | 4,092 | (70) | 1,634 | (49) | 5,726 | (62) | 182,989 | (45) |
| Injection drug use (IDU) | 347 | (6) | 484 | (14) | 831 | (9) | 98,901 | (24) |
| IDU & male-male sex | 498 | (8) | 283 | (8) | 781 | (8) | 24,334 | (6) |
| Heterosexual contact | 437 | (7) | 527 | (16) | 964 | (10) | 89,009 | (22) |
| Blood product exposure | 36 | (1) | 43 | (1) | 79 | (1) | not available | |
| Perinatal exposure | 19 | (0) | 27 | (1) | 46 | (0) | 3,788 | (1) |
| Undetermined/other[4] | 430 | (7) | 366 | (11) | 796 | (9) | 6,905 | (2) |
| **Total** | **5,859** | **(100)** | **3,364** | **(100)** | **9,223** | **(100)** | **405,926** | **(100)** |

1. U.S. AIDS data were reported as of 12/31/2004 and are the most recent statistics available. These include 401,999 adult and 3,827 pediatric AIDS cases. Estimates for the states and areas with confidential name-based HIV infection reporting were not readily available.
2. And not Hispanic. All race and ethnicity categories are mutually exclusive.
3. Asian & Pacific Islander cases were split into either Asian, or Native Hawaiian & Other Pacific Islander. A few cases could not be reassigned and are included only in the old category.
4. Includes cases with incomplete information, and sexual exposures where the heterosexual partner is not known to be HIV+, IDU, or a bisexual male. One case was probably infected via occupational exposure.

## Table 4: People presumed living with HIV/AIDS by gender, race or ethnicity, and HIV exposure category—reported as of 6/30/2006—King County

| | White[1] | | Black[1] | | Hispanic | | Asian & PI[1,2] | | Native Am/AN[1,3] | | Total[4] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **HIV Exposure Category** | **No.** | **%** | **No.** | **%** | **No.** | **%** | **No.** | **%** | **No.** | **%** | **No.** | **%** |
| **Male** | | | | | | | | | | | | |
| Male-male sex | 3,237 | (79) | 335 | (36) | 355 | (67) | 101 | (68) | 30 | (36) | 4,092 | (70) |
| Injection drug use (IDU) | 111 | (3) | 72 | (8) | 30 | (6) | 3 | (2) | 8 | (10) | 227 | (4) |
| IDU & male-male sex | 399 | (10) | 36 | (4) | 34 | (6) | 5 | (3) | 13 | (15) | 498 | (8) |
| Heterosexual contact | 46 | (1) | 98 | (10) | 21 | (4) | 6 | (4) | 2 | (2) | 174 | (3) |
| Blood product exposure | 16 | (0) | 2 | (0) | 2 | (0) | 1 | (1) | 0 | (0) | 21 | (0) |
| Perinatal exposure | 1 | (0) | 4 | (0) | 0 | (0) | 1 | (1) | 0 | (0) | 6 | (0) |
| Undetermined/other | 78 | (2) | 127 | (14) | 45 | (8) | 17 | (11) | 4 | (5) | 277 | (5) |
| **Male Subtotal** | **3,888** | **(95)** | **674** | **(72)** | **487** | **(92)** | **134** | **(91)** | **57** | **(68)** | **5,295** | **(90)** |
| **Female** | | | | | | | | | | | | |
| Injection drug use | 62 | (2) | 36 | (4) | 4 | (1) | 0 | (0) | 17 | (20) | 120 | (2) |
| Heterosexual contact | 110 | (3) | 112 | (12) | 23 | (4) | 7 | (5) | 7 | (8) | 263 | (4) |
| Blood product exposure | 4 | (0) | 9 | (1) | 2 | (0) | 0 | (0) | 0 | (0) | 15 | (0) |
| Perinatal exposure | 3 | (0) | 7 | (1) | 2 | (0) | 1 | (1) | 0 | (0) | 13 | (0) |
| Undetermined/other | 35 | (1) | 97 | (10) | 12 | (2) | 6 | (4) | 3 | (4) | 153 | (3) |
| **Female Subtotal** | **214** | **(5)** | **261** | **(28)** | **43** | **(8)** | **14** | **(9)** | **27** | **(32)** | **564** | **(10)** |
| **Total** | **4,102** | **(70)** | **935** | **(16)** | **530** | **(9)** | **148** | **(3)** | **84** | **(1)** | **5,859** | **(100)** |

## Table 5: People presumed living with HIV/AIDS by gender, race or ethnicity, and HIV exposure category—reported as of 6/30/2006—Washington State

| | White[1] | | Black[1] | | Hispanic | | Asian & PI[1,2] | | Native Am/AN[1,3] | | Total[4] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **HIV Exposure Category** | **No.** | **%** | **No.** | **%** | **No.** | **%** | **No.** | **%** | **No.** | **%** | **No.** | **%** |
| **Male** | | | | | | | | | | | | |
| Male-male sex | 4,550 | (70) | 449 | (34) | 489 | (56) | 138 | (57) | 53 | (33) | 5,726 | (62) |
| Injection drug use (IDU) | 346 | (5) | 116 | (9) | 63 | (7) | 6 | (2) | 16 | (10) | 551 | (6) |
| IDU & male-male sex | 629 | (10) | 56 | (4) | 53 | (6) | 7 | (3) | 22 | (14) | 781 | (8) |
| Heterosexual contact | 128 | (2) | 141 | (11) | 52 | (6) | 15 | (6) | 5 | (3) | 343 | (4) |
| Blood product exposure | 42 | (1) | 2 | (0) | 7 | (1) | 1 | (0) | 0 | (0) | 53 | (1) |
| Perinatal exposure | 7 | (0) | 9 | (1) | 2 | (0) | 2 | (1) | 1 | (1) | 21 | (0) |
| Undetermined/other | 235 | (4) | 163 | (12) | 87 | (10) | 26 | (11) | 6 | (4) | 526 | (6) |
| **Male Subtotal** | **5,937** | **(91)** | **936** | **(70)** | **753** | **(86)** | **195** | **(81)** | **103** | **(64)** | **8,001** | **(87)** |
| **Female** | | | | | | | | | | | | |
| Injection drug use (IDU) | 167 | (3) | 65 | (5) | 13 | (1) | 3 | (1) | 30 | (19) | 280 | (3) |
| Heterosexual contact | 308 | (5) | 185 | (14) | 78 | (9) | 25 | (10) | 21 | (13) | 621 | (7) |
| Blood product exposure | 8 | (0) | 12 | (1) | 3 | (0) | 3 | (1) | 0 | (0) | 26 | (0) |
| Perinatal exposure | 9 | (0) | 10 | (1) | 4 | (0) | 2 | (1) | 0 | (0) | 25 | (0) |
| Undetermined/other | 100 | (2) | 126 | (9) | 22 | (3) | 13 | (5) | 8 | (5) | 270 | (3) |
| **Female Subtotal** | **592** | **(9)** | **398** | **(30)** | **120** | **(14)** | **46** | **(19)** | **59** | **(36)** | **1,222** | **(13)** |
| **Total** | **6,529** | **(71)** | **1,334** | **(14)** | **873** | **(9)** | **241** | **(3)** | **162** | **(2)** | **9,223** | **(100)** |

1. And not Hispanic. All race and ethnicity categories are mutually exclusive.
2. Due to small cell sizes, data have been combined for Asians, Native Hawaiians, and other Pacific Islanders.
3. Native American or Alaskan Native
4. Totals include 31 King County and 32 Washington State people classified in multiple race, and 23 King County and 47 Washington State people with missing race.

## Table 6: People presumed living with HIV/AIDS by gender and age at HIV diagnosis—reported as of 6/30/2006—King County and Washington State

| | King County | | | | Washington State | | | |
|---|---|---|---|---|---|---|---|---|
| Age at HIV Diagnosis | Male | | Female | | Male | | Female | |
| | No. | (%) | No. | (%) | No. | (%) | No. | (%) |
| Under 13 years | 11 | (0) | 15 | (3) | 27 | (0) | 65 | (5) |
| 13-19 years | 82 | (2) | 32 | (6) | 144 | (2) | 418 | (34) |
| 20-29 years | 1,505 | (28) | 194 | (34) | 2,302 | (29) | 396 | (32) |
| 30-39 years | 2,364 | (45) | 192 | (34) | 3,407 | (43) | 216 | (18) |
| 40-49 years | 1,076 | (20) | 83 | (15) | 1,662 | (21) | 83 | (7) |
| 50-59 years | 222 | (87) | 43 | (8) | 384 | (0) | 15 | (1) |
| 60 years and over | 35 | (1) | 5 | (1) | 75 | (1) | 29 | (2) |
| **Total** | **5,295** | **(100)** | **564** | **(100)** | **8,001** | **(100)** | **1,222** | **(100)** |

## Table 7: People presumed living with HIV/AIDS by gender, race or ethnicity, and place of birth[1]—reported as of 6/30/2006—King County and Washington

| Race / Ethnicity | King County | | | | Washington State | | | |
|---|---|---|---|---|---|---|---|---|
| | U.S.-born | | Foreign-born | | U.S.-born | | Foreign-born | |
| | No. | (%) | No. | (%) | No. | (%) | No. | (%) |
| White, non-Hispanic | 3,832 | (98) | 88 | (2) | 6,149 | (98) | 129 | (2) |
| Black, non-Hispanic | 609 | (67) | 300 | (33) | 931 | (72) | 368 | (28) |
| *Male Black, non-Hispanic* | *489* | *(75)* | *164* | *(25)* | *717* | *(79)* | *192* | *(21)* |
| *Female Black, non-Hispanic* | *120* | *(47)* | *136* | *(53)* | *214* | *(55)* | *176* | *(45)* |
| Hispanic | 205 | (43) | 277 | (57) | 318 | (40) | 469 | (60) |
| Asian & PI, non-Hispanic | 46 | (34) | 90 | (66) | 80 | (36) | 142 | (64) |
| Native American, non-Hispanic | 78 | (95) | 4 | (5) | 155 | (97) | 5 | (3) |
| Multiple or unknown race, non-Hispanic | 44 | (90) | 5 | (10) | 59 | (87) | 9 | (13) |
| **TOTAL** | **4,814** | **(86)** | **764** | **(14)** | **7,692** | **(87)** | **1,122** | **(20)** |

1. Table 7 does not include 269 King County and 400 Washington cases missing place of birth information.

**Figure 1: Number of new HIV/AIDS diagnoses, deaths, and people living with HIV/ AIDS at end of three year intervals—reported as of 6/30/2006—King County**

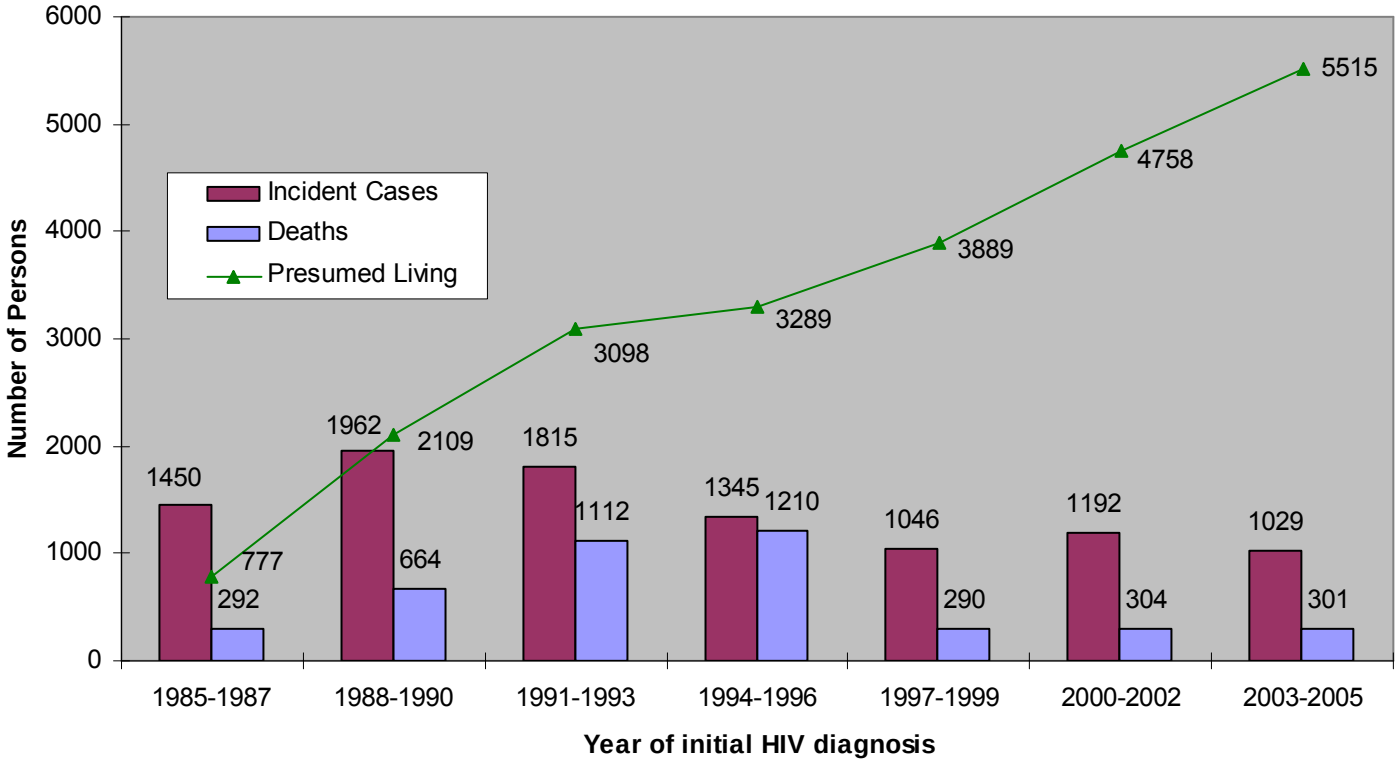
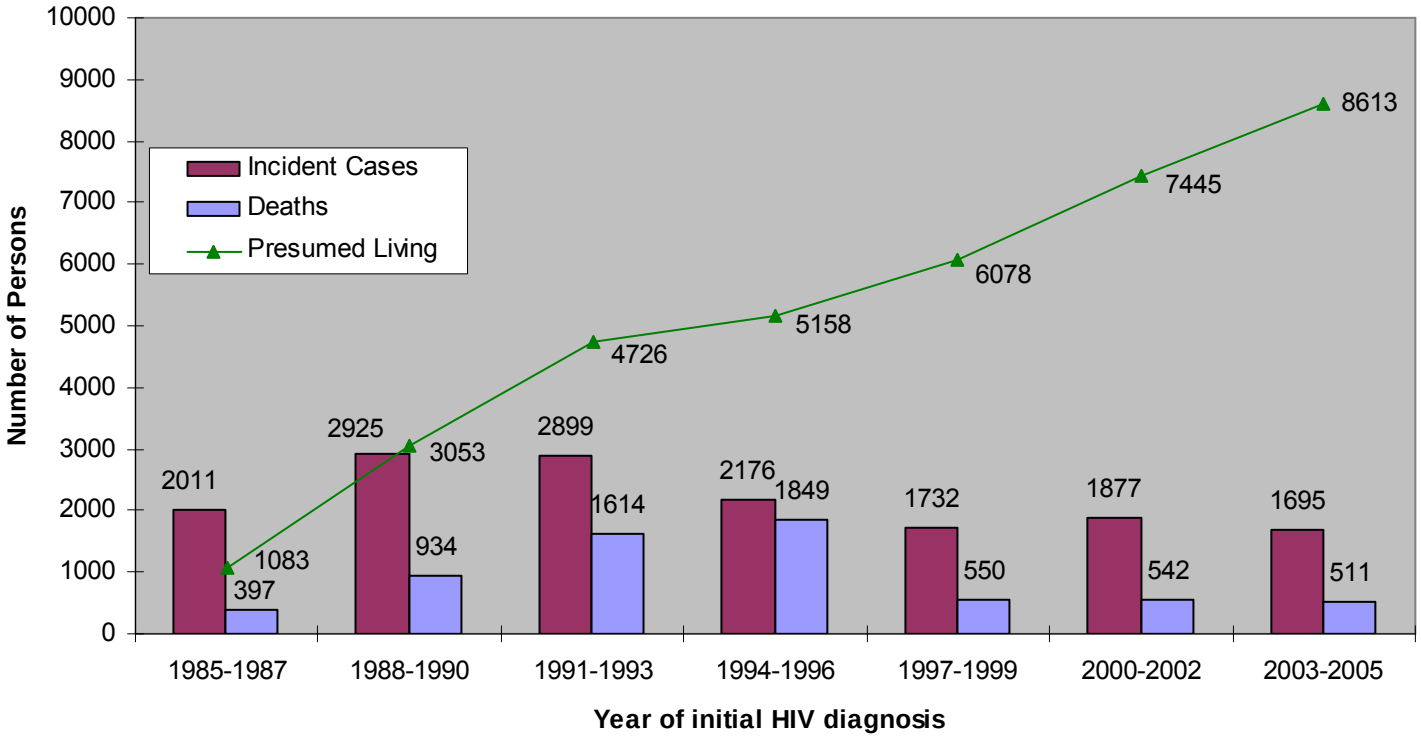



