BRITISH COLUMBIA
CENTRE *for* **EXCELLENCE**
in **HIV/AIDS**

HIV MONITORING
QUARTERLY REPORT

FOR VANCOUVER COASTAL HEALTH

THIRD QUARTER 2013
UPDATED VERSION: NOV 28, 2014 *

* See foreword

BC Centre for Disease Control
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Foreword

As part of the BC Centre for Excellence (BC-CFE) in HIV/AIDS's mandate to evaluate the outcomes of STOP HIV/AIDS programming in BC, we have developed quarterly HIV/AIDS monitoring reports. These reports provide up-to-date data on a variety of key HIV-related surveillance and treatment indicators. Selection of these indicators was achieved through a collaborative process with various Health Authority (HA) representatives. There are six reports in total, one for each HA and one for the province of BC as a whole. In addition, there is a technical report which explains how each HIV indicator is calculated. Data used in these reports come from the British Columbia Centre for Disease Control (BCCDC), MSP billings, hospitalization data from the Discharge Abstract Database, the Sunquest Laboratory database at the Provincial Public Health Microbiology and Reference Laboratory, Providence Health Care laboratory and the BC-CFE Drug Treatment Program (DTP) Database.

The objectives of these reports are to:

1. Provide timely HA-specific information on key HIV indicators which will guide and inform HIV leaders and innovators in the development of future HIV interventions and programs which will ultimately lead to decreasing the burden of HIV in BC. The indicators will reflect ongoing or past successful public health interventions and highlight areas in the HIV care spectrum which require further attention and support.

2. Highlight limitations in our current data due to incomplete or time lagged data and to develop future strategies to improve complete and timely data capture.

These reports are produced for the benefit of individual HAs. As such, we are enthusiastic about your involvement and cooperation regarding the development of these monitoring reports. Please forward your comments and queries to Irene Day, Director of Operations at the BC-CFE at iday@cfenet.ubc.ca.

* Please note that for Q2 and Q3 2013 reports, a coding revision resulted in data display errors in Indicator 5, the Cascade of Care (in Figures 5.1–5.7 on pp. 22–27 in this report), which has been updated; and, only for Q3 2013 reports, Appendix Table for Indicator 5 (on p. 37 in this report). All other figures and reports remain accurate. Please discard any previous reports and use this updated version. If you have any questions, please contact Irene Day at iday@cfenet.ubc.ca.

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The Seek and Treat for Optimal Prevention (STOP) HIV/AIDS BC Provincial Program: A Note on Monitoring and Interpreting HIV Indicators

The Seek and Treat for Optimal Prevention (STOP) of Hiv/Aids programme is a provincial initiative to improve HIV diagnosis and care delivery in BC through increased HIV-specific funding to all HSDA's across BC. The STOP provincial programme is an expansion of a four-year STOP pilot project which was implemented in two Health Service Delivery Areas in March 2010; the Vancouver HSDA which bears the largest burden of the HIV epidemic in the province and the Northern Interior HSDA which bears a high burden of HIV-related mortality. The STOP pilot project demonstrated the urgent need for improved efforts in early diagnosis of HIV and timely initiation of highly active antiretroviral therapy (HAART) initiation.

The expansion to a province-wide programme was announced on November 30th 2012 by the BC Ministry of Health with roll out of funding beginning on April 1st, 2013. This funding is intended to be used in the implementation and evaluation of HIV-related diagnosis and care initiatives within individual HA's. Goals of the project include: 1. A reduction in the number of new HIV infections in BC; 2. Improvements in the quality, effectiveness, and reach of HIV prevention services; 3. An increase in early diagnosis of HIV; 4. A reduction in AIDS cases and HIV-related mortality.

The goals of HA-led STOP-funded initiatives are to work toward achieving these goals. To these ends some outcome measures or indicators of progress have been drafted that should be considered in the design and implementation phases of these initiatives.

HIV Testing Episodes and Rates

In this section, the number of HIV test episodes and point of care (POC) HIV tests conducted each quarter in BC is shown. In general terms the goal is to increase the number of tests performed and to maximize testing efficiency. Test episodes are allocated by region according to where the test is performed.

Indicator 1. HIV Testing Episodes

Figure 1.1   HIV Test Episodes in Vancouver Coastal Health, 2009 Q1–2013 Q3

	2009	Q2	Q3	Q4	2010	Q2	Q3	Q4	2011	Q2	Q3	Q4	2012	Q2	Q3	Q4	2013	Q2	Q3
VCH	18.9	17.9	18.3	17.1	18.8	18.3	18.6	19.3	20.7	20.1	26.0	24.0	27.2	26.9	29.5	29.4	33.5	35.1	33.4
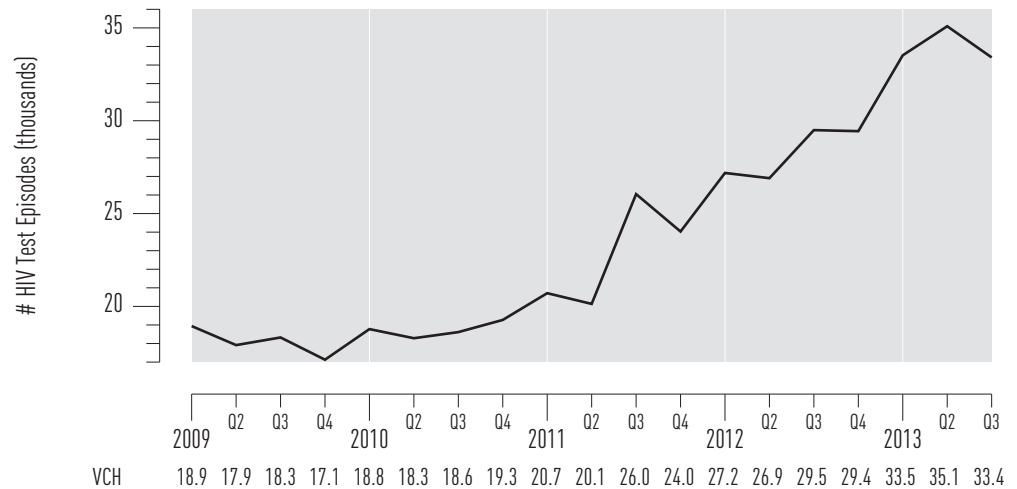
Figure 1.2   HIV Test Episodes by Gender and Prenatal Status in Vancouver Coastal Health, 2009 Q1–2013 Q3 [1]

	2009	Q2	Q3	Q4	2010	Q2	Q3	Q4	2011	Q2	Q3	Q4	2012	Q2	Q3	Q4	2013	Q2	Q3
Female	10.1	9.6	9.8	9.3	10.0	9.7	10.0	9.8	10.6	9.7	10.6	11.6	13.6	13.5	14.7	14.8	17.1	18.0	17.3
Male	8.4	7.8	8.0	7.4	8.3	8.2	8.2	8.2	8.7	8.0	9.0	9.6	11.3	11.3	12.4	12.6	14.2	15.1	14.0
Prenatal	3.5	3.2	3.3	3.2	3.4	3.1	3.4	3.5	3.7	3.4	3.5	3.7	4.1	3.7	3.6	3.6	3.6	3.5	3.7
Non-prenatal	6.6	6.4	6.6	6.1	6.6	6.6	6.6	6.3	6.8	6.4	7.1	8.0	9.5	9.8	11.1	11.2	13.5	14.5	13.6
Other	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.3	0.3	0.2	0.2	0.2

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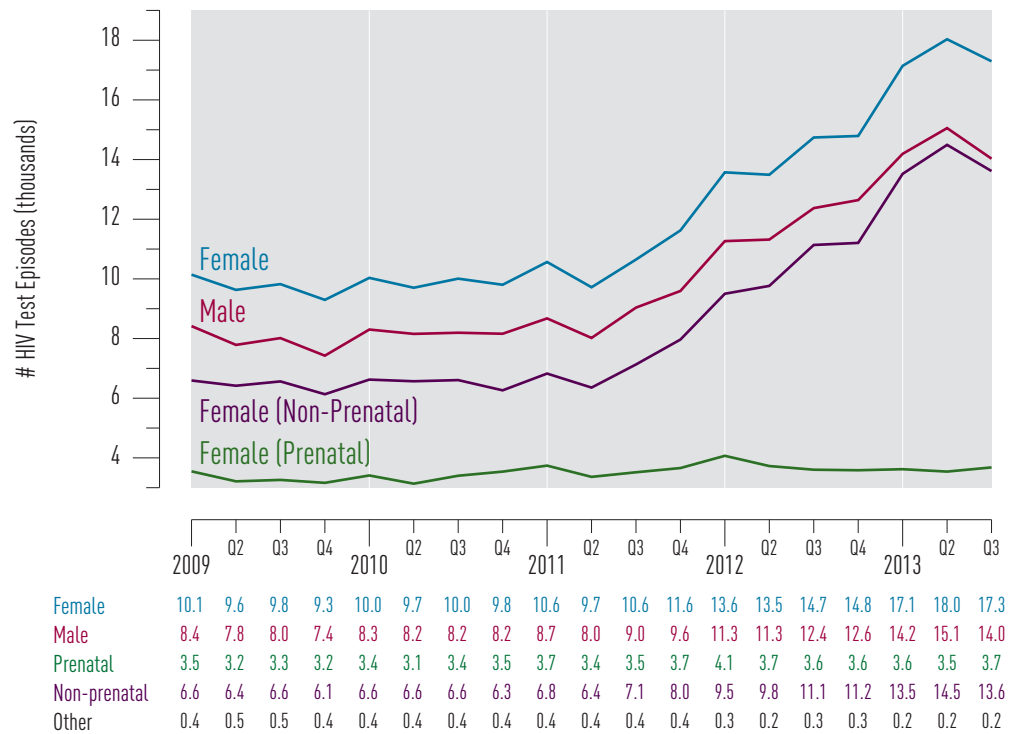
1   NB: Testing does not include point of care tests.

Figure 1.3   HIV Test Episodes by Age Category for Vancouver Coastal Health, 2009 Q1–2013 Q3 [1,2]

	2009	Q2	Q3	Q4	2010	Q2	Q3	Q4	2011	Q2	Q3	Q4	2012	Q2	Q3	Q4	2013	Q2	Q3
< 30	7.0	6.8	7.5	6.8	7.0	6.9	7.2	7.1	7.1	6.8	7.8	8.5	8.9	9.1	9.7	9.5	8.6	9.0	9.2
30 – 39	6.4	5.9	6.0	5.7	6.4	6.1	6.2	6.2	6.7	5.9	6.4	6.5	7.8	7.4	7.7	7.6	8.8	9.0	8.9
40 – 49	3.2	2.9	2.7	2.6	3.0	2.9	2.8	2.8	3.1	2.8	3.0	3.2	3.9	3.7	3.9	4.1	5.1	5.4	4.9
≥ 50	2.3	2.2	2.2	2.1	2.4	2.4	2.4	2.3	2.7	2.6	3.0	3.4	4.6	4.8	6.0	6.5	9.0	9.8	8.6
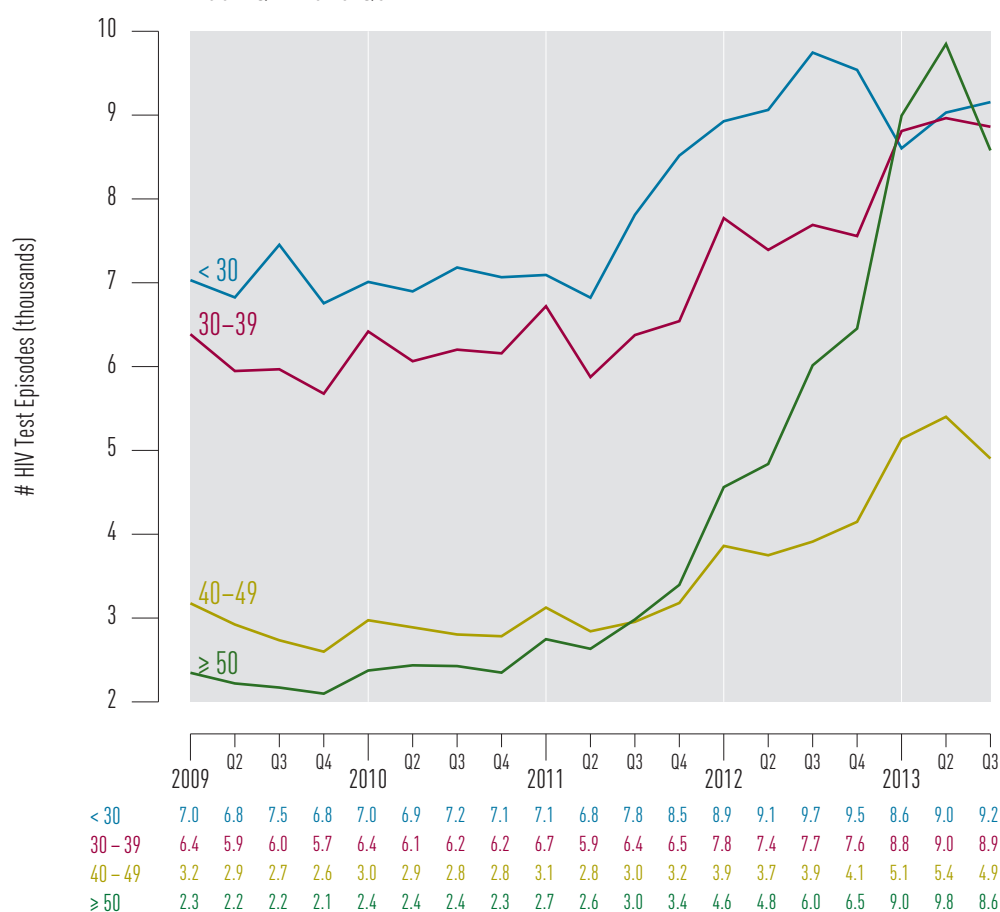
Figure 1.4   Point-of-Care HIV Tests in Vancouver Coastal Health, 2010 Q4–2013 Q3

