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

HIV MONITORING QUARTERLY REPORT

FOR VANCOUVER COASTAL HEALTH

THIRD QUARTER 2014

BC Centre for Disease Control
An agency of the Provincial Health Services Authority

First Nations Health Authority
Health through wellness

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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 HA's. 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.

List of Indicators

Indicator 1. Testing Episodes

Indicator 2. HIV Testing Rate

Indicator 3. New HIV Diagnoses

Indicator 4. Stage of HIV Infection at Diagnosis

Indicator 5. HIV Cascade of Care

Indicator 6. Programmatic Compliance Score (PCS)

Indicator 7. New Antiretroviral Starts

Indicator 8. CD4 Cell Count at ART Initiation

Indicator 9. Active and Inactive Drug Treatment Program Participants

Indicator 10. Antiretroviral Adherence Level

Indicator 11. Resistance Testing Results by Resistance Category

Indicator 12. AIDS-Defining Illness

Indicator 13. HIV-Related Mortality

Table of Contents

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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 antiretroviral therapy (art) initiation.

The expansion to a province-wide programme was announced on November 30th 2013 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 for Vancouver Coastal Health, 2009 Q4–2014 Q3 [1]

	Q4 2009	Q1 2010	Q2	Q3	Q4	Q1 2011	Q2	Q3	Q4	Q1 2012	Q2	Q3	Q4	Q1 2013	Q2	Q3	Q4	Q1 2014	Q2	Q3
Vancouver Coastal Health	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	33.7	35.6	34.4	33.5	38.9	42.1	46.5
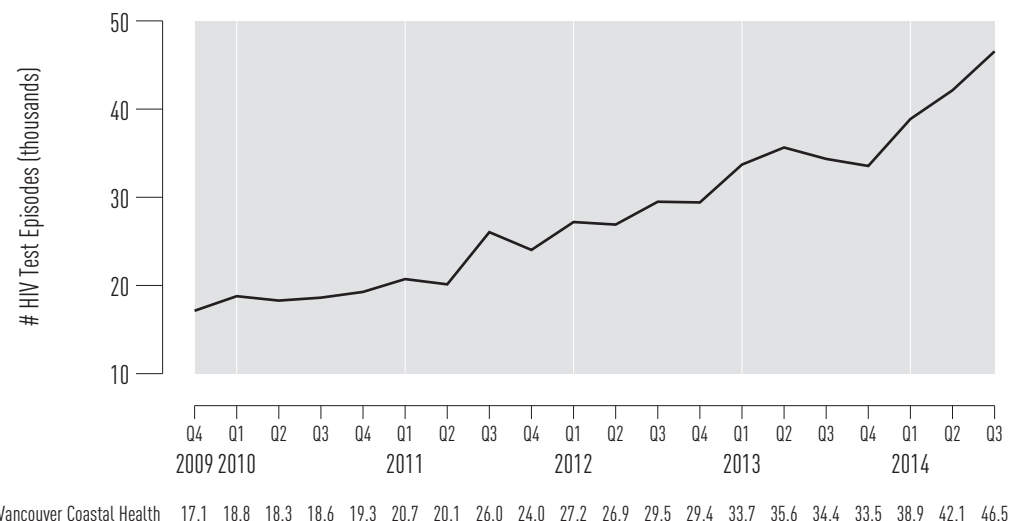
Figure 1.2   HIV Test Episodes by Gender and Prenatal Status for Vancouver Coastal Health, 2009 Q4–2014 Q3 [1,2]

	Q4 2009	Q1 2010	Q2	Q3	Q4	Q1 2011	Q2	Q3	Q4	Q1 2012	Q2	Q3	Q4	Q1 2013	Q2	Q3	Q4	Q1 2014	Q2	Q3
Female	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	17.2	18.3	17.7	17.2	19.7	21.6	23.8
Male	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	14.3	15.3	14.4	14.3	16.8	18.3	20.4
Female (Prenatal)	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	3.7	3.9	3.8	3.7
Female (Non-prenatal)	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	13.6	14.8	14.0	13.6	15.8	17.9	20.0
Other	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	0.1	0.2	0.2	0.2

Figure 1.3   HIV Test Episodes by Age Category for Vancouver Coastal Health,
2009 Q4–2014 Q3 [1,2]

	Q4 2009	Q1 2010	Q2	Q3	Q4	Q1 2011	Q2	Q3	Q4	Q1 2012	Q2	Q3	Q4	Q1 2013	Q2	Q3	Q4	Q1 2014	Q2	Q3
< 30	5.8	6.0	6.0	6.3	6.1	6.1	5.9	6.7	6.8	7.3	7.2	8.1	8.1	8.5	9.0	9.2	9.1	9.6	9.9	11.1
30–39	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	8.6	10.2	10.1	10.6
40–49	2.6	3.0	2.9	2.8	2.8	3.1	2.8	3.0	3.2	3.9	3.8	3.9	4.1	5.2	5.5	5.0	4.9	5.7	6.0	6.5
≥ 50	2.1	2.4	2.4	2.4	2.3	2.8	2.6	3.0	3.4	4.6	4.8	6.0	6.4	9.1	10.2	9.0	9.0	11.0	14.0	16.1
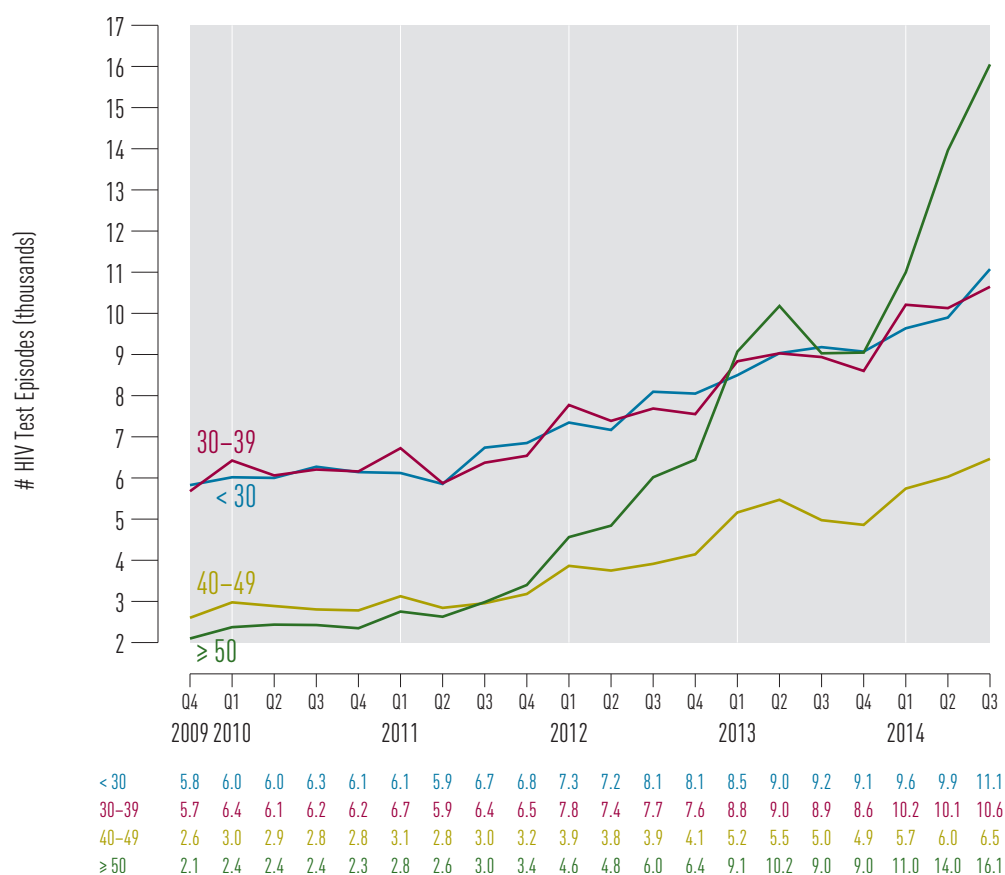
Figure 1.4   Point-of-Care HIV Tests for Vancouver Coastal Health, 2010 Q4–2014 Q3 [1]

	Q4 '10	Q1 '11	Q2	Q3	Q4	Q1 2012	Q2	Q3	Q4	Q1 2013	Q2	Q3	Q4	Q1 2014	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	2.1	1.9	2.1	2.0	2.2

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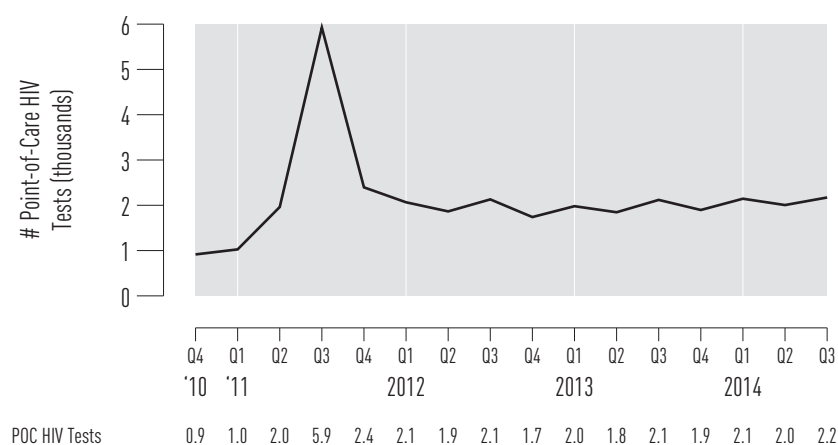
1   *Data Source: The BC Public Health Microbiology and Reference Laboratory (BCPHMRL)
courtesy of the BC Centre for Disease Control (BCCDC).*

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 are available from the fourth quarter of 2010 forward.*

2   *NB: Testing does not include point of care tests.*

Figure 1.5   HIV Test Episodes for Vancouver Coastal Health by HSDA, 2009 Q4–2014 Q3

	Q4 2009	Q1 2010	Q2	Q3	Q4	Q1 2011	Q2	Q3	Q4	Q1 2012	Q2	Q3	Q4	Q1 2013	Q2	Q3	Q4	Q1 2014	Q2	Q3
North Shore / Coast Garibaldi	2.2	2.3	2.3	2.4	2.4	2.4	2.3	2.4	2.4	2.8	2.6	2.7	2.8	3.0	3.2	3.2	3.3	3.7	4.9	5.4
Richmond	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	1.9	1.9	1.8	3.1	5.4	5.4
Vancouver	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	28.7	30.6	29.3	28.4	32.2	31.8	35.8

12
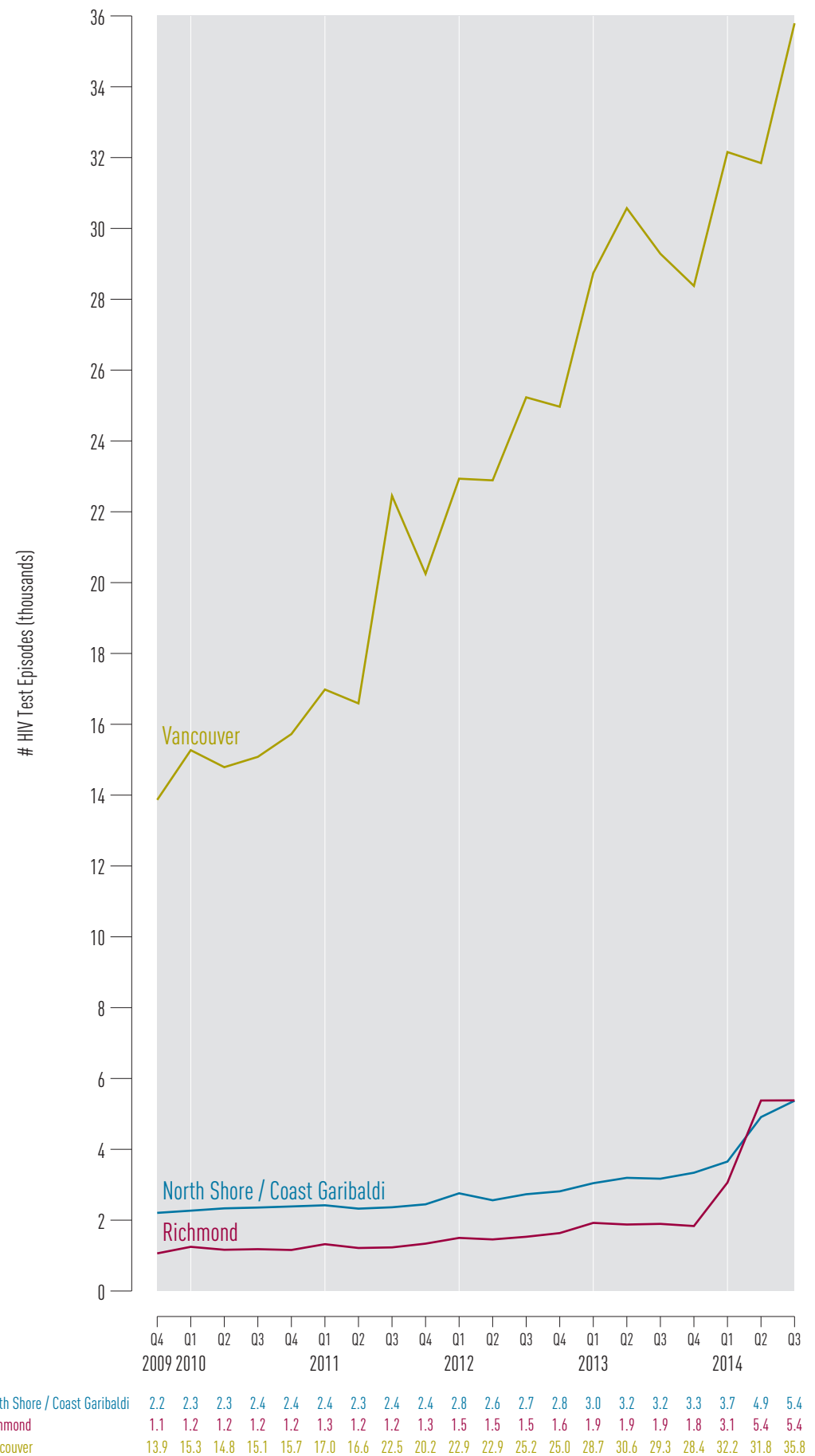
Indicator 2. HIV Testing Rates

Figure 2.1   Rate of HIV Testing for Vancouver Coastal Health and HSDAs, 2009–2013 [1]