**Figure 2: Number of new HIV/AIDS diagnoses, deaths, and people living with HIV/ AIDS at end of three year intervals—reported as of 6/30/2006—Washington State**



# Table 8: Demographic characteristics of King County residents diagnosed 1981-2005 and reported through 6/30/2006, by date of HIV diagnosis

| | 1981-1996 | | 1997-1999 | | 2000-2002 | | 2003-2005[1] | | Trend[2] |
|---|---|---|---|---|---|---|---|---|---|
| | No. | (%) | No. | (%) | No. | (%) | No. | (%) | 1997-2005 |
| **TOTAL** | **6,687** | **(100)** | **1,046** | **(100)** | **1,192** | **(100)** | **1,029** | **(100)** | |
| **HIV Exposure Category** | | | | | | | | | |
| Men who have sex with men (MSM) | 5,090 | (76) | 723 | (69) | 753 | (63) | 657 | (64) | down |
| Injection drug user (IDU) | 371 | (6) | 62 | (6) | 86 | (7) | 58 | (6) | |
| MSM-IDU | 706 | (11) | 86 | (8) | 94 | (8) | 72 | (7) | |
| Heterosexual contact | 228 | (3) | 68 | (7) | 148 | (12) | 92 | (9) | up |
| Blood product exposure | 89 | (1) | 5 | (0) | 7 | (1) | 5 | (0) | |
| Perinatal exposure | 21 | (0) | 3 | (0) | 3 | (0) | 0 | (0) | |
| *SUBTOTAL- known risk* | *6,505* | | *947* | | *1,091* | | *884* | | |
| Undetermined/other[3] | 182 | (3) | 99 | (9) | 101 | (8) | 145 | (14) | up |
| **Sex & Race/Ethnicity** | | | | | | | | | |
| **Male** | *6,329* | *(95)* | *939* | *(90)* | *1,045* | *(88)* | *914* | *(89)* | |
| White Male[4] | 5,239 | (78) | 663 | (63) | 699 | (59) | 570 | (55) | down |
| Black Male[4] | 571 | (9) | 125 | (12) | 173 | (15) | 162 | (16) | up |
| Hispanic Male | 329 | (5) | 105 | (10) | 112 | (9) | 111 | (11) | |
| Other Male[4] | 190 | (3) | 46 | (4) | 61 | (5) | 71 | (7) | up |
| **Female** | *358* | *(5)* | *107* | *(10)* | *147* | *(12)* | *115* | *(11)* | |
| White Female[4] | 195 | (3) | 41 | (4) | 48 | (4) | 28 | (3) | |
| Black Female[4] | 108 | (2) | 55 | (5) | 70 | (6) | 68 | (7) | |
| Hispanic Female | 23 | (0) | 4 | (0) | 15 | (1) | 10 | (1) | |
| Other Female[4] | 32 | (0) | 7 | (1) | 14 | (1) | 9 | (1) | |
| **Race/Ethnicity** | | | | | | | | | |
| White[4] | 5,434 | (81) | 704 | (67) | 747 | (63) | 598 | (58) | down |
| Black[4] | 679 | (10) | 180 | (17) | 243 | (20) | 230 | (22) | up |
| Hispanic | 352 | (5) | 109 | (10) | 127 | (11) | 121 | (12) | |
| Asian & Pacific Islander[4] | 103 | (2) | 29 | (3) | 41 | (3) | 38 | (4) | |
| Native American or Alaskan Native[4] | 94 | (1) | 17 | (2) | 17 | (1) | 16 | (2) | |
| Multiple Race[4] | 23 | (0) | 2 | (0) | 12 | (1) | 16 | (2) | up |
| Unknown Race[4] | 2 | (0) | 5 | (0) | 5 | (0) | 10 | (1) | |
| **Place of Birth** | | | | | | | | | |
| Born in U.S. or Territories | 6,181 | (92) | 831 | (79) | 918 | (77) | 773 | (75) | |
| Born outside U.S. | 370 | (6) | 145 | (14) | 237 | (20) | 219 | (21) | up |
| Birthplace unknown | 136 | (2) | 70 | (7) | 37 | (3) | 37 | (4) | |
| **Age at diagnosis of HIV** | | | | | | | | | |
| 0-19 years | 124 | (2) | 20 | (2) | 18 | (2) | 11 | (1) | |
| 20-24 years | 538 | (8) | 66 | (6) | 96 | (8) | 80 | (8) | |
| 25-29 years | 1,341 | (20) | 179 | (17) | 167 | (14) | 134 | (13) | down |
| 30-34 years | 1,599 | (24) | 259 | (25) | 265 | (22) | 182 | (18) | down |
| 35-39 years | 1,363 | (20) | 234 | (22) | 280 | (23) | 241 | (23) | |
| 40-44 years | 823 | (12) | 143 | (14) | 185 | (16) | 185 | (18) | up |
| 45-49 years | 471 | (7) | 74 | (7) | 90 | (8) | 106 | (10) | up |
| 50-54 years | 215 | (3) | 43 | (4) | 58 | (5) | 49 | (5) | |
| 55-59 years | 131 | (2) | 16 | (2) | 18 | (2) | 26 | (3) | |
| 60-64 years | 47 | (1) | 4 | (0) | 9 | (1) | 7 | (1) | |
| 65 + years | 35 | (1) | 8 | (1) | 6 | (1) | 8 | (1) | |
| **Residence** | | | | | | | | | |
| Seattle residence | 5,813 | (87) | 876 | (84) | 967 | (81) | 779 | (76) | down |
| King County outside Seattle | 874 | (13) | 170 | (16) | 225 | (19) | 250 | (24) | up |

1. Data from recent years are incomplete. 119 cases diagnosed in 2006 are not included in this table.
2. The chi-square test for trend identifies statistical changes ($p < .05$) over the periods 1997-99, 2000-02, and 2003-05.
3. Undetermined mode of exposure includes cases with incomplete information, and sexual exposures where the heterosexual

# Table 9: Demographic characteristics of Washington State residents diagnosed 1981-2005 and reported through 6/30/2006, by date of HIV diagnosis

| | 1981-1996 | | 1997-1999 | | 2000-2002 | | 2003-2005[1] | | Trend[2] |
|---|---|---|---|---|---|---|---|---|---|
| | No. | (%) | No. | (%) | No. | (%) | No. | (%) | 1997-2005 |
| **TOTAL** | **10,175** | **(100)** | **1,732** | **(100)** | **1,877** | **(100)** | **1,695** | **(100)** | |
| **HIV Exposure Category** | | | | | | | | | |
| Men who have sex with men (MSM) | 7,023 | (69) | 1,046 | (60) | 1,068 | (57) | 954 | (56) | down |
| Injection drug user (IDU) | 884 | (9) | 173 | (10) | 205 | (11) | 139 | (8) | down |
| MSM-IDU | 1,068 | (10) | 143 | (8) | 137 | (7) | 115 | (7) | |
| Heterosexual contact | 557 | (5) | 171 | (10) | 269 | (14) | 212 | (13) | up |
| Blood product exposure | 215 | (2) | 10 | (1) | 10 | (1) | 11 | (1) | |
| Perinatal exposure | 51 | (1) | 5 | (0) | 4 | (0) | 2 | (0) | |
| *SUBTOTAL- known risk* | *9,798* | | *1,548* | | *1,693* | | *1,433* | | |
| Undetermined/other[3] | 377 | (4) | 184 | (11) | 184 | (10) | 262 | (15) | up |
| **Sex & Race/Ethnicity** | | | | | | | | | |
| **Male** | *9,346* | *(92)* | *1,498* | *(86)* | *1,584* | *(84)* | *1,438* | *(85)* | |
| White Male[4] | 7,746 | (76) | 1,085 | (63) | 1,072 | (57) | 951 | (56) | down |
| Black Male[4] | 785 | (8) | 178 | (10) | 243 | (13) | 219 | (13) | up |
| Hispanic Male | 528 | (5) | 157 | (9) | 177 | (9) | 166 | (10) | |
| Other Male[4] | 287 | (3) | 78 | (5) | 92 | (5) | 102 | (6) | |
| **Female** | *829* | *(8)* | *234* | *(14)* | *293* | *(16)* | *257* | *(15)* | |
| White Female[4] | 507 | (5) | 117 | (7) | 124 | (7) | 98 | (6) | |
| Black Female[4] | 186 | (2) | 82 | (5) | 106 | (6) | 98 | (6) | |
| Hispanic Female | 70 | (1) | 17 | (1) | 30 | (2) | 32 | (2) | |
| Other Female[4] | 66 | (1) | 18 | (1) | 33 | (2) | 29 | (2) | |
| **Race/Ethnicity** | | | | | | | | | |
| White[4] | 8,253 | (81) | 1,202 | (69) | 1,196 | (64) | 1,049 | (62) | down |
| Black[4] | 971 | (10) | 260 | (15) | 349 | (19) | 317 | (19) | up |
| Hispanic | 598 | (6) | 174 | (10) | 207 | (11) | 198 | (12) | |
| Asian & Pacific Islander[4] | 155 | (2) | 47 | (3) | 66 | (4) | 65 | (4) | |
| Native American or Alaskan Native[4] | 160 | (2) | 37 | (2) | 35 | (2) | 38 | (2) | |
| Multiple Race[4] | 26 | (0) | 2 | (0) | 12 | (1) | 17 | (1) | up |
| Unknown Race[4] | 12 | (0) | 10 | (1) | 12 | (1) | 11 | (1) | |
| **Place of Birth** | | | | | | | | | |
| Born in U.S. or Territories | 9,405 | (92) | 1,409 | (81) | 1,476 | (79) | 1,330 | (78) | |
| Born outside U.S. | 576 | (6) | 217 | (13) | 318 | (17) | 316 | (19) | up |
| Birthplace unknown | 194 | (2) | 106 | (6) | 83 | (4) | 49 | (3) | down |
| **Age at diagnosis of HIV** | | | | | | | | | |
| 0-19 years | 249 | (2) | 32 | (2) | 34 | (2) | 21 | (1) | |
| 20-24 years | 940 | (9) | 121 | (7) | 157 | (8) | 157 | (9) | up |
| 25-29 years | 2,031 | (20) | 274 | (16) | 247 | (13) | 215 | (13) | down |
| 30-34 years | 2,373 | (23) | 398 | (23) | 396 | (21) | 278 | (16) | down |
| 35-39 years | 1,959 | (19) | 375 | (22) | 419 | (22) | 345 | (20) | |
| 40-44 years | 1,233 | (12) | 255 | (15) | 291 | (16) | 296 | (17) | |
| 45-49 years | 692 | (7) | 131 | (8) | 159 | (8) | 194 | (11) | up |
| 50-54 years | 324 | (3) | 78 | (5) | 94 | (5) | 97 | (6) | |
| 55-59 years | 208 | (2) | 41 | (2) | 41 | (2) | 56 | (3) | |
| 60-64 years | 85 | (1) | 12 | (1) | 20 | (1) | 17 | (1) | |
| 65 + years | 81 | (1) | 15 | (1) | 19 | (1) | 19 | (1) | |
| **Residence[5]** | | | | | | | | | |
| Region 1- Spokane area | 502 | (5) | 105 | (6) | 107 | (6) | 92 | (5) | |
| Region 2- Yakima area | 300 | (3) | 79 | (5) | 71 | (4) | 71 | (4) | |
| Region 3- Everett area | 800 | (8) | 150 | (9) | 133 | (7) | 162 | (10) | up |
| Region 4- Seattle area | 6,687 | (66) | 1,046 | (60) | 1,192 | (64) | 1,029 | (61) | |
| Region 5- Tacoma area | 1,066 | (10) | 197 | (11) | 213 | (11) | 189 | (11) | |
| Region 6- Olympia area | 820 | (8) | 155 | (9) | 161 | (9) | 152 | (9) | |

1. Data from recent years are incomplete. 119 cases diagnosed in 2006 are not included in this table.
2. The chi-square test for trend identifies statistical changes ($p < .05$) over the periods 1997-99, 2000-02, and 2003-05.
3. Undetermined mode of exposure includes cases with incomplete information, and sexual exposures where the heterosexual partner is not known to be HIV+, IDU, or a bisexual male. One case was probably infected through occupational exposure.
4. And not Hispanic. The groups Asian and Native Hawaiian & Pacific Islanders are grouped because of small cell sizes.
5. The counties and regions are: Region 1—Adams, Asotin, Columbia,, Asotin, Columbia, Ferry, Garfield, Lincoln, Okanogan, Pend Oreille, Spokane, Stevens, Walla Walla, and Whitman; Region 2- Benton, Chelan, Douglas, Franklin, Grant, Kittitas, Klickitat, and Yakima; Region 3- Island, San Juan, Skagit, Snohomish, and Whatcom; Region 4- King; Region 5- Kitsap and Pierce; Region 6- Clallam, Clark, Cowlitz, Grays Harbor, Jefferson, Lewis, Mason, Pacific, Skamania, Thurston, and Wahkiakum.

# Annual Review of the Epidemiology of HIV and AIDS in Seattle & King County

This summary of the status of the HIV and AIDS epidemics in King County (KC), Washington is through June 30, 2006. This update is compiled from clinical reports of people with AIDS (since 1981) and HIV (since 1999, including retrospective reports of earlier diagnoses).