	Q4	2011	Q2	Q3	Q4	2012	Q2	Q3	Q4	2013	Q2	Q3
POC HIV Tests	0.9	1.0	2.0	5.9	2.4	2.1	1.9	2.1	1.7	2.0	1.8	1.9
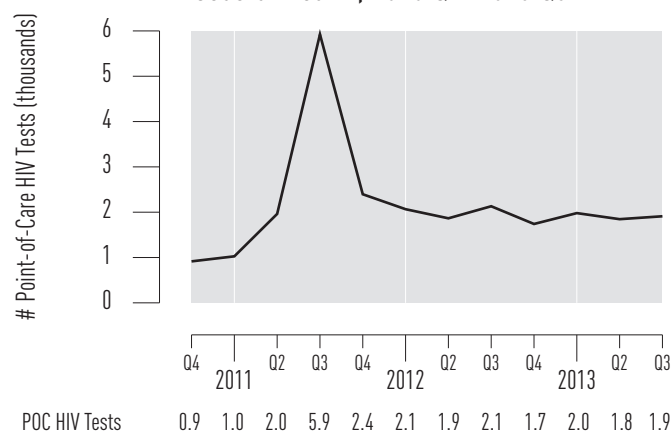
2   *Data Source: The BC Public Health Microbiology and Reference Laboratory (BCPHMRL) courtesy of the BC Centre for Disease Control (BCCDC).*

Limitations:
1   *Repeat tests in individuals who test using various identifiers may not be identified and these individuals may be counted more than once.*
2   *POC testing data is available from the fourth quarter of 2010 and onwards.*

Figure 1.5   HIV Test Episodes by Health Service Delivery Area in Vancouver Coastal Health, 2009 Q1–2013 Q3

	2009	Q2	Q3	Q4	2010	Q2	Q3	Q4	2011	Q2	Q3	Q4	2012	Q2	Q3	Q4	2013	Q2	Q3
Vancouver	15.2	14.5	14.9	13.9	15.3	14.8	15.1	15.7	17.0	16.6	22.5	20.2	22.9	22.9	25.2	25.0	28.5	29.9	28.2
Richmond	1.2	1.1	1.2	1.1	1.2	1.2	1.2	1.2	1.3	1.2	1.2	1.3	1.5	1.5	1.5	1.6	1.9	2.0	2.0
North Shore / Coast Garibaldi	2.5	2.3	2.3	2.2	2.3	2.3	2.4	2.4	2.4	2.3	2.4	2.5	2.8	2.6	2.7	2.8	3.1	3.3	3.2
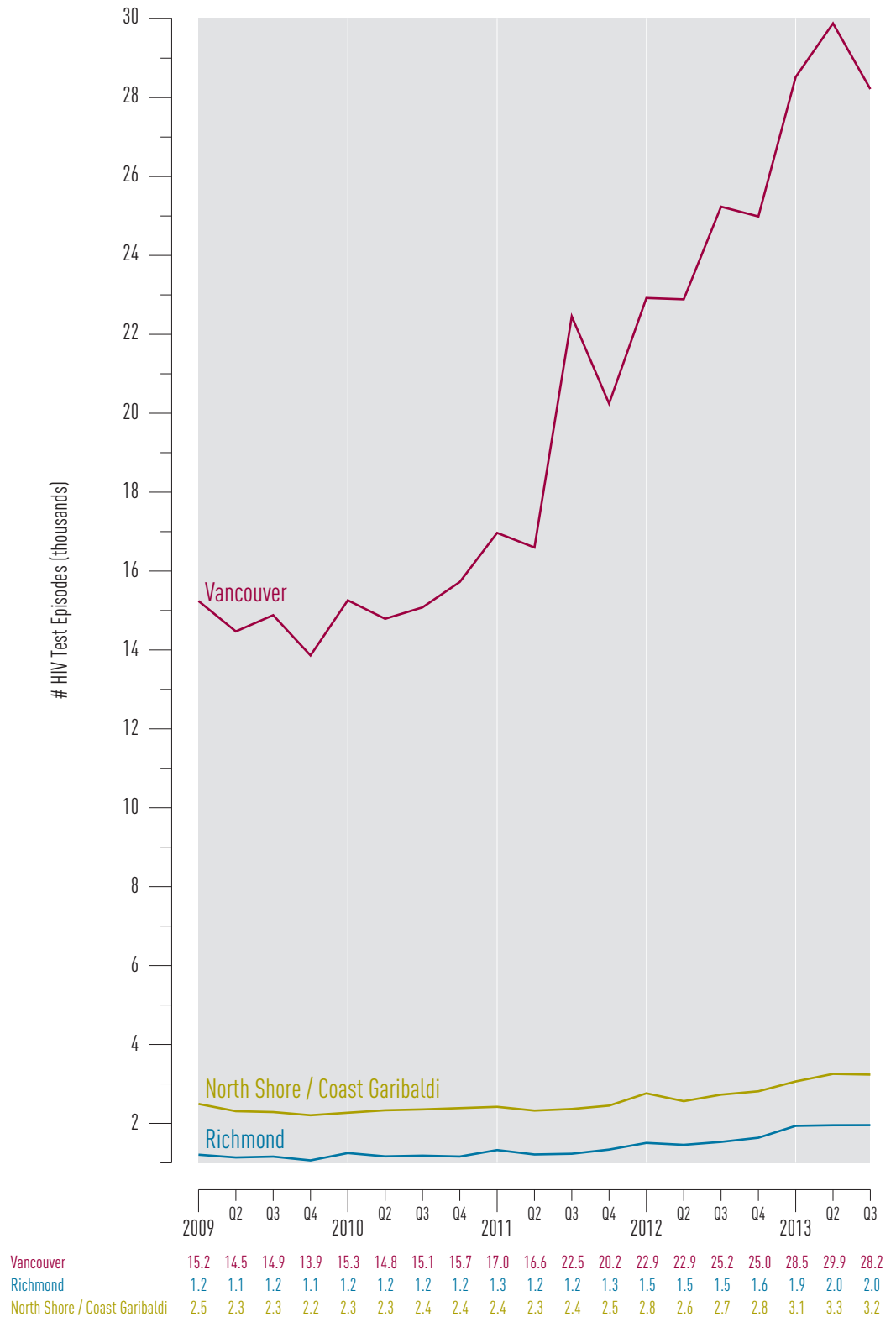
Indicator 2. HIV Testing Rates

Figure 2.1   Rate of HIV Testing in Vancouver Coastal Health and HSDAs, 2009–2012 [1]

HIV Testing Episodes per 100,000 Population

Vancouver

All HSDAs

North Shore / Coast Garibaldi

Richmond

	2009	2010	2011	2012
VCH	5114.6	5088.5	5342.2	7111.4
Vancouver	6614.1	6522.7	6889.9	9532.3
Richmond	2578.9	2681.9	2773.9	3399.4
North Shore / Coast Garibaldi	3411.9	3432.6	3507.6	4037.7
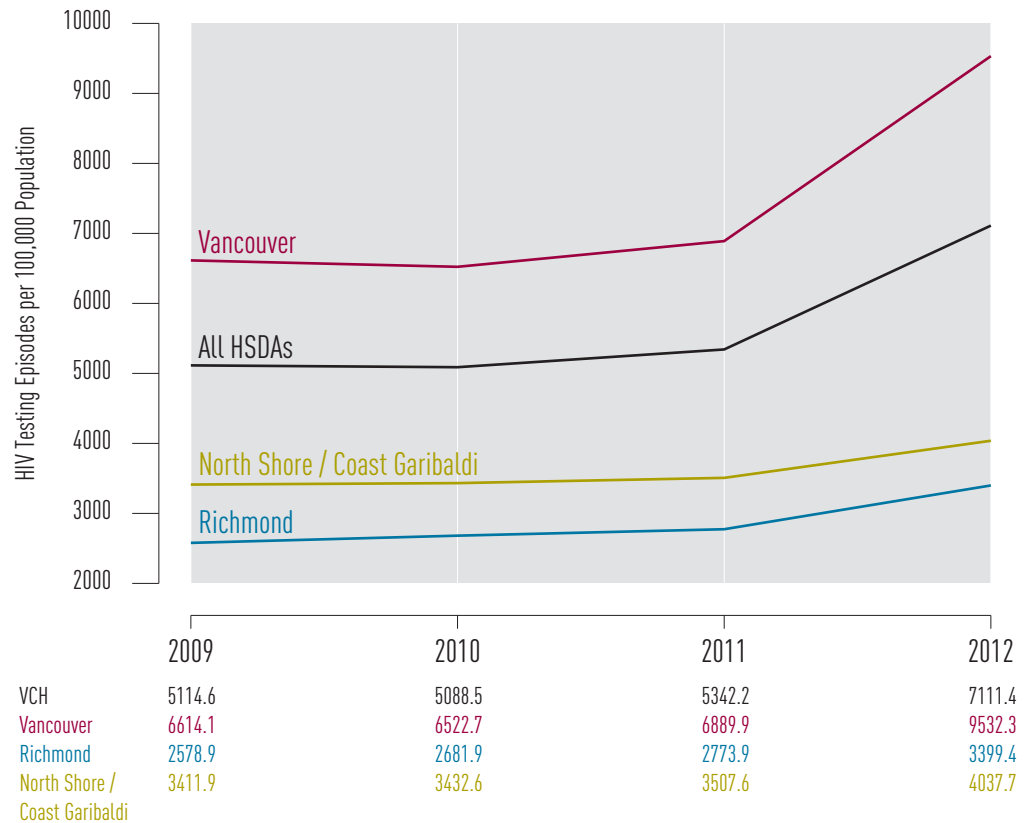
Figure 2.2   Rate of HIV Testing by Gender in Vancouver Coastal Health, 2009–2012 [1]

HIV Testing Episodes per 100,000 Population

Female

Male

	2009	2010	2011	2012
Female	5415.4	5359.4	5657.8	7609.7
Male	4488.3	4522.1	4720.9	6425.6

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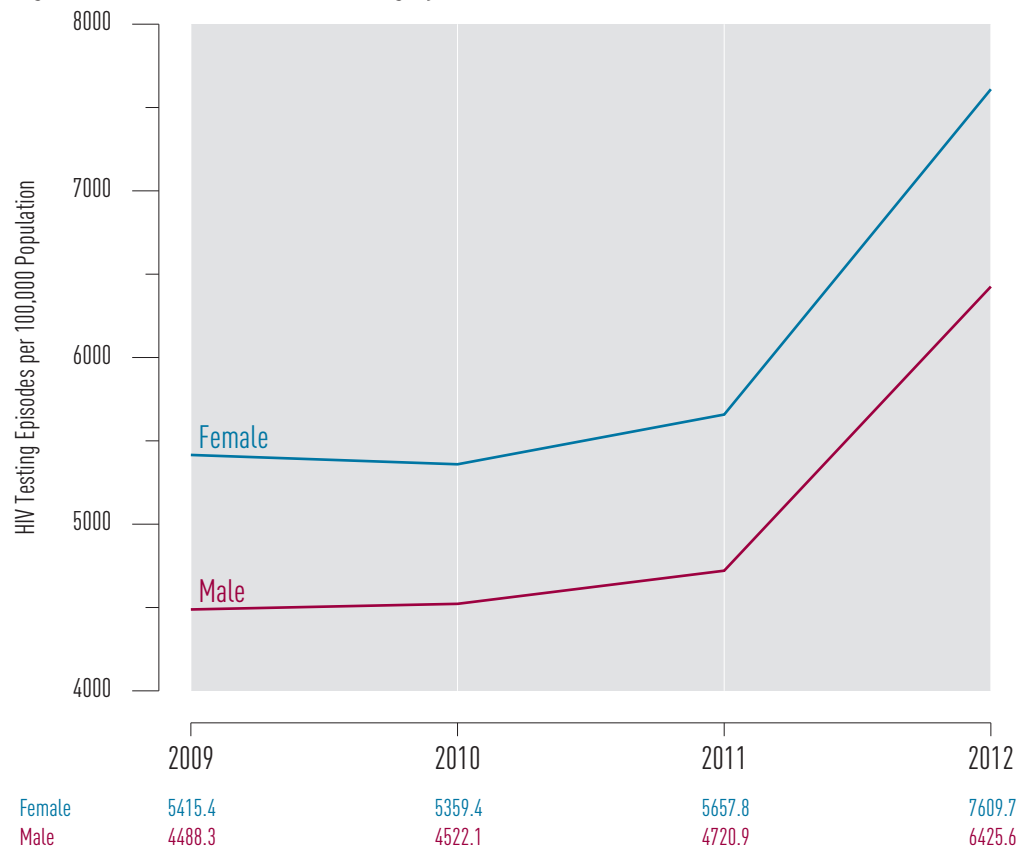
Figure 2.3   Rate of HIV Testing by Age Category in Vancouver Coastal Health, 2009–2012 [1]

