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

Summary Tables and Figures

HIV/AIDS Epidemiology and Surveillance News

Suggested Citation: *HIV/AIDS Epidemiology Section, Prevention Division, Public Health - Seattle & King County, and Infectious Disease and Reproductive Health Assessment Unit, Washington State Department of Health. Washington State/Seattle King County HIV/AIDS Epidemiology Report. Second half 2003: Vol 63.*

Credits

This is the sixty-third edition of the HIV/AIDS Epidemiology Report. This report, in general, includes data through the end of December 2003. The report is produced as a joint project by Public Health - Seattle & King County and the Washington State Infectious Disease and Reproductive Health Assessment Unit. It is funded in part by a Centers for Disease Control and Prevention cooperative agreement for HIV/AIDS surveillance. We wish to thank the health care providers caring for people with HIV/AIDS and the clinics and patients participating in epidemiologic studies. Their cooperation with the public health departments' HIV/AIDS control efforts provides the basis for the data presented in this report. We also wish to acknowledge the outstanding assistance of our staff. Public Health - Seattle & King County staff include Roxi Smith (who provided desktop publishing for this edition), Tom Davis, Amy Bauer, Laura Arnold, Laurie Smith, and Peter de Turk. Washington State Infectious Disease and Reproductive Health (IDRH) Assessment Unit staff include Mark Charonis, Kealy McCleery, Anna Easton, Sandy Hitchcock, Anna Meddaugh, and Mary Roberts.

HIV/AIDS Epidemiology Report Co-editors:

HIV/AIDS Epidemiology Program
Susan Buskin, PhD, MPH and Jim Kent MPH
Senior Epidemiologists
400 Yesler Way, 3rd Floor
Seattle, WA 98104
(206) 296-4645

IDRH Assessment Unit
Maria Courogen, MPH
Section Manager/Lead Epidemiologist
Washington State Department of Health
PO Box 47838
Olympia, WA 98504-7838
(360) 236-3458

Public Health
Seattle & King County
HEALTHY PEOPLE. HEALTHY COMMUNITIES.

Washington State Department of Health

To be included on the mailing list or to request address corrections, write to the Public Health - Seattle & King County HIV/AIDS Epidemiology Program, 400 Yesler Way, 3rd Floor, Seattle, WA 98104 or phone (206) 296-4645

Alternative Formats Provided Upon Request.

HIV/AIDS Reporting Requirements

Washington State implemented HIV infection reporting on September 1, 1999. Health care providers are required to report all HIV infections, regardless of the date of the patient's initial diagnosis, to the local health department. However, the requirement is limited to those patients who seek HIV care or were tested on or after September 1, 1999

Local health department officials forward case reports to the State Department of Health, replacing the name of the patient with a standard code prior to forwarding if the report indicates asymptomatic infection. As has been the case since 1984, AIDS and symptomatic HIV case reports are not subject to coding. Names are not sent to the Federal Government.

Laboratory evidence of HIV infection (i.e., western blot assays, p24 antigen detection, viral culture, nucleic acid detection [viral load]) also became reportable by laboratories effective September 1, 1999. Low CD4 counts (<200/ul or <14% of total lymphocytes) already have been reportable since 1993. However, laboratory reporting does not relieve health care providers of their duty to report since most of the critical information necessary for surveillance and follow-up is not available for reporting by laboratories.

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

The HIV/AIDS Epidemiology Program's publications are also on the internet at: www.metrokc.gov/health/apu/epi

Contributors to this issue

Public Health - Seattle & King County

Amy Bauer, MPH, Epidemiologist

Barb Gamble, MPA, HIV Prevention Planner

Elizabeth Barash, MPH, Epidemiologist

Erin Burchfield, MPA, Project Coordinator, Seattle RARE Project

Erin Kahle, MPH, Epidemiologist

Jim Kent, MS, Epidemiologist, Head of HIV/AIDS Surveillance for King County

Hanne Thiede, DVM, MPH, Epidemiologist

Linda Oakley, Project Manager, STARHS Adverse Events Study (ARBOR)

Susan Buskin, PhD, MPH, Senior Epidemiologist

Washington State Department of Health

Maria Courogen, MPH, Epidemiologist, Head of HIV/AIDS Surveillance for Washington State

Todd E. Rime, MA, Research Investigator

University of Washington

Connie Celum, MD, MPH, Principal Investigator for HSV-HIV Transmission Trials, Professor of Medicine

Explanation of new format for Epidemiology Report summary tables and figures

This edition of the HIV/AIDS Epidemiology report introduces new data and a new format in our summary statistical tables and figures. The revisions reflect increases in our analytical capacity and a broader understanding of the local HIV/AIDS epidemic since implementing HIV infection reporting in 1999. The new tables generally describe persons reported living with HIV infection or AIDS, while the older version described all persons diagnosed with AIDS in the past 23 years, including those who had died. As always, you may request additional statewide data from the DOH office at (360) 236-3455, or King County data from (206) 296-4645. A brief outline for each revised data table or figure is below.

Table 1: Reported cases, deaths, and persons living with HIV/AIDS. There are separate columns of data for persons with HIV infection and AIDS. In addition, the footnotes provide comparison between the reported numbers used throughout the tables and the estimated true number who are infected or have AIDS.

Table 2: Case counts and deaths by resident county at diagnosis. In addition to cumulative cases and deaths, this table also has separate columns describing persons living with HIV infection, and total persons living with HIV or AIDS.

Tables 3, 4, 5, 6: Demographic characteristics of persons living with HIV/AIDS. These tables describe all persons reported living with HIV or AIDS. Table 3 provides one-way demographic descriptions, while Tables 4 and 5 describe sex by race/ethnicity by HIV exposure category. Table 6 shows sex by age group.

Figures 1 and 2: HIV/AIDS cases, deaths, and persons living with HIV/AIDS. These two figures for King County and Washington show the numbers of new diagnoses of HIV infection and deaths over time. In addition, the number of persons living with HIV/AIDS is shown.

Tables 7 and 8: Demographic characteristics and year of HIV diagnosis. These tables for King County and for Washington show the numbers and trends over time for all persons diagnosed with HIV/AIDS, based on the year of initial diagnosis with HIV infection.

Maria Courogen, Susan Buskin, and Jim Kent, Editors of the HIV/AIDS Epidemiology Report

Table 1. Surveillance of reported[1] HIV/AIDS cases, deaths, and persons living with HIV/AIDS by time of case report- King County, other WA counties, all WA State, and U.S.

		Adult/Adolecent		Pediatric[2]		
		HIV	AIDS	HIV	AIDS	Total
King County	New cases reported in 2nd half 2003	176	208	0	0	384
	New cases reported all 2003	325	328	0	0	653
	Cumulative Cases	2,387	6,993	17	14	9,411
	Cumulative Deaths	70	3,888	0	9	3,967
	Persons Living (prevalent cases)	2,317	3,105	17	5	**5,444**
Other Counties	New cases reported in 2nd half 2003	94	85	1	0	180
	New cases reported all 2003	172	182	1	0	355
	Cumulative Cases	1,214	3,867	20	18	5,119
	Cumulative Deaths	62	2,004	1	11	2,078
	Persons Living (prevalent cases)	1,152	1,863	19	7	3,041
Washington State	New cases reported in 2nd half 2003	270	293	1	0	564
	New cases reported all 2003	497	510	1	0	1,008
	Cumulative Cases	3,601	10,860	37	32	14,530
	Cumulative Deaths	132	5,892	1	20	6,045
	Persons Living (prevalent cases)	3,469	4,968	36	12	**8,485**
United States[3]	Cases reported as of 12/31/2002					
	Cumulative Cases	195,401	877,275	4,358	9,300	1,086,334
	Cumulative Deaths	NA	496,262	NA	5,407	501,669
	Persons Living (prevalent cases)	NA	381,013	NA	3,893	384,906

1. There are an estimated 11,000 to 13,000 persons living in Washington with HIV infection including AIDS. These include the 8,485 prevalent cases reported above. In King County, there are an estimated 7,200 to 8,400 persons living with HIV infection including AIDS. These include the 5,444 prevalent cases reported above. The difference between the estimated cases and the reported prevalent cases include three groups:
    a. A small number of persons diagnosed with AIDS but not yet reported (probably fewer than 5% of the total AIDS reports).
    b. An unknown number of persons diagnosed with HIV infection but not yet reported (possibly 8-13% of total persons infected with HIV).
    c. An unknown number of persons (possibly 20-25% of the total HIV estimate) infected with HIV but not yet diagnosed or reported.
2. Pediatric cases are persons under age 13 years at the time of diagnosis with HIV or AIDS.
3. Cumulative U.S. data for persons 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.

Numbers of cumulative deaths and persons living are not available (NA) at this time.

Table 2. Cumulative HIV/AIDS case counts and deaths by resident county and AIDSNet region at diagnosis - reported as of 12/31/03 - WA State

		Cumulative Cases	Deaths		Presumed Living			
			Number	(%)[1]	HIV	AIDS	Total	(Total %)[2]
Region 1	Adams	6	1	(17)	1	4	5	(0.1)
	Asotin	17	7	(41)	2	8	10	(0.1)
	Columbia	5	3	(60)	1	1	2	(<0.1)
	Ferry	7	6	(86)	0	1	1	(<0.1)
	Garfield	0	0	(0)	0	0	0	(0.0)
	Lincoln	4	2	(50)	0	2	2	(<0.1)
	Okanogan	28	8	(29)	7	13	20	(0.2)
	Pend Orielle	9	5	(56)	1	3	4	(<0.1)
	Spokane	580	252	(43)	122	206	328	(3.9)
	Stevens	26	8	(31)	4	14	18	(0.2)
	Walla Walla	64	31	(48)	5	28	33	(0.4)
	Whitman	12	4	(33)	2	6	8	(0.1)
	Subtotal R1	**758**	**327**	(43)	**145**	**286**	**431**	(5.1)
Region 2	Benton	99	35	(35)	20	44	64	(0.8)
	Chelan	45	21	(47)	11	13	24	(0.3)
	Douglas	4	2	(50)	2	0	2	(<0.1)
	Franklin	57	13	(23)	18	26	44	(0.5)
	Grant	37	22	(59)	7	8	15	(0.2)
	Kittitas	17	9	(53)	3	5	8	(0.1)
	Klickitat	16	8	(50)	5	3	8	(0.1)
	Yakima	201	77	(38)	47	77	124	(1.5)
	Subtotal R2	**476**	**187**	(39)	**113**	**176**	**289**	(3.4)
Region 3	Island	75	36	(48)	15	24	39	(0.5)
	San Juan	24	10	(42)	6	8	14	(0.2)
	Skagit	73	29	(40)	22	22	44	(0.5)
	Snohomish	774	300	(39)	189	285	474	(5.6)
	Whatcom	191	76	(40)	39	76	115	(1.4)
	Subtotal R3	**1,137**	**451**	(40)	**271**	**415**	**686**	(8.1)
Region 4	King	9,411	3,967	(42)	2,334	3,110	5,444	(64.2)
Region 5	Kitsap	262	106	(40)	67	89	156	(1.8)
	Pierce	1,304	544	(42)	316	444	760	(9.0)
	Subtotal R5	**1,566**	**650**	(42)	**383**	**533**	**916**	**(10.8)**
Region 6	Clallam	66	29	(44)	13	24	37	(0.4)
	Clark	523	199	(38)	119	205	324	(3.8)
	Cowlitz	118	50	(42)	28	40	68	(0.8)
	Grays Harbor	59	29	(49)	10	20	30	(0.4)
	Jefferson	31	17	(55)	4	10	14	(0.2)
	Lewis	48	27	(56)	7	14	21	(0.2)
	Mason	87	20	(23)	18	49	67	(0.8)
	Pacific	22	11	(50)	5	6	11	(0.1)
	Skamania	7	5	(71)	0	2	2	(<0.1)
	Thurston	218	76	(35)	54	88	142	(1.7)
	Wahkiakum	3	0	(0)	1	2	3	(0.0)
	Subtotal R6	**1,182**	**463**	(39)	**259**	**460**	**719**	**(8.5)**
Total		**14,530**	**6,045**	**(42)**	**3,505**	**4,980**	**8,485**	**(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 persons presumed living with HIV/AIDS- King County, other WA Counties, all WA State, and U.S. - reported as of 12/31/03

	King County		Other Counties		All Washington		Estimated U.S.[1]	
	Number	(%)	Number	(%)	Number	(%)	Number	(%)
Sex								
Male	4,935	(91)	2,465	(81)	7,400	(87)	208,244	(74)
Female	509	(9)	576	(19)	1,085	(13)	73,683	(26)
Unknown	0	(0)	0	(0)	0	(0)	4	(0)
Age Group								
Under 13 years	22	(0)	26	(1)	48	(1)	2,363	(1)
13-19 years	59	(1)	56	(2)	115	(1)	N/A[a]	
20-29 years	1,289	(24)	733	(24)	2,022	(24)	N/A[a]	
30-39 years	2,521	(46)	1,249	(41)	3,770	(44)	N/A[a]	
40-49 years	1,224	(22)	728	(24)	1,952	(23)	N/A[a]	
50-59 years	290	(5)	194	(6)	484	(6)	N/A[a]	
60 years and over	39	(1)	55	(2)	94	(1)	N/A[a]	
Race/Ethnicity								
White[2]	3,932	(72)	2,246	(74)	6,178	(73)	107,992	(38)
Black[2]	818	(15)	335	(11)	1,153	(14)	141,184	(50)
Hispanic	463	(9)	288	(9)	751	(9)	28,364	(10)
Asian & Pacific Islander[2]	118	(2)	75	(2)	193	(2)	*3,574*	(1)
Asian [2,3]	*112*	(2)	*30*	(1)	142	(2)	N/A	
Native Hawaiian & Other PI [2,3]	*6*	(0)	*9*	(0)	15	(0)	N/A	
Native American&Alaska Native[2]	88	(2)	73	(2)	161	(2)	1,565	(1)
Multi Race[2,3]	12	(0)	1	(0)	13	(0)	N/A	
Unknown	13	(0)	23	(1)	36		1,645	(1)
HIV Exposure Category								
Male-male sex	3,819	(70)	1,482	(49)	5,301		125,268	(44)
Injection drug use (IDU)	358	(7)	491	(16)	849		54,211	(19)
IDU & male-male sex	485	(9)	261	(9)	746	(9)	16,143	(6)
Heterosexual contact	386	(7)	441	(15)	827	(10)	78,381	(28)
Blood product exposure	43	(1)	41	(1)	84	(1)	N/A	
Perinatal exposure	20	(0)	25	(1)	45	(1)	3,114	(1)
Undetermined/other[4]	333	(6)	300	(10)	633	(7)	1887[b]	(1)
Total Cases	**5,444**	(100)	**3,041**	(100)	**8,485**	(100)	**281,931**	(100)

1. U.S. data were reported as of 12/31/2002 and are the most recent statistics available. Estimates were imputed from CDC data for the states and areas with confidential named-based HIV infection reporting.
   a. Age related data for persons ages 13+ were grouped differently by CDC, and could not adequately be redistributed to agree with Washington State intervals.
   b. Includes hemophilia, blood transfusion, and risk not reported or not identified
2. And not Hispanic. All categories are mutually exclusive.
3. Revised federal Office of Management and Budget classifications for race split the old category of Asian & Pacific Islander into two (Asian versus Native Hawaiian & Other Pacific Islander), and added Multiple Race. Some previously collected data could not be split and are shown only in the old category.
4. Includes persons for whom exposure information is incomplete (due to death, refusal to be interviewed, or loss to fol low-up), patients still under investigation, patients whose only risk was heterosexual contact where the risk of the sexual partner(s) was (were) undetermined, persons exposed to HIV through their occupation, and patients whose mode of exposure remains undetermined.

Tables 4 and 5. Persons presumed living with HIV/AIDS cases by gender, race/ethnicity, and HIV exposure category - reported as of 12/31/03

Table 4. King County

HIV Exposure Category	White[1] Number	(%)	Black[1] Number	(%)	All Hispanic Number	(%)	Asian & PI[1,2] Number	(%)	Native Am/AN[1,3] Number	(%)	Total[4] Number	(%)
Male												
Male-male sex	3,078	(78)	313	(38)	309	(67)	75	(64)	32	(36)	3,819	(70)
Injection drug use (IDU)	115	(3)	77	(9)	33	(7)	4	(3)	8	(9)	241	(4)
IDU & male-male sex	388	(10)	41	(5)	30	(6)	4	(3)	21	(24)	485	(9)
Heterosexual contact	35	(1)	86	(11)	13	(3)	5	(4)	2	(2)	142	(3)
Blood product exposure	22	(1)	2	(0)	3	(1)	1	(1)	0	(0)	28	(1)
Perinatal exposure	1	(0)	3	(0)	0	(0)	1	(1)	0	(0)	5	(0)
Undetermined/other	85	(2)	80	(10)	34	(7)	12	(10)	2	(2)	215	(4)
MALE SUBTOTAL	**3,724**	(95)	**602**	(74)	**422**	(91)	**102**	(86)	**65**	(74)	**4,935**	(91)
Female												
Injection drug use (IDU)	61	(2)	39	(5)	3	(1)	0	(0)	14	(16)	117	(2)
Heterosexual contact	103	(3)	99	(12)	23	(5)	7	(6)	7	(8)	244	(4)
Blood product exposure	4	(0)	9	(1)	1	(0)	1	(1)	0	(0)	15	(0)
Perinatal exposure	4	(0)	8	(1)	2	(0)	1	(1)	0	(0)	15	(0)
Undetermined/other	36	(1)	61	(7)	12	(3)	7	(6)	2	(2)	118	(2)
FEMALE SUBTOTAL	**208**	(5)	**216**	(26)	**41**	(9)	**16**	(14)	**23**	(26)	**509**	(9)
TOTAL	**3,932**	**(72)**	**818**	**(15)**	**463**	**(9)**	**118**	**(2)**	**88**	**(2)**	**5,444**	**(100)**

Table 5. Washington State

HIV Exposure Category	White[1] Number	(%)	Black[1] Number	(%)	All Hispanic Number	(%)	Asian & PI[1,2] Number	(%)	Native Am/AN[1,3] Number	(%)	Total[4] Number	(%)
Male												
Male-Male sex	4,283	(69)	405	(35)	426	(57)	107	(55)	56	(35)	5,301	(62)
Injection drug use (IDU)	353	(6)	123	(11)	63	(8)	8	(4)	17	(11)	569	(7)
IDU & male-male sex	598	(10)	58	(5)	50	(7)	7	(4)	31	(19)	746	(9)
Heterosexual contact	102	(2)	124	(11)	34	(5)	10	(5)	6	(4)	278	(3)
Blood product exposure	50	(1)	2	(0)	7	(1)	1	(1)	0	(0)	61	(1)
Perinatal exposure	7	(0)	7	(1)	2	(0)	2	(1)	1	(1)	19	(0)
Undetermined/other	224	(4)	107	(9)	68	(9)	18	(9)	3	(2)	426	(5)
Male Subtotal	**5,617**	(91)	**826**	(72)	**650**	(87)	**153**	(79)	**114**	(71)	**7,400**	(87)
Female												
Injection drug use (IDU)	169	(3)	68	(6)	13	(2)	2	(1)	27	(17)	280	(3)
Heterosexual contact	288	(5)	155	(13)	65	(9)	19	(10)	16	(10)	549	(6)
Blood product exposure	9	(0)	10	(1)	1	(0)	3	(2)	0	(0)	23	(0)
Perinatal exposure	9	(0)	11	(1)	4	(1)	2	(1)	0	(0)	26	(0)
Undetermined/other	86	(1)	83	(7)	18	(2)	14	(7)	4	(2)	207	(2)
Female Subtotal	**561**	(9)	**327**	(28)	**101**	(13)	**40**	(21)	**47**	(29)	**1,085**	(13)
TOTAL	**6,178**	**(73)**	**1,153**	**(14)**	**751**	**(9)**	**193**	**(2)**	**161**	**(2)**	**8,485**	**(100)**

1. And not Hispanic. All categories are mutually exclusive.
2. Due to small cell sizes, data has been combined for Asian and Native Hawaiian & Other Pacific Islander.
3. Native American or Alaska Native.
4. Totals include 12 King County and 13 Washington Sate persons classified as multiracial, and 13 King County and 36 Washington State persons for whom race was unknown.