## Global and National Perspective

According to the Joint United Nations Programme on HIV/AIDS[1], 38.6 million people worldwide were living with HIV or AIDS at the end of 2005, including 2.3 million children under 15 years of age. On average, 1.0% of adults worldwide age 15-49 are infected with HIV. An estimated 4.1 million people acquired HIV infection, and 2.8 million deaths occurred, in 2005. Twenty-five million people have died from AIDS worldwide since 1981.

There are 1,039,000 to 1,185,000 HIV infected people in the United States, including an estimated one-quarter who remain undiagnosed and unaware of their status[2]. About 40,000 new infections occur each year (less than 1% of the world total), with nearly 16,000 deaths in 2004[3].

The Seattle metropolitan statistical area (MSA), which includes King, Snohomish and Island counties, is one of 114 U.S. metropolitan areas with a population of 500,000 or more. In 2004, the Seattle MSA ranked 27th in the cumulative number and 52nd in annual rate nationally with a reported AIDS rate of 11.6 cases per 100,000 population. In comparison, the Tacoma MSA had a rate of 5.0, and the Portland (Oregon) MSA rate was 10.5 per 100,000. The highest metropolitan rates in the country were in Fort Lauderdale FL (58.4), Miami FL (57.8), New York City (56.7), Washington DC (40.3), W Palm Beach FL (39.5), Baton Rouge LA (35.0), and San Francisco CA (33.5). [3]

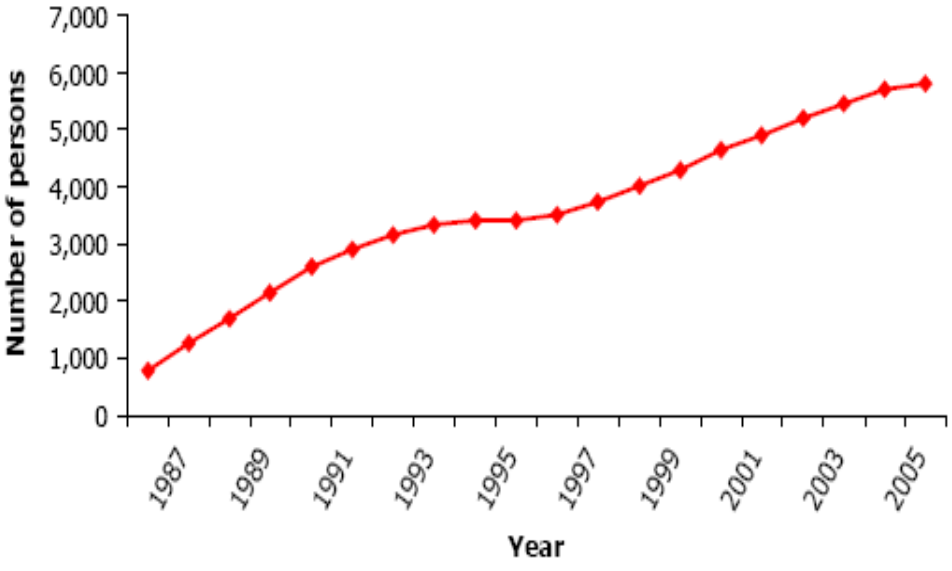
The Seattle MSA cases make up a decreasing proportion of total U.S. cases over time. The Seattle MSA accounted for 1.01% of the cumulative U.S. total at the end of 1992, 0.95% at the end of 1996, and 0.84% at the end of 2004.[3]

## Number of People Infected with HIV in King County

The Washington State Department of Health estimates that 11,000 to 13,000 Washington residents, and 7,200 to 8,400 King County residents are living with HIV or AIDS.[4] The estimated number of new HIV diagnoses has been level with 350-400 new diagnoses each year since 1998. Because there are about 100 HIV-related deaths annually, the reported number of King County residents living with HIV/AIDS is increasing (Figure 1).

As of June 30, 2006, HIV-infected King County residents include 3,225 reported living with AIDS, 2,610 reported living with HIV but not AIDS, an estimated 300-500 people diagnosed not yet reported, and an estimated 800-2,200 people who are unaware of their infection status.

**Figure 1: People Reported Living with HIV or AIDS**
**King Co. 1986—2005, data reported through June 30, 2006**



## Characteristics of People Living with HIV or AIDS

Table 1 presents the number of reported cases and estimated number of total infections (including undiagnosed and unreported cases). Rates are calculated as the estimated number infected with HIV, divided by the 2004 census for each category. These estimated rates of HIV infection vary widely between population groups. The rate among males is about ten times higher than among females. Compared with Whites, the rates are more than two times higher among Blacks and Native American & Alaskan Natives (NA/AN), and 1.5 time higher among Hispanics, but are lower among Asians and Pacific Islanders (API). Overall rates are highest among Black and Hispanic males, and lowest among API, White, and Hispanic females.

Ninety percent of people living with HIV or AIDS in King County are male. Most, 70%, are White, 16% are Black, 9% Hispanic, 3% API, and 1% NA/AN. Eighty-two percent were born in the U.S. or territories, 13% were foreign-born, and the birthplace was unknown for 5%.

Seven percent of cases have no identified behavioral exposure to HIV (using the standard CDC-defined categories). Among cases with known exposure, 75% are men who have sex with men (MSM), 9% are MSM who also inject drugs (MSM-IDU), 6% are injection drug users (IDU), 8% report having a heterosexual partner with HIV or at risk of HIV infection, and fewer than 1% each were born to HIV-infected mothers or received blood products (mostly prior to 1985 in the US).

The distribution of exposure categories differs by race and gender. MSM exposure accounts for 80% of known exposures among White men, 58% among Black men, 73% among Hispanic men, 82% among API men, and 55% among NA/AN men. MSM-IDU is the second most common exposure among White men (11%), Hispanic men (8%), and NA/AN men (23%). Heterosexual transmission is the second most common exposure among Black men (18%) and API men (9%).

The primary HIV exposure category for women is a heterosexual partner known to have HIV, or whose HIV status is unknown but who has sex with men or injects drugs. These heterosexual exposures are documented for nearly two-thirds of all women with known risk (including 63% of Whites, 68% of Blacks, 80% of Hispanics, and 76% of API). However, among NA/AN women with HIV, IDU is the most common risk behavior (59%), and 41% had heterosexual partners with HIV or at risk.

HIV-infected residents of King County were born the world over. Among people diagnosed with HIV in 2003 or 2004, the place of birth is

- 78% United States
- 2% Asia and Eastern Europe
- 9% Africa
- 7% Mexico, Latin America and Caribbean
- 1% Western Europe or Canada
- 2% unknown birthplace

Infection rates are higher among foreign-born Blacks (1.8%) than native-born Blacks (1.1%). Foreign-born Blacks are a significant population for special prevention interventions because the risk profiles, language, cultural, and educational needs differ from those among their U.S-born counterparts. The majority of reported cases among foreign-born Blacks are due to heterosexual transmission (48%) or have no identified risk (43%), while 57% of native-born Blacks are MSM or MSM-IDU, and 17% are IDU.

Forty-three percent of people currently living with HIV are age 40-49 years, and 24% are age 50 years or over. At the time of diagnosis, 77% of HIV-infected individuals resided in Seattle, 6% on the Eastside, 2% north of Seattle and Lake Washington, and 15% in South King County.

## Immunologic and Virologic Status

The immunologic status of people living with HIV was evaluated in the ASD study by recording CD4 and viral load values. During 2003, the status of 1,111 people included 17% with severe immune deficiency (CD4 under 200), 47% with moderate immune deficiency (200-500), and 36% with negligible immune deficiency (CD4 over 500). Among 1,249 ASD study subjects, 31% had no detectable viral load, 30% had a low viral burden (under 10,000 copies per microliter), 16% had a moderate viral burden (10-50,000 copies), and 23% had a high viral burden (over 50,000 copies). As of

## Table 1: Characteristics of King Co. residents Living with HIV or AIDS as of 6/30/2006

| Characteristics | Actual Reports | | Estimated HIV Prevalence | | |
|---|---|---|---|---|---|
| | Number Reported | Percent | Estimated Infected* | 2004** Population | Estimated Rate (Percent)*** |
| **Total** | 5,859 | 100% | 8,400 | 1,738,896 | 0.5% |
| **Race/Ethnicity** | | | | | |
| White, not Hispanic | 4,102 | 70% | 5,910 | 1,229,757 | 0.5% |
| Black, not Hispanic | 935 | 16% | 1,350 | 100,943 | 1.3% |
| *Foreign-born Blacks* | *300* | *5%* | *430* | *23,862* | *1.8%* |
| *Native-born Blacks* | *609* | *10%* | *880* | *77,081* | *1.1%* |
| Hispanic | 530 | 9% | 760 | 113,120 | 0.7% |
| Asian & Pacific Islander | 148 | 3% | 210 | 230,354 | 0.1% |
| Native American or Alaskan Native | 84 | 1% | 120 | 10,850 | 1.1% |
| Multiple or other Race | 35 | <1% | 50 | 53,872 | 0.1% |
| Missing | 25 | <1% | N.A. | Not applicable | Not applicable |
| **Sex & Race/Ethnicity** | | | | | |
| **Male** | 5,295 | 90% | 7,590 | 864,386 | 0.9% |
| White Male | 3,888 | 66% | 5,630 | 611,573 | 0.9% |
| Black Male | 674 | 12% | 980 | 50.710 | 1.9% |
| Hispanic Male | 487 | 8% | 710 | 60,627 | 1.2% |
| Asian or Pacific Islander Male | 134 | 2% | 190 | 109,232 | 0.2% |
| Native American or Alaskan Native Male | 57 | 1% | 80 | 5,242 | 1.5% |
| Multiple or Unknown Race | 55 | <1% | N.A. | 27,002 | Not applicable |
| **Female** | 564 | 10% | 810 | 874,510 | 0.1% |
| White Female | 214 | 4% | 310 | 609,891 | <0.1% |
| Black Female | 261 | 4% | 380 | 50,233 | 0.7% |
| Hispanic Female | 43 | 1% | 60 | 52,493 | 0.1% |
| Asian or Pacific Islander Female | 14 | <1% | 20 | 121,122 | <0.1% |
| Native American or Alaskan Native Female | 27 | <1% | 40 | 5,608 | 0.7% |
| Multiple or Unknown Race | 5 | <1% | N.A. | 26,870 | Not applicable |
| **HIV Exposure Category** | | | | | |
| Men who have sex w/men (MSM) | 4,092 | 75% | 6,300 | 40,000 | 15.8% |
| Injection drug user (IDU) | 347 | 6% | 570 | 15,000 | 3.8% |
| MSM-IDU | 498 | 9% | 780 | 3,150 | 24.8% |
| Blood product exposure | 36 | 1% | 60 | Unknown | Unknown |
| Heterosexual contact | 437 | 8% | 660 | 1,245,000 | 0.1% |
| Perinatal exposure | 19 | <1% | 30 | Unknown | Unknown |
| **Subtotal- known exposure** | 5,429 | 100% | 8,400 | 1,738,896 | 0.5% |
| *Undetermined/ other* | *430* | *7%* | *N.A.* | *Not applicable* | *Not applicable* |
| **Current Age as of 6/30/2006** | | | | | |
| 0-14 years | 17 | <1% | 20 | 315,835 | 0.0% |
| 15-19 years | 9 | <1% | 20 | 96,862 | <0.1% |
| 20-24 years | 76 | 1% | 110 | 103,615 | 0.1% |
| 25-29 years | 285 | 5% | 410 | 122,133 | 0.3% |
| 30-39 years | 1,552 | 26% | 2,220 | 293,441 | 0.8% |
| 40-49 years | 2,523 | 43% | 3,620 | 311,191 | 1.2% |
| 50 years and over | 1,397 | 24% | 2,000 | 495,819 | 0.4% |
| **Place of Birth** | | | | | |
| Native-born | 4,814 | 82% | 7,250 | 1,408,793 | 0.5% |
| Foreign-born | 764 | 13% | 1,150 | 330,103 | 0.3% |
| Unknown birthplace | 281 | 5% | N.A | Not applicable | Not applicable |

* As many as 8,400 King Co. residents may be infected with HIV. Each estimate is the proportion of cases not missing data, times 8,400, rounded to the nearest 10.

** Population estimates are from the 2004 American Community Survey of the U.S. Census Bureau.

*** The estimated rate is the estimated number infected divided by the population.

September 1, 2006, all viral load and CD4 assessments will be reported to Public Health, so population-based immunologic and virologic data will soon be available.

## Trends in Diagnosis of HIV Infection

Based upon data reported through June 2006, we compared the characteristics of persons diagnosed with HIV infection during 1997-1999, 2000-2002, and 2003-2005 (Table 2). A chi-square test for trend was used to establish statistically significant changes over time in the proportion of cases in each group.

Although the relative ranking of each group has not changed over time, there have been substantial shifts in the proportion of persons newly diagnosed with HIV infection among different groups. Between the three-year periods 1997-99 through 2003-05, the proportion of cases increased for heterosexual transmission (from 7% to 9%), Black males (from 12% to 16%), and all Blacks (from 17% to 22%). The proportion of cases decreased among White males (from 63% to 55%), and all Whites (from 67% to 58%). Foreign-born cases increased from 14% to 21% of the total, including an increase among foreign-born Blacks from 5% to 10% of the total HIV cases.

At the initial diagnosis of HIV infection, most King County residents reported with HIV were age 25-29 or 30-34 years. The age distribution at the time of diagnosis has remained largely unchanged throughout the epidemic. However, the population of people living with HIV has aged consistently over the past decade as HIV has become a chronic infection. In 1997, half of individuals living with HIV were under age 38 and half were over age 38. In 2005, this median age was 43.

The residence of King County residents diagnosed with HIV is shifting away from Seattle. The proportion of cases among City residents has dropped from 84% to 76% of newly diagnosed cases, while South King County residents now make up 15% rather than 11% of new cases (comparisons for 1997-9 vs. 2003-05).

The overall perinatal transmission rate in King County and in Washington is essentially zero because of effective HIV screening and anti-retroviral prophylaxis during pregnancy and at birth. Approximately 15-30 HIV+ women give birth each year in Washington but there have not been any perinatal infections transmitted to infants born in King County since 1997. All recent diagnoses of perinatal infection have been made among children after they moved to King Co. or Washington.

## Incidence and Resistance Testing

In two CDC-funded projects, Public Health tests small amounts of leftover sera from HIV-diagnostic specimens to help characterize the virus in persons newly diagnosed with HIV. We are currently testing about two-thirds of all specimens for King County residents; we expect the remaining third will be included in the next 12 months. These tests reveal several characteristics of the HIV virus circulating within the local population.

► 23% of new HIV diagnoses are among persons recently infected. Probability calculations suggest these persons were likely infected within the past 12 months.