	2009	2010	2011	2012
< 30	5804.6	5663.0	6001.1	7525.5
30–39	10783.1	10968.5	11129.1	13278.5
40–49	4835.7	4704.4	4894.4	6473.7
≥ 50	1820.8	1891.1	2180.7	4171.4
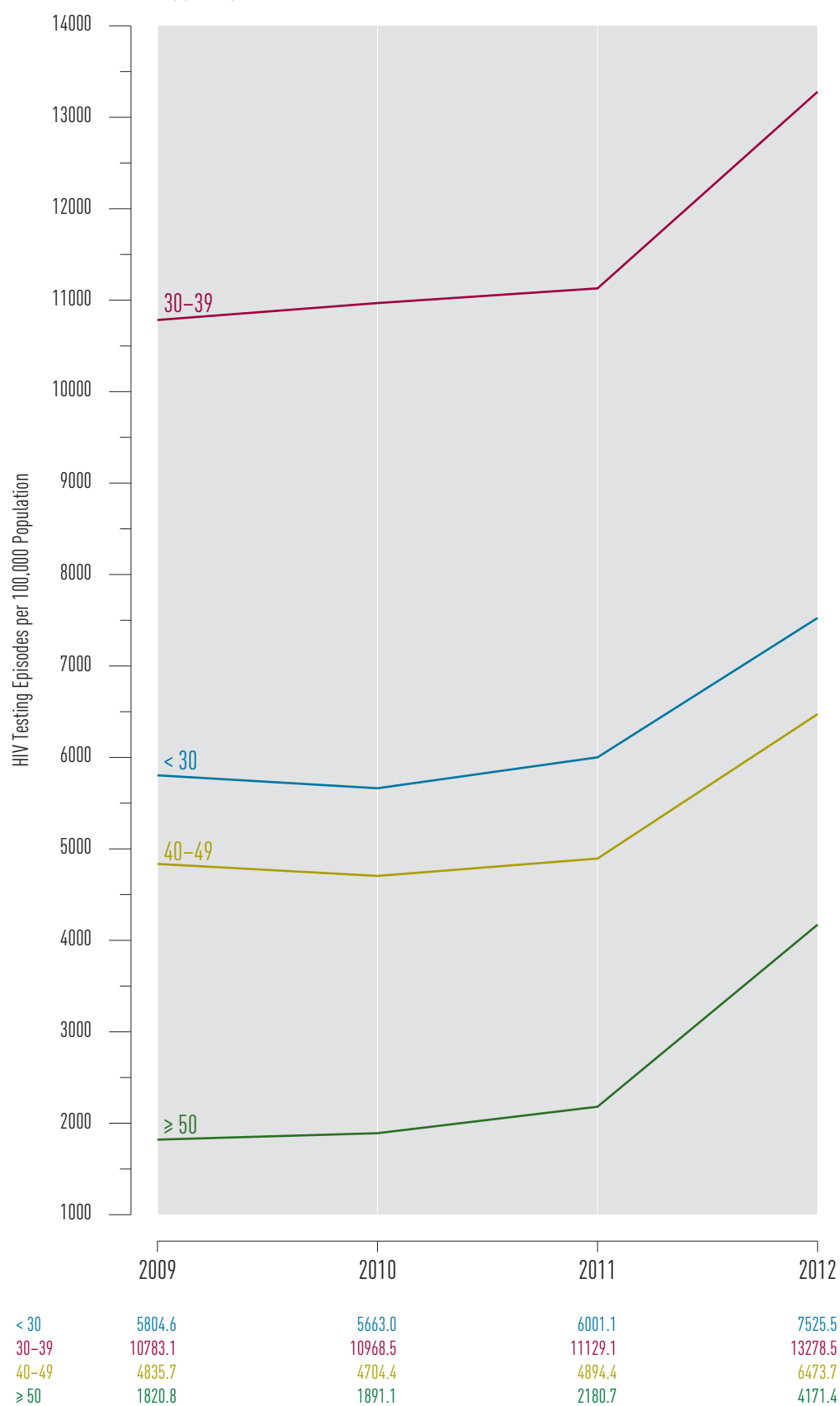
New HIV Diagnoses

Trends in HIV diagnoses by gender and exposure category are described. Interpreting HIV diagnoses must be done with consideration that trends are influenced by both changes in testing rate as well as changes in transmission rates. It is important to note that new HIV diagnoses cases and rates are not synonymous with HIV incidence as a person may have become infected with HIV long before they tested positive for HIV. However, as there is no reliable method for measuring HIV incidence we follow trends in HIV diagnoses.

Indicator 3. New HIV Diagnoses

Figure 3.1   New HIV Diagnoses for Vancouver Coastal Health, 2009 Q1–2013 Q3 [3]

Vancouver Coastal Health		2009	Q2	Q3	Q4	2010	Q2	Q3	Q4	2011	Q2	Q3	Q4	2012	Q2	Q3	Q4	2013	Q2	Q3
	By Client Residence	51	36	41	36	41	45	41	40	32	48	57	41	43	33	34	32	32	45	50
	By Provider Address	*56*	*46*	*45*	*40*	*45*	*50*	*49*	*43*	*34*	*47*	*65*	*42*	*47*	*38*	*38*	*38*	*32*	*51*	*58*
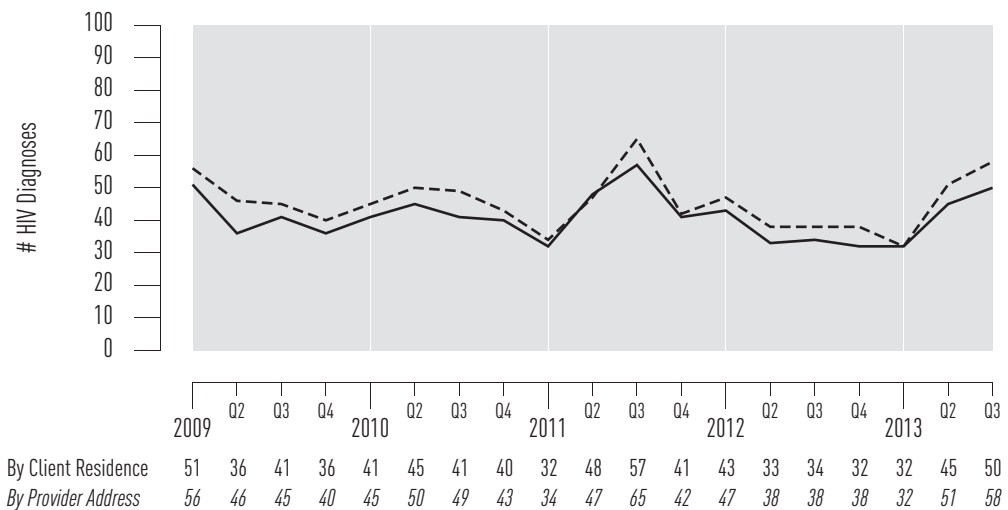
Figure 3.2   New HIV Diagnoses for Vancouver Coastal Health by Gender, 2009 Q1–2013 Q3

	2009	Q2	Q3	Q4	2010	Q2	Q3	Q4	2011	Q2	Q3	Q4	2012	Q2	Q3	Q4	2013	Q2	Q3
Female	10	4	1	5	8	8	5	3	3	7	2	2	5	4	3	2	4	4	3
Male	41	32	40	31	33	37	36	37	29	41	55	39	38	29	31	30	28	41	47
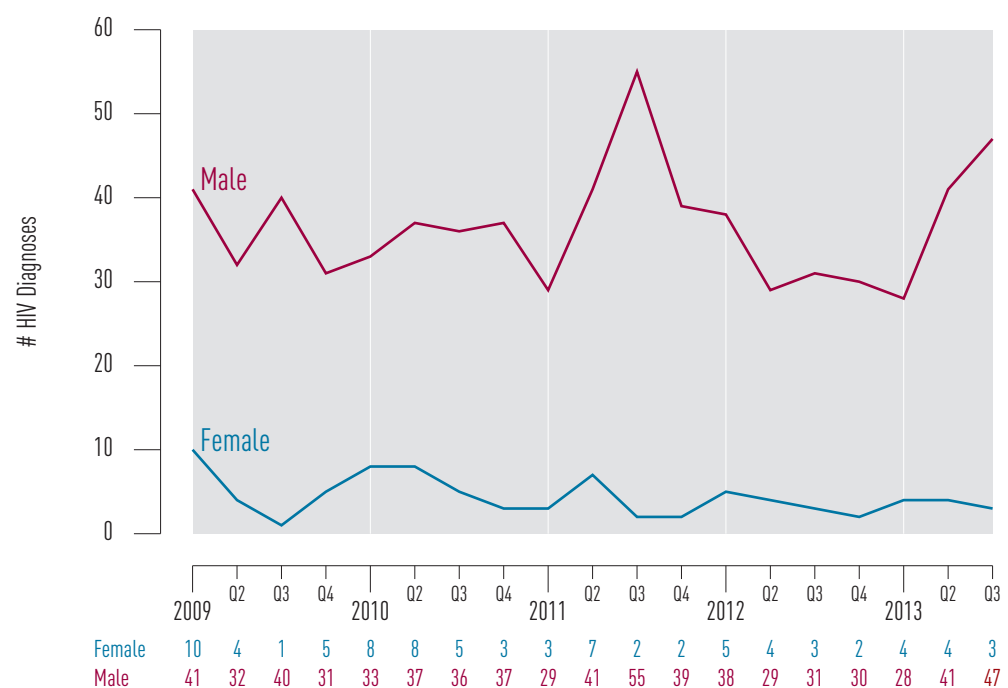
3   *Data Source:* BCCDC

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Figure 3.3 — New HIV Diagnoses for Vancouver Coastal Health by Age Category, 2009 Q1–2013 Q3

	2009	Q2	Q3	Q4	2010	Q2	Q3	Q4	2011	Q2	Q3	Q4	2012	Q2	Q3	Q4	2013	Q2	Q3
< 30 years	9	8	10	9	12	12	12	7	3	10	13	12	11	10	6	13	7	11	17
30–39 years	14	11	7	12	16	10	15	12	12	16	22	8	12	11	7	6	13	14	8
40–49 years	18	12	18	11	10	16	10	11	11	12	13	13	12	6	11	9	7	8	12
≥ 50 years	10	5	6	4	3	7	4	10	6	10	9	8	8	6	10	4	5	12	13
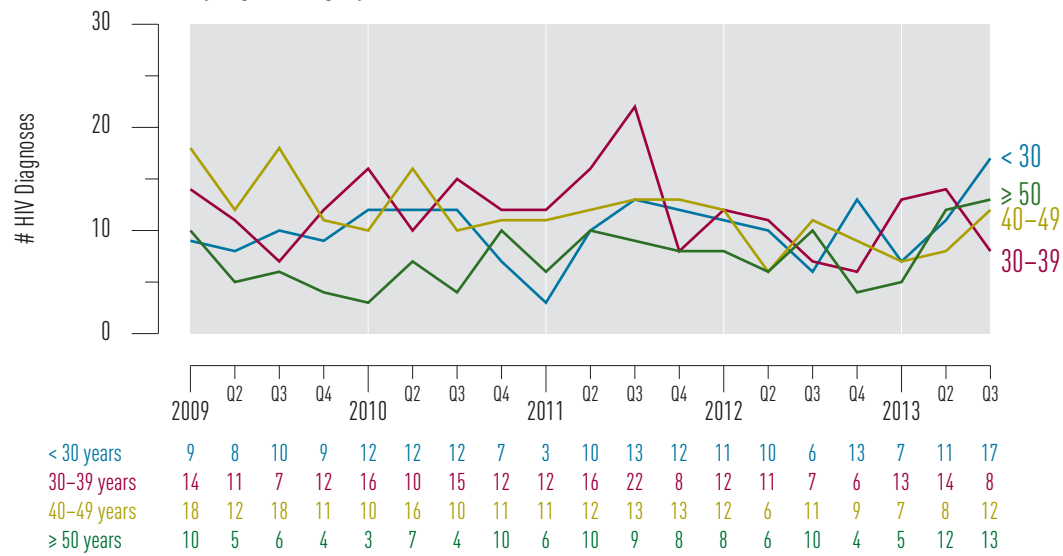
Figure 3.4 — New HIV Diagnoses for Vancouver Coastal Health by Exposure Category, 2009 Q1–2013 Q3 [4]

	2009	Q2	Q3	Q4	2010	Q2	Q3	Q4	2011	Q2	Q3	Q4	2012	Q2	Q3	Q4	2013
MSM (men having sex with men)	29	25	26	24	30	26	29	27	23	36	43	30	33	25	26	22	19
IDU (injection drug use)	8	6	3	3	6	7	5	3	3	2	8	0	3	4	1	3	3
HET (heterosexual contact)	12	4	5	8	5	11	7	10	6	10	6	9	7	4	6	6	5
Other (other exposure identified)	2	1	2	0	0	1	0	0	0	0	2	0	0	0	0	0	1
NIR/Unknown (no identified exposure)	0	0	5	1	0	0	0	0	0	0	0	0	0	0	1	1	4

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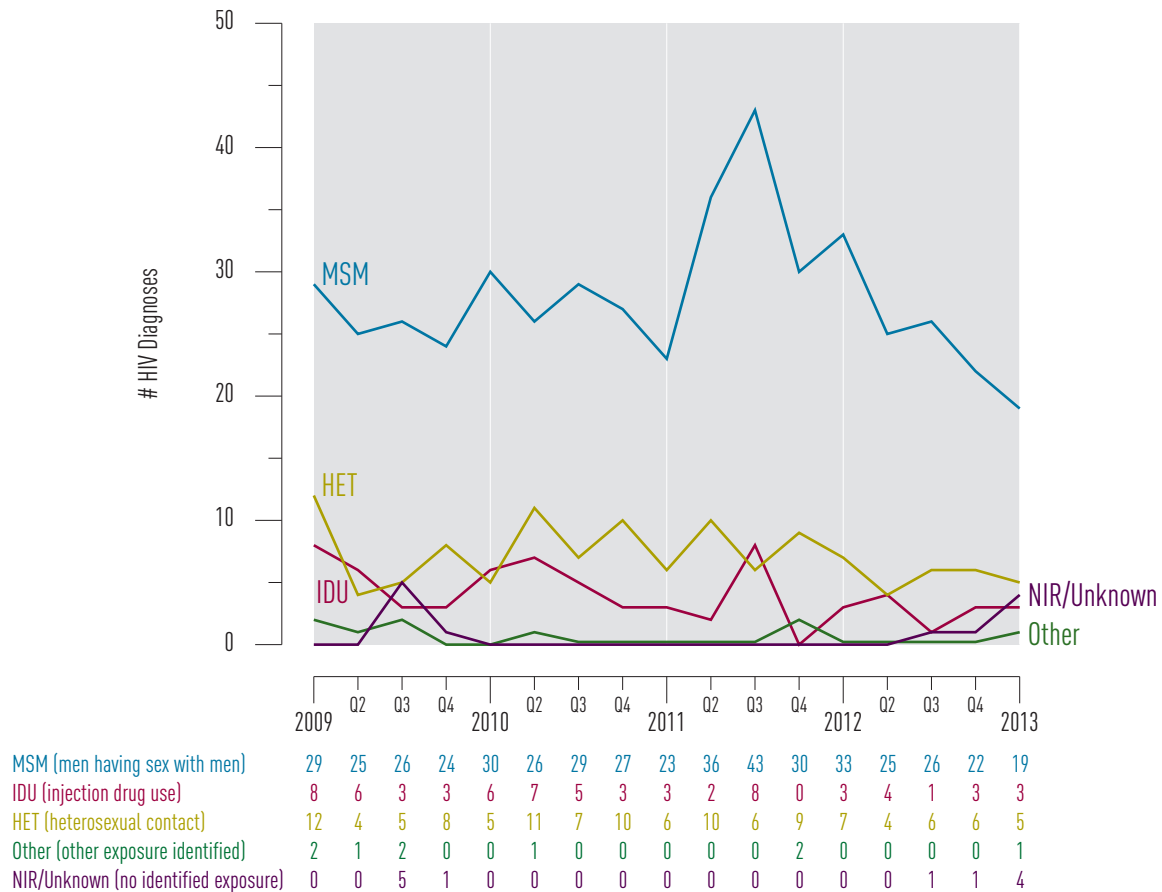
4   BCCDC: Data lags by 6 months.

