hiv/aids

2nd HALF `12 EPIDEMIOLOGY REPORT

WASHINGTON STATE • SEATTLE & KING COUNTY

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

Credits

This 81st edition of the HIV/AIDS Epidemiology Report includes data available through the end of December 2012. This report is produced jointly by Public Health – Seattle & King County and the Infectious Disease Assessment Unit, Washington State Department of Health. It is funded partly by a Centers for Disease Control and Prevention cooperative agreement for HIV/AIDS surveillance. We thank the medical providers caring for people with HIV/AIDS and the clinics and patients participating in epidemiologic projects. Their cooperation with public health department HIV/AIDS control efforts permits the collection of data included in this report which are used for further prevention and planning efforts. We also wish to acknowledge the outstanding assistance of our staff, including Christy Johnson, Allison Moore, Rachel Patrick, Michelle Perry, Ariel VanZandt (disease investigation and intervention); Sandy Hitchcock (data entry and quality assurance); Shirley Zhang and Leslie Pringle (data management); and Teal Bell, Amy Bennett, Jen Reuer and Christina Thibault (epidemiologists).

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HIV/AIDS Reporting Requirements

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

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

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

For further information about HIV/AIDS reporting requirements, please call your local health department or the Washington State Department of Health at 888-367-5555. In King County, call 206-263-2000.

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HIV/AIDS Epidemiology publications are online at:
www.kingcounty.gov/healthservices/health/communicable/hiv/epi.aspx.

Alternative formats provided upon request.
To be included on the mailing list or for address corrections,
please call 206-263-2000.

HIV/AIDS Epidemiology and Surveillance News

Executive Summary

HIV reporting: Reporting requirements for HIV are summarized on page ii. Although HIV case reports may be initiated by laboratories and completed by health department staff, we appreciate medical providers submitting case reports directly. Case report forms are available on-line or by calling (888) 367-5555 (State) or (206) 263-2000 (King County). To ensure correct and timely data, reporting of progressions to AIDS, deaths and diagnoses of potential public health significance (unusual strains) are also appreciated.

HIV & AIDS data: Key points from the tables and figures that summarize HIV/AIDS diagnosed among Washington State residents through 12/31/2012:

- 7,104 King County residents were documented as living with HIV (diagnosed and reported to the health department and not known to have died or relocated), including 55% with AIDS (PLWHA); King County estimates a total of 7,200 – 8,000 PLWHA, see Table 1.
- 11,462 documented PLWHA (also 56% with AIDS) were residents of Washington State (which has an estimated 11,500 – 12,700 PLWHA, Table 1)

Care cascade and other metrics: Estimates of King County data suggest about 58% of local PLWHA are virologically suppressed (this compares to fewer than one quarter of U.S. residents from national estimates of virologic suppression). Of individuals with a viral load test reported in the last two years, 83% were virologically suppressed. Over 95% of individuals diagnosed with HIV in 2011 and 2012 were linked to care within three months, as defined by a CD4+ lymphocyte or plasma viral load test reported to the health department from that time period.

Medical Monitoring Project (MMP) in King County: Individuals selected for MMP and interviewed for the 2010 and 2011 cycles were, for the most part, representative of PLWHA reported to HIV surveillance. MMP participants were less likely to be foreign born — in part because the interviews are conducted only in English and Spanish — and have undetectable viral load — because MMP is a sample of PLWHA in medical care. Cigarette smoking (42%), binge alcohol drinking (15%), gaps in health insurance coverage (13%), homelessness (11%), injection drug use (8%), and incarceration (6%) are some of the factors likely to present challenges and increased morbidity among these PLWHA.

2011 National HIV Behavioral Survey (NHBS) of Seattle area men who have sex with men (MSM): The 2011 NHBS of MSM in the Seattle area was the second Seattle NHBS MSM survey; the earlier one was conducted in 2008. HIV prevalence was slightly higher (19%) in 2011 relative to 2008 (16%) and was also elevated among African Americans, relative to other race/ethnicities, and increased with age. Most HIV-infected MSM (81%) were aware of their infection. Among HIV uninfected MSM, HIV testing in the last 12 months was more common among individuals with two or more partners, more than a high school education, and any STD diagnoses in the past year.

Estimating HIV incidence in King County and Washington State: HIV incidence surveillance is a national effort aimed at tracking new HIV infections — rather than new HIV diagnoses as the national HIV surveillance system tracks. In this article, trends in new HIV infections and diagnoses in King County and Washington State are presented and compared, with the finding that case counts are a reasonably good estimate of new, or incident infections.

Seattle and King County STD report: In WA, HIV is primarily a sexually transmitted disease with about 79% of newly-diagnosed people reporting sexual risk factors and no injection drug or other HIV exposures. The 300 –350 annual new HIV cases in King County are fewer than the annual number of syphilis cases and much fewer than the annual numbers of chlamydia and gonorrhea in King County. Trends of STD morbidity and HIV testing history for at-risk individuals are presented in this annual summary.

Tuberculosis and HIV: Globally, it is estimated that TB may be responsible for up to a quarter of HIV related deaths. TB-HIV co-infection is associated with negative outcomes relative to mono-infection. In this brief article, we summarize the impact and rationale for a more simple and rapid regimen for the treatment of latent TB as background for a currently enrolling clinical trial.

University of Washington AIDS Clinical Trials Unit (ACTU) Current Studies: A summary of the enrollment criteria, goals and procedures for all currently enrolling studies is presented here.

HIV /AIDS Data in King County and Washington

Snapshot	King County	Washington
1. Estimated[1] number living with HIV/AIDS	7,200 to 8,000	11,500 to 12,700
2. Estimated new HIV infections 2011	300 to 350	500 to 600
3. Estimated 2011 deaths among people with HIV or AIDS	75	130
4. Proportion with HIV who know their HIV status	80% to 90%	80% to 90%
5. Reported[1] number of people living with HIV/AIDS	7,104	11,462

Table 1: Surveillance of reported HIV/AIDS cases, deaths, and people living with HIV/AIDS - reported as of 12/31/2012 - King County, other Washington counties, Washington, and the U.S.

		HIV	AIDS	Total
King County	New cases reported in 2nd half 2012	128	30	158
	Cases reported year-to-date	244	91	335
	Cumulative Cases	3,405	8,504	11,909
	Cumulative Deaths	200	4,605	4,805
	Persons Living (prevalent cases)	3,205	3,899	**7,104**
Washington State	New cases reported in 2nd half 2012	226	56	282
	Cases reported year-to-date	421	166	587
	Cumulative Cases	5,430	13,600	19,030
	Cumulative Deaths	380	7,188	7,568
	Persons Living (prevalent cases)	5,050	6,412	**11,462**
United States[2]	Cases reported as of 12/31/2011			
	Cumulative Cases	Unknown	1,190,719	Unknown
	Cumulative Deaths	Unknown	658,992	Unknown
	Persons Living (prevalent cases)	360,130	531,727	**891,857**

1. The difference between the estimated number (line 1) and the reported number (line 5) above include
   i. A small number of AIDS diagnoses not yet reported (perhaps 5% of total AIDS reports).
   ii. An unknown number of people diagnosed with HIV but not yet reported.
   iii. An unknown number of people (10-20% of the total) infected with HIV but not yet diagnosed or reported.
2. U.S. data include HIV and AIDS data from 50 states plus 6 U.S. dependent areas. Estimated from 2011 U.S. CDC HIV Surveillance Report.

Table 2: Cumulative HIV/AIDS case counts and deaths by resident county at diagnosis - reported as of 12/31/2012 - Washington State

	Cumulative	Deaths		Presumed Living			
	Cases	N	%[1]	HIV	AIDS	Total	Total %[2]
Adams	7	1	14%	0	6	6	0.1%
Asotin	26	8	31%	6	12	18	0.2%
Benton	156	43	28%	45	68	113	1.0%
Chelan	78	29	37%	24	25	49	0.4%
Clallam	87	43	49%	19	25	44	0.4%
Clark	742	260	35%	213	269	482	4.2%
Columbia	7	4	57%	0	3	3	<0.1%
Cowlitz	162	68	42%	49	45	94	0.8%
Douglas	9	2	22%	3	4	7	0.1%
Ferry	7	6	86%	0	1	1	<0.1%
Franklin	91	22	24%	27	42	69	0.6%
Garfield	1	0	<1%	1	0	1	<0.1%
Grant	62	23	37%	15	24	39	0.3%
Grays Harbor	97	38	39%	20	39	59	0.5%
Island	96	43	45%	25	28	53	0.5%
Jefferson	41	18	44%	10	13	23	0.2%
King	11,909	4,805	40%	3,205	3,899	7,104	62.0%
Kitsap	338	139	41%	85	114	199	1.7%
Kittitas	24	10	42%	3	11	14	0.1%
Klickitat	17	8	47%	6	3	9	0.1%
Lewis	62	28	45%	11	23	34	0.3%
Lincoln	4	2	50%	0	2	2	<0.1%
Mason	136	35	26%	42	59	101	0.9%
Okanogan	39	14	36%	7	18	25	0.2%
Pacific	35	13	37%	11	11	22	0.2%
Pend Orielle	9	6	67%	0	3	3	<0.1%
Pierce	1,750	710	41%	495	545	1,040	9.1%
San Juan	29	12	41%	6	11	17	0.1%
Skagit	109	46	42%	28	35	63	0.5%
Skamania	8	7	88%	0	1	1	<0.1%
Snohomish	1,136	406	36%	295	435	730	6.4%
Spokane	794	345	43%	180	269	449	3.9%
Stevens	27	17	63%	6	4	10	0.1%
Thurston	300	108	36%	72	120	192	1.7%
Wahkiakum	3	0	<1%	1	2	3	0.0%
Walla Walla	68	34	50%	8	26	34	0.3%
Whatcom	246	101	41%	57	88	145	1.3%
Whitman	23	4	17%	5	14	19	0.2%
Yakima	295	110	37%	70	115	185	1.6%
Total	**19,030**	**7,568**	**40%**	**5,050**	**6,412**	**11,462**	**100%**

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

Table 3: Demographic characteristics of people presumed living with HIV/AIDS – reported as of 12/31/2012 - King County, other Washington counties, and all Washington State.

	King County		Other Counties		Washington State	
	N	%	N	%	N	%
Sex						
Male	6,353	89%	3,519	81%	9,872	86%
Female	751	11%	839	19%	1,590	14%
Age Group at diagnosis of HIV						
Under 13 years	39	1%	52	1%	91	1%
13-19 years	130	2%	121	3%	251	2%
20-29 years	2,034	29%	1,287	30%	3,321	29%
30-39 years	2,923	41%	1,525	35%	4,448	39%
40-49 years	1,470	21%	946	22%	2,416	21%
50-59 years	419	6%	324	7%	743	6%
60 years and over	89	1%	103	2%	192	2%
Current Age as of 12/31/2012						
Under 13 years	11	<1%	19	<1%	30	<1%
13-19 years	21	<1%	27	1%	48	<1%
20-29 years	430	6%	321	7%	751	7%
30-39 years	1,206	17%	796	18%	2,002	17%
40-49 years	2,530	36%	1,448	33%	3,978	35%
50-59 years	2,094	29%	1,233	28%	3,327	29%
60 years and over	812	11%	514	12%	1,326	12%
Race/Ethnicity[1]						
White	4,709	66%	2,930	67%	7,639	67%
Black	1,201	17%	564	13%	1,765	15%
Hispanic	758	11%	563	13%	1,321	12%
Asian & Pacific Islander	248	3%	149	3%	397	3%
Native American or Alaskan Native	68	1%	86	2%	154	1%
Multiple Race	120	2%	54	1%	174	2%
Unknown Race	0	0%	12	0%	12	0%
HIV Exposure Category						
Male-male sex	4,904	69%	2,215	51%	7,119	62%
Injection drug use (IDU)	326	5%	471	11%	797	7%
IDU & male-male sex	612	9%	360	8%	972	8%
Heterosexual contact[2]	694	10%	763	18%	1,457	13%
Blood product exposure[3]	28	<1%	32	1%	60	1%
Perinatal exposure	31	<1%	42	1%	73	1%
Other/Undetermined[3]	509	7%	475	11%	984	9%
Total	**7,104**	**100%**	**4,358**	**100%**	**11,462**	**100%**

1. All race and ethnicity categories are mutually exclusive; Asian, Native Hawaiian, and Pacific islanders were grouped due to small cell sizes.
2. King County and Washington data include presumed heterosexual cases (females who deny injection drug use but have had sexual intercourse with a man whose HIV status or HIV risk behaviors are unknown).
3. Undetermined mode of exposure includes cases with incomplete information, and males with heterosexual contact where the heterosexual partner(s) are not known to be HIV-infected, IDU, or bisexual male. One King/ WA case was probably infected through occupational exposure.

Table 4: People presumed living with HIV/AIDS by gender, race or ethnicity, and HIV exposure category – reported as of 12/31/2012 - King County

	White[1]		Black[1]		Hispanic		Asian & PI[1,2]		Native Am/AN[1,3]		Total[4]	
HIV Exposure Category	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Male												
Male-male sex	3,707	79%	414	34%	522	69%	158	64%	28	41%	4,904	69%
Injection drug use (IDU)	109	2%	56	5%	32	4%	6	2%	5	7%	214	3%
IDU & male-male sex	481	10%	44	4%	50	7%	5	2%	13	19%	612	9%
Heterosexual contact	46	1%	110	9%	24	3%	6	2%	0	<1%	187	3%
Blood product exposure	13	<1%	3	<1%	0	<1%	0	<1%	0	<1%	16	<1%
Perinatal exposure	1	<1%	8	1%	0	<1%	2	1%	0	<1%	12	<1%
Undetermined/other	113	2%	180	15%	73	10%	36	15%	2	3%	408	6%
Male Subtotal	**4,470**	**95%**	**815**	**68%**	**701**	**92%**	**213**	**86%**	**48**	**71%**	**6,353**	**89%**
Female												
Injection drug use (IDU)	63	1%	33	3%	3	<1%	0	<1%	8	12%	112	2%
Heterosexual contact[5]	153	3%	267	22%	43	6%	25	10%	12	18%	507	7%
Blood product exposure	4	<1%	8	1%	0	<1%	0	<1%	0	<1%	12	<1%
Perinatal exposure	2	<1%	13	1%	2	<1%	2	1%	0	<1%	19	<1%
Undetermined/other	17	<1%	65	5%	9	1%	8	3%	0	<1%	101	1%
Female Subtotal	**239**	**5%**	**386**	**32%**	**57**	**8%**	**35**	**14%**	**20**	**29%**	**751**	**11%**
Total	**4,709**	**100%**	**1,201**	**100%**	**758**	**100%**	**248**	**100%**	**68**	**100%**	**7,104**	**100%**

Table 5: People presumed living with HIV/AIDS by gender, race or ethnicity, and HIV exposure category – reported as of 12/31/2012 – Washington State

	White[1]		Black[1]		Hispanic		Asian & PI[1,2]		Native Am/AN[1,3]		Total[4]	
HIV Exposure Category	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Male												
Male-male sex	5,373	70%	591	33%	769	58%	221	56%	55	36%	7,119	62%
Injection drug use (IDU)	324	4%	93	5%	68	5%	9	2%	13	8%	517	5%
IDU & male-male sex	771	10%	66	4%	81	6%	7	2%	20	13%	972	8%
Heterosexual contact	136	2%	169	10%	69	5%	15	4%	8	5%	400	3%
Blood product exposure	36	<1%	3	<1%	2	<1%	0	<1%	0	<1%	41	<1%
Perinatal exposure	7	<1%	20	1%	2	<1%	2	1%	1	1%	34	<1%
Undetermined/other	304	4%	245	14%	165	12%	59	15%	7	5%	789	7%
Male Subtotal	**6,951**	**91%**	**1,187**	**67%**	**1,156**	**88%**	**313**	**79%**	**104**	**68%**	**9,872**	**86%**
Female												
Injection drug use (IDU)	180	2%	58	3%	17	1%	4	1%	15	10%	280	2%
Heterosexual contact[5]	441	6%	386	22%	122	9%	59	15%	33	21%	1,057	9%
Blood product exposure	6	<1%	9	1%	1	<1%	3	1%	0	<1%	19	<1%
Perinatal exposure	7	<1%	23	1%	5	<1%	4	1%	0	<1%	39	<1%
Undetermined/other	54	1%	102	6%	20	2%	14	4%	2	1%	195	2%
Female Subtotal	**688**	**9%**	**578**	**33%**	**165**	**12%**	**84**	**21%**	**50**	**32%**	**1,590**	**14%**
Total	**7,639**	**100%**	**1,765**	**100%**	**1,321**	**100%**	**397**	**100%**	**154**	**100%**	**11,462**	**100%**

1. And not Hispanic. All race and ethnicity categories are mutually exclusive.
2. Due to small cell sizes, data have been combined for Asians, Native Hawaiians, and other Pacific Islanders.
3. Native American or Alaska Native.
4. Totals include 120 King County and 174 Washington persons classified as multiple race, and 12 Washington persons with missing race.
5. Includes presumed heterosexual cases (females who deny injection drug use but have had sexual intercourse with a man whose HIV status and HIV risk behaviors are unknown).

Table 6: People presumed living with HIV/AIDS by gender and age at HIV diagnosis – reported as of 12/31/2012— King County and Washington State

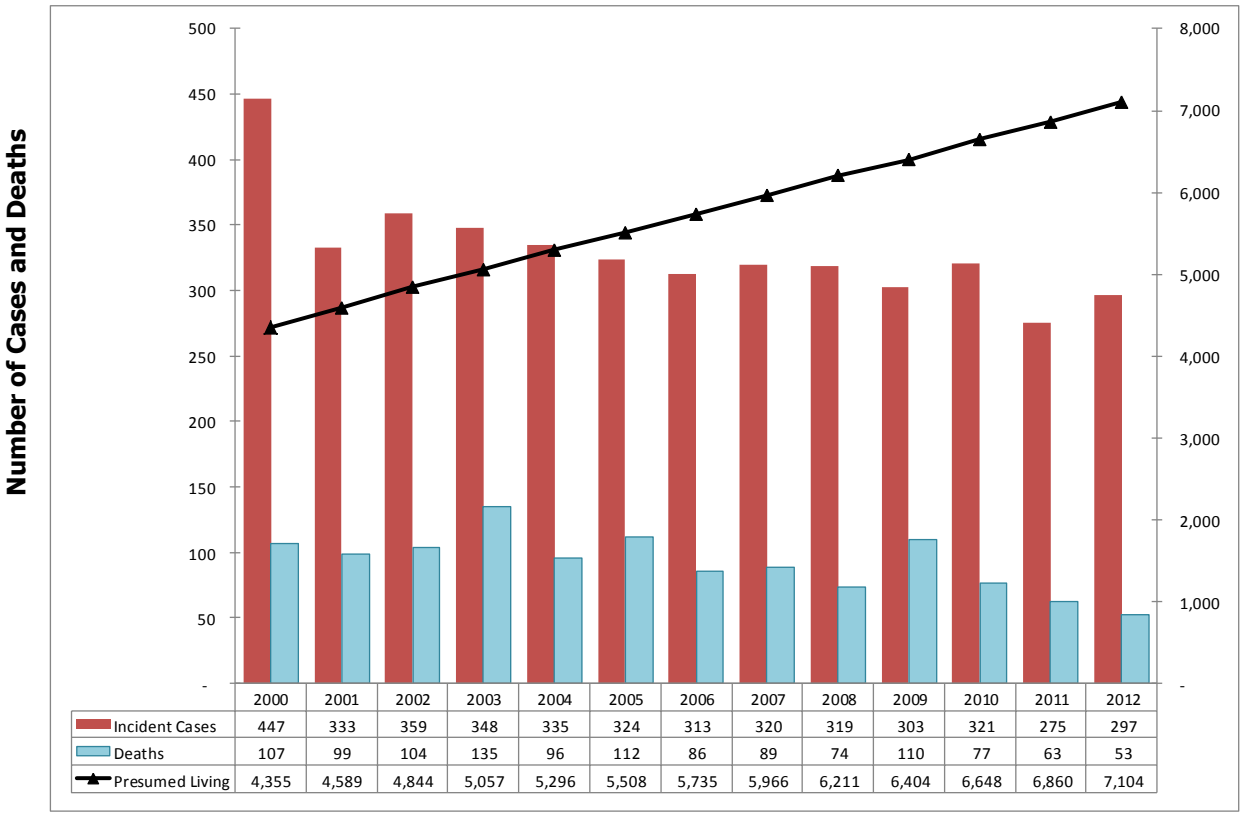
	King County				Washington State			
Age at HIV Diagnosis	**Male**		**Female**		**Male**		**Female**	
	N	**%**	**N**	**%**	**N**	**%**	**N**	**%**
Under 13 years	16	<1%	23	3%	42	<1%	49	3%
13-19 years	91	1%	39	5%	168	2%	83	5%
20-24 years	661	10%	93	12%	1,089	11%	229	14%
25-29 years	1,139	18%	141	19%	1,723	17%	280	18%
30-34 years	1,429	22%	141	19%	2,101	21%	271	17%
35-39 years	1,248	20%	105	14%	1,842	19%	234	15%
40-44 years	853	13%	77	10%	1,333	14%	178	11%
45-49 years	490	8%	50	7%	800	8%	105	7%
50-54 years	236	4%	43	6%	407	4%	76	5%
55-59 years	114	2%	26	3%	203	2%	57	4%
60 years and over	76	1%	13	2%	164	2%	28	2%
Total	**6,353**	**100%**	**751**	**100%**	**9,872**	**100%**	**1,590**	**100%**

Table 7: People presumed living with HIV/AIDS by race or ethnicity and place of birth[1] - reported as of 12/31/2012 – King County and Washington State