Table 6. Persons presumed living with HIV/AIDS by gender and age at HIV diagnosis reported as of 12/31/03 - King County and Washington State

	King County				Washington State			
	Male		Female		Male		Female	
Age	Number	(%)	Number	(%)	Number	(%)	Number	(%)
Under 13 years	8	(0)	16	(3)	24	(0)	29	(3)
13-19 years	78	(2)	31	(6)	136	(2)	64	(6)
20-29 years	1,435	(29)	179	(35)	2,171	(29)	369	(34)
30-39 years	2,210	(45)	182	(36)	3,201	(43)	375	(35)
40-49 years	961	(19)	67	(13)	1,452	(20)	181	(17)
50-59 years	212	(4)	30	(6)	347	(5)	54	(5)
60 years and over	31	(1)	4	(1)	69	(1)	13	(1)
Total	**4,935**	**(100)**	**509**	**(100)**	**7,400**	**(1)**	**1,085**	**(100)**

Figure 1. **Number of new HIV/AIDS cases, deaths, and person living with HIV/AIDS at the end of three year intervals- reported as of 12/31/03 - King County**

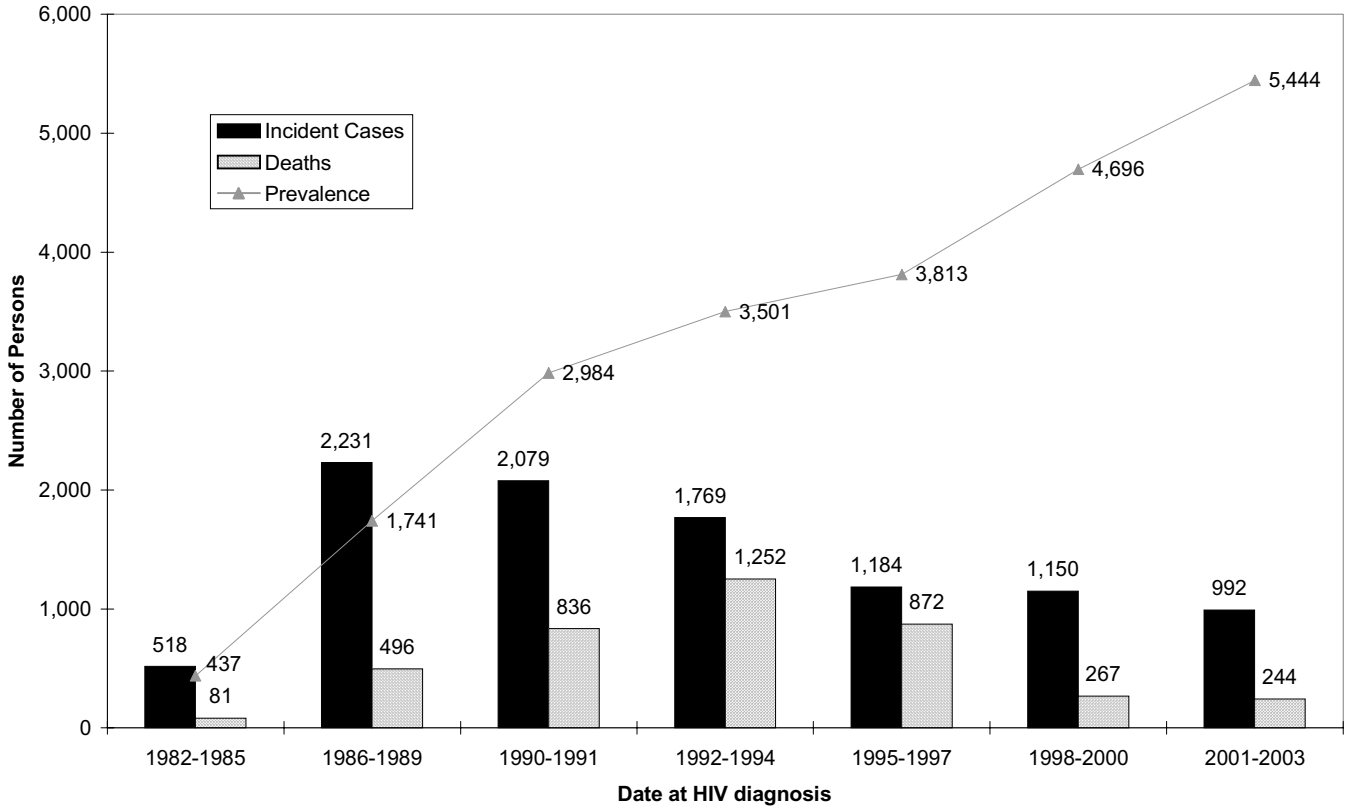


Figure 2. **Number of new HIV/AIDS cases, deaths, and persons living with AIDS at the end of three year intervals - reported as of 12/31/03- Washington State**

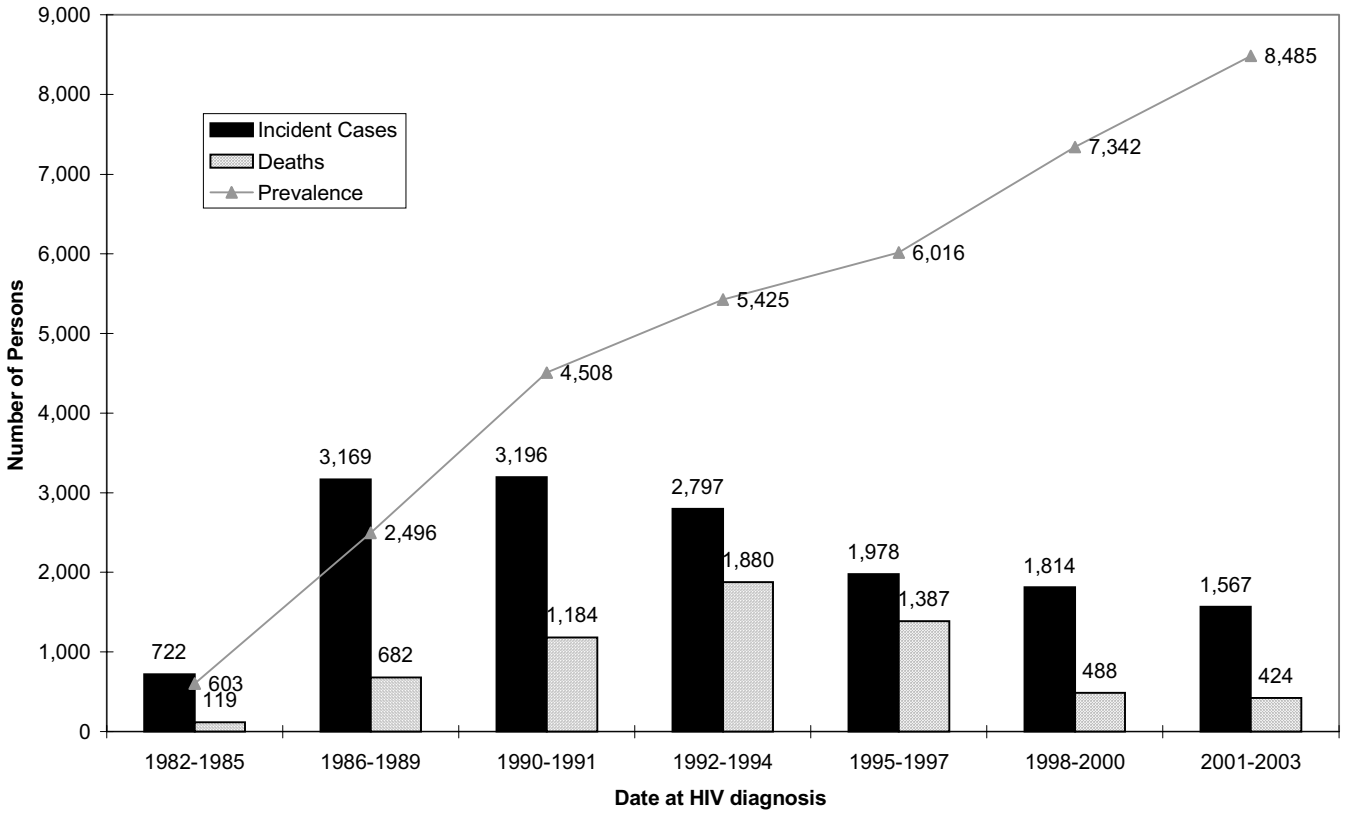


Table 7. Demographic characteristics and year of HIV diagnosis for 9,411 Seattle-King County residents - reported through 12/31/2003

	1982-1988		1989-1991		1992-1994		1995-1997		1998-2000		2001-2003[1]		Trend
	No	(%)	No	(%)	No	(%)	No	(%)	No	(%)	No	(%)	1995-2003
TOTAL	**2,237**	**(100)**	**2,079**	**(100)**	**1,769**	**(100)**	**1,184**	**(100)**	**1,150**	**(100)**	**992**	**(100)**	
HIV Exposure Category													
Men who have sex with men (MSM)	1,754	(78)	1,591	(77)	1,330	(75)	798	(67)	766	(67)	634	(64)	
Injection drug user (IDU)	109	(5)	108	(5)	113	(6)	86	(7)	79	(7)	69	(7)	
MSM-IDU	264	(12)	246	(12)	155	(9)	106	(9)	83	(7)	68	(7)	
Heterosexual contact	31	(1)	59	(3)	89	(5)	77	(7)	107	(9)	119	(12)	up
Blood product exposure	47	(2)	31	(1)	11	(1)	5	(0)	6	(1)	5	(1)	
Perinatal exposure	6	(0)	4	(0)	8	(0)	6	(1)	4	(0)	0	(0)	
SUBTOTAL- known risk	*2,211*		*2,039*		*1,706*		*1,078*		*1,045*		*895*		
Undetermined/other[2]	26	(1)	40	(2)	63	(4)	106	(9)	105	(9)	97	(10)	
Sex & Race/Ethnicity													
Male	2,161	(97)	1,977	(95)	1,655	(94)	1,073	(91)	1,010	(88)	875	(88)	
White Male[3]	1,898	(85)	1,652	(79)	1,309	(74)	795	(67)	690	(60)	578	(58)	down
Black Male[3]	134	(6)	179	(9)	178	(10)	136	(11)	159	(14)	144	(15)	up
Hispanic Male	79	(4)	90	(4)	117	(7)	98	(8)	108	(9)	104	(10)	
Other Male[3]	50	(2)	56	(3)	51	(3)	44	(4)	53	(5)	49	(5)	
Female	76	(3)	102	(5)	114	(6)	111	(9)	140	(12)	117	(12)	
White Female[3]	48	(2)	65	(3)	53	(3)	50	(4)	56	(5)	30	(3)	
Black Female[3]	21	(1)	25	(1)	40	(2)	43	(4)	62	(5)	62	(6)	up
Hispanic Female	2	(0)	3	(0)	11	(1)	8	(1)	13	(1)	11	(1)	
Other Female[3]	5	(0)	9	(0)	10	(1)	10	(1)	9	(1)	14	(1)	
Race/Ethnicity													
White[3]	1,946	(87)	1,717	(83)	1,362	(77)	845	(71)	746	(65)	608	(61)	down
Black[3]	155	(7)	204	(10)	218	(12)	179	(15)	221	(19)	206	(21)	up
Hispanic	81	(4)	93	(4)	128	(7)	106	(9)	121	(11)	115	(12)	up
Asian & Pacific Islander[3]	25	(1)	34	(2)	31	(2)	24	(2)	35	(3)	32	(3)	
Native American & Alaska Native[3]	27	(1)	25	(1)	24	(1)	28	(2)	17	(1)	20	(2)	
Multi Race[3]	3	(0)	5	(0)	6	(0)	1	(0)	2	(0)	7	(1)	up
Unknown	0	(0)	1	(0)	0	(0)	1	(0)	8	(1)	4	(0)	
Age at diagnosis of HIV													
0-19 years	55	(2)	27	(1)	25	(1)	21	(2)	21	(2)	11	(1)	
20-24 years	261	(12)	134	(6)	126	(7)	58	(5)	82	(7)	81	(8)	up
25-29 years	493	(22)	399	(19)	331	(19)	218	(18)	176	(15)	128	(13)	down
30-34 years	532	(24)	493	(24)	404	(23)	290	(24)	261	(23)	226	(23)	
35-39 years	423	(19)	469	(23)	365	(21)	245	(21)	260	(23)	248	(25)	up
40-44 years	238	(11)	267	(13)	231	(13)	160	(14)	178	(15)	152	(15)	
45-49 years	119	(5)	153	(7)	152	(9)	97	(8)	98	(9)	73	(7)	
50-54 years	58	(3)	61	(3)	77	(4)	55	(5)	49	(4)	40	(4)	
55-59 years	40	(2)	37	(2)	40	(2)	24	(2)	14	(1)	18	(2)	
60-64 years	13	(1)	22	(1)	13	(1)	4	(0)	5	(0)	9	(1)	
65 + years	5	(0)	17	(1)	5	(0)	12	(1)	6	(1)	6	(1)	

1. Due to delays in reporting, data from recent years are incomplete.
2. Includes persons for whom exposure information is incomplete (due to death, refusal to be interviewed, or loss to follow-up), patients still under investigation, patients whose only risk was heterosexual contact where the risk of the sexual partner was undetermined, persons exposed to HIV through their occupation, and patients whose mode of exposure remains undetermined.
3. And not Hispanic. The groups Asian and Native Hawaiian & Other Pacific Islander were grouped due to small cell sizes. All categories are mutually exclusive.

Table 8. Demographic characteristics and year of HIV diagnosis for 14,530 Washington State residents - reported through 12/31/2003

	1982-1988		1989-1991		1992-1994		1995-1997		1998-2000		2001-2003[1]		Trend
	No	(%)	No	(%)	No	(%)	No	(%)	No	(%)	No	(%)	1995-2003
TOTAL	**3,178**	**(100)**	**3,196**	**(100)**	**2,797**	**(100)**	**1,978**	**(100)**	**1,814**	**(100)**	**1,567**	**(100)**	
HIV Exposure Category													
Men who have sex with men (MSM)	2,346	(74)	2,263	(71)	1,843	(66)	1,148	(58)	1,070	(59)	892	(57)	
Injection drug user (IDU)	214	(7)	255	(8)	312	(11)	224	(11)	207	(11)	151	(10)	
MSM-IDU	382	(12)	381	(12)	237	(8)	169	(9)	118	(7)	106	(7)	down
Heterosexual contact	69	(2)	139	(4)	217	(8)	206	(10)	208	(11)	228	(15)	up
Blood product exposure	110	(3)	65	(2)	32	(1)	17	(1)	10	(1)	6	(0)	
Perinatal exposure	7	(0)	14	(0)	15	(1)	19	(1)	6	(0)	1	(0)	down
SUBTOTAL- known risk	*3,128*		*3,117*		*2,656*		*1,783*		*1,619*		*1,384*		
Undetermined/other[2]	50	(2)	79	(2)	141	(5)	195	(10)	195	(11)	183	(12)	
Sex & Race/Ethnicity													
Male	3,034	(95)	2,964	(93)	2,492	(89)	1,713	(87)	1,542	(85)	1,328	(85)	
White Male[3]	2,664	(84)	2,475	(77)	1,974	(71)	1,298	(66)	1,073	(59)	889	(57)	down
Black Male[3]	183	(6)	245	(8)	253	(9)	188	(10)	215	(12)	201	(13)	up
Hispanic Male	112	(4)	160	(5)	185	(7)	148	(7)	168	(9)	158	(10)	up
Other Male[3]	75	(2)	84	(3)	80	(3)	79	(4)	86	(5)	80	(5)	
Female	144	(5)	232	(7)	305	(11)	265	(13)	272	(15)	239	(15)	
White Female[3]	105	(3)	165	(5)	160	(6)	149	(8)	127	(7)	93	(6)	
Black Female[3]	27	(1)	43	(1)	80	(3)	71	(4)	90	(5)	91	(6)	up
Hispanic Female	5	(0)	11	(0)	37	(1)	23	(1)	30	(2)	25	(2)	
Other Female[3]	7	(0)	13	(0)	28	(1)	22	(1)	25	(1)	30	(2)	up
Race/Ethnicity													
White[3]	2,769	(87)	2,640	(83)	2,134	(76)	1,447	(73)	1,200	(66)	982	(63)	down
Black[3]	210	(7)	288	(9)	333		259	(13)	305	(17)	292	(19)	up
Hispanic	117	(4)	171	(5)	222		171	(9)	198	(11)	183	(12)	up
Asian & Pacific Islander[3]	31	(1)	45	(1)	53		39	(2)	58	(3)	55	(4)	up
Native American & Alaska Native[3]	45	(1)	42	(1)	47		54	(3)	33	(2)	38	(2)	
Multi Race[3]	3	(0)	7	(0)	6	(0)	2	(0)	2	(0)	7	(0)	
Unknown	3	(0)	3	(0)	2	(0)	6	(0)	18	(1)	10	(1)	
Age at diagnosis of HIV													
0-19 years	97	(3)	67	(2)	48	(2)	50	(3)	35	(2)	21	(1)	down
20-24 years	421	(13)	261	(8)	223	(8)	123	(6)	135	(7)	125	(8)	up
25-29 years	699	(22)	625	(20)	520	(19)	339	(17)	264	(15)	198	(13)	down
30-34 years	741	(23)	728	(23)	661	(24)	450	(23)	390	(21)	331	(21)	
35-39 years	560	(18)	655	(20)	554	(20)	412	(21)	388	(21)	366	(23)	
40-44 years	326	(10)	395	(12)	371	(13)	268	(14)	288	(16)	242	(15)	
45-49 years	158	(5)	236	(7)	219	(8)	154	(8)	158	(9)	139	(9)	
50-54 years	83	(3)	97	(3)	99	(4)	95	(5)	91	(5)	67	(4)	
55-59 years	53	(2)	69	(2)	64	(2)	47	(2)	39	(2)	38	(2)	
60-64 years	21	(1)	35	(1)	18	(1)	18	(1)	12	(1)	22	(1)	
65 + years	19	(1)	28	(1)	20	(1)	22	(1)	14	(1)	18	(1)	

1. Due to delays in reporting, data from recent years are incomplete.
2. Includes persons for whom exposure information is incomplete (due to death, refusal to be interviewed, or loss to follow-up), patients still under investigation, patients whose only risk was heterosexual contact where the risk of the sexual partner was undetermined, persons exposed to HIV through their occupation, and patients whose mode of exposure remains undetermined.
3. And not Hispanic. The groups Asian and Native Hawaiian & Other Pacific Islander were grouped due to small cell sizes. All categories are mutually exclusive.