MSM=men who have sex with men; IDU= injection drug user; HET=heterosexual. NIR=No identified risk/exposure.

Figure 3.5   New HIV Diagnoses for Vancouver Coastal Health by HSDA,
2009 Q1–2013 Q3
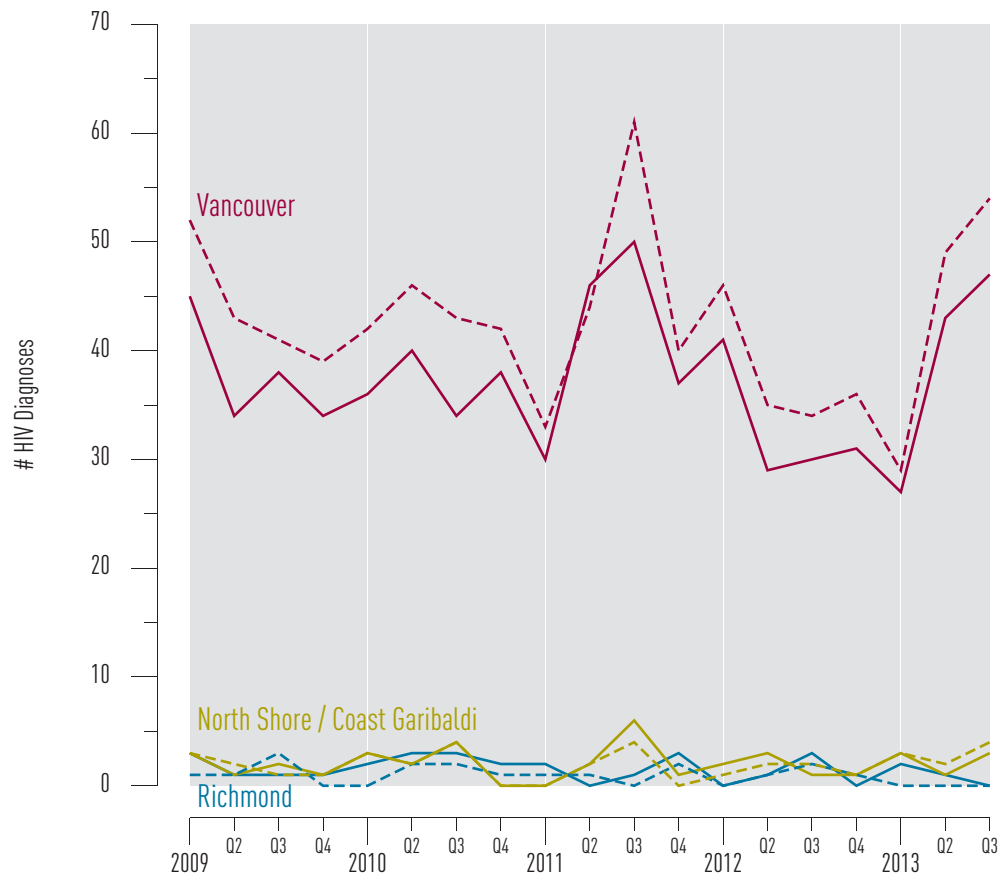
		2009	Q2	Q3	Q4	2010	Q2	Q3	Q4	2011	Q2	Q3	Q4	2012	Q2	Q3	Q4	2013	Q2	Q3
Vancouver	By Client Residence	45	34	38	34	36	40	34	38	30	46	50	37	41	29	30	31	27	43	47
	By Provider Address	52	43	41	39	42	46	43	42	33	44	61	40	46	35	34	36	29	49	54
Richmond	By Client Residence	3	1	1	1	2	3	3	2	2	0	1	3	0	1	3	0	2	1	0
	By Provider Address	1	1	3	0	0	2	2	1	1	1	0	2	0	1	2	1	0	0	0
North Shore / Coast Garibaldi	By Client Residence	3	1	2	1	3	2	4	0	0	2	6	1	2	3	1	1	3	1	3
	By Provider Address	3	2	1	1	3	2	4	0	0	2	4	0	1	2	2	1	3	2	4

"By Provider Address" is graphed as dashed line in same colour.

Stage of HIV infection at diagnosis

Classification of stage of HIV infection, in the absence of information regarding recent testing history, is reliant on clinical information available at the time of diagnosis, including first CD4+ cell count, laboratory results suggestive of acute HIV infection, and clinical presentation with an AIDS-defining illness (Table 1). The benefits of Treatment as Prevention (TasP) are maximized when antiretroviral therapy (ART) is initiated at high CD4 cell counts. Accordingly, it is preferable that individuals newly diagnosed with HIV be in the early stages of HIV infection (stage 0 or 1) to allow for early ART initiation.

N.B. Interpretation of stage of HIV infection at diagnosis should proceed with caution. Early increases in diagnosis at late stage (i.e., low CD4 counts) may represent a "catching up" of previously missed long term infected individuals rather than a trend toward diagnosis at later stage of infection.

Indicator 4. Stage of HIV Infection at Diagnosis

Table 1   Staging Classifications of Infection at Time of HIV Diagnosis Based on CDC HIV Surveillance Case Definitions

Stage	Criteria				
0	Laboratory criteria met for acute HIV infection, or previous negative or indeterminate HIV test within 180 days of first confirmed positive HIV test.				
1	Stage 0 not met	and	CD4 ≥500	and	No AIDS case report
2a			CD4 350–499		
2b			CD4 200–349		
3			(CD4 <200	or	AIDS case report)
Unknown			No available CD4	and	No AIDS case report

Figure 4.1   Stage of HIV Infection at Diagnosis for Vancouver Coastal Health, 2010–2012 [5]
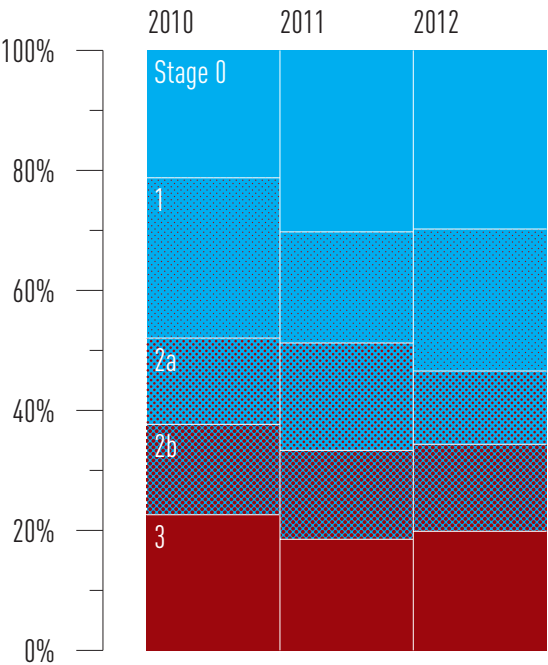
Figure 4.2   Stage of HIV Infection at Diagnosis by Gender for Vancouver Coastal Health, 2010–2012 [5]
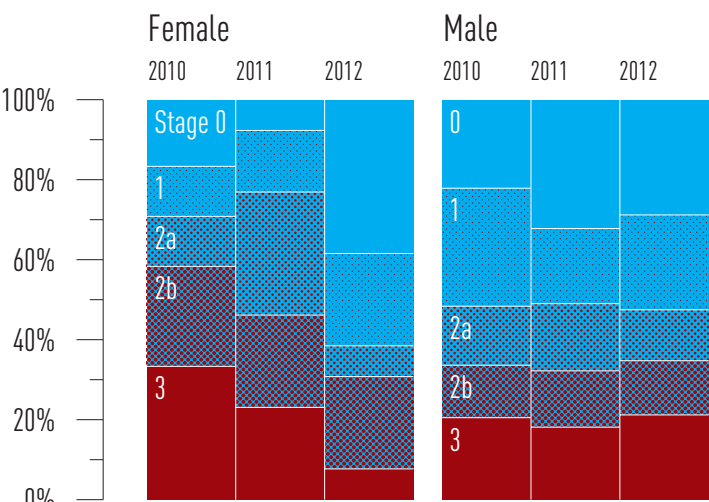
		VCH			Female			Male	
	2010	2011	2012	2010	2011	2012	2010	2011	2012
Stage 0	31	49	39	4	1	5	27	48	34
Stage 1	39	30	31	3	2	3	36	28	28
Stage 2a	21	29	16	3	4	1	18	25	15
Stage 2b	22	24	19	6	3	3	16	21	16
Stage 3	33	30	26	8	3	1	25	27	25
Unknown	21	16	11	0	1	1	21	15	10
Total *(n=)*	167	178	142	24	14	14	143	164	128

5   *Data Source:* BCCDC

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Figure 4.3 Stage of HIV Infection at Diagnosis by Age Category for Vancouver Coastal Health, 2010–2012 [5]
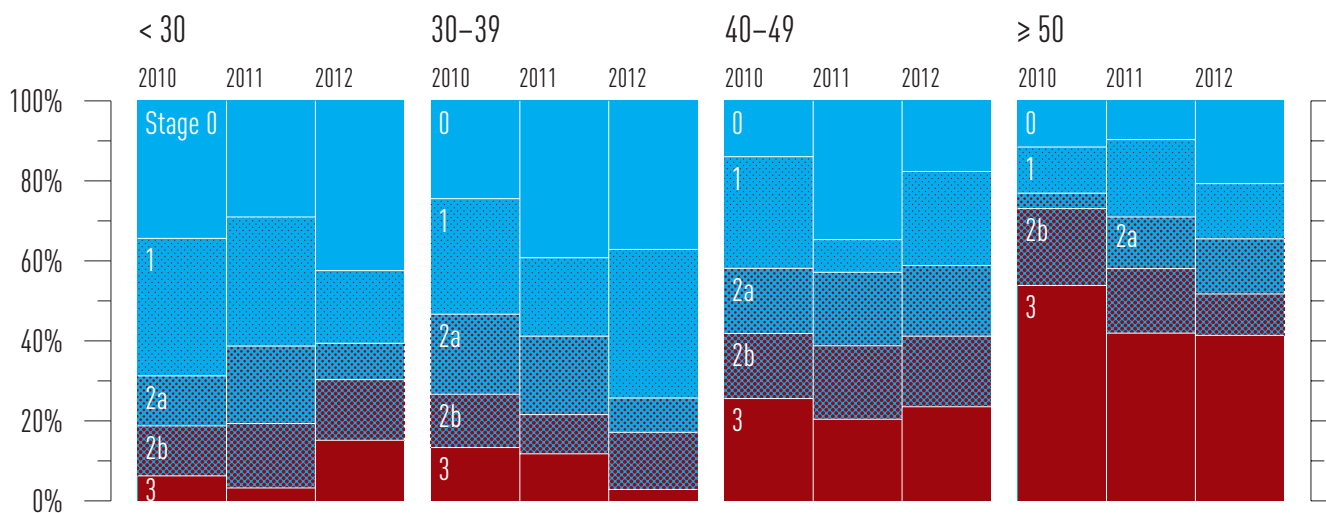
Figure 4.4 Stage of HIV Infection at Diagnosis by Exposure Category for Vancouver Coastal Health, 2010–2012 [5,6]
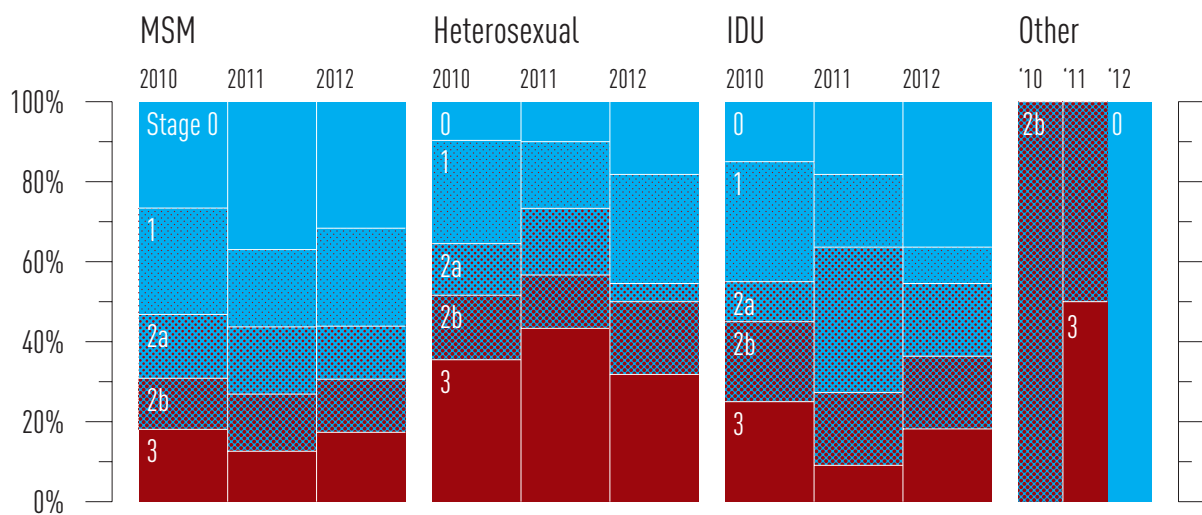
	< 30 years			30–39 years			40–49 years			≥ 50 years			MSM			HET			IDU			Other			NIR/Unknown		
	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012
Stage 0	11	9	14	11	20	13	6	17	6	3	3	6	25	44	31	3	3	4	3	2	4	0	0	0	0	0	0
Stage 1	11	10	6	13	10	13	12	4	8	3	6	4	25	23	24	8	5	6	6	2	1	0	0	0	0	0	0
Stage 2a	4	6	3	9	10	3	7	9	6	1	4	4	15	20	13	4	5	1	2	4	2	0	0	0	0	0	0
Stage 2b	4	5	5	6	5	5	7	9	6	5	5	3	12	17	13	5	4	4	4	2	2	1	1	0	0	0	0
Stage 3	2	1	5	6	6	1	11	10	8	14	13	12	17	15	17	11	13	7	5	1	2	0	1	0	0	0	0
Unknown	8	4	6	9	7	2	3	2	0	1	3	3	18	13	8	2	1	1	1	2	0	0	0	0	0	0	2
Total (n=)	40	35	39	54	58	37	46	51	34	27	34	32	112	132	106	33	31	23	21	13	11	1	2	0	0	0	2

6   MSM=men who have sex with men; IDU= injection drug user; HET=heterosexual. NIR=No identified risk/exposure.

Indicator 5. HIV Cascade of Care

The success of seek, test, treat and retain (STTR) strategies like STOP is reliant on early diagnosis of HIV, linking newly diagnosed HIV-positive persons with ongoing care, retaining persons in HIV-care; initiating ART based on best evidenced practices and maintaining optimal ART adherence to ensure a suppressed viral load. These stages of HIV-care can be summarized as: 1. HIV diagnosis, 2. Linkage to HIV care, 3. Retention in HIV care, 4. On ART and 5. Achieving a suppressed VL; collectively, they are referred to as the cascade of care. Leakage between any of these stages of HIV-care means a reduction in the potential of ART as a benefit to the HIV-positive individual and as an HIV transmission prevention method on a population level. Thus, when interpreting trends in the cascade of care, we strive to see increases along each step of the cascade of care (ie. reduced attrition) with the ultimate goal being 100% within each stage of the cascade. Monitoring the Cascade of Care provides a picture as to where deficiencies lie in the delivery and uptake of HIV-care. In this section we present the cascade of care for the year 2012 in BC overall and stratified by sex and age for each Health Authority.