	2009	2010	2011	2012	2013
All Vancouver Coastal Health	5115.0	5086.7	5336.7	7017.3	8884.1
North Shore / Coast Garibaldi	3412.9	3425.3	3504.4	4017.2	4556.6
Richmond	2576.4	2682.0	2773.9	3389.4	3939.8
Vancouver	6615.2	6522.7	6881.8	9350.3	12168.0
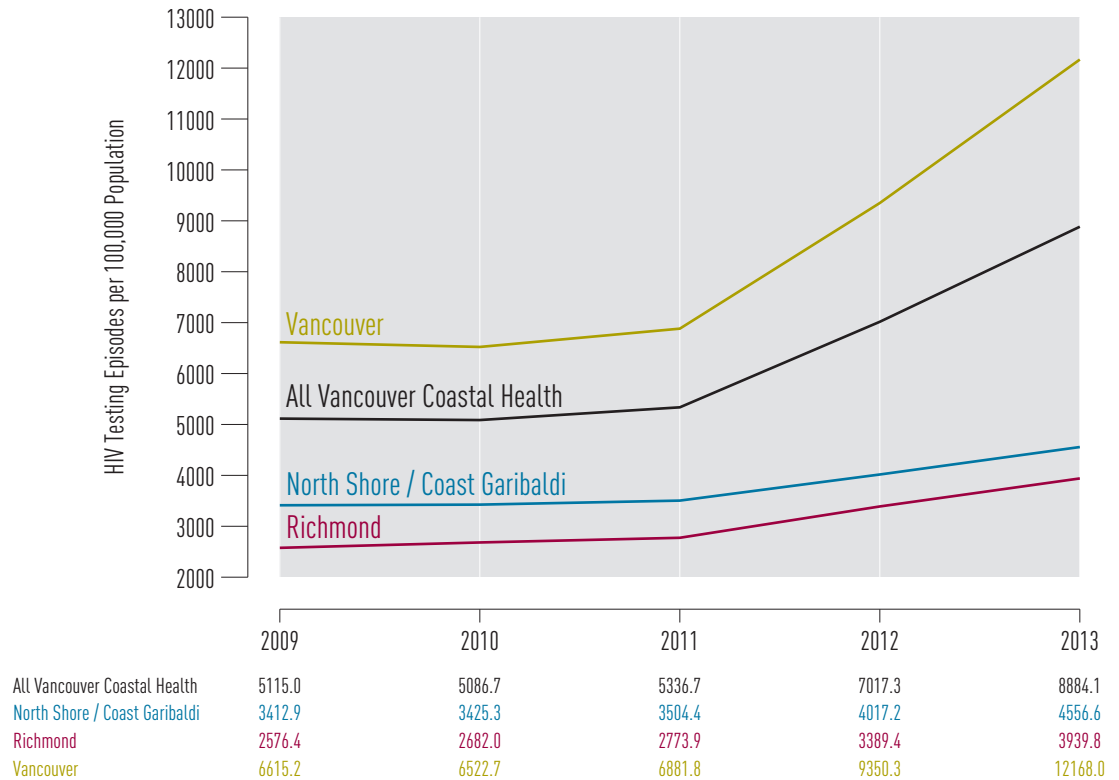
Figure 2.2   Rate of HIV Testing by Gender for Vancouver Coastal Health, 2009–2013 [1]

	2009	2010	2011	2012	2013
Female	5412.5	5350.6	5649.0	7508.8	9687.1
Male	4492.4	4527.0	4719.4	6341.3	7957.1

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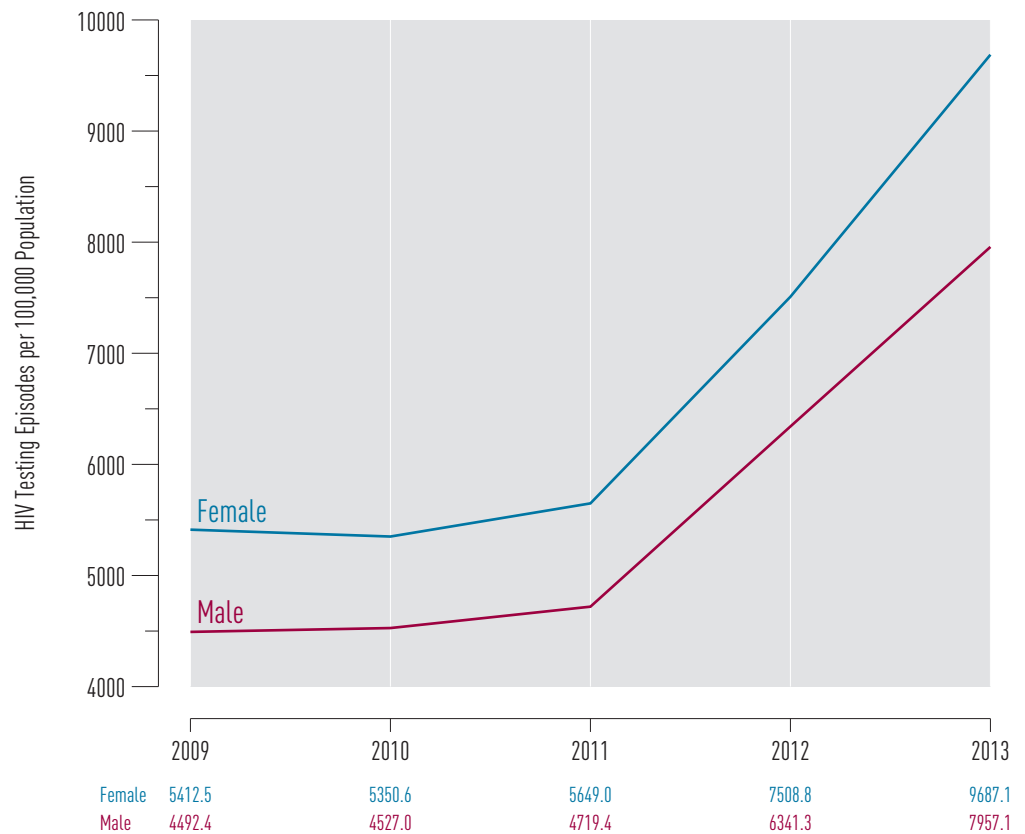
Figure 2.3

Rate of HIV Testing by Age Category for Vancouver Coastal Health, 2009–2013 [1]

	2009	2010	2011	2012	2013
< 30	4898.0	4831.4	4942.7	5907.0	7122.3
30–39	10935.0	11192.1	11433.9	13492.2	16204.2
40–49	4871.2	4771.7	4990.0	6554.3	9223.8
≥ 50	1820.7	1872.6	2157.5	4127.1	7163.8
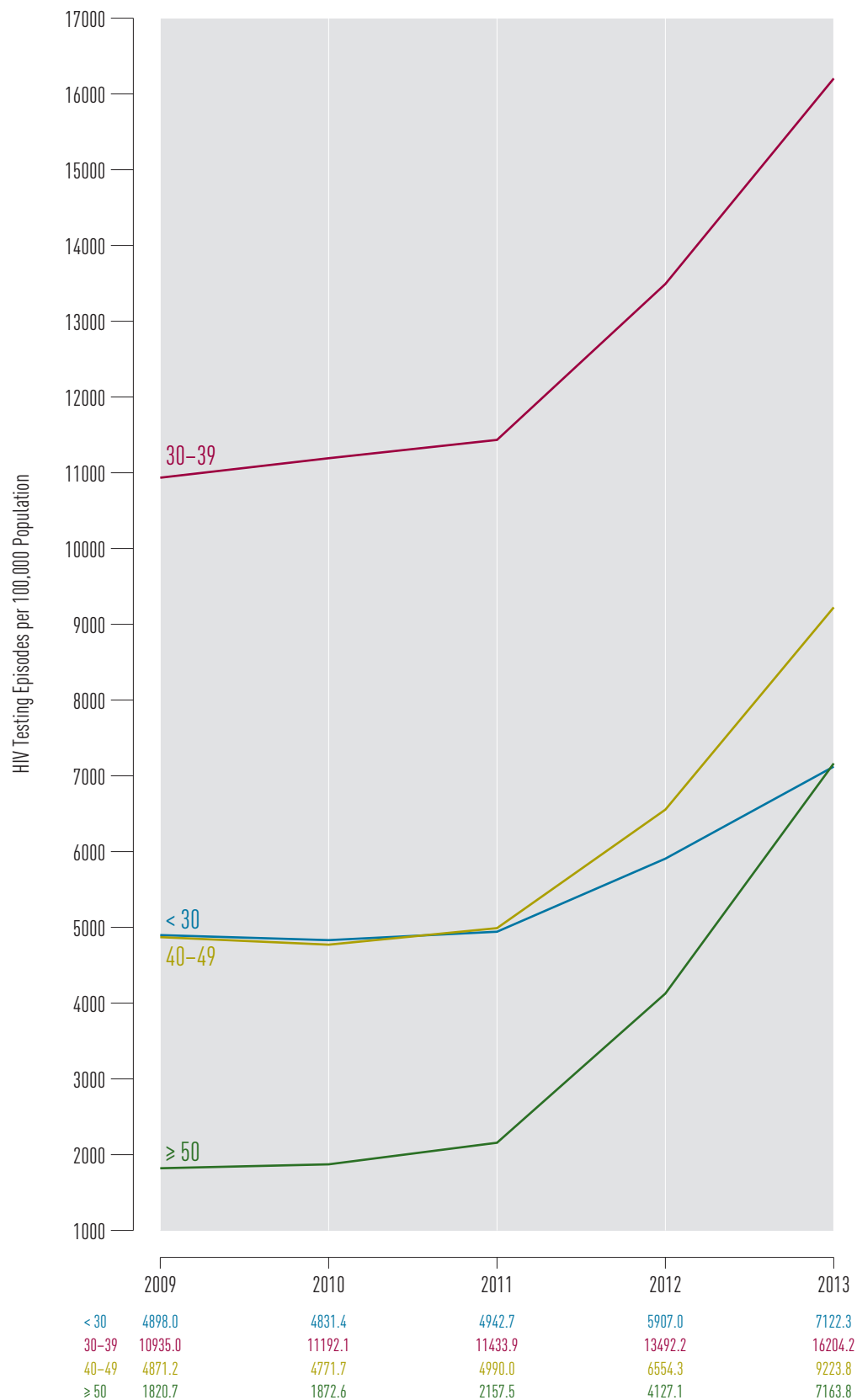
1   *NB: Testing does not include point of care tests.*

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 Q4–2014 Q3 [3]