Annual review of HIV and AIDS in Washington State residents diagnosed outside of King County

Introduction

Washington State's first case of AIDS was diagnosed in 1982 in King County (KC). Since that time, the majority (65%) of HIV and AIDS cases have resided in KC at time of diagnosis. Although the rate of HIV/AIDS has declined since 1993 both inside and outside KC, the decline is greatest for cases among White, non-Hispanic men who have sex with men (MSM) and is more prominent in KC. HIV/AIDS cases from outside of KC contribute to the changing profile of an epidemic that includes a higher proportion of cases in women and among racial/ethnic minorities, and in cases attributable to injection drug use (IDU) and heterosexual contact. This report examines HIV and AIDS cases diagnosed in Washington State with a focus on cases diagnosed outside of KC.

Methods

This report is based on 14,540 HIV and AIDS cases diagnosed among Washington State residents and reported to the Department of Health through January 30, 2004. The AIDS cases include those HIV-infected individuals reported with an opportunistic infection since 1982, as well as those with severe immunodeficiency reported since 1993. All-inclusive reporting of HIV infection in Washington State was implemented in September 1999; consequently, diagnoses reported since then include patients with all stages of HIV disease. Due to reporting delays, some patients diagnosed in more recent periods may not have been reported; therefore, absolute numbers of cases diagnosed in 2003 are provisional and should be interpreted with caution.

For the following analyses, cases were categorized as KC or non-KC and by AIDS Service Network (AIDSNet) Region according to the county of residence at HIV or AIDS diagnosis. The lead (most populous) county for the Regions are Spokane (Region 1), Yakima (Region 2), Snohomish (Region 3), Pierce (Region 5), and Clark (Region 6); KC by itself is Region 4. Data for Eastern Washington and Western Washington excluding KC delineated by county using the Cascade mountain range are also presented. Regions 1 and 2 comprise Eastern Washington cases, and Regions 3, 5 and 6 comprise Western Washington cases.

HIV/AIDS Incidence and Deaths

Figure 1 shows the reported Washington State AIDS diagnoses and deaths for 1982 to 2003. The number of diagnosed AIDS cases increased each year until 1993. The national AIDS case definition was expanded in 1993 to include asymptomatic HIV infection with laboratory evidence of severe immunodeficiency. Consequently, persons were reported earlier in the course of their disease, a phenomenon contributing to the apparent peak in AIDS incidence. After 1993 the number of AIDS diagnoses declined in and outside KC, with a smaller decline in cases outside KC. From 1993 to 1998, annual diagnoses outside KC declined by 55% (351 to 159). The trend then stabilized to an average of 183 AIDS cases diagnosed per year. This stabilized trend is consistent with the trend being observed in KC as well as nationally.

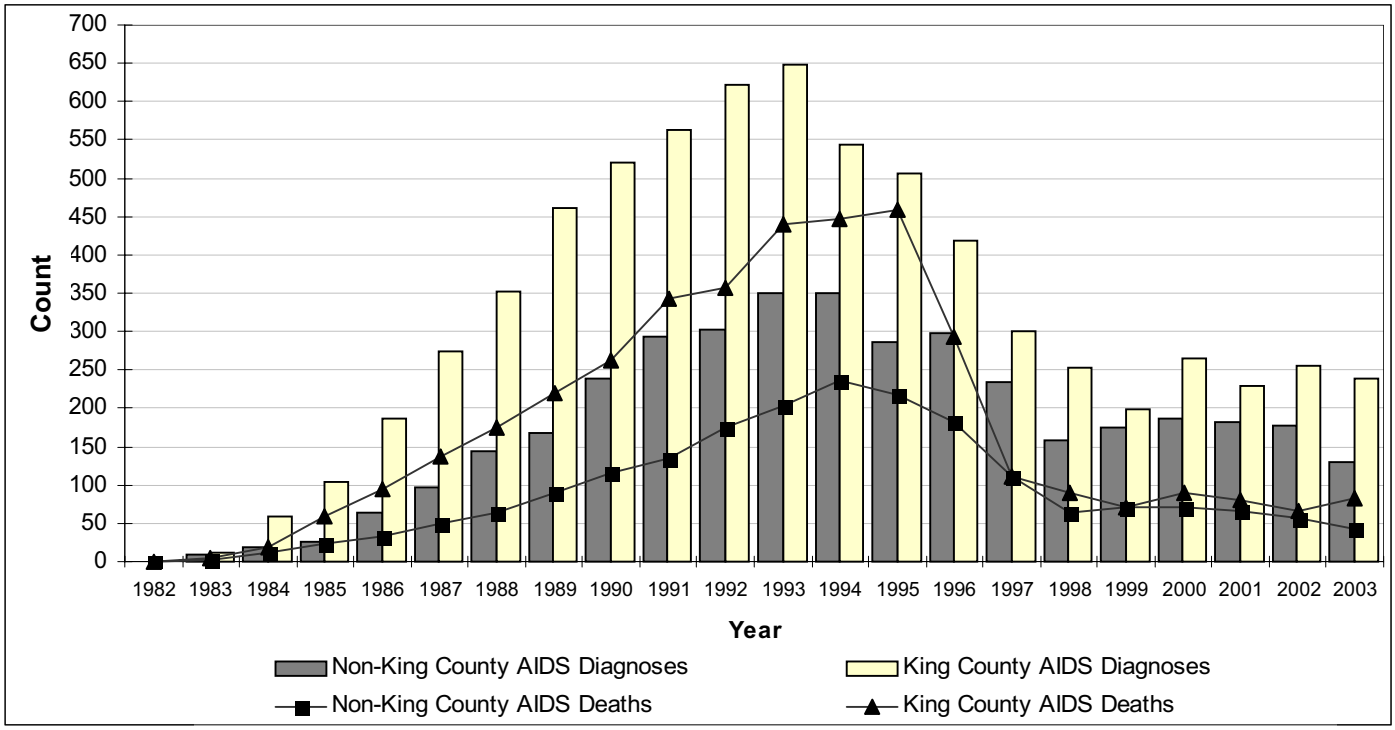
The number of AIDS deaths in Washington State has also decreased greatly since the mid-1990s. Deaths among AIDS cases diagnosed outside KC reached a high of 237 in 1994, then decreased a striking 76% to 56 deaths in 2002. In recent years, the number of deaths reported in those diagnosed with AIDS has stabilized, similar to the trend in AIDS incidence. This trend has also been observed in KC and nationally.

Since 2000 (the first full year after HIV reporting was initiated), there have been 998 new HIV diagnoses in KC and 520 from outside KC. Figure 2 displays HIV incidence rates per 100,000 population by AIDSNet region for the years 2000, 2001 and 2002. Region 5 had the highest rate of new HIV diagnoses outside KC with an incidence of 5.9 per 100,000 population in 2000, and 4.3 in 2001 and 2002. All other regions outside KC averaged two to four new HIV diagnoses per 100,000 population per year.

Trends in HIV diagnoses

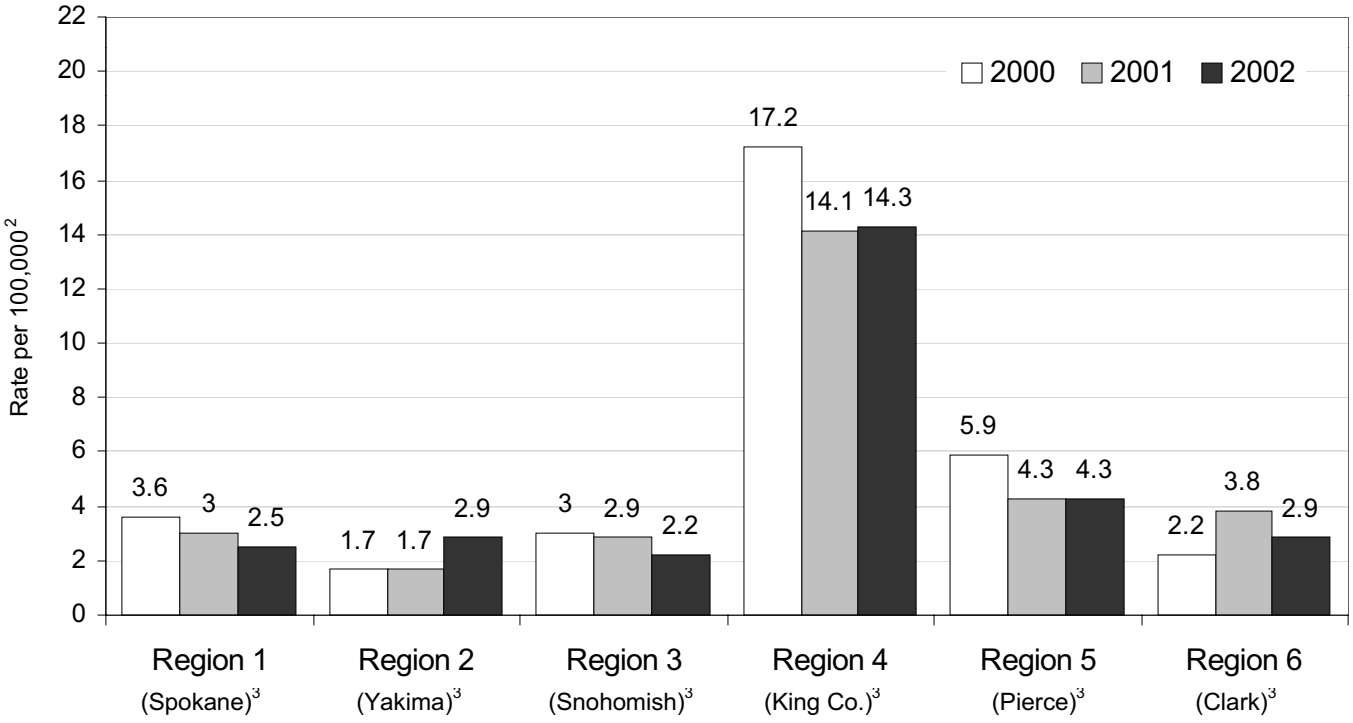
Washington State surveillance data indicate a proportional shift in those diagnosed with HIV/AIDS over time. There have been increases in the proportion of HIV and AIDS cases diagnosed in women, racial/ethnic minorities, and those acquiring HIV via injection drug use and heterosexual contact. Table 1 displays these trends for all Washington State HIV cases diagnosed outside King County. These data are based on 5,099 HIV cases outside KC by their earliest reported HIV diagnosis. Due to small numbers, the data are shown for Eastern Washington and Western Washington excluding KC. Chi-square for linear trend in proportions was used to identify significant trends based on year categories 1982-89, 1990-97, and 1998-2003. Associations significant at $p<0.05$ are indicated by shading in the table.

Figure 1. King County and Non-King County AIDS cases and deaths by year as of 1/30/04



Note: 2003 counts are considered incomplete due to reporting delays.

Figure 2. HIV incidence[1] rates by AIDSNet region, 2000-2002 as of 1/30/04



[1] HIV incidence includes new HIV diagnoses within the period.

[2] Crude Rate, not adjusted for age, calculated using Intercensal /Postcensal Population Estimates, 2003, WA State Office of Financial Management.

[3] Lead (most populous) county for the AIDSNet region.

Note: Does not include those who have only been tested anonymously for HIV.

Eastern Washington:

HIV cases diagnosed in Eastern Washington from 1998-2003 were predominately White males (57%), and Hispanic males (19%). Compared with 1982-89, the proportion of White males has significantly decreased from 80%, while Hispanic males increased from 7%. The proportion of females diagnosed in Eastern Washington has significantly increased from 9% in 1982-89 to 18% in 1998-2003. Hispanic females accounted for less than 1% of diagnoses in 1982-89, and 6% by 1998-2003. Overall, the percent of diagnoses among Eastern Washington Hispanics went from 7% in 1982-89 to 24% in 1998-2003. The majority of HIV cases in Eastern Washington were diagnosed at ages 30-39 (38% 1998-2003); this has not changed significantly since 1982. However, there was a significant decrease in the proportion of cases diagnosed at ages 20-29 (42% 1982-89 to 22% 1998-2003), and a corresponding increase in the proportion diagnosed when ages 40 to 49 (15% 1982-89 to 24% 1998-2003) and ages 50 to 59 (4% 1982-89 to 12% 1998-2003).

Those cases exposed solely through men having sex with men (MSM) made up the highest proportion of HIV cases diagnosed in Eastern Washington. However, the percentage dropped from 59% in 1982-89 to 49% in 1998-2003. The proportion of cases with dual exposure (MSM/IDU) significantly decreased from 15% in 1982-89 to 8% in 1998-2003. There was also a significant decrease (6% 1982-89 to less than 1% 1998-2003) in those exposed through blood products (transfusions, transplants, or hemophilia treatments). The proportion of Eastern Washington HIV cases exposed through heterosexual contact increased significantly from 3% in 1982-89 to 15% in 1998-2003. Since the most common mode of exposure for men was having sex with men, and the most common for women was heterosexual contact, there was an association between the decreasing MSM trends and increasing proportion of affected females.

Western Washington excluding King Co.:

HIV cases diagnosed in Western Washington excluding KC from 1998-2003 were also predominately male (78%). The percentage of White males significantly decreased from 80% in 1982-89 to 57% in 1998-2003. Consequently, the proportions of Black, Hispanic, and Asian & Pacific Islander males has significantly increased. The proportion of females has significantly increased from 8% in 1982-89 to 22% in 1998-2003. This includes significant increases in the proportions of HIV diagnoses among females of all races and ethnicities. Overall, in years 1982 to 89, 87% of HIV diagnoses were White and 13% were non-White. From 1998 to 2003 the proportions were 68% and 32%, respectively. The largest share of HIV cases in Western Washington were diagnosed when they were ages 30-39 (39% 1998-2003). There was a significant decrease in the proportion of cases diagnosed at ages 13-19 (4% 1982-89 to 1% 1998-2003) and ages 20-29 (36% 1982-89 to 20% 1998-2003), and a significant increase in the proportion diagnosed when ages 40-49 (14% 1982-89 to 27% 1998-2003) and ages 50-59 (5% 1982-89 to 8% 1998-2003).

Exposure through men having sex with men made up the highest proportion of HIV cases diagnosed in Western Washington. The percentage dropped significantly from 64% in 1982-89 to 44% in 1998-2003. The proportion of diagnoses with dual exposure (MSM/IDU) also significantly decreased from 13% in 1982-89 to 5% in 1998-2003, as did those exposed through blood products (5% 1982-89 to less than 1% 1998-2003). The percentage of Western Washington HIV cases exposed through injection drug use significantly increased from 11% in 1982-89 to 18% in 1998-2003. The proportion exposed through heterosexual contact also significantly increased (4% 1982-89 to 18% 1998-2003).

Persons living with HIV

There are an estimated 11,000 to 13,000 persons living with HIV infection, including AIDS, in Washington State. Given that approximately 35% of all Washington HIV and AIDS cases are diagnosed outside KC, it is estimated that 3,850 to 4,550 persons are living with HIV or AIDS outside of KC. Because 3,024 have been diagnosed and reported outside of KC as of January 30, 2004, we estimate there are approximately 1,500 persons outside KC who either tested anonymously, have been diagnosed and not yet reported, or are not yet diagnosed and are unaware of their positive HIV status. The CDC estimates that one-quarter of all HIV-infected persons in the United States are undiagnosed and unaware of their status. [1]

Table 2 describes the demographic characteristics of 8,486 HIV and AIDS cases reported to the Department of Health and presumed living in each AIDSNet region, as well as KC vs. non-KC. These data are based on the location of their first diagnosis (HIV or AIDS), and may not necessarily represent where they acquired HIV or where they are currently living.

Thirty-six percent (3,024) of reported HIV and AIDS cases presumed living were diagnosed outside of KC. Of these, 14% were from Region 1, 9% from Region 2, 23% from Region 3, 30% from Region 5, and 24% from Region 6. Of the 433 cases presumed living in Region 1, 76% were reported from Spokane Co.; 43% of the 286 cases presumed living in Region 2 were reported from Yakima Co.; 69% of the 673 cases presumed living in Region 3 were reported from Snohomish Co.; 83% of the 912 cases presumed living in Region 5 were reported from Pierce Co.; and 44% of the 720 cases presumed living in Region 6 were reported from Clark Co. The prevalence rate of reported individuals living with HIV

Table 1. Demographic trends by year of first HIV diagnosis for HIV and AIDS cases reported outside of King County as of 1/30/04

Region[1]	Eastern Washington			Western Washington Excluding King County		
Year of Diagnosis	1982-1989	1990-1997	1998-2003[2]	1982-1989	1990-1997	1998-2003[2]
Sex & Race/Ethnicity						
Male	91% (270)	88% (532)	82% (272)	92% (905)	82% (1,614)	78% (712)
White Male[3]	80% (236)	71% (425)	57% (183)	80% (788)	66% (1,297)	57% (512)
Black Male[3]	3% (8)	4% (22)	5% (16)	6% (59)	8% (152)	11% (96)
Hispanic Male	7% (21)	11% (67)	19% (60)	3% (29)	5% (101)	6% (54)
Asian & Pacific Islander (PI) Male[3]	-0-	1% (3)	1% (2)	1% (10)	1% (24)	3% (30)
Native Am/Alaska Native (AK) Male[3]	2% (5)	2% (13)	1% (3)	2% (16)	2% (31)	2% (16)
Female	9% (27)	12% (72)	18% (59)	8% (79)	18% (362)	22% (195)
White Female[3]	8% (23)	7% (40)	10% (32)	7% (65)	12% (232)	11% (102)
Black Female[3]	1% (2)	2% (9)	2% (6)	1% (9)	4% (72)	6% (51)
Hispanic Female	<1% (1)	3% (17)	6% (18)	<1% (3)	2% (32)	1% (13)
Asian & PI Female[3]	-0-	<1% (3)	-0-	<1% (1)	1% (13)	1% (13)
Native Am/AN Female[3]	<1% (1)	<1% (3)	<1% (1)	<1% (1)	1% (12)	2% (14)
Race/Ethnicity						
White[3]	87% (259)	77% (465)	67% (215)	87% (853)	78% (1,529)	68% (614)
Black[3]	3% (10)	5% (31)	7% (22)	7% (68)	11% (224)	16% (147)
Hispanic	7% (22)	14% (84)	24% (78)	3% (32)	7% (133)	7% (67)
Asian & Pacific Islander[3]	-0-	1% (6)	1% (2)	1% (11)	2% (37)	5% (43)
Native Am/AK Native[3]	2% (6)	3% (16)	1% (4)	2% (17)	2% (43)	3% (30)
Age at HIV Diagnosis						
12 years and Under	1% (2)	1% (8)	<1% (1)	1% (11)	1% (18)	<1% (2)
13-19 years	3% (8)	2% (9)	2% (8)	4% (40)	2% (38)	1% (13)
20-29 years	42% (125)	27% (163)	22% (73)	36% (350)	27% (541)	20% (183)
30-39 years	35% (103)	41% (249)	38% (124)	39% (381)	41% (807)	39% (354)
40-49 years	15% (44)	18% (110)	24% (78)	14% (135)	21% (414)	27% (248)
50-59 years	4% (12)	8% (46)	12% (39)	5% (44)	6% (113)	8% (75)
60+ years	1% (3)	3% (19)	2% (8)	2% (23)	2% (45)	4% (32)
Exposure Category						
Men who had sex w/men (MSM)	59% (174)	53% (318)	49% (163)	64% (626)	50% (996)	44% (399)
Injection drug user (IDU)	15% (44)	15% (88)	12% (41)	11% (107)	18% (348)	18% (167)
MSM/IDU	15% (44)	10% (61)	8% (25)	13% (123)	9% (168)	5% (48)
Heterosexual Contact	3% (9)	11% (65)	15% (51)	4% (41)	13% (260)	18% (160)
Blood Product Exposure	6% (17)	2% (14)	<1% (1)	5% (51)	2% (43)	<1% (4)
Perinatal	1% (2)	1% (8)	<1% (1)	1% (11)	1% (18)	<1% (2)
Undetermined/Other	2% (7)	8% (50)	15% (49)	2% (25)	7% (143)	14% (127)
Totals	100% (297)	100% (604)	100% (331)	100% (984)	100% (1,976)	100% (907)

Note: Shaded areas reflect a trend in proportions significant at $p < 0.05$.