Figure 5.1 Estimated Cascade of Care for Vancouver Coastal Health, Year Ending 2013 Q3 [7]
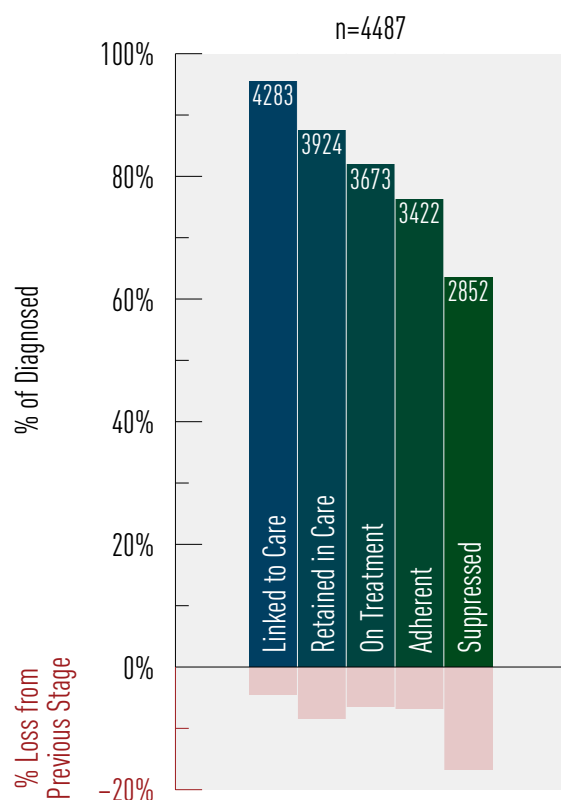
Figure 5.2 Estimated Cascade of Care for Vancouver Coastal Health by Gender, Year Ending 2013 Q3 [8]
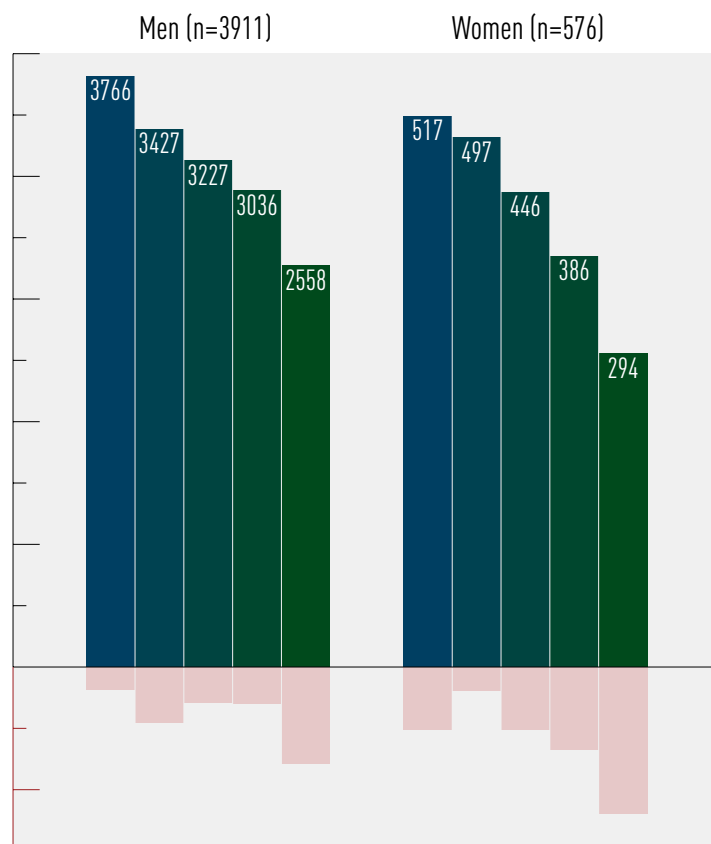
5,6 *Data is for the period 2012 Q3–2013 Q3.*
Data Sources:

1 *British Columbia Centre for Excellence Drug Treatment Program (DTP) Database (ARV use, VL and CD4 count).*
2 *Administrative data (ex. MSP billings; hospitalization data from the Discharge Abstract Database (DAD)).*

Limitations: HA assignment is based on the most recent HA of residence of the patient, if not available of the HIV-care provider. If the most recent HA of residence is not updated then the designated HA may be incorrect.

NB: Transgender has been assigned to their biological sex.

< 30
n=224

30–39
n=613

40–49
n=1473

≥ 50
n=2177

% of Diagnosed

% Loss from Previous Stage

Linked to Care · Retained in Care · On Treatment · Adherent · Suppressed

< 30: 154, 133, 116, 99, 82

30–39: 583, 516, 458, 409, 334

40–49: 1418, 1288, 1207, 1109, 915

≥ 50: 2128, 1988, 1892, 1805, 1521

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7   Data is for the period 2012 Q3–2013 Q3.
    Data Sources:
    1   British Columbia Centre for Excellence Drug Treatment Program (DTP) Database (ARV use, VL and CD4 count).
    2   Administrative data (ex. MSP billings; hospitalization data from the Discharge Abstract Database (DAD)).

    Limitations: HA assignment is based on the most recent HA of residence of the patient, if not available of the HIV-care provider.
    If the most recent HA of residence is not updated then the designated HA may be incorrect.

MSM
n=1852

Non-MSM
n=1197

Unknown
n=1438

% of Diagnosed

1812 — Linked to Care
1703 — Retained in Care
1621 — On Treatment
1537 — Adherent
1328 — Suppressed

1170
1142
1052
934
694

1301
1079
1000
951
830

% Loss from Previous Stage

8   *Data is for the period 2012 Q3–2013 Q3.*
Data Sources:
1   British Columbia Centre for Excellence Drug Treatment Program (DTP) Database (ARV use, VL and CD4 count).
2   Administrative data (ex. MSP billings; hospitalization data from the Discharge Abstract Database (DAD)).

Limitations: HA assignment is based on the most recent HA of residence of the patient, if not available of the HIV-care provider.
If the most recent HA of residence is not updated then the designated HA may be incorrect.

Figure 5.5   Estimated Cascade of Care for Vancouver Coastal Health by Age Category and MSM Status, Year Ending 2013 Q3 [11]

9   *Data is for the period 2012 Q3–2013 Q3.*
     Data Sources:
     1   *British Columbia Centre for Excellence Drug Treatment Program (DTP) Database (ARV use, VL and CD4 count).*
     2   *Administrative data (ex. MSP billings; hospitalization data from the Discharge Abstract Database (DAD)).*

     Limitations: HA assignment is based on the most recent HA of residence of the patient, if not available of the HIV-care provider.
     If the most recent HA of residence is not updated then the designated HA may be incorrect.

IDU
n=1276

Non-IDU
n=2133

Unknown
n=1079

% of Diagnosed

100%
80%
60%
40%
20%
0%
−20%

% Loss from
Previous Stage

IDU values: Linked to Care 1254, Retained in Care 1248, On Treatment 1152, Adherent 1027, Suppressed 773

Non-IDU values: 2082, 1953, 1861, 1772, 1534

Unknown values: 947, 724, 660, 623, 545

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10   *Data is for the period 2012 Q3–2013 Q3.*
    Data Sources:
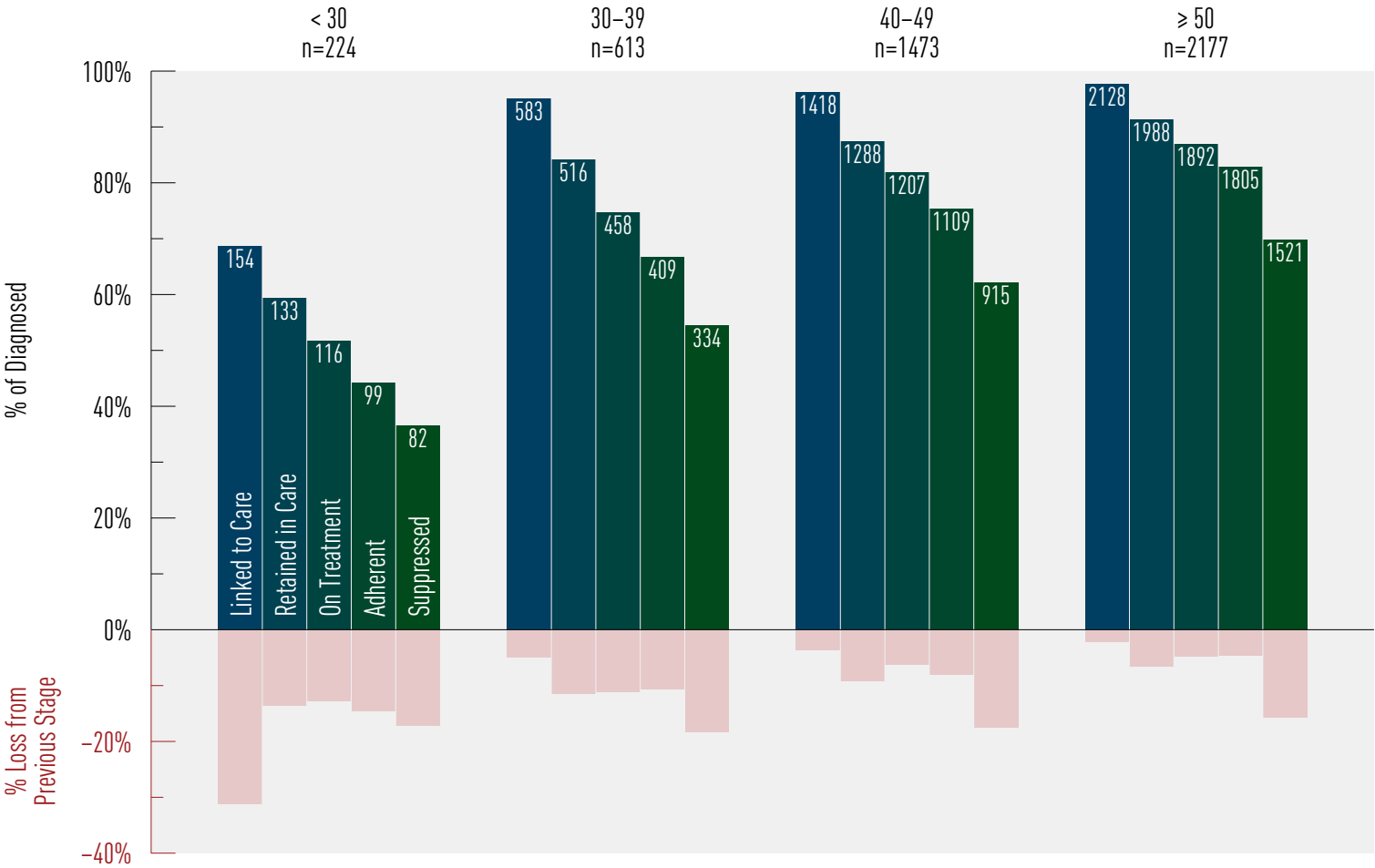   *1   British Columbia Centre for Excellence Drug Treatment Program (DTP) Database (ARV use, VL and CD4 count).*
    2   Administrative data (ex. MSP billings; hospitalization data from the Discharge Abstract Database (DAD)).

Limitations: HA assignment is based on the most recent HA of residence of the patient, if not available of the HIV-care provider.
If the most recent HA of residence is not updated then the designated HA may be incorrect.

North Shore/Coast Garibaldi
n=278

Richmond
n=127

Vancouver
n=4081

% of Diagnosed

% Loss from Previous Stage

Linked to Care — Retained in Care — On Treatment — Adherent — Suppressed

North Shore/Coast Garibaldi: 258, 241, 231, 222, 180

Richmond: 115, 107, 98, 97, 86

Vancouver: 3909, 3577, 3344, 3103, 2586

Indicator 6. The Programmatic Compliance Score (PCS)

The Programmatic Compliance Score (PCS) is a summary measure of risk of future death, immunologic failure and virologic failure from all causes for people who are starting ART for the first time. It is composed of patient- and physician-driven effects. PCS scores range from 0–6 with higher scores indicative of poorer health outcomes and greater risk of death. Table 1 provides mortality, immunologic failure and virologic failure probabilities for given PCS scores. We interpret an individual with a PCS≥4 as being 22 times more likely to die, almost 10 times more likely to have immunologic failure and nearly 4 times as likely to demonstrate virologic failure compared to those individuals with a PCS score of 0. A detailed description of how the PCS score is calculated and its valida¬tion can be found in the technical report. In short, PCS scores are calculated by summing the results (yes=1, no=0) of six un-weighted non-performance indicators based on IAS–USA treatment guidelines:

1. having <3 CD4 cell count tests in the first year after starting antiretroviral therapy (ART);
2. having <3 plasma viral load (VL) tests in the first year after starting ART;
3. not having drug resistance testing done prior to starting ART;
4. starting on a non-recommended ART regimen;
5. starting therapy with CD4<200 cells/μL; and
6. not achieving viral suppression within 9 months since ART initiation.