	King County				Washington State			
	U.S.-born		**Foreign-born**		**U.S.-born**		**Foreign-born**	
Race / Ethnicity	**N**	**%**	**N**	**%**	**N**	**%**	**N**	**%**
White, non-Hispanic	4,371	78%	148	12%	7,085	78%	191	10%
Black, non-Hispanic	699	13%	478	39%	1,091	12%	626	34%
Male Black, non-Hispanic	*557*		*240*		*849*		*304*	
Female Black, non-Hispanic	*142*		*238*		*242*		*322*	
Hispanic	281	5%	417	34%	452	5%	735	40%
Asian & PI, non-Hispanic	62	1%	166	14%	102	1%	258	14%
Native American, non-Hispanic	61	1%	5	<1%	145	2%	5	<1%
Multiple or unknown race, non-Hispanic	104	2%	11	1%	156	2%	16	1%
TOTAL	**5,578**	**82%**	**1,225**	**18%**	**9,031**	**83%**	**1,831**	**17%**

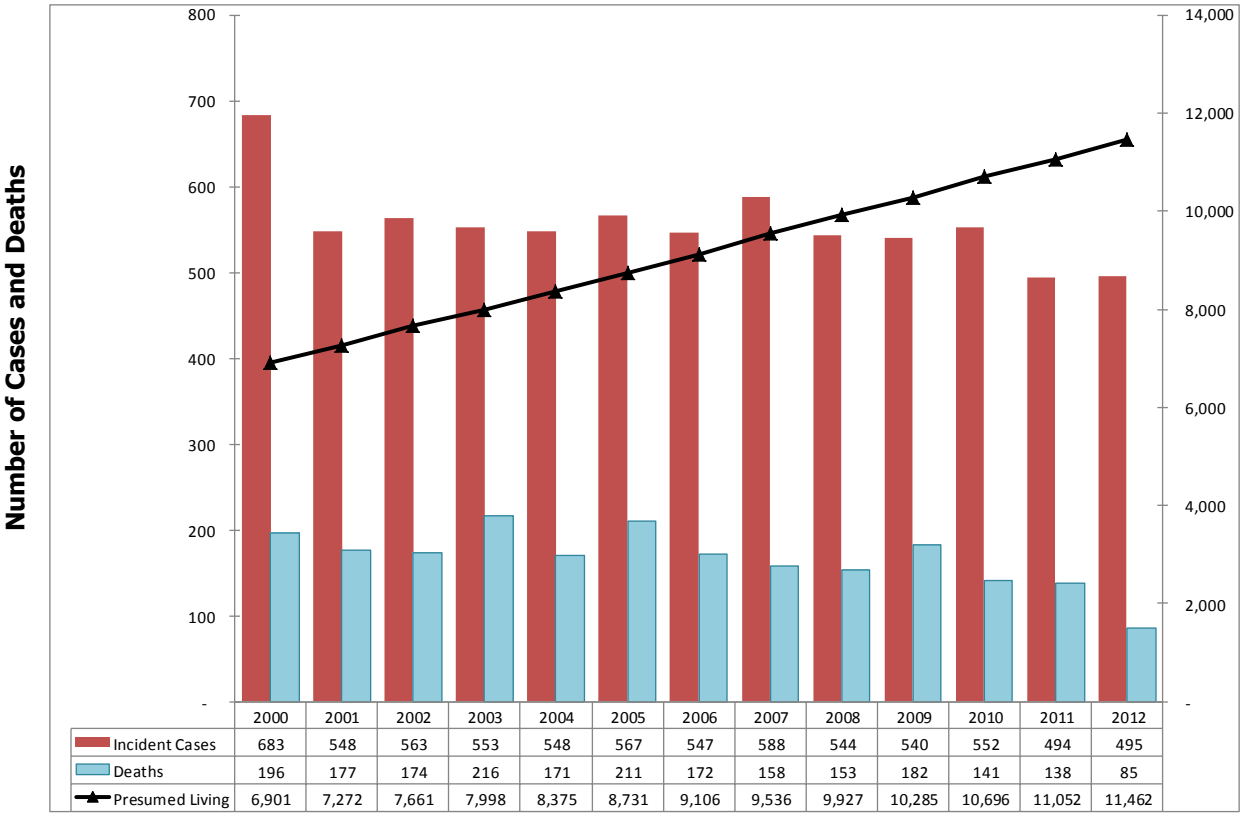
1. Table 7 does not include 301 King County and 600 Washington cases missing place of birth information.

Figure 1: HIV/AIDS incident cases, deaths, and presumed living by year - reported as of 12/31/2012 - King County



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Incident Cases	447	333	359	348	335	324	313	320	319	303	321	275	297
Deaths	107	99	104	135	96	112	86	89	74	110	77	63	53
Presumed Living	4,355	4,589	4,844	5,057	5,296	5,508	5,735	5,966	6,211	6,404	6,648	6,860	7,104

Figure 2: HIV/AIDS incident cases, deaths, and presumed living by year - reported as of 12/31/2012 - Washington State



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Incident Cases	683	548	563	553	548	567	547	588	544	540	552	494	495
Deaths	196	177	174	216	171	211	172	158	153	182	141	138	85
Presumed Living	6,901	7,272	7,661	7,998	8,375	8,731	9,106	9,536	9,927	10,285	10,696	11,052	11,462

Table 8: Demographic characteristics of King County residents diagnosed 1982-2012 and reported through 12/31/2012, by date of HIV diagnosis

	1982-2003		2004-2006		2007-2009		2010-2012[1]		Proportional Trend[2] (if statistically significant)
	N	%	N	%	N	%	N	%	2004-2012
TOTAL	**9,102**	**100%**	**972**	**100%**	**942**	**100%**	**893**	**100%**	
HIV Exposure Category[3]									
Men having sex with men (MSM)	6,648	76%	602	70%	595	74%	593	77%	up
Injection drug use (IDU)	525	6%	53	6%	32	4%	35	5%	
MSM-IDU	924	11%	90	10%	68	8%	72	9%	
Heterosexual contact[4]	572	7%	113	13%	106	13%	63	8%	down
Blood product exposure	97	1%	1	<1%	1	<1%	0	<1%	
Perinatal exposure	27	<1%	1	<1%	5	1%	6	1%	
SUBTOTAL- known risk	*8,793*		*860*		*807*		*769*		
Sex & Race/Ethnicity[5]									
Male	*8,453*	*93%*	*862*	*89%*	*820*	*87%*	*779*	*87%*	
White Male	6,622	73%	534	55%	498	53%	495	55%	
Black Male	880	10%	143	15%	119	13%	101	11%	down
Hispanic Male	602	7%	111	11%	127	13%	118	13%	
Other Male	349	4%	74	8%	76	8%	65	7%	
Female	*649*	*7%*	*110*	*11%*	*122*	*13%*	*114*	*13%*	
White Female	280	3%	31	3%	29	3%	31	3%	
Black Female	258	3%	60	6%	73	8%	59	7%	
Hispanic Female	46	1%	7	1%	11	1%	8	1%	
Other Female	65	1%	12	1%	9	1%	16	2%	
Race/Ethnicity[5]									
White	6,902	76%	565	58%	527	56%	526	59%	
Black	1,138	13%	203	21%	192	20%	160	18%	
Hispanic	648	7%	118	12%	138	15%	126	14%	
Asian & Pacific Islander	170	2%	49	5%	52	6%	53	6%	
Native American or Alaskan Native	112	1%	8	1%	6	1%	4	<1%	
Multiple Race	132	1%	29	3%	27	3%	24	3%	
SUBTOTAL- known race/ethnicity	*9,102*	*100%*	*972*	*100%*	*942*	*100%*	*893*	*100%*	
Place of Birth									
Born in U.S. or Territories	8,056	91%	711	77%	670	73%	623	73%	down
Born outside U.S.	825	9%	212	23%	249	27%	226	27%	up
SUBTOTAL- known birthplace	8,881	*100%*	923	*100%*	919	*100%*	849	*100%*	
Age at diagnosis of HIV									
0-19 years	152	2%	10	1%	27	3%	20	2%	
20-29 years	2,332	26%	222	23%	255	27%	254	28%	up
30-39 years	4,098	45%	389	40%	278	30%	280	31%	down
40-49 years	1,896	21%	264	27%	236	25%	202	23%	down
50-59 years	511	6%	72	7%	108	11%	109	12%	up
60+ years	113	1%	15	2%	38	4%	28	3%	up
Residence									
Seattle residence	7,743	85%	718	74%	657	70%	657	74%	
King Co. residence outside Seattle	1,359	15%	254	26%	285	30%	236	26%	

1. Due to delays in reporting, data from recent years are incomplete.
2. Chi-square statistical trends in proportions ($p<.05$) were calculated for cases with known characteristics for the periods 2004-06, 2007-09, and 2010-12.
3. Excluding people for whom exposure information is incomplete (due to death, refusal to be interviewed, or loss to follow up), persons exposed to HIV through their occupation, and patients whose mode of exposure remains undetermined.
4. Includes presumed heterosexual cases (females who deny injection drug use but have had sexual intercourse with a man whose HIV status or HIV risk behaviors are unknown).
5. All race and ethnicity categories are mutually exclusive; Asian, Native Hawaiian and Pacific Islanders were grouped due to small cell sizes.

Table 9: Demographic characteristics of Washington residents diagnosed 1982-2012 and reported through 12/31/2012, by date of HIV diagnosis

	1982-2003		2004-2006		2007-2009		2010-2012[1]		Trend[2] (as Table 8 suggests)
	N	%	N	%	N	%	N	%	2004-2012
TOTAL	**14,155**	**100%**	**1,662**	**100%**	**1,672**	**100%**	**1,541**	**100%**	
HIV Exposure Category[3]									
Men having sex with men (MSM)	9,333	69%	925	63%	951	67%	926	73%	up
Injection drug use (IDU)	1,282	9%	136	9%	85	6%	82	6%	down
MSM-IDU	1,419	10%	143	10%	120	8%	102	8%	
Heterosexual contact[4]	1,222	9%	252	17%	242	17%	141	11%	down
Blood product exposure	217	2%	4	<1%	2	<1%	0	<1%	
Perinatal exposure	58	<1%	2	<1%	14	1%	17	1%	up
SUBTOTAL- known risk	*13,531*	*100%*	*1,462*	*100%*	*1,414*	*100%*	*1,268*	*100%*	
Sex & Race/Ethnicity[5]									
Male	*12,720*	*90%*	*1,410*	*85%*	*1,394*	*83%*	*1,329*	*86%*	
White Male	10,001	71%	936	56%	849	51%	808	52%	down
Black Male	1,222	9%	200	12%	187	11%	175	11%	
Hispanic Male	959	7%	169	10%	232	14%	220	14%	up
Other Male	538	4%	105	6%	126	8%	126	8%	
Female	*1,435*	*10%*	*252*	*15%*	*278*	*17%*	*212*	*14%*	
White Female	757	5%	99	6%	105	6%	75	5%	
Black Female	405	3%	91	5%	109	7%	90	6%	
Hispanic Female	127	1%	30	2%	38	2%	17	1%	
Other Female	146	1%	32	2%	26	2%	30	2%	
Race/Ethnicity[5]									
White	10,758	76%	1,035	62%	954	57%	883	57%	down
Black	1,627	12%	291	18%	296	18%	265	17%	
Hispanic	1,086	8%	199	12%	270	16%	237	15%	up
Asian & Pacific Islander	257	2%	70	4%	82	5%	92	6%	up
Native American or Alaskan Native	209	1%	27	2%	24	1%	19	1%	
Multiple Race	205	1%	40	2%	46	3%	45	3%	
SUBTOTAL- known race/ethnicity	14,142	100%	1,662	100%	1,672	100%	1,541	100%	
Place of Birth									
Born in U.S. or Territories	12,567	91%	1,277	81%	1,199	76%	1,046	75%	down
Born outside U.S.	1,206	9%	302	19%	376	24%	354	25%	up
SUBTOTAL- known birthplace	*13,773*	*100%*	*1,579*	*100%*	*1,575*	*100%*	*1,400*	*100%*	
Age at diagnosis of HIV									
0-19 years	299	2%	22	1%	62	4%	51	3%	up
20-29 years	3,733	26%	391	24%	448	27%	414	27%	up
30-39 years	6,097	43%	569	34%	485	29%	469	30%	down
40-49 years	2,939	21%	481	29%	408	24%	343	22%	down
50-59 years	838	6%	165	10%	192	11%	194	13%	up
60+ years	249	2%	34	2%	77	5%	70	5%	up

1. Due to delays in reporting, data from recent years are incomplete.
2. Chi-square statistical trends in proportions ($p<.05$) were calculated for cases with known characteristics for the periods 2004-06, 2007-09, and 2010-12.
3. Excluding people for whom exposure information is incomplete (due to death, refusal to be interviewed, or loss to follow up), patients still under investigation, persons whose only risk was heterosexual contact and 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.
4. Includes presumed heterosexual cases (females who deny injection drug use but have had sex with men not known to be HIV-infected).
5. All race and ethnicity categories are mutually exclusive; Asian, Native Hawaiian and Pacific Islanders were grouped due to small cell sizes.

HIV care cascade and other metrics: HIV Infection, diagnosis, care status, and viral load level among King County residents

Until there is a cure, or a vaccine, for HIV, rapid diagnosis and widespread treatment ("test and treat") of HIV infected individuals are two key elements of HIV prevention. The HIV care cascade[1] may be the standard method of monitoring the success in diagnosing and effectively treating HIV. A local care cascade has been included in the Washington State/King County Epidemiology Report since 2011. The King County care cascade and the other metrics presented in this section include King County HIV data as of December 31, 2012. In the tables and figures presented in this section, we have included in-migrants. That is a key distinguishing feature of data in this section relative to the tables and figures in the first nine pages of this report – those initial tables and figures are limited to individuals residing in King County at the time of HIV/AIDS diagnosis. Going forward this section will continue to include tables and graphs but not this explanatory text.

To monitor HIV testing, we collect a history of prior negative HIV tests among recently diagnosed individuals by patient interview whenever possible, or else by medical record review. These data are collected as part of HIV incidence surveillance (see an article on the latest findings from HIV Incidence Surveillance elsewhere in this issue). Although it may not be the case on an individual level, on a population level, individuals recently diagnosed with HIV are clearly the population who had been at highest risk of acquiring HIV. And more than four of five individuals recently diagnosed with HIV in King County are men who had sex with men who are encouraged to undergo HIV testing as often as every three months, depending on their specific risk characteristics. Thus the larger proportion of recently HIV-diagnosed individuals with a recent negative test, the better HIV testing is in our population.

In contrast to the nation-wide care cascade published by Gardner et al[1], we present initial engagement in HIV care (or linkage) as a separate figure, as care engagement at time of HIV diagnosis may not reflect current care seeking behavior. To measure initial linkage to care, we calculated time from HIV infection to the first reported CD4+ lymphocyte (CD4) or plasma viral load (VL) test. In WA CD4 and VL have been reportable since 2006. We present the proportion of individuals with a first reported lab test within three months of their diagnosis. These may be an over-estimate of individuals linked to care as they include initial laboratory results from the local One-on-One program which conducts an initial assessment of individuals recently diagnosed with HIV and refers them to care. Although One-on-One conducts CD4 and VL testing One-on-One does not provide ongoing HIV primary care.

These data are from a mature HIV surveillance system. King County has also conducted extensive follow-up of individuals with no laboratory monitoring tests reported 2007 through 2011. This follow-up has effectively streamlined the denominator of people living with HIV/AIDS (PLWHA) in King County which may, relative to national or other jurisdictions' data, result in far higher estimates of care and viral suppression. Other numbers, primarily numerator data of numbers of people with one or more labs (CD4 or VL) reported are conservative because reporting of recent laboratory tests is incomplete.

Care Cascade (Figure 1): People living with HIV. There are an estimated 7,700 PLWHA in King County. This estimate and all subsequent data include King County residents diagnosed with HIV and PLWHA who have moved into King County; those who have died or moved away are excluded. This estimate is calculated as 6,563 reported cases, divided by 85% (an estimated 80 - 90% of PLWHA know their status), and rounded to the nearest 100. Diagnosed. Surveillance data indicate that as of December 31, 2012, there were 6,563 PLWHA diagnosed and living in King County. At least one care visit in the past year. During the period January 1, 2012, to December 31, 2012, 75% (5,785 / 7,700) of PLWHA had some laboratory evidence of medical care. There were 778 diagnosed and reported PLWHA without reported labs in this period. Engaged in care or virologically suppressed in the past year. We defined continuous engagement in care as PLWHA with lab results in two or more quarters of 2012. Fifty eight percent of PLWHA (4,449 / 7,700) were engaged in care in this time period. An additional 10% (744 / 7,700) of PLWHA were virologically suppressed at the time of their last lab, but did not have labs reported in two quarters of the year. Thus a total of 67% (5,193 / 7,700) of PLWHA met these criteria. Virologic suppression. 4,450 / 7,700 or 58% of PLWHA in King County had a suppressed (undetectable or below 200 particles per microliter) VL level at their last measurement in 2012. Our estimate of viral suppression is roughly double the CDC's national estimate of 28% of all HIV-infected individuals having an undetectable HIV VL.

The local 2011 National HIV Behavioral Surveillance system (NHBS) conducts surveys of MSM every three years in the Seattle metropolitan area, sampling MSM from bars, dance clubs, retail businesses, and other venues. In the other years, NHBS surveys IDU and heterosexuals.

NHBS data may be used as supporting evidence to verify the 85% proportion of PLWHA who are aware of their status that we have used for our local care cascade. In the two MSM cycles we've conducted locally in 2008 and 2011, 113 (84%) of 134 HIV-infected MSM were aware of their HIV serostatus. In the 2012 NHBS survey of IDU, 89% of IDU (51 of 57) were aware of their serostatus. This includes 93% (28 of 30) of the MSM-IDU and 85% (23 of 27) of the IDU who were not MSM.

HIV testing (Figure 2): Since 2006, there has been an increase in the proportion of newly HIV-diagnosed individuals for whom we have an HIV testing history. Excluding the most recent year (2012), the proportion of newly-diagnosed PLWHA with a known testing history increased from 65% to 80%. There have been no significant improvements in the percent of newly-diagnosed individuals with recent negative HIV tests over the past nine years.

AIDS diagnosed within one year of HIV (Figure 3): We calculated the percent of PLWHA diagnosed each year 1990 through 2011 where the individual was diagnosed with AIDS within one year of their HIV diagnosis. Although there has been no change in this proportion in the past decade, a smaller percentage (generally one quarter to one half) have progressed to AIDS in 12 months since highly active antiretrovirals were introduced relative to before the HAART era (about 1996). Before 1996, about half of PLWHA progressed to AIDS within one year of their HIV diagnosis.

Linkage to care (Figure 4): Our data indicate 95% or more of newly HIV diagnosed individuals are linked to care within three months of their HIV diagnosis. This has increased from less than 70% in the late 1990's, although the initial increases may be more reflective of improvements in laboratory reporting than improvements in linkage to care.

Clinical characteristics (Figures 5A and 5B): Laboratory results for the most recent reported laboratory tests in 2011 and 2012 are presented for CD4 counts in Figure 4A and viral load test results in Figure 4B. Of 6,563 PLWHA, 5,685 (87%) had a VL test reported in 2011 or 2012. More than four of five individuals (83%) had undetectable (and up to 199 copies) viral load results. CD4 test results were found for 5,800 PLWHA (88% of 6,563) in 2011 or 2012. Fifty-seven percent had CD4+ lymphocyte test results of 500 or greater.

Potential Disparities (Figures 6A and 6D): In figures 6A through 6D three data elements of the care cascade (describing care engagement and viral suppression) are shown for sub-populations of PLWHA. Because we don't have good estimates of the proportion of sub-populations of HIV-infected individuals who have been diagnosed, 85% was used for each subcategory (data not shown). We estimated there were 6,850 men and 870 women living in King County who were infected with HIV and 57-58% of women and men, respectively were virologically suppressed. In figure 1B, we estimate 58% of 5,900 men who have sex with men (MSM) and 46% of 1,010 injection drug users (IDU) were virologically suppressed. In figure 1C 55% of roughly 830 Latinos, 55% of 1,400 Blacks, and 59% 4,970 Whites were virologically suppressed. U.S. versus foreign birthplace are compared in Figure 1D with 58% of 5,940 U.S.-born and 56% of 1,710 foreign born PLWHA found to be virologically suppressed.

Conclusions: HIV reporting data, including the reporting of CD4 and VL, allow for a deeper understanding of the care characteristics of PLWHA. The collection of these data may be used to promote engagement in HIV care and to target HIV and AIDS prevention activities. Not surprisingly, viral suppression among IDU was lower than that for other HIV risk groups. It was interesting to note that, in general, IDU were engaged in health care – to the extent that such engagement could be measured by reported HIV-related laboratory tests that were conducted in two or more quarters of 2012. However, IDU do not appear to have benefited from antiretroviral use to the same extent as PLWHA in other HIV risk categories. Fortunately, HIV transmission among IDU appears to have remained low, when proportions of new cases who are IDU are compared to the proportion of new cases in other risk categories. We attribute a larger amount of viral suppression locally relative to national data to (1) early adoption of universal treatment of HIV by many local HIV care providers; (2) care promotion by the health department and community partners; (3) the lack of a wait list for Ryan White care services in Washington state where low income PLWHA may receive help in paying for medical insurance and/or antiretrovirals; and (4) cleaner data – due to re-categorization of individuals who have relocated and died as determined by our recent investigations of individuals without recent laboratory tests from 2007 through 2011. Prior work from our surveillance group has demonstrated the extent to which variations in denominators and cleaner data impact care estimates[2].