[1] Regions were delineated by county, using the Cascade mountain range to define the state's east-west boundary.

[2] Case counts for more recent time periods are considered incomplete due to reporting delays.

[3] And not Hispanic.

outside KC is 70 per 100,000 population. Region 5 has the highest prevalence rate (93.9 per 100,000) followed by Region 6 (72.1 per 100,000). Of all the HIV cases presumed living and initially diagnosed outside KC, 61% have progressed to AIDS.

Most HIV/AIDS cases presumed living outside KC are male (81%). Region 5 has the highest percentage of Black males (14%), and Region 2 had the highest percentage of Hispanic males (27%). Nineteen percent of cases presumed living with HIV outside KC are female. Region 5 and Region 2 have the highest proportions of female cases (24% and 23% respectively). The majority of persons living with HIV outside KC are White (75%); 11% are Black, 10% are Hispanic, 3% are Asian or Pacific Islander, and 2% are Native American or Alaskan Native. Region 2 has the highest proportion of Hispanic persons (36%) living with HIV. Region 5 has the highest proportion of Black individuals (21%) living with HIV.

The majority of HIV/AIDS cases living outside KC were first diagnosed when they were ages 30-39 (39%). The exception is Region 2, where cases tend to have been diagnosed younger (41% were ages 20-29).

Men having sex with men was the most common mode of exposure for cases living with HIV outside of KC. Forty-nine percent had MSM as their only exposure; 9% had dual exposure MSM and IDU. Sixteen percent had IDU as their only form of exposure, and 15% were exposed through heterosexual contact. Cases living outside of KC were more likely than those in KC to have been exposed through injection drug use and heterosexual contact, and less likely to have MSM exposure. Region 5 had the highest proportion of cases living with HIV exposed through injection drug use (20%); Region 2 had the smallest percentage (11%). Region 2 had the highest proportion (19%) exposed through heterosexual contact; Region 1 had the lowest (8%).

Comments

In the last decade, dramatic decreases have been observed in Washington State and nationally in the number of AIDS cases diagnosed each year and the number deaths in those diagnosed with AIDS. In Washington, the declines were most noticeable in KC; however, regions outside of KC experienced a 49% reduction in AIDS incidence from 1993 to 2002, and a 72% decrease in AIDS deaths. These declines were brought about primarily by the 1995-1996 introduction of antiretroviral drugs that effectively prevent the progression of HIV infection to AIDS and from AIDS to death. Other factors contributing to the decline included more effective prophylaxis to prevent opportunistic infections, better monitoring of HIV progression, and the effect of education and prevention messages.

In more recent years, AIDS incidence and deaths have leveled off, both in and outside of KC. There are a number of possible reasons for this. Persons may not have access to health services, in which case they may be getting tested for HIV late in the course of their infection or, if known to be positive, may not be receiving appropriate treatment. Those who are receiving treatment may be having difficulty adhering to treatment regimens or experiencing treatment failures due to the development of more resistant strains of HIV. In addition, as persons age with HIV infection they are more likely to die of conditions unrelated to their HIV infection.

HIV treatment regimens have altered the natural course of HIV infection by delaying progression to AIDS and death. For this reason, data on AIDS incidence and deaths do not adequately describe the HIV epidemic. Since full reporting of HIV was initiated in September 1999, it is now possible to report emerging trends in HIV diagnoses. The next step in understanding the leading edge of the HIV epidemic will be to initiate HIV incidence surveillance. Use of STARHS (serologic testing algorithm for recent HIV seroconversion, or less sensitive or detuned HIV test) on a routine basis for those who are newly diagnosed with HIV will allow for better characterization of those populations that are becoming newly infected. Systems are currently being put into place to initiate HIV incidence surveillance in KC, and plans are being made to set up systems for conducting HIV incidence surveillance outside of KC as well.

Despite diminishing AIDS diagnoses and deaths, the number of people living with HIV infection in Washington State continues to grow. Each year outside of KC there are approximately three new HIV infected persons diagnosed for every AIDS death. The epidemic also continues to shift, and is affecting a larger proportion of females and those who are not White (particularly Blacks and Hispanics). Cases in women and those who are Hispanic continue to make up an increasing proportion of Eastern Washington cases. Cases in women and those who are Black constitute an increasing proportion of Western Washington excluding KC cases. AIDSNet regions should continue to take into account their local data and use the data to target groups most-at-risk with appropriate HIV prevention and education messages and interventions.

• Contributed by Todd E. Rime, MA, and Maria Courogen, MPH

Reference

1. CDC. Guidelines for National HIV Case Surveillance, including monitoring for HIV infection and AIDS. **Morbidity and Mortality Weekly Report** (RR 13), 12/10/99.

Table 2. Characteristics of Washington State HIV and AIDS cases presumed living (n=8,486) and reported to the Department of Health by January 30, 2004[1]

AIDSNET Region	1 (Spokane)	2 (Yakima)	3 (Snohomish)	5 (Pierce)	6 (Clark)	Non-King	King
Prevalence Rate[2] (per 100,000 residents)	63.8	43.0	66.8	93.9	72.1	70.0	307.0
Total in Region	5% (433)	3% (286)	8% (673)	11% (912)	9% (720)	36% (3,024)	64% (5,462)
Sex & Race/Ethnicity							
Male	89% (383)	77% (219)	82% (553)	76% (697)	83% (598)	81% (2,450)	91% (4,952)
White Male[3]	74% (315)	45% (127)	69% (462)	54% (489)	69% (491)	63% (1,884)	69% (3,736)
Black Male[3]	5% (20)	3% (9)	4% (28)	14% (125)	6% (39)	7% (221)	11% (604)
Hispanic Male	6% (27)	27% (78)	5% (33)	6% (51)	5% (38)	8% (227)	8% (423)
Asian & Pacific Islander (PI) Male[3]	<1% (2)	1% (2)	2% (14)	2% (18)	2% (14)	2% (50)	2% (103)
Native Am/Alaska Native (AN) Male[3]	3% (12)	1% (2)	2% (14)	1% (13)	1% (7)	2% (48)	1% (66)
Female	11% (50)	23% (67)	18% (120)	24% (215)	17% (122)	19% (574)	9% (510)
White Female[3]	8% (33)	13% (37)	12% (79)	12% (110)	13% (93)	12% (352)	4% (210)
Black Female[3]	2% (8)	1% (4)	2% (16)	8% (68)	2% (15)	4% (111)	4% (215)
Hispanic Female	<1% (2)	9% (25)	1% (8)	2% (20)	1% (5)	2% (60)	1% (40)
Asian & PI Female[3]	<1% (2)	-0-	1% (9)	1% (9)	1% (4)	1% (24)	<1% (16)
Native Am/AN Female[3]	1% (3)	<1% (1)	1% (7)	1% (8)	1% (4)	1% (23)	<1% (24)
Race							
White[3]	82% (348)	58% (164)	81% (541)	66% (599)	82% (584)	75% (2,236)	72% (3,946)
Black[3]	7% (28)	5% (13)	7% (44)	21% (193)	8% (54)	11% (332)	15% (819)
Hispanic	7% (29)	36% (103)	6% (41)	8% (71)	6% (43)	10% (287)	9% (463)
Asian & PI[3]	1% (4)	1% (2)	3% (23)	3% (27)	3% (18)	3% (74)	2% (119)
Native Am/AK Native[3]	4% (15)	1% (3)	3% (21)	2% (21)	2% (11)	2% (71)	2% (90)
Age at HIV Diagnosis							
12 years and Under	1% (5)	1% (4)	1% (6)	1% (9)	1% (5)	1% (29)	<1% (24)
13-19 years	1% (6)	3% (8)	3% (22)	4% (36)	3% (20)	3% (92)	2% (108)
20-29 years	28% (120)	41% (116)	28% (189)	31% (281)	29% (208)	30% (914)	30% (1,625)
30-39 years	41% (178)	35% (99)	42% (284)	38% (350)	38% (274)	39% (1,185)	44% (2,394)
40-49 years	20% (86)	15% (43)	20% (132)	20% (179)	22% (158)	20% (598)	19% (1,035)
50-59 years	7% (30)	5% (13)	4% (26)	5% (47)	6% (43)	5% (159)	4% (241)
60+ years	2% (8)	1% (3)	2% (14)	1% (10)	2% (12)	2% (47)	1% (35)
Exposure Category							
Men who had sex w/men (MSM)	51% (221)	47% (135)	53% (353)	45% (408)	49% (355)	49% (1,472)	70% (3,831)
Injection drug users (IDU)	16% (71)	11% (32)	10% (69)	20% (185)	18% (131)	16% (488)	7% (364)
MSM/IDU	11% (46)	9% (25)	9% (58)	8% (76)	8% (54)	9% (259)	9% (486)
Heterosexual Contact	9% (38)	19% (54)	16% (104)	16% (149)	14% (99)	15% (444)	7% (384)
Blood Product Exposure	1% (4)	1% (2)	1% (9)	1% (12)	2% (13)	1% (40)	1% (41)
Perinatal	1% (5)	1% (4)	1% (6)	1% (9)	1% (5)	1% (29)	<1% (23)
Undetermined/Other	11% (48)	12% (34)	11% (74)	8% (73)	9% (63)	10% (292)	6% (333)
Current Status							
HIV only	34% (147)	40% (113)	40% (270)	42% (384)	36% (260)	39% (1,174)	43% (2,335)
AIDS	66% (286)	60% (173)	60% (403)	58% (528)	64% (460)	61% (1,850)	57% (3,127)
Total (8,486)	100% (433)	100% (286)	100% (673)	100% (912)	100% (720)	100% (3,024)	100% (5,462)

[1] Based on location of earliest reported diagnosis of HIV or AIDS; presumed living includes all persons reported with HIV or AIDS who are not known to have died based on death record search.

[2] Calculated using Intercensal /Postcensal Population Estimates, 2003, WA State Office of Financial Management.

[3] And not Hispanic. The groups Asian and Native Hawaiian & Other Pacific Islander were grouped due to small cell sizes

HIV prevalence, incidence and risk behaviors among Seattle-King County STD clinic patients, 1988-2002

The Centers for Disease Control and Prevention (CDC) sponsored unlinked anonymous HIV seroprevalence surveys in different sentinel populations in selected metropolitan areas between 1988 and 1999.[1,2] CDC funded this survey in Seattle through 1997 and alternate funding supported the survey from 1998 to 2002. The findings described in this report are based on data collected during cross-sectional surveys conducted in the second half of each year between 1988 and 2002 at the Public Health - Seattle & King County (PHSKC) Sexually Transmitted Diseases (STD) Clinic. Leftover blood specimens collected for clinical purposes were tested for HIV antibodies after removal of personal identifiers and linked via an anonymous code to data collected from patient records. The less sensitive HIV-1 EIA (Serological Testing Algorithm for Recent HIV Seroconversion, STARHS) methodology described by Janssen et al. was used to estimate HIV incidence.[3] The unlinked nature of the survey avoids participation bias and helps assure a representative sample of the survey population while preserving the anonymity of STD Clinic clients.

Our findings among eligible surveyed STD patients are summarized below. Only data from the first clinic visit for each patient in each annual survey period are included. Results are combined for all women and men who have sex with women only (MSW) because of the similar HIV seroprevalence and are presented separately for men who have sex with men (MSM). The terms MSW and MSM are used because men are classified, for the purpose of this report, according to the gender of their sex partners.

Results

Women and men who have sex with women only - HIV prevalence and trends

Data from 21,083 women and MSW visits were included in the survey between 1988 and 2002 (Table 1). A little over one-third were women. Over half (58%) were White, 26% African American, 5% Hispanic, 4% Asian & Pacific Islander, 2% Native American & Alaska Native, and 5% of mixed or another race or ethnicity. Fifty-eight percent were younger than age 30. The gender distribution remained stable over the years of the survey, while the proportion of White clients increased from 55% in 1988-90 to 63% in 2001-02 and the proportion of African American clients decreased from 32% in 1988-90 to 21% in 2001-02. Seven percent had injected drugs at some time in their life and 4.0% had injected in the 12 months prior to their visit.

Seventy-one (0.5%) of the men and 26 (0.3%) of the women tested positive for HIV. HIV prevalence declined from 0.8% in 1988-90 to 0.2% in 1997-98 and increased again to 0.6% in 2001-02 due to initial declines and subsequent increases among men. HIV prevalence fluctuated in several of the racial/ethnic groups over the years of the survey; only the decline among Native American & Alaska Natives was statistically significant. No Asian & Pacific Islander or Native American & Alaska Native clients tested positive after 1989 and 1991, respectively. African Americans and Hispanic clients had higher HIV prevalence than White clients. There were no HIV infections detected among clients younger than 20 years. HIV prevalence declined among 20-29 year olds, increased in recent years among 30-39 year olds, and remained unchanged among clients 40 and older. Although HIV prevalence was higher among clients who reported ever having injected drugs in the earlier years of the survey, this difference was less marked in recent years. None of the female/MSW STD clients who injected in the past year have been HIV positive since this information was first collected in 1993. Although the proportion of patients who were diagnosed with gonorrhea declined from 9% in 1989 to 2% in 2001-02, the HIV prevalence among patients with gonorrhea increased significantly from 0.7% 1989-90 to 5% in 2001-02.

Men who have sex with men - HIV prevalence and trends

A total of 2,952 male STD patients reported sex with other men (Table 2). They comprised 18% of the male STD Clinic clients, increasing from 10% in 1988-90 to 31% in 2001-02. The demographic and risk exposure characteristics were very different from those of the female and MSW STD Clinic population. Almost 80% were White, 7% African American, 7% Hispanic, 3% Asian & Pacific Islander, 2% Native American & Alaska Native, and 4% of mixed or another race/ethnicity. Almost 60% were 30 years or older. A history of drug injection was reported by 9% and 4% had injected in the year prior to their visit.

A total of 387 (13%) MSM were HIV seropositive including 16% of the men who reported sex with men only and 5% of the MSM who ever had sex with women. During the 15 annual survey periods, only two of the 65 MSM younger than 20 tested HIV positive (data not presented in Table 2 for confidentiality). HIV prevalence in African American MSM was higher than in White MSM, particularly in recent years where African American MSM had 2.6 times the HIV prevalence of White MSM.

HIV prevalence declined from 32% in 1988-90 to 5% in 1997-98 reaching a low of 4% in 1997 when the trend reversed and increased to 6% in 1998 and 11% in 1999, 7% in 2000, 12% in 2001, and 15% in 2002 (totaling 158 cases between 1998 and 2002). Because of the high HIV prevalence in the early years of the survey there was a statistically significant decreasing trend overall and in many subgroups between 1988-90 and 2001-02. However, since 1997 statistically significant increases were seen in several subcategories in addition to the overall increasing trend. HIV prevalence more than tripled in White MSM and almost quadrupled in Black MSM between 1997-98 and 2001-02. The increase was most pronounced among MSM 30 years and older although the percent of HIV-seropositive MSM 20-29 years old increased from 5% in 1997-1998 to 9% in 2001-2002. Throughout the survey years MSM who were HIV seropositive were more likely to have a diagnosis of gonorrhea compared to those who were seronegative. In 2001-02 the HIV seroprevalence among MSM with gonorrhea had increased to 1989-90 levels of 37%. There were no HIV-positive cases among MSM who injected drugs in the past year from 1997 to 2001, but in 2002, five of the HIV-seropositive MSM reported injecting in the past year. Between 1997 and 2002 58% of the HIV-seropositive MSM reported five or more different sex partners in the past year, 66% reported two or more partners in the past two months, and 55% reported two or more new partners in the past two months (data not shown).

Recent sexual behaviors

In 1997 information on sexual risk behaviors in the past year was added to the survey (Table 3). The prevalence of these behaviors did not change noticeably between 1997 and 2002 and the results are combined for the six years. About 15% of females and MSW reported five or more sex partners in the last year compared to over half of the MSM. Sixteen percent of female/MSW clients reported two or more new sex partners in the last two months compared to 47% of MSM clients. Condom use at last sex increased with increasing number of partners, although almost 60% of females/MSW and 55% of MSM with five or more partners in the past year reported no condom use at their last sexual encounter. Thirty-six percent of both women/MSW and MSM who reported sex with an IDU in the past year had also injected drugs in the past year (data not shown). None of the females/MSW who reported sex with an HIV-positive person were HIV-positive, whereas 20% of the MSM who reported this behavior were positive (data not shown). Three percent of women reported sex with a bisexual man and 18% of MSM reported sex with a woman in the past year—3% of these men were HIV-seropositive (data not shown).

HIV testing

In addition to information on recent sexual risk behaviors, information on HIV testing was also added to the survey in 1997. Among female/MSW STD clients sampled (had blood drawn) between 1997 and 2002, 92% had HIV counseling and testing as part of their current visit, and 72% had a history of previous HIV testing (not necessarily at the STD Clinic). Among the 28 females/MSW who tested HIV positive on the survey during these years, 10 (36%) already knew they were HIV positive, and an additional 11 (39%) learned they were HIV-positive at that visit (if they received the results). (Table 4) Thus, 7 (25%) clients might have been unaware of their positive status because they had no history of a prior positive test and did not test at the current visit.

Among MSM clients sampled (had blood drawn) between 1997 and 2002, 84% had HIV counseling and testing at the current visit, and 88% reported prior testing. Among the 165 MSM who tested HIV-seropositive during these years, 97 (59%) already knew they were HIV positive at the time of the visit, increasing from 41% in 1999 to 66% in 2002 (Table 4). An additional 36 (22%) tested positive at the visit and presumably got their results. Thirty-one (19%) of the HIV-positive MSM may not have known their status because they did not have a history of a prior HIV-positive test and did not get tested at the current visit. This percent decreased from 41% in 1999 to 10% in 2002. Eighty-seven percent of the HIV-negative MSM correctly knew their status when they attended the STD Clinic.

HIV incidence

The less sensitive HIV-1 EIA or STARHS was performed on 388 HIV-seropositive specimens from 1990 to 2002, including samples from 70 females/MSW and 318 MSM. Only 5 seropositive specimens from the earlier years were not available for testing. There were too few recent female/MSW seroconverters to allow for valid calculation of HIV seroincidence. Among the 318 HIV-positive samples from MSM between 1990 and 2002, 25 tested non-reactive on the less sensitive HIV-1 EIA indicating recent infection. Specimens from clients with a history of a previous HIV-positive test more than 6 months before the current blood draw or an unknown previous test date were excluded because antiretroviral treatment or an extremely compromised immune system may have caused a false-positive non-reactive LS-EIA result. The estimated annual HIV seroincidence ranged from 0.9% in 1993-1994 to 3.3% and 3.4% in 1990-92 and 2001-2002, respectively (Table 5). Although there was an increasing trend in HIV incidence from 1993-94 to 2001-02 the differences were not statistically significant as indicated by the broad and overlapping confidence intervals.