In this section we provide PCS scores and their components over time for the province of BC. A decline to 0%, **(i.e., all individuals having a score of 0)** is the eventual goal.

Table 2. The Probability of Mortality, Immunologic Failure and Virologic Failure based on the Programmatic Compliance Score

Programmatic Compliance Score	Mortality Risk Ratio (95% Confidence Interval)	Immunologic Failure Risk Ratio (95% CI)	Virologic Failure Risk Ratio (95% CI)
0 (Best score)	1 (–)	1 (–)	1 (–)
1	3.81 (1.73–8.42)	1.39 (1.04–1.85)	1.32 (1.05–1.67)
2	7.97 (3.70–17.18)	2.17 (1.54–3.04)	1.86 (1.46–2.38)
3	11.51 (5.28–25.08)	2.93 (1.89–4.54)	2.98 (2.16–4.11)
4 or more (Worst score)	22.37 (10.46–47.84)	9.71 (5.72–16.47)	3.80 (2.52–5.73)

Reference: Lima VD, Le A, Nosyk B, Barrios R, Yip B, et al. (2012) Development and Validation of a Composite Programmatic Assessment Tool for HIV Therapy. PLoS ONE 7(11): e47859. doi:10.1371/journal.pone.0047859

Figure 6.1   PCS Components for Vancouver Coastal Health, 2011 Q4–2013 Q3 [14]

Non Viral suppression at 9 Mo.
Baseline CD4 <200 cells/μL

<3 CD4 Tests
Non-Recommended ART
No Baseline Genotype
<3 Viral Load Tests

2011 Q4	2012 Q1				2013 Q1		
n= 194	209	213	228	242	241	226	203
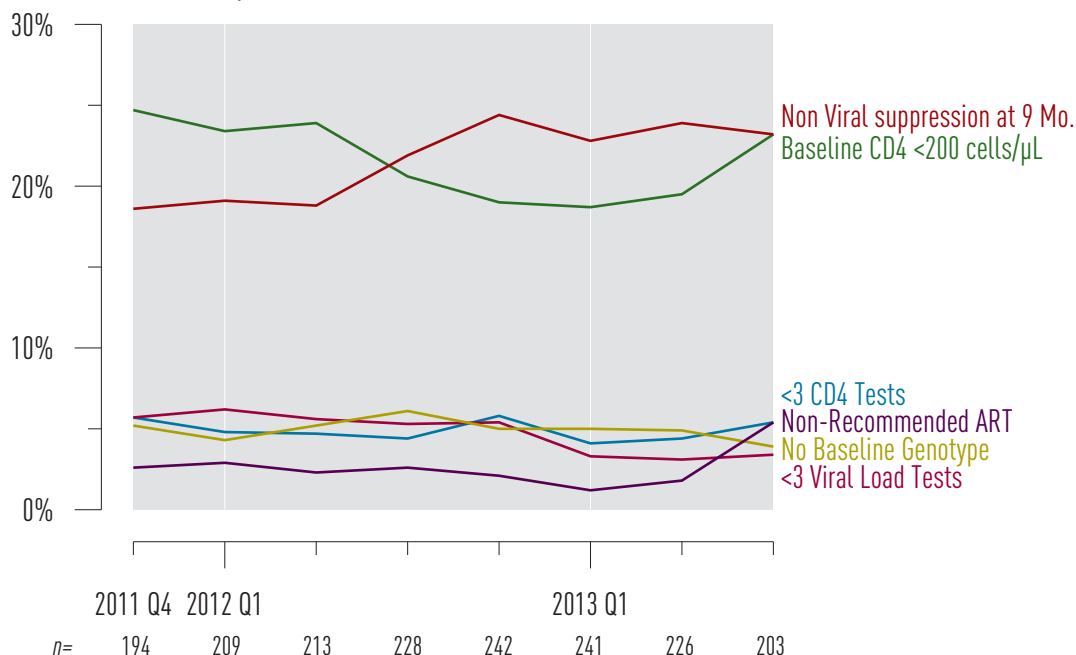
Figure 6.2   Historical Trends for PCS Score for Vancouver Coastal Health, 2011 Q4–2013 Q3 [15]

Distribution of PCS Score

Improving Health Outcomes

	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
	2011	2012				2013		
n=	194	209	213	228	242	241	226	203
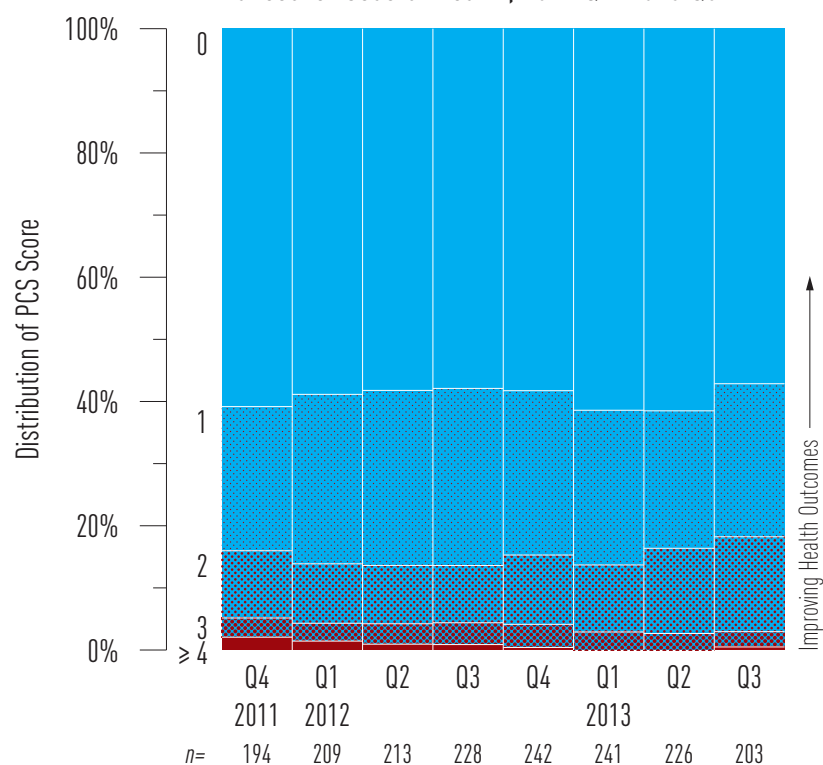
NB: A score of 0 is the best score and a score of 4 or more is the worst score.

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12   *Data Source: British Columbia Centre for Excellence Drug Treatment Program (DTP) Database.*
     Limitations: CD4 cell count capture is approximately 80%.

13   *Data Source: British Columbia Centre for Excellence Drug Treatment Program (DTP) Database.*
     Each quarter's data is calculated as the sum of the 4 quarters leading up to it. e.g. 2012 Q1 is calculated from 2011 Q2 – 2012 Q1.

Antiretroviral Uptake

In this section we present trends in ART uptake, the number and proportion of new HIV treatment initiations and the number of active and inactive DTP participants. Trends in ART uptake should be interpreted under the consideration of changing BC HIV treatment guidelines. BC HIV treatment guidelines are updated regularly by the BC-CFE Therapeutic Guidelines Committee and reflect those of the International AIDS Society. Most recent changes were made in 2012 and HIV treatment is now recommended for all HIV-positive adults regardless of CD4 cell count; as evidence demonstrates that early initiation of HIV treatment maximizes both the individual's health outcomes as well as the potential of ART as a form of HIV transmission prevention at a population level. As such, trends in the number and proportion of persons on ART and new ART starts (in both naïve and experienced persons) are expected to increase over time at higher CD4 cell counts.

Indicator 7. New Antiretroviral Therapy Starts in Vancouver Coastal Health

Figure 7   BC-CfE Drug Treatment Program Enrollment: New Antiretroviral Participants for Vancouver Coastal Health, 2011 Q3 – 2013 Q2 [14]
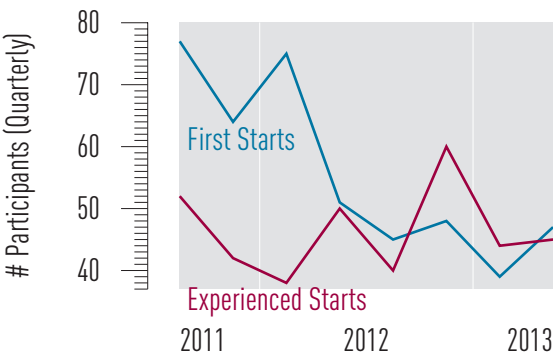
Indicator 8. CD4 Cell Count at ART Initiation

Figure 8   CD4 Cell Count at ART Initiation of ART-Naïve DTP Participants for Vancouver Coastal Health, 2011 Q4–2013 Q3 [17]

	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
	2011	2012				2013		
n=	71	79	55	52	51	46	53	58

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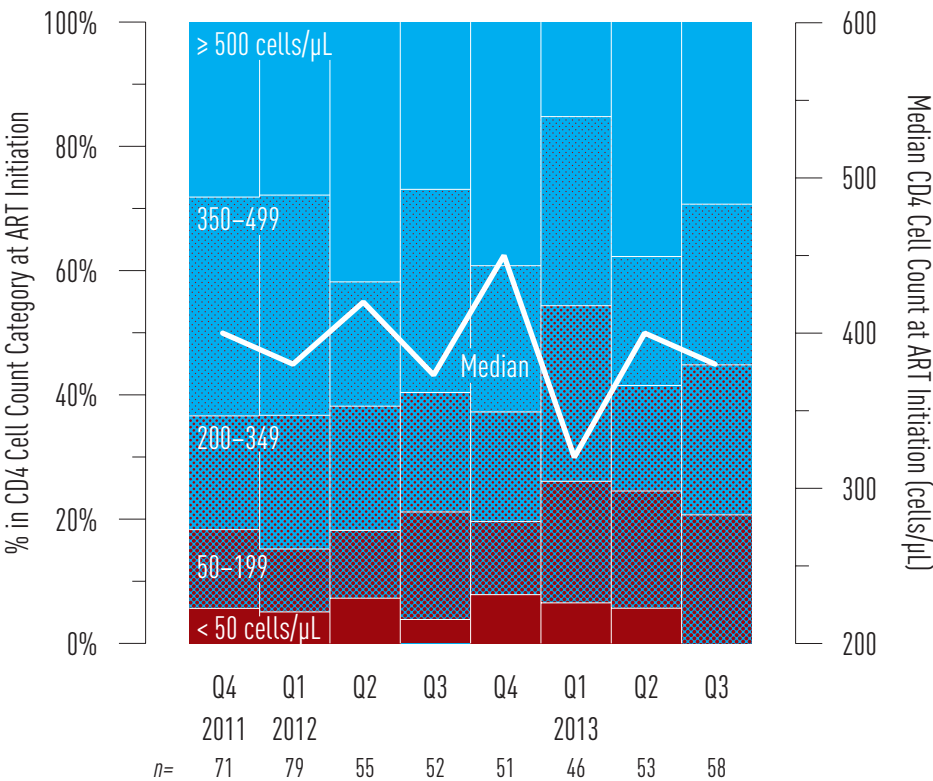
14   *Data Source: Drug Treatment Program Database*
     Limitation: DTP participants are designated to an HA based on most current residence provided by the participant.

15   *Data Source: Drug Treatment Program Database*
     Limitations: CD4 cell count data is approximately 80% complete.

Indicator 9. Active and Inactive DTP Participants

Table 3. Distribution of People on ART for Vancouver Coastal Health, 2013 Q3 [16]

Age	< 30	141
	30–39	508
	40–49	1256
	≥ 50	1838
Gender	Male	3293
	Female	450
Exposure	MSM	1587
	IDU	1094
Total		3743

Figure 9   Active and Inactive DTP Participants
for Vancouver Coastal Health, 2011 Q4–2013 Q3 [19]

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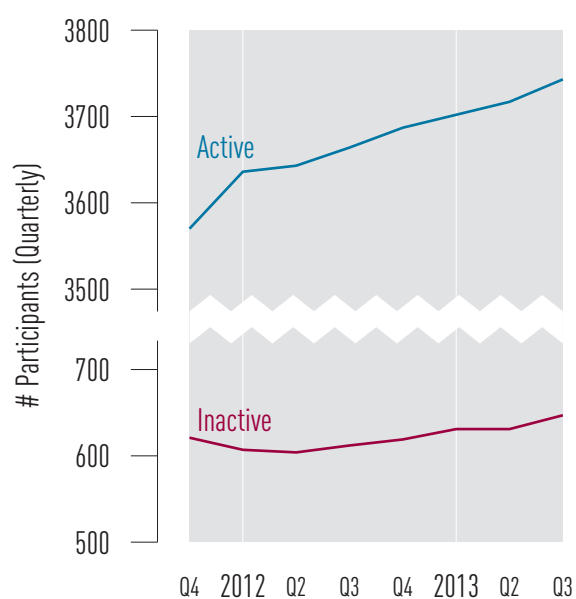
16   *Data Source: Drug Treatment Program Database*
Limitation: DTP participants are designated to an HA based on most current residence provided by the participant.

Definitions:
'On antiretroviral therapy' defined as being on treatment in the current quarter
'Unknown/not stated' defined as being on treatment in the current quarter, and city of residence unknown

17   *Active DTP participants: are those who are prescribed one or more drugs in the last six months.*
Inactive DTP Participants: Persons no longer prescribed drugs through the HIV/AIDS Drug Treatment Program in the last quarter.

Antiretroviral Adherence Level

In this section we present trends in prescription refill adherence levels for individuals in their first year of treatment. Given that the benefits of ART are compromised in the presence of imperfect ART adherence, we expect to see the proportion of persons on ART achieving near perfect adherence (ie. ≥95%) to increase with time. Furthermore, it is important that trends in the proportion of ART users achieving prescription refill adherence of ≥95% keep pace with new ART starts and increase among those continuing on ART.