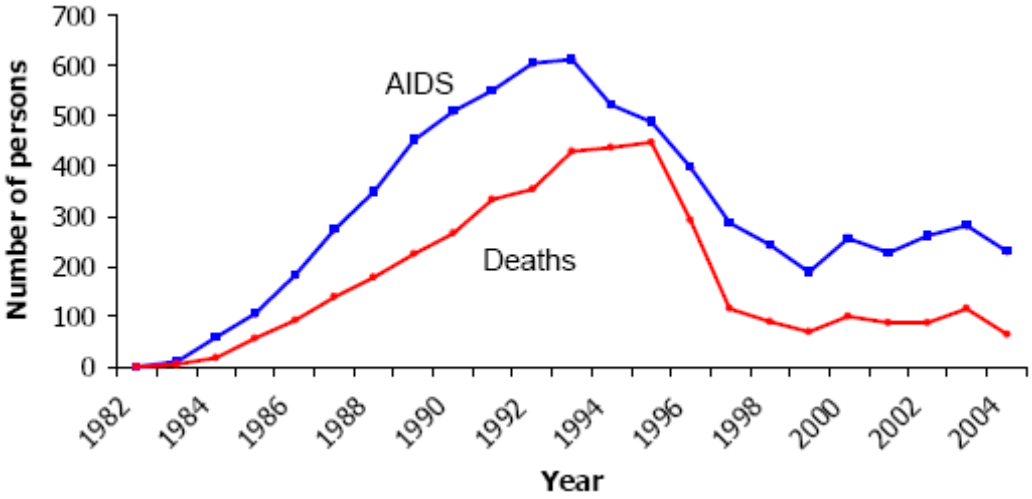
► 11% of treatment-naïve persons have high-level resistance to one or more class of anti-retroviral drugs; 3% are resistant to two or more classes of drugs. These proportions have not changed since preliminary resistance testing data first became available in 1998.

► 8% of specimens are non-B subtypes of HIV-1. Most of these were among persons born in other countries.

## Declining transmission rates

While the number of persons living with HIV has been increasing about 5% annually since effective treatments became available, the number who are diagnosed each year has been relatively stable. Therefore, the *transmission rate* (new diagnoses divided by total infected population) is declining slightly. This may mean that the few infected persons who transmit the virus to uninfected persons represent a smaller proportion of the entire infected population each year. This may be partly due to more HIV-infected people knowing their status and reducing risk to their partners.

**Figure 2: New AIDS Cases and Deaths**
**King County 1986—2005, data reported through June 30, 2006**




## Diagnoses of AIDS and Deaths

The diagnosis of AIDS is an important marker of HIV disease progression. Between 1981 and June 30, 2006 a total of 7,321 King Co. residents have been diagnosed with AIDS and 4,096 (56%) have died. There were about 250 new AIDS diagnoses annually between 1998 and 2004 (Figure 2). The number of AIDS deaths fluctuated between 70 and 120 annually from 1998 through 2004.

HIV/AIDS was the leading cause of death among 25-44 year old males in King County during the years 1989 to 1996,[5] but dropped to the 5th leading cause of death by 2004.

The decline in deaths is due to implementing effective antiretroviral treatments, effective prophylaxis to prevent opportunistic infections, monitoring of HIV progression (for example by assays of CD4 counts and HIV viral load), and prevention efforts to reduce HIV transmission rates.

Given the availability of highly active antiretroviral therapy (or HAART), ongoing progression to AIDS and deaths are worrisome. Several factors contribute to these progressions and deaths. Some people learn their HIV status too late in the course of their HIV disease to prevent AIDS, some have problems accessing treatment, and some refuse treatment. Other people may experience treatment failures due to problems with taking medications, adverse side effects of HAART, and / or development of HIV strains resistant to antiretroviral drugs. Strategies to counter these factors include increased HIV testing to promote earlier diagnosis, and simplifying HAART regimens to improve adherence.

## Conclusions

King County has an estimated 7,200 - 8,400 HIV-infected residents, including approximately 3,200 persons with AIDS and 5,200 persons who have not developed AIDS. Over 4,000 HIV-infected persons have died since 1982. About 350-400 new HIV infections have been diagnosed each year since 1998, of which about one-quarter were not diagnosed with HIV until they had already developed AIDS. The numbers of deaths, new HIV, and new AIDS diagnoses were roughly level from 1998 to 2005.

The total number of persons living with AIDS or with HIV infection in King County is increasing because each year there are more new diagnoses than deaths. Most HIV-infected King County residents are White men who have sex with men, are 30-45 years of age, and reside in Seattle. However, an increasing proportion of cases are among Blacks, and the proportion of cases due to heterosexual transmission is increasing. HIV infection among foreign-born persons accounts for all of the increase in the proportion of cases among Blacks, and much of the increase among heterosexual-transmission cases.

*Contributed by Amy Bauer MPH, and Jim Kent MS*


1. World Health Organization. 2006 Report on the Global AIDS Epidemic. Available at www.unaids.org

2. Glynn M, Rhodes P. Estimated HIV prevalence in the United States at the end of 2003 [Abstract T1-B1101]. Presented at the National HIV Prevention Conference, Atlanta, GA; June 2005.

3. Centers for Disease Control and Prevention. *HIV/AIDS Surveillance Report*, 2004 (Vol. 16), Atlanta: US Department of Health and Human Services, CDC; 2004. Available at http://www.cdc.gov/hiv/stats/hasrlink.htm.

4. Washington Department of Health. HIV Prevalence Estimation in Washington (working document)

## Table 2: Selected HIV/AIDS Trends in King County, Washington State 1997 - 2005

| Characteristics | 1997-2005 Trend | Average % or range |
|---|---|---|
| **HIV Exposure Category [1]** | | |
| Men who have sex with men (MSM) | No change | 73% |
| Injection drug user (IDU) | No change | 7% |
| MSM-IDU | No change | 9% |
| Heterosexual contact | Increasing | 7% - 10% |
| **Sex & Race/Ethnicity** | | |
| **Male** | No change | 89% |
| White Male | Decreasing | 63% to 55% |
| Black Male | Increasing | 12% to 16% |
| Hispanic Male | No change | 10% |
| **Female** | No change | 11% |
| White Female | No change | 4% |
| Black Female | No change | 6% |
| Hispanic Female | No change | 1% |
| **Race/Ethnicity** | | |
| White, non Hispanic | Decreasing | 67% to 58% |
| Black, non Hispanic | Increasing | 17% to 22% |
| Hispanic | No change | 11% |
| Asian or Pacific Islander | No change | 3% |
| American Indian/ Alaska Native | No change | 2% |
| **Age at diagnosis of HIV** | | |
| 0-19 years | No change | 2% |
| 20-29 years | No change | 22% |
| 30-39 years | Decreasing | 47% to 41% |
| 40-49 years | Increasing | 21% to 28% |
| 50-59 years | No change | 6% |
| 60 + years | No change | 1% |
| **Residence** | | |
| Seattle | Decreasing | 84% to 76% |
| North and East King County | No change | 7% |
| South King County | Increasing | 9% to 15% |
| **Place of birth, race, and exposure** | | |
| Foreign-born | Increasing | 14% to 21% |
| *Heterosexual Foreign-born* | *No change* | *5%* |
| *Foreign-born Blacks* | *Increasing* | *5% to 10%* |
| Native-born | Decreasing | 79% to 75% |
| *Heterosexual Native-born* | *No change* | *5%* |
| *Native-born Blacks* | *No change* | *11%* |

1. The HIV exposure category trends shown here are adjusted for cases with unknown risk and therefore are different than the raw data shown in Table 8 (page 7) of this Epidemiology Report.

# Update on the Medical Monitoring Project

The Medical Monitoring Project (MMP) has gotten off to a quick start in the first year of data collection (2005-06). In summary, MMP[1] is a CDC-funded multi-region surveillance project that employs interview and medical record abstraction to learn about the presentation and treatment of HIV in 26 sites across the country, including WA State. MMP arose out of the need for a nationally representative, population-based surveillance system to assess clinical outcomes, risk behaviors, adherence data, and clinician treatment patterns impacting the quality of HIV care. Core HIV surveillance is not structured to capture these elements and may have only incomplete CD4 count, viral load, and drug resistance information. This project has been funded for a four-year project period (2005-2008). Washington, along with 12 other sites, collected data in Year 1 (2005-06) and all 26 sites will participate in Year 2.

In order to collect comprehensive information on each individual, a questionnaire was administered with modules covering access to health care, adherence, sexual behaviors, drug use behaviors, and access to prevention services. The data from the questionnaire will be combined with information from respondents' medical charts. Data collection for the first year will continue until the second year methods receive final approval-- expected in the winter of 2006/07. Forty facilities state-wide were selected for participation for the first two years of the project. The facilities included were large and small, urban and rural, HRSA (federal Health Resources Services Administration) and non-HRSA funded, for whom, surveillance records indicated, were providing HIV-care in 2004. Four hundred patients were selected to be sampled in the first year and to date, 126 interviews have been completed and of these 99 medical charts abstracted.

**Table 1: Number of interviews and chart reviews completed by characteristics of facilities participating in MMP 2005-06 (Year 1), Washington State**

| | 2005/2006 Completed Data Collection | | | |
|---|---|---|---|---|
| **Facility Characteristics** | **Interviews (n=126)** | | **Medical Chart Abstractions (n=99)** | |
| **Geographic Region** | No. | (%) | No. | (%) |
| Central WA | 5 | (4) | 5 | (5) |
| Eastern WA | 12 | (10) | 11 | (11) |
| Northern WA | 4 | (3) | 2 | (2) |
| Southern WA | 4 | (3) | 3 | (3) |
| Western WA (King, Pierce & Thurston Co.) | 101 | (80) | 78 | (79) |
| **Size** | | | | |
| Large (>100 HIV patients) | 106 | (84) | 83 | (84) |
| Medium (<100 and >50 HIV Patients) | 17 | (14) | 14 | (14) |
| Small* (<50 HIV Patients) | 3 | (2) | 2 | (2) |
| **Type** | | | | |
| Urban Facility | 114 | (90) | 89 | (90) |
| Rural Facility | 12 | (10) | 10 | (10) |
| **Funding Source** | | | | |
| HRSA funded Facility | 63 | (50) | 53 | (54) |
| Non-HRSA funded Facility | 63 | (50) | 46 | (46) |

*Note: 2 of the small facilities did not see any patients during the patient sampled period and therefore could not participate in the first year of data collection.

Table 1 describes characteristics of the facilities data were collected from in Year 1, 2005/06. The majority of HIV care has been provided in large urban settings. The majority of interviews 80% (101/126) were conducted in Western WA. Of the forty facilities selected in 2005, 36 were eligible, and of these 27 participated (75%) and 9 declined participation (25%). Of the four ineligible facilities, two were later determined to be part of the same medical facility as a third participating site; and two did not provide primary HIV care -- they only referred HIV patients. Of the 27 sites participating, three did not have any HIV-infected patients seen during the three month sampling period. Among those facilities that refused to participate, 89% (8/9) were private medical facilities (data not shown). Typically, publicly-funded facilities have an already established working relationship with the Washington State Department of Health (DOH) or Public Health – Seattle & King County (PHSKC) and are therefore more likely to participate in department-related projects. The state DOH also used intradepartmental HIV client services staff to help recruit the MMP facilities across the state.

**Year Two (2006/2007) Data Collection**

The same facilities selected for participation in the first year of data collection were selected for Year 2006/2007. This allowed us to begin earlier recruitment and marketing of MMP to the facilities that refused participation in 2005. MMP staff members have been urging facility participation by communicating the impact of not participating to facility providers. If a facility refuses to participate in MMP, they are essentially preventing us from gathering data about patients like theirs and sites like them (i.e.; large vs. small, urban vs. rural, and HRSA vs. non-HRSA funded). Declining facilities thus result in a) missed opportunities to learn about care patterns in patients like the ones they're caring for and b) data not available to support grants bringing resources in for their patients. Similarly, participants who decline (as well as those never asked to participate due to their providers' refusal) may have provided important, unique or new information about risk behaviors and the receipt of HIV care.

For each year of the project, a sample of 400 patients will be selected from participating WA State facilities. The number of patients sampled from any one facility will depend on the number of patients who received HIV-related medical care during a predetermined period of several months and on the number of facilities participating. Collection of patient lists began on August 1st 2006. Once all of the patient lists are compiled, DOH staff will send a de-identified list to CDC for sampling.

For facilities that participated in 2005, the facilities that saw approximately 75 to 200 patients in the PDP each had approximately 10-20 patients sampled. Those that saw 30 to 50 patients in the PDP had approximately 5-10 patients sampled. The closer we can get to having all 36 eligible sampled facilities participate, the smaller the burden will be on each participating facility.

Once the sampled patient list is received from CDC, DOH and PHSKC MMP staff will contact the participating facilities to start collecting data; this involves asking patients to be interviewed, compensating patients $30 for their time, and abstracting medical charts. MMP staff will not approach selected patients directly unless previously arranged by the facility. The MMP staff members have many marketing materials to share with the facilities and will work with them on the best ways to approach their patients.

Maximum participation of providers and patients increases the likelihood of obtaining information that is truly representative of patients in care for HIV locally and nationally. If you are a selected provider or represent a selected facility, we urge you to take part in the project; it is essential that all selected providers participate.

Security and confidentiality of all personal and health care information will be strictly maintained throughout the course of this project. Facility, provider and patient names are not disclosed to CDC.

If you have any questions about this project or would like to view our marketing materials, please call Elizabeth Barash at 206-296-2907 (King County) or Alexia Exarchos at (253) 395-6730 (Washington State).

*Contributed by Alexia Exarchos, MPH and Elizabeth Barash, MPH.*

1. Thiede H, Lynch C, Kahle E, Buskin S. New approaches to monitoring HIV: Three new surveillance projects. HIV/AIDS Epidemiology Report 2nd Half 2004.

## Washington State Never in Care —a new Health Department Initiative

The Washington State Department of Health (DOH) and Public Health – Seattle & King County (PHSKC) are collaborating with CDC and four other areas on a project to learn more about people diagnosed with HIV who fail to receive timely primary medical care for HIV infection. This project, called the Never In Care (NIC) project, is a vital component of CDC's Advancing HIV Prevention Initiative which aims to reduce barriers to early diagnosis of HIV infection and increase access to quality medical care, treatment, and prevention services for those living with HIV. NIC team members in Washington State will interview people diagnosed with HIV who haven't received primary medical care within three months of their HIV diagnosis and provide direct referrals to appropriate services with the goal of engaging people in primary care. The interview data obtained through this project will help care services and prevention planners better understand the barriers to accessing care, reasons that some people delay seeking care, and factors that may help motivate people to enter care.

People who have delayed seeking care following their diagnosis are a subset of the broader group of people who are not consistently in care. By focusing on those who were never in care, we hope to be better able to find and interview people not long after their initial HIV diagnosis. NIC may provide an intervention before untreated HIV has negative impacts on health and help people understand the importance of seeking timely primary medical care to maintain their quality of life.

The Washington State Board of Health recently adopted changes to the reporting requirements to allow public health authorities to confidentially retain names of people diagnosed with HIV infection and to require laboratories to report all CD4 counts and viral load test results in settings related to HIV care. These revisions will help the NIC project team to identify people who have delayed receiving care.

DOH and PHSKC activities include conducting formative research with medical providers and others who may have experience with NIC-eligible populations, hosting a focus group of people who are (or perhaps once were) eligible for the project, submitting a protocol for approval by a local Human Subjects Review Board and other governing agencies, then finally conducting referrals and interviews. If you have any questions about this project, or experiences to share, please contact Maria Courogen (360) 236-3458 or Jim Kent (206) 205-6121.