Comments

In summary, HIV prevalence remained low over the 15 survey years among women and MSW STD Clinic clients. Prevalence increased after 1997-98 among MSW, Hispanics, those 30-39 years of age, and those with a diagnosis of gonorrhea. HIV prevalence was higher among African American and Hispanic clients throughout the survey years. HIV prevalence among MSM clients declined sharply from 1988-90 to 1997-98 but rose again through 2001-02. HIV prevalence was 20 times higher among MSM compared to MSW and women. HIV prevalence among African American MSM was about two-fold higher than among White MSM and has increased at a higher rate in recent years. No HIV cases were seen in women and MSW under the age of 20 and the prevalence among MSM in this age group was low. None of the MSW and women who reported injecting illicit drugs in the last year were HIV positive while 19% of MSM who reported injecting were HIV positive in 2001-02. HIV seroincidence increased in each two-year interval from 1994-95 to 2001-02 among MSM. Although these increases were not statistically significant they are worrisome in light of the continuing high rates of syphilis and bacterial STDs among MSM in King County, and contribute to the concern that HIV infection may be increasing in our area as in San Francisco.[4, 5, 6]

A high proportion of STD Clinic patients received HIV testing. The proportion of MSM clients who were aware of their positive HIV status increased between 1999 and 2002 because an increasing proportion knew their positive status at the time of the visit or were diagnosed at that visit. Similarly, a very high percent of MSM correctly knew their HIV-seronegative status. These results, of course, include only STD Clinic clients with blood draws, so the true HIV test prevalence may be higher or lower. While it is encouraging that a high percent know their positive status, it is concerning that such a high percent of MSM diagnosed with HIV are in need of STD Clinic services. It is fortunate, however, that these HIV-positive MSM access the STD Clinic, which can provide comprehensive diagnostic, treatment, prevention, and referral services for this population.

There are some limitations to this survey. First, not all STD clinic patients have blood drawn, which may bias the observed HIV prevalence rates if blood draw is related to HIV status. For that reason we collect information on self-reported HIV status among STD Clinic clients with no blood draws who would otherwise be eligible for inclusion in the survey. When this information is taken into account the estimated "true" HIV prevalence among MSM STD Clinic clients would have been closer to 10% in 1998, 12% in 1999, and 10% in 2000 compared to 6%, 11%, and 7%, respectively. HIV prevalence among MSM with and without blood draws in 2001 and 2002 did not differ and HIV prevalence between women and MSW clients with and without blood draws did not differ markedly in any of the survey years. Second, because the annual surveys are cross-sectional, client characteristics may differ between different survey years making comparisons across years less valid.

Because STD clinics serve large numbers of persons at increased risk for HIV due to unprotected sex and multiple sexual partners, these clinics continue to be important sites for monitoring emerging patterns and trends in local HIV epidemiology. While CDC discontinued unlinked HIV serosurveys among STD clinic populations in the US in 1999, other countries, including the UK, continue to consider these surveys extremely important for monitoring HIV.[7] The increase in HIV prevalence and the indication of an increase in incidence in recent years among MSM clients is of continued concern and warrants close monitoring. Increases in HIV and other STDs and associated risk behaviors among local King County MSM demonstrate a need for a heightened emphasis on prevention.

For additional information on the King County HIV seroprevalence surveys, please contact Hanne Thiede at (206) 296-4318 or e-mail at hanne.thiede@metrokc.gov.

• *Contributed by Hanne Thiede, DVM, MPH.*

References

1. Dondero TJ, Pappaioanou M, Curran JW. Monitoring the levels and trends of HIV infection: the Public Health Service's HIV Surveillance Program. *Public Health Reports* 1988;103:213-220.
2. Pappaioanou M, Dondero TJ, Petersen LR, Onorato IM, Sanchez CD, Curran JW. The family of HIV seroprevalence surveys: objectives, methods, and uses for sentinel surveillance of HIV in the United States. *Public Health Reports* 1990, 105:113-119.
3. Janssen RS, Satten GA, Stramer SL et al. New Testing Strategy to Detect Early HIV-1 Infection for Use in Incidence Estimates and for Clinical and Prevention Purposes. *JAMA* 1998;280:42-48.
4. Resurgent bacterial sexually transmitted disease among men who have sex with men - King County, Washington, 1997-1999. *MMWR* 1999;48:773-777.
5. Williams LA, Klausner JD, Whittington WL et al. Elimination and reintroduction of primary and secondary syphilis. *Am J Public Health* 1999;89:1093-1097.
6. Katz MH, Schwarcz SK, Kellogg TA, et al. Impact of highly active antiretroviral treatment on HIV seroincidence among men who have sex with men: San Francisco. *Am J Public Health* 2002;92:388-394.
7. Gill ON, Jordan LF, Njoroge J, et al. Recent trends in HIV prevalence and diagnosis among STI clinic attendees in the United Kingdom using unlinked anonymous testing. 14th International AIDS Conference, Barcelona, Spain 2002.

We appreciate the dedicated collaboration of the STD Clinic and the Public Health Laboratory which makes this survey possible

Table 1. HIV prevalence and trends among female and MSW STD clinic patients, King County 1988-2002

		Women and men who have sex with women only						
	Total[1]	**1988-90**	**1991-92**	**1993-94**	**1995-96**	**1997-98**	**1999-00**	**2001-02**
	N (column %)	**N (HIV%)**	**N (HIV%)**	**N (HIV%)**	**N (HIV%)**	**N (HIV%)**	**N (HIV%)**	**N (HIV%)**
Total	21,083 (100.0)	4,683 (0.8)	2,875 (0.5)	2,973 (0.3)	2,736 (0.3)	2,711 (0.2)	2,487 (0.3)	2,614 (0.6)*^
Sex								
Male	13,027 (61.8)	2,950 (0.9)	1,769 (0.6)	1,886 (0.4)	1,667 (0.4)	1,567 (0.2)	1,562 (0.3)	1,626 (0.7)*^
Female	8,056 (38.2)	1,733 (0.5)	1,106 (0.4)	1,087 (0.3)	1,069 (0.3)	1,144 (0.3)	925 (0.2)	992 (0.3)
Race/ethnicity[2]								
White	12,076 (57.6)	2,259 (0.4)	1,542 (0.4)	1,734 (0.2)	1,592 (0.3)	1,600 (0.2)	1,432 (0.1)	1,617 (0.4)
Black	5,517 (26.3)	1,489 (1.1)	878 (0.8)	787 (0.6)	630 (0.5)	584 (0.5)	604 (0.5)	545 (1.1)
Hispanic	1,103 (5.3)	213 (0.9)	172 (0.6)	147 (1.4)	126 (1.6)	160 (0)	159 (1.3)	126 (2.4)^
Asian/PI	933 (4.4)	148 (0.7)	89 (0)	108 (0)	142 (0)	120 (0)	152 (0)	174 (0)
AI/AK Native	403 (2.0)	103 (3.9)	47 (2.1)	57 (0)	58 (0)	54 (0)	47 (0)	37 (0)*
Other	941 (4.5)	142 (0.7)	136 (0)	138 (0)	175 (0)	181 (0)	83 (0)	86 (0)
Age (years)								
<20	2,303 (11.1)	699 (0)	378 (0)	353 (0)	267 (0)	244 (0)	196 (0)	166 (0)
20-29	9,836 (47.2)	2,298 (0.8)	1,420 (0.5)	1,391 (0.3)	1,288 (0.1)	1,214 (0)	1,034 (0.2)	1,191 (0.3)*
30-39	5,517 (26.5)	1,177 (1.3)	711 (0.8)	787 (0.6)	700 (0.7)	729 (0.4)	702 (0.3)	711 (1.4)^
40+	3,180 (15.3)	496 (0.4)	327 (0.6)	441 (0.2)	448 (0.7)	517 (0.6)	548 (0.6)	403 (0.5)
IDU ever								
No	19,633 (93.1)	4,382 (0.6)	2,656 (0.4)	2,758 (0.3)	2,534 (0.3)	2,549 (0.2)	2,303 (0.3)	2,451 (0.6)^
Yes	1,450 (6.9)	301 (3.7)	219 (2.3.)	215 (1.4)	202 (0.5)	162 (0)	184 (0.5)	167 (0)*
IDU last year[3]								
No	13,011 (96.2)	NA	NA	2,857 (0.4)	2,596 (0.4)	2,626 (0.2)	2,391 (0.3)	2,541 (0.6)^
Yes	514 (3.8)	NA	NA	116 (0)	140 (0)	85 (0)	96 (0)	77 (0)
Sex w/IDU ever								
No	19,326 (91.7)	4,444 (0.7)	2,563 (0.4)	2,719 (0.3)	2,454 (0.3)	2,467 (0.2)	2,250 (0.2)	2,429 (0.6)*^
Yes	1,757 (8.3)	239 (1.7)	312 (1.6)	254 (0.4)	282 (0.4)	244 (0.4)	237 (0.8)	189 (0)*^
Gonorrhea[4]								
No	18,822 (96.2)	2,890 (0.5)	2,680 (0.5)	2,892 (0.3)	2,692 (0.3)	2,669 (0.2)	2,437(0.2)	2,562 (0.5)
Yes	741 (3.8)	273 (0.7)	195 (1.5)	81 (0)	44 (2.3)	42 (0)	50 (2.0)	56 (5.4)**^

* Statistically significant decreasing trend between 1988-2002 at $p<0.05$.
** Statistically significant increasing trend between 1988-2002 at $p<0.05$.
^ Statistically significant increasing trend between 1997 and 2002 at $p<0.05$.
1. Individual categories may not add up to total because of missing data.
2. Race and ethnicity categories are mutually exclusive; each race excludes Hispanic ethnicity. The groups Asian and Native Hawaiian & Other Pacific Islander were grouped due to small cell sizes.
3. Information on IDU during the past year was collected 1993-2002.
4. Information on gonorrhea diagnosis at this visit was collected 1989-2002.

Table 2. HIV prevalence and trends among MSM STD clinic patients, King County 1988-2002

		Men who have sex with men						
	Total[1]	**1988-90**	**1991-92**	**1993-94**	**1995-96**	**1997-98**	**1999-00**	**2001-2002**
	N (column %)	**N (HIV%)**	**N (HIV%)**	**N (HIV%)**	**N (HIV%)**	**N (HIV%)**	**N (HIV%)**	**N (HIV%)**
Total	2,952 (100.0)	311 (32.2)	298 (19.1)	323 (12.4)	319 (7.8)	411 (4.9)	572 (8.9)	718 (13.1)*^
Race/ethnicity[2]								
White	2,268 (77.4)	258 (32.6)	243 (19.8)	252 (12.3)	222 (7.2)	306 (3.9)	435 (9.2)	552 (12.0)*^
Black	215 (7.3)	21(28.6)	28 (25.0)	22 (9.1)	28 (10.7)	34 (8.8)	35 (22.9)	47 (31.9)^
Hispanic	189 (6.5)	--	--	24 (4.2)	24 (12.3)	21 (0)	51 (5.9)	39 (12.8)^
Asian/PI	100 (3.4)	--	--	--	--	--	22 (0)	42 (9.5)
AI/AK Native*	55 (1.9)	--	--	--	--	--	--	--
Other	104 (3.6)	--	--	--	23 (4.4)	28 (7.1)	--	--
Age (years)								
<20	65 (2.2)	--	--	--	--	--	--	--
20-29	1,185 (40.9)	139 (28.1)	123 (13.0)	138 (13.0)	136 (7.4)	178 (5.1)	197 (1.5)	274 (8.8)*^
30-39	1,066 (36.8)	118 (34.7)	116 (22.4)	109 (13.8)	96 (8.3)	136 (5.9)	217 (14.3)	274 (16.4)*^
40+	580 (20.0)	44 (38.6)	47 (29.8)	64 (10.9)	72 (6.9)	86 (3.5)	142 (11.3)	125 (14.4)*^
IDU ever								
No	2,692 (91.2)	290 (31.4)	249 (18.1)	292 (12.7)	287 (7.7)	387 (4.7)	518 (9.1)	669 (12.7)*^
Yes	260 (8.8)	21 (42.9)	49 (24.5)	31 (9.7)	32 (9.4)	24 (8.3)	54 (7.4)	49 (18.4)*
IDU last year[3]								
No	2,241 (95.6)	NA	NA	303 (12.2)	299 (8.0)	398 (5.0)	550 (9.3)	691 (12.9)^
Yes	102 (4.4)	NA	NA	20 (15.0)	20 (5.0)	--	22 (0)	27 (18.5)^
Sex w/IDU ever								
No	2,662 (90.2)	287 (32.8)	256 (18.8)	288 (12.2)	282 (7.8)	381 (4.5)	507 (8.9)	661 (13.0)*^
Yes	290 (9.8)	24 (25.0)	42 (21.4)	35 (14.3)	37 (8.1)	30 (10.0)	65 (9.2)	57 (14.0)*
Gonorrhea[4]								
No	2,661 (92.6)	203 (27.1)	263 (13.7)	309 (11.3)	307 (7.2)	385 (4.4)	539 (8.7)	655 (10.8)*^
Yes	213 (7.4)	30 (36.7)	35 (60.0)	--	--	26 (11.5)	33 (12.1)	63 (36.5)^

* Statistically significant decreasing trend between 1988-2002 at $p<0.05$.
^ Indicates statistically significant increasing trend between 1997 and 2002 at $p<0.05$.
1. Individual categories may not add up to total because of missing data.
2. Race and ethnicity categories are mutually exclusive; each race excludes Hispanic ethnicity. The groups Asian and Native Hawaiian & Other Pacific Islander were grouped due to small cell sizes.
3. Information on IDU during the past year was collected 1993-2002.
4. Information on gonorrhea diagnosis at this visit was collected 1989-2002.

-- Data not shown because of small denominator (N < 20) which makes percentages less reliable. Individual categories may not add up to total because of missing data.

Table 3. Recent sexual behaviors among STD Clinic patients, King County 1997-2002

Sexual behaviors	Women and men who have sex with women only N=7,816	Men who have sex with men N=1,701
	Percent	Percent
Numbers of sex partners in past year		
0 sex partners	4.9	2.3
1 sex partner	28.2	12.0
2 – 4 sex partners	52.4	34.7
5 or more sex partners	14.5	51.0
Number of partners in past 2 months		
0 sex partners	16.9	8.4
1 sex partner	54.4	32.5
2 or more sex partners	28.8	59.1
Number of new partners in past 2 months		
0 new sex partners	54.3	30.5
1 new sex partner	30.1	22.4
2 or more new sex partners	15.6	47.1
Condom used at last sex by no. of partners*		
1 sex partner past year	29.7 (N=1,779)	30.6 (N=147)
2-4 sex partners past year	37.8 (N=3,512)	44.8 (N=455)
5 or more sex partners past year	41.1 (N=978)	45.5 (N=706)
Sex with IDU in past yr.		
Yes	3.9	4.5
Sex with HIV+ in past yr.		
Yes	0.6	14.1
Exchanged money or drugs for sex in past yr.		
Yes	5.3	3.4
Sex with MSM (women) in past yr.		
Yes	3.4	NA
Sex with women (MSM) in past yr.		
Yes	NA	18.1

* Records with missing data on condom use were excluded from analysis.

Table 4. Correct knowledge of HIV status in relation to the STD clinic visit, 1997-2002

Correct knowledge of HIV serostatus	Females/MSW		MSM	
	HIV+ N=28 N (%)	HIV- N=7,777* N (%)	HIV+ N=164* N (%)	HIV- N=1,533* N (%)
Knew at time of visit	10 (35.7)	5,589 (71.9)	97 (59.2)	1,333 (87.0)
Knew after visit**	11 (39.3)	2,044 (26.3)	36 (22.0)	177 (11.5)
May not have known after visit	7 (25.0)	144 (1.9)	31 (18.9)	23 (1.5)

* 11 HIV-seronegative women/MSW, 3 seronegative MSM, and 1 seropositive MSM lacked data on testing during the survey visit.
**Assumes results were given.

Table 5. HIV prevalence and estimated annual incidence among MSM STD clinic patients, King County 1990-2002

Year of survey	Men who have sex with men	
	Prevalence % HIV+ (95% CI*)	Estimated Incidence % new HIV+ (95% CI*)
1990-92	26.9 (22.2, 32.1)	3.3 (0.6, 10.5)
1993-94	12.4 (9.0, 16.5)	0.9 (0, 6.8)
1995-96	7.8 (5.1, 11.4)	1.8 (0.1, 8.2)
1997-98	4.9 (3.0, 7.4)	2.0 (0.3, 7.4)
1999-00	8.9 (6.7, 11.6)	2.5 (0.6, 7.3)
2001-02	13.1 (10.7, 15.8)	3.4 (1.3, 7.2)

* The 95% confidence interval (CI) is the interval within which the point estimate (prevalence or incidence) is expected to fall 95% of the time; if the 95% CI overlap then the difference in prevalence or incidence in different time periods is not statistical significant.

HIV prevalence among military recruit applicants in Seattle, Tacoma, and Washington State

Since October 1985, all persons applying for active or reserve military service, the service academies or the Reserve Officer Training Corps have been screened for HIV infection as a part of their entrance medical evaluation. The Department of Defense shares these data with the Centers for Disease Control and Prevention (CDC) for HIV surveillance purposes. The CDC compiles the data and issues periodic reports to state and local health departments.

Individuals with known risk factors are likely underrepresented among military applicants who are screened for HIV. Persons with acknowledged drug use and male-male sexual activity are excluded from entry into military service. Prior to mid-1993, questions about these behaviors were specifically raised in screening interviews. Potential applicants are no longer asked about homosexual activity, a.k.a. "*don't ask, don't tell,*" but are informed that they will be screened for HIV antibody.

Between October 1985 and December 2001, 6,895,477 persons nationwide were tested in this program. Eighty-three percent were male, 17% were female, 70% White, 19% Black, 7% Hispanic, and 4% were of other races/ethnicities. Table 1 shows the proportion of US military recruits, by sex and by race, who tested HIV positive over five time periods.

- Nationally the percent of recruits testing HIV positive has dropped steadily since 1985, as shown in Table 1.
- The decline has been more notable among male recruits (from 0.14% in 1985-1989 to 0.04% in 1999-2001) than among female recruits (from 0.06% in 1985-1989 to 0.03% in 1999-2001).
- There have been marked declines both among Whites (from 0.06% to 0.01%) and Blacks (from 0.35% to 0.13%) over this same time period.

Table 2 (next page) shows cumulative national rates of persons testing HIV positive compared with those for Washington, Seattle (King, Snohomish, and Island Counties) and Tacoma (all of Pierce County) Metropolitan Statistical Areas (MSA).

Examination of these cumulative data reveal:

- Washington state's HIV seropositivity rate was less than half that of the nation as a whole: 0.03% versus 0.08%.
- HIV seropositivity in recruits from Seattle MSA (0.04%) and Tacoma MSA (0.05%) was one and a half to two times higher, respectively than that of Washington State as a whole (0.03%)
- Washington State's seropositivity rate among female recruits (< 0.01%) was less than one-fourth that among male recruits (0.04%). Both sexes were lower than the national average (0.05% for women, 0.08% for men).
- Black men from Washington State had a considerably higher rate (0.24%) than White men (0.02%), although both rates were lower than their national counterparts (0.27% and 0.04% respectively). The rate among Hispanic men from Washington (0.09%) was slightly slower than the national rate (0.10%).
- Of 6,174 Asian & Pacific Islanders (A/PI) tested in Washington, 3 (0.05%) were HIV positive. None of the 2,445 Native American/Alaska Native (NA/AN) applicants tested positive. Nationally, 0.02% of A/PI and 0.04% of NA/AN tested positive, rates similar to the 0.03% seen in Whites (data not presented in Table 2).
- Both locally and nationally, HIV seropositivity rates were lowest in 17-19 year old applicants and generally were highest in those over 30.
- Nationally, the ratio of seropositive men to women

Table 1. Military recruits testing HIV positive (US data, 1985-2001)

Period	Men	Women	Whites	Blacks	All recruits
1985-1989	0.14%	0.06%	0.06%	0.35%	0.12%
1990-1992	0.07%	0.05%	0.03%	0.23%	0.07%
1993-1995	0.04%	0.04%	0.02%	0.16%	0.04%
1996-1998	0.04%	0.03%	0.01%	0.13%	0.04%
1999-2001	0.04%	0.03%	0.01%	0.13%	0.04%

[1] Prevalence of HIV-1 antibody in civilian applicants for military service, October 1985 – December 2001. Department of Defense. Selected tables prepared by the Division of HIV/AIDS, Centers for Disease Control and Prevention, 2003.

was highest in recruits from age 25 and over (about 3:1 in both 25-29 and 30+ groups), and less in those 20-24 (about 2:1). Among 17-19 year olds, a higher proportion of females (0.03%) tested positive compared to males (0.02%).