	Q4 '09	Q1 '10	Q2	Q3	Q4	Q1 2011	Q2	Q3	Q4	Q1 2012	Q2	Q3	Q4	Q1 2013	Q2	Q3	Q4	Q1 2014	Q2	Q3
Vancouver Coastal	36	41	45	41	40	32	48	57	41	43	33	33	32	31	45	40	25	37	49	38
by Provider Address	*40*	*45*	*50*	*49*	*43*	*34*	*47*	*65*	*42*	*47*	*38*	*37*	*38*	*31*	*50*	*49*	*29*	*41*	*54*	*38*
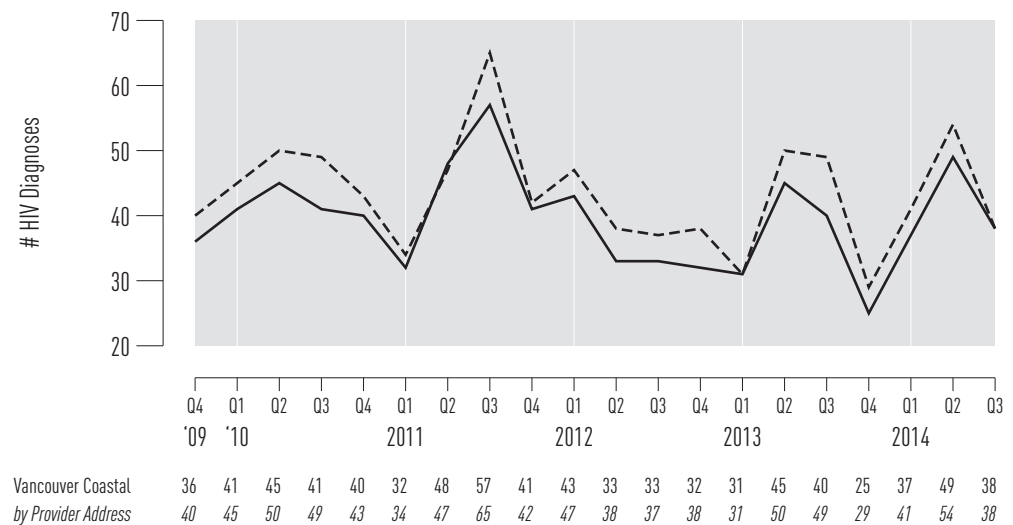
Figure 3.2   New HIV Diagnoses for Vancouver Coastal Health by Gender, 2009 Q4–2014 Q3 [3]

	Q4 '09	Q1 '10	Q2	Q3	Q4	Q1 2011	Q2	Q3	Q4	Q1 2012	Q2	Q3	Q4	Q1 2013	Q2	Q3	Q4	Q1 2014	Q2	Q3
Female	5	8	8	5	3	3	7	2	2	5	4	3	2	4	4	1	1	3	4	4
Male	31	33	37	36	37	29	41	55	39	38	29	30	30	27	41	39	24	33	44	34
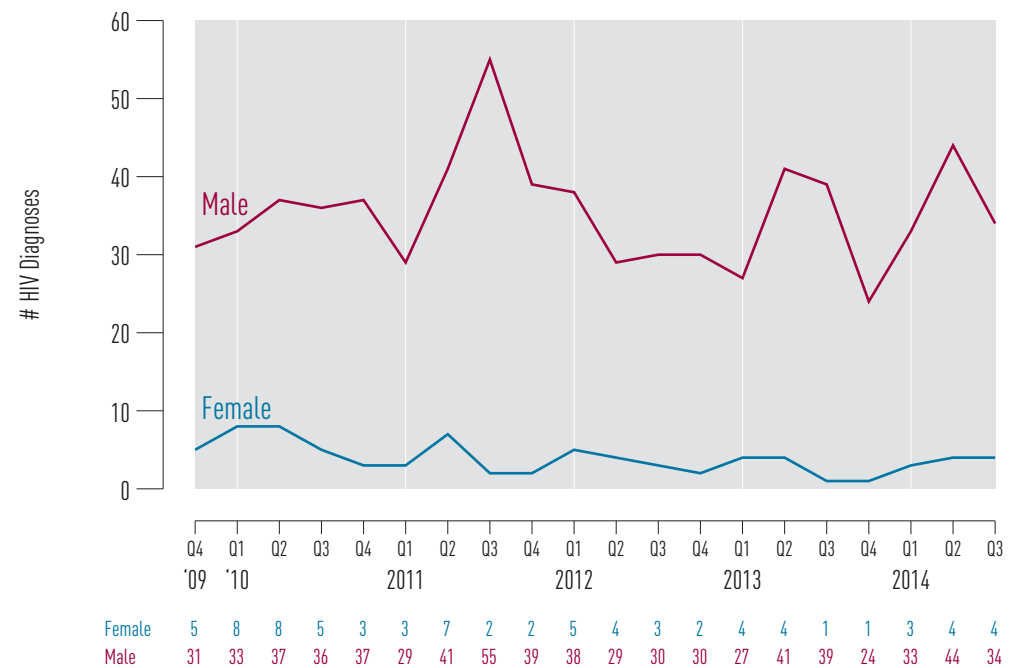
3   *Data Source: BCCDC. "By Provider Address" is graphed as dashed line in same colour.*

Figure 3.3   New HIV Diagnoses for Vancouver Coastal Health by Age Category, 2009 Q4–2014 Q3 [3]

	Q4 '09	Q1 '10	Q2	Q3	Q4	Q1 2011	Q2	Q3	Q4	Q1 2012	Q2	Q3	Q4	Q1 2013	Q2	Q3	Q4	Q1 2014	Q2	Q3
< 30	9	12	12	12	7	3	10	13	12	11	10	6	13	7	11	14	6	11	12	7
30–39	12	16	10	15	12	12	16	22	8	12	11	7	6	11	14	5	3	10	16	17
40–49	11	10	16	10	11	11	12	13	13	12	6	11	9	8	8	11	10	8	7	5
≥ 50	4	3	7	4	10	6	10	9	8	8	6	9	4	5	12	10	6	8	14	9
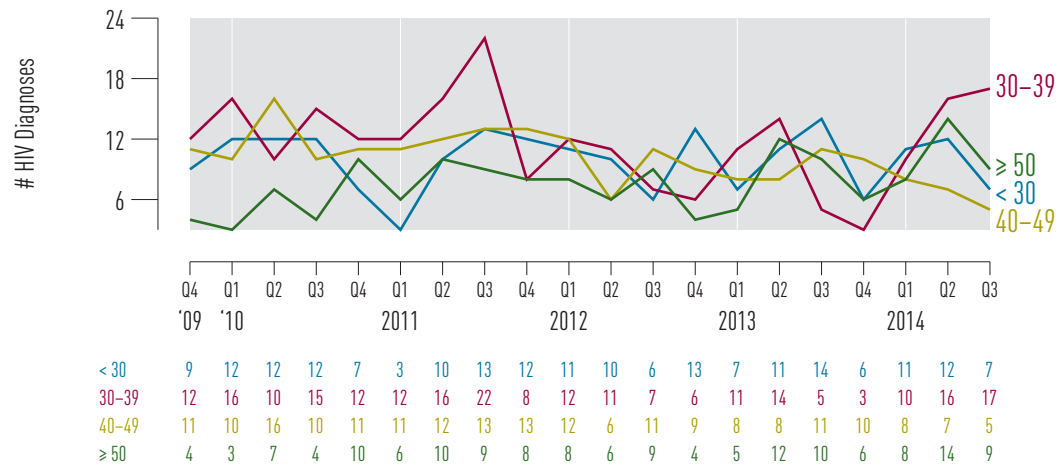
Figure 3.4   New HIV Diagnoses for Vancouver Coastal Health by Exposure Category, 2009 Q4–2014 Q1 [3,4]

	Q4 '09	Q1 '10	Q2	Q3	Q4	Q1 2011	Q2	Q3	Q4	Q1 2012	Q2	Q3	Q4	Q1 2013	Q2	Q3	Q4	Q1 2014
MSM (men who have sex with men)	24	30	26	29	27	23	36	43	30	33	25	25	22	19	32	29	20	27
IDU (injection drug user)	3	6	7	5	3	3	2	8	0	3	4	1	3	3	3	3	2	4
HET (heterosexual)	8	5	11	7	10	6	10	6	9	7	4	6	6	8	8	6	2	3
Other (other exposure identified)	0	0	1	0	0	0	0	0	2	0	0	0	0	0	1	1	0	0
NIR/Unknown (no identified exposure)	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	3

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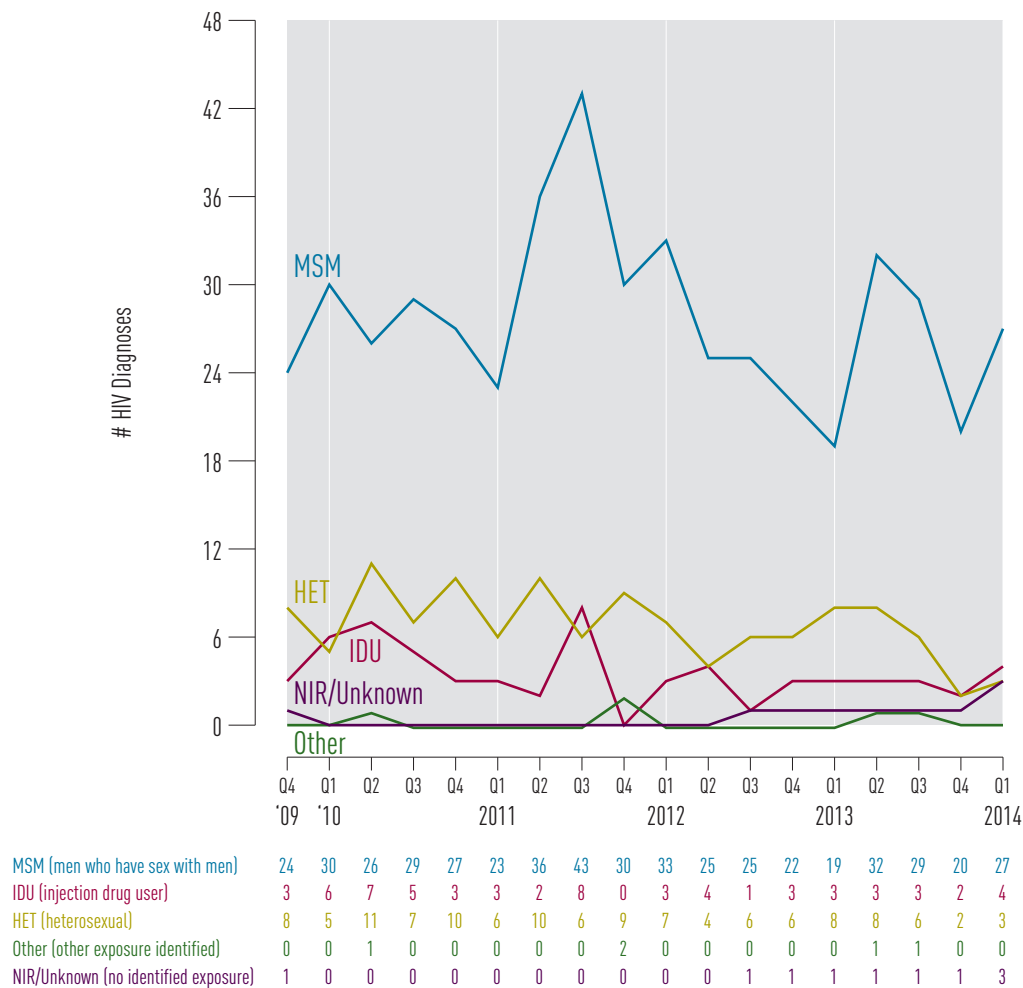
3   *Data Source: BCCDC. "By Provider Address" is graphed as dashed line in same colour.*

4   *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 Q4–2014 Q3 [3]

		Q4 2009	Q1 2010	Q2	Q3	Q4	Q1 2011	Q2	Q3	Q4	Q1 2012	Q2	Q3	Q4	Q1 2013	Q2	Q3	Q4	Q1 2014	Q2	Q3
North Shore / Coast Garibaldi	by Client Residence	1	3	2	4	0	0	2	6	1	2	3	1	1	3	1	4	1	1	3	3
	by Provider Address	1	3	2	4	0	0	2	4	0	1	2	2	1	3	2	4	0	1	2	3
Richmond	by Client Residence	1	2	3	3	2	2	0	1	3	0	1	3	0	2	1	0	1	1	1	2
	by Provider Address	0	0	2	2	1	1	1	0	2	0	1	2	1	0	0	0	2	2	1	3
Vancouver	by Client Residence	34	36	40	34	38	30	46	50	37	41	29	29	31	26	43	36	23	35	45	33
	by Provider Address	39	42	46	43	42	33	44	61	40	46	35	33	36	28	48	45	27	38	51	32