*Contributed by Mark Stenger, Elizabeth Barash, and Susan Buskin*

# Primary multi-drug resistant (MDR) HIV in King County: Recommendations for pre-treatment testing

HIV treatment guidelines from the U.S. Dept. of Health and Human Services (available on the web at http://aidsinfo.nih.gov/contentfiles/adultandadolescentgl.pdf) recommend conducting drug-resistance testing before starting anti-retroviral treatment for HIV. As is recommended for TB, identification of drug-resistant HIV prior to treatment allows selection of treatment regimens with a higher probability of success. Resistance testing may be done as part of an HIV screening program or as part of a post-positive-HIV-test comprehensive assessment, including partner counseling and referral services (PCRS, formerly called "partner notification") and medical assessments, such as CD4+ lymphocyte and HIV-1 RNA level (viral load) tests. When multi-drug resistance is found, PCRS efforts can be enhanced to (1) find additional people infected with hard-to-treat virus so as to tailor their treatment regimens accordingly and to (2) try to block further spread of a virus that may be more difficult to treat.

King County has had two projects conducting primary HIV drug resistance genotype testing surveillance: from 1998-2000 and 2003 to present. This surveillance is not yet population-based, with only two local (but large) labs participating. These labs account for over half of all new HIV diagnoses. The participating labs set aside aliquots of sera from positive diagnostic HIV tests for resistance testing. The aliquots are sent to the genotype laboratory pending investigation to confirm the HIV diagnosis is new and the patient has not yet used antiretroviral therapy. HIV Surveillance Program staff members at the State Department of Health are exploring the possibility of consolidating HIV confirmatory testing in centralized public health labs, in part to facilitate true population-based primary HIV-resistance surveillance.

Over the course of conducting local resistance surveillance the proportion of people with high level resistance to one or more antiretroviral drug has remained steadily about 11%. About 3% of individuals had multi-drug resistance, defined as high level resistance to one or more drug in each of two or more of the three major drug classes: protease inhibitors (PIs), nucleoside or nucleotide reverse transcriptase inhibitors (NRTIs), and non-nucleoside reverse transcriptase inhibitors (NNRTIs).

We have investigated 12 cases of MDR HIV since 2000. These cases were identified in 2000 (n=1), 2003 (n=4), 2004 (n=3), 2005 (n=3), and so far in 2006 (n=1). The pattern of resistance breaks down as follows (limited to high level resistance): 2 had resistance to PI & NNRTI, 2 had resistance to PI & NRTI, 4 had resistance to NNRTI & NRTI, and 4 had resistance to all 3 classes. Notably, the two most recent cases were infected with very similar viruses with 97.7% homology. Follow-up investigation confirmed that the specimens were from different individuals, and both genotype test results were confirmed by a second laboratory on new specimens. Both individuals were men who had sex with multiple, mostly anonymous, male partners. PCRS investigations of the few identifiable partners have not yielded any additional primary MDR HIV, nor identified matching (or any) acquired drug resistance in a couple of partners with long-standing HAART-treated HIV.

Antiretroviral drug resistance surveillance is essential to monitor potential community-wide loss of effective treatments. Community resistance levels are needed to inform treatment decisions and guide prevention efforts, for example for post-exposure prophylaxis or to prevent vertical transmission when a woman in labor is diagnosed with HIV and there isn't time to test for resistance. Primary resistance is a marker for inadequately treated HIV, often due to failure to adhere to antiretrovirals, combined with viral replication, persistence of drug resistant virus, and ongoing behaviors promoting HIV transmission. In sum, morbidity and mortality due to HIV may be reduced with population-based drug resistance surveillance to identify unusual strains of HIV and, when resistance is present, to adjust treatments accordingly and promote prevention activities to limit the spread of resistant virus.

*Contributed by Susan Buskin, MPH, PhD and Robert W. Wood, MD, FACP*

# Characterizing populations that receive late diagnoses of HIV to target prevention efforts

## Introduction:

Knowledge of who is at risk for HIV is crucial to identify and target at-risk populations for scarce HIV prevention and care resources. HIV disease prevalence, or the number of people who are presumed to be living with HIV disease (including those with AIDS), establishes the burden of HIV disease within our communities and provides an adequate population-level measure of disease risk. However, since accurate estimates of HIV prevalence are difficult to calculate, and published estimates are often out-of-date, local health departments and HIV prevention workers generally rely instead on HIV counseling and testing (C & T) data, as well as core surveillance data, to guide targeting efforts.

Knowing whom to target can be challenging. HIV C & T data are useful, but are only collected from publicly-funded testing sites across the state. Hence, these data do not necessarily represent the large proportion of testing that occurs in private facilities and elsewhere. C & T data are also limited in that they are collected in aggregate form and cannot always be reliably de-duplicated. Surveillance data, collected by the HIV/AIDS Reporting System (HARS), are individual-level data that provide a reliable baseline estimate of disease prevalence. Yet, HARS is limited in that it is only able to track cases of HIV infection that have received a confidential (vs. anonymous) diagnosis of HIV infection. The long latency period (or interval, usually many years, between initial infection and emergence of clinical symptoms) for HIV disease can contribute to significant delays in case detection. Many at-risk individuals also remain reluctant to get tested for HIV due to misperceptions about their own disease risk as well as fear of being diagnosed with HIV. For these and other reasons, HIV surveillance data remain incomplete, and this incompleteness poses a challenge for those who are attempting to reach and more fully understand at-risk populations.

Early HIV C & T is a proven method of HIV prevention that has been shown to be one of the most effective public health strategies available to control the HIV epidemic. Many researchers have reported a strong association between knowledge of HIV status among HIV-infected individuals and a reduction in risk behaviors that lead to transmission. On average it takes about 10 years before an untreated HIV-infected person progresses to AIDS. If early HIV testing to be universally employed among all people at-risk for HIV, very few people would be diagnosed simultaneously with HIV and AIDS. In Washington State, more than one third of new HIV diagnoses are accompanied, either immediately or followed within 12 months, by an AIDS diagnosis. These are “late diagnoses” of HIV. Thus, more work is needed to detect new infections more quickly and prevent late diagnoses from occurring.

Since progression to AIDS is often a clinically conspicuous event (except when it’s based on asymptomatic falls of CD4 counts below 200/14%), and one that is usually inevitable if an infected person does not receive adequate treatment, it is generally safe to assume that nearly all cases of HIV infection are eventually reported to HARS (either via AIDS-related health providers, mandatory laboratory reporting, or the routine matching of HARS data with national death registry data). As a result, a comparison of cases with early-detected HIV vs. late-detected cases that had already progressed to AIDS (or did so quickly) becomes possible, and could potentially provide very useful information to the HIV prevention community. Large-scale similarity between these two groups would support the conventional use of both C & T data and surveillance data in order to profile as yet un-detected cases. On the other hand, if the characteristics of these two groups are vastly different, then prevalence estimates and targeting strategies may have to be adjusted accordingly.

Groups that are more likely to delay HIV testing may, as a result, be under-represented by both testing and surveillance data. Conducting a comparison between late and early diagnoses may also provide a future means of evaluating the performance and efficiency of public health screening efforts.

## Methods:

Using core surveillance (HARS) data, we compared two recently-diagnosed groups of HIV-infected individuals who were living in Washington State at the time of their initial (confidential) HIV diagnosis. Since mandatory reporting of asymptomatic HIV infection did not begin in Washington until September 1999, only cases diagnosed since January 2000 were included in our analysis. For the most part, annual time points were used to enhance comparability. The first analysis group, labeled the Early Diagnosis group, is composed of asymptomatic cases of HIV infection initially diagnosed 2000-2004 and without (as of May 2006) an AIDS diagnosis. The second, or Late Diagnosis group, includes cases of HIV infection initially diagnosed 2000-2005 and with an AIDS diagnosis within 12 months of initial HIV diagnosis. Because our inclusion criteria for the Late Diagnosis group depends on an observation period of 12 months, we excluded all cases of asymptomatic HIV infection diagnosed later than 2004 (for many of these cases, the twelve month window would yet not have ended by May 2006). However, if a case diagnosed in 2005 had already developed AIDS symptoms, we included that case in the analysis, especially since inclusion of these cases bolstered the numbers of the smaller Late Diagnosis group and allowed for a more statistically powerful comparison of the two groups. This analysis is fundamentally a comparison of the distribution of demographic and risk characteristic within each group.

We analyzed both the absolute number and the relative proportion of all cases diagnosed each year between 2000 and 2004 for the existence of any apparent trends. We also evaluated change over time in the likelihood for late diagnosis between major demographic and risk sub-groups. Because the selection criteria were altered for 2005 cases, we limited these trend analyses to just cases diagnosed from 2000 to 2004. The statistical significance of trends is not reported since the purpose of these analyses was only to demonstrate large or obvious associations.

We used stratified frequency tables to compare within-group distributions of key variables. (Note: When viewing these tables, it is important not to directly compare the absolute numbers of cases between analysis groups due to different sizes of groups—rather the proportions may be compared.) Crude and adjusted analyses were also performed using logistic regression modeling. Membership in the Early vs. Late Diagnosis groups formed the single, dichotomous outcome variable used for all models. Odds ratios and 95% confidence intervals (CI) are based on Wald chi square estimates. All analyses were conducted with SAS, Statistical Analysis Software, version 9.1; Carey NC.

## Results:

A total of 3,566 cases of HIV infection were diagnosed in Washington State between 2000 and 2005. Of those, 690 cases were excluded either because they had developed AIDS 12 or more months after initial HIV diagnosis or because they were diagnosed in 2005 and did not have enough time to exhibit AIDS symptoms. After exclusion, 2,876 cases (81%) remained eligible for our analysis. The Early Diagnosis group contained 1,581 cases, while the Late Diagnosis group contained 1,295 cases (Table 1).

We evaluated trends in HIV diagnoses between 2000 and 2004(Figure 1). After an initial decline from 2000 to 2001, absolute values appeared fairly stable within both analysis groups. Early diagnoses averaged 316 cases, while late diagnoses averaged 222. An increasing trend in the proportion of cases belonging to the Early Diagnosis group was noticeable, with a steady rise from 47% in 2000 to 58% in 2004. However, the proportion of those assigned to the Late Diagnosis group within each year appears to have remained roughly the same (range: 34-39%).

Similar trend analyses were performed comparing the annual proportions of those who received a late diagnosis by race/ethnicity (non-Hispanic Whites, non-Hispanic Blacks, and Hispanics/Latinos), residence at initial HIV diagnosis (inside vs. outside King County), and reported mode of exposure. Stratification into groups resulted in smaller numbers that were accompanied by increased random variability, making trend detection difficult. Nonetheless, a higher likelihood towards late diagnosis can be seen in four out of five years among cases of Hispanic ethnicity vs. other racial/ethnic subgroups (Figure 2). Residence outside King County also appears to be consistently related to an increased likelihood toward late diagnosis (Figure 3).

**Table 1. Demographic characteristics for early vs. late HIV diagnoses in Washington State, 2000-2005**

| | Early Diagnosis* | | Late Diagnosis† | | Total | | Crude Odds Ratio (95% CI) | |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | **BOLD** = significant | |
| Total | 1,581 | 100% | 1,295 | 100% | 2,876 | 100% | NA | NA |
| Sex | | | | | | | | |
| Male | 1,343 | 85% | 1,094 | 84% | 2,437 | 85% | reference | reference |
| Female | 238 | 15% | 201 | 16% | 439 | 15% | 1.04 | (0.85-1.27) |
| Race/Ethnicity | | | | | | | | |
| White, NH | 1,031 | 65% | 775 | 60% | 1,806 | 63% | reference | reference |
| Black, NH | 292 | 18% | 249 | 19% | 541 | 19% | 1.13 | (0.94 - 1.38) |
| Hispanic | 154 | 10% | 169 | 13% | 323 | 11% | **1.46** | **(1.15 - 1.85)** |
| Asian / PI | 52 | 3% | 50 | 4% | 102 | 4% | 1.28 | (0.86 - 1.91) |
| Am. Indian / AK Native | 29 | 2% | 35 | 3% | 64 | 2% | 1.61 | (0.97 - 2.65) |
| Other/ Unknown | 23 | 1% | 17 | 1% | 40 | 1% | 0.98 | (0.52 - 1.85) |
| Age at Initial HIV Diagnosis | | | | | | | | |
| < 20 | 35 | 2% | 5 | 0% | 40 | 1% | 0.41 | (0.16 - 1.08) |
| 20-29 | 440 | 28% | 152 | 12% | 592 | 21% | reference | reference |
| 30-39 | 637 | 40% | 545 | 42% | 1,182 | 41% | **2.48** | **(1.99 - 3.08)** |
| 40-49 | 360 | 23% | 396 | 31% | 756 | 26% | **3.18** | **(2.52 - 4.02)** |
| 50+ | 109 | 7% | 197 | 15% | 306 | 11% | **5.23** | **(3.88 - 7.05)** |
| Mode of Exposure | | | | | | | | |
| MSM | 970 | 61% | 669 | 52% | 1,639 | 57% | reference | reference |
| IDU | 145 | 9% | 142 | 11% | 287 | 10% | **1.42** | **(1.10 - 1.83)** |
| MSM/IDU | 116 | 7% | 59 | 5% | 175 | 6% | 0.74 | (0.53 - 1.02) |
| Heterosexual | 188 | 12% | 210 | 16% | 398 | 14% | **1.62** | **(1.30 - 2.02)** |
| Blood / Ped. | 11 | 1% | 11 | 1% | 22 | 1% | 1.45 | (0.63 - 3.36) |
| NIR | 151 | 10% | 204 | 16% | 355 | 12% | **1.96** | **(1.55 - 2.47)** |
| AIDSNet Region | | | | | | | | |
| 1 | 71 | 4% | 85 | 7% | 156 | 5% | **1.74** | **(1.25 - 2.41)** |
| 2 | 49 | 3% | 62 | 5% | 111 | 4% | **1.84** | **(1.25 - 2.70)** |
| 3 | 104 | 7% | 136 | 11% | 240 | 8% | **1.90** | **(1.44 - 2.49)** |
| 4 | 1,060 | 67% | 731 | 56% | 1,791 | 62% | reference | reference |
| 5 | 171 | 11% | 156 | 12% | 327 | 11% | **1.32** | **(1.04 - 1.68)** |
| 6 | 126 | 8% | 125 | 10% | 251 | 9% | **1.44** | **(1.10 - 1.88)** |

Source: Washington State HIV/AIDS Reporting System (HARS); reported as of May 31, 2006

* 'Early Diagnosis' = cases of HIV infection, initially diagnosed 2000-2004, in which no AIDS diagnosis has been reported

† 'Late Diagnosis' = cases of HIV infection, initially diagnosed 2000-2005, in which AIDS was also diagnosed within 12 months of initial HIV diagnosis

