



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

# HIV MONITORING QUARTERLY REPORT **FOR BRITISH COLUMBIA**

SECOND QUARTER 2014



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



First Nations Health Authority  
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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](mailto:iday@cfenet.ubc.ca).

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# Acknowledgements and Contributions



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**British Columbia Centre for Excellence in HIV/AIDS (BC-CFE):** The BC-CFE is responsible for the conception, preparation and ongoing review of this quarterly report. The BC-CFE provides the data and outputs for Indicators 5 (Hiv Cascade of Care), 6 (Programmatic Compliance Score), 7 (New Antiretroviral Starts), 8 (CD4 Cell Count at ART Initiation), 9 (Active and Inactive Drug Treatment Program Participants), 10 (Antiretroviral Adherence Level), 11 (Resistance Testing Results by Resistance Category), 12 (AIDS-Defining Illness), and 13 (HIV-Related Mortality). The BC-CFE database provides PVL and CD4 cell count testing data, as well as ART use. All PVL measurements in BC are performed at the St Paul's Hospital virology laboratory, thus PVL data capture is 100%. An estimated 80% of all CD4 count measurements performed in the province are captured in the BC-CFE data holdings. The STOP HIV/AIDS Technical Monitoring Committee-BC-CFE is responsible for oversight of the monitoring report. Motoi Matsukura writes and compiles the monitoring report. Guillaume Colley, Dr. Viviane Lima and Nada Gataric perform analysis of Indicators 5–13. James Nakagawa is responsible for publishing and editing. This report was conceived and guided by Dr. Julio Montaner.



BC Centre for Disease Control  
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**British Columbia Centre for Disease Control (BCCDC):** The BCCDC provides the data and outputs for Indicator 1 (HIV Testing Episodes), Indicator 2 (HIV Testing Rate), Indicator 3 (New HIV Diagnoses), Indicator 4 (Stage of HIV at Diagnosis) and Indicator 12 (AIDS-Defining Illness). The BCCDC is the single provincial agency that centralizes all HIV surveillance through the Public Health Microbiology and Reference Laboratory, which does more than 90% of all HIV screening tests in BC and all confirmatory testing. Theodora Consolacion and Dr. Mark Gilbert are responsible for outputs for Indicators 1–4.

## Other Data Sources:

The above databases were supplemented with:

- (I) The BC Vital Statistics database which was used to calculate Indicator 5. The HIV Cascade of Care and Indicator 13. HIV-Related Mortality.
- (II) Linkage and preparation of the de-identified individual-level database used for calculating Indicator 5. The HIV Cascade of Care was facilitated by the British Columbia Ministry of Health.
- (III) The Statistics Canada database: BC and HIV-positive population counts were acquired through the statistics Canada website to calculate HIV-specific mortality rates for Indicator 13. HIV-Related Mortality.