Figure 1: HIV Care Cascade for King County as of December 31, 2012

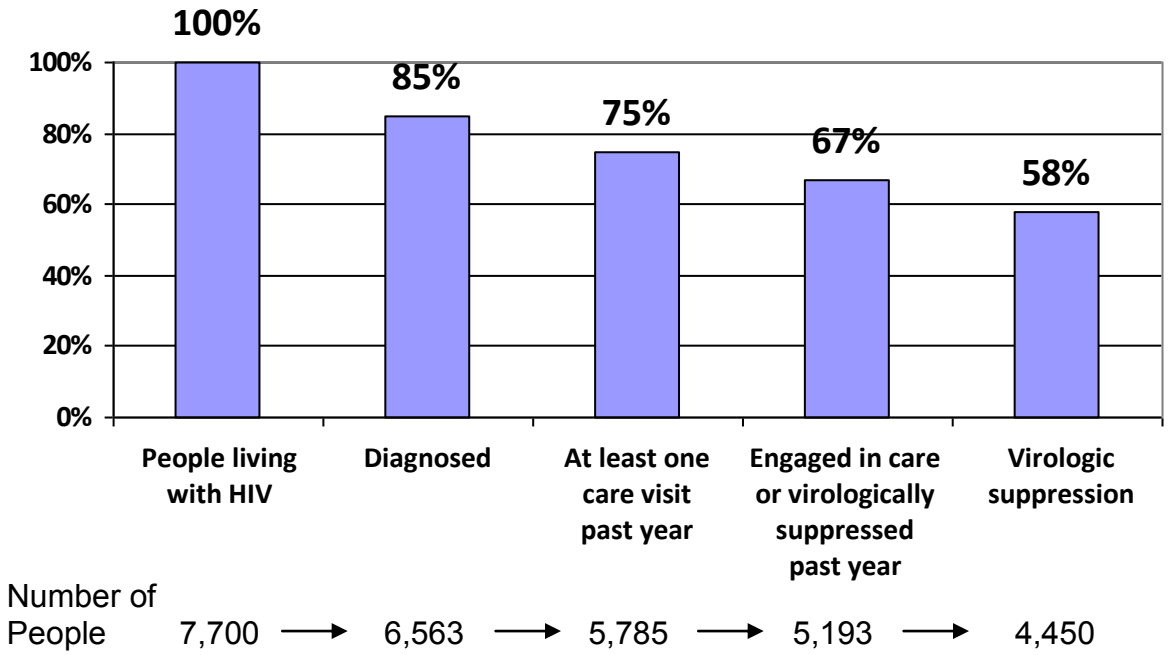
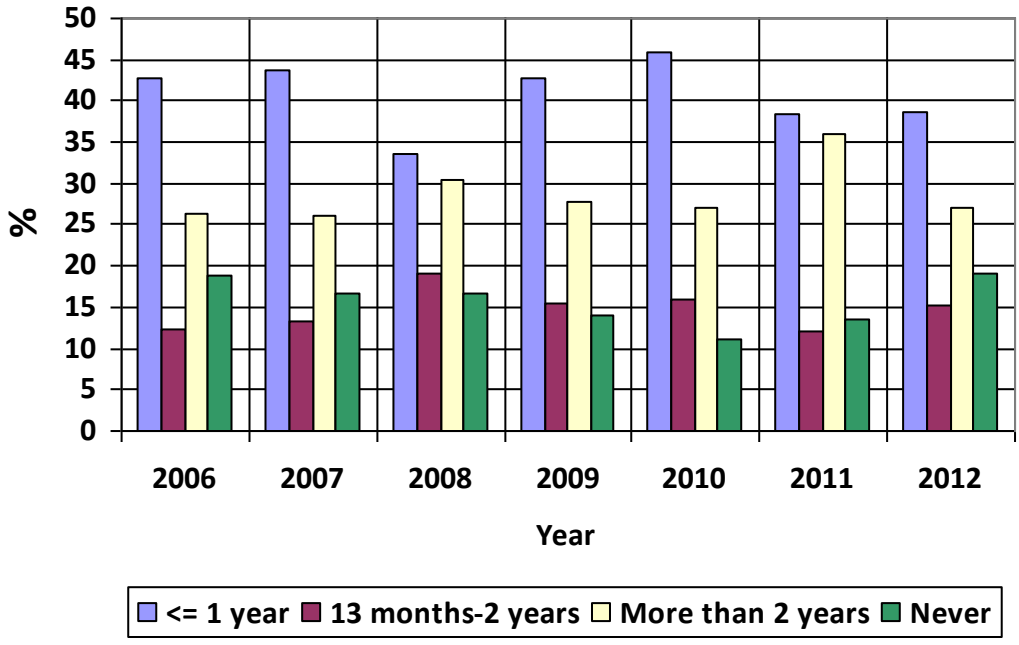


Figure 2: HIV testing history among newly diagnosed HIV cases, King County, WA, 2006 to 2012



1. Gardner EM et al. The Spectrum of Engagement in HIV Care and its Relevance to Test-and-Treat Strategies for Prevention of HIV Infection. Clin Infect Dis. 2011 March 15; 52(6): 793–800.
2. Dombrowski JC et al. Population-based metrics for the timing of HIV diagnosis, engagement in HIV care, and virologic suppression. AIDS. 2012 Jan 2;26(1):77-86.

Figure 3: AIDS diagnosed within one year of HIV infection, King County, WA

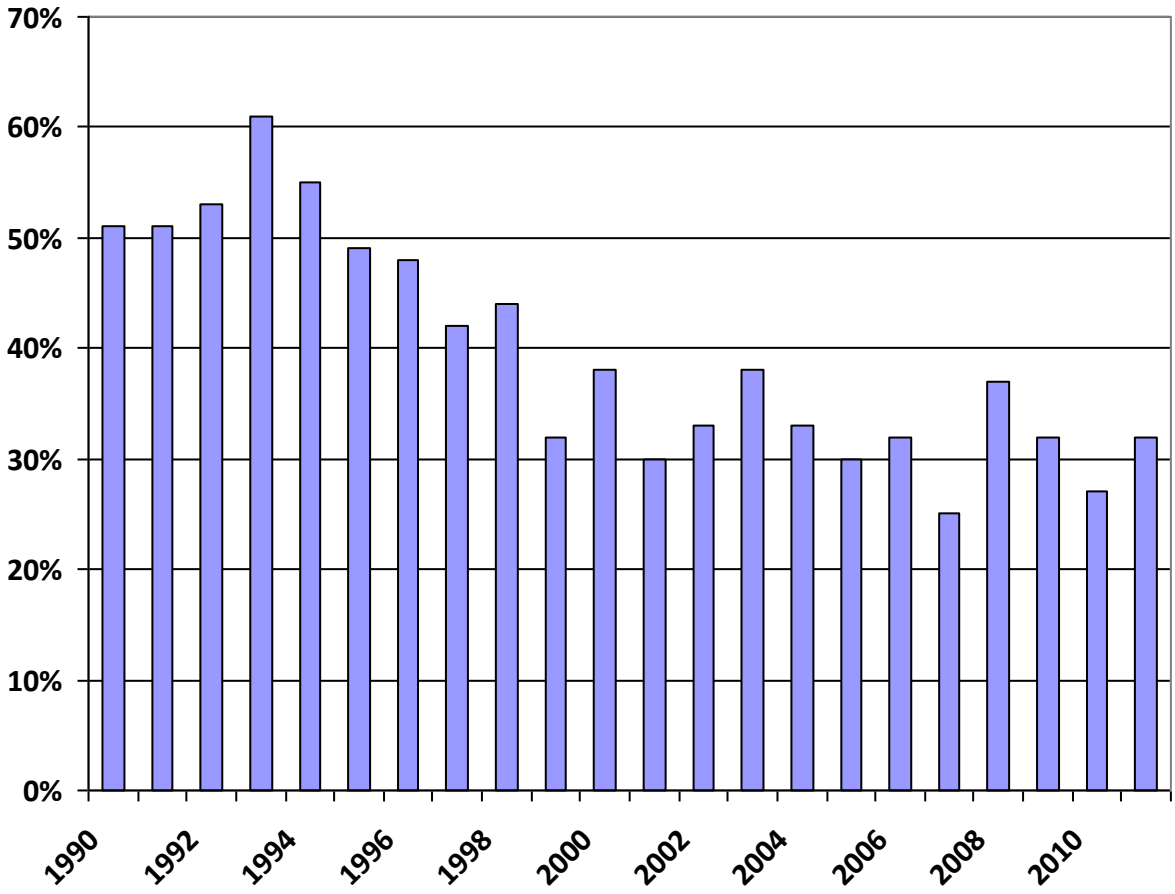


Figure 4: Timely linkage to care (reported CD4+ lymphocyte test of plasma viral load test within three months of HIV diagnosis), King County, WA 1996 to 2012

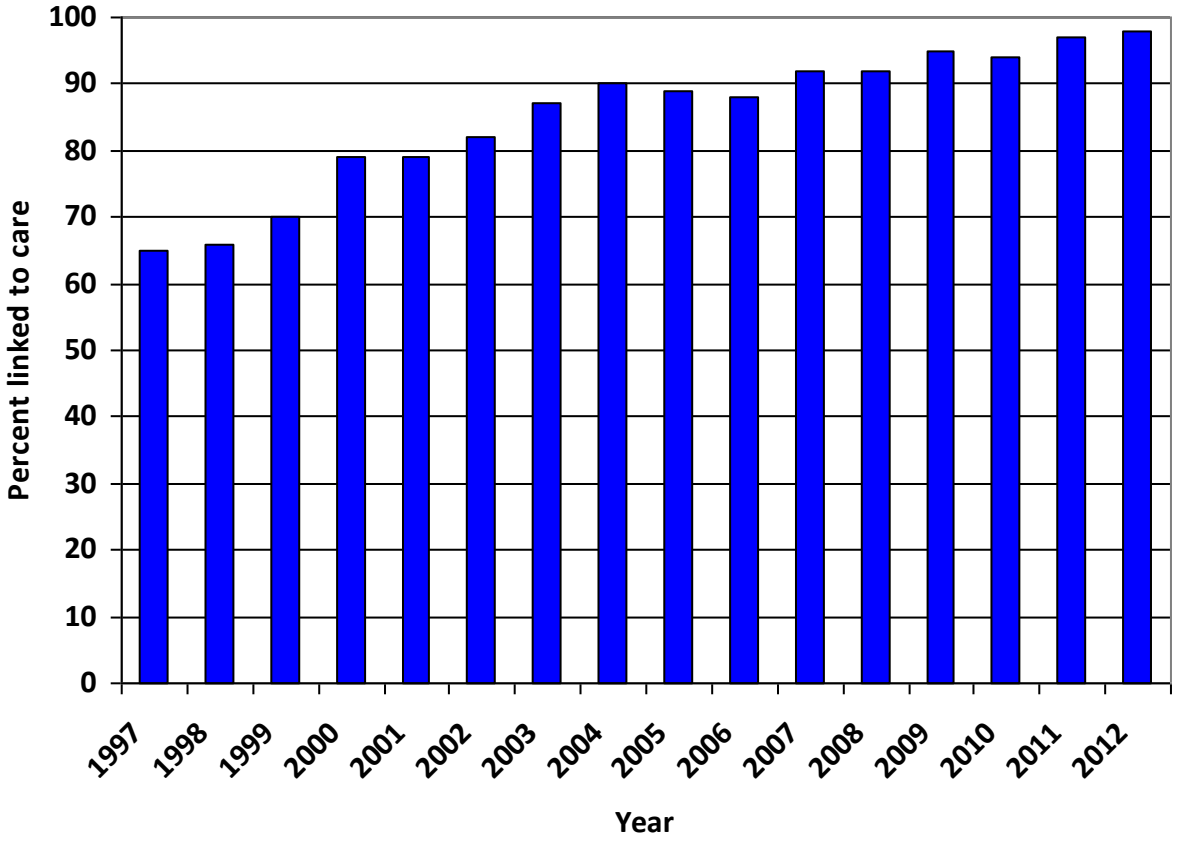


Figure 5A: Most recent CD4+ T-lymphocyte counts 2011-2012, King County, WA

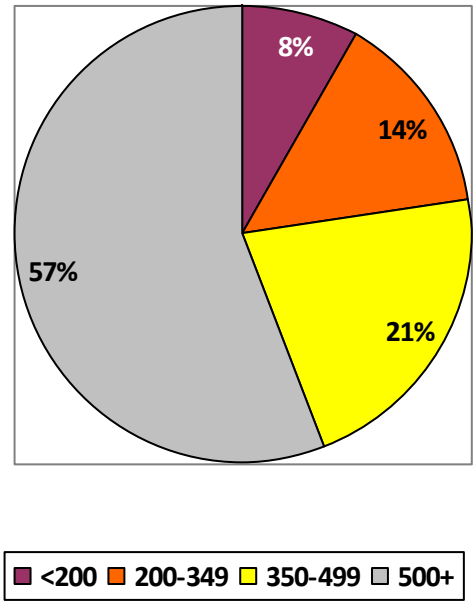


Figure 5B: Most recent plasma viral load 2011-2012, King County, WA

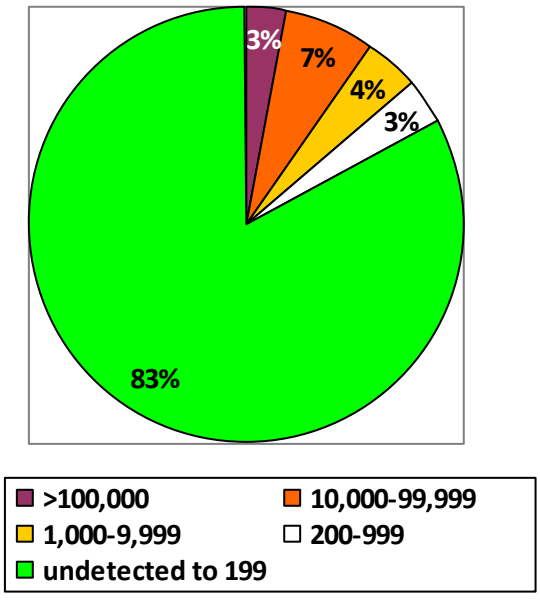


Figure 6A: HIV Care Cascade by gender for King County as of December 31, 2012

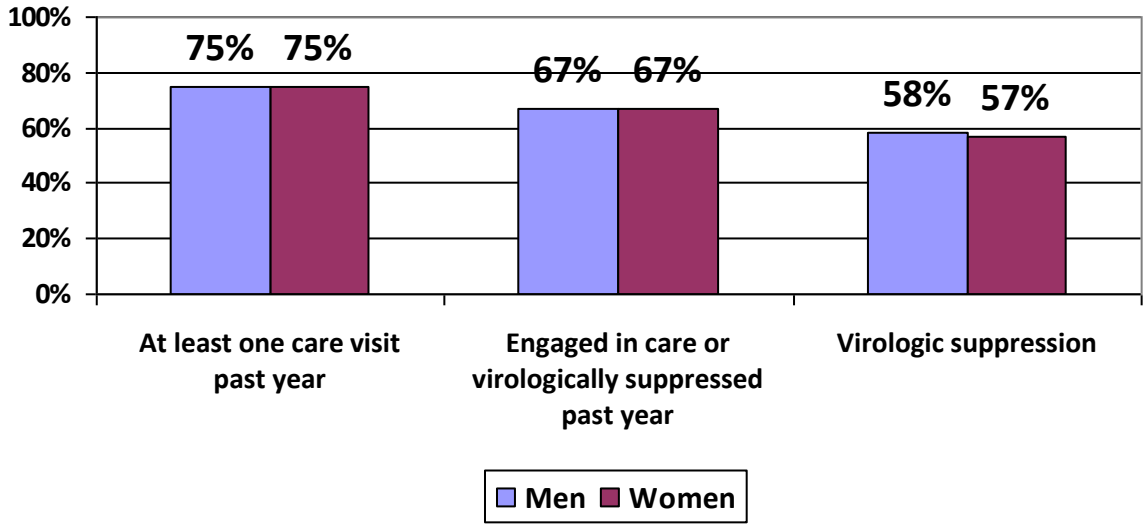


Figure 6B: HIV Care Cascade by HIV risk - men who have sex with men (MSM) and injection drug users (IDU) - for King County as of December 31, 2012

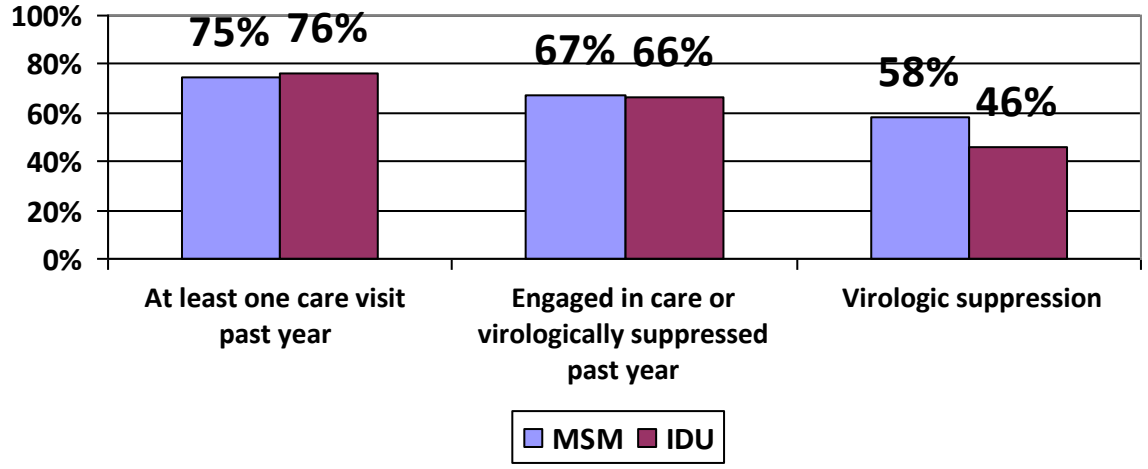


Figure 6C: HIV Care Cascade by race/ethnicity for King County as of December 31, 2012

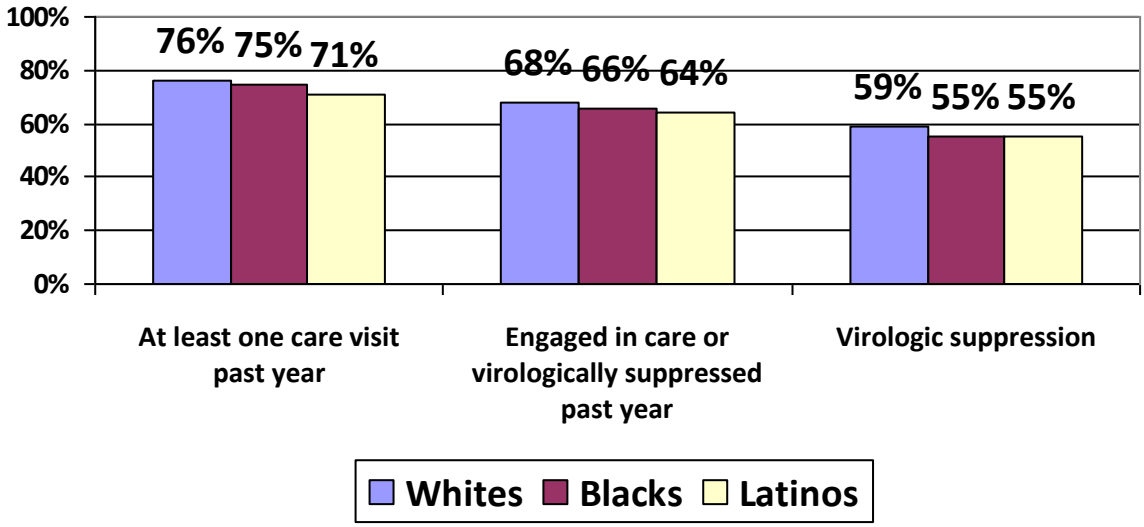
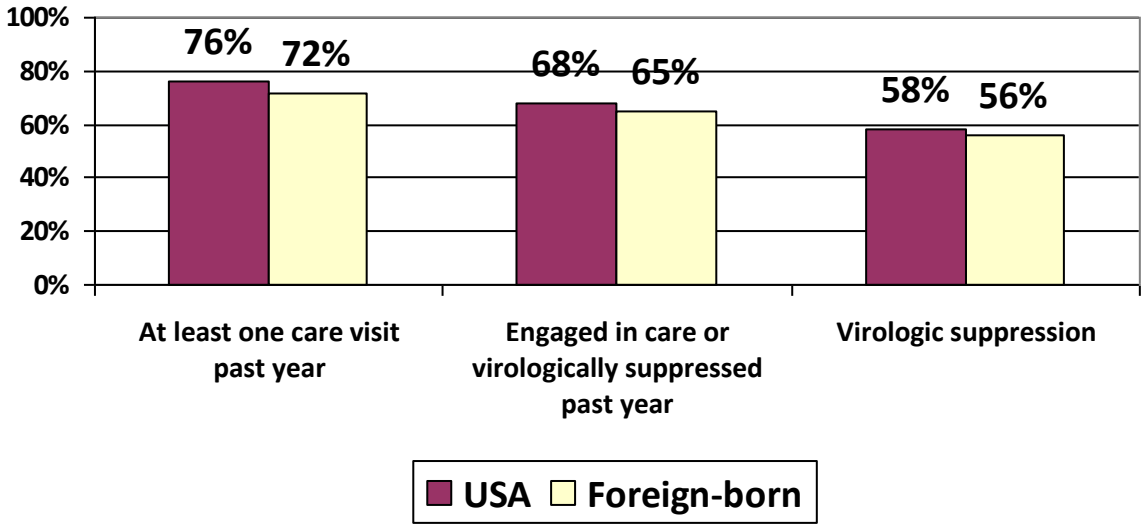


Figure 6D: HIV Care Cascade by birthplace for King County as of December 31, 2012



Results from the Medical Monitoring Project, 2010 and 2011. King County WA

Background

As of December 31, 2010, an estimated 803,771 persons were living with a diagnosis of human immunodeficiency virus (HIV) infection or acquired immunodeficiency syndrome (AIDS) in the United States and 7,007 were living in King County, WA[1]. HIV surveillance programs in the United States collect limited information about people who have received diagnoses of HIV infection and AIDS. Supplemental surveillance projects are needed to collect information about care-seeking behaviors, health-care use, and other behaviors among persons living with HIV. Data on the clinical and behavioral characteristics of persons receiving medical care for HIV infection are critical to help reduce HIV-related morbidity and mortality and for program planning to allocate services and resources, guide prevention planning, assess unmet medical and ancillary service needs, and help develop intervention programs and health policies at the local, state, and national levels.