**Figure 1. New diagnoses of HIV infection in Washington State, 2000-2005**

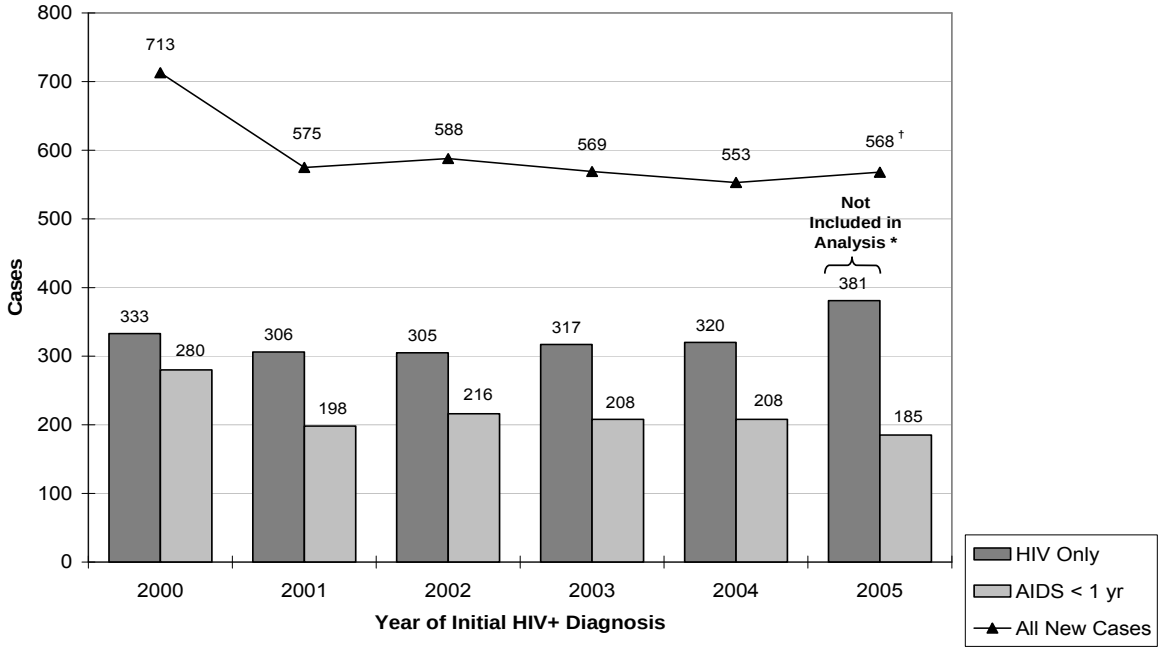


**Figure 2. Trends in the proportion of late HIV diagnoses by race/ethnicity, Washington State, 2000-2004**

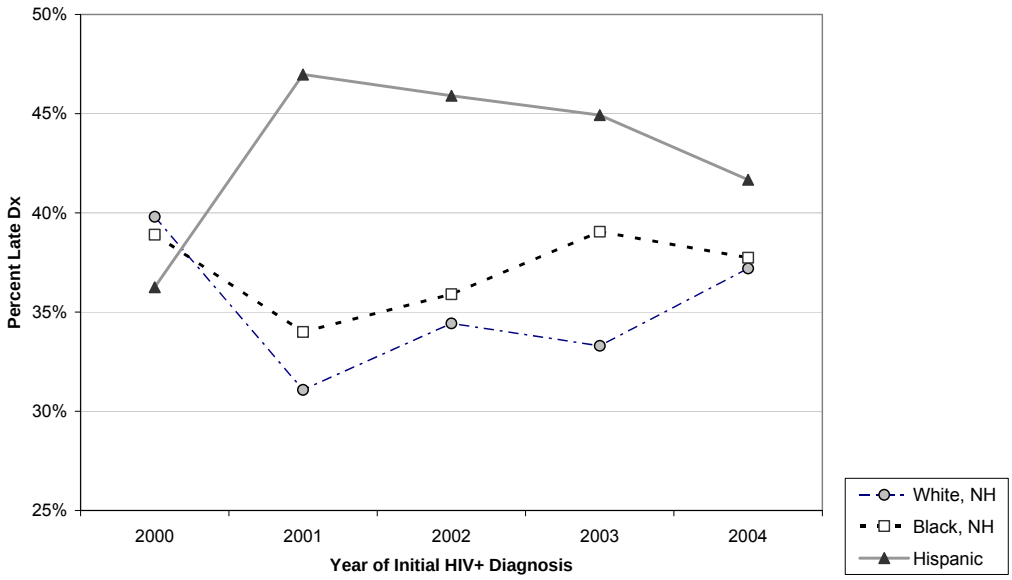
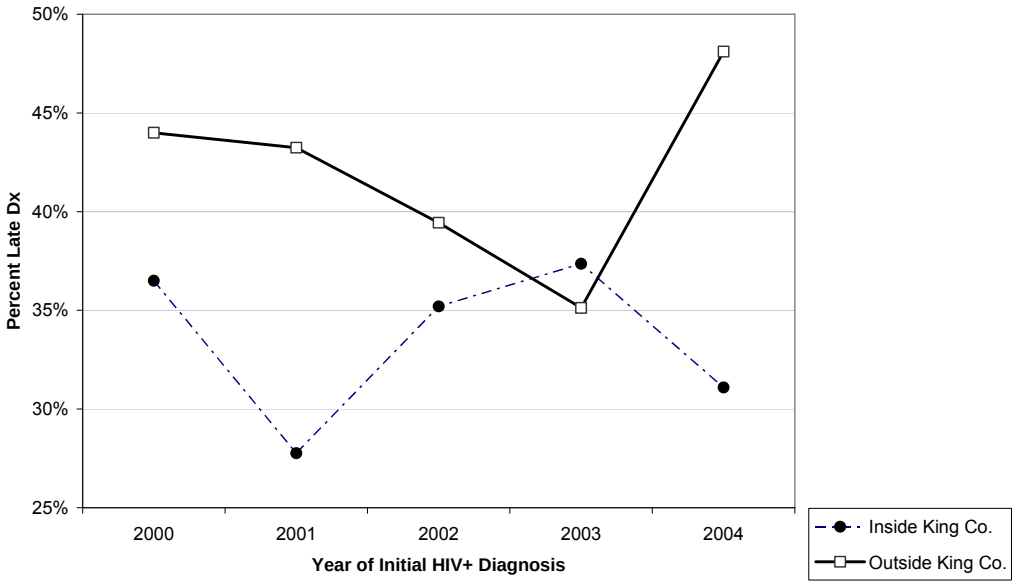



**Figure 3. Trends in the proportion of late HIV diagnoses by residence inside vs. outside King County, Washington State, 2000-2004**




With regard to risk, cases with the highest likelihood over time for late diagnosis were those not reporting any risk behaviors (NIR), followed closely by those reporting high risk heterosexual behavior (Figure 4).

A crude statewide comparison of the distribution of demographic traits between the two analysis groups indicates that sex was not associated with late diagnosis (Table 1). However, within King County, female cases had a 44% increased odds of a late diagnosis relative to male cases (Table 2). The direction of the association reversed for cases residing outside King County, where female cases had a 36% decreased odds of a late diagnosis relative to male cases (Table 3). In a logistic regression model adjusting for age at diagnosis, race/ethnicity, AIDSNet region of residence at diagnosis, and self-reported mode of exposure (risk), male cases were 32% (95% CI 4% - 67%) more likely to be late diagnosed than female cases.

Age at initial HIV diagnosis was strongly and positively associated with the likelihood for late diagnosis, and this association persisted throughout all crude and adjusted models. Statewide, and using 20 to 29 years old as the reference group, the 30 to 39 year old group was nearly 2.5 times more likely, the 40 to 49 group 3.2 times more likely, and the over-fifty group 5.2 times more likely to receive a late diagnosis (Table 1). When a continuous age at diagnosis variable was placed in a model adjusting for sex, race/ethnicity, region and risk, each increasing year of age was associated with a 5.7% (495% CI .8% - 6.6%) increased likelihood for late diagnosis.

Similar to the situation with sex, the association between late diagnosis and race/ethnicity was heavily dependent on AIDSNet region of residence. Overall, cases of Hispanic ethnicity had a

**Figure 4. Trends in the proportion of late diagnoses of HIV infection in Washington State by mode of exposure, 2000-2005**

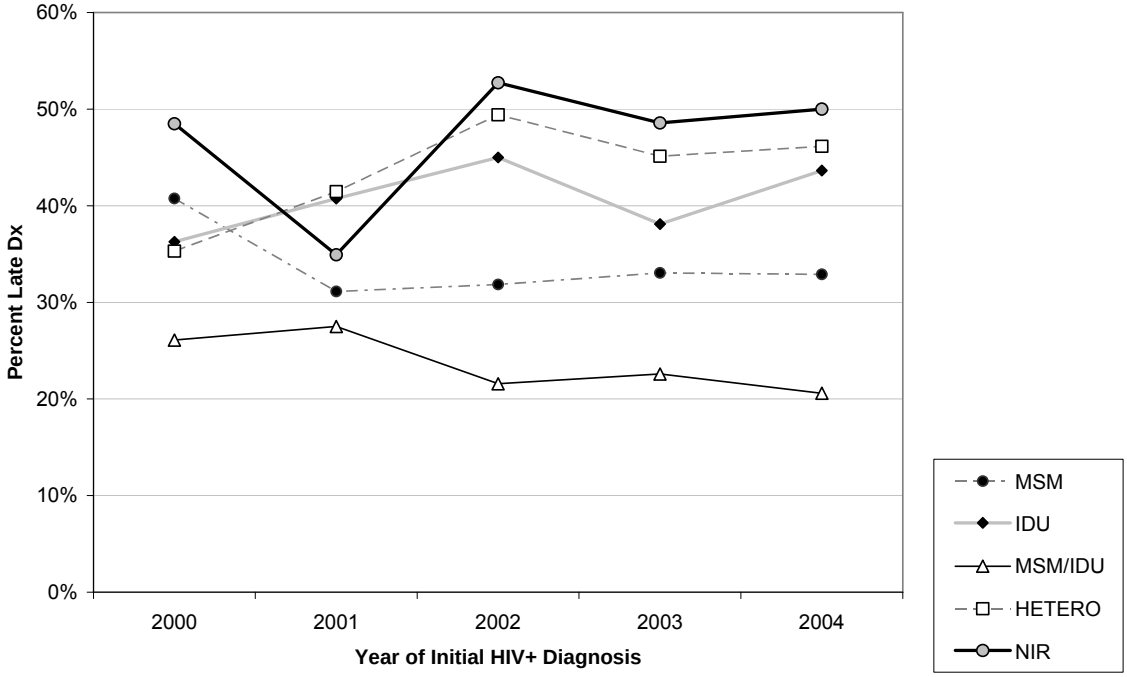



**Table 2. Demographic characteristics for early vs. late HIV diagnoses in King County, 2000-2005**

| | Early Diagnosis* | | Late Diagnosis† | | Total | | Crude Odds Ratio (95% CI) | |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | **BOLD** = significant | |
| Total | 1,060 | 100% | 731 | 100% | 1,791 | 100% | NA | NA |
| Sex | | | | | | | | |
| Male | 958 | 90% | 634 | 87% | 1,592 | 89% | reference | reference |
| Female | 102 | 10% | 97 | 13% | 199 | 11% | **1.44** | **(1.07 - 1.93)** |
| Race/Ethnicity | | | | | | | | |
| White, NH | 688 | 65% | 394 | 54% | 1,082 | 60% | reference | reference |
| Black, NH | 204 | 19% | 185 | 25% | 389 | 22% | **1.58** | **(1.25 - 2.00)** |
| Hispanic | 95 | 9% | 103 | 14% | 198 | 11% | **1.89** | **(1.40 - 2.57)** |
| Asian / PI | 39 | 4% | 22 | 3% | 61 | 3% | 0.99 | (0.58 - 1.69) |
| Am. Indian / AK Native | 13 | 1% | 16 | 2% | 29 | 2% | **2.15** | **(1.02 - 4.52)** |
| Other/ Unknown | 21 | 2% | 11 | 2% | 32 | 2% | 0.92 | (0.44 - 1.92) |
| Age at Initial HIV Diagnosis | | | | | | | | |
| < 20 | 21 | 2% | 0 | 0% | 21 | 1% | NA | NA |
| 20-29 | 286 | 27% | 85 | 12% | 371 | 21% | reference | reference |
| 30-39 | 449 | 42% | 344 | 47% | 793 | 44% | **2.58** | **(1.95 - 3.41)** |
| 40-49 | 237 | 22% | 219 | 30% | 456 | 25% | **3.11** | **(2.29 - 4.21)** |
| 50+ | 67 | 6% | 83 | 11% | 150 | 8% | **4.17** | **(2.79 - 6.24)** |
| Mode of Exposure | | | | | | | | |
| MSM | 732 | 69% | 425 | 58% | 1,157 | 65% | reference | reference |
| IDU | 64 | 6% | 53 | 7% | 117 | 7% | 1.43 | (0.97 - 2.09) |
| MSM/IDU | 80 | 8% | 37 | 5% | 117 | 7% | 0.80 | (0.53 - 1.20) |
| Heterosexual | 91 | 9% | 106 | 15% | 197 | 11% | **2.01** | **(1.48 - 2.72)** |
| Blood / Ped. | 7 | 1% | 5 | 1% | 12 | 1% | 1.23 | (0.39 - 3.90) |
| NIR | 86 | 8% | 105 | 14% | 191 | 11% | **2.10** | **(1.54 - 2.86)** |
| AIDSNet Region | | | | | | | (reference equals all other regions) | |
| 4 | 1,060 | 100% | 731 | 100% | 1,791 | 100% | **0.64** | **(0.55 - 0.74)** |

Source: Washington State HIV/AIDS Reporting System (HARS); reported as of May 31, 2006

* 'Early Diagnosis' = cases of HIV infection, initially diagnosed 2000-2004, in which no AIDS diagnosis has been reported

† 'Late Diagnosis' = cases of HIV infection, initially diagnosed 2000-2005, in which AIDS was also diagnosed within 12 months of initial HIV diagnosis

**Table 3. Demographic characteristics for early vs. late HIV diagnoses outside King County, 2000-2005**

| | Early Diagnosis* | | Late Diagnosis† | | Total | | Crude Odds Ratio (95% CI) **BOLD** = significant | |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | | |
| Total | 521 | 100% | 564 | 100% | 1,085 | 100% | NA | NA |
| Sex | | | | | | | | |
| Male | 385 | 74% | 460 | 82% | 845 | 78% | reference | reference |
| Female | 136 | 26% | 104 | 18% | 240 | 22% | **0.64** | **(0.48 - .85)** |
| Race/Ethnicity | | | | | | | | |
| White, NH | 343 | 66% | 381 | 68% | 724 | 67% | reference | reference |
| Black, NH | 88 | 17% | 64 | 11% | 152 | 14% | **0.66** | **(0.46 - 0.93)** |
| Hispanic | 59 | 11% | 66 | 12% | 125 | 12% | 1.01 | (0.69 - 1.47) |
| Asian / PI | 13 | 2% | 28 | 5% | 41 | 4% | 1.94 | (0.99 - 3.80) |
| Am. Indian / AK Native | 16 | 3% | 19 | 3% | 35 | 3% | 1.07 | (0.54 - 2.11) |
| Other/ Unknown | 2 | 0% | 6 | 1% | 8 | 1% | 2.7 | (0.54 - 13.47) |
| Age at Initial HIV Diagnosis | | | | | | | | |
| < 20 | 14 | 3% | 5 | 1% | 19 | 2% | 0.82 | (0.28 - 2.37) |
| 20-29 | 154 | 30% | 67 | 12% | 221 | 20% | reference | reference |
| 30-39 | 188 | 36% | 201 | 36% | 389 | 36% | **2.46** | **(1.73 - 3.48)** |
| 40-49 | 123 | 24% | 177 | 31% | 300 | 28% | **3.31** | **(2.29 - 4.78)** |
| 50+ | 42 | 8% | 114 | 20% | 156 | 14% | **6.24** | **(3.96 - 9.84)** |
| Mode of Exposure | | | | | | | | |
| MSM | 238 | 46% | 244 | 43% | 482 | 44% | reference | reference |
| IDU | 81 | 16% | 89 | 16% | 170 | 16% | 1.07 | (0.76 - 1.52) |
| MSM/IDU | 36 | 7% | 22 | 4% | 58 | 5% | 0.60 | (0.34 - 1.04) |
| Heterosexual | 97 | 19% | 104 | 18% | 201 | 19% | 1.05 | (0.75 - 1.45) |
| Blood / Ped. | 4 | 1% | 6 | 1% | 10 | 1% | 1.46 | (0.41 - 5.25) |
| NIR | 65 | 12% | 99 | 18% | 164 | 15% | **1.49** | **(1.04 - 2.13)** |
| AIDSNet Region | | | | | | | (reference equals all other regions outside King County) | |
| 1 | (Spokane) | 71 | 14% | 85 | 15% | 156 | 14% | 1.12 | (0.80 - 1.58) |
| 2 | (Yakima) | 49 | 9% | 62 | 11% | 111 | 10% | 1.19 | (0.80 - 1.77) |
| 3 | (Everett) | 104 | 20% | 136 | 24% | 240 | 22% | 1.27 | (0.96 - 1.70) |
| 5 | (Tacoma) | 171 | 33% | 156 | 28% | 327 | 30% | 0.78 | (0.60 - 1.02) |
| 6 | (Olympia) | 126 | 24% | 125 | 22% | 251 | 23% | 0.89 | (0.67 - 1.18) |