# Membership of the STOP HIV/AIDS Technical Monitoring Committee–BC-CfE

Dr. Rolando Barrios, *Chair*, BC-CfE

Kate Heath, BC-CfE

Bohdan Nosyk, BC-CfE

Viviane Dias Lima, BC-CfE

Irene Day, BC-CfE

Dr. Mark Gilbert, BCCDC

Dr. Mel Kradjen, BCCDC

Stephanie Konrad, FHA

Joanne Nelson, FNHA

Jennifer May-Hadford, IHA

James Haggerstone, NHA

Dr. Neora Pick, PHSA

Dr. Reka Gustafson, VCHA

Melanie Rusch, VIHA



# 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.

*NB: HIV screening tests conducted by the VIHA Laboratory are not included.*

## Indicator 1. HIV Testing Episodes

Figure 1.1

HIV Test Episodes for BC, 2009 Q3–2014 Q2

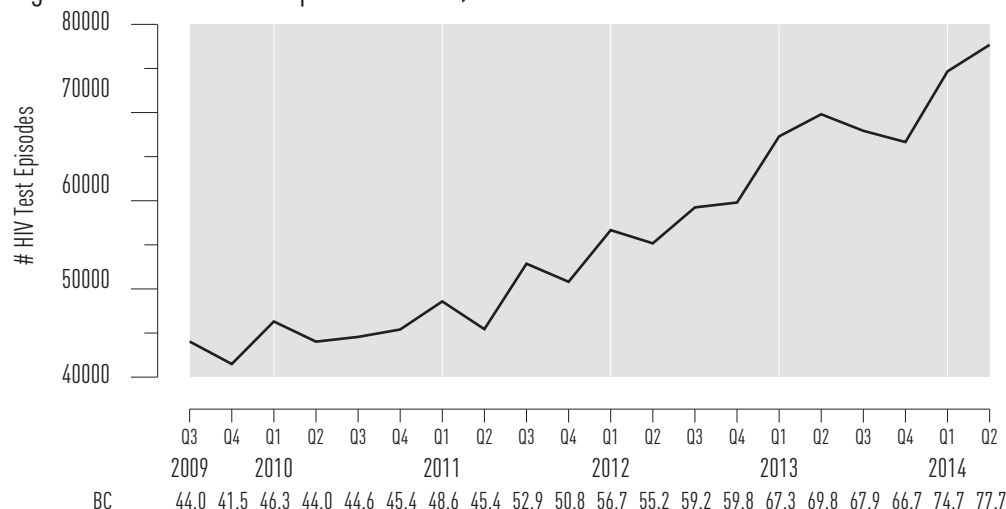
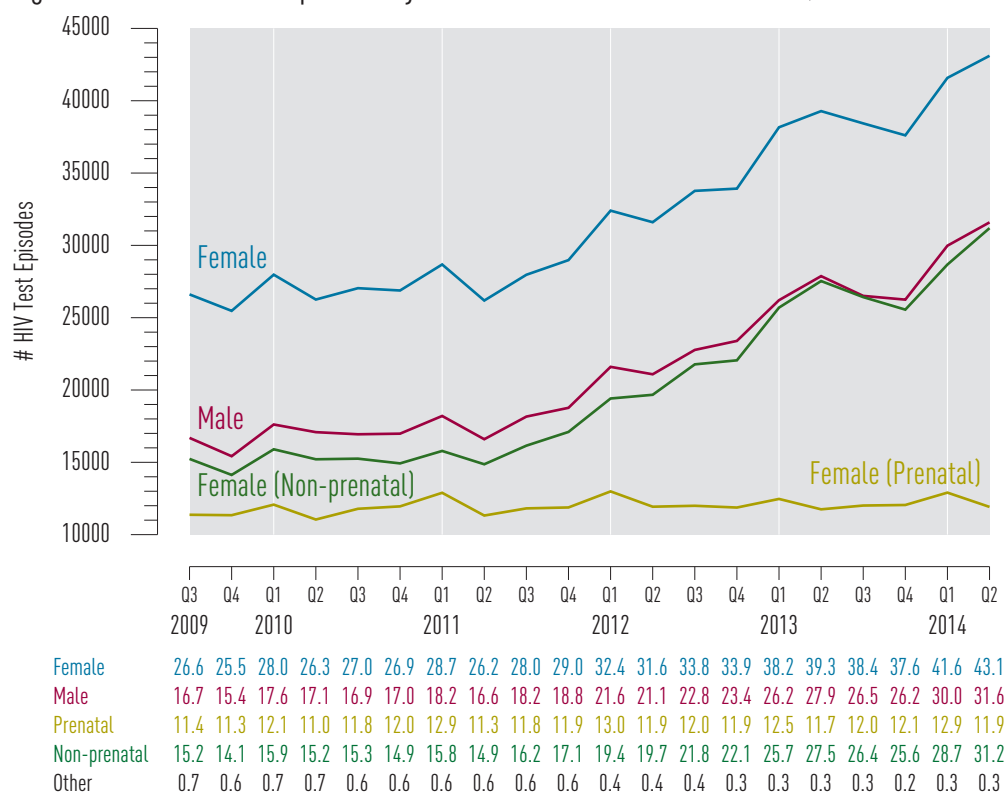


Figure 1.2

HIV Test Episodes by Gender and Prenatal Status for BC, 2009 Q3–2014 Q2<sup>1</sup>



<sup>1</sup> NB: Testing does not include point of care tests.

Figure 1.3 HIV Test Episodes by Age Category for BC, 2009 Q3–2014 Q2<sup>1,2</sup>

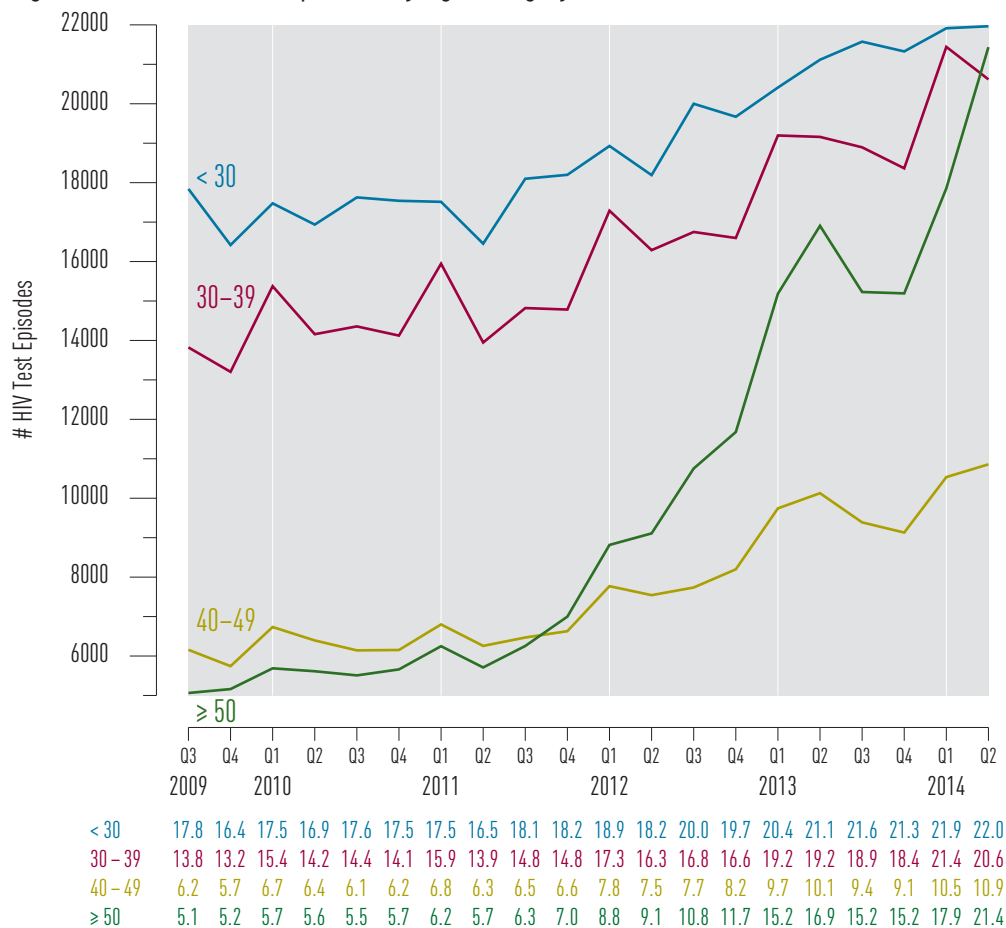
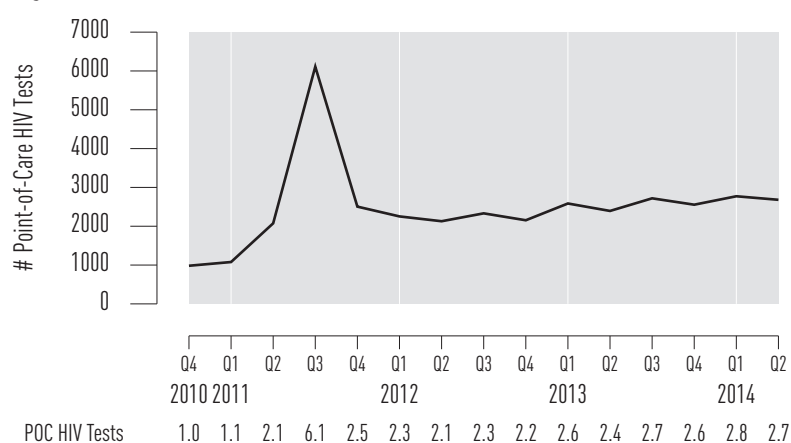