Indicator 10. Antiretroviral Adherence

Figure 10   Distribution of Individuals by Adherence Level in 1st Year of Therapy, Based on Pharmacy Refill Compliance for Vancouver Coastal Health, 2011 Q4–2013 Q3 [20]

	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
	2011	2012				2013		
n=	62	88	75	75	67	77	59	51

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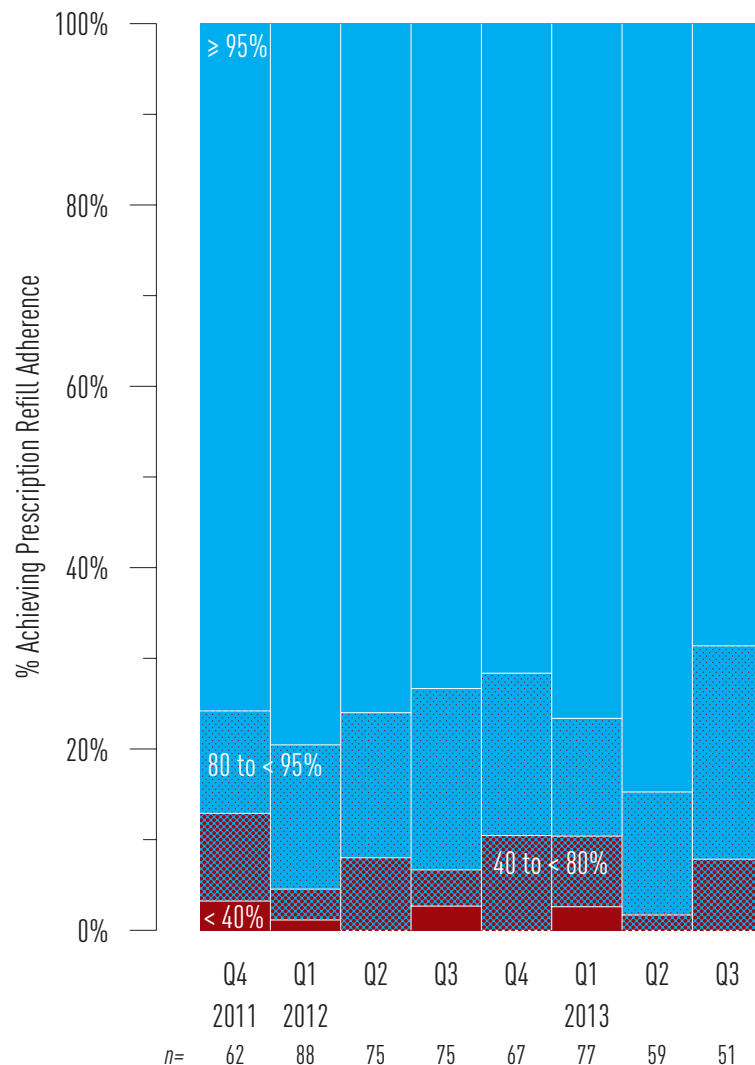
18   *Data Source: Drug Treatment Program Database*
      Limitation: Prescription refill adherence is used as a proxy for patient adherence.

Indicator 11. Resistance Testing and Results

In this section, we present trends in cumulative resistance testing by resistance category: Suppressed (where a DTP participant's viral load is too low to be genotyped); Wild Type (where no HIV treatment resistances were discovered), Never Genotyped, and Resistances to one, two or three HIV treatment classes. Resistance testing prior to ART initiation is recommended in the BC HIV treatment primary care guidelines. Thus, it is expected that trends over time should find all persons enrolled in the DTP to have been genotyped. Trends over time should also show an increase in the proportion of DTP participants achieving a suppressed status and an increase in resistance testing should not lead to an increase in the number of ART resistances occurring.

Figure 11   Cumulative Resistance Testing Results by Resistance Category in Vancouver Coastal Health, 2011 Q4–2013 Q3 [21]

| n= | 3190 | 3328 | 3231 | 3256 | 3178 | 3309 | 3263 | 3253 |
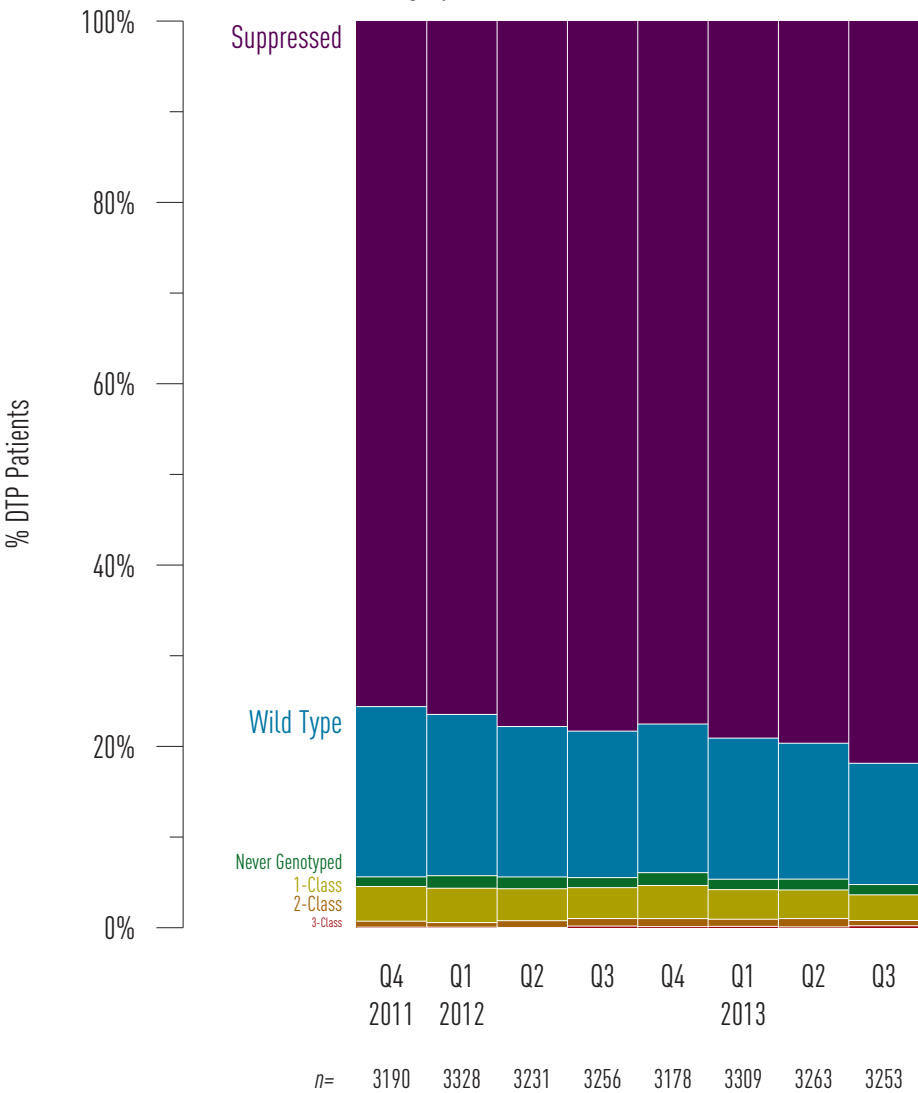
19   *Data Source: Drug Treatment Program Database*

   Limitation: DTP participants are designated to an HA based on most current residence provided by the participant.

Indicator 12. AIDS-Defining Illness

Improvements in ART and the expansion of ART province-wide has led to very low numbers of recorded AIDS cases across BC. However, interpreting trends in AIDS cases is challenging as AIDS reporting is passive in BC and it is likely that they are under reported across all Health Authorities. In addition to under reporting, methods of reporting AIDS cases are inconsistent across HA's and do not truly reflect the current reality of new AIDS diagnoses. Efforts will need to be made to improve under and inconsistent reporting of AIDS cases across all HA's. The table below shows AIDS cases using three definitions. First, AIDS cases were defined as the number of physician-reported AIDS defining illness (ADI) in a given year. AIDS case reporting is a passive process; as such, we have plotted DTP reported AIDS cases as well as the proportion of persons initiating ART with a CD4<200 cells/μL.

Figure 12   AIDS Case Rate and Reports for Vancouver Coastal Health, 2005–2012 [22]

Rate per 100,000 population

CD4<200 at ART Initiation

AIDS: BCCDC Reports

AIDS: DTP Reports

		2005	2006	2007	2008	2009	2010	2011	2012
CD4<200 at ART initiation	CASES	113	116	127	97	82	65	51	45
	PER 100K	10.7	10.9	11.7	8.9	7.4	5.7	4.4	3.8
AIDS: DTP Reports	CASES	60	53	68	56	40	46	34	15
	PER 100K	5.7	5.0	6.3	5.1	3.6	4.0	2.9	1.3
AIDS: BCCDC Reports	CASES	70	54	63	67	46	35	30	–
	PER 100K	6.7	5.1	5.8	6.1	4.1	3.1	2.6	–

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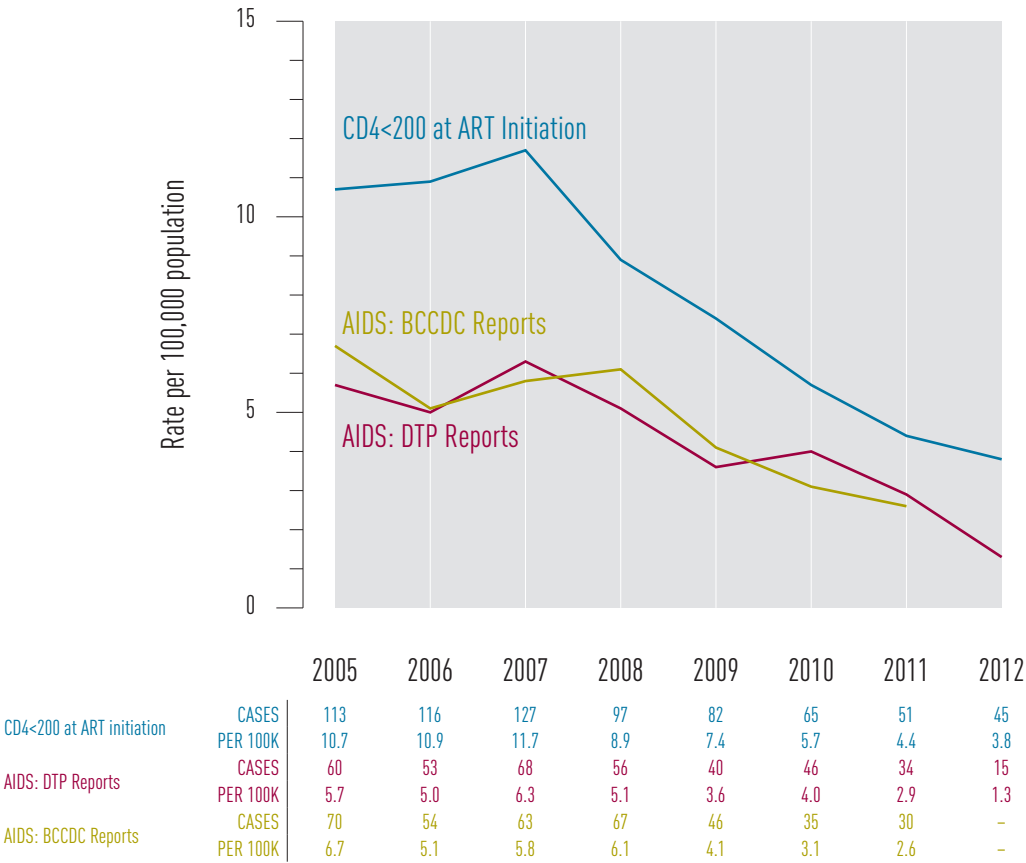
20   *Data Source: Drug Treatment Program Database*

     Limitation: AIDS case reporting was investigated using 2 definitions: First, using AIDS cases reported in AIDS case report forms from the DTP, and second, using a CD4 cell count of <200 cells/μL at time of ART initiation using DTP data. AIDS case reporting is passive in BC, thus; AIDS case reporting is not well captured. The DTP sends out AIDS reporting forms to physicians annually. Interpreting AIDS case reports should be done with these limitations in mind. AIDS data is updated annually as very few AIDS cases reports are reported in general and trends would be difficult to notice if reported quarterly.

Indicator 13. HIV-Related Mortality

Evidence indicates that individuals who initiate treatment with recommended ART in a timely fashion may live near normal lifespans. Excess mortality among HIV positive persons is, therefore, an important measure of HIV care with a goal of minimizing HIV-related mortality in British Columbia.

Figure 13 · HIV-Related Deaths by Year for Vancouver Coastal Health, 2004–2011 [20]

	2004	2005	2006	2007	2008	2009	2010	2011
HIV-Related Deaths	55	88	73	49	36	34	18	20
Per 100 HIV+ Population	0.90	1.41	1.15	0.76	0.54	0.50	0.26	0.28
Per 100,000 Population	5.30	8.46	6.79	4.51	3.30	3.05	1.58	1.73
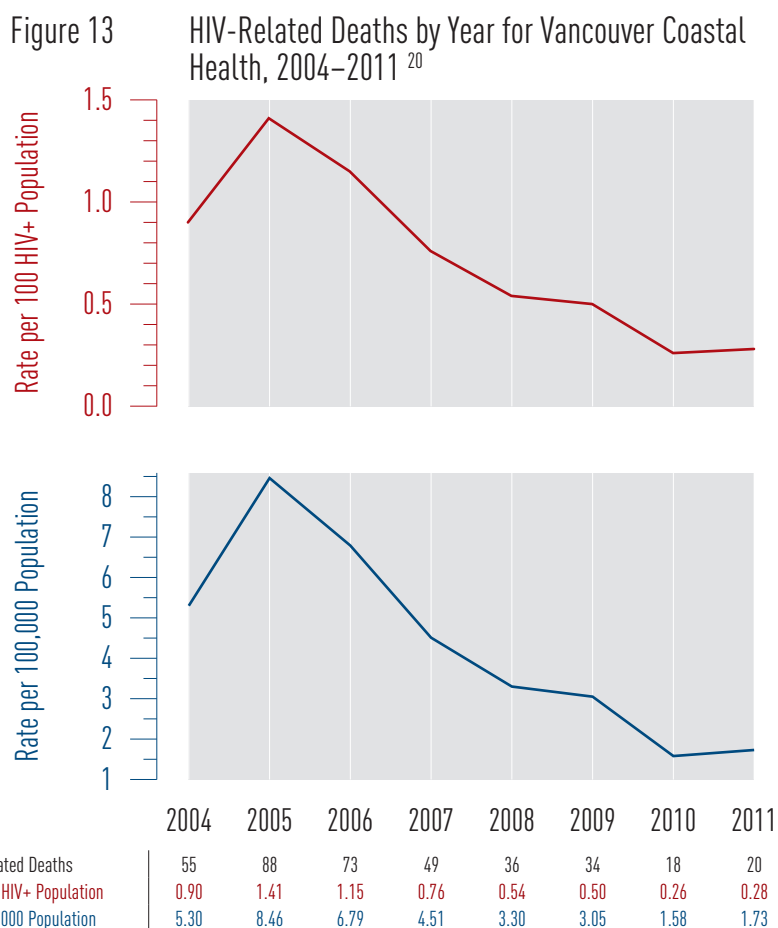
21   *Data Source: BC Vital Statistics*

Limitation:
1. DTP participants are designated to an HA based on most current residence provided by the participant.
2. Mortality data is updated annually.
3. The most recent available data was used.