HIV seroprevalence data from civilian military recruit applicants represent testing of a large number of persons from all areas of the U.S. over a long period of time. Military recruit results are limited by the lack of behavioral data, the relatively narrow age range tested, and because they likely under-represent HIV prevalence in the general population due to self-selection bias. Nevertheless, these data define some of the major trends in the epidemic including the disproportionate impact of HIV on persons of color, the wide geographic variability in prevalence, and concern about HIV infection in young women.

• *Contributed by Amy Bauer, MPH*

Table 2. HIV prevalence among military recruit applicants, 10/1985 - 12/2001

	United States			Washington State			Seattle MSA[2]			Tacoma MSA[3]		
Group	HIV+	# tested	% HIV+	HIV+	# tested	% HIV+	HIV+	# tested	% HIV+	HIV+	# tested	% HIV+
All recruits[1]	5,195	6,895,477	0.08	49	150,742	0.03	19	46,953	0.04	12	22,374	0.05
All men[1]	4,667	5,727,453	0.08	48	125,439	0.04	19	39,314	0.05	11	17,709	0.06
All women[1]	528	1,168,024	0.05	1	25,303	0.00	0	7,639	0.00	1	4,665	0.02
All Whites	1,547	4,798,358	0.03	26	127,412	0.02	10	38,280	0.03	3	16,598	0.02
White men	1,445	4,091,973	0.04	26	107,130	0.02	10	32,438	0.03	3	13,471	0.02
White women	102	706,385	0.01	0	20,282	0.00	0	5,842	0.00	0	3,127	0.00
All Blacks	3,038	1,303,687	0.23	15	7,852	0.19	5	3,145	0.16	7	3,012	0.23
Black men	2,650	975,164	0.27	14	5,842	0.24	5	2,396	0.21	6	2,144	0.28
Black women	388	328,523	0.12	1	2,010	0.05	0	749	0.00	1	868	0.12
All Hispanics	442	504,969	0.09	4	5,200	0.08	1	1,361	0.07	2	782	0.26
Hispanic men	416	424,911	0.10	4	4,282	0.09	1	1,099	0.09	2	601	0.33
Hispanic women	26	80,058	0.03	0	918	0.00	0	262	0.00	0	181	0.00
All 17-19 year olds	829	3,792,580	0.02	6	81,243	0.01	2	24,111	0.01	1	10,608	0.01
17-19 yr. men	663	3,150,946	0.02	6	67,850	0.01	2	20,183	0.01	1	8,591	0.01
17-19 yr. women	166	641,634	0.03	0	13,393	0.00	0	3,928	0.00	0	2,017	0.00
All 20-24 year olds	1,922	2,033,796	0.09	18	42,393	0.04	9	13,641	0.07	4	6,579	0.06
20-24 yr. men	1,717	1,687,547	0.10	17	35,032	0.05	9	11,390	0.08	3	5,112	0.06
20-24 yr. women	205	346,249	0.06	1	7,361	0.01	0	2,251	0.00	1	1,467	0.07
All 25-29 year olds	1,385	619,319	0.22	13	14,485	0.09	5	5,029	0.10	2	2,683	0.07
25-29 yr. men	1,293	512,206	0.25	13	11,988	0.11	5	4,217	0.12	2	2,043	0.10
25-29 yr. women	92	107,113	0.09	0	2,497	0.00	0	812	0.00	0	640	0.00
All 30+ year olds	1,059	449,782	0.24	12	12,621	0.10	3	4,172	0.07	5	2,504	0.20
30+ yr. men	994	376,754	0.26	12	10,569	0.11	3	3,524	0.09	5	1,963	0.25
30+ yr. women	65	73,028	0.09	0	2,052	0.00	0	648	0.00	0	541	0.00

[1]Includes persons in racial categories not given in the following rows of table.

[2]Seattle MSA includes King, Snohomish, and Island Counties.

[3]Tacoma MSA is Pierce County.

Changes in mortality among HIV infected: Update from the Adult/Adolescent Spectrum of HIV-related Diseases (ASD) project

Introduction

The decline in AIDS-related deaths since the introduction of highly active antiretroviral therapy (HAART) has been well recognized in the United States[1,2]. The AIDS-defining opportunistic illnesses (OIs) that were once the major cause of death for HIV-infected patients have been significantly reduced by viral suppression and bolstered immune response provided by HAART. Although mortality has decreased significantly, adverse side effects of HAART, poor treatment adherence, not accessing HIV care, late diagnoses of HIV, and complications of co-infections such as hepatitis C have contributed to continued mortality among HIV-infected individuals. Liver, renal and heart diseases are known to be adverse events of HAART that can be potentially fatal[3]. The benefits of HAART therapy have been shown to clearly outweigh any adverse events for persons with advanced HIV disease, but it is important to understand the health complications potentially associated with antiretroviral therapies and how mortality has changed in the HAART era.

Methodology

The Seattle Adult/Adolescent Spectrum of HIV-related Diseases (ASD) project is part of a Center for Disease Control and Prevention (CDC) sponsored multicenter medical records-based observational cohort study and is designed to monitor the spectrum and frequency of HIV-related illness. Seattle ASD, which began in 1990, has produced a large comprehensive database containing detailed information about HIV disease progression, treatment and other medical conditions in a cohort of HIV-infected individuals receiving treatment at selected Seattle area medical facilities. Medical records are reviewed at regular intervals, and clinical information is gathered for each patient until death, relocation or loss-to-follow-up (defined as 18 months with no contact). Information about cause of death is obtained through medical record abstractions and death certificate reviews. Both causes of death and conditions present at the time of death are coded in the ASD database by ICD-9 coding for deaths prior to 1999 and ICD-10 coding for deaths including and after 1999. Data for this analysis were collected through December 2003.

At the end of 2003, 4,543 individuals had been enrolled in Seattle ASD, including 1,206 whom had died from 1990 through 2003. Causes of death evaluated for this study included all OIs, other infections (e.g. septicemia and pneumonia), neoplasms, and diseases which may have been adverse events from HAART (liver, renal and heart disease). The 1,206 individuals were separated into two groups (deaths 1990 through 1996 and deaths 1997 through 2003) to compare changes in mortality after the introduction of HAART. All post-HAART deaths were included in this analysis regardless of whether the person had used HAART prior to death. All causes of death for each patient were considered in the analysis without specification as primary, underlying or other cause of death, and individuals could have more than one infection or disease. AIDS-defining opportunistic illnesses and other significant medical conditions (e.g. pneumonia, sepsis or myocardial infarction) present at the time of death were included with causes of death listed on the death certificate. Demographic factors associated with cause of death were analyzed for differences in pre-HAART and post-HAART era deaths.

Results

Of the 1,206 individuals in this study who died between 1990 and 2003, 1,013 (84%) died prior to the introduction of HAART, and 193 (16%) died after the introduction of HAART (Table 1). The proportion of decedents that were male decreased (94% versus 84%). The proportion of Whites among those who died decreased, and there were increases in the proportion of non-Whites among those who died. IDU, heterosexuals and people with unknown or other HIV risks increased in proportion of deaths after HAART as the proportion of deaths among MSM decreased. The proportion of deaths among younger people (<40 years old at time of death) was observed to decrease after the introduction of HAART with increased observed proportions among people aged 40-59 at time of death.

The pre- and post-HAART differences in OIs and other diseases reported at time of death are shown in Table 2. All causes of death from each patient were included in the analysis, not just primary or underlying cause of death, and therefore the sum of the diseases is greater than the total number of deaths. Of the ASD patients who died before the introduction of HAART, 75% had an OI at time of death. However, after the introduction of HAART the number of individuals that died with an OI dropped significantly to 39% (Relative risk [RR] =0.5, 95% Confidence interval [CI] =0.4-0.6). Significant decreases were seen in HIV wasting syndrome (17% versus 7%), tuberculosis and other mycobacterial infections (33% versus 11%), cytomegalovirus disease, including retinitis (17% versus 7%), Kaposi's sarcoma (7% versus 3%), *Pneumocystis carinii* pneumonia (10% versus 4%) and cryptosporidiosis (3% versus 0%).

Table 1. Characteristics of persons with HIV who died in the pre-HAART era versus the post-HAART era, Seattle ASD 1990-2003

	1990-1996 N=1013	1997-2003 N=193
Sex	**N (%)**	**N (%)**
Male	953 (94)	162 (84)
Female	60 (6)	31(16)
Race/ethnicity		
White	794 (78)	110 (57)
Black	127 (13)	47 (24)
Hispanic	63 (6)	17 (9)
Asian/Pacific Islander	16 (2)	6 (3)
Am. Indian/Alaskan Native	13 (1)	7 (4)
Exposure risk		
MSM	663 (65)	91 (47)
IDU	102 (10)	42 (22)
MSM/IDU	188 (19)	33 (17)
Heterosexual	35 (3)	13 (7)
Other/Unknown	22 (2)	14 (7)
Age at death		
<30	120 (12)	12 (6)
30-39	502 (50)	73 (38)
40-49	297 (29)	80 (41)
50-59	77 (8)	25 (13)
60+	17 (2)	3 (2)
Mean age at death	38.8	41.6

Table 2. Infections and diseases present at time of death in the pre-HAART versus post-HAART eras, Seattle ASD 1990-2003

	1990-1996 N=1013	1997-2003 N=193	Relative Risk
	N (%)	**N (%)**	**(95% C.I)**
Any AIDS-defining opportunistic illness *	760 (75)	75 (39)	0.5 (0.4-0.6)
Mycobacterium, TB and other *	339 (33)	22 (11)	0.3 (0.2-0.5)
Wasting *	175 (17)	13 (7)	0.4 (0.2-0.7)
Cytomegalovirus *	169 (17)	13 (7)	0.4 (0.2-0.7)
Dementia/encephalopathy	117 (12)	17 (9)	0.8 (0.5-1.2)
Pneumocystis carinii pneumonia *	98 (10)	8 (4)	0.4 (0.2-0.9)
Septicemia	93 (9)	20 (10)	1.1 (0.7-1.8)
Lymphoma, all*	91 (9)	9 (5)	0.5 (0.3-1.0)
Kaposi's sarcoma *	75 (7)	5 (3)	0.3 (0.1-0.9)
Progressive multifocal leukoencephalopathy	48 (5)	6 (3)	0.7 (0.3-1.5)
Heart disease	40 (4)	13 (7)	1.7 (0.9-3.1)
Liver disease *	37 (4)	25 (13)	3.5 (2.2-5.8)
Cryptosporidiosis *	33 (3)	0 (0)	NA
Isosporiasis *	33 (3)	0 (0)	NA
Pneumonia, not specified	32 (3)	2 (1)	0.3 (0.1-13.6)
Cryptococcosis	20 (2)	4 (2)	1.0 (0.4-3.0)
Toxoplasmosis	15 (1)	2 (1)	0.7 (0.2-3.0)
Renal disease *	15 (1)	13 (7)	4.5 (2.2-9.4)

*Indicates statistically significant increases or decreases in proportions ($p<0.05$ by Chi-square) between pre-HAART and post-HAART era deaths.
NA indicates not able to calculate.

Significant increases in non-opportunistic illnesses included liver disease (4% versus 13%) and renal disease (1% versus 7%). A proportional increase was also noted for heart disease, although this was not statistically significant.

Diseases with significant increases or decreases were further analyzed by sex, race/ethnicity, HIV exposure risk category and age group to determine significant demographic variables. Tuberculosis/other mycobacterial infections and HIV wasting syndrome at time of death were common OIs that showed significant decreases in almost all demographic categories. Kaposi's sarcoma, cytomegalovirus, isosporiasis and cryptosporidiosis showed significant proportional decreases among males, White race, MSM and individuals 30 to 39 years old at time of death. Increases in proportions of deaths with liver disease were significant among males, Blacks, Hispanics, MSM, IDU and people under 40 years old at time of death. Increases in proportions of deaths with renal disease were significant among both sexes, Whites, MSM and people aged 30 to 39 at time of death. Septicemia significantly increased among females and heart disease significantly increased among IDU.

Discussion

We saw an increase in the proportion of deaths that were among females and persons of non-White race/ethnicity in the post-HAART era. These demographic shifts could be due to overall increases in HIV infections within these populations. The average age of HIV-infected persons has not significantly changed in the last ten years suggesting that the increase in proportion of deaths among older patients is not an artifact of HIV incidence but an increase in longevity due to HAART[4]. The overall decrease in the number of deaths, particularly deaths from opportunistic infections was identified across all demographic populations.

The proportion of individuals dying with liver, renal or heart disease increased as the proportion of OIs decreased. Previous studies have indicated that HAART may contribute to liver toxicity, renal failure and cardiac complications[3]. The increase in the proportion of deaths from heart disease was not significant in this cohort. However, both the proportions of liver disease and renal disease as a cause of death were significantly associated with post-HAART death.

Conclusion

The introduction of HAART in the middle 1990's was a pivotal moment in the AIDS epidemic. AIDS-related deaths have declined and remained at a dramatically lower level, and new antiretroviral treatments and regimens with fewer adverse events are being released. HAART has been shown to slow disease progression and decrease mortality, but it is important to recognize that HIV treatments frequently involve difficult regimens and sometimes have debilitating side effects. This study was limited to available data from medical records and death certificates. Also, as our aim was to look at changes in mortality after the introduction of HAART, in most analyses we did not distinguish whether ASD patients that died in the post-HAART era ever received HAART themselves – nor which specific antiretrovirals and regimens they may have received. Further studies should continue to look at deaths among patients receiving and not receiving HAART; examine liver, renal and heart diseases among patients that are not deceased; and look for associations between rates of these diseases and use of HAART. Future studies should also look at how demographic and behavioral factors, such as IDU, impact HAART use and examine other possible adverse events associated with HAART.

● *Contributed by Erin Kahle, MPH, and Elizabeth Barash, MPH*

References

1. CDC. Update: AIDS-United States, 2000-2002. Morb Mortal Wkly Rep. 2002 Jul 12; 51(27):592-5.
2. Selik RM, et al. Trends in disease updated on US death certificates that mentioned HIV infection, 1987-1999. J Acquir Immune Defic Syndr. 2002 Apr 1; 29(4):378-87.
3. Reisler RB, et al. Grade 4 events are as important as AIDS events in the era of HAART. J Acquir Immune Defic Syndr. 2003 Dec 1; 34(4):379-86.
4. PHSKC. Epidemiology of HIV/AIDS, Seattle-King County, Washington. HIV/AIDS Epidemiology Program, Public Health Seattle & King County. 2001 April; www.metrokc.gov/health/apu/epi.
5. Tedaldi EM, et al. Influence of coinfection with hepatitis C virus on morbidity and mortality due to human immunodeficiency virus infection in the era of highly active antiretroviral therapy. Clin Infect Dis 2003 Feb 1; 36(3):363-7.

Study to evaluate the benefits and risks associated with STARHS (LSEIA/detuned assay) for patients

The "Arbor Study" is a new project, funded by the Centers for Disease Control and Prevention (CDC), to assess the risks and benefits to patients receiving STARHS (Serologic Testing Algorithm for Recent HIV Seroconversion, also known as the less sensitive or detuned HIV test). This patient interview study, conducted by Public Health-Seattle & King County (PHSKC), focuses on patients who received positive HIV test results since January 2002 at Health Department locations in King County and will begin its enrollment period in the first quarter of 2004.

STARHS uses a dual testing strategy in which sera from persons who test positive on a standard HIV test are re-tested using a less sensitive version of the standard test. Persons testing non-reactive on the less sensitive test are considered to have seroconverted within the past year. Patients are counseled that health experts do not know the accuracy of STARHS and that they should talk to their physicians about other tests to find out how long they may have been infected. The primary goal of using STARHS is to estimate HIV incidence on the population level, but since almost all patients opt to know their STARHS results, it is important to consider some of the potential benefits and risks for those patients. For example, those with probable recent infection may share the result with their health care providers and - along with other tests – may use it in deciding when to initiate antiretroviral therapy or to estimate the risk of disease progression. Partner notification may be more effective among persons with recent HIV infection than among those with long-standing infections. Of concern is the possibility that, by limiting the possible exposure period, clients may suspect a particular partner as the source of infection. Anger and resentment toward a suspected partner may have adverse consequences such as dissolution of a previously stable relationship or psychological, physical, or partner violence. In order to obtain information about potential risks and benefits, participants complete an interview. Interview questions focus on both sex and needle sharing partners.

Although anecdotal feedback from counselors in the past has not identified adverse consequences associated with receipt of STARHS, this has not yet been systematically addressed. The study will compare the responses for those who had STARHS and those who did not. Among those who had STARHS, the study will compare those whose tests suggested recent seroconversion and those whose tests did not.

There are two significant audiences for the results of this project. The first audience is governmental agencies , including the Food and Drug Administration (FDA), which is responsible for licensing the LS-EIA and the CDC, which holds the Investigational New Drug/Device (IND)application. The results of this project may be helpful to move the LS-EIA/STARHS test out of investigational status. The second audience includes researchers and public health entities who are participating in STARHS projects trying to decide whether or not to return STARHS results to clients. With the results of this project, they may determine that the benefits of returning results outweigh the risks or vice-versa.

Participants will be paid $20 for the approximately one-hour interview. Participation is by referral only and will be offered by staff at the Harborview Madison Clinic, the STD and HIV/AIDS Program (HAP) clinics at Harborview, and the One-on-One Program (a HAP resource for newly positive clients providing initial HIV clinical assessment, emotional support and referrals to services). Enrollment is expected to last through early summer 2004.

If you would like to find out more information about the Arbor Study, you may contact Linda Oakley, the Study Coordinator, at (206) 296-2904 or email at linda.oakley@metrokc.gov or contact Dr. Gary Goldbaum, the Principal Investigator, at (206) 296-4991.

• Contributed by Linda Oakley, Project Manager, Arbor Study

The Seattle RARE project: Assessing the HIV prevention needs of people of African descent in King County

Background

In Seattle-King County, as in the U.S., epidemiologic data indicate that HIV and AIDS disproportionately affects African Americans and foreign-born Black immigrants. Overall, the percent of HIV/AIDS cases that are among people of color has steadily increased from 13% of cases in 1982-88 to 29% in 1995-97 and 39% in 2000-2003. Blacks, the most disproportionately impacted racial group, are 3.9 times more likely to be recently diagnosed with HIV than whites. About 1.7% of Black men and 0.6% of Black women in King County are currently living with HIV/AIDS. Foreign-born Blacks comprise an increasing share of the infections among Blacks in King County. In light of these data, Public Health—Seattle & King County decided to assess the HIV prevention needs of the Black community in order to provide more effective prevention services.

At the request of Executive Ron Sims, King County applied for and received money from the Department of Health and Human Services to conduct a RARE Project (Rapid Assessment, Response, and Evaluation). The Office of Minority Health has funded RARE Projects throughout the country to investigate racial health disparities related to HIV/AIDS. Seattle's RARE Project sought to gather in-depth information from the local Black community about barriers to receiving HIV prevention services and to find out how to more effectively address these barriers. The project was overseen by a Community Working Group (CWG) comprised of local service providers, leaders, and community members with unique experience and expertise in HIV prevention.