Methods

The Medical Monitoring Project (MMP) is a supplemental surveillance system that collects annual cross-sectional samples of clinical and behavioral data on HIV-infected adults receiving care. The methods have been described in detail elsewhere[2]. MMP uses a three-stage sampling design to obtain annual cross-sectional probability samples of HIV-infected adults in care. In the first stage, states are selected to participate, then HIV care facilities in these states are sampled, and finally HIV infected adults in care at participating facilities are sampled. Face-to-face or telephone interviews are conducted to collect information on demographics, adherence to HIV medication regimens, and behavioral risk factors. The data are collected in 19 states and Puerto Rico. Medical record reviews are conducted to collect additional data on diagnosis of opportunistic illnesses, prescription of preventive therapies and antiretroviral medications, laboratory results, adverse events, and health services utilization. We report on two years of MMP interview data from the King County MMP project collected from August 2010 through April 2012.

Results

During the two most recent complete cycles of data collection, 377 persons living with HIV or AIDS (PLWHA) were interviewed for MMP in King County. Among the 377 participants, 90% were male, 10% were female (**Table 1**). Seventy-three percent of participants reported their sexual orientation as homosexual, 17% as heterosexual, and 8% as bisexual. Most participants were white (74%). The age groups with the greatest proportion of participants were 45-54 years (39%) and 35-44 years (31%). Most participants were born in the United States (85%).

The majority of participants (74%) had been diagnosed with HIV infection ≥ 5 years previously. Questions about most recent CD4 T-lymphocyte tests and viral load tests were not asked in the 2010 data collection cycle, so the following data are from 2011 only. The most recent CD4+ T-lymphocyte (CD4) count among 215 participants from 2011 who reported having a CD4 test during the past 12 months was <200 cells/mm^3 for 17 (8%) participants, 200–499 cells/mm^3 for 62 (29%), ≥500 cells/mm^3 for 107 (50%), and unknown for 29 (13%) participants (**Table 1**). Among the 215 2011 participants who reported having an HIV viral load test during the past 12 months, the most recent viral load was undetectable for 159 (74%) participants, detectable for 35 (16%), and the viral load was unknown for 21 (10%).

To assess the representativeness of participants in MMP, characteristics which are available both in MMP and the enhanced HIV AIDS Reporting System (eHARS) are compared in Table 1. Overall, MMP participants are similar to the larger population of PLWHA. However, a larger proportion of the MMP participants are white, born in the United States, and reported their most recent viral load was undetectable.

Approximately three-quarters of participants had more than a high school education (73%). A total of 11% of participants reported that they had been homeless at some time during the 12 months before the interview. Six percent of participants reported they had been in jail or prison in the previous 12 months (**Table 2**).

Of the 372 (99%) participants who reported having any type of health insurance or coverage during the

past 12 months, 45% reported having private health insurance or coverage through a health maintenance organization, 30% reported having Medicaid, and 23% reported having Medicare. Participants could select more than one type of medical insurance or coverage response. Thirteen percent of participants reported a gap in health insurance coverage in the last 12 months. Thirty-seven percent of participants reported that SSI or SSDI was their primary source of money or financial support during the past 12 months (**Table 2**).

Almost all the participants (95%) reported ever taking antiretroviral medications (ART) for HIV infection and among the 356 who had ever taken ART, 345 (97%) reported currently taking ART. Of those currently taking ART, almost one-third (29%) reported they never miss a dose of their medication. Of the 347 persons for whom the date of last visit for medical care was available, 319 (85%) reported that they had visited a health-care provider for HIV medical care within the past three months (**Table 2**).

A total of 13 (4%) participants reported having been admitted to a mental health facility during the past 12 months. In addition, 39 (10%) participants reported that they had been to an emergency department for HIV medical care, and 28 (7%) reported having been admitted to the hospital for an HIV-related illness during the past 12 months (Table 2).

Among the 377 participants, 198 (53%) reported being tested for an STD during the past 12 months; among those tested the most common STD diagnoses received were herpes (6%), syphilis (5%), gonorrhea (4%), and chlamydia (4%). A total of 26 (7%) reported receiving the HPV vaccine. Among males, 6% received the HPV vaccine and 16% of women had received the vaccine. Among all 377 participants, 316 (84%) reported that they had received a seasonal influenza vaccination during the past 12 months (**Table 2**).

Forty-one percent of participants reported using non-injection drugs in the last 12 months and 8% reported using injection drugs. Sixty percent of participants reported smoking at least 100 cigarettes in their lifetime and 42% of them reported that they currently smoke daily. Fifteen percent of participants had 5 or more drinks in one sitting in the last 30 days (**Table 2**).

Discussion

The results outlined above suggest that PLWHA in King County who are receiving medical care had many positive findings, including that most had seen their HIV provider recently, were taking antiretroviral therapy, had an undetectable viral load and had CD4 counts out of the severe immunosuppression range (> 200 cells/mm^3). Almost all had some form of health insurance coverage and had an annual influenza vaccine. On the other hand, even in this cohort of PLWHA relatively well engaged in health care, there were substantial comorbidities (mental illness and substance use) and socio-demographic issues (homelessness and incarceration) that may interfere with regular health care access.

A spin off project called Case Surveillance Based Sampling was started in November 2012. This project, which is not just limited to people who were in care for HIV, will hopefully elucidate some of the issues encountered by a representative sample of people living with HIV in King County.

- *Contributed by Elizabeth Barash and Susan Buskin*

1. HIV/AIDS Epidemiology Unit, Public Health – Seattle & King County and the Infectious Disease Assessment Unit, Washington State Department of Health
2. McNaghten AD, Wolfe MI, Onorato I, et al. Improving the representativeness of behavioral and clinical surveillance for persons with HIV in the United States: the rationale for developing a population-based approach. PLoS One 2007; 2 (6): e550

Table 1. Percentage of participants, by selected characteristics King County WA, Comparing the Medical Monitoring Project, 2010 and 2011 and HIV Surveillance

	MMP N=377		Surveillance N=7,606	
Characteristic	**N**	**%**	**N**	**%**
Sex at Birth				
Male	340	90%	6,761	89%
Female	37	10%	845	11%
Self-Defined sexual orientation or HIV Risk Category				
Homosexual	274	73%	5,825	77%
Heterosexual	64	17%	1,781	23%
Bisexual	29	8%	n/a	--
Other	10	3%	n/a	--
Race/Ethnicity				
White, non-Hispanic	280	74%	4,878	64%
Black, non-Hispanic	61	16%	1,369	18%
Hispanic or Latino	35	9%	849	11%
Asian	10	3%	250	3%
Native Hawaiian or Other Pacific Islander	9	2%	23	<1%
American Indian or Alaska Native	13	4%	70	1%
Age at interview				
0-17	0	--	19	<1%
18-24	3	<1%	190	2%
25-34	32	8%	1,052	14%
35-44	115	31%	2,051	27%
45-54	147	39%	2,776	36%
≥55	80	21%	1,508	20%
Years since HIV diagnosis				
≤5 years	68	18%	2,279	30%
>5 years	279	74%	5,327	70%
Missing	30	8%	NA	--
Country of birth				
United States	320	85%	5,884	78%
Other	57	15%	1,662	22%
Most recent CD4 count (not available MMP 2010 N=215)				
0-199	17	8%	997	13%
200-499	62	29%	2,667	35%
≥500	107	50%	3,797	50%
Don't know	29	13%	145	2%
Most recent viral load (not available MMP 2010 N=215)				
Undetectable	159	74%	4,682	62%
Detectable but less than 5,000 viral copies/ml	21	10%	1,471	19%
5,000 to 100,000 viral copies/ml	11	5%	789	10%
Greater than 100,000 viral copies/ml	3	1%	330	4%
Don't know	21	10%	334	4%

Table 2. Selected Socio-demographic Variables from the Seattle Medical Monitoring Project

	N	%
Jail last 12 months		
Yes	24	6%
No	351	94%
Education		
< High school	33	7%
High school diploma or equivalent	74	20%
> High school	270	73%
Homeless at some time in past 12 months		
Yes	40	11%
No	337	89%
Health insurance coverage in past 12 months		
Yes	372	99%
No	5	1%
Type of health insurance in the past 12 months		
Private health insurance or HMO	167	45%
Medicaid	112	30%
Medicare	87	23%
Gap in health insurance coverage past 12 months		
Yes	27	13%
No	185	86%
Source of most money or financial support		
Salary or Wages	188	50%
Social Security Supplemental Income or Disability Insurance (SSI or SSDI)	112	30%
Public assistance ("welfare")	26	7%
Spouse, partner or family	17	5%
Other	34	9%
Non-injection illicit drug use last 12 months		
Yes	154	41%
No	219	59%
Illicit injection drug use last 12 months		
Yes	31	8%
No	342	92%
Smoked at least 100 cigarettes in lifetime		
Yes	225	60%
No	147	39%
Missing	5	1%
Current smoker frequency (n=225)		
Daily	94	42%
Weekly	9	4%
Monthly	6	3%
Less than monthly	11	5%
Never	105	47%
More than 5 drinks one sitting last 30 days		
0 days	163	43%
1-5 days	44	12%
>5 days	12	3%
No alcohol last 30 days	62	16%
No alcohol last 12 months	96	26%

(Table 2 continued on next page)

Table 2. (Continued) Selected Socio-demographic Variables from the Seattle Medical Monitoring Project

	N	%
Admitted to mental health facility last 12 months		
Yes	13	(4%)
No	364	(96%)
Emergency Dept. visit for HIV last 12 months		
Yes	39	(10%)
No	338	(90%)
Admitted to hospital for HIV last 12 months		
Yes	28	7%
No	349	93%
Tested for STD last 12 months		
Yes	198	53%
No	179	47%
Received HPV vaccine last 12 months		
Yes	26	7%
No	351	93%
Received seasonal flu vaccine last 12 months		
Yes	316	84%
No	61	16%
Months since last HIV medical care visit		
0-3	319	85%
4-6	50	13%
7-9	5	1%
Ever take ART		
Yes	356	95%
No	19	5%
Currently take ART (N=356)		
Yes	345	97%
No	11	3%
Last time missed ART		
Within the last week	8	2%
1-2 weeks ago	48	13%
3-4 weeks ago	32	9%
1-3 months ago	48	13%
> 3 months ago	57	15%
Never skip medication	110	29%

Highlights from the 2011 Seattle Area National HIV Behavioral Survey of Men Who have Sex with Men

Men who have sex with men (MSM) remain the group most impacted by HIV nationally and locally. Nationwide MSM comprised 61% and MSM who also had a history of injection drug use (MSM/IDU) an additional 3% of the estimated 47,129 persons diagnosed with HIV infection in 2010[1]. In King County 86% of HIV cases diagnosed 2009-2011 were among MSM (78%) or MSM/IDU (8%)[2]. This report describes findings from the 2011 Seattle area National HIV Behavioral Surveillance (NHBS) survey of MSM (NHBS-MSM3). The CDC sponsors NHBS surveys in 20 large U.S. urban areas including the Seattle Division of the Seattle Metropolitan Statistical Area (King and Snohomish counties). The purpose of NHBS is to monitor prevalence and trends of HIV and HIV-related risk and prevention behaviors. Each year one of three populations at increased risk of HIV is surveyed using a common CDC protocol and questionnaire at all sites. We have reported results from earlier Seattle area NHBS surveys including MSM[3], IDU[4,5], and heterosexuals at increased risks[6,7], in earlier issues of the HIV/AIDS Epidemiology Report.

Methods

The CDC NHBS MSM surveys are conducted using venue-based sampling (VBS)[8]. Prior to the survey we identified venues in the Seattle area (King County) that were frequented by MSM and would be eligible and feasible for recruitment. Every month a sampling calendar was constructed by randomly choosing 18-20 venues and sampling times. During each sampling event, NHBS staff counted and intercepted men attending the venue and asked them if they were interested in participating in the study. A recreational vehicle with two private interview rooms served as a field office. Potential study participants were screened for eligibility (18 years or older, ever having had male-male sex, able to complete the survey in English or Spanish, no prior participation in that year, and residence in King or Snohomish County). Those who were eligible and provided informed consent completed an interviewer-administered survey about their sociodemographic characteristics, sexual and drug-use practices, and health history. Participants provided separate consent for HIV testing. We used rapid HIV testing on fingerstick specimens (OraQuick®) and those with reactive ("positive") rapid test results provided an oral fluid sample for Western Blot confirmatory testing. Participants received a monetary incentive, condoms, and information about local HIV prevention, health and social services. No personal identifiers were collected. The study was approved by the Washington State Institutional Review Board.

Results

Recruitment

The Seattle area NHBS-MSM3 team conducted 97 recruitment events between 7/7/2011 and 12/4/2011 at 42 different venues. The venues included 12 bars, 2 cafés/restaurants, 9 dance clubs, 1 gym, 1 gay event, 7 social organizations, 3 parks/beaches, 3 retail businesses, and 4 sex establishments. The team counted 9,542 men, approached 3,098 (32%) of whom 2,206 (71%) agreed to stop and talk about the study. A total of 626 (28% of the 2,206 and 20% of the 3,098) agreed to screen for the study and 426 (68%) of those men were eligible to participate and 419 completed an interview. Among these 419 men, 371 reported sex with another man in the last 12 months and were included in this analysis. These 371 men were recruited at bars (33%), dance clubs (23%), retail businesses (14%), cafés and restaurants (8%), gyms (7%) social organizations (6%), sex establishments (5%), parks (3%), and gay events (2%).

Sociodemographic characteristics

HIV prevalence is included in Tables 1, 2 and 3; the description of HIV prevalence by sociodemographic characteristics and sexual and drug use practices is presented in a separate section below.

The median age was 33 years with 38% younger than 30 years, which is younger than the general male King County population 18 years and older (**Table 1**). We compared our sample to the King County population and found lower proportions of whites and Asian/Pacific Islanders and higher proportions of African Americans and men reporting multiple races, possibly due to the urban focus of the recruitment venues. Educational attainment was similar to the general population while household income was lower; this could be related to the younger age and fewer household members among our sample. Health insurance coverage was lower than among the general adult King County population, possibly because coverage is lower among men and among younger people. We recruited men from 47 different zip codes across King County (**Figure 1**). The majority of participants resided in

Seattle, including 39% in zip codes 98102 and 98122.

Sexual behaviors

Most (87%) participants identified as gay (**Table 2**). Almost half reported 5 or more male sex partners in the last 12 months and very few (8%) reported sex with women. Twenty-eight percent reported unprotected (without a condom) anal intercourse (UAI) with a man of opposite or unknown HIV status ("non-concordant UAI") in the last 12 months and about half (51%) reported intentionally having UAI with a man of the same HIV status. The survey included a series of questions about the most recent sexual contact with a male partner. A little less than half reported that their last male sex partner was a main partner[a], 51% reported that the last male partner was HIV negative, 15% that he was HIV positive, and 34% did not know his status. Men who self-reported being HIV-positive were much more likely to report an HIV-positive partner (65%) than men who reported being HIV negative (5%) (data not shown). Eleven percent reported non-concordant UAI and 19% reported drug use during their last sexual encounter with a man. Thirty-seven percent reported concurrent male sex partners during the sexual relationship with the most recent male partner.

Drug and alcohol use

Over half (53%) reported using drugs other than marijuana, 20% reported using cocaine, 18% ecstasy, 16% amphetamines, and 30% poppers in the last 12 months (**Table 3**). Fifty-three (14%) reported ever injecting illicit drugs (data not shown) and 25 (7%) had injected in the last 12 months. The most commonly injected drugs were amphetamines (88%) and heroin (44%). Among the 22 who reported injecting amphetamines, 19 (86%) also used amphetamines by other routes. Thirty-four percent reported binging on alcohol[b] on 4 or more occasions in the last 30 days.

HIV prevalence

A total of 363 of the 371 participants consented to HIV testing. A total of 281 tested negative, 68 tested HIV positive and 11 indeterminate on confirmatory testing; confirmatory results were missing from three men (**Table 4**). Of the 268 men who reported being HIV negative, 253 (94%) tested negative in the survey. Of the 68 men who tested HIV positive, 55 (81%) reported a previous positive test, one (1%) reported having tested indeterminate, 11 (16%) reported having tested negative, and one (1%) did not know his HIV status. A total of 66 of the 371 participants self-reported being HIV-positive. Of these 66, 55 tested HIV-positive, eight had indeterminate results, one did not have a confirmatory test, one tested negative on confirmatory testing, and one did not consent to HIV testing. All 11 self-reported HIV-positive participants without an HIV-positive test result in the survey were likely HIV positive. They had all seen a healthcare provider for HIV-related care, they all reported being on antiretroviral medication, and they all reported a viral load result. Because we did not have a positive HIV confirmatory test, however, data from these 11 participants were excluded from the analysis of HIV prevalence along with data from eight men who did not provide consent and data from three with unknown confirmatory results, leaving data from 349 men for analysis.

The overall HIV prevalence was 19% and increased by age from 4% among 18-24 year olds to 34% among those 50 years or older (**Table 1**). HIV prevalence was highest among African American MSM (36%). The difference in race/ethnicity was statistically significant when we compared African Americans to all other groups combined (36% vs. 17%; p=0.01). HIV prevalence was significantly higher among men with lower education (28%) compared to those with a college degree (12%). HIV prevalence was also higher among those with lower income (31%), those who were unemployed (30%) and those who had health insurance (23%), factors that may be a consequence of HIV infection.

HIV infection was more common among men who identified as gay (21%) than among those who identified as bisexual (7%) (**Table 2**). Similarly, HIV prevalence was lower (4%) among men who reported sex with a female than among those who did not (21%). There were no statistically significant differences in HIV prevalence by number of male sex partners, but HIV prevalence was significantly higher among those who reported UAI with a non-concordant male partner in the last 12 months (27% vs. 17%) and among those who had been diagnosed with a sexually transmitted disease (STD) (33% vs. 18%). HIV prevalence was also higher among those who reported drug use at their last male-male sexual encounter (29% vs. 17%) and among those who reported concurrent sexual relationships (27% vs. 15%).

Men who reported use of amphetamines or poppers and who had injected in the past 12 months were also more likely to be HIV positive (41%, 32% and 46%, respectively) than those who did not report these drug use behaviors (**Table 3**).

a. A man you have sex with and who you feel committed to above anyone else. This is a partner you would call your boyfriend, husband, significant other or life partner.
b. Five or more drinks in on setting.

HIV testing and other health history

Overall 95% of the participants had ever tested for HIV (data not shown). Among those who self-reported not being HIV positive, 62% had tested within the last 12 months (**Table 5**). The majority (69%) had actively sought testing ("asked for their last test") rather than being offered testing. The most common reason for not testing in the past 12 months was being at low risk for HIV (50%) followed by being afraid of knowing one's HIV status (13%). A little over 60% had been vaccinated against hepatitis A and B (information on completion of vaccination series was not available). Self-reported hepatitis C prevalence was 5% overall, and as expected, higher among self-reported HIV positive participants (17%) and among those with an injection drug history (13%). An STD diagnosis was twice as common among self-reported HIV positives (21%) compared to self-reported HIV negatives (10%).

Health related variables among self-reported HIV positive participants

Among the 66 men who self-reported being HIV positive, 57% were diagnosed five or more years ago while 12% were diagnosed within the previous year (**Table 6**). Eighty-nine percent reported having health insurance, all had seen a health care provider for their HIV infection within the last 8 months (82% within 3 months), and 76% were on antiretroviral medication (ART). Among the 16 who were not on ART, the most common reasons were "CD4 count and viral load are good" (n=6) and "Doctor advised to delay treatment" (n=3). Eighty-six percent reported a viral load result and it was undetectable in 68% of these men; these comprise 59% of the men with self-reported HIV infection.

Factors associated with HIV testing in the last 12 months

We assessed factors associated with having an HIV test in the last 12 months using logistic regression analysis. Education was the only sociodemographic variable (from Table 1) that was associated with HIV testing in the last 12 months among those who did not report being HIV positive (**Table 7**). Those with post high school education were more likely to have tested than those with a high school education or less. After controlling for education, we found that HIV testing was associated with having more than one male sex partner, intentional concordant UAI, and using poppers in the last 12 months. Not surprisingly testing was also associated with having an STD diagnosis since frequent HIV testing is recommended for MSM with a recent bacterial STD.[c] HIV testing was not associated with any other drugs or sexual practices listed in Tables 2 and 3.

Factors associated with non-concordant UAI with a male partner

Overall 28% reported non-concordant UAI in the last 12 months. Homelessness in the previous 12 months was the only sociodemographic factor (from Table 1) associated with non-concordant UAI with a male partner in the last 12 months. Among those who were homeless, 45% reported non-concordant UAI compared to 25% among those who were not homeless (**Table 8**). After controlling for being homeless in logistic regression analyses, men who reported using powdered cocaine, amphetamines, ecstasy, painkillers or poppers in the last 12 months were also more likely to report non-concordant UAI than men who did not report using these drugs. Men who reported 5 or more sex partners in the last 12 months and using drugs at their last male-male sexual encounter were also more likely to report non-concordant UAI in the last 12 months. Non-concordant UAI was not associated with any other drugs or sexual practices listed in Tables 2 and 3.