Figure 1.4 Point-of-Care HIV Tests for BC, 2010 Q4–2014 Q2



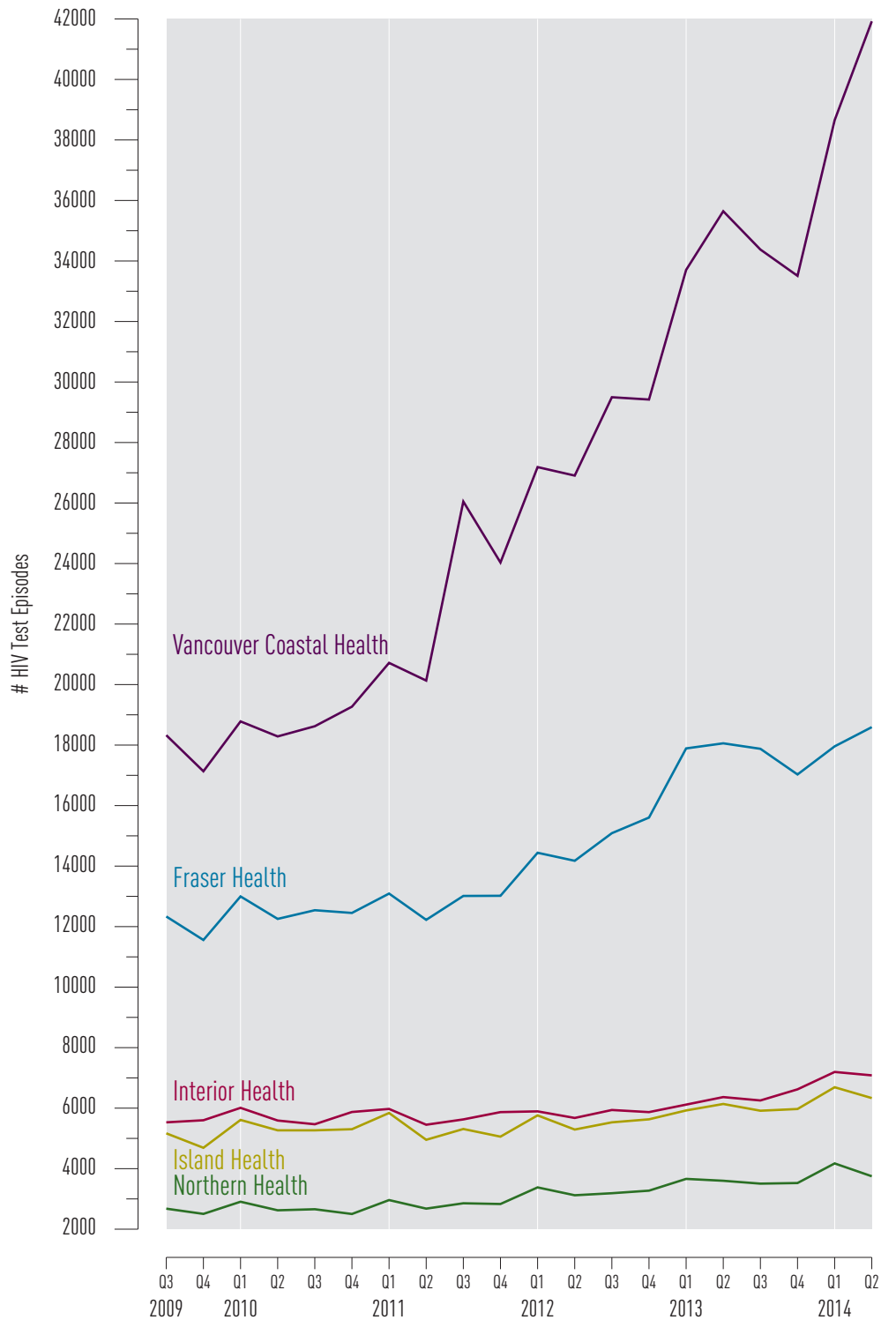
<sup>2</sup> Data Source: The BC Public Health Microbiology and Reference Laboratory (BCPHMRL) courtesy of the BC Centre for Disease Control (BCCDC).