3   *Data Source:* BCCDC. *"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			CD4 ≥500	*and*	No AIDS case report
2a			CD4 350–499		
2b	Stage 0 not met	*and*	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, 2010–2013 [5]
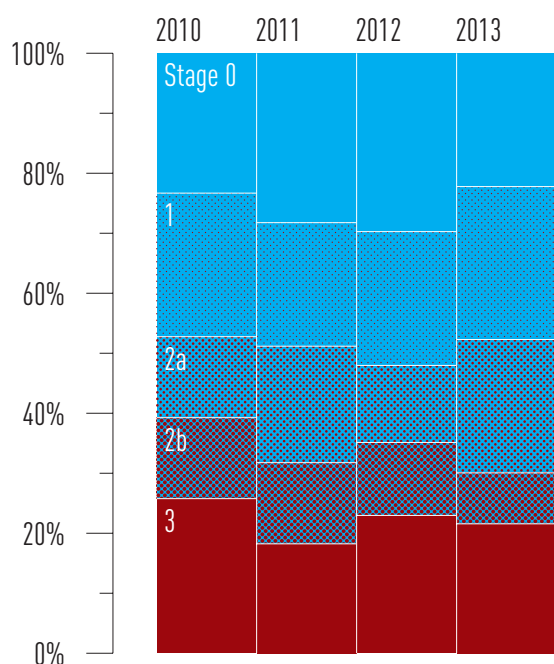
Figure 4.2   Stage of HIV Infection at Diagnosis by Gender for Vancouver Coastal Health, 2010–2013 [5]
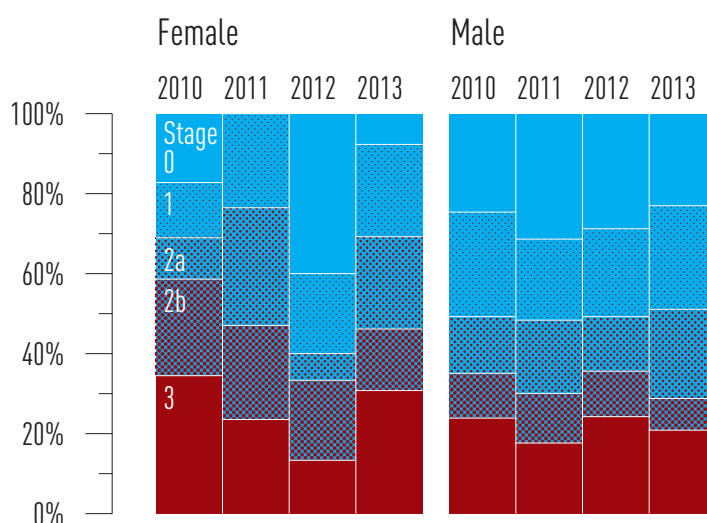
			VCH				Female				Male
	2010	2011	2012	2013	2010	2011	2012	2013	2010	2011	2012	2013
Stage 0	38	48	44	34	5	0	6	1	33	48	38	32
Stage 1	39	35	33	39	4	4	3	3	35	31	29	36
Stage 2a	22	33	19	34	3	5	1	3	19	28	18	31
Stage 2b	22	23	18	13	7	4	3	2	15	19	15	11
Stage 3	42	31	34	33	10	4	2	4	32	27	32	29
Unknown	22	17	9	5	0	0	1	0	22	16	8	5
Total (n=)	185	187	157	158	29	17	16	13	156	169	140	144

5   *Data Source: BCCDC*

Figure 4.3 Stage of HIV Infection at Diagnosis by Age Category for Vancouver Coastal Health, 2010–2013 [5]
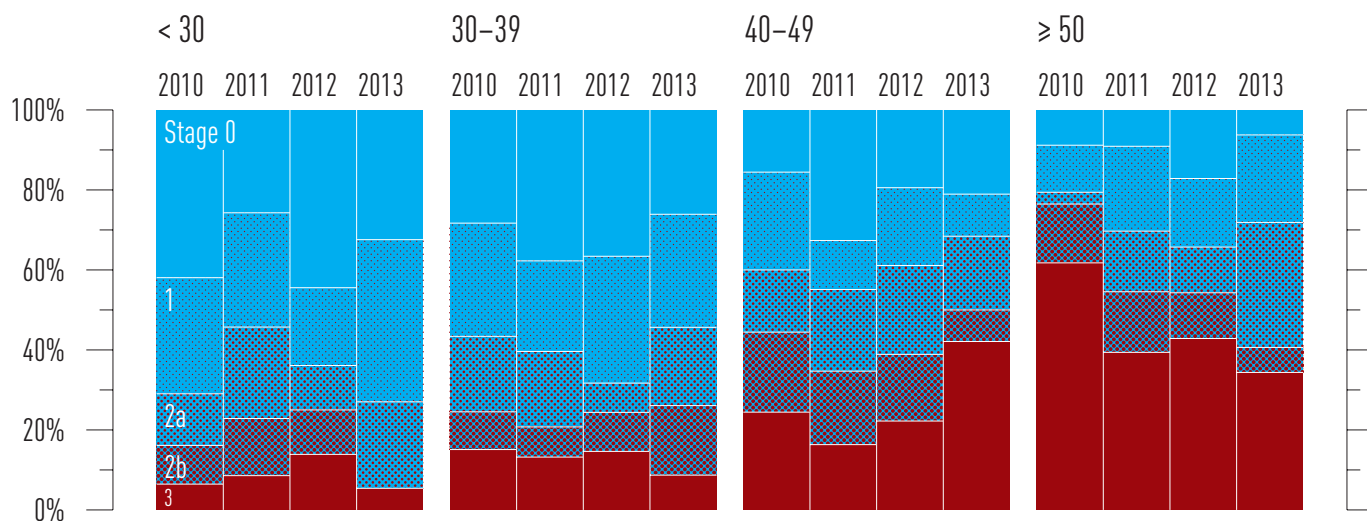
Figure 4.4 Stage of HIV Infection at Diagnosis by Exposure Category for Vancouver Coastal Health, 2010–2013 [5,6]

	< 30 years				30–39 years				40–49 years				≥ 50 years				MSM				IDU				Heterosexual				Other				NIR/Unknown			
	2010	'11	'12	'13	'10	'11	'12	'13	'10	'11	'12	'13	'10	'11	'12	'13	'10	'11	'12	'13	'10	'11	'12	'13	'10	'11	'12	'13	'10	'11	'12	'13	'10	'11	'12	'13
Stage 0	13	9	16	12	15	20	15	12	7	16	7	8	3	3	6	2	30	44	35	25	3	2	4	6	5	2	5	3	0	0	0	0	0	0	0	0
Stage 1	9	10	7	15	15	12	13	13	11	6	7	4	4	7	6	7	24	27	26	30	6	2	1	3	9	6	6	4	0	0	0	0	0	0	0	2
Stage 2a	4	8	4	8	10	10	3	9	7	10	8	7	1	5	4	10	15	23	14	26	2	4	4	4	5	5	1	4	0	1	0	0	0	0	0	0
Stage 2b	3	5	4	0	5	4	4	8	9	9	6	3	5	5	4	2	12	16	13	11	4	2	2	0	5	5	3	2	1	0	0	0	0	0	0	0
Stage 3	2	3	5	2	8	7	6	4	11	8	8	16	21	13	15	11	17	15	22	18	7	1	1	1	17	13	9	12	0	2	0	0	1	0	2	2
Unknown	8	4	5	1	10	7	2	1	3	2	0	0	1	4	2	3	17	13	7	3	1	2	0	0	3	1	1	0	0	1	0	2	1	0	1	0
Total (n=)	39	39	41	38	63	60	43	47	48	51	36	38	35	37	37	35	115	138	117	113	23	13	12	14	44	32	25	25	1	4	0	2	2	0	3	4

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 2014 Q3 [7]

Figure 5.2 Estimated Cascade of Care for Vancouver Coastal Health by Gender, Year Ending 2014 Q3 [8]

7,8 *Data is for the period 2013 Q4–2014 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.

Figure 5.3   Estimated Cascade of Care for Vancouver Coastal Health by Age Category, Year Ending 2014 Q3 [9]

9   Data is for the period 2013 Q4–2014 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.
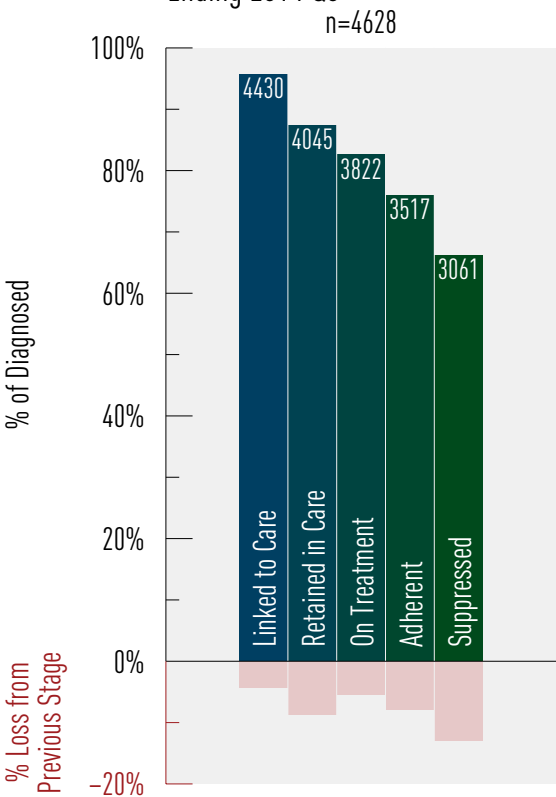   *If the most recent HA of residence is not updated then the designated HA may be incorrect.*

Figure 5.4   Estimated Cascade of Care for Vancouver Coastal Health by MSM Status, Year Ending 2014 Q3 [10]