Comments

This is the second NHBS MSM survey in the Seattle area. HIV prevalence was 20% higher in the 2011 MSM3 survey than in the 2008 MSM2 survey (19% vs. 16%). The 20% increase is higher than the 10% increase from 2008 to 2011 in the number of men living with HIV in King County whose mode of transmission was MSM or MSM/IDU[9,10]. The change in community-wide prevalence may be due to increased survival despite a decrease in newly diagnosed cases reported to Public Health over these years. Most, but not all, of the men with HIV infection in the NHBS-MSM3 survey were aware of their status and were diagnosed several years ago, so it is not clear if the difference is related to new HIV diagnoses that have not yet registered in the surveillance system, non-representativeness of UBS or variation due to chance between the 2008 and 2011 surveys. HIV prevalence in the 2011 Seattle area survey was comparable to the overall HIV prevalence of 18% among the 20 NHBS sites[11]. Similar to the national NHBS data, we found that HIV prevalence was highest among African American MSM and increased by age. Interestingly, the local HIV surveillance system has not demonstrated a disproportionately higher number of cases among African American MSM and MSM/IDU during this time period. The proportion of men who were aware of their HIV-positive status was higher in the Seattle area survey than in the national sample (81% vs. 66%).

c. http://www.kingcounty.gov/healthservices/health/communicable/std/providers/msmstd.aspx

HIV testing findings were similar in the 2008 and 2011 Seattle area surveys with 61% and 62%, respectively, having tested in the last 12 months. In both surveys men who reported certain risky sex and drug use practices were also more likely to have tested in the last 12 months, although in the 2011 survey, those who reported non-concordant UAI were not more likely to test.

The self-reported HIV-positive men in our sample appeared to be engaged in HIV care and treatment and over half of those who were not on ART reported that it was because it was not indicated. Self-reported HIV-positive men were much more likely to report HIV-positive sex partners than self-reported HIV-negative men, indicating serosorting. On the other hand, the higher prevalence of STD diagnoses among self-reported HIV-positive men is worrisome.

The results of the survey are subject to some potential biases. Venue-based sampling underrepresents MSM who do not attend the sampling venues and may produce a sample of MSM who practice higher-risk sex since a high proportion of venues were settings where men may meet sex partners. NHBS is designed to survey populations at increased risk of HIV and while the NHBS-MSM3 survey sample may not represent the general MSM population in King County, it may provide a more accurate picture of MSM at increased risk of HIV acquisition and transmission. Data are self-reported and may be subject to social desirability bias.

Our findings highlight several HIV prevention successes. It is encouraging that many MSM practiced safer sex, that many MSM at higher risk of HIV infection tested recently, that a high proportion of HIV-positive MSM knew their status and took steps to prevent transmission, and that a high proportion were engaged in care and had viral load suppression. However, there is still room for improvement and continued efforts are important to reduce residual risky sexual and drug-use behaviors among both HIV-negative and HIV-positive MSM, to encourage HIV testing to improve detection of infection, and to ensure viral load suppression among an even higher proportion of individuals with HIV infection.

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- *Contributed by Hanne Thiede, Richard Burt, Carrie Shriver and Dawn Spellman*

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Table 1: Sociodemographic characteristics among participants in the 2011 Seattle area National HIV Behavioral Surveillance - men who have sex with men survey

	Participants N=371		HIV Prevalence N=349		p value[1]	Male Adult King County Population
	n	%	n/N	Row %		%
TOTAL			**68/349**	**19%**		
Age (years)						
18-24	60	16%	2/56	4%	<0.01	12%
24-29	82	22%	10/81	12%		11%
30-39	99	27%	16/93	17%		20%
40-49	83	22%	25/75	33%		20%
50+	47	13%	15/44	34%		37%
Median	33 years					
Race/ethnicity						
White	228	62%	42/217	19%	0.06	72%
Black	39	11%	13/36	36%		6%
Hispanic	50	14%	6/47	13%		6%
Asian/Pacific Islander	19	5%	1/18	6%		13%
Am. Indian/AK Native	6	2%	1/5	20%		1%
Multiple races	27	7%	3/24	13%		3%
Foreign born						
No	323	87%	62/305	20%	0.29	
Yes	48	13%	6/44	14%		20%
Education						
High school or less	93	25%	24/86	28%	0.01	
Post high school	127	34%	26/118	22%		
College grad. (4 years)	151	41%	18/145	12%		45%
Employed						
No	128	34%	36/119	30%	<0.01	
Yes	243	66%	32/230	14%		
Household income (annual)						
Median	$30,000-$34,999					$70,567
$15,000	93	25%	27/86	31%	<0.01	
$15,000 - $39,999	114	31%	24/108	22%		
$40,000 – $74,999	96	26%	10/90	11%		
$75,000+	65	18%	7/65	11%		
Health insurance						
No	107	29%	11/103	11%	<0.01	
Yes	264	71%	57/246	23%		84%
Homeless, 12 months						
No	331	89%	59/310	19%	0.55	
Yes	40	11%	9/39	23%		

1.Comparing HIV prevalence.
Age (2010): WA OFM www.ofm.wa.gov/pop/race/10estimates/detailed.asp.
Foreign born, education and median income (2007-2011): US Census Quick Facts (Total population) http://quickfacts.census.gov/qfd/states/53/53033.html.
Health insurance (Adult 2011): PHSKC Fact Sheet www.kingcounty.gov/healthservices/health/partnerships/HealthReform.aspx
Race (2010): www.ofm.wa.gov/pop/census2010/sf1/data/county/wa_2010_sf1_county_05000US53033.pdf.
Some categories may not add up to total because of missing data for individual variables.

Table 2: Sexual identity and behaviors among participants in the 2011 Seattle area National HIV Behavioral Surveillance - men who have sex with men survey

	Participants N=371		HIV prevalence N=349		p value[1]
	n	%	n/N	Row %	
Sexual orientation					
Homosexual/gay	322	87%	65/303	21%	0.03[2]
Bisexual	44	12%	3/42	7%	
Heterosexual	4	1%	0	--	
LAST 12 MONTHS					
Number of male sex partners					
1	95	26%	15/92	16%	0.67
2 - 4	104	28%	19/95	20%	
5 – 9	78	21%	13/72	18%	
10+	94	25%	21/90	23%	
Mean	9.6	--	--	--	
Median	3	--	--	--	
Sex with female					
No	339	91%	66/321	21%	0.03
Yes	31	8%	1/27	4%	
Non-concordant UAI with male[3]					
No	268	72%	42/252	17%	0.03
Yes	102	28%	26/96	27%	
Intentional concordant male UA[4]					
No	171	49%	28/161	17%	0.19
Yes	178	51%	39/168	23%	
STD diagnosis					
No	328	88%	55/309	18%	0.03
Yes	43	12%	13/40	33%	
LAST MALE PARTNER					
Type of partner					
Main	171	46%	32/164	20%	0.99
Casual	200	54%	36/185	19%	
Partner HIV status					
Negative	188	51%	20/183	11%	<0.01
Positive	57	15%	33/47	70%	
Unknown	126	34%	15/119	13%	
Type of sex at last sexual encounter					
Oral sex only	104	28%	16/97	16%	0.54
Protected anal sex	117	32%	19/110	17%	
Concordant UAI[3]	110	30%	24/103	23%	
Non-concordant UAI[4]	40	11%	9/39	23%	
Drug use at last sexual encounter					
No	299	81%	48/281	17%	0.02
Yes	72	19%	20/68	29%	
Concurrent male sexual partnerships					
No	157	42%	23/150	15%	0.04
Yes	138	37%	34/128	27%	
Don't know	76	20%	11/71	15%	

1. Comparing HIV prevalence.
2. Excluding 4 men who identified as heterosexuals.
3. Unprotected (no condom) anal intercourse (UAI) with a male partner of same HIV status.
4. UAI with a man of opposite or unknown HIV status.

Some categories may not add up to total because of missing data for individual variables.

Table 3: Substance use behaviors among participants in the 2011 Seattle area National HIV Behavioral Surveillance - men who have sex with men survey

	Participants N=371		HIV prevalence N=349		p value[1]
	n	%	N	Row %	
DRUG USE LAST 12 MONTHS					
Any drug use (excluding marijuana)					
No	173	47%	19/164	12%	<0.01
Yes	198	53%	49/185	26%	
Powdered cocaine					
No	295	80%	54/277	19%	0.99
Yes	76	20%	14/72	19%	
Amphetamines					
No	310	84%	44/291	15%	<0.01
Yes	61	16%	24/58	41%	
Ecstasy					
No	304	82%	57/283	20%	0.52
Yes	67	18%	11/66	17%	
Painkillers (Oxycontin, Vicodin, Percocet)					
No	314	85%	59/297	20%	0.67
Yes	57	15%	9/52	17%	
Poppers					
No	260	70%	36/249	14%	<0.01
Yes	111	30%	32/100	32%	
Drug injection					
No	342	93%	55/321	17%	<0.01
Yes	25	7%	11/24	46%	
ALCOHOL USE LAST 30 DAYS					
Alcohol binge 4+ times					
No	246	66%	45/229	20%	0.91
Yes	125	34%	23/120	19%	

1. Comparing HIV prevalence.
Some categories may not add up to total because of missing data for individual variables.

Table 4: HIV prevalence and self-reported HIV status among participants in the Seattle area 2011 National HIV Behavioral Surveillance - men who have sex with men survey

Self-reported HIV status	Serologic HIV status				
	Negative	Positive	Indeterminate	Unknown	TOTAL[1]
	n (%)	n (%)	n (%)	n (%)	
Negative	253 (90%)	11 (16%)	2 (18%)	2 (67%)	268
Positive	1 (<1%)	55 (81%)	8 (73%)	1 (33%)	65
Indeterminate	2 (1%)	1 (1%)	1 (9%)	0	4
Unknown	25 (9%)	1 (1%)	0	0	26
TOTAL	281	68	11	3	363

1. Excluding 8 participants who did not consent to HIV testing, including 1 person who self-reported being HIV positive.

Table 5: Health–related factors among participants in the 2011 Seattle area National HIV Behavioral Surveillance - men who have sex with men survey

	n/N	%
Last HIV test[1]		
Never tested	17/303	6%
> 12 months ago	97/303	32%
Previous 12 months	189/303	62%
Previous 6 months	131/303	43%
Previous 3 months	86/303	28%
Last HIV test		
Asked for test	187/272	69%
Offered test	85/272	31%
Hepatitis vaccination		
Hepatitis A vaccination	229/371	62%
Hepatitis B vaccination	235/371	63%
Self-reported HCV positive		
Among all participants	17/371	5%
Among self-reported HIV negatives	4/275	1%
Among self-reported HIV positives	11/66	17%
Among never injectors	10/316	3%
Among ever injectors	7/53	13%
STD diagnosis last 12 months	43/371	12%
Among self-reported HIV negatives	28/275	10%
Among self-reported HIV positives	14/66	21%

1. Among those who did not self-report being HIV positive.
Some categories may not add up to total because of missing data for individual variables.

Table 6: HIV- related factors among self-reported HIV-positive participants in the 2011 Seattle area National HIV Behavioral Surveillance - men who have sex with men survey

	N=66 n	%
Time since first HIV-positive test		
Within 1 year	8	12%
2-4 years	20	30%
5-9 years	8	12%
10+ years	30	45%
Health insurance	59	89%
Saw a healthcare provider for HIV care	66	100%
Receiving HIV antiretroviral treatment	50	76%
Most recent viral load result		
Undetectable	39	59%
<5,000	7	11%
5,000-100,000	6	9%
>100,000	5	8%
Don't know	8	12%

Some categories may not add up to total because of missing data for individual variables.

Table 7: Sociodemographic characteristics and sexual and drug use behaviors associated with having an HIV test in the last 12 months among participants who did not report being HIV-positive in the 2011 Seattle area National HIV Behavioral Surveillance - men who have sex with men survey

	HIV test last 12 months		Unadjusted p value	Adjusted odds ratio[1]	95% CI[1]	Adjusted p value[1]
	n/N	Row%				
TOTAL	189/303	62%				
Education						
≤ High school	38/70	54%	0.049	1.0		0.05
Post high school	73/99	72%		2.1	1.1-4.1	
College graduate	80/134	60%		1.2	0.7-2.2	
LAST 12 MONTHS						
Poppers						
No	132/227	58%	<0.01	1.0		0.01
Yes	59/76	75%		2.1	1.2-3.7	
Number of male sex partners						
1	33/81	41%	<0.01	1.0		<0.01
2-4	63/87	70%		3.6	1.9-6.8	
5-9	43/63	68%		3.1	1.5-6.2	
10+	52/72	72%		3.9	2.0-7.8	
Intentional concordant UAI						
No	84/150	55%	0.01	1.0		0.01
Yes	94/133	70%		1.9	1.1-3.1	
STD diagnosis						
No	164/274	60%	<0.01	1.0		<0.01
Yes	25/29	86%		4.5	1.5-13.3	

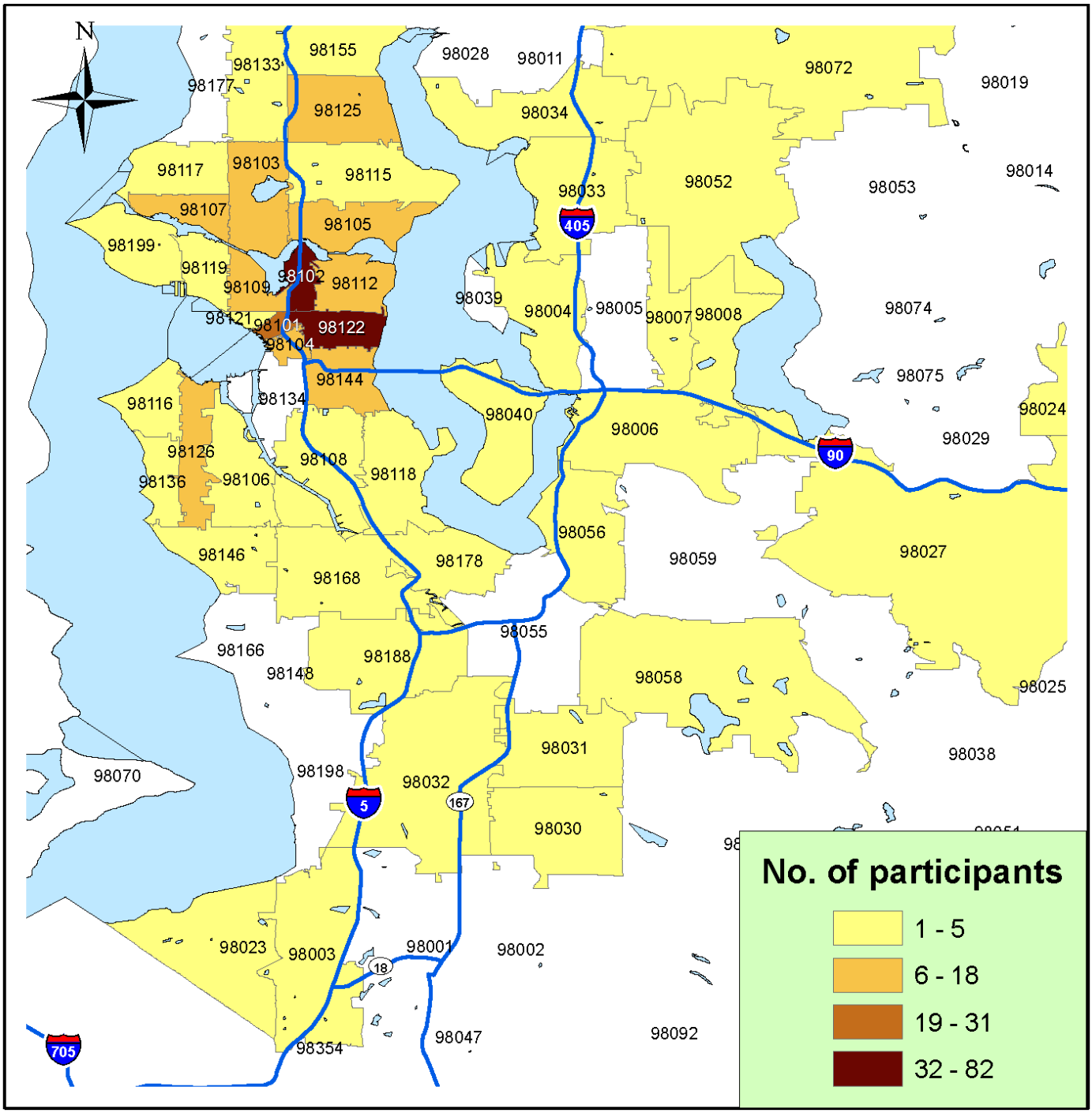
1. Controlled for education.
Some categories may not add up to total because of missing data for individual variables.

Table 8: Sociodemographic characteristics and sexual and drug use behaviors associated with non-concordant Unprotected Anal Intercourse among participants in the 2011 Seattle area National HIV Behavioral Surveillance - men who have sex with men survey

	Non-concordant UAI		Unadjusted p value	Adjusted odds ratio[1]	95% CI[1]	Adjusted p value[1]
	n/N	Row %				
TOTAL	102/370	28%				
Homeless, 12 months						
No	84/330	25%	0.01	1.0		0.01
Yes	18/40	45%		2.4	1.3-4.7	
LAST 12 MONTHS						
Powdered cocaine						
No	71/294	24%	<0.01	1.0		0.02
Yes	31/76	41%		1.9	1.1-3.3	
Amphetamine use						
No	69/309	22%	<0.01	1.0		<0.01
Yes	33/61	54%		3.7	2.0-6.8	
Ecstasy use						
No	71/304	23%	<0.01	1.0		<0.01
Yes	31/66	47%		2.6	1.5-4.6	
Painkiller (Oxycontin, Vicodin, Percocet) use						
No	75/313	24%	<0.01	1.0		<0.01
Yes	27/57	47%		2.5	1.4-4.6	
Popper use						
No	62/259	24%	0.02	1.0		0.02
Yes	40/111	36%		1.8	1.1-2.9	
Number of male sex partners						
1	13/95	14%	<0.01	1.0		<0.01
2-4	21/103	20%		1.6	0.8-10.0	
5-9	27/78	35%		3.1	1.5-6.7	
10+	41/94	44%		4.9	2.4-10.0	
LAST MALE PARTNER						
Drug use at last sexual encounter						
No	66/298	22%	<0.01	1.0		<0.01
Yes	36/72	50%		3.2	1.9-5.6	

1. Controlled for homelessness in the last 12 months.
Some categories may not add up to total because of missing data for individual variables.

Figure 1: Resident zip codes among participants in the 2011 Seattle area National HIV Behavioral Surveillance - men who have sex with men survey



Estimating HIV Incidence in King County and Washington State

Introduction

HIV incidence is defined as the number of new HIV infections that occur in a population during a given time period. Partially as a result of the long latency period which is characteristic of HIV disease, during which patients often do not realize they are infected, many cases of HIV infection are not diagnosed until months or years after the time of infection. Since HIV infection is difficult to observe or measure directly, HIV surveillance systems have traditionally relied instead on reported diagnoses of HIV infection as a proxy measure for HIV incidence. HIV case counts have long been used to determine both the scale and direction of the HIV epidemic, and to describe populations most at risk for acquiring HIV. However, questions remain regarding just how well HIV diagnosis data perform these functions.

More than a third of new HIV cases (34%) in Washington meet the definition of late HIV diagnosis, meaning they are diagnosed with AIDS within 12 months of initial HIV diagnosis[1]. Most of these cases have been infected for at least five years, often much longer. Hence, HIV diagnosis data are limited in their ability to describe recent HIV transmission (or seroconversion) in a timely manner. Fortunately, new technologies have recently made it possible to estimate true HIV incidence, including cases that have or have not yet been diagnosed. A comparison of HIV estimates with HIV count data could help not only broaden our understanding of the HIV epidemic itself, but also evaluate the accuracy and usefulness of available data to both monitor disease trends and measure the effectiveness of HIV prevention strategies.

Washington is currently one of 25 states that receive federal funding to conduct HIV Incidence Surveillance (HIS). This supplemental surveillance program gathers the information we need in order to estimate HIV incidence for our state and for the nation. HIV Incidence Surveillance relies on a unique laboratory process called STARHS (serological testing algorithm for recent HIV seroconversion) which is able to distinguish between blood taken from recently-infected individuals vs. those who have been infected longer. Cases are categorized as "recent" if they appear to have been infected within the past six months (the STARHS window period).

Nationally, the U.S. Centers for Disease Control and Prevention (CDC) estimates that approximately 47,500 people were newly infected with HIV in 2010[2]. In this article, we present five years of HIV incidence estimates for Washington State and King County , and compare them to new HIV case counts during the same years.

Methods

We estimated HIV incidence among Washington State residents ages 13 and older between 2007 and 2011. Our estimates are based on data collected from individuals who were diagnosed with HIV infection during the same time frame and reported to the state's HIV surveillance system as of January 2013.

Our HIV incidence estimates are based on a stratified extrapolation method described by Karon, et. al[3]. We used the CDC-supplied statistical programs (SAS version 9.2) which are designed to construct local HIV incidence estimates. Briefly, via routine case investigations, we collected HIV testing and treatment history (TTH) data from most newly diagnosed cases of HIV infection, regardless of stage of disease at diagnosis. This included information about prior HIV testing dates, HIV testing frequency, and use of antiretroviral (ARV) medications. We later excluded cases diagnosed with AIDS within six months of HIV diagnosis, as well as cases that were already taking ARVs at the time of HIV diagnosis.