**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 for BC by Health Authority, 2009 Q3–2014 Q2



Fraser Health	12.3	11.6	13.0	12.3	12.5	12.5	13.1	12.2	13.0	13.0	14.4	14.2	15.1	15.6	17.9	18.1	17.9	17.0	18.0	18.6
Interior Health	5.5	5.6	6.0	5.6	5.5	5.9	6.0	5.5	5.6	5.9	5.9	5.7	5.9	5.9	6.1	6.4	6.3	6.6	7.2	7.1
Island Health	5.2	4.7	5.6	5.3	5.3	5.3	5.8	5.0	5.3	5.1	5.8	5.3	5.5	5.6	5.9	6.1	5.9	6.0	6.7	6.3
Northern Health	2.7	2.5	2.9	2.6	2.7	2.5	3.0	2.7	2.9	2.8	3.4	3.1	3.2	3.3	3.7	3.6	3.5	3.5	4.2	3.7
Vancouver Coastal Health	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	33.7	35.6	34.4	33.5	38.7	41.9



## Indicator 2. HIV Testing Rates

Figure 2.1 Rate of HIV Testing for BC and Health Authorities, 2009–2013 <sup>1</sup>

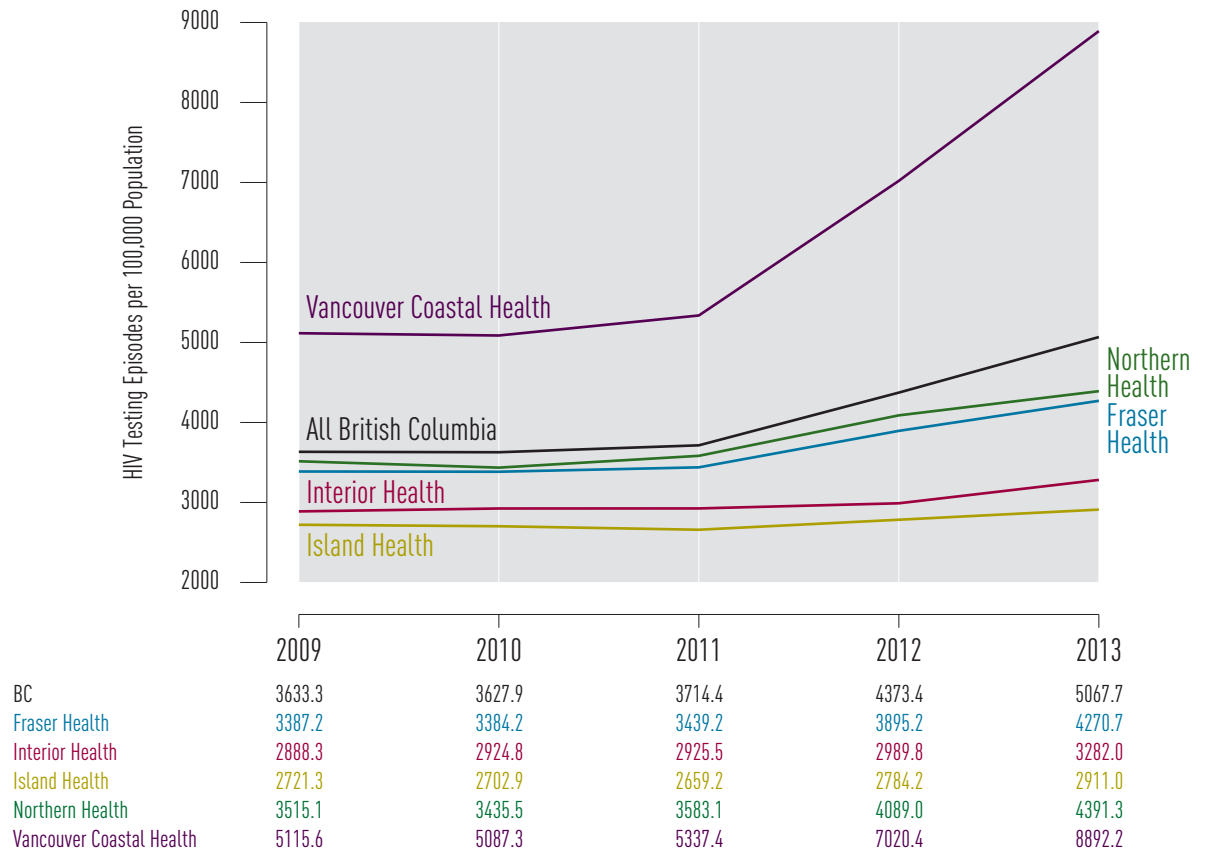


Figure 2.2 Rate of HIV Testing by Gender for BC, 2009–2013 <sup>1</sup>

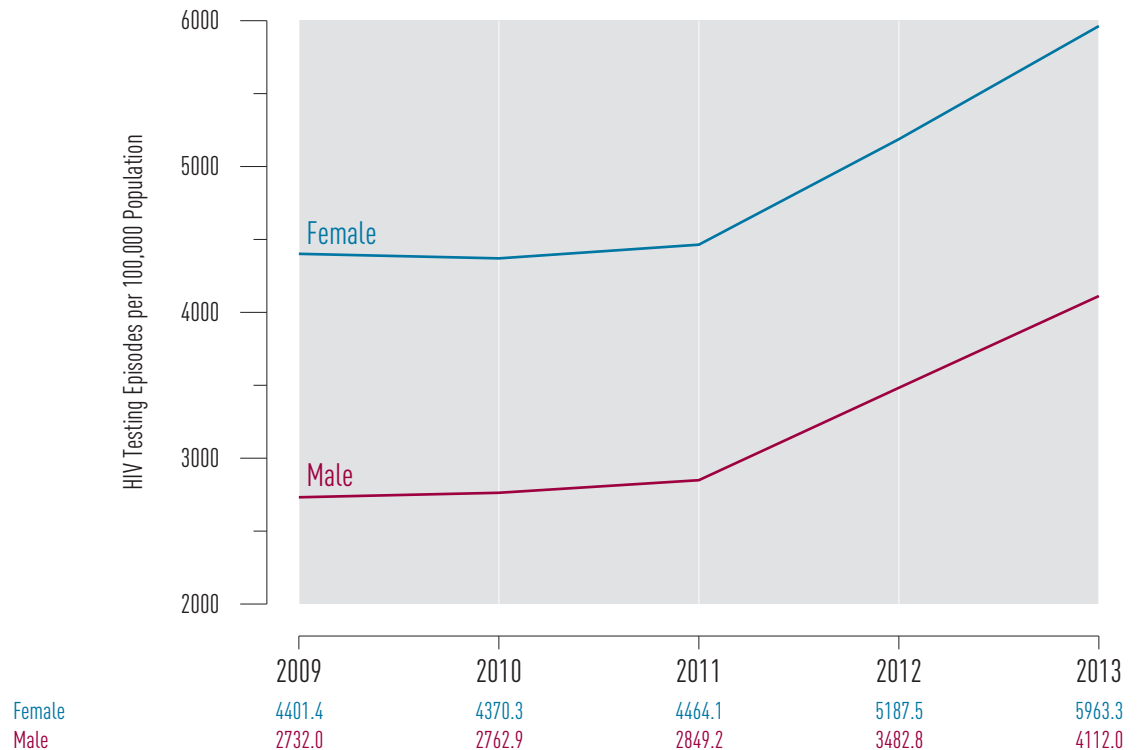
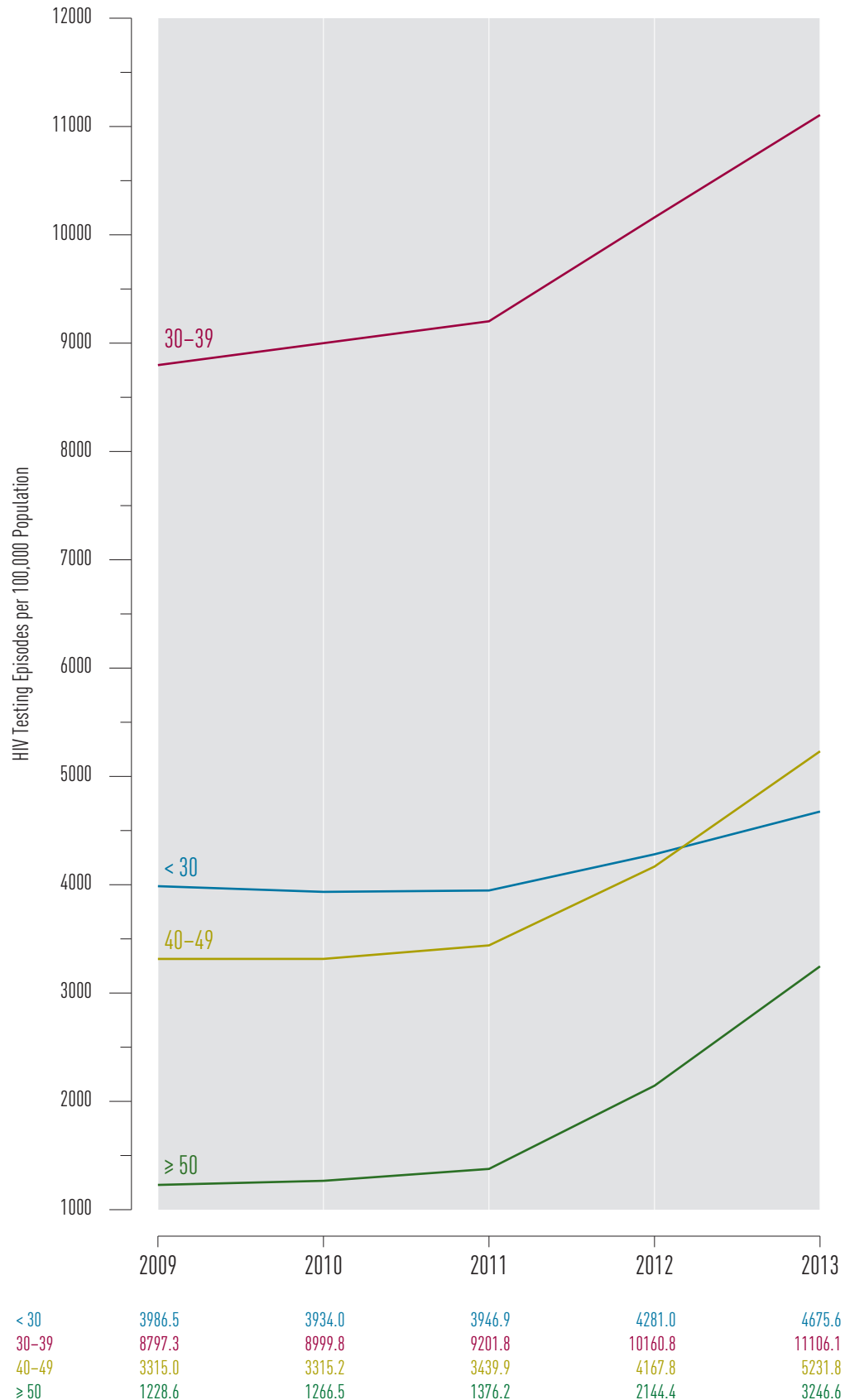