10   *Data is for the period 2013 Q4–2014 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 2014 Q3 [11]
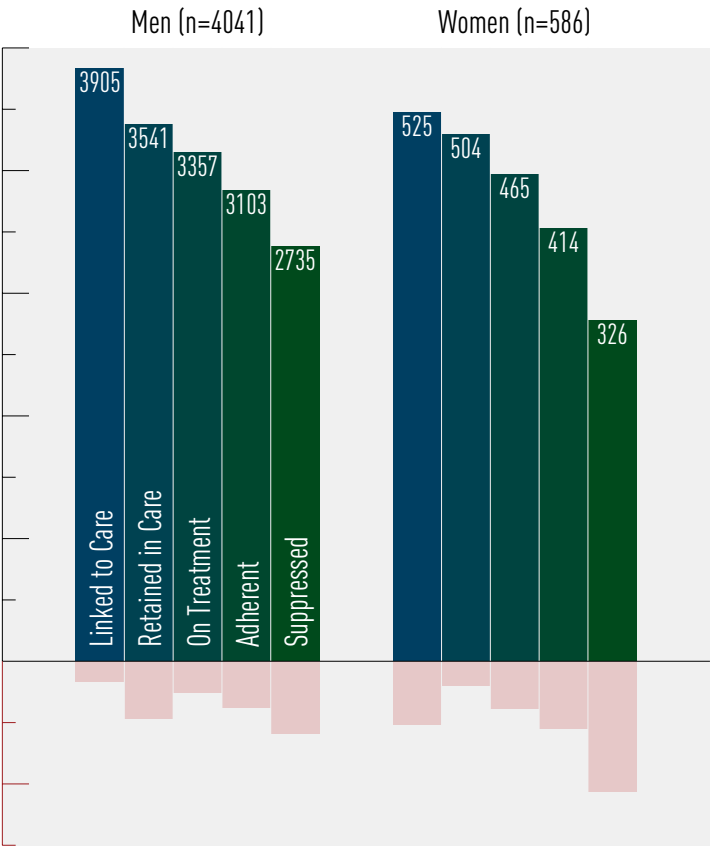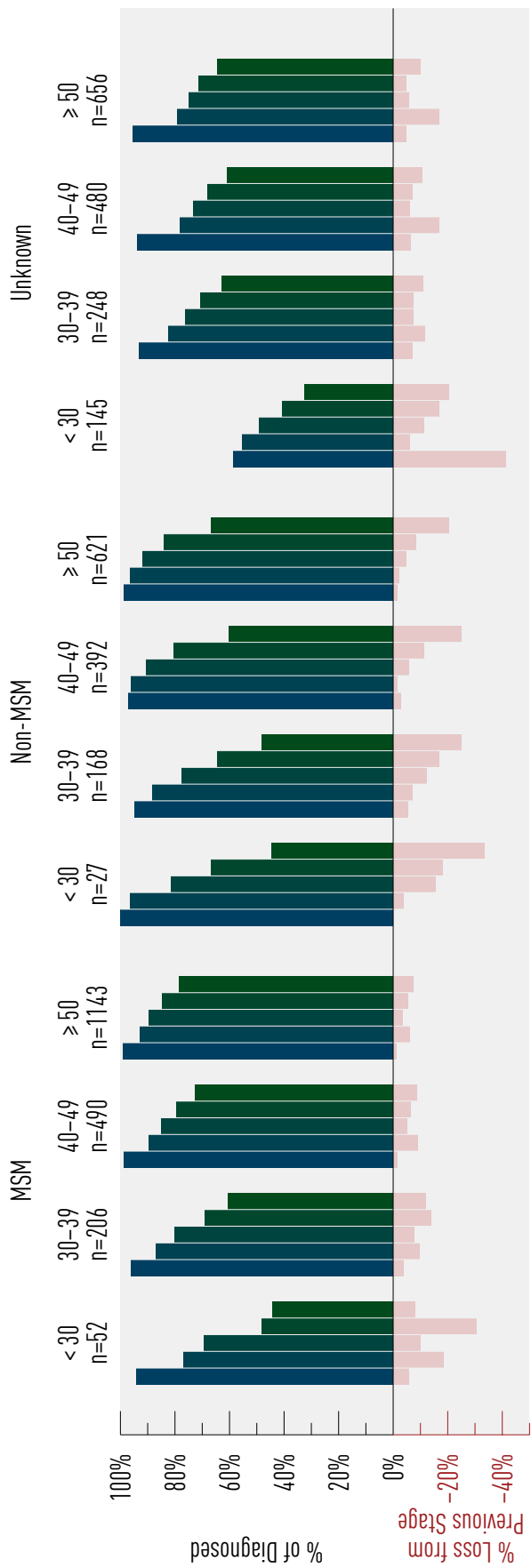
Figure 5.6   Estimated Cascade of Care for Vancouver Coastal Health by History of IDU, Year Ending 2014 Q3 [12]
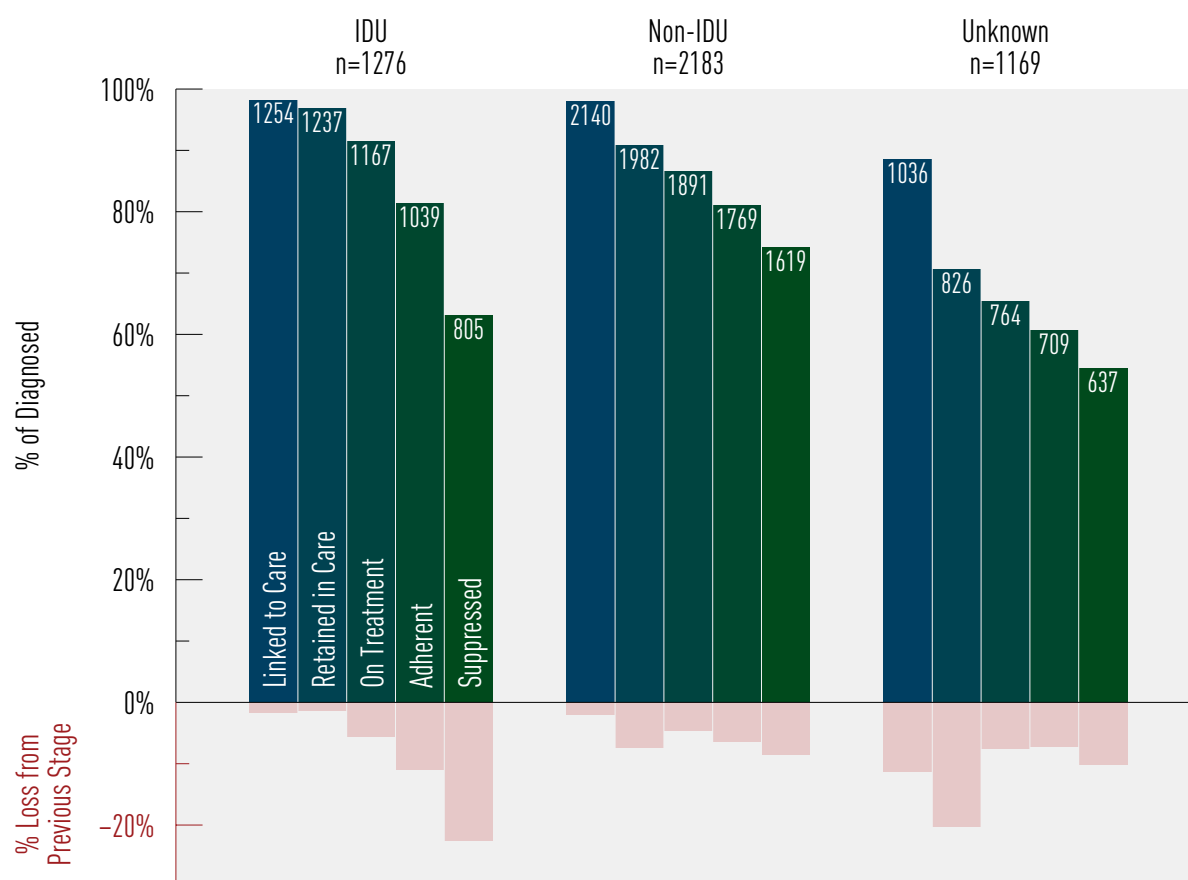
12   *Data is for the period 2013 Q4–2014 Q3.*
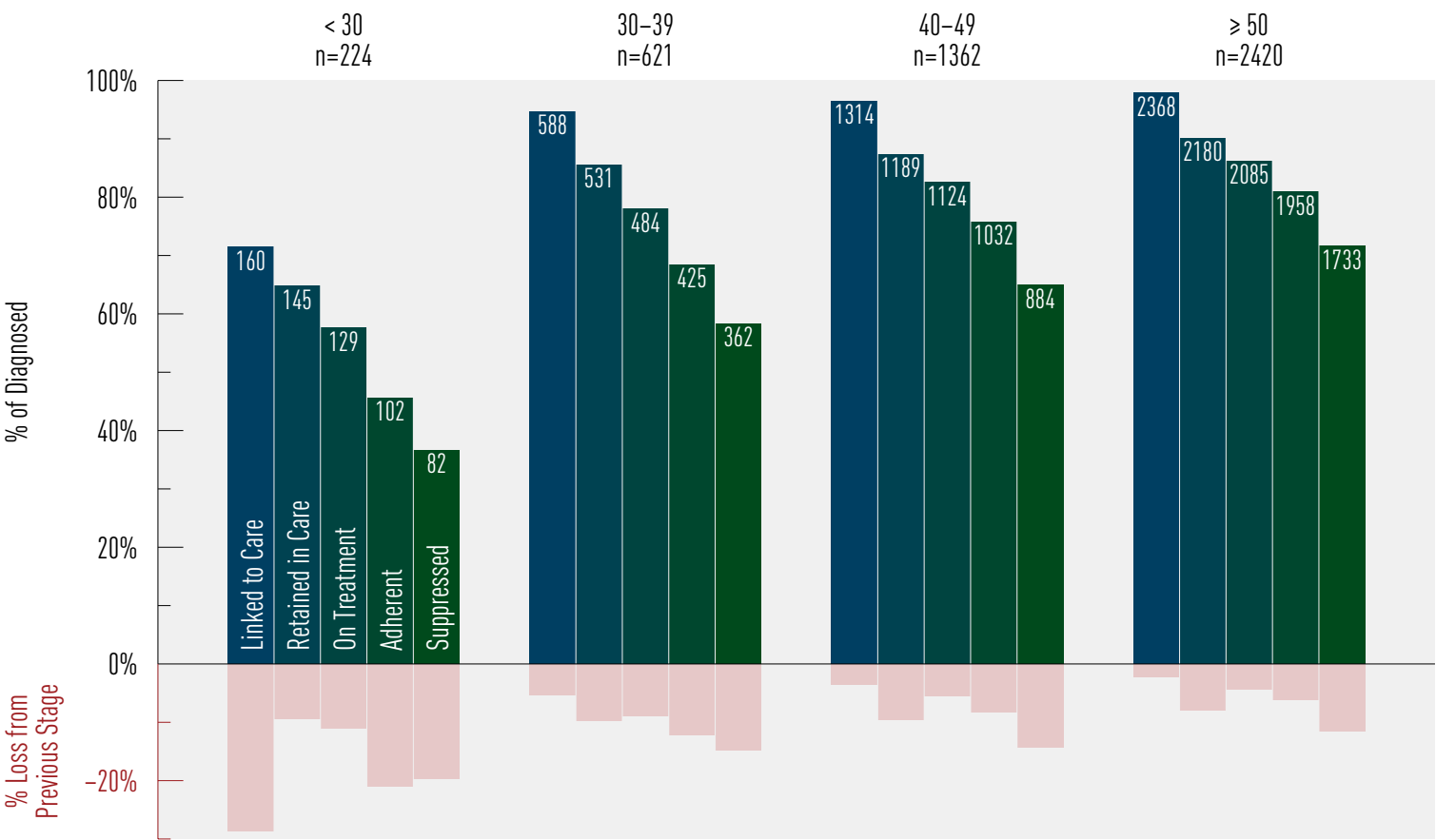   *Data Sources:*
      1   British Columbia Centre for Excellence Drug Treatment Program (DTP) Database (ARV use, VL and CD4 count).
      2   Administrative data (ex. MSP billings; hospitalization data from the Discharge Abstract Database (DAD)).

      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 5.7   Estimated Cascade of Care for Vancouver Coastal Health by HSDA, Year Ending 2014 Q3 [13]
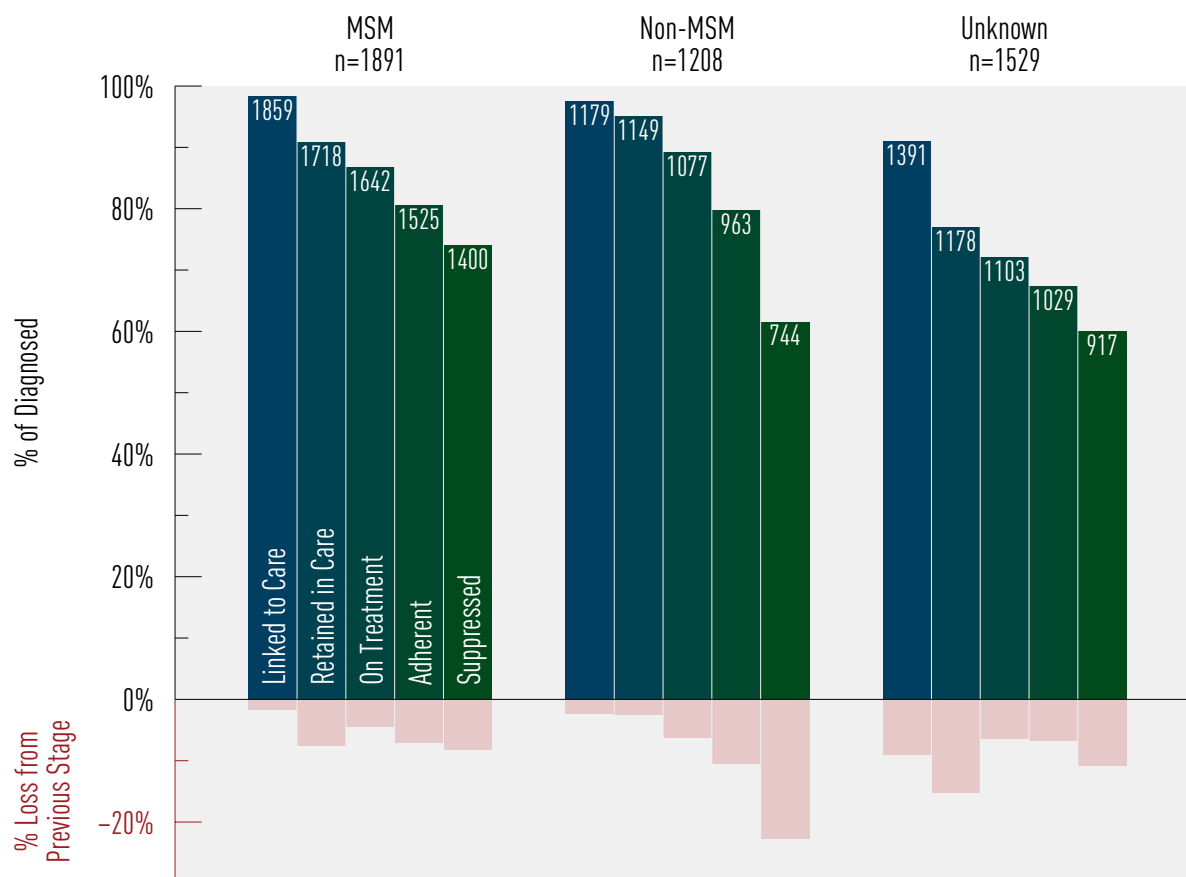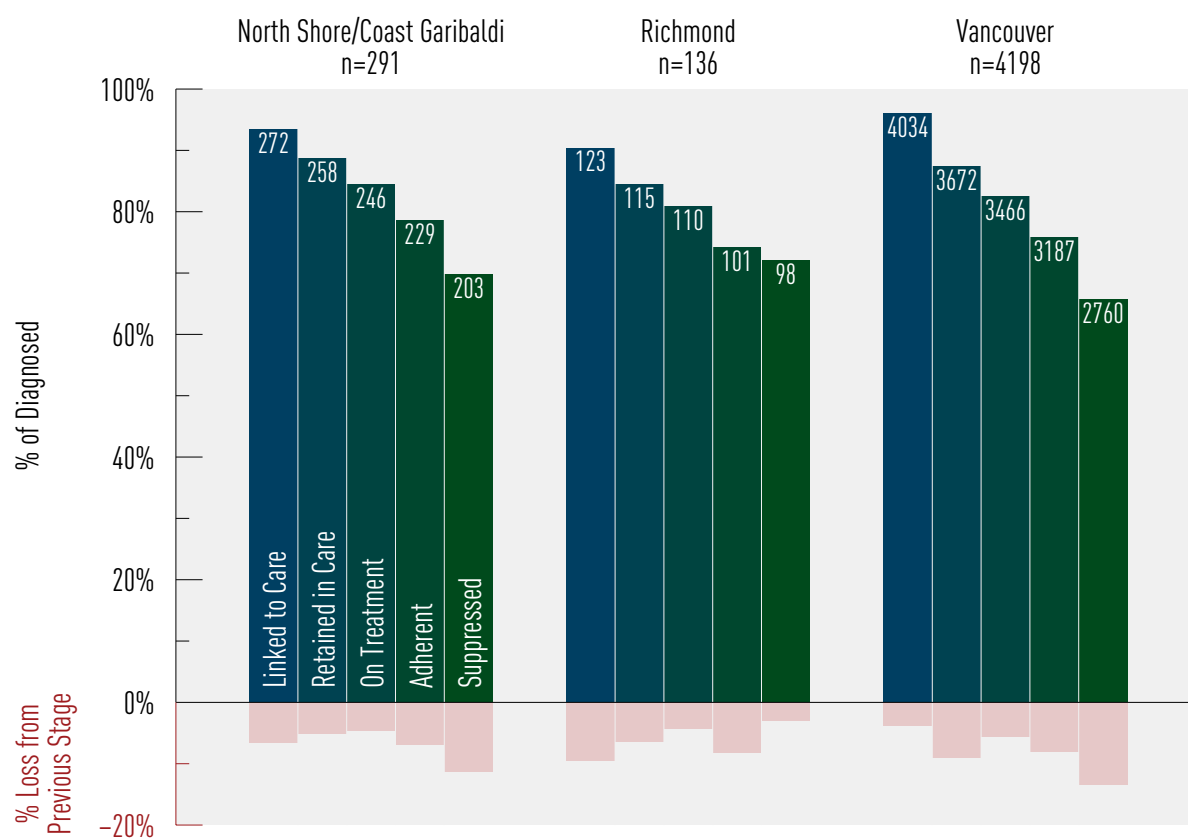
13   *Data is for the period 2013 Q4–2014 Q3.*
      Data Sources:
      1   *British Columbia Centre for Excellence Drug Treatment Program (DTP) Database (ARV use, VL and CD4 count).*
      2   *Administrative data (ex. MSP billings; hospitalization data from the Discharge Abstract Database (DAD)).*