STARHS is a two-test algorithm performed on blood specimens from individuals confirmed HIV-positive using a standard diagnostic algorithm. HIS collaborates with public and private/commercial laboratories to locate, determine the disposition of, and ship remnant diagnostic blood specimens for testing at a special, CDC-designated STARHS laboratory located in New York. STARHS relies in part on a unique assay, called BED, which can determine whether a person was recently infected with HIV. The period of recent infection is roughly 6 months (162 days)[4]. The total number of diagnosed and undiagnosed HIV infections in a given

year is estimated based on the observed number of new HIV diagnoses classified as recent infections using STARHS and the estimated probability that a new HIV infection would be diagnosed within the STARHS recency period (and thus be classified as a recent infection).

We also calculated annual, statewide HIV disease rates based on both new HIV cases and estimated HIV infections. Rates represent the number of reported or estimated cases divided by the number of people (ages 13 and older) who are living in Washington during a given calendar year. Rates are described as cases/infections per 100,000 state residents. Population estimates were provided by the Washington State Office of Financial Management. Confidence intervals for new HIV case rates are based on a Poisson distribution. Confidence intervals for estimated HIV infection rates represent the combined uncertainty associated with both the process of incidence estimation as well as rate calculation. In other words, we calculated disease rates based on the mid-point as well as the upper and lower limits of each incidence estimate, then added the additional uncertainty produce by rate calculation.

Results

For the most part, estimated numbers of HIV infections were comparable to or slightly less than reported numbers of new HIV diagnoses (**Table 1 and Figures 1 through 5**). Each estimate was accompanied by a relatively large amount of statistical uncertainty, represented as 95% confidence intervals (95% C.I.). These intervals typically encompassed the corresponding case count, meaning that there was usually no evidence (at the $p = 0.05$ level) that the number of estimated infections within a given year differed significantly from the number of diagnoses during the same time period. For example, in 2010 the estimated number of new HIV infections across Washington State was 464 (95% C.I.: 305-623). That same year, 552 new HIV diagnoses were reported. Since the reported case count fell well within the confidence interval of the incidence estimate, we don't have statistical evidence to say one number is statistically different from the other.

Statewide, annual HIV incidence estimates ranged from a low of 390 new infections in 2009 to a high of 541 in 2007. Although the estimates appeared to decrease somewhat from the beginning to the end of the five-year period, the trend was not statistically significant. Likewise, none of the annual incidence estimates were significantly different from one another, whether state, King County, or MSM-specific estimates were examined. However, the 2009 incidence estimate appeared much lower than other annual estimates. Indeed, 2009 was the only year in which estimated number of infections was significantly lower than the number of diagnoses within the same year (**Figures 1, 2, and 4**). That temporary decrease appears to be driven mostly by decreases in estimated infections among men who have sex with men (MSM) residing in King County, including those who inject drugs (MSM/IDU) (data not shown).

There was also a great deal of agreement between estimated and reported values with regard to the distribution of values across demographic, risk, and geographic strata. For example, both incidence estimates and new case counts would suggest that

- four out of five people recently infected with HIV in Washington (>82%, on average) are male,
- three out of four (>73%) are either MSM or MSM/IDU,
- over half (>55%) reside in King County, and
- more than one third (>34%) are MSM or MSM/IDU who reside in the City of Seattle.

Compared to case counts, incidence estimates did suggest that a larger proportion of HIV infections occur among young people. Depending on the year, as many as 1 in 4 (25%) estimated HIV infections occurred among people between 13 and 24 years of age, whereas the corresponding proportion among reported cases was typically below 15%.

Although we attempted to calculate incidence estimates for specific racial and ethnic groups, estimates for groups such as Blacks/African-Americans or Hispanics proved too unstable to include in this report. However, the annual estimates among non-Hispanic Whites did indicate that more than one in three (>33%) HIV infections in Washington occur among people who belong to a racial/ethnic minority. This proportion is slightly less than that derived from reported cases: 43%, on average between 2007 and 2011 (data not shown).

Statewide, new HIV case rates decreased significantly between 2007 and 2011 (**Figure 6**), ranging from a high of 10.8 cases per 100,000 in 2007 to a low of 8.7 cases per 100,000 in 2011. On average, rates based on reported cases dropped about 0.4 cases per 100,000 each year. Estimated HIV infection rates did not display a trend over time, and similar to counts, were not significantly different from one another or from rates based on reported cases.

Discussion

The large degree of corroboration between estimated HIV infections and new HIV diagnoses reinforces the notion that the latter, more widely available data can be used as a reasonable proxy measure for HIV incidence. Moderate variability from year to year and wide confidence intervals surrounding individual estimates indicate the need to interpret our findings with a healthy degree of caution. Nevertheless, it seems safe to conclude that case-based HIV surveillance data do a reasonably good job of describing the state's HIV epidemic. If anything, case counts appear to slightly over-represent actual HIV incidence, meaning that the volume of HIV transmission in Washington might be somewhat lower than count data alone would suggest[5,6].

While the dip in estimated HIV incidence in 2009 seems relatively large, it was not statistically significant. Most of the change appears to have been driven by a decrease in estimated incidence among MSM residing within King County. However, given the stable, endemic nature of HIV transmission in Washington (case counts have fluctuated little over the past >15 years), as well as the typically slow pace at which population-level risk behaviors tend to change over time, we find it difficult to conclude that actual HIV incidence experienced any sort of dramatic change within a single year,

Table 1: Comparing New HIV Cases* with Estimated New HIV Infections, Washington State, 2007-2011

	2007		2008		2009	
	New HIV Cases	Estimated Infections	New HIV Cases	Estimated Infections	New HIV Cases	Estimated Infections
	N	N (95% CI)	N	N (95% CI)	N	N (95% CI)
Total	588	541 (359, 724)	542	533 (280, 785)	539	390 (249, 531)
Gender						
Male	490	440 (282, 598)	446	433 (208, 658)	452	311 (203, 419)
Female	98	101 (24, 179)	96	100 (5, 195)	87	79 (0, 162)
Age in years						
13-24	90	137 (62, 212)	79	81 (16, 145)	81	97 (33, 161)
25-34	152	153 (75, 231)	161	197 (53, 341)	158	153 (75, 231)
35-44	182	151 (67, 234)	156	145 (18, 272)	144	72 (21, 124)
45+	161	101 (34, 168)	143	110 (0, 226)	148	68 (18, 117)
Sexual orientation						
MSM and MSM/IDU**	431	404 (264, 544)	380	393 (185, 602)	396	289 (193, 385)
Other	157	138 (43, 232)	162	139 (22, 256)	143	101 (5, 196)
Residency						
Inside Seattle	233	245 (159, 331)	218	219 (70, 368)	194	143 (81, 204)
Outside Seattle	355	297 (157, 436)	324	314 (132, 495)	345	247 (131, 364)
Inside King Co.	319	332 (216, 447)	317	321 (139, 503)	300	200 (126, 275)
Outside King Co.	269	210 (95, 324)	225	212 (65, 358)	239	190 (82, 297)
Sex by residency						
MSM inside Seattle**	196	206 (136, 275)	179	199 (59, 340)	164	130 (76, 183)
MSM outside Seattle**	235	198 (91, 305)	201	194 (57, 331)	233	160 (85, 234)

* Cases newly diagnosed with HIV infection and reported to the state's HIV surveillance system
** Includes men who have sex with men who are injection drugs users (MSM/IDU) and those who are not (MSM)

only to rebound a short while later. It is more likely that this change represents an artifact caused by an inconsistency in the quality of underlying data used to calculate the estimates. As we move forward, we expect the completeness and quality of these data to continue to improve. Hence, we anticipate that this kind of artificial variability in our estimates will be minimized.

Both our methods of HIV incidence estimation and HIV rate calculation are accompanied by a certain amount of statistical uncertainty; the former typically being much greater than the latter. When calculating HIV rates based on incidence estimates, we were not entirely sure how to derive 95% confidence intervals, or correctly account for both forms of uncertainty. The approach used seems reasonable. However, we have already shared this report with HIV incidence experts at CDC and specifically requested feedback on this issue. In the future, we will continue to work with our federal partners to ensure that our handling of statistical uncertainty meets appropriate biostatistical standards.

In 2012, the Washington State HIV Prevention Planning group established an ambitious goal: to reduce annual HIV incidence among gay and bisexual men living in Seattle by 50% by 2017. Until recently we did not have the methods to estimate HIV incidence within such a narrowly defined risk group; and, we are

Table 1: (Continued) Comparing New HIV Cases* with Estimated New HIV Infections, Washington State, 2007-2011

	2010		2011	
	New HIV Cases	Estimated Infections	New HIV Cases	Estimated Infections
	N	N (95% CI)	N	N (95% CI)
Total	552	464 (305, 623)	497	528 (330, 725)
Gender				
Male	482	344 (229, 458)	429	479 (292, 667)
Female	70	121 (14, 227)	68	48 (0, 104)
Age in years				
13-24	74	97 (29, 165)	66	122 (38, 205)
25-34	164	176 (86, 265)	150	182 (77, 287)
35-44	155	110 (30, 189)	125	117 (30, 205)
45+	149	82 (20, 144)	150	106 (21, 192)
Sexual orientation				
MSM and MSM/IDU**	412	323 (220, 426)	374	445 (266, 623)
Other	139	141 (25, 257)	123	83 (11, 155)
Residency				
Inside Seattle	241	190 (108, 272)	199	245 (120, 370)
Outside Seattle	311	274 (143, 405)	298	283 (145, 421)
Inside King Co.	322	272 (164, 379)	273	297 (156, 437)
Outside King Co.	230	193 (82, 303)	224	231 (109, 353)
Sex by residency				
MSM inside Seattle**	208	149 (96, 201)	172	223 (104, 341)
MSM outside Seattle**	205	174 (90, 259)	203	222 (99, 344)

* Cases newly diagnosed with HIV infection and reported to the state's HIV surveillance system
** Includes men who have sex with men who are injection drugs users (MSM/IDU) and those who are not (MSM)

excited now to be developing this level of capacity. Although 2012 incidence estimates are not yet available — the baseline estimate cannot be calculated for a year that ended so recently — incidence estimates from previous years suggest that roughly 181 new HIV infections each year (again, about one third of the statewide total) can be attributed to Seattle MSM. Hence, a 50% reduction in HIV incidence within this group would require reducing group-level incidence by about 90 new infections each year. If successful, the direct impact of this achievement would be to reduce statewide HIV incidence by more than 18%. Yet, the total impact may be even larger since lower HIV transmission within this important core risk group would likely have a cascading effect, reducing HIV transmission among separate but adjacent at-risk individuals and risk populations in Washington.

HIV incidence estimates are limited in ways that HIV case counts are not. The large degree of uncertainty surrounding estimates has already been mentioned. In addition, since these estimates are produced by mathematical models, they are dependent on a number of underlying assumptions, some of which may or may not be valid within local areas or individual populations. For example, one such assumption is that HIV testing patterns within populations of interest remain unchanged. There is evidence to suggest that testing patterns among Seattle MSM may have changed between 2007 and 2011[7]. The degree to which a violation of this constant-testing-assumption has on the estimates themselves is difficult to measure. Finally, due to the need to locate, test, and enter the results of BED recency assays conducted with remnant HIV-positive sera, the process of collecting the necessary data to produce incidence estimates can be lengthy, often requiring 1-2 years of follow-up. In contrast, most HIV diagnoses (>90%) are reported to the state's surveillance system within six months of diagnosis. In conclusion, we have found that new HIV case counts seem to act as a reasonable proxy measure of HIV incidence in Washington State. We will continue to estimate HIV incidence on a routine basis in the future, and we will continue to monitor and evaluate whether the assumptions underlying our estimation methods remain valid.

- *Submitted by Jason Carr and Christina Thibault*

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2 Centers for Disease Control and Prevention. Estimated HIV Incidence in the United States, 2007–2010. HIV Surveillance Supplemental Report 2012;17(No.4). http://www.cdc.gov/hiv/topics/surveillance/resources/reports/index.htm#supplemental. Published December 2012.

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5 Koopman JS, Simon CP, Riolo CP (2005). When to control endemic infections by focusing on high-risk groups. Epidemiology, 16(5); 621-7.

6 Brenner BG, Roger M, Stephens D, Moisi D, Hardy I, Weinberg J, Turgel R, Charest H, Koopman J, Wainberg MA; Montreal Cohort Study Group (2011). Tranmission clustering drives the onward spread of the HIV epidemic among men who have sex with men in Quebec. J Infect Dis. 204(7): 1115-9.

7 Katz, DA, Dombrowski JC, Swanson F, Buskin SE, Golden MR, Stekler JD. HIV intertest interval among MSM in King County, Washington. Sex Transm Infect. 2012 May 5. [Epub ahead of print] PubMed PMID: 22563016.

Figure 1: Total New HIV Cases vs. Total Estimated Infections, Washington State, 2007-2011

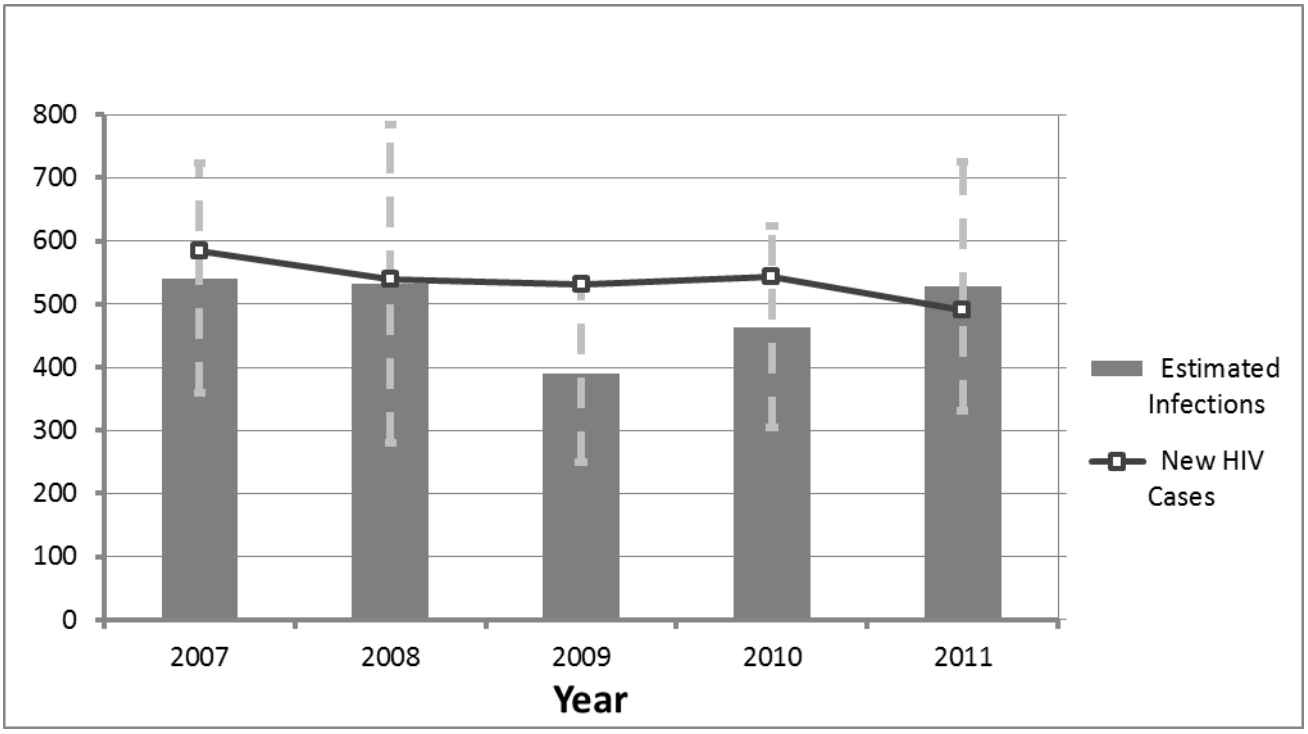


Figure 2: New HIV Cases vs. Estimated Infections inside King County, 2007-2011

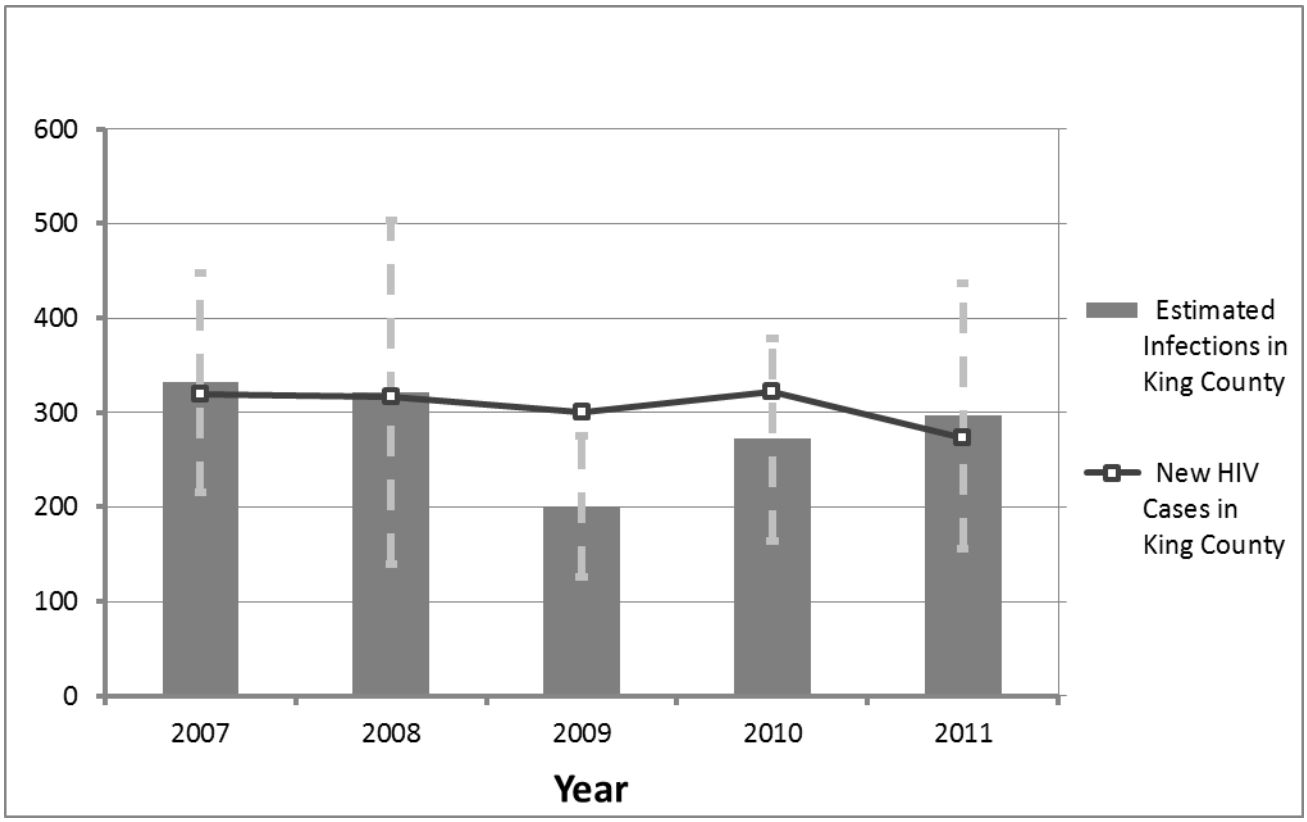


Figure 3: New HIV Cases vs. Total Estimated Infections, Outside King County, 2007-2011

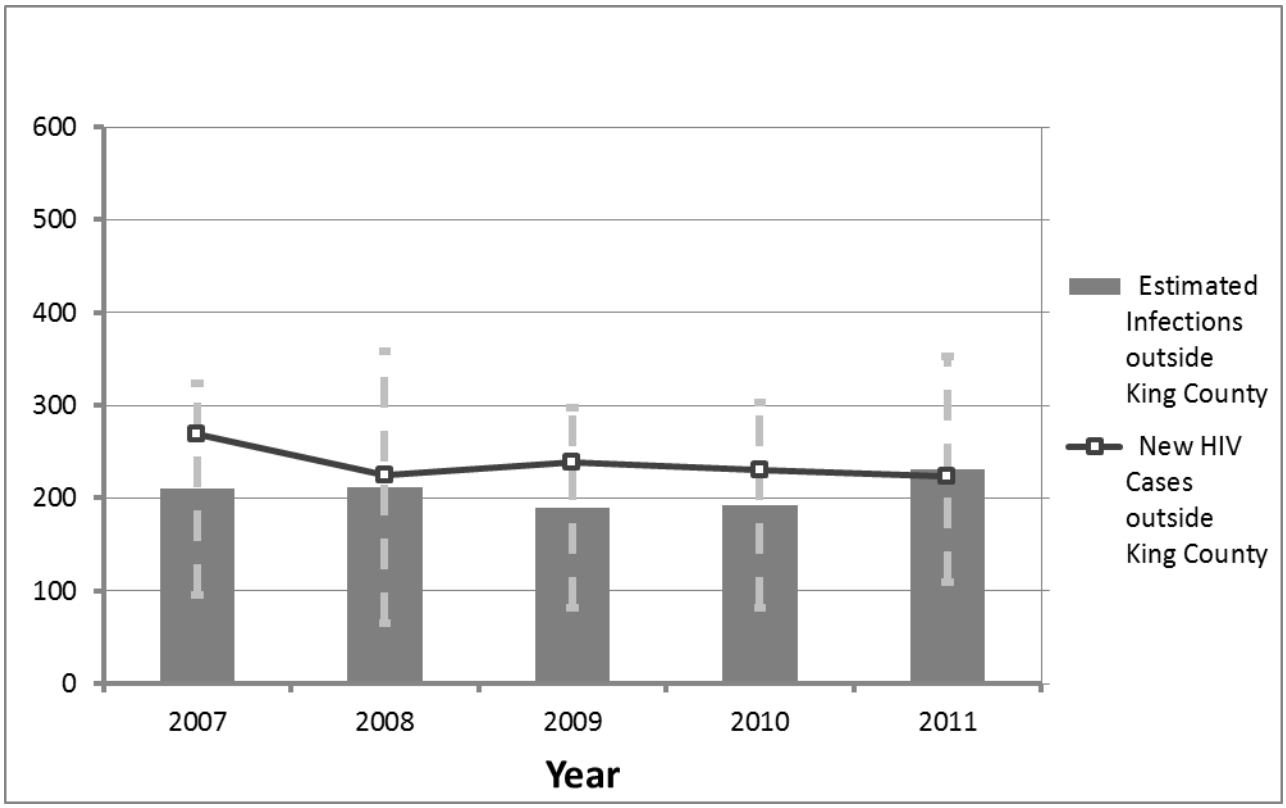


Figure 4: New HIV Cases among MSM vs. Estimated Infections among MSM, Washington State, 2007-2011