Source: Washington State HIV/AIDS Reporting System (HARS); reported as of May 31, 2006

* 'Early Diagnosis' = cases of HIV infection, initially diagnosed 2000-2004, in which no AIDS diagnosis has been reported

† 'Late Diagnosis' = cases of HIV infection, initially diagnosed 2000-2005, in which AIDS was also diagnosed within 12 months of initial HIV diagnosis

46% increased odds of a late diagnosis relative to White, non-Hispanic cases (Table 1). Within King County, the association grew even stronger, with Hispanics being 89% more likely to be diagnosed late than Whites (Table 2). Similarly, Black, non-Hispanics residing in King County were 58% more likely to receive a late diagnosis vs. Whites. Yet, when we looked outside King County, the association with Hispanic ethnicity all but disappeared, while Black cases were actually 34% LESS likely than Whites to be diagnosed late (Table 3). Limited to male cases, Hispanics from across the state were 51% more likely to receive a late diagnosis than White males (Table 4). No significant associations were observed between race/ethnicity and late diagnosis among female cases (data not shown). In a logistic regression model adjusting for sex, age, region and risk, cases of Hispanic ethnicity were 64% (95% CI 28% - 111%) more likely to receive a late diagnosis than White, non-Hispanic cases.

Cases at highest self-reported levels of risk for HIV were the least likely to receive a late diagnosis of HIV infection, providing evidence for the hypothesis that as an individual's self-perceived risk for HIV increases, so does their chances of undergoing early screening. In a logistic model adjusting for sex, age, region and race/ethnicity, cases reporting MSM or MSM/IDU behaviors were collectively 48% (95% CI 37% - 57%) less likely to be diagnosed late than other, non-MSM associated cases (statewide). IDU (non-MSM) cases, high risk heterosexual cases, and cases with no reported risk behaviors (NIR's) were 1.5, 2.1, and 2.2 times more likely to receive a late diagnosis than MSM-

**Table 4. Demographic characteristics for early vs. late HIV diagnoses in WA State among males, 2000-2005**

| | Early Diagnosis* | | Late Diagnosis† | | Total | | Crude Odds Ratio (95% CI) | |
|---|---|---|---|---|---|---|---|---|
| | No. | % | No. | % | No. | % | **BOLD** = significant | |
| Total | 1,343 | 100% | 1,094 | 100% | 2,437 | 100% | NA | NA |
| Race/Ethnicity | | | | | | | | |
| White, NH | 928 | 69% | 698 | 64% | 1,626 | 67% | reference | reference |
| Black, NH | 204 | 15% | 176 | 16% | 380 | 16% | 1.15 | (0.92 - 1.44) |
| Hispanic | 131 | 10% | 149 | 14% | 280 | 11% | **1.51** | **(1.17 - 1.95)** |
| Asian / PI | 46 | 3% | 39 | 4% | 85 | 3% | 1.13 | (0.73 - 1.75) |
| Am. Indian / AK Native | 14 | 1% | 18 | 2% | 32 | 1% | 1.71 | (0.84 - 3.46) |
| Other/ Unknown | 20 | 1% | 14 | 1% | 34 | 1% | 0.93 | (0.47 - 1.86) |
| Age at Initial HIV Diagnosis | | | | | | | | |
| < 20 | 22 | 2% | 3 | 0% | 25 | 1% | 0.43 | (0.13 - 1.45) |
| 20-29 | 357 | 27% | 114 | 10% | 471 | 19% | reference | reference |
| 30-39 | 558 | 42% | 478 | 44% | 1,036 | 43% | **2.68** | **(2.10 - 3.42)** |
| 40-49 | 318 | 24% | 343 | 31% | 661 | 27% | **3.38** | **(2.60 - 4.38)** |
| 50+ | 88 | 7% | 156 | 14% | 244 | 10% | **5.55** | **(3.97 - 7.77)** |
| Mode of Exposure | | | | | | | | |
| MSM | 970 | 72% | 669 | 61% | 1,639 | 67% | reference | reference |
| IDU | 90 | 7% | 104 | 10% | 194 | 8% | **1.68** | **(1.24 - 2.26)** |
| MSM/IDU | 116 | 9% | 59 | 5% | 175 | 7% | **0.74** | **(0.53 - 1.02)** |
| Heterosexual | 71 | 5% | 104 | 10% | 175 | 7% | **2.12** | **(1.55 - 2.92)** |
| Blood / Ped. | 4 | 0% | 6 | 1% | 10 | 0% | 2.18 | (0.61 - 7.74) |
| NIR | 92 | 7% | 152 | 14% | 244 | 10% | **2.40** | **(1.82 - 3.16)** |
| AIDSNet Region | | | | | | | | |
| 1(Spokane) | 55 | 4% | 78 | 7% | 133 | 5% | **2.14** | **(1.50 - 3.07)** |
| 2(Yakima) | 28 | 2% | 49 | 4% | 77 | 3% | **2.64** | **(1.64 - 4.25)** |
| 3(Everett) | 79 | 6% | 111 | 10% | 190 | 8% | **2.12** | **(1.56 - 2.88)** |
| 4(Seattle) | 958 | 71% | 634 | 58% | 1,592 | 65% | reference | reference |
| 5(Tacoma) | 122 | 9% | 124 | 11% | 246 | 10% | **1.54** | **(1.17 - 2.01)** |
| 6(Olympia) | 101 | 8% | 98 | 9% | 199 | 8% | **1.47** | **(1.09 - 1.97)** |

Source: Washington State HIV/AIDS Reporting System (HARS); reported as of May 31, 2006

* 'Early Diagnosis' = cases of HIV infection, initially diagnosed 2000-2004, in which no AIDS diagnosis has been reported

† 'Late Diagnosis' = cases of HIV infection, initially diagnosed 2000-2005, in which AIDS was also diagnosed within 12 months of initial HIV diagnosis

associated cases, respectively.

Residence in a given AIDSNet region was highly associated with late diagnosis in both crude and adjusted models. Cases who resided in AIDSNets 1-3 were collectively 68% (range: 39% - 104%) more likely to be diagnosed late vs. cases residing in Regions 4-6. With King County cases as the reference group, the likelihood for late diagnosis was higher in all other regions (range: 32% to 90% higher). The highest likelihood for late diagnosis was exhibited by Region 3 cases, which were 1.9 times more likely to receive a late diagnosis than King County cases, and 1.3 times more likely to be late diagnosed than all other cases residing outside King County.

As already indicated, multiplicative effect modification (EM) was observed when certain risk factors for late diagnosis were combined in logistic regression models. While an examination of EM extends beyond the scope of this article, and small numbers generally prevent the combination of more than two factors, a few models nonetheless deserve mention. For example, in a model adjusting for sex, age at diagnosis, and race/ethnicity, cases who resided in AIDSNets 1-3 and who did not report any MSM risk behavior were 4.0 (95% CI 2.7 - 5.9) times more likely to be late diagnosed vs. MSM-associated cases who resided in AIDSNets

4-6. Also, in a model adjusting for sex, age, and region, non-MSM Hispanic cases were 3.2 (95% CI 1.9 - 5.2) times more likely to be late diagnosed vs. non-Hispanic cases who reported MSM behavior.

## Discussion:

While the overall proportion of cases receiving a late HIV diagnosis has decreased over time, recent decreases have occurred very slowly, and the fraction of late diagnoses remains high. Without question, significant opportunities to improve early HIV screening remain. Add to that the disparity observed with regard to more late diagnoses among Hispanic cases (particularly within King County) vs. other racial/ethnic groups and the need for improvement becomes even more pressing.

The association between late testing and age suggests that screening programs may not be reaching older segments of the population. Yet, these associations should be interpreted with caution. The very outcome of late diagnosis implicitly requires the passage of time. Also, older individuals with HIV are more likely to develop AIDS faster than younger people.

That early testing is related to self-reported risk behavior is not surprising. While local public health efforts targeting those deemed most at risk should continue, our results indicate that these efforts could be enhanced by broadening the dissemination of prevention messages describing the HIV risks associated with high risk heterosexual activity (particularly within Hispanic communities) and promoting the merits of early screening. The similarity in proportions of late diagnosis between cases reporting high-risk heterosexual contact and those not reporting any specific risk behaviors may imply these two groups are demographically similar to one another.

Newly proposed, and probably soon-to-be released, CDC guidelines recommend that HIV testing become a routinely administered test with an 'opt-out' option rather than testing only with extensive pre-test counseling and tests only aimed only at those with known HIV risks. It may be that many of the approximately 25% of HIV-infected people who have not been diagnosed with HIV are unaware of their HIV risks as "their" risk behaviors are only known to their partners or their partners' partners. The new guidelines were designed with risk-unaware individuals in mind. Thus, education about risk may not suffice to help these people get an early HIV diagnosis.Limitations of these analyses include potential confounding factors that we could not measure. Among the potential confounders might be degree of assimilation and awareness of HIV risk, such as "being out" among men who have sex with men, which may be more common in the urban core of Seattle relative to outlying regions. Further, HIV screening in women might be enhanced by routine pregnancy-related screenings.

It is important to point out that although some conspicuous differences do exist between the early and late diagnosis groups, these groups are actually quite similar with regard to most demographic and risk characteristics. In fact, the very lack of large differences supports the notion that cases who remain un-detected by HARS are probably not so different from detected cases as to merit any sweeping changes in the way public health currently targets at-risk populations. It is probable that surveillance data are adequately describing HIV morbidity in a manner that facilitates effective local targeting efforts.

In sum, we hope that these detailed analyses of late HIV diagnosis data will prove useful, and may point to certain areas or segments of the population where C & T efforts, or just routine testing as CDC proposes, could be improved. However, the results of these analyses are preliminary and should not be used as the sole basis for any community planning decisions. More evaluation is needed, and the authors welcome feedback from public health practitioners and other members of the HIV prevention community.

*Contributed by Jason Carr, MPH and Nigel Turner, RS, MPH*

# The ongoing challenge of adequate adherence to HIV therapy: Notes from the International Conference on HIV Treatment Adherence

**Jersey City, New Jersey March 8-10, 2006. Sponsored by the National Institute for Mental Health and International Association of Physicians in AIDS Care**

**Is 95% or better adherence still the goal?** This question was raised by Dr. David Bangsberg, one of the keynote speakers at the conference. The 95% goal was derived from single protease inhibitor (PI) based highly active antiretroviral treatment (HAART) regimens where a consistently high level of adherence is needed to avoid development of resistance and persistent viremia. Now with boosted PI and non-nucleoside reverse transcriptase inhibitor (NNRTI)-based combinations the risk of developing resistance with less-than-perfect adherence has been reduced. Further, benefits in prevention of disease progression, including reduced viral replication and low risk of progression to AIDS/death, are seen with lower levels of adherence. Research has shown that adherence as low as 50% can be somewhat effective; however adherence for some regimens must still be higher.

Many dually diagnosed (e.g. mentally ill &/or substance using &/or homeless) people with HIV can not achieve consistently high levels of treatment adherence. In the past, treatment was deferred for some members of these populations -- hoping to treat the substance use or mental illness or resolve the homelessness situations first. Some of these dually-diagnosed people may have experienced premature mortality due to this policy.

Researchers in other fields have been working on determining predictors of adherence and intervention success to improve adherence for over 50 years without providing any simple solutions. A meta analysis of HIV compared to other illnesses is below, summarizing 289 studies on HIV and on five other major categories of chronic disorders.

1948—1988 Meta Analysis

| Condition | # Studies | Mean Adherence |
|---|---|---|
| HIV | 8 | 88.3% |
| Arthritis | 22 | 81.2% |
| Gastrointestinal | 42 | 80.4% |
| Cancer | 65 | 79.4% |
| Coronary Artery disease | 129 | 76.6% |
| Diabetes | 23 | 67.5% |

Fifty to eighty percent is an average adherence range as measured by MEMS caps (an electronic monitoring device); self reported adherence is higher than that measured by MEMS caps. In sum, the 95% goal is good but often unrealistic. Thus the simple take-home message needs to be to encourage patients to aim for the best adherence as possible

**Who needs adherence assistance?** Almost everybody needs at least some adherence help. Some people only need occasional reminders but others may need weekly visits or even directly observed treatment (DOT). Ask patients what they are feeling about adherence. No one size fits all. Don't assume they'll choose to be on HAART for the rest of their lives without provider support and encouragement!

**What are the most important factors getting in the way of adherence?** Lack of strong **s**ocial networks in a patient's life, lack of personal routines (like when people sleep, watch a specific television show, listen to a radio broadcast, or eat). lack of safety nets for basic needs, natural catastrophes like hurricanes, poverty, poor public transportation, inflexible clinic hours, religious and other leaders (think of South Africa's leaders as an example), personal beliefs (such as that HIV does not cause AIDS or belief in non-conventional medicine or other healing methods), legal problems (undocumented immigrants, people with outstanding warrants), drug use, lack of fluency in the dominant language (English), and mental illness.

**What do successful adherence programs have in common?** They consider who the patient is, address underlying medical conditions (for example with "one-stop shopping" provision of services for substance use, mental health, and case management) take in to account where patients live (e.g. homeless, group home, jail/prison – fear of disclosure of HIV can be a serious impediment for many), and the patient's existing social support or lack thereof. Patients must know the names of their drugs or carry a written copy of these with them at all times (to ensure uninterrupted delivery

in case of unexpected hospitalization or incarceration), and they also need to know their insurance plan, if any. Providers that are most successful in promoting adherence among their patients know their staff's capabilities, the patient's wishes and goals, insurance requirements, and their self—what is it about a provider that make a patient wait hours to see them. Other successful providers suggest that it is important to establish trusting relations and may employ touch (such as placing their hand on the patient's shoulder or arm), make time to interact with clients, write up care plans (including the patients' treatment goals, labs, and where to go next), and they check on medication adverse effects including gastrointestinal distress, anemia, renal function, and liver function.