RARE methodology

By design, RARE projects focus on two geographic sites, with each site being no larger than 22 square blocks. A combination of community expertise and analysis of HIV/STD surveillance data for Blacks in King County quickly helped select two sites for the study: the 23rd Avenue corridor in the Central District of Seattle and the south end of Rainier Avenue from Orchard to Henderson. Using the standardized RARE methodology, a team of six field investigators undertook mapping and ethnographic observations of the sites and conducted interviews, focus groups, and street intercepts with members of the priority population, service providers, and community leaders. A driving characteristic of the RARE methodology is its rapid nature. The Seattle RARE Project began in March 2003 with the selection of the geographic sites, field team, and CWG, included two months of data collection, and concluded in August 2003 with the presentation of the final report to the CWG.

The field team conducted 84 one-to-one interviews and 18 focus groups. Brief street intercept surveys with 109 community members provided additional detail on specific issues raised during the assessment.
The assessment included information from a wide variety of people who provided in-depth information about their community's current knowledge and perceptions of HIV prevention. Community participants were nearly evenly split between men and women, with an age range of 18 to 71 years old. Eighty-two percent were African American and 11% were African-born. Nearly half were formerly incarcerated. The project held separate focus groups with formerly incarcerated men, heterosexual women, people buying and selling drugs, youth (18 to 24 year olds), people born in African, gay-identified men, social service providers, HIV service providers, public safety, clergy, leaders in the African-born community, and business owners. The project attempted but was unable to conduct interviews with civil rights leaders. Overall, community members, service providers, and community leaders from both sites were cohesive in their assessment of current HIV prevention efforts and suggestions for improvement.

Findings

1. People know the basics of HIV transmission, but myths remain

Overall, community members expressed a basic working knowledge of how HIV is transmitted. When asked how you could get HIV, people talked about unprotected sex as a main method of transmission and therefore the need for condoms to prevent the infection. Almost all participants stated that any kind of unprotected sex was risky, including both vaginal and anal sex in that category. Participants also clearly linked drug use with HIV transmission. They talked about the risk of sharing needles and most also described any drug use as risky both because people are more likely to make poor decisions and because many drugs increase the desire to have sex. People in recovery were particularly clear about the risky sexual behavior they engaged in while they were formerly using substances such as crack.

In addition to basic knowledge, however, many participants held myths about HIV transmission. Some equated HIV transmission with any type of body fluid exchange, such as playing basketball with someone who was sweating or sharing saliva with someone by sharing

a cup. Other participants worried about getting HIV from needles in medical settings, either because of sloppy handling or because of a deliberate plot to spread HIV to the Black community. Many related stories about mismanaged medical procedures for members of their community. Also influential were perceptions that HIV was a "White" or "gay" disease, and therefore it was safe to have unprotected sex with someone who was Black, particularly Black women. Very few people interviewed felt that they were personally at risk for HIV, even if they were sexually active or currently using drugs.

2. Stigma and fear drive community attitudes

Participants repeatedly stated that the barriers to HIV prevention were a result of the stigma and fear that surrounds HIV in the Black community. Whether or not they agreed with the community norm, almost every community member, service provider, and community leader described how the general Black community strongly equated HIV with immorality or immoral behavior. The perceived community definition of "immoral" varied across interviews; some participants included promiscuity and drug use, while most included "gay behavior". Many participants talked about how their churches deliberately described HIV as a disease of immorality and would not include HIV+ individuals in the church family. People talked about how the shame of being HIV positive radiates far beyond the individual. If you have HIV, you not only bring shame on yourself, but also your family, your church, and your community. In fact, participants said there was much less shame around having family members in trouble with drugs or incarcerated, than having a family member with HIV.

Participants talked at length about how these powerful community responses kept people from all types of HIV prevention – from simple steps like talking about HIV in the community, to more overt actions such as choosing to be tested. Many service providers said that when they discussed the growing epidemic as part of their job, they were accused of "contributing to the negative perception of Black people" and "condemning the behavior of African Americans yet again". Community members were afraid that people they knew would find out that they were going to get tested and make assumptions about their behavior. They wondered how they would cope with HIV if they had it, including how they would pay for expensive medications or deal with the family and community shame. Many participants were also afraid that if they found out that they were positive, there would be nothing they could do but die a shameful death. Service providers talked about the need to educate the community around the availability of medications and other assistance.

3. Distrust and mistrust of HIV prevention work

Although the level of intensity varied, most community experts, and some service providers and community leaders, openly distrusted many aspects of the HIV information they have received. For many participants, this distrust was rooted in the origins of HIV and the belief that the government was covering up the fact that it created HIV by blaming Africa and Black people for its inception. Some participants believed that HIV "got out of the lab" by mistake, and then the government spread a story about HIV originating in Africa to further malign all Black people. Others, however, cited past events such as the Tuskegee Experiment as proof that the government would willingly infect the Black community and had created HIV as a form of genocide or population control for Africans and African Americans. This distrust also affected people's attitudes around HIV testing. A few people said they would not get tested because they believed that the government was spreading HIV through the tests themselves. More often, however, participants were extremely wary of giving their names and blood to the government for testing. There was little confidence in the government's ability or desire to keep their status confidential.

4. Invisibility of HIV and lack of services

Even though HIV and AIDS disproportionately impacts African Americans and foreign-born Blacks in King County, members of the community feel they do not see information about the epidemic or HIV prevention education information. They cited the lack of organizations, funding, and information as a direct cause of the epidemic and the stigma around HIV. Field team members did not find HIV prevention pamphlets, media, posters, advertisements, or brochures within the two sites during their observation. Information was not readily available at community centers, libraries, or local businesses.

In addition, many community members, non-HIV service providers, and community leaders did not know specific locations in or near their neighborhood for HIV information and testing if they had wanted to seek it out. One local organization, People Of Color Against AIDS Network (POCAAN), was most consistently mentioned as "doing HIV work", although many interviewees were unclear about exactly what they did or where they were. The Brother to Brother Barbershop program was also mentioned by some interviewees who had attended their workshops.

5. The importance of HIV prevention education

Participants consistently felt that improved HIV prevention education in their neighborhoods would prevent HIV and reduce the stigma and fear around the disease. The

idea of HIV education was seen as positive and non-threatening, in direct contrast to the fears and confidentiality issues surrounding HIV testing. Two main themes emerged around what would make HIV education effective. First, the education needed to be delivered by peers, and second, HIV information should be "everywhere" and "anywhere people gather".

Because of the strong fear and distrust around HIV/AIDS issues, respondents strongly preferred to receive their prevention education information from closely matched peers. At a base level, this meant that the education must come from a Black person with a non-judgmental attitude. Most participants, however, took the match concept further and wanted the match to include a variety of personal characteristics, including gender, age, and, when possible, personal background or experience (such as being formerly incarcerated). Although this finding was true for most participants we talked to, formerly incarcerated men, African-born immigrants, and youth stated this preference the most strongly.

Interview and focus group participants were asked a series of specific questions about where to provide HIV education. Overall, they were very positive about a range of neighborhood locations for HIV information including community centers, beauty/barber/nail shops, bus stops, community gatherings, and community colleges. Most also talked about how important it was to have HIV information at schools. There was a strong feeling that if the community really wants to overcome this epidemic, then everyone should be involved and knowledgeable. To do this, the information must be so visible it becomes unavoidable.

6. Confidentiality is essential

All members of the community emphasized the importance of confidentiality around HIV issues. Because of the overwhelming culture of stigma and shame discussed earlier, participants stated that even the idea that the community would know they accessed HIV prevention would keep them from getting the help they might need. Although some people worried about being seen accessing HIV education and information, overall that was less of a concern than being seen having anything to do with HIV testing. Many participants feared being seen walking into an HIV-identified clinic or van, openly wondering how such an approach could ever be confidential. They did not trust that those doing the testing would keep their names confidential, or that their medical records would remain secure. There also was a belief that if they tested positive, the government or Public Health would require them to come downtown and "name names", thereby revealing their status and forcing them to compromise their partner's confidentiality.

Overall, interacting with someone "who looks like me" seemed to be more associated with confidentiality for HIV education issues, than for HIV testing. When asked if race mattered for testing, participants were much more likely to emphasize "professionalism" or "that they can keep it confidential" as prerequisites for the people who may be testing them, and downplay the race of the tester. Across the board, professional and non-judgmental behavior on the part of the tester was seen as an important indicator of confidentiality.

7. The testing Catch-22

Although most participants were enthusiastic about the need for HIV education in their neighborhoods, they remained dubious about the viability and accessibility of HIV counseling and testing. The stigma and fear associated with HIV is a large barrier to HIV counseling and testing. Also, because many people do not see themselves as at risk for HIV, the need to get tested drops to the bottom of a long list of life issues. Questions around what would make people more comfortable being tested revealed a difficult Catch-22. On one hand, because of overwhelming confidentiality issues, community members did not want to get tested at a location identified in any way with HIV – including a mobile van. Often these fears also extended to asking for an HIV test at a local neighborhood or school clinic where another client or a practitioner might know them. Many of these people said they would prefer to go somewhere outside the community because there would be less chance of being identified. On the other hand, however, many respondents insisted that it must be someone from the community performing the HIV test because that would increase their feeling of security and comfort. They did not want to have to travel very far to get testing, and did not necessarily trust the government to provide it, thinking that their status and name would be linked and kept on file. Overall people didn't know about anonymous testing, or didn't believe that it would ever actually be anonymous.

When asked what would resolve this Catch-22, many participants talked about having HIV testing available along with a host of other testing services, so no one would know exactly what they were being tested for, but they would still have a reason to be accessing the facility. Participants made two suggestions for how this could work: either unobtrusively offering HIV testing at a multi-use center in the neighborhood that already offered a variety of services, or creating a health screening van that was identified with testing for many diseases including HIV. Both community experts and service providers did not understand why HIV testing was not just a routine part of visits to the doctor, particularly given the increasing number of infections. Although they were careful to say it should not be mandatory, participants said they often are not offered HIV tests, or they have to say yes to one of several stigmatizing questions to be offered a test. This creates a strong barrier to accessing testing, even in the privacy of a doctor's office.

8. The need for leadership

Participants clearly described a lack of leadership around HIV in the Black community. For many, this was a symptom of a larger lack of community leadership from elected officials, traditional African American organizations, and local and national spokespeople. Indeed, many of these more traditional leadership groups were unwilling or unable to participate in this study. Instead, most participants described the need for HIV leadership to come from a broader definition of community leaders that focused on religious leaders, community involvement, and trusted elders, teachers, and business people.

Participants were both pessimistic and hopeful about the role of churches and mosques within HIV prevention. As discussed earlier, many said that clergy were mainly to blame for the perpetuation of stigma surrounding HIV. Many service providers in particular talked about their negative experiences trying to reform church attitudes and bring religious leaders into the HIV prevention effort. Other community members, however, talked about the change that they see in clergy willingness to participate. No matter how realistic they felt it was to believe clergy would become involved, the community clearly identified the potential power of their leadership. This was true both for the Christian and Muslim communities.

Most of the church leaders interviewed were open to participating in various types of HIV education. Most, however, described clear limits to acceptable HIV prevention in their churches and identified several main barriers to becoming strong HIV prevention leaders. The most common issue had to do with aspects of their theology that they perceived as contradictory to HIV prevention. For some clergy, this meant that they were willing to participate in education about HIV transmission, but not to espouse condom distribution or the concept of safer sex. For others, HIV prevention only meant abstinence education. Often clergy drew the line at the idea of testing at their churches or mosques, believing this condoned the behavior that transmitted the disease.

Due to the perception that there is a traditional leadership void in the Black community, many participants said that the burden of leadership really fell to all community members. Instead of defining a leader by their title, participants described a leader as someone who they trusted or someone who took a stand and helped the community. Most often, participants described elders, teachers and business people as the people with enough trust and influence to provide true leadership for the HIV prevention effort. They talked about how HIV prevention information and changing attitudes from these sources was the key to reducing stigma and spreading an effective message. The underlying message was that everyone needed to be a leader if the community is going to effectively fight rising HIV rates.

How has Public Health—Seattle & King County responded?

In July 2003, Public Health's HIV/AIDS Program staff presented the RARE findings to the Seattle-King County HIV Prevention Planning Committee. The committee recommended the inclusion of the primary findings in the 2004-05 HIV Prevention Request For Proposals (RFP). The final RFP required applicants proposing to serve African Americans and/or foreign-born Blacks to incorporate the RARE findings in the development of their intervention plans. Public Health instructed a non-conflicted review panel to include responsiveness to the findings as part of their proposal rating. As a result of this RFP, Public Health funded four programs serving people of African descent: high-risk heterosexuals, including African immigrants; non-gay-identified Black men; gay-identified Black men; and male-to-female transgendered people. All programs will provide services in the RARE sites and all rely on closely matched peer educators to deliver the interventions.

In addition, Public Health has undertaken several initiatives to increase access to HIV counseling and testing by people of African descent. The department has funded a capacity building program to increase the ability of Public Health clinics to provide HIV counseling and testing to African immigrants. Public Health has also funded a pilot program to deliver incented Rapid HIV testing to people of color through POCAAN. This spring will see the launch of a mass media campaign targeting African American men who have sex with men. This campaign will target gay and non-gay-identified men and encourage regular HIV testing and partner communication. Finally, Public Health is beginning discussions about the possibility of providing intensive technical assistance to help publicly funded clinics serving people of African descent to incorporate HIV counseling and testing as a routine part of their health screening services.

The full final report is available online at http://www.metrokc.gov/health/apu/publications/rare/index.htm.

• *Contributed by Barb Gamble, MPA, and Erin Burchfield, MPA*

HIV perceptions and testing behavior among Asian and Pacific Islanders: Results of the Seattle-area HITS-API study, 2003

Introduction

Starting in the 1990's, the Centers for Disease Control and Prevention (CDC) sponsored several time-limited cross-sectional surveys called the HIV Testing Survey (HITS) to measure frequency and explore correlates of HIV testing in individuals at risk for HIV infection.[1,2] HITS also explored whether perceptions of risk were associated with behavior or willingness to test for HIV. HITS-2000 (see HIV Testing Patterns and Reasons for Delaying Testing by Persons at Risk for HIV – Seattle-King County, HIV/AIDS Epidemiology Report March 2003) was the first local survey. Public Health-Seattle and King County (PHSKC) conducted an additional survey 2002-2003 among Asian and Pacific Islanders (HITS-API) to examine HIV testing patterns and behaviors in API. The API population is the largest non-White group in King County (13.4%).

Little is known about the HIV risk practices and HIV testing experiences of API.[3] National data show that API have a lower risk of AIDS than do Whites and a much lower rate than other Persons of Color.[4] However, API are frequently misclassified as another race or ethnicity in AIDS surveillance data which would reduce API AIDS rates.[5,6] Also, formative research indicated that API may not be very open to discussing sexual experiences or drug use, especially to perceived "outsiders", and HIV transmission risk is often hard to obtain. Local studies with limited data suggest that API are under-represented among at-risk STD clinic and drug treatment patients compared to their prevalence in King County. One local study found that young men who have sex with men (MSM) API had a similar HIV risk compared to other young MSM.[7] HITS API offered an opportunity to examine risk and HIV testing behavior and how API perceived risk of HIV infection.

Methodology

The questionnaire for HITS-API was derived from the national HITS-2001 survey with additional questions added to specify API ancestry and for interviewers to rate the reliability of each subject. HITS-API was conducted anonymously and targeted participants from three different at-risk populations: MSM who had sexual contact with one or more men in the previous 12 months, heterosexuals (HET) who had two or more sexual partners in the previous 12 months, and injection drug users (IDU) who had actively injected drugs in the previous 12 months. The interviews took place between June 2002 and June 2003 with a goal or recruiting 100 subjects from each of the three at-risk populations. Screening questions confirmed that subjects could complete the interview in English, were at least 18 years of age, a resident of Washington state for at least 6 months, self-identified as being API, and fulfilled the criteria for one or more at-risk groups (MSM, HET or IDU). Various recruitment efforts were utilized, including outreach worker recruitment, venue recruitment, respondent-driven sampling and placement of flyers at different locations and in API publications. All interviewees provided informed consent prior to commencement of the interview. Trained staff conducted the interviews, and subjects received $25 for their participation. Relevant data from HITS-2000 were analyzed and compared to HITS-API to provide comparisons between the at-risk API population and a more racially/ethnically diverse cross-section of at-risk populations in Seattle and King County.

Results

Of the 187 individuals who were screened for the HITS-API survey, 165 (88%) were included in these analyses. Four were excluded for not being API, twelve did not report "at-risk" behavior as in the eligibility criteria, and six were already HIV positive. Table 1 shows the demographics of the cohort. Fifty-six percent of participants were MSM, 39% were HET and 12% were IDU (totals are greater than 100% due to respondents belonging to more than one at-risk population). Subjects were young – 52% were between the ages of 18 and 24. Education levels were high – 70% had some college education, including 35 % who were college graduates. The majority of the respondents were employed (64%), including 71% of MSM. The majority of participants had seen HIV prevention messages on TV (68%), in newspapers/magazines (72%), at a health center (72%), on a bus/at bus stop (61%) or on a billboard (58%).

A higher percentage of heterosexuals (37%) and IDU (50%) in HITS-API perceived themselves to be at medium to high risk of contracting HIV, relative to 22% of MSM. Most respondents felt they had a low chance of getting HIV (62%) (Table 2a-2b). In comparison with the HITS-2000 data, a smaller proportion of respondents to HITS-API felt they had a medium to high chance of being infected with HIV (28%) than did respondents in the HITS-2000 study (33%). Only 10% of HITS-API respondents described their chances of getting HIV as none versus 26% of those in HITS-2000. All API IDU felt at least some chance of getting HIV compared with 28% in the HITS-2000 (n=97) group that reported no chance of infection.

Among HITS-API respondents, 70% had been tested for HIV, 47% tested in the previous year and 32% tested regularly, defined as testing every 6 months or at the same time every year (Table 3a). Most participants had tested for HIV at least once, regardless of perceived risk. Thirty-five percent of participants that perceived a medium or high risk of getting HIV tested regularly compared to the 33% of participants with a low or no perceived risk testing regularly. A higher proportion of participants in HITS-2000 had ever been tested (89%), tested in the past year (67%) and tested regularly (43%) relative to HITS-API participants (Table 3b).

Tables 4 and 5 show condom usage with non-primary sex partners and perceived risk. Among 63 heterosexuals with non-primary sex partners, 32% described a medium to high chance to getting HIV (Table 4). Of those, half sometimes or never used condoms with non-primary sex partners. Heterosexual sex included data for both vaginal and anal sex. Sixty-six percent of heterosexual respondents who only sometimes or never used condoms with non-primary sex partners reported their chance of getting HIV to be low or none. Seventy-seven percent of men who had sex with male non-primary partners and always used condoms described their chance of getting HIV to be low or none (Table 5). Only 28% of MSM respondents with non-primary sex partners perceived themselves at a medium to high chance of getting HIV, and of those, 50% sometimes or never used condoms. Data for MSM sexual behavior included both insertive and receptive anal sex. For both heterosexuals and MSM with non-primary sex partners, most (57% and 66%, respectively) perceived a low chance of being infected with HIV despite over half not always using condoms with non-primary partners.

Drug use in the HITS-API population was found in all three at-risk populations (Table 6). Forty-two percent (42%) of MSM, 66% of heterosexuals and all IDU used drugs in the previous year. Almost 70% of respondents that perceived their chance of getting HIV to be medium to high had used drugs in the previous year.