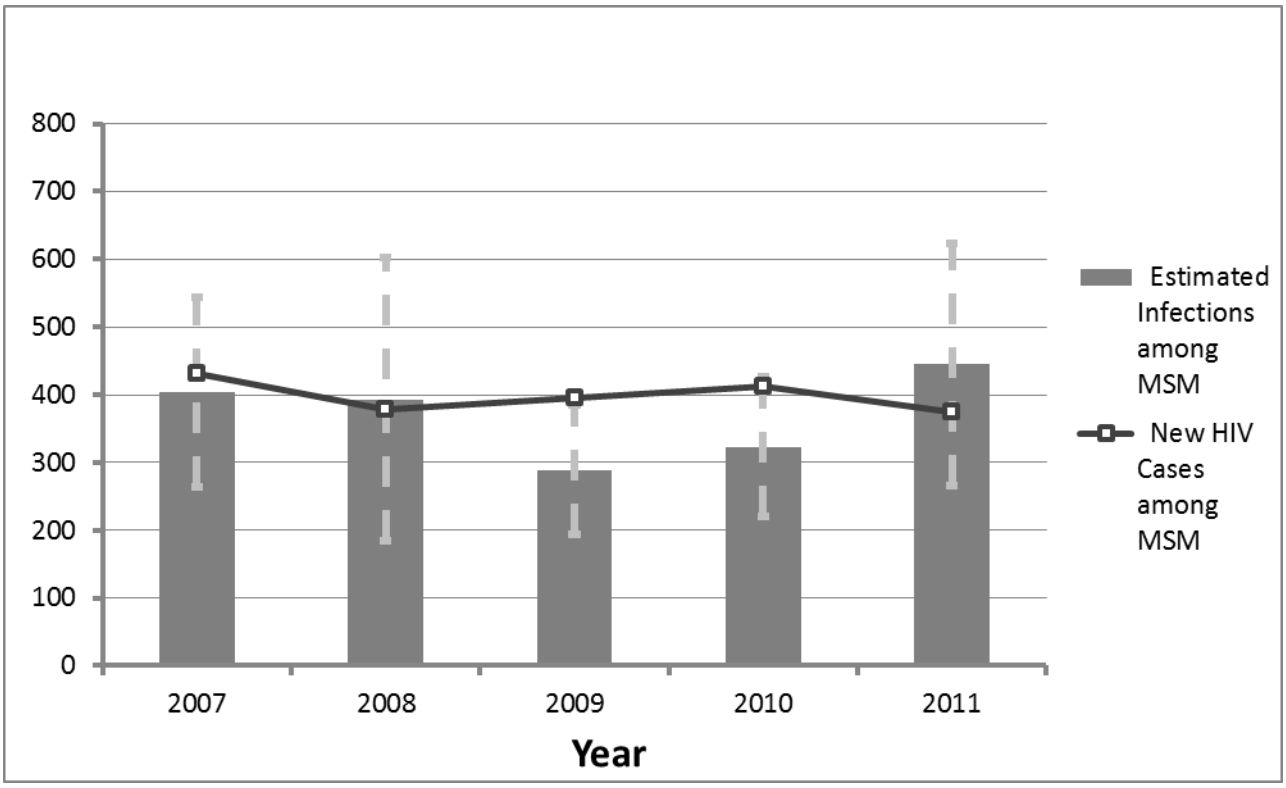


Figure 5: New HIV Cases among Seattle MSM vs. Estimated Infections among Seattle MSM, 2007-2011

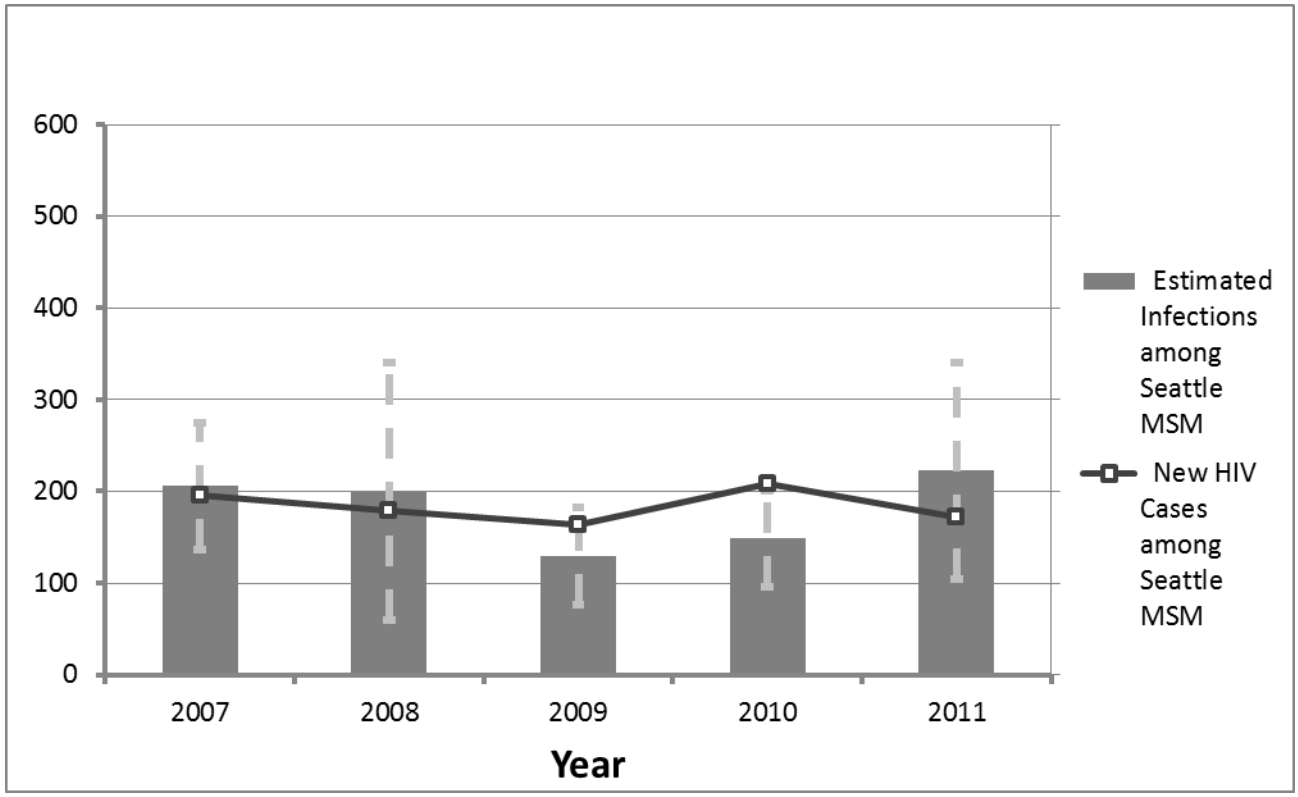
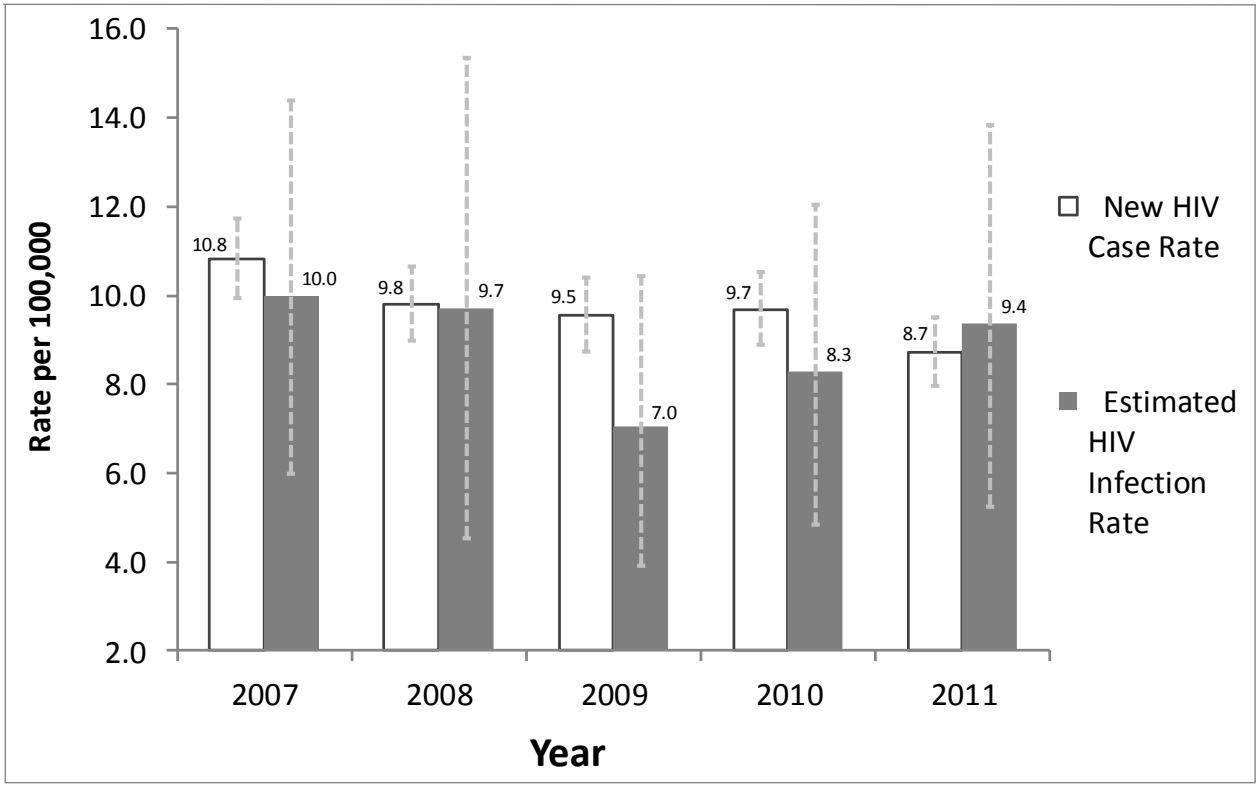


Figure 6: New HIV Cases Rates vs. Estimated HIV Infection Rates, Washing State, 2007-2011



STD Report

STD Case Counts

Table 1: King County STD morbidity

	2011		2012	
	2011 Q4	YTD	2012 Q4	YTD
Gonorrhea (GC)	339	1,406	452	1,560
GC: MSM*	188	685	299	927
Urethral GC	78	291	128	360
Rectal GC	79	287	119	375
Pharyngeal GC	78	253	140	449
GC: Women^	78	394	74	331
GC: MSW^†	45	214	52	195
Chlamydia (CT)	1,614	6,499	1,748	6,896
CT: MSM	197	762	318	1,061
Urethral CT	74	344	119	396
Rectal CT	113	399	198	651
CT: Women^	1,033	4,134	1,039	4,156
CT: MSW^	296	1,255	285	1,225
Syphilis‡	130	512	104	455
Primary and secondary	68	260	51	223
Early latent	24	111	18	118
Late + unk duration	38	141	35	112
Early syphilis: MSM	82	340	62	304
Early syphilis: Women	2	5	2	6
Early syphilis: MSW	6	17	1	11
Congenital syphilis	0	0	0	2

* Men who have sex with men
† Men who have sex with women
^ Genital tract infection
‡ Total cases (all stages)

Table 2: King County newly diagnosed HIV cases*

	2011		2012	
	2011 Q3	YTD	2012 Q3	YTD
Total^	63	202	64	222
MSM	46	158	47	152
Women[a]	6	22	6	33
MSW[a]	4	10	6	20

* Data shown for prior quarter due to reporting delay
^ Column may not equal total due to missing sexual preference data

Trends in STD Morbidity

Figure 1: Quarterly King County STD morbidity, women and MSW

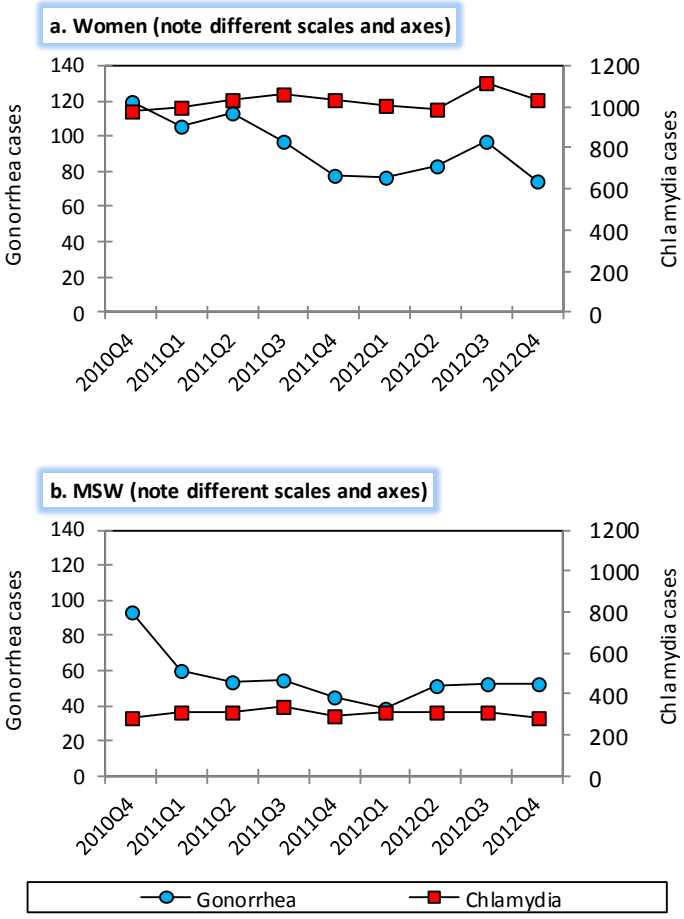
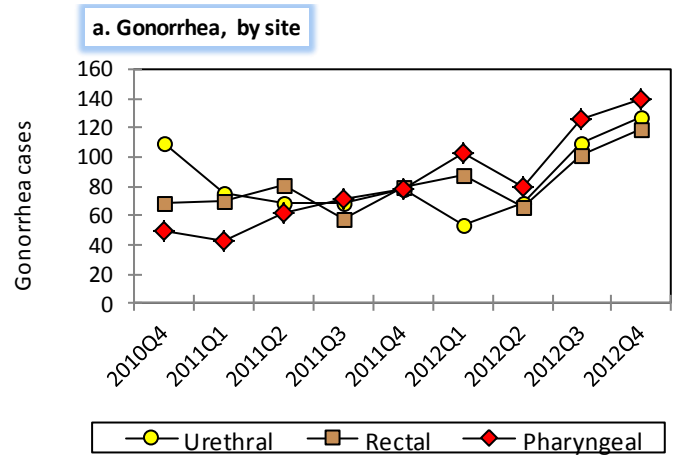
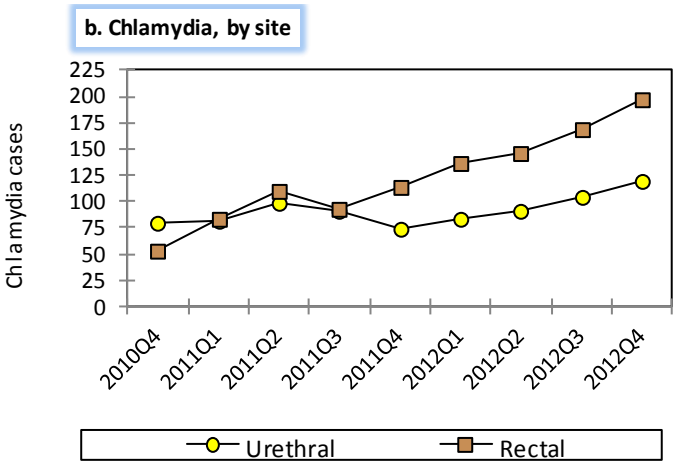
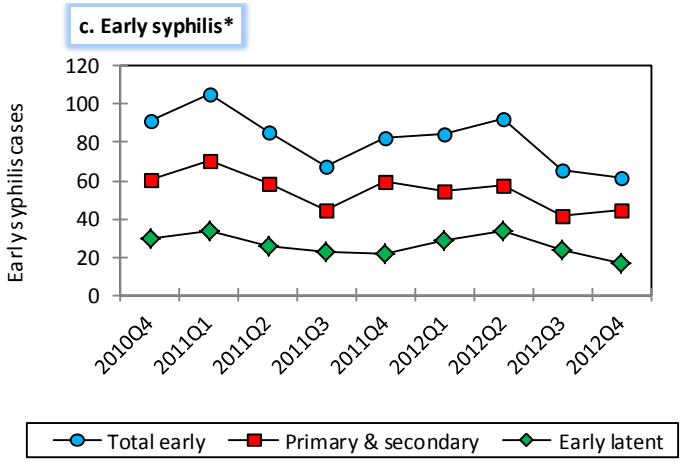


Figure 2: Quarterly King County STD morbidity among MSM

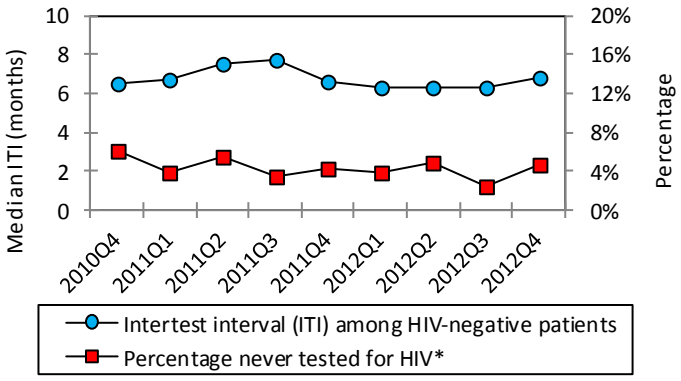






* Includes primary, secondary, and early latent syphilis cases

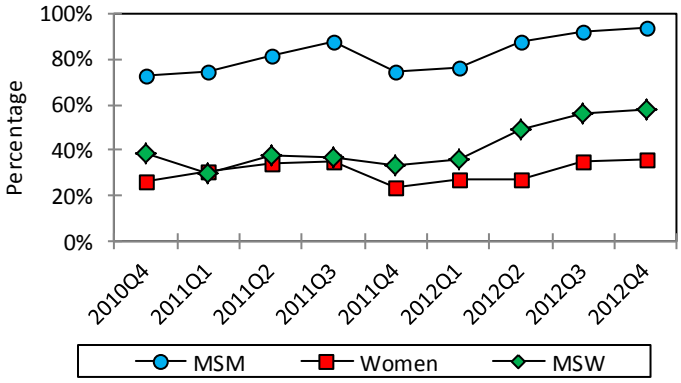
Figure 3: HIV testing among PHSKC STD Clinic patients, MSM (note different scales)



* Includes patients who reported never testing or negative/unknown results

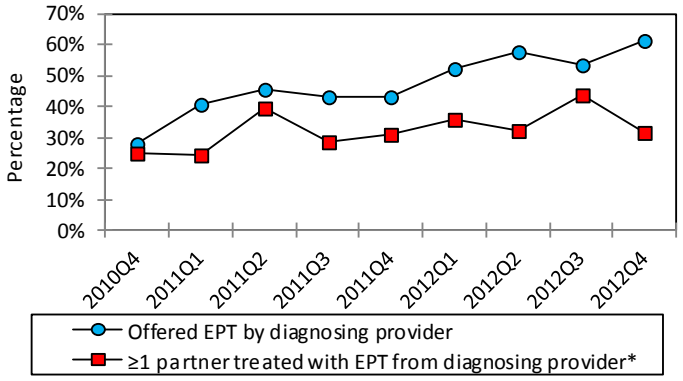
HIV testing should be performed annually on low-risk MSM and quarterly on high-risk MSM[b].

Figure 4: Percentage of King County residents with a bacterial STD tested for HIV (excludes HIV+ residents)



Anyone diagnosed with a bacterial STD should be tested for HIV.

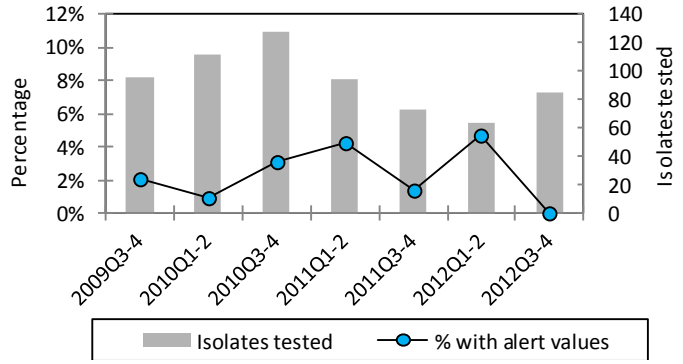
Figure 5: Expedited Partner Therapy (EPT) among King County women and MSW diagnosed with GC or CT



* Median number of patients surveyed per quarter = 37 (Range 13-78)

All women and MSW diagnosed with gonorrhea or chlamydia should be offered EPT by their diagnosing provider.