      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.

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 validation 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)

Figure 6.1   PCS Components for Vancouver Coastal Health, 2012 Q4–2014 Q3 [14]

	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
	2012	2013				2014		
n=	279	273	259	239	222	188	190	197
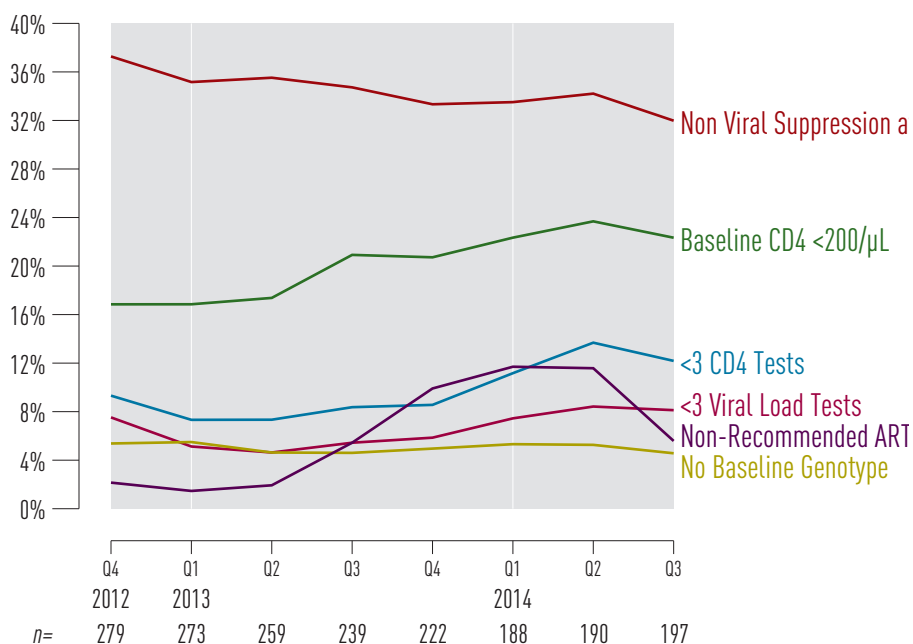
Figure 6.2   Historical Trends for PCS Score for Vancouver Coastal Health, 2012 Q4–2014 Q3 [14,15]

	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3
	2012	2013				2014		
n=	279	273	259	239	222	188	190	197

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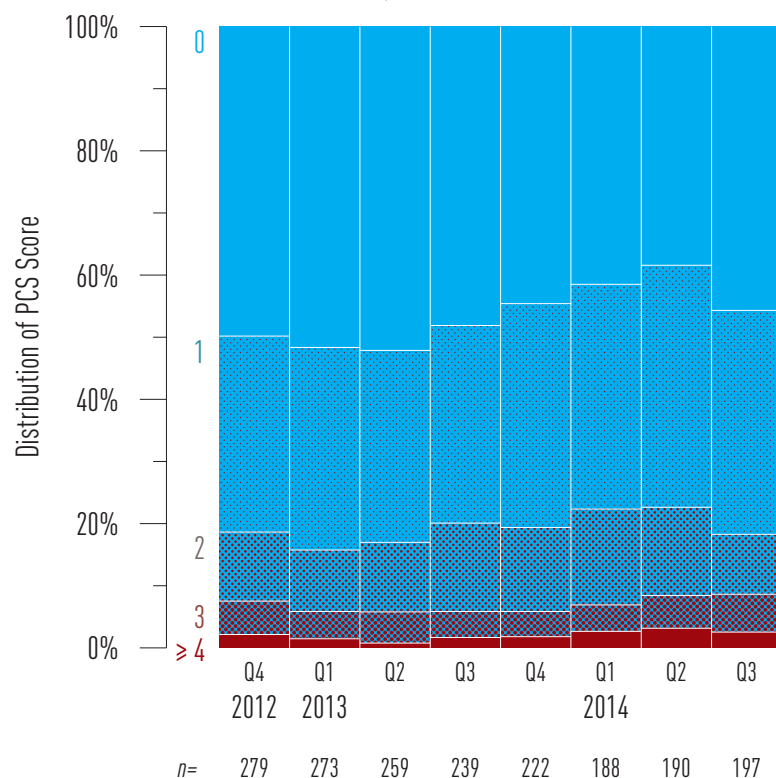
14   *Data Source: British Columbia Centre for Excellence Drug Treatment Program (DTP) Database. Limitations: CD4 cell count capture is approximately 80%.*

15   *Each quarter's data is calculated as the sum of the 4 quarters leading up to it. e.g. 2013 Q1 is calculated from 2012 Q2 – 2013 Q1.*
     NB: A score of 0 is the best score and a score of 4 or more is the worst score.

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 ART Participants in Vancouver Coastal Health, 2012 Q4–2014 Q3 [16]
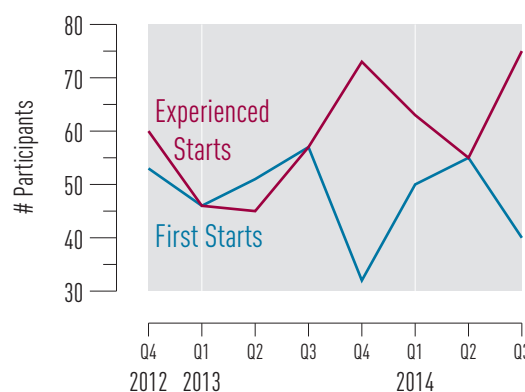
Indicator 8. CD4 Cell Count at ART Initiation

Figure 8 CD4 Cell Count at ART Initiation of ART-Naïve DTP Participants in Vancouver Coastal Health, 2012 Q4–2014 Q3 [17]

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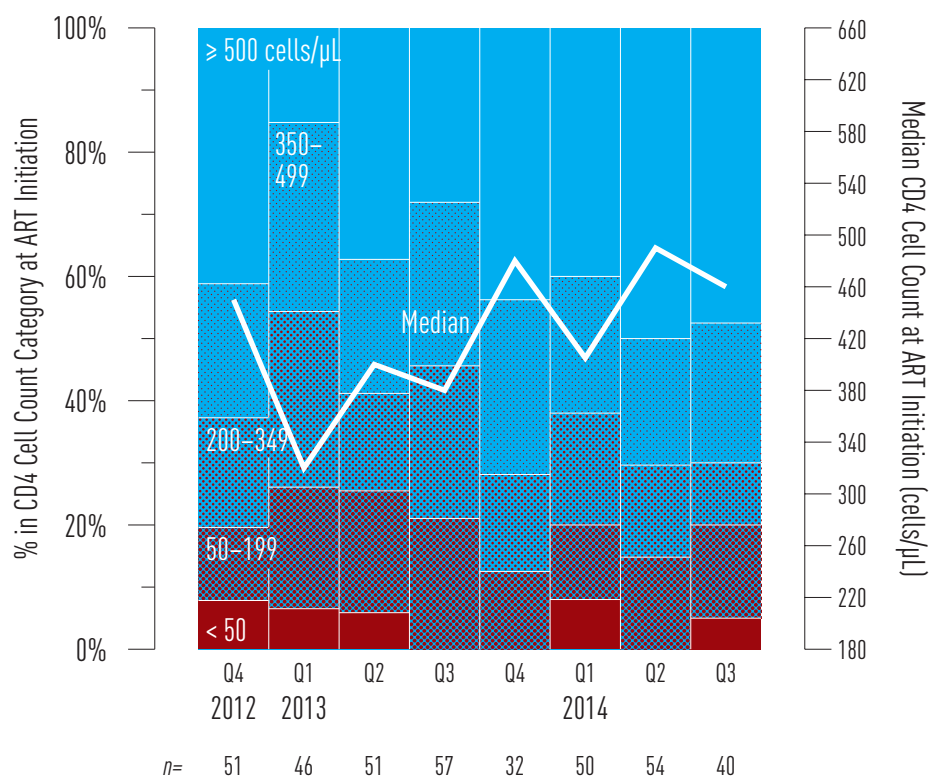
16 *Data Source: Drug Treatment Program Database*
    Limitation: DTP participants are designated to an HA based on most current residence provided by the participant.

17 *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, 2014 Q3 [18]

Age	< 30	144
	30–39	517
	40–49	1203
	⩾ 50	2011
Gender	Male	3410
	Female	465
Exposure	MSM	1660
	IDU	1153
Total		3875

Figure 9   Active and Inactive DTP Participants in Vancouver Coastal Health, 2012 Q4–2014 Q3 [19]

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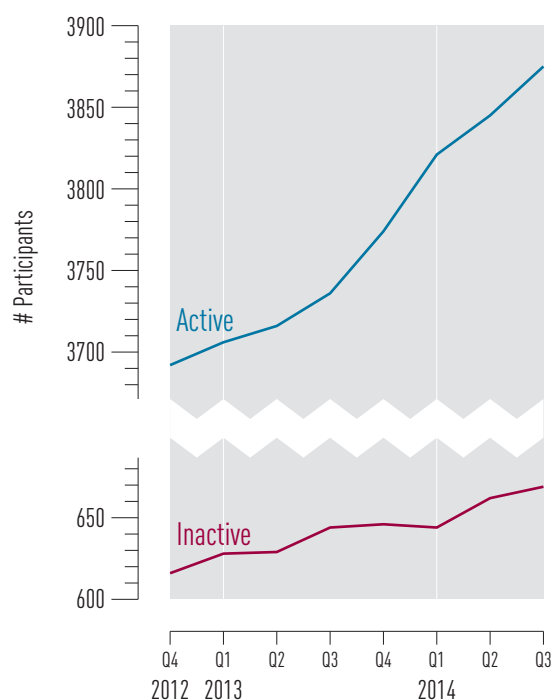
18   *Data Source: Drug Treatment Program Database*
      Limitation: DTP participants are designated to an HA based on most current residence provided by the participant.