Figure 2.3 Rate of HIV Testing by Age Category for BC, 2009–2013 <sup>1</sup>



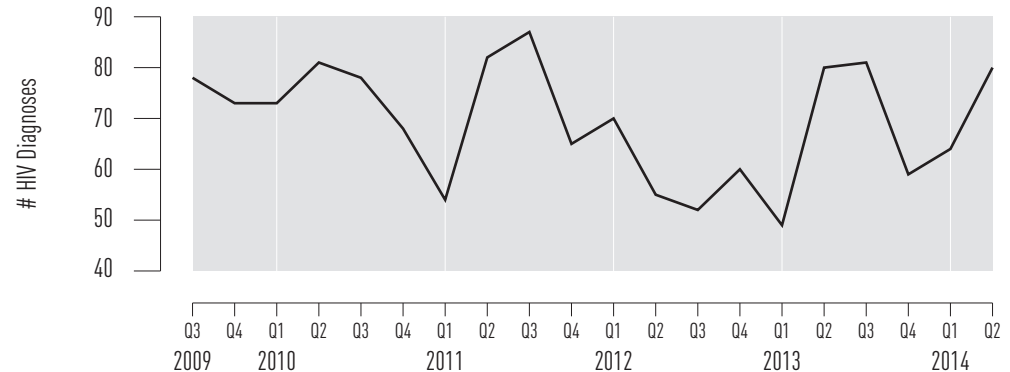
<sup>1</sup> NB: Testing does not include point of care tests.

# 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.

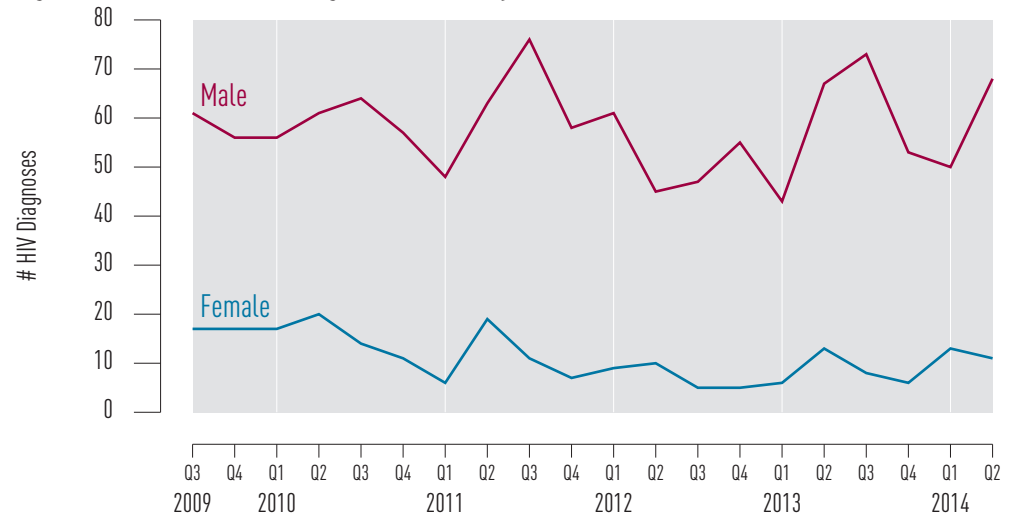
## Indicator 3. New HIV Diagnoses

Figure 3.1 New HIV Diagnoses for BC, 2009 Q3–2014 Q2 <sup>3</sup>



British Columbia	By Client Residence	78	73	73	81	78	68	54	82	87	65	70	55	52	60	49	80	81	59	64	80
	By Provider Address	78	73	73	81	78	68	54	82	87	65	70	55	52	60	49	80	81	59	64	80

Figure 3.2 New HIV Diagnoses for BC by Gender, 2009 Q3–2014 Q2 <sup>3</sup>



Female	17	17	17	20	14	11	6	19	11	7	9	10	5	5	6	13	8	6	13	11
Male	61	56	56	61	64	57	48	63	76	58	61	45	47	55	43	67	73	53	50	68

<sup>3</sup> Data Source: BCCDC.



Figure 3.3 New HIV Diagnoses for BC by Age Category, 2009 Q3–2014 Q2 <sup>3</sup>