Figure 6: Percentage of male GISP[c] urethral isolates with alert values for cephalosporins or azithromycin (note scales)



Alert value = Minimum Inhibitory Concentration (MIC, lowest antibiotic concentration needed to halt bacterial growth) is higher than preset thresholds[d]. Alert value MICs represent decreased susceptibility to an antibotic but may not represent resistance.

Table 3: Male GISP urethral isolates with alert values for cephalosporins or azithromycin[e]

	2011		2012	
	2011 Q3-4	YTD	2012 Q3-4	YTD
Total isolates tested*	73	167	85	149
MSM	52	125	72	122
MSW	21	42	13	24
Total alert isolates*	1	5	0	3
MSM	0	3	0	2
MSW	1	2	0	1

* Column may not equal total due to missing sexual preference data

- *Contributed by David Katz*

Endnotes:

[a]The increase observed in the year-to-date cases of HIV among women and heterosexual men is attributable primarily to an increase in HIV diagnoses among foreign-born blacks. Only 9 cases of HIV infection were diagnosed among foreign-born black women and heterosexual men in the first three quarters of 2011, compared to 23 such cases in 2012.

[b]High-risk = MSM with any one of the following in the prior year: diagnosis of a bacterial STD, methamphetamine or popper use, ≥10 sex partners (anal or oral), or unprotected anal sex with a partner of unknown or discordant HIV status.
Low-risk = sexually active MSM who do not meet high-risk criteria.

[c]Gonococcal Isolate Surveillance Project (GISP), source of antibiotic susceptibility data, is supported by the Centers for Disease Control and Prevention.

[d]Alert values: Ceftriaxone MIC ≥ 0.125 µg/ml; Cefixime MIC ≥ 0.25 µg/ml; and Azithromycin MIC ≥ 2.0 µg/ml.

[e]Abnormal amount of missing sexual preference data in 2012Q1 due to technical issues with data collection instrument.

Tuberculosis and HIV

Tuberculosis (TB) is a leading cause of morbidity and mortality worldwide. It is second only to HIV as a cause of death from a single infectious agent, and TB is the most common cause of death for people infected with HIV - resulting in up to 25% of deaths in those infected with HIV. In 2011, almost 9 million people had active tuberculosis, and 1.4 million people died from this infection. TB also has a huge socioeconomic impact, not only on populations themselves infected with TB, but TB also leaves 10 million children orphaned worldwide. Locally, TB is also a concern. The Washington state case rate of active tuberculosis is 3.8 per 100,000 people, which is consistent with the national average. In 2011, there were 200 cases of TB with 6 deaths in the state of Washington. Prevention and treatment of tuberculosis are paramount.

TB is contracted as people with active pulmonary TB aerosolize the bacterium (called *Mycobacterium tuberculosis* or MTB) which is ultimately inhaled by another person. Thus, the lungs are the most common site of active disease, but osteomyelitis, meningitis, and/or any other organ in the body can be involved. When a person develops active TB, the symptoms, such as cough, fever, night sweats, and weight loss, may be mild for many months. This can lead to delays in seeking care, and may result in transmission to others.

Not everyone exposed to tuberculosis develops an active infection. After a person has been exposed to MTB, the immune system usually controls the infection and illness does not occur. However, the mycobacteria remain latent in the body (latent TB) and may reactivate later resulting in disease. Of the 33% of the world's population with latent TB, 10% will develop active tuberculosis (called reactivation) during their lifetime. However, people with weakened immune systems such as HIV have a 10% **per year** risk of reactivation – people with HIV are approximately 30 times more likely to develop active TB if exposed to it. It is important to identify people with latent tuberculosis and provide therapy because HIV and TB form a deadly combination, each accelerating the other disease. Without proper treatment, two thirds of people with active TB will die.

Treatment - of both active and latent tuberculosis - is effective, but the medication regimens are cumbersome and can result in adverse side effects. There are also many interactions with medications, including antiretrovirals used to treat HIV. Currently the standard treatment of latent tuberculosis requires six to nine months of isoniazide (INH). Other simpler treatment regimens have been tried. Previously, therapy with rifampin and pyrazinamide for two months appeared effective, but resulted in significant liver toxicity. Rifapentine (a rifamycin) is gaining more interest. It is more potent against MTB than rifampin and provides longer drug exposures. A recent study evaluating rifapentine and INH weekly for 12 weeks versus INH daily for six months in HIV infected volunteers with latent TB showed the combination given weekly to be equivalent to standard treatment. Combination therapy for latent TB also has the benefit of potentially decreasing resistance to the medications if a patient actually has active TB. Therapies with shorter duration, fewer interactions and adverse side effects, and improved efficacy continue to be a focus of investigation.

Therefore, the ACTU is currently enrolling in a study to evaluate HIV infected individuals who have been diagnosed with latent tuberculosis. They are randomized to standard of care with nine months of INH versus four weeks of therapy with rifapentine and INH. Further details and information about this and other currently enrolling studies are presented on the following pages.

- *Contributed by Shelia Dunaway*

UW AIDS Clinical Trials Unit - CURRENT STUDIES

Did You Know?

The ACTG supports the largest network of expert clinical and translational investigators and therapeutic clinical trials units in the world, including sites in resource-limited countries. As a study volunteer, you can play an important role in the fight against HIV and AIDS.

- Most of what's in your medicine cabinet was proven safe and effective through clinical studies
- You don't have to have HIV to participate in many HIV clinical studies
- More than 30 life-saving HIV meds were discovered with the help of research and countless volunteers. In fact, HIV medical research has extended years of life in the United States.
- We won't be able to find a cure for AIDS without clinical research…and people like you!

Participating in a study is an important decision. We hope that our staff—along with talking with your doctor, a family member, or a friend -- will help you better understand the ins and outs of participating in research.

With your permission and your input, our staff works with your primary care provider to maximize your health care. Why participate?

- Free access to expensive medicines
- Frequent lab monitoring at no cost
- Confidential, personalized care
- Access to after-hours on - call staff, 24/7
- No insurance required

Call the UW ACTU at 206-744-3184 and ask for Eric Helgeson for appointments or additional information.

Hepatitis C & HIV

Hepatitis C (HCV) infection is difficult. HIV will change your life. Infection with HIV and HCV together makes the treatment of both much more difficult. The U.S. guidelines recommend that all HIV+ people should be screened for HCV infection. Prevention of HCV for those not already infected as well as reducing the damage of chronic liver disease in those who are infected are important concerns for HIV infected people and their health care providers.

The Boceprevir Study

For people who have both HIV and Hepatitis C: This study is being done to see if adding an investigational drug called boceprevir to the current standard treatment for hepatitis C (which is pegylated interferon alfa 2b + ribavirin) is safe, and whether it will help people with both HIV and hep C (genotype 1) better fight their hep C.

People participating in this study can be either hepatitis C treatment naïve (individuals who have never taken hep C medications) or hep C treatment experienced (individuals who have tried hep C medications before).

Length of Study: About 72 weeks. Schedule of Study visits: Screening, entry, and weeks 2,4,6, 8, 10, 12, 16, 20, 24 then every 4-8 weeks up to week 72.

Boceprevir, pegylated–interferon alpha 2b and ribavirin are all provided at no cost as part of this study.

Participants will receive $20.00 per study visit, starting at entry.

Requirements:

- Men or women ≥ 18 years of age with HIV and hepatitis C
- Have hepatitis C genotype 1 infection
- Have a hepatitis C viral load greater than 10,000
- Have had a liver biopsy within 104 weeks prior to entry
- If on HIV meds, must be taking either raltegravir OR efavirenz AND have undetectable viral load
- If not on HIV meds, have HIV viral load less than 50,000
- Have a T-cell count greater than 200
- Not pregnant or breast feeding or planning pregnancy, or if you are a male, do not have a female partner who is pregnant
- Cannot be taking an HIV protease inhibitor

Why is HEP C Treatment Vital to People with HIV?

Past research has shown that people with both HIV and HCV tend to experience more rapid liver disease progression than people who have HCV alone, suggesting that they may benefit from earlier hepatitis C treatment.

About one in four people living with HIV in the US are co-infected with HCV. Co-infection is even more common among HIV+ injection drug users, of whom about 80% also have HCV.

HCV can progress more rapidly and lead to serious liver damage more often in HIV+ people.

According to the CDC, having HIV more than triples the risk of liver disease, liver failure, and liver-related death due to HCV. Co-infection with HCV may also make HIV treatment more challenging. Therefore, it is important for HIV+ people to know whether they have HCV.

The CDC recommends that all HIV+ people be screened for both hepatitis B and hepatitis C. Some experts recommend that HIV+ people at risk for HCV be screened every year.

Treatment of HIV/HCV coinfection is complicated. It is important to have a health care provider who is familiar with HIV and HCV to get the best treatment for both diseases.

Existing treatments for HCV are not only complicated by HIV, but less effective in people with HIV. Fortunately, there are ongoing efforts to find treatment regimens that work well in coinfected individuals.

The good news is that HCV can be treated successfully, even in HIV+ people.

The R5 Tropic Study

For HIV+ people with the R5 type of virus who have never taken HIV Medication:
This is a study for people who are infected with the R5 type of HIV. Among patients who have previously received HIV medications, approximately 50% to 60% have circulating CCR5-tropic HIV.

The purpose of this study is to compare how the investigational regimens below affect the bone mineral density (BMD) in people who have never taken HIV medications.

We will also compare the effects of these regimens on changes in the immune system and kidney, bone, and neurocognitive function.

Our previous classes of anti-HIV medications have worked only after the virus has gotten inside the cell and has already been doing some of its infection processes. This new class of medication works much earlier so that it blocks the virus's ability to get inside the cell to begin with.

Participants will be assigned by chance (like flipping a coin) to either:

- Group A: Prezista + Norvir + Selzentry + Emtriva + Viread placebo once daily
- Group B: Prezista + Norvir + Viread + Emtriva + Selzentry placebo once daily

Length of Study: about 48 weeks. Schedule of study visits: Screening, Pre-Entry, Entry, and weeks 4, 16, 24, 36 and 48.

DXA bone scans and neuropsychologic testing will be performed.

Exams, lab tests, and all HIV medications are provided to you at no cost.

Participants will receive $20.00 per study visit, starting at entry, $25 per DXA, and $10 for neuropsychological tests.

Requirements:

- HIV+ men and women, age 18 and up
- Have not taken HIV meds
- No resistance to the type of meds provided by the study
- Have the R5 type of HIV based on a Trofile test performed by us
- Viral load currently 1000 or higher
- Never taken bone therapies
- No history, after 18 years of age, of fracture due to weak bones
- No active hepatitis B infection

More about Selzentry and the CCR5 Receptor

Selzentry (maraviroc) is the first "attachment inhibitor" drug. It's a brand new class of medications that works by what we call a "new mechanism of action," by the way it stops HIV from getting inside of a human T cell.

This is important because when a medication works by a new mechanism of action, it is predictably going to be active against viruses that have become resistant or non-responsive to our previous classes of medications.

Rather than fighting HIV inside white blood cells, like most antiretrovirals used to treat infection with HIV, maraviroc prevents the virus from entering uninfected cells.

It does this by blocking the predominant route of entry, the CCR5 co-receptor, a protein on the surface of the CD4 immune cells affected by HIV.

When maraviroc blocks this receptor, HIV cannot infect that cell.

TB Prevention Study

For HIV+ people who have latent Tuberculosis: Tuberculosis (TB) is an infection caused by bacteria. TB usually affects the lungs, but sometimes can affect other organs, especially for HIV+ people with a CD4 cell count under 200.

TB is a very serious disease worldwide. Almost 1/3 of the world's population, and 1/3 of people with HIV, are infected with TB.

One in ten people living with HIV will get active TB within a year of being diagnosed with HIV.

The rate of TB for people with HIV in the United States is 40 times the rate for people who aren't HIV infected.

TB can make HIV multiply faster, lower the CD4 cell count, and make HIV disease worse.

Treatments for preventing TB take a long time, and can be difficult to take at the same time as HIV medicines.

The purpose of this study is to see if treatment with a 4-week daily regimen of Rifapentine/Isoniazid is safe and effective at preventing active TB when compared to a standard nine month daily regimen with Isoniazid.

Length of Study: About 4 years.

Schedule of Study visits: Screening, Entry, weeks 2, 4, 8, 12, 16, 20, 24., 36, 48, and every 12 weeks starting at week 48.

Exams, lab tests, Rifapentine, Isoniazid and vitamin B6 are provided at no cost. Participants will receive $20.00 per study visit, starting at entry.

Requirements:

- HIV+ men and women, age 18 and up
- Have a +TB skin or blood test
- No history of treatment for tuberculosis in last 2 years
- Not on protease inhibitor or raltegravir-based regimen NOR planning to start one within 4 weeks of entry
- No acute hepatitis B or C liver cirhosis

Why is Preventing Active TB Important to People with HIV?

For many people, TB is the first sign of immune dysfunction associated with HIV infection, and active TB is an AIDS-defining illness. The good news is that TB treatment leads to lower HIV levels in people with both infections.

The risk of developing active tuberculosis is much higher in people who are infected with HIV. Because HIV weakens the immune system, people that have both HIV and TB are 40 times more likely to develop active, infectious TB than people who are not HIV+.

One of the most important aspects of having HIV and TB is that they both make each other worse. TB makes HIV multiply faster and HIV helps TB become active.

It is very important for people that are HIV+ to be tested for TB. If infected you need to complete preventive therapy as soon as possible to prevent the TB germ from causing the active disease of tuberculosis, causing your viral load to sky rocket, making you sick and possibly even killing you.

It is not easy to treat both TB and HIV at the same time. The drugs used to treat TB and HIV can both cause damage to the liver and kidneys. Also there can be negative drug interactions between the medications used to fight these two individual problems.

It is not easy to handle the side effects of treating TB and it may take a long time, but it can be cured.

What is Inflammation?

When the body fights invaders like viruses or bacteria, or repairs injured tissues, fluid and cells get transported to the site of injury.

As HIV chronically infects the body, cells and tissues are destroyed and then heal (but not always!), activating the immune system.

That leads to an overstimulated immune system that can become burned out or weakened.

So, even though a lab result may show a high CD4 count, the amount of inflammation in the body may be causing damage on a cellular level.

And that can lead to heart, liver, kidney disease, and greater levels of bone loss.

The big question is whether increased inflammation affects the lifespan of people with HIV.

Early studies suggest inflammation could be linked to all causes of death among people with HIV.

Despite lower viral loads and higher CD4 counts, inflammation plays a major role in both HIV-related cancers and death.

The Inflammation Study is Open Again

For HIV+ people with an undetectable viral load:
Inflammation is a condition that affects everyone with HIV.

The main goal of this study is to see how taking Lipitor® affects inflammation biomarker blood tests in HIV+ people who don't need to take medicine for high cholesterol.

HIV causes inflammation inside the body, which may contribute to heart disease and cancers that have become some of the leading causes of death in people with HIV.

It will take more studies before we know how to prevent heart, liver and kidney disease in people with HIV. But one thing seems clear: HIV isn't sitting silently during its 'latency period.' Indeed, it is quite active, leaving a significant imprint on the body's immune and inflammatory systems.

This study will also see if Lipitor is safe for people with HIV who are also taking medication for HIV. All people who enroll in this study will add both Lipitor and a dummy pill to their current HIV medicines. Group A will receive the dummy pill during the 1st half of the study and Lipitor during the 2nd half.

Group B will receive Lipitor during the 1st half and the dummy pill during the 2nd half of the study.

Length of study: 48 weeks: 24 weeks on Lipitor, and 24 weeks on a dummy pill.

Participants will receive $20.00 per study visit.

Requirements:

- Must be 18 years or older
- On HIV meds (including a protease inhibitor) for at least 6 months
- No current or past cancers
- No chronic active hepatitis B or C
- LDL cholesterol less than 130

The Cholesterol Study

For HIV+ people with abnormal lipids:
People infected with HIV have lower levels of HDL (the "good") cholesterol which increases the risk of cardiovascular disease (heart attack and stroke). Having abnormal cholesterol levels is a risk factor for heart disease.

There are two main kinds of cholesterol. One is low-density lipoproteins (LDL) or "bad" cholesterol, which can clog the arteries. The higher your LDL, the higher your risk of heart disease. The other is high-density lipoproteins (HDL) or "good" cholesterol, which can help reduce the risk of heart disease.

This study will see if treatment with extended-release niacin or fenofibrate can raise HDL (the good kind) cholesterol and improve blood vessel function as measured by ultrasound (brachial artery flow-mediated dilation).

Length of Study: 6 months. Schedule of Study visits: Screening, Entry, & weeks 4, 8, 12, 16 and 24.

Study visits include physical exams and blood draws.

Exams, lab tests, and study medications are provided at no cost.

Participants will receive $20.00 per visit, starting at entry and $15 for each ultrasound.

Cholesterol Study Requirements:

- HIV+, 18 years or older
- Taking HIV meds for at least 2 years
- CD4 (T-cell) count ≥ 100 & undetectable HIV viral load
- Fasting HDL ("good") cholesterol ≤ 40 for men & ≤ 50 for women
- Fasting triglycerides 200—800 and LDL ("bad") cholesterol < 160
- No heart disease
- If diabetic, diabetes is under control
- Not taking certain medications to lower cholesterol

More About Lipids and HIV

Lipids are fats and fat-like substances in the blood. Cholesterol and triglycerides are lipids. Your body uses cholesterol to build and maintain cells and to make some hormones.

After eating, energy that is not needed right away is converted into triglycerides, which is stored in fat cells.

While having some cholesterol and triglycerides in the blood is important for the body to function properly, having too much is unhealthy. Having high levels of lipids is called hyperlipidemia.

There are many possible causes for high lipid levels, including HIV and some of the HIV drugs. This puts HIV+ people at particular risk for developing hyperlipidemia.

Although you cannot tell if you have this condition without lab tests, it can cause serious long-term health problems.

The main danger is heart disease. If you have too much cholesterol in your blood it can build up in your arteries (blood vessels), forming plaque.

This buildup of plaque can lead to a heart attack or a stroke.

Next-PrEP Study is Now Open

Using HIV medicines to prevent people from getting HIV:
(PrEP) is a promising new biomedical intervention to prevent HIV transmission in HIV-negative people who are at high risk of becoming exposed to HIV.

Our study will assess the safety and tolerability of 4 antiretroviral (ARV) drug regimens used as PrEP to prevent HIV transmission in men who have sex with men (MSM) as well as transgender women.

Participants will be randomly assigned (like flipping a coin) to one of 4 groups.

- Group A: Selzentry + Emtriva placebo + Viread placebo
- Group B: Selzentry + Emtriva + Viread placebo
- Group C: Selzentry + Emtriva Placebo + Viread
- Group D: Selzentry placebo + Emtriva placebo + Viread

Our previous classes of anti-HIV medications have worked only after the virus has gotten inside the cell and has already been doing some of its infection processes. This new class of medication works much earlier so that is blocks the virus's ability to get inside the cell to begin with. Approved HIV medicines used for PrEP must be taken every day to work.

Length of Study: About 49 weeks. Schedule of Study visits: Screening, entry, and weeks 2, 4,8,16, 24,32,40,48 and 49.

Participants will receive $20.00 per study visit, starting at entry.

This is an investigational study of new medicines for PrEP. The FDA has recently approved one drug, Truvada, for use to prevent HIV infection.

Exams, lab tests, and all study drugs are provided at no cost.

Requirements:

- Were born male, age 18 y/o & older
- Had receptive OR insertive anal intercourse without using condoms with either an HIV-positive male partner OR a male partner of unknown HIV status within 3 months of entering the study
- Not enrolled in an HIV vaccine trial and received active drug (not a placebo)
- Not enrolled in any other HIV interventional research study
- Have not used HIV medicines (for PEP or PrEP) 90 days prior to entry
- Are willing to undergo all required study procedures (including sexual assessment by computer assisted self-interview, use of a drug monitoring device, and text messaging)

Our Commitment To You

A study visit at the UW AIDS Clinical Trials Unit (ACTU) includes physical examinations, updating your health status and obtaining a wide variety of often costly laboratory tests.

Our commitment to you is to use your contributions to our studies wisely and respectfully as we monitor and evaluate your physical health and response to the study drug.

This also includes providing you with accurate, up-to-date information about HIV infection and its effect on your body, and steps you can take to minimize its impact.

We will also keep you informed of any new information about the study medications you are taking.

And once the study has been completed, we will share the results with you.

Progress in conquering HIV infection and AIDS is a team effort, and you are a critical and much appreciated part of that team.

The Role of Research Studies

HIV/AIDS clinical trials are carefully designed research studies that involve people and are designed to answer specific questions about the safety and effectiveness of treatment for HIV/AIDS and related conditions.

Clinical trials are vitally important because there are no other direct ways to learn how different people respond to medications, treatments, or therapeutic approaches.

Clinical trials may study experimental medications to treat HIV and AIDS, FDA approved medications used in new ways or in new combinations, or medications to prevent or treat related infections. They may also study ways to help persons manage their HIV/AIDS medications and the long-term general health of persons with HIV/AIDS.

Clinical trials and laboratory studies conducted by the ACTG have made major contributions to:

- optimizing antiretroviral therapy (ART)
- managing drug resistance
- preventing and treating co-infections
- evaluating acute and long-term toxicities
- demonstrating the importance of pharmacogenomics in predicting drug toxicities

Results of these studies have helped establish the standard for the management of HIV disease and form the basis of current treatment guidelines.

This progress in the treatment of HIV-1-infected individuals has resulted in dramatic reductions in AIDS mortality in the U.S. and other countries of the developed world.

UW AIDS Clinical Trials Unit

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