      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

19   *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, 2012 Q4–2014 Q3 [20]

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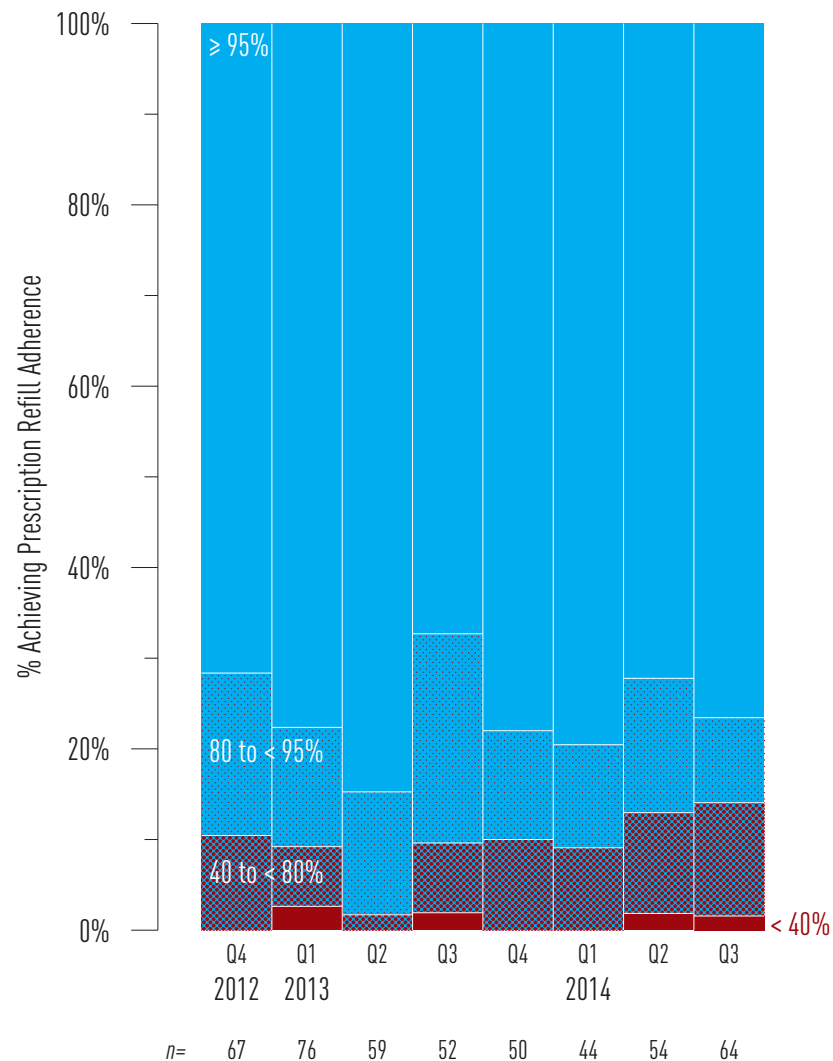
20   Data Source: Drug Treatment Program Database
      Limitation: Prescription refill adherence is used as a proxy for patient adherence.

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 for Vancouver Coastal Health, 2012 Q4–2014 Q3 [21]
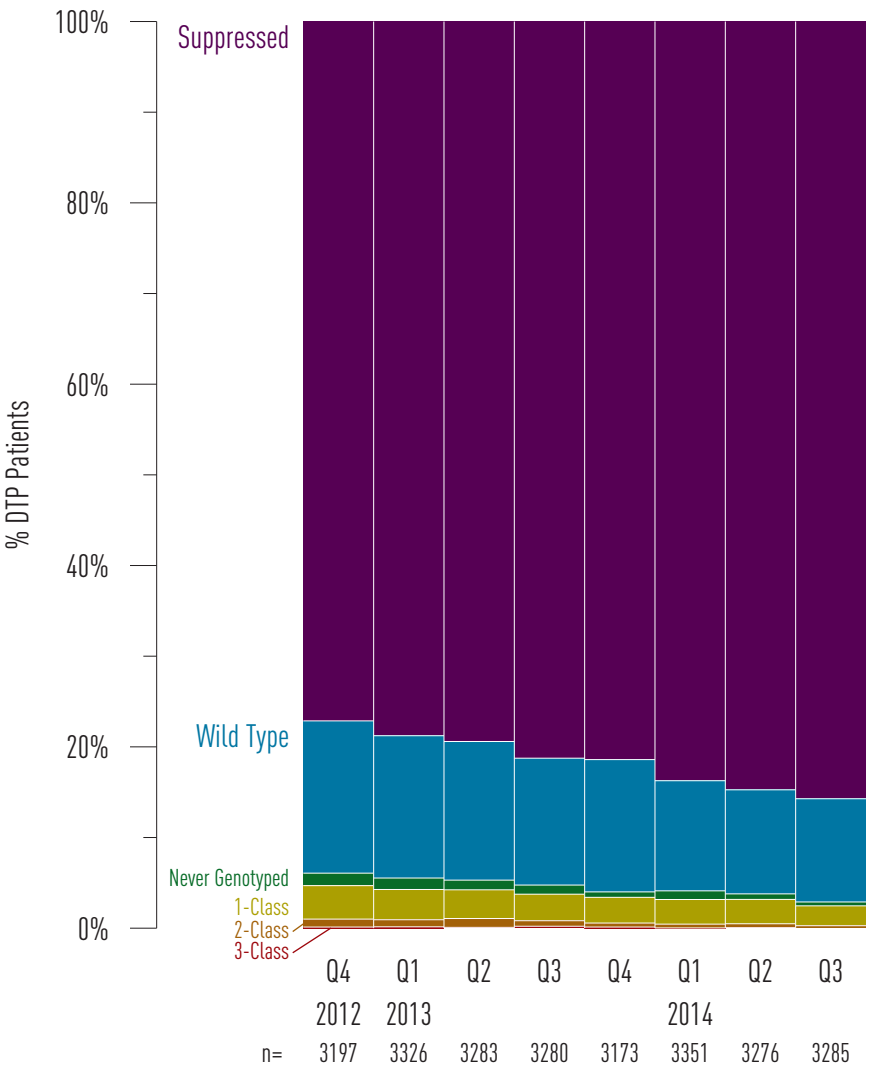
21   *Data Source: Drug Treatment Program Database*

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

33

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 and physicians can voluntarily report AIDS cases to the BCCDC or DTP. As such, we have plotted both BCCDC reports and DTP reported AIDS cases. We also show the proportion of persons initiating ART with a CD4<200 cells/µL.

Figure 12   AIDS Case Rate and Reports for Vancouver Coastal Health, 2006–2013 [22]

		2006	2007	2008	2009	2010	2011	2012	2013
CD4<200 at ART initiation	CASES	118	130	95	82	69	52	48	42
	PER 100K	11.1	12.0	8.7	7.4	6.1	4.5	4.1	3.5
AIDS: DTP Reports	CASES	95	81	81	60	50	32	28	20
	PER 100K	8.9	7.5	7.4	5.4	4.4	2.8	2.4	1.7
AIDS: BCCDC Reports	CASES	71	72	75	54	47	34	27	–
	PER 100K	6.7	6.7	6.9	4.8	4.1	2.9	2.3	–

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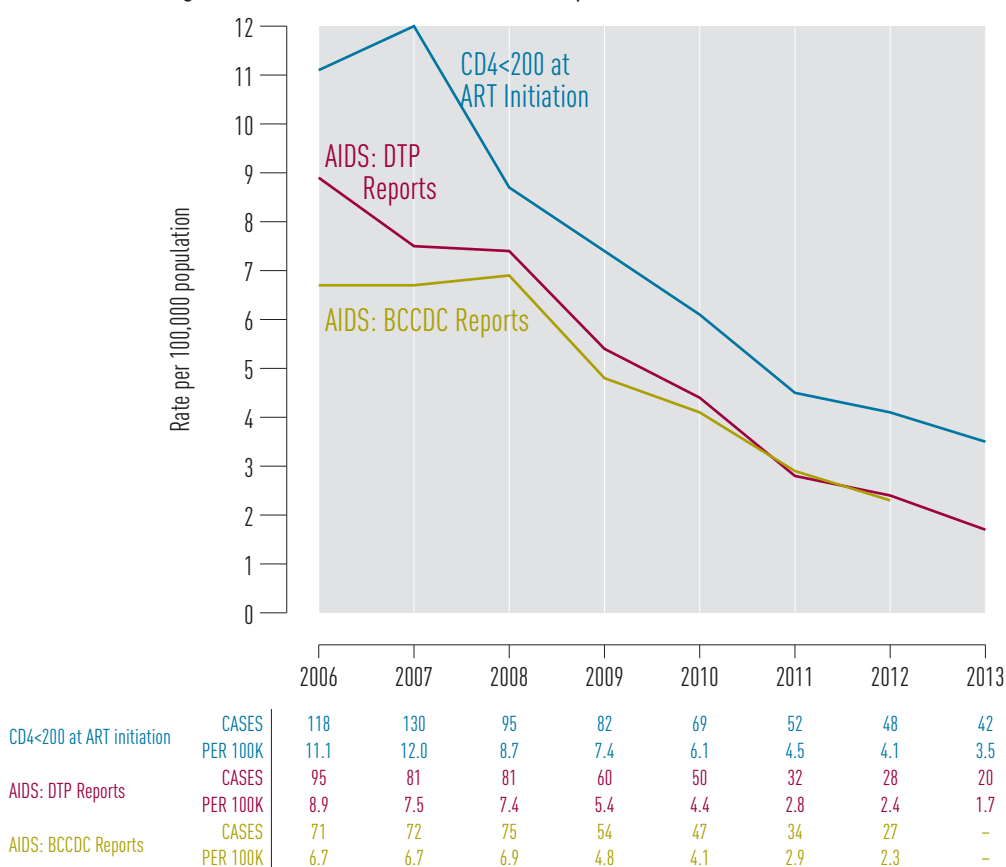
[22]   *Data Source: DTP AIDS cases are obtained from the Drug Treatment Program Database; BCCDC AIDS cases are obtained from the BC-CDC; CD4<200 at ART initiation data came from the DTP database.*

Limitation: AIDS case reporting was investigated using 3 definitions: First, using AIDS cases reported in AIDS case report forms from the DTP; Second, using AIDS cases reported via the BCCDC and third, 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. The BCCDC uses DTP AIDS case reports as well as physician AIDS case reports made directly to the BCCDC. 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 [23]

	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
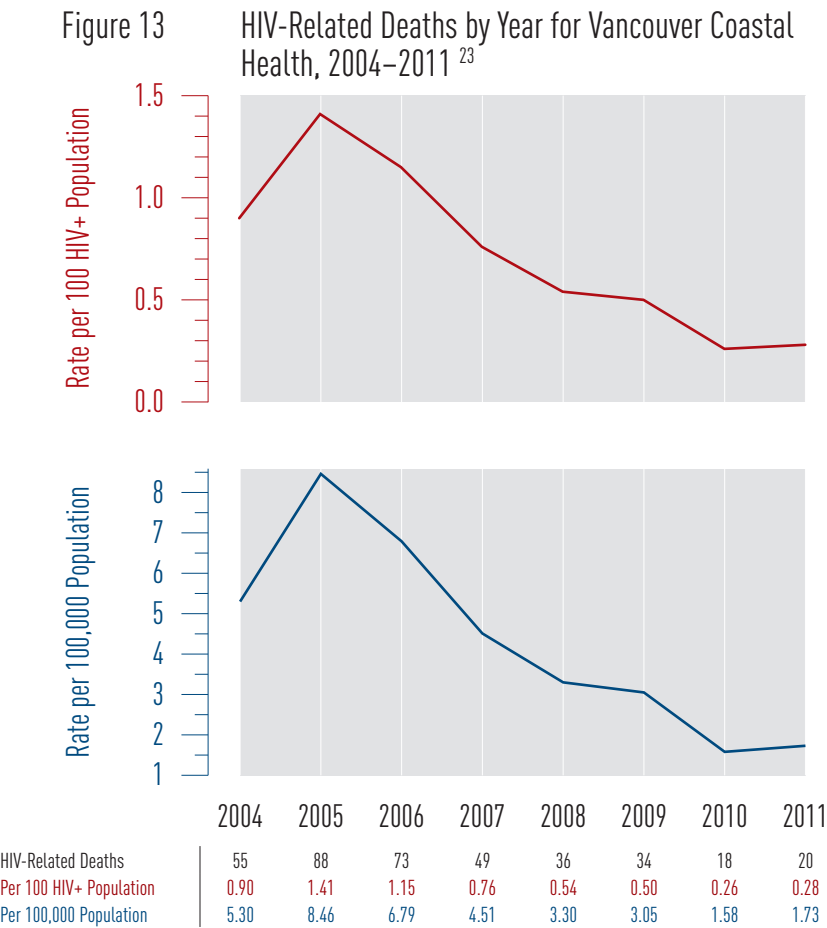
23   *Data Source: BC Vital Statistics*

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)