Appendices

Indicator 1: Test Episodes (thousands)

		2009				2010				2011				2012				2013		
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
Van. Coastal Health		18.9	17.9	18.3	17.1	18.8	18.3	18.6	19.3	20.7	20.1	26.0	24.0	27.2	26.9	29.5	29.4	33.5	35.1	33.4
Gender	Female	10.1	9.6	9.8	9.3	10.0	9.7	10.0	9.8	10.6	9.7	10.6	11.6	13.6	13.5	14.7	14.8	17.1	18.0	17.3
	Male	8.4	7.8	8.0	7.4	8.3	8.2	8.2	8.2	8.7	8.0	9.0	9.6	11.3	11.3	12.4	12.6	14.2	15.1	14.0
	Other	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.3	0.3	0.2	0.2	0.2
Female (Prenatal)		3.5	3.2	3.3	3.2	3.4	3.1	3.4	3.5	3.7	3.4	3.5	3.7	4.1	3.7	3.6	3.6	3.6	3.5	3.7
Female (Non-prenatal)		6.6	6.4	6.6	6.1	6.6	6.6	6.6	6.3	6.8	6.4	7.1	8.0	9.5	9.8	11.1	11.2	13.5	14.5	13.6
Age	< 30	7.0	6.8	7.5	6.8	7.0	6.9	7.2	7.1	7.1	6.8	7.8	8.5	8.9	9.1	9.7	9.5	8.6	9.0	9.2
	30–39	6.4	5.9	6.0	5.7	6.4	6.1	6.2	6.2	6.7	5.9	6.4	6.5	7.8	7.4	7.7	7.6	8.8	9.0	8.9
	40–49	3.2	2.9	2.7	2.6	3.0	2.9	2.8	2.8	3.1	2.8	3.0	3.2	3.9	3.7	3.9	4.1	5.1	5.4	4.9
	≥ 50	2.3	2.2	2.2	2.1	2.4	2.4	2.4	2.3	2.7	2.6	3.0	3.4	4.6	4.8	6.0	6.5	9.0	9.8	8.6
POC HIV Tests									0.9	1.0	2.0	5.9	2.4	2.1	1.9	2.1	1.7	2.0	1.8	1.9
Richmond		1.2	1.1	1.2	1.1	1.2	1.2	1.2	1.2	1.3	1.2	1.2	1.3	1.5	1.5	1.5	1.6	1.9	2.0	2.0
Vancouver		15.2	14.5	14.9	13.9	15.3	14.8	15.1	15.7	17.0	16.6	22.5	20.2	22.9	22.9	25.2	25.0	28.5	29.9	28.2
North Shore / Coast Garibaldi		2.5	2.3	2.3	2.2	2.3	2.3	2.4	2.4	2.4	2.3	2.4	2.5	2.8	2.6	2.7	2.8	3.1	3.3	3.2

Indicator 2: Rate of HIV Testing per 100,000

		2009	2010	2011	2012
Vancouver Coastal Health		5114.6	5088.5	5342.2	7111.4
Richmond		2578.9	2681.9	2773.9	3399.4
Vancouver		6614.1	6522.7	6889.9	9532.3
North Shore / Coast Garibaldi		3411.9	3432.6	3507.6	4037.7
Gender	Female	5415.4	5359.4	5657.8	7609.7
	Male	4488.3	4522.1	4720.9	6425.6
Age	< 30	5804.6	5663.0	6001.1	7525.5
	30–39	10783.1	10968.5	11129.1	13278.5
	40–49	4835.7	4704.4	4894.4	6473.7
	≥ 50	1820.8	1891.1	2180.7	4171.4

Indicator 3: New HIV Diagnoses

		2009				2010				2011				2012				2013		
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
Vancouver Coastal Health	By Client Residence	51	36	41	36	41	45	41	40	32	48	57	41	43	33	34	32	32	45	50
	By Provider Address	56	46	45	40	45	50	49	43	34	47	65	42	47	38	38	38	32	51	58
Gender	Female	10	4	1	5	8	8	5	3	3	7	2	2	5	4	3	2	4	4	3
	Male	41	32	40	31	33	37	36	37	29	41	55	39	38	29	31	30	28	41	47
Age	< 30	9	8	10	9	12	12	12	7	3	10	13	12	11	10	6	13	7	11	17
	30–39	14	11	7	12	16	10	15	12	12	16	22	8	12	11	7	6	13	14	8
	40–49	18	12	18	11	10	16	10	11	11	12	13	13	12	6	11	9	7	8	12
	≥ 50	10	5	6	4	3	7	4	10	6	10	9	8	8	6	10	4	5	12	13
Exposure	MSM	29	25	26	24	30	26	29	27	23	36	43	30	33	25	26	22	19	–	–
	IDU	8	6	3	3	6	7	5	3	3	2	8	0	3	4	1	3	3	–	–
	HET	12	4	5	8	5	11	7	10	6	10	6	9	7	4	6	6	5	–	–
	Other	2	1	2	0	0	1	0	0	0	0	0	2	0	0	0	0	1	–	–
	NIR	0	0	5	1	0	0	0	0	0	0	0	0	0	0	1	1	4	–	–
Richmond	By Client Residence	3	1	1	1	2	3	3	2	2	0	1	3	0	1	3	0	2	1	0
	By Provider Address	1	1	3	0	0	2	2	1	1	1	0	2	0	1	2	1	0	0	0
Vancouver	By Client Residence	45	34	38	34	36	40	34	38	30	46	50	37	41	29	30	31	27	43	47
	By Provider Address	52	43	41	39	42	46	43	42	33	44	61	40	46	35	34	36	29	49	54
North Shore / Coast Garibaldi	By Client Residence	3	1	2	1	3	2	4	0	0	2	6	1	2	3	1	1	3	1	3
	By Provider Address	3	2	1	1	3	2	4	0	0	2	4	0	1	2	2	1	3	2	4

Indicator 4: **Stage of HIV Infection at Baseline**

	VCH			Female			Male			< 30 years			30–39 years			40–49 years		
	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012
Stage 0	31	49	39	4	1	5	27	48	34	11	9	14	11	20	13	6	17	6
Stage 1	39	30	31	3	2	3	36	28	28	11	10	6	13	10	13	12	4	8
Stage 2a	21	29	16	3	4	1	18	25	15	4	6	3	9	10	3	7	9	6
Stage 2b	22	24	19	6	3	3	16	21	16	4	5	5	6	5	5	7	9	6
Stage 3	33	30	26	8	3	1	25	27	25	2	1	5	6	6	1	11	10	8
Unknown	21	16	11	0	1	1	21	15	10	8	4	6	9	7	2	3	2	0
Total	167	178	142	24	14	14	143	164	128	40	35	39	54	58	37	46	51	34

	≥ 50 years			MSM			Heterosexual			IDU			Other Exposure			NIR/Unknown		
	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012
Stage 0	3	3	6	25	44	31	3	3	4	3	2	4	0	0	0	0	0	0
Stage 1	3	6	4	25	23	24	8	5	6	6	2	1	0	0	0	0	0	0
Stage 2a	1	4	4	15	20	13	4	5	1	2	4	2	0	0	0	0	0	0
Stage 2b	5	5	3	12	17	13	5	4	4	4	2	2	1	1	0	0	0	0
Stage 3	14	13	12	17	15	17	11	13	7	5	1	2	0	1	0	0	0	0
Unknown	1	3	3	18	13	8	2	1	1	1	2	0	0	0	0	0	0	2
Total	27	34	32	112	132	106	33	31	23	21	13	11	1	2	0	0	0	2

Indicator 5: **HIV Cascade of Care**			DIAGNOSED	LINKED	RETAINED	ON ART	ADHERENT	SUPPRESSED
Vancouver Coastal Health			4487	4283	3924	3673	3422	2852
Age Category	< 30		224	154	133	116	99	82
	30–39		613	583	516	458	409	334
	40–49		1473	1418	1288	1207	1109	915
	≥ 50		2177	2128	1988	1892	1805	1521
Age Category and MSM Status	MSM	< 30	51	47	37	33	26	25
		30–39	204	195	175	156	139	116
		40–49	567	555	514	491	460	393
		≥ 50	1030	1015	978	941	912	794
	Non-MSM	< 30	36	34	33	28	21	14
		30–39	169	163	145	126	103	72
		40–49	416	406	403	370	323	237
		≥ 50	576	567	562	528	487	371
	Unknown	< 30	138	73	63	55	52	43
		30–39	240	225	196	176	167	146
		40–49	490	457	372	346	326	285
		≥ 50	571	546	448	423	406	356
Gender	Male		3911	3766	3427	3227	3036	2558
	Female		576	517	497	446	386	294
Injection Drug Use	IDU		1276	1254	1248	1152	1027	773
	Non-IDU		2133	2082	1953	1861	1772	1534
	Unknown		1079	947	724	660	623	545
MSM Status	MSM		1852	1812	1703	1621	1537	1328
	Non-MSM		1197	1170	1142	1052	934	694
	Unknown		1438	1301	1079	1000	951	830
Health Authority	Vancouver		4081	3909	3577	3344	3103	2586
	Richmond		127	115	107	98	97	86
	North Shore / Coast Garibaldi		278	258	241	231	222	180

Indicator 6: **Programmatic Compliance Score (PCS)**

	2011 Q4	2012 Q1	Q2	Q3	Q4	2013 Q1	Q2	Q3
< 3 CD4 Tests	5.7%	4.8%	4.7%	4.4%	5.8%	4.1%	4.4%	5.4%
< 3 Viral Load Tests	5.7%	6.2%	5.6%	5.3%	5.4%	3.3%	3.1%	3.4%
No Baseline Genotype	5.2%	4.3%	5.2%	6.1%	5.0%	5.0%	4.9%	3.9%
Baseline CD4 < 200 cells/μL	24.7%	23.4%	23.9%	20.6%	19.0%	18.7%	19.5%	23.2%
Non-Recommended ART	2.6%	2.9%	2.3%	2.6%	2.1%	1.2%	1.8%	5.4%
Non Viral suppression at 9 Mo.	18.6%	19.1%	18.8%	21.9%	24.4%	22.8%	23.9%	23.2%
PCS Score: 0	118	123	124	132	141	148	139	116
PCS Score: 1	45	57	60	65	64	60	50	50
PCS Score: 2	21	20	20	21	27	26	31	31
PCS Score: 3	6	6	7	8	9	7	6	5
PCS Score: 4 or more	4	3	2	2	1	0	0	1
Total (n=)	**194**	**209**	**213**	**228**	**242**	**241**	**226**	**203**

Indicator 7: **New DTP ARV Participants**

	2011 Q4	2012 Q1	Q2	Q3	Q4	2013 Q1	Q2	Q3
First Starts	70	81	56	52	54	47	53	60
Experienced Starts	45	40	50	40	59	46	45	58

Indicator 8: **CD4 Cell Count at ART Initiation for ARV-Naïve DTP Participants**

CD4 ≥ 500	20	22	24	14	20	7	20	17
CD4 350–499	25	29	11	17	13	14	11	15
CD4 200–349	13	17	11	10	9	14	9	13
CD4 50–199	9	8	6	9	6	9	10	13
CD4 < 50	3	5	4	2	4	3	3	1
CD4 Median (cells/μL)	*404*	*380*	*420*	*373*	*440*	*320*	*400*	*380*
Total (n=)	**70**	**81**	**56**	**52**	**52**	**47**	**53**	**59**

Indicator 9: **Active and Inactive DTP Participants**

Active DTP Participants	3573	3637	3648	3664	3691	3706	3724	3752
Inactive DTP Participants	698	686	684	690	695	711	711	728

Indicator 10: **Antiretroviral Adherence**

≥ 95%	47	70	57	55	48	59	50	35
80% to < 95%	7	14	12	16	12	10	8	13
40% to < 80%	6	3	6	3	7	6	2	4
< 40%	2	1	0	1	0	2	0	0
Total (n=)	**62**	**88**	**75**	**75**	**67**	**77**	**60**	**52**

Indicator 11: **Resistance Testing and Results**

Suppressed	2412	2545	2514	2550	2464	2617	2599	2663
Wild Type	599	592	536	526	521	515	489	435
Never Genotyped	34	46	42	36	45	38	39	37
1-Class	122	126	114	111	116	108	103	92
2-Class	21	17	24	27	28	26	30	19
3-Class	2	2	1	6	4	5	3	7
Total (n=)	**3190**	**3328**	**3231**	**3256**	**3178**	**3309**	**3263**	**3253**

Indicator 12: **AIDS-Defining Illness**

		2005	2006	2007	2008	2009	2010	2011	2012
CD4 < 200 at	Cases	113	116	127	97	82	65	51	45
ART initiation	*Rate per 100,000*	*10.7*	*10.9*	*11.7*	*8.9*	*7.4*	*5.7*	*4.4*	*3.8*
AIDS Cases	Cases	60	53	68	56	40	46	34	15
(DTP Reports)	*Rate per 100,000*	*5.7*	*5.0*	*6.3*	*5.1*	*3.6*	*4.0*	*2.9*	*1.3*
AIDS Cases	Cases	70	54	63	67	46	35	30	–
(BCCDC Reports)	*Rate per 100,000*	*6.7*	*5.1*	*5.8*	*6.1*	*4.1*	*3.1*	*2.6*	–

Indicator 13: **HIV-Related Mortality**

	2004	2005	2006	2007	2008	2009	2010	2011
Vancouver Coastal Health	55	88	73	49	36	34	18	20
Per 100 HIV+ Population	0.90	1.41	1.15	0.76	0.54	0.50	0.26	0.28
Per 100,000 Population	5.30	8.46	6.79	4.51	3.30	3.05	1.58	1.73