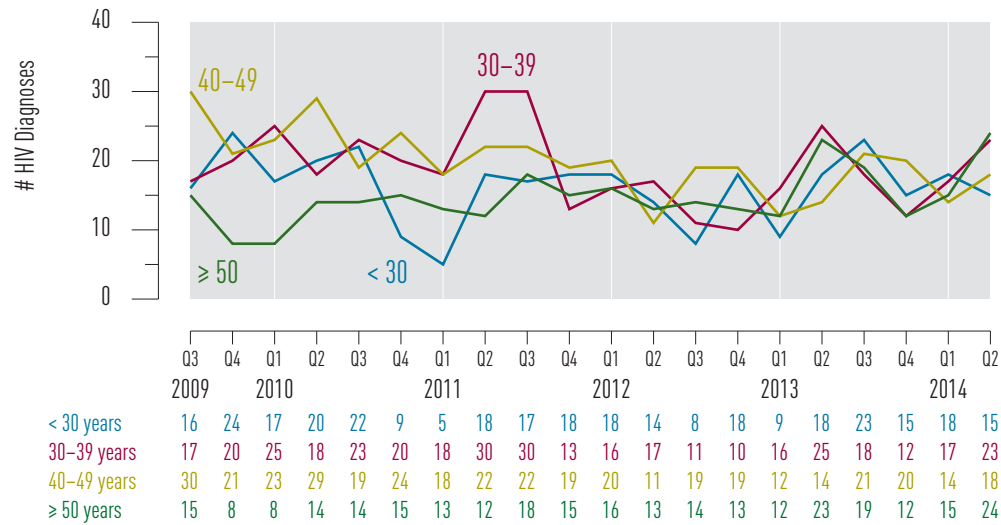
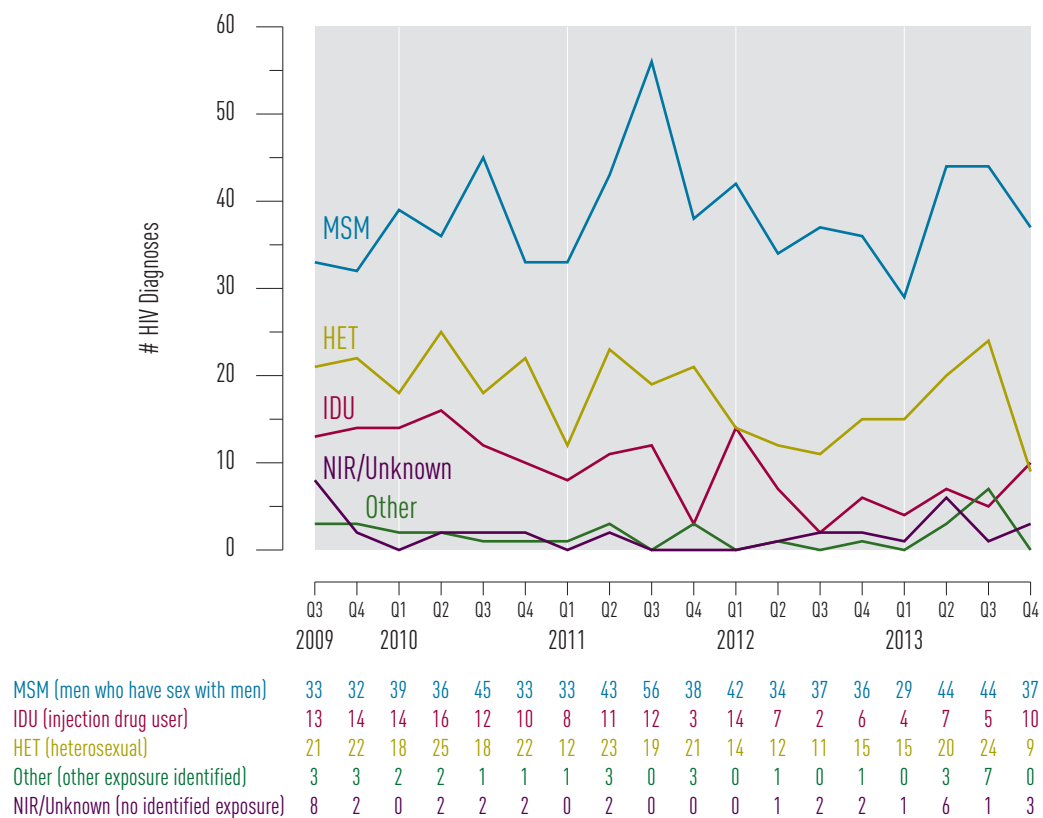


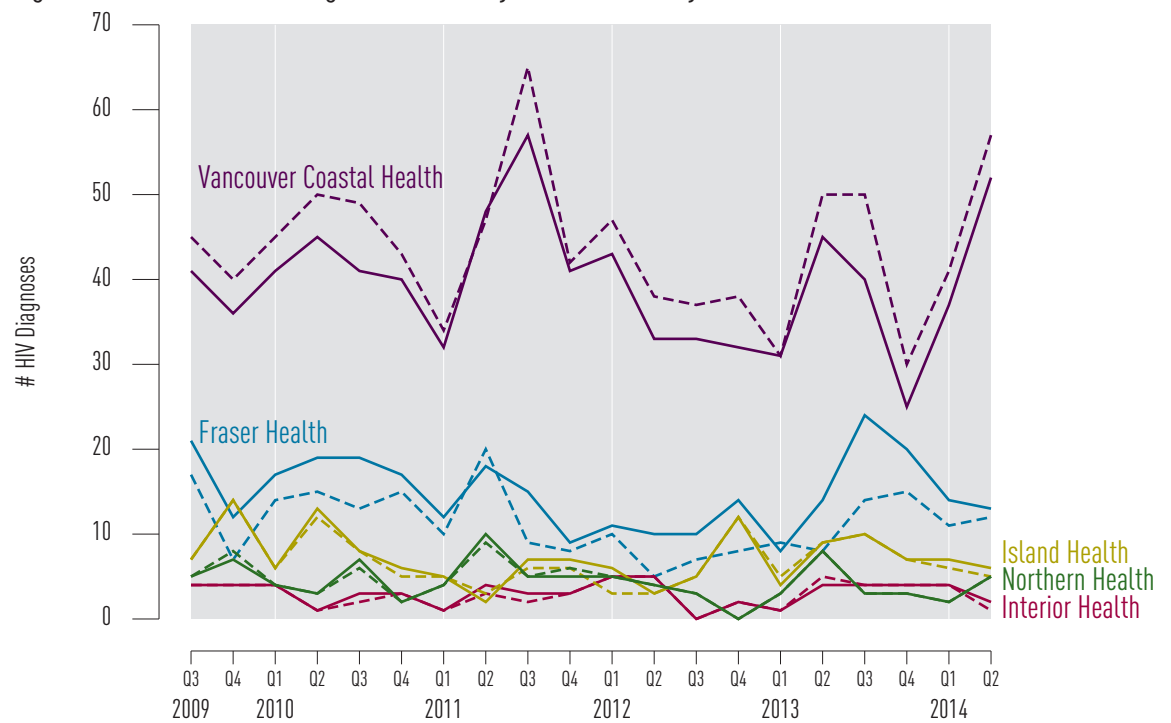
Figure 3.4 New HIV Diagnoses for BC by Exposure Category, 2009 Q3–2013 Q4 <sup>3,4</sup>



<sup>3</sup> Data Source: BCCDC.