**How is adherence measured?** Various techniques of measurement include self reporting, diaries (researchers and others find these frequently incomplete), pill counts, refill timing and MEMS caps. If adherence is based on refill timing, keep in mind that patients may use other pharmacies (refill measures are best in a health maintenance organization [HMO] or other central pharmacy setting, such as the Veteran's Administration [VA]) and that patients may order meds in advance, and that a refill does not mean patient is taking their pills. (However when there are gaps in refills, this can initiate a reminder.) An indirect measure, such as viral load may also be a good proxy for most patients. It is important to monitor adherence over time as there may be neurological/cognitive changes in older HIV patients. Patients may also be able to identify patterns of non-adherence (e.g. associated with binge drinking, vacations, weekends, etc.) to predict and avoid in the future. Try to always ask about adherence at every visit. One good question is "On a scale of 1-10 how would you rate your taking your HIV drugs?"

**What else, besides meds, is it important for patients to adhere to?** Dietary requirements, timing of dosages, (some meds need to be taken at narrow time windows to avoid resistance-promoting trough levels), quantity (correct number of pills), and most importantly, returning for clinic visits. Receiving regular medical care is one of the strongest predictors of good medication adherence.

**What are some specific adherence techniques that work?** (1) Cognitive behavior interviews, or mental status exams, which may ask questions of the patients to assess their understanding of their regimen and adherence and find out what they don't understand and why they may have less than ideal adherence. (2) Motivational interviewing works with a "stages of change" cycle and tries to encourage patients to progress to a highly adherent stage from contemplation to action. (3) Pre treatment placebo practice trials, such as those that use M & Ms or jelly beans to help patients practice adherence and find out what problems they may have before they start with a real HAART regimen. (4) A series of weekly clinic sessions before and/or after starting meds. (5) Ongoing evaluation of adherence by asking questions, such as "How many pills have you taken this week?" (6) Identification of potential problems and toxicities up front; (7) Ask client what method of adherence help would be best for them (e.g. offer a menu of options); (8) Encourage timing of taking meds to tie into something else they do on a regular schedule: e.g. eating meals or watching TV. (9) Ask many questions: Always be sure to ask new patients if they have ever taken HAART drugs (including from street, friends, PEP [post-exposure prophylaxis], or PrEP [pre-exposure prophylaxis]). Before starting HAART, ask if the patient is ready to begin therapy. Ask the patient what his/her survival goals are, do they want to live? What are they willing to do to live? How long do they want to live? (This may be a key short term method to get patients to think about taking their meds.) If an on-treatment viral load is above limit of detection, ask if that was what the patient was expecting or if they thought they had higher adherence. (10) Consider a social marketing approach. For example office posters that read, "Have you taken your medication today?" (11) DOT (directly observed therapy) for example, after outreach, monitor daily, then weekly, then as needed – this may include phone contact with or without a visual connection. Other methods include computer tools, like emailed reminders; asking the patient to paint a picture of his/her pills, cell phone reminders, wrist watches with alarms, and pagers (good for people with cognitive problems).

No one method has been proven to be better than others. Whatever techniques you use, try to engage the patient, inspire trust, show that you really care, be passionate about the process, be flexible, encourage patient to set their own goals, help the patient monitor their labs to measure success, and adjust the plan as you work towards goals.

*Contributed by Susan Buskin, PhD, MPH and Beverly Heintz, BS*

# AIDS Clinical Trials Unit Update: New Targets in the Treatment of HIV

The use of combinations of medications to treat HIV, referred to as Highly Active Anti-Retroviral Therapy (HAART), has resulted in dramatic improvement in the outcome of people infected with HIV. However, people may still fail therapy because of resistance in their strain of HIV that happens with certain changes in the genetic code of the virus. Fortunately, as our understanding of HIV has advanced, new targets in the HIV lifecycle have been identified which provide potential new treatments for individuals who have failed other regimens.

Drugs called entry inhibitors act at one of the several different steps that occur when HIV attaches and enters cells. During one of the entry steps, HIV binds to proteins, called co-receptors, on the surface of a cell called. CXCR4 and CCR5 are the names of two co-receptors. Co-receptor inhibitors function by preventing the virus from binding to CXCR4 or CCR5, and thereby prevent HIV from infecting the cell. Blocking these co-receptors has been shown to inhibit HIV replication in vitro (in a test tube), and clinical trials are underway for inhibitors of both of these co-receptors. AMD-11070 is a CXCR4 inhibitor that is in an early phase of testing. The UW ACTU has been conducting a phase 1 study of AMD-11070, in which the drug is tested in healthy volunteers for its safety, to see how the drug is metabolized, and whether food affects its absorption. A few individuals with HIV have also received AMD-11070 in a separate study.

CCR5 inhibitors are further in development than CXCR4 inhibitors. Results from clinical studies of two CCR5 inhibitors (maraviroc and vicriviroc) have demonstrated that each of these drugs has anti-HIV activity in humans. However, some concerns have arisen during one Phase II trial with vicriviroc because of five patients (nationwide) who developed cancer (four were lymphomas). It is not clear if these cases were related to the CCR5 inhibitor because patients with advanced HIV disease are known to have a higher risk of developing malignancies, especially lymphomas, and a few of the patients in this study had a history of previous malignancies before they were treated with vicriviroc. At the present time, the study is continuing, study volunteers were informed about the cancers, and close monitoring of all participants is occurring. Additional studies with both these experimental medications are in progress.

Another new class of HIV medications under development is integrase inhibitors. Integrase is a protein that allows HIV to combine its genetic material into the DNA of a human cell. This step is thought to be necessary for HIV to replicate and integrase inhibitors interfere with this process. Results from early studies for two different integrase inhibitors were presented at a national HIV meeting early in 2006. Both drugs were shown to suppress HIV infection and appeared safe. A study of an integrase inhibitor called GS-9137 is ongoing at the UW ACTU.

New drugs are also being developed that are members of the existing classes of HIV medications. Darunavir (previously called TMC-114) is a protease inhibitor (PI) that was approved by the FDA in June 2006 for treatment of HIV infection in individuals who have received previous antiretroviral therapy. Darunavir is a second generation PI that is active against strains of HIV resistant to other PIs. In clinical trials to date, including at the UW ACTU, darunavir has been shown to be effective even for people who have failed treatment with other PIs. The UW ACTU has been involved with the development of several of these new compounds and our studies will continue to contribute to improved future HIV treatment. For additional information or if you are interested in HIV-related treatment research, please contact the ACTU at (206) 731-3184. Please see the following list of our studies that are open to new volunteers as of July 2006.

**RESEARCH HELPS! HELP RESEARCH!**

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The following is a list of studies open for enrollment (July 2006). Screening, lab tests and clinical monitoring that are part of a study are provided free of charge for participants. Enrollment in a study at the ACTU does not replace the role of a primary care provider. The ACTU coordinates efforts with each participant's primary care provider. **Providers and potential enrollees can call the ACTU at 206.731.3184 and ask for appointments or additional information.**

| **Antiretroviral (ARV) Studies** | | |
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| **Eligibility** | **Study Purpose** | **Study Drug or Treatment** |
| Treatment naïve (<7 days of ARV treatment)<br>HIV RNA >1000<br>No evidence of any major resistance (if had a genotype) | **(Study 5202)**<br>This study is being done to compare the effectiveness and safety of drug combinations in the **initial treatment of HIV infection.** | Will be randomized to one of the following groups:<br>Group A: EFV plus FTC/TDF plus ABC/3TC placebo<br>Group B: EFV plus ABC/3TC plus FTC/TDF placebo<br>Group C: ATV with RTV plus FTC/TDF plus ABC/3TC placebo<br>Group D: ATV with RTV plus **ABC/3TC plus FTC/TDF placebo** |
| **Eligibility** | **Study Purpose** | **Study Drug or Treatment** |
| Acute AIDS-defining opportunistic illness (OI) or serious bacterial infection (BI)<br>CD4 <200 for subject w/BI including bacterial pneumonia<br>No ARV treatment within last 8 weeks<br>No ARV treatment for ³31 days within last 6 months<br>Not pregnant | **(Study # 5164)**<br>**Immediate vs deferred** HIV treatment in patients presenting with acute OI's and BI's to see if it is better to start treatment right away or to wait until the OI or BI has resolved. | **Arm A**: ARV treatment within 2 weeks after starting treatment for OI or BI<br>**Any FDA-approved ARV regimen will be allowed.**<br>**Kaletra, D4T, and D4T XR will be provided if chosen as part of the regimen**<br>**Arm B**: ARV treatment deferred until after OI or BI resolved (at least 4 weeks after entry, but no more than 32 weeks after entry) |

| **Complications of HIV and Other Conditions: Neuropathy** | | |
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| **Eligibility** | **Study Purpose** | **Study Drug or Treatment** |
| Peripheral neuropathy related to either d4T, ddI, or ddC<br>Current regimen must contain d4T, ddI, or ddC<br>Must be on current regimen for ³ 8 weeks<br>HIV RNA < 10,000<br>Not pregnant | **(Study # 5157)**<br>To see if acetyl-L-carnitine (ALC) reduces neuropathy symptoms in patients taking d4T, ddI, or ddC. This study will also assess the safety and tolerability of this investigational treatment for peripheral neuropathy | **Day 1-7:** Acetyl-L-carnitine (ALC) 500mg (1 tablet) 2X/day<br>**Day 8-14:** ALC 1000mg (2 tablets) twice a day<br>**Day 15-Week 24**<br>ALC 1500mg (3 tablets) or maximum tolerated dose twice a day |

| Other Studies | | |
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| **Eligibility** | **Study Purpose** | **Study Drug or Treatment** |
| HIV positive **women** 13 years or older<br><br>HIV RNA < 55,000 copies/ml<br><br>CD4 count ≥ 200/$mm^3$<br><br>**NOT** pregnant<br><br>Either taking LPV/r or **NO** protease inhibitors<br><br>NNRTI's and TDF are **NOT** allowed<br><br>Current use of oral contraceptives (within 2 months), Depro-Provera (within 6 months), or Lunelle (within 3 months) **NOT** allowed<br><br>Must weigh less then 198 pounds<br><br>Current use of the contraceptive patch Ortho Evra **IS** allowed | **(Study # 5188)**<br><br>This study will examine the interaction between an antiretroviral (ARV) regimen containing lopinavir/ritonavir (LPV/r, Kaletra) and the transdermal (patch) contraceptive system (TCS), Ortho Evra. The effect of LPV/r on a single dose of the oral contraceptive Ortho Novum (pill) will also be studied. | Arm A: LPV/r (LPV 400 mg plus ritonavir 100 mg) twice a day plus two or more NRTI's.<br><br>• Single dose of Ortho Novum 5-7 days after start of menses<br><br>Ortho Evra contraceptive patch for 3 weeks (change once each week)<br><br>Arm B: Either not on any ARV's or taking NRTI's only.<br><br>• Single dose of Ortho Novum 5-7 days after start of menses<br><br>**Ortho Evra contraceptive patch for 3 weeks (change once each week)**<br><br>**Note: ARV therapy (including LPV/r) is** NOT **supplied. The study drugs Ortho Novum and Ortho Evra** ARE **supplied.** |
| No cigarette smoking in last 90 days<br><br>Not pregnant<br><br>No use of inhaled nasal or lung medication<br><br>No respiratory infection or bronchitis within 3 weeks | **(Study # 080)**<br><br>To see if alveolar macrophages is a reservoir for HIV | None<br><br>The macrophages are collected by a bronchoalveolar lavage procedure (BAL) in the Pulmonary Lab. |

Key to Terms:

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| 3TC: | lamivudine (Epivir) | HBV: | hepatitis B |
| ABC: | abacavir (Ziagen) | HCV: | hepatitis C |
| APV: | amprenavir (Agenerase) | IDV: | indinavir (Crixivan) |
| ARV: | antiretroviral | LPV/r: | lopinavir/ritonavir (Kaletra) |
| AZT: | zidovudine (Retrovir) | NFV: | nelfinavir (Viracept) |
| CBV: | combivir (lamivudine/zidovudine) | NNRTI: | non-nucleoside reverse transcriptase inhibitor |
| ddI: | didanosine (Videx) | NRTI: | nucleoside reverse transcriptase inhibitor |
| d4T: | stavudine (Zerit) | NVP: | nevirapine (Viramune) |

| Studies for HIV 'Negative' Participants | | |
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| **Eligibility** | **Study Purpose** | **Study Drug or Treatment** |
| HIV negative<br>Age 18-50 years<br>No active heart or lung disease<br>No hypertension<br>Not pregnant<br>No blood draws or donations within 6 weeks of screening | **(Study 084)**<br><br>To study factors that control HIV infection in the test tube in a type of white blood cells called macrophages. This study may also help us learn more about how HIV infects cells. | Up to 5 study visits<br><br>Screening<br><br>3 on-study visits at ACTU for 100cc blood draw<br><br>Two thirds of participants will undergo a leukapheresis procedure at the Clinical Research Center at UWMC |
| **Eligibility** | **Study Purpose** | **Study Drug or Treatment** |
| HIV negative<br><br>Male or non-pregnant female, age 18-40<br><br>No history of heart, liver, or kidney disease<br><br>No history of cardiac disease, abnormal EKG, or bradycardia<br><br>No smoking for at least one month before and throughout the study.<br><br>No history of diabetes or a family history of type 2 diabetes and a fasting glucose >110 mg/dl. | **(Study # 165)**<br><br>To determine if cytochrome P450 (CYP) enzymes and the multidrug resistant transporter (P-gp), are significantly induced after chronic administration of ritonavir and nelfinavir | **Part One (First 14 subjects)**<br><br>Visit Set One :<br><br>Day 1: Mini-cocktail (digoxin & midazolam)<br><br>Day 2: 4-drug cocktail (caffeine, tolbutamide, dextromorphan, & midazolam)<br><br>Day 3-17: Randomized to nelfinavir or rifampin<br><br>Visit Set Two:<br><br>Day 17: Mini-cocktail (digoxin & midazolam)<br><br>Day 18: 4-drug cocktail (caffeine, tolbutamide, dextromorphan, & midazolam)<br><br>Day 19-44: No drugs administered<br><br>Day 45-59: If randomized to nelfinavir on day 3, will receive rifampin. If randomized to rifampin on day 3, will receive nelfinavir<br><br>Visit Set Three:<br><br>Day 59: Mini-cocktail (digoxin & midazolam)<br><br>Day 60: 4-drug cocktail (caffeine, tolbutamide, dextromorphan, & midazolam)<br><br>**Part Two (Next 14 subjects)**<br><br>***Same as above, except ritonavir will be used in place of nelfinavir)***<br><br>***ALL ON-STUDY VISITS WILL BE AT THE CLINICAL RESEARCH CENTER AT UWMC*** |

Visit our website at http://depts.washington.edu/actu and find out about our latest studies, meet our staff, and find out about our outreach and ***Positivamente Latino*** programs. You can send your questions, comments, and suggestions to us via email at actu@u.washington.edu. For information in Spanish call us at 206.731.3497.