	'09 Q4	2010 Q1	Q2	Q3	Q4	2011 Q1	Q2	Q3	Q4	2012 Q1	Q2	Q3	Q4	2013 Q1	Q2	Q3	Q4	2014 Q1	Q2	Q3
Vancouver Coastal Health	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	33.7	35.6	34.4	33.5	38.9	42.1	46.5
Gender Female	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	17.2	18.3	17.7	17.2	19.7	21.6	23.8
Male	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	14.3	15.3	14.4	14.3	16.8	18.3	20.4
Other	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.1	0.2	0.2	0.2
Female (Prenatal)	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	3.7	3.9	3.8	3.7
Female (Non-prenatal)	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	13.6	14.8	14.0	13.6	15.8	17.9	20.0
Age < 30	5.8	6.0	6.0	6.3	6.1	6.1	5.9	6.7	6.8	7.3	7.2	8.1	8.1	8.5	9.0	9.2	9.1	9.6	9.9	11.1
30–39	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	8.6	10.2	10.1	10.6
40–49	2.6	3.0	2.9	2.8	2.8	3.1	2.8	3.0	3.2	3.9	3.8	3.9	4.1	5.2	5.5	5.0	4.9	5.7	6.0	6.5
≥ 50	2.1	2.4	2.4	2.4	2.3	2.8	2.6	3.0	3.4	4.6	4.8	6.0	6.4	9.1	10.2	9.0	9.0	11.0	14.0	16.1
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	2.1	1.9	2.1	2.0	2.2
North Shore / Coast Garibaldi	2.2	2.3	2.3	2.4	2.4	2.4	2.3	2.4	2.4	2.8	2.6	2.7	2.8	3.0	3.2	3.2	3.3	3.7	4.9	5.4
Richmond	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	1.9	1.9	1.8	3.1	5.4	5.4
Vancouver	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	28.7	30.6	29.3	28.4	32.2	31.8	35.8

Indicator 2: Rate of HIV Testing per 100,000

		2009	2010	2011	2012	2013
Vancouver Coastal Health		5115.0	5086.7	5336.7	7017.3	8884.1
North Shore / Coast Garibaldi		3412.9	3425.3	3504.4	4017.2	4556.6
Richmond		2576.4	2682.0	2773.9	3389.4	3939.8
Vancouver		6615.2	6522.7	6881.8	9350.3	12168.0
Gender	Female	5412.5	5350.6	5649.0	7508.8	9687.1
	Male	4492.4	4527.0	4719.4	6341.3	7957.1
Age	< 30	4898.0	4831.4	4942.7	5907.0	7122.3
	30–39	10935.0	11192.1	11433.9	13492.2	16204.2
	40–49	4871.2	4771.7	4990.0	6554.3	9223.8
	≥ 50	1820.7	1872.6	2157.5	4127.1	7163.8

Indicator 3: New HIV Diagnoses

		'09 Q4	2010 Q1	Q2	Q3	Q4	2011 Q1	Q2	Q3	Q4	2012 Q1	Q2	Q3	Q4	2013 Q1	Q2	Q3	Q4	2014 Q1	Q2	Q3
Vancouver Coastal Health	By Client Residence	36	41	45	41	40	32	48	57	41	43	33	33	32	31	45	40	25	37	49	38
	By Provider Address	40	45	50	49	43	34	47	65	42	47	38	37	38	31	50	49	29	41	54	38
Gender	Female	5	8	8	5	3	3	7	2	2	5	4	3	2	4	4	1	1	3	4	4
	Male	31	33	37	36	37	29	41	55	39	38	29	30	30	27	41	39	24	33	44	34
Age	< 30	9	12	12	12	7	3	10	13	12	11	10	6	13	7	11	14	6	11	12	7
	30–39	12	16	10	15	12	12	16	22	8	12	11	7	6	11	14	5	3	10	16	17
	40–49	11	10	16	10	11	11	12	13	13	12	6	11	9	8	8	11	10	8	7	5
	≥ 50	4	3	7	4	10	6	10	9	8	8	6	9	4	5	12	10	6	8	14	9
Exposure	MSM	24	30	26	29	27	23	36	43	30	33	25	25	22	19	32	29	20	27	–	–
	IDU	3	6	7	5	3	3	2	8	0	3	4	1	3	3	3	3	2	4	–	–
	HET	8	5	11	7	10	6	10	6	9	7	4	6	6	8	8	6	2	3	–	–
	Other	0	0	1	0	0	0	0	0	2	0	0	0	0	0	1	1	0	0	–	–
	NIR/Unknown	1	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	3	–	–
North Shore / Coast Garibaldi	By Client Residence	1	3	2	4	0	0	2	6	1	2	3	1	1	3	1	4	1	1	3	3
	By Provider Address	1	3	2	4	0	0	2	4	0	1	2	2	1	3	2	4	0	1	2	3
Richmond	By Client Residence	1	2	3	3	2	2	0	1	3	0	1	3	0	2	1	0	1	1	1	2
	By Provider Address	0	0	2	2	1	1	1	0	2	0	1	2	1	0	0	0	2	2	1	3
Vancouver	By Client Residence	34	36	40	34	38	30	46	50	37	41	29	29	31	26	43	36	23	35	45	33
	By Provider Address	39	42	46	43	42	33	44	61	40	46	35	33	36	28	48	45	27	38	51	32

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

	VCH '10	'11	'12	'13	Female '10	'11	'12	'13	Male '10	'11	'12	'13	< 30 years '10	'11	'12	'13	30–39 years '10	'11	'12	'13	40–49 years '10	'11	'12	'13
Stage 0	38	48	44	34	5	0	6	1	33	48	38	32	13	9	16	12	15	20	15	12	7	16	7	8
Stage 1	39	35	33	39	4	4	3	3	35	31	29	36	9	10	7	15	15	12	13	13	11	6	7	4
Stage 2a	22	33	19	34	3	5	1	3	19	28	18	31	4	8	4	8	10	10	3	9	7	10	8	7
Stage 2b	22	23	18	13	7	4	3	2	15	19	15	11	3	5	4	0	5	4	4	8	9	9	6	3
Stage 3	42	31	34	33	10	4	2	4	32	27	32	29	2	3	5	2	8	7	6	4	11	8	8	16
Unknown	22	17	9	5	0	0	1	0	22	16	8	5	8	4	5	1	10	7	2	1	3	2	0	0
Total	185	187	157	158	29	17	16	13	156	169	140	144	39	39	41	38	63	60	43	47	48	51	36	38

	≥ 50 years '10	'11	'12	'13	MSM '10	'11	'12	'13	IDU '10	'11	'12	'13	Heterosexual '10	'11	'12	'13	Other Exposure '10	'11	'12	'13	NIR/Unknown '10	'11	'12	'13
Stage 0	3	3	6	2	30	44	35	25	3	2	4	6	5	2	5	3	0	0	0	0	0	0	0	0
Stage 1	4	7	6	7	24	27	26	30	6	2	1	3	9	6	6	4	0	0	0	0	0	0	0	2
Stage 2a	1	5	4	10	15	23	14	26	2	4	4	4	5	5	1	4	0	1	0	0	0	0	0	0
Stage 2b	5	5	4	2	12	16	13	11	4	2	2	0	5	5	3	2	1	0	0	0	0	0	0	0
Stage 3	21	13	15	11	17	15	22	18	7	1	1	1	17	13	9	12	0	2	0	0	1	0	2	2
Unknown	1	4	2	3	17	13	7	3	1	2	0	0	3	1	1	0	0	1	0	2	1	0	1	0
Total	35	37	37	35	115	138	117	113	23	13	12	14	44	32	25	25	1	4	0	2	2	0	3	4

Indicator 5: **HIV Cascade of Care**			DIAGNOSED	LINKED	RETAINED	ON ART	ADHERENT	SUPPRESSED
Vancouver Coastal Health			4628	4430	4045	3822	3517	3061
Age Category	< 30		224	160	145	129	102	82
	30–39		621	588	531	484	425	362
	40–49		1362	1314	1189	1124	1032	884
	≥ 50		2420	2368	2180	2085	1958	1733
Age Category and MSM Status	MSM	< 30	52	49	40	36	25	23
		30–39	206	198	179	165	142	125
		40–49	490	483	439	417	390	356
		≥ 50	1143	1130	1061	1024	968	896
	Non-MSM	< 30	27	27	26	22	18	12
		30–39	168	159	148	130	108	81
		40–49	392	381	376	355	315	236
		≥ 50	621	612	599	570	522	415
	Unknown	< 30	145	85	80	71	59	47
		30–39	248	231	204	189	175	156
		40–49	480	450	375	352	327	292
		≥ 50	656	626	520	491	468	422
Gender	Male		4041	3905	3541	3357	3103	2735
	Female		586	525	504	465	414	326
Injection Drug Use	IDU		1276	1254	1237	1167	1039	805
	Non-IDU		2183	2140	1982	1891	1769	1619
	Unknown		1169	1036	826	764	709	637
MSM Status	MSM		1891	1859	1718	1642	1525	1400
	Non-MSM		1208	1179	1149	1077	963	744
	Unknown		1529	1391	1178	1103	1029	917
Health Authority	North Shore / Coast Garibaldi		291	272	258	246	229	203
	Richmond		136	123	115	110	101	98
	Vancouver		4198	4034	3672	3466	3187	2760

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

	2012 Q4	2013 Q1	Q2	Q3	Q4	2014 Q1	Q2	Q3
< 3 CD4 Tests	9.3%	7.3%	7.3%	8.4%	8.6%	11.2%	13.7%	12.2%
< 3 Viral Load Tests	7.5%	5.1%	4.6%	5.4%	5.9%	7.4%	8.4%	8.1%
No Baseline Genotype	5.4%	5.5%	4.6%	4.6%	5.0%	5.3%	5.3%	4.6%
Baseline CD4 < 200 cells/μL	16.8%	16.8%	17.4%	20.9%	20.7%	22.3%	23.7%	22.3%
Non-Recommended ART	2.2%	1.5%	1.9%	5.4%	9.9%	11.7%	11.6%	5.6%
Non Viral suppression at 9 Mo.	37.3%	35.2%	35.5%	34.7%	33.3%	33.5%	34.2%	32.0%
PCS Score: 0	139	141	135	115	99	78	73	90
PCS Score: 1	88	89	80	76	80	68	74	71
PCS Score: 2	31	27	29	34	30	29	27	19
PCS Score: 3	15	12	13	10	9	8	10	12
PCS Score: 4 or more	6	4	2	4	4	5	6	5
Total (n=)	**279**	**273**	**259**	**239**	**222**	**188**	**190**	**197**

Indicator 7: **New DTP ARV Participants**

First Starts	53	46	51	57	32	50	55	40
Experienced Starts	60	46	45	57	73	63	55	75

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

CD4 ≥ 500	21	7	19	16	14	20	27	19
CD4 350–499	11	14	11	15	9	11	11	9
CD4 200–349	9	13	8	14	5	9	8	4
CD4 50–199	6	9	10	12	4	6	8	6
CD4 < 50	4	3	3	0	0	4	0	2
CD4 Median (cells/μL)	*450*	*320*	*400*	*380*	*480*	*405*	*490*	*460*
Total (n=)	**51**	**46**	**51**	**57**	**32**	**50**	**54**	**40**

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

Active DTP Participants	3692	3706	3716	3736	3774	3821	3845	3875
Inactive DTP Participants	616	628	629	644	646	644	662	669

Indicator 10: **Antiretroviral Adherence**

≥ 95%	48	59	50	35	39	35	39	49
80% to < 95%	12	10	8	12	6	5	8	6
40% to < 80%	7	5	1	4	5	4	6	8
< 40%	0	2	0	1	0	0	1	1
Total (n=)	**67**	**76**	**59**	**52**	**50**	**44**	**54**	**64**

Indicator 11: **Resistance Testing and Results**

Suppressed	2466	2620	2607	2665	2583	2806	2776	2816
Wild Type	537	522	502	459	463	407	376	374
Never Genotyped	44	42	35	33	19	32	20	14
1-Class	118	111	104	96	90	91	88	72
2-Class	28	26	32	20	14	14	14	9
3-Class	4	5	3	7	4	1	2	0
Total (n=)	**3197**	**3326**	**3283**	**3280**	**3173**	**3351**	**3276**	**3285**

Indicator 12: **AIDS-Defining Illness**

		2006	2007	2008	2009	2010	2011	2012	2013
CD4 < 200 at	Cases	118	130	95	82	69	52	48	42
ART initiation	*Rate per 100,000*	*11.1*	*12.0*	*8.7*	*7.4*	*6.1*	*4.5*	*4.1*	*3.5*
AIDS Cases	Cases	95	81	81	60	50	32	28	20
(DTP Reports)	*Rate per 100,000*	*8.9*	*7.5*	*7.4*	*5.4*	*4.4*	*2.8*	*2.4*	*1.7*
AIDS Cases	Cases	71	72	75	54	47	34	27	–
(BCCDC Reports)	*Rate per 100,000*	*6.7*	*6.7*	*6.9*	*4.8*	*4.1*	*2.9*	*2.3*	–

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