Associations between unsafe behavior and HIV testing are shown in Table 7 for both HITS-API and HITS-2000. Unsafe behavior was defined as sex with non-primary partners where condoms were not always used in the past year or ever sharing a needle or injection equipment for injection drug use in the past year. For HITS-API, there was no association between HIV testing and unsafe behavior (odds ratio [OR] = 0.9, not statistically significant). However, HITS-2000 respondents with unsafe behavior were more likely to get HIV tested in the past year (OR=1.8, CI=1.1-3.2).

Discussion

The majority of respondents in the HITS-API study were well educated and informed about HIV infection and prevention. Almost half (47%) had received an HIV test in the past year, compared to 67% of HITS-2000 participants (66% versus 64%). In general, respondents understood transmission and testing options and were aware of prevention messages in their community. Based on participant responses, the overall perceived risk for HIV infection was high, and many engaged in high-risk activities, including unprotected sexual activity and drug use. Nearly half of persons claiming to be at low to no risk of HIV did not always use condoms with non-primary partners. This may suggest that prevention messages are not effectively targeting this population. Due to language and cultural barriers, the HITS-API study excluded non-English speaking API from interviews. If a barrier exists between prevention and the HITS-API respondents, a much greater barrier may separate non-English speaking API from receiving education and prevention messages.

The results from the HITS-API study in the Seattle area were limited by several factors. Recruitment efforts were restricted due to lack of API specific venues where MSM, HET and IDU might be found and potential cultural and social impact caused by the interviewers being of discordant heritage, race and /or ethnicity from subjects. The interviewers were challenged with recruiting participants in a population that may have been especially reluctant to discuss issues of sex and drug use.

• Contributed by Erin Kahle in collaboration with Mark Freedman and Jennifer Stephens

References

1. Woods WJ, et al. Name-based reporting of HIV-positive test results as a deterrent to testing. *American Journal of Public Health*. 1999;89(7): 1097-100.
2. Kegeles SM, et al. Mandatory reporting of HIV would deter men from being tested. *JAMA*. 1989;261:1275-1276.
3. Shapiro J, Vives G. Demographic and attitudinal variables related to high-risk behaviors in Asian males who have sex with men. *AIDS Patient Care STDs*. 1999;13:337-75.
4. Haverkos HW, et al. Relative rates of AIDS among racial/ethnic groups by exposure categories. *J Natl Med Assoc*. 1999;91:17-24.
5. Kelly JJ, et al. Race/ethnicity misclassification of persons reported with AIDS. *Ethn Health*. 1996;1:87-94.
6. Courogen M. Racial and ethnicity classification of persons with HIV/AIDS in Washington State: a comparison of two public health databases. *HIV/AIDS Epidemiology Report Washington State/ Seattle & King County*. 1999;4:14-16.
7. Choi K, et al. Unprotected sex and associated risk factors among young Asian and Pacific Islander men who have sex with men. AIDS Educ Prev. 2002;14(6):472-481.

Table 1. Demographic characteristics of HITS-API respondents

CHARACTERISTIC	MSM N=93		HETERO N=65		IDU N=20		TOTAL N=165[1]	
	N	(C%)	N	(C%)	N	(C%)	N	(C%)
Race/Ethnicity								
White	12	(13)	10	(15)	13	(65)	29	(18)
Black	3	(3)	3	(5)	1	(5)	6	(4)
Hispanic	4	(4)	10	(15)	2	(10)	15	(9)
Asian	84	(90)	44	(68)	17	(18)	139	(84)
Pacific Islander	21	(23)	29	(45)	4	(20)	51	(31)
American Indian/Alaska Native	1	(1)	1	(2)	3	(15)	5	(3)
Multi-racial	28	(30)	26	(4)	14	(70)	63	(38)
Sex								
Male	91	(98)	25	(38)	17	(85)	122	(74)
Female	0	(0)	40	(62)	3	(15)	41	(25)
Transgender	2	(2)	0	(0)	0	(0)	2	(1)
Age								
18-24	39	(42)	44	(68)	6	(30)	85	(52)
25-29	19	(20)	6	(9)	3	(15)	25	(15)
30-39	24	(26)	12	(18)	7	(35)	39	(24)
40-49	9	(10)	1	(2)	3	(15)	11	(7)
= 50	2	(2)	2	(3)	1	(5)	5	(3)
Education								
Did not complete high school	8	(9)	6	(9)	4	(20)	16	(10)
High school diploma or equivalent	10	(11)	20	(31)	8	(40)	34	(21)
Some college	30	(32)	28	(43)	6	(30)	58	(35)
Four plus years college	45	(48)	11	(17)	2	(10)	57	(35)
Employment								
Unemployed	27	(29)	28	(43)	11	(55)	60	(36)
Employed	66	(71)	37	(57)	9	(45)	105	(64)
Housing Situation								
Rent home/apt	46	(49)	31	(48)	4	(20)	77	(47)
Own home	18	(19)	5	(8)	0	(0)	22	(13)
Live with friends/family (don't pay rent)	24	(26)	22	(34)	3	(15)	48	(29)
Live in hotel/rooming house	0	(0)	0	(0)	1	(5)	1	(1)
Homeless	2	(2)	6	(9)	10	(50)	12	(7)
Other	3	(3)	1	(2)	2	(10)	5	(3)
Heard about HIV Prevention (past 12 mos):								
On the radio	38	(41)	40	(62)	11	(55)	82	(50)
On TV	66	(71)	42	(65)	13	(65)	113	(68)
In newspaper/magazine	77	(83)	39	(60)	13	(65)	119	(72)
At health center	62	(67)	47	(72)	16	(80)	118	(72)
At sex club/bath house	26	(28)	1	(2)	3	(15)	29	(18)
On the internet	50	(54)	19	(29)	1	(5)	70	(42)
On a bus/at bus stop	56	(60)	38	(58)	13	(65)	101	(61)
On a billboard	62	(67)	28	(43)	14	(70)	95	(58)
Other location	24	(26)	13	(20)	5	(25)	40	(24)

C% designates column percents.

[1] Sum of groups is greater than 165 as subjects may meet more than one risk category.

Table 2a. Perceived chance of being infected with HIV - HITS-API

PERCEIVED RISK	MSM		HETERO		IDU		TOTAL	
	N	(C%)	N	(C%)	N	(C%)	N	(C%)
High/Medium	20	(22)	24	(42)	10	(50)	46	(28)
Low	67	(72)	31	(48)	10	(50)	103	(62)
None	6	(5)	10	(15)	0	(0)	16	(10)
TOTAL	**93**		**65**		**20**		**165**	

C% designates column percents.

Table 2b. Perceived chance of being infected with HIV - HITS-2000

PERCEIVED RISK*	MSM		HETERO		IDU		TOTAL	
	N	(C%)	N	(C%)	N	(C%)	N	(C%)
High/Medium	16	(19)	29	(32)	43	(44)	88	(33)
Low	40	(48)	40	(44)	23	(24)	103	(38)
None	21	(25)	21	(23)	27	(28)	69	(26)
TOTAL	**77**		**90**		**93**		**260**	

C% designates column percents.
*10 had missing data.

Table 3a. Perceived chance of being infected with HIV and testing behavior - HITS-API

PERCEIVED RISK	Ever tested		Tested past year		Tested regularly	
	N	(R%)	N	(R%)	N	(R%)
High/Medium (N=46)	35	(76)	22	(48)	16	(35)
Low (N=103)	73	(71)	51	(50)	33	(32)
None (N=10)	8	(80)	4	(40)	4	(40)
TOTAL (N=165)	**116**	**(70)**	**77**	**(47)**	**53**	**(32)**

R% designates row percents.

Table 3b. Perceived chance of being infected with HIV and testing behavior – HITS-2000

PERCEIVED RISK*	Ever tested		Tested past year		Tested regularly	
	N	(R%)	N	(R%)	N	(R%)
High/Medium (N=88)	82	(93)	61	(69)	36	(41)
Low (N=103)	89	(86)	68	(66)	45	(44)
None (N=69)	61	(88)	44	(64)	30	(43)
TOTAL (N=260)	**232**	**(89)**	**173**	**(67)**	**111**	**(43)**

R% designates row percents.
*10 had missing data.

Table 4. Perceived chance of being infected with HIV and condom usage among heterosexuals with non-primary sex partners (vaginal and anal sex) - HITS-API

PERCEIVED RISK	ALWAYS		NOT ALWAYS		TOTAL	
	N	(C%)	N	(C%)	N	(C%)
High/Medium	10	(30)	10	(33)	20	(32)
Low	20	(61)	16	(53)	36	(57)
None	3	(9)	4	(13)	7	(11)
TOTAL	**33**		**30**		**63**	

C% designates column percents.

Table 5. Perceived chance of being infected with HIV and condom usage among men who have sex with male non-primary sex partners (receptive and insertive anal sex) - HITS-API

PERCEIVED RISK	ALWAYS		NOT ALWAYS		TOTAL	
	N	(C%)	N	(C%)	N	(C%)
High/Medium	8	(24)	8	(33)	16	(28)
Low	22	(65)	16	(67)	38	(66)
None	4	(12)	0	(0)	4	(7)
TOTAL	**34**		**24**		**58**	

C% designates column percents.

Table 6. Perceived chance of being infected with HIV among respondents with any drug use in past year HITS-API

PERCEIVED RISK	MSM		HETERO		IDU		TOTAL	
	N	(C%)	N	(C%)	N	(C%)	N	(C%)
High/Medium	11	(28)	17	(40)	10	(50)	32	(35)
Low	26	(67)	20	(47)	10	(50)	51	(56)
None	2	(5)	6	(14)	0	(0)	8	(9)
TOTAL	**39**		**43**		**20**		**91**	

C% designates column percents.

Table 7. HIV testing in past year by whether respondent claimed any unsafe behavior - HITS-API and HITS-2000

	HITS-API				HITS-2000			
	Testing in past year		No testing in past year		Testing in past year		No testing in past year	
	N	(R%)	N	(R%)	N	(R%)	N	(R%)
Agreggate HIV risk:								
Unsafe behavior	28	(48)	30	(52)	76	(76)	24	(24)
No unsafe behavior	49	(46)	58	(54)	107	(63)	63	(37)
O.R. (95% C.I.)	0.9 (0.5-1.7)				1.9 (1.1-3.2)			

R% designates row percents.

The interaction between Herpes Simplex Virus and Human Immunodeficiency Virus

Background: Epidemiologic data on HSV-2 and HIV infection

HSV-2 and HIV susceptibility

Over the past 2 decades, numerous observational studies have suggested that of all the sexually transmitted infections (STIs) that may increase the probability of HIV acquisition and transmission, genital herpes (HSV-2) may be the most important. HSV-2 infection rates range from 22% of sexually active adults in the US, 60% of HIV-negative men who have sex with men (MSM) in Peru, and up to 70% of HIV-negative women in sub-Saharan Africa.

Over 30 epidemiologic studies have demonstrated that prevalent HSV-2 increases the risk of HIV-1 acquisition from two to four-fold.[1] Mechanisms accounting for this increased susceptibility are likely related to a "portal of entry" in genital lesions and the presence of increased numbers of activated target cells for HIV (i.e., CD4+ lymphocytes and macrophages). Up to 90% of persons who have HSV-2 infection are unaware of it until they are tested for the presence of HSV-2 specific antibodies, and with counseling are able to recognize genital ulcers and the milder forms of HSV-2 reactivation such as tingling, itching, and small fissures.

HSV-2 and HIV infectiousness

HSV-2 may also increase the infectiousness of HIV-infected individuals, the majority of whom are also infected with HSV-2. HIV-1 infected persons who are co-infected with HSV-2 experience more frequent subclinical and clinical reactivations of HSV-2 than HIV-uninfected persons, particularly among those with CD4 counts <200 and even among those on HAART. The majority of HSV-2 reactivation is subclinical in HIV-infected persons. During HSV-2 reactivation in HIV-infected persons, studies have shown increased mucosal shedding of HIV, which could lead to greater infectiousness.

HSV-2 and HIV natural history

Studies conducted in the early 1990s during the era of zidovudine (AZT) monotherapy looked at whether addition of acyclovir might improve outcomes. Most of the studies were too small to provide a definitive answer, so a pooled analysis of eight randomized trials that included 1,792 patients and 2,947 patient-years of follow-up was performed. This analysis showed that patients treated with suppressive acyclovir had a 20% smaller risk of death compared with patients not treated with acyclovir.[2]

A subsequent study, conducted prior to the availability of potent antiretroviral therapy, showed that persons with HSV-2 infection have lower viral loads when they are treated with daily acyclovir. While the decrease in HIV RNA was about 48% - less than observed during treatment with potent antiretrovirals - this difference may translate into a substantial impact on long term progression of HIV disease.[3]

HSV-2 Suppression to prevent transmission of HSV-2

A recent randomized placebo-controlled multicenter trial was published that showed that daily suppressive valacyclovir therapy reduced the acquisition of HSV-2 by 50% in HSV-2 discordant couples. This landmark study was the first trial to demonstrate that transmission of a sexually-transmitted viral infection can be prevented by suppressive treatment.[4]

Interventions to interrupt HSV-2 and HIV transmission

HSV-2 Treatment to prevent transmission or acquisition of HIV

The University of Washington is leading two parallel proof-of-concept studies to assess whether HSV-2 increases susceptibility to and infectiousness of HIV. The most direct way to assess the contribution of HSV-2 to HIV acquisition is to suppress HSV-2 reactivation with anti-HSV drugs in a randomized, double-blind, placebo controlled study. Such a trial is currently underway among HIV-negative MSM in the United States and Peru and among heterosexual women in Africa. Because of excellent efficacy and tolerability, low incidence of adverse events, and low cost as a generic drug, acyclovir 400 mg bid is the drug undergoing testing. This trial is currently enrolling HIV negative MSM who are HSV-2 seropositive in Seattle through the University of Washington. Inquiries or referrals can be made at (206) 520-3800. Hopefully the results will provide a direct measure of the risk of HIV that is attributable to HSV-2 reactivation.

A second study, funded by the Bill and Melinda Gates Foundation, is being conducted to study the effect of genital herpes on HIV transmission among heterosexual HIV-discordant couples in which the HIV positive partner also has HSV-2 infection and will be randomized to daily acyclovir or placebo. This trial of HSV-2 suppression on HIV transmission will be primarily conducted at sites in Africa and India, and will be initiated in mid-2004. The success of the recent study examining the effect of valacyclovir on HSV-2 transmission in heterosexual, HSV-2 discordant couples suggests that these studies are feasible.

Summary: HSV-2 and HIV "Links"

New approaches to reduce the transmission of HSV-2 and HIV-1 are critically needed. Substantial observational data indicate a link between HSV-2 and HIV. HIV negative individuals at risk for HIV infection who have genital herpes are twice as likely to acquire HIV. People co-infected with HIV and HSV-2 reactivate their HSV-2 infection more frequently and are more likely to shed HIV in higher quantities; consequently, they may be more infectious to their partners during unprotected sex.

More research is needed to examine the link between genital herpes treatment and HIV acquisition and transmission, and to identify strategies for HIV prevention by preventing, suppressing, or treating genital HSV-2 infection. Two "proof of concept" studies are being conducted by the University of Washington to test whether suppressive antiviral therapy can prevent HIV acquisition and transmission, respectively. Depending on the results of this research, HSV-2 prevention, diagnosis, suppression, and treatment may become important tools for HIV prevention efforts.

• *Contributed by Connie Celum, MD, MPH*

References

1. Wald A, Link K. Risk of human immunodeficiency virus infection in herpes simplex virus type 2-seropositive persons: a meta-analysis. *J Infect Dis* 2002;**185**(1)**:**45-52.
3. Schacker T, Zeh J, Hu H, Shaughnessy M, Corey L. Changes in Plasma Human Immunodeficiency Virus Type 1 RNA Associated with Herpes Simplex Virus Reactivation and Suppression. *J Infect Dis* 2002;**186**(12)**:**1718-1725.
2. Ioannidis JPA, Collier AC, Cooper DA, et al. Clinical efficacy of high-dose acyclovir in patients with human immunodeficiency virus infection: a meta-analysis of randomized individual patient data. *J Infect Dis* 1998;**178**(2)**:**349-59.
4. Corey L, Wald A, Patel R, et al. Once-daily valacyclovir to reduce the risk of transmission of genital herpes. N Engl J Med 2004;350:11-20.

HIV antiretroviral resistance among antiretroviral naïve persons—Seattle/King County Washington

Resistance testing among antiretroviral treatment-naïve persons recently infected with HIV is increasingly recommended on a routine basis in the US.[1] The clinical value of antiretroviral resistance testing at this early stage of HIV infection depends in part on the prevalence of resistance-associated mutations among recently infected persons, and in part on the persistence of resistant virus. It was previously thought that during the period from HIV infection to commencing HAART, wild-type HIV would replace antiretroviral-resistant HIV due to a better replicative capacity in wild-type virus. However, it is now known that resistant virus can persist indefinitely.[2] To estimate the local population-level prevalence of antiretroviral resistance, Public Health has participated in two surveillance projects.

In the first project, specimens were collected during 1997-1999 from drug-naïve persons recently infected with HIV. HIV-1 protease and reverse transcriptase RNA sequences were amplified from plasma by RT-PCR, sequenced and analyzed. Of 47 patients, 5 (15%) had resistance-associated mutations: 3 had primary mutations associated with resistance to nucleoside reverse transcriptase inhibitors (NRTI) or non-nucleoside-RTIs (NNRTI), and 3 patients had secondary NTRI mutations. No primary mutations associated with resistance to protease inhibitors (PI) were found. Additional details are in a publication that also includes data from Los Angeles.[3]

The second project is called ARVDRT, or Antiretroviral Drug Resistance Testing and it started in July 2003 and is ongoing. People with HIV infection who are newly diagnosed at Public Health — Seattle & King County facilities are eligible for resistance testing if they have leftover HIV-diagnostic sera from a first positive HIV test, they are 14 years of age or older, Washington residents, not known to be taking antiretrovirals, and had not previously tested HIV positive (more than 90 days prior) per local surveillance or other records. Both persons anonymously and confidentially registered are eligible which may lead to potential duplication if anonymously registered clients retest at a later time under a different anonymous code. To date, 72 people have been eligible, and of these 63 (88%) had sufficient quantities of leftover diagnostic sera to amplify their HIV RNA and run a genotypic resistance test. Of the 63, 7 (11%) have had high levels of resistance to one or more antiretroviral. Only 2 (3%) have had multidrug resistance with high level resistance to one or more drug in two or more classes of drugs (PI, NNRTI, and NRTI). Overall, 2 people had high level resistance to one or more PI (indinavir, nelfinavir, and saquinavir); 3 people had high level resistance to a single NRTI (zidovudine), and 5 people had high level resistance to two or more NNRTI (delavirdine, efavarenz, and nevirapine).

For additional information on the ARVDRT project, please call the principal investigator, Susan Buskin, at (206) 205-6123. If you have a patient whom you believe may have been eligible and you would like to request a copy of their resistance test results, your patient can recontact their HIV test counselor to fill out a standard health department medical information release authorization. Alternatively you may call Libby Charhon Page at (206) 205-1470.

• *Contributed by Susan Buskin, PhD, MPH*

References

1. Hirsch MS et al. Antiretroviral drug resistance testing in adults infected with human immunodeficiency virus type 1: 2003 recommendations of an International AIDS Society-USA panel. CID 2003;37:113-128.
2. Little SJ et al. Persistence of transmitted drug resistance among subjects with primary HIV infection not receiving antiretroviral therapy [abstract 95]. 9th Conference on Retroviruses and Opportunistic Infections Seattle 2003.
3. Sullivan PS et al. Low prevalence of antiretroviral resistance among persons recently infected with human immunodeficiency virus in two US cities. Int J STD & AIDS 2002;13:554-558.