<sup>4</sup> MSM=men who have sex with men; IDU= injection drug user; HET=heterosexual. NIR=No identified risk/exposure. “By Provider Address” is graphed as dashed line in same colour.

Figure 3.5 New HIV Diagnoses for BC by Health Authority, 2009 Q3–2014 Q2<sup>3</sup>



Fraser Health	By Client Residence	21	12	17	19	19	17	12	18	15	9	11	10	10	14	8	14	24	20	14	13
	By Provider Address	17	7	14	15	13	15	10	20	9	8	10	5	7	8	9	8	14	15	11	12
Interior Health	By Client Residence	4	4	4	1	3	3	1	4	3	3	5	5	0	2	1	4	4	4	4	2
	By Provider Address	4	4	4	1	2	3	1	3	2	3	5	5	0	2	1	5	4	4	4	1
Island Health	By Client Residence	7	14	6	13	8	6	5	2	7	7	6	3	5	12	4	9	10	7	7	6
	By Provider Address	7	14	6	12	8	5	5	3	6	6	3	3	5	12	5	9	10	7	6	5
Northern Health	By Client Residence	5	7	4	3	7	2	4	10	5	5	5	4	3	0	3	8	3	3	2	5
	By Provider Address	5	8	4	3	6	2	4	9	5	6	5	4	3	0	3	8	3	3	2	5
Vancouver Coastal Health	By Client Residence	41	36	41	45	41	40	32	48	57	41	43	33	33	32	31	45	40	25	37	52
	By Provider Address	45	40	45	50	49	43	34	47	65	42	47	38	37	38	31	50	50	30	41	57

<sup>3</sup> 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	Stage 0 not met	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 BC, 2010–2013<sup>5</sup>

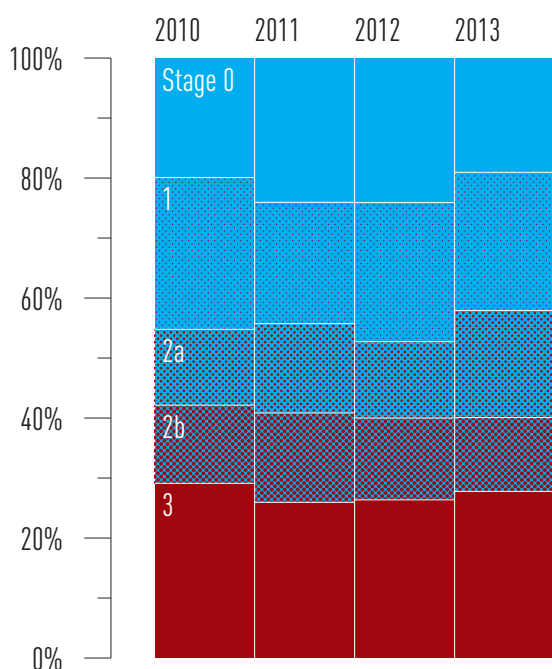


Figure 4.2 Stage of HIV Infection at Diagnosis by Gender for BC, 2010–2013<sup>5</sup>

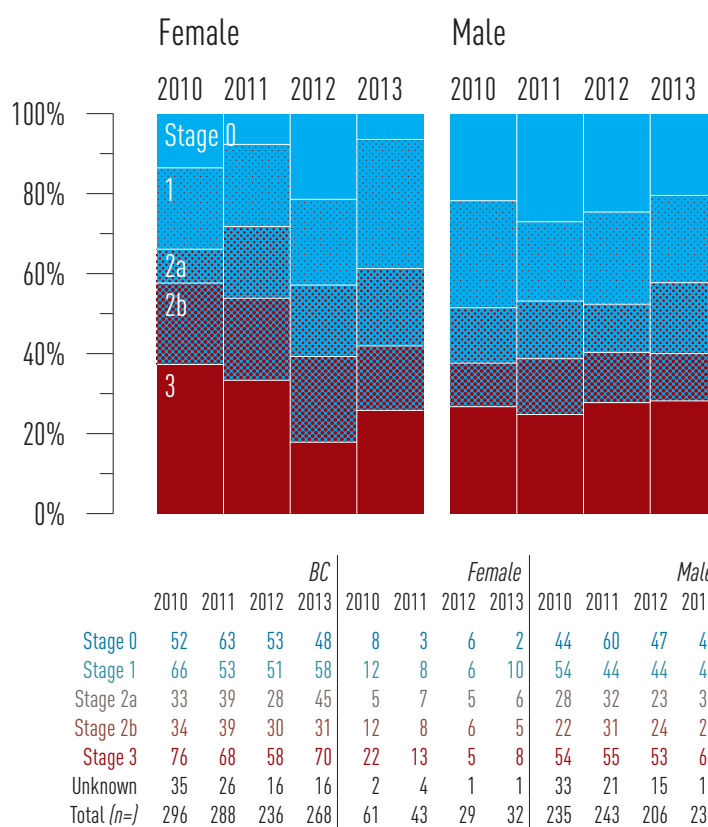


Figure 4.3 Stage of HIV Infection at Diagnosis by Age Category for BC, 2010–2013 <sup>5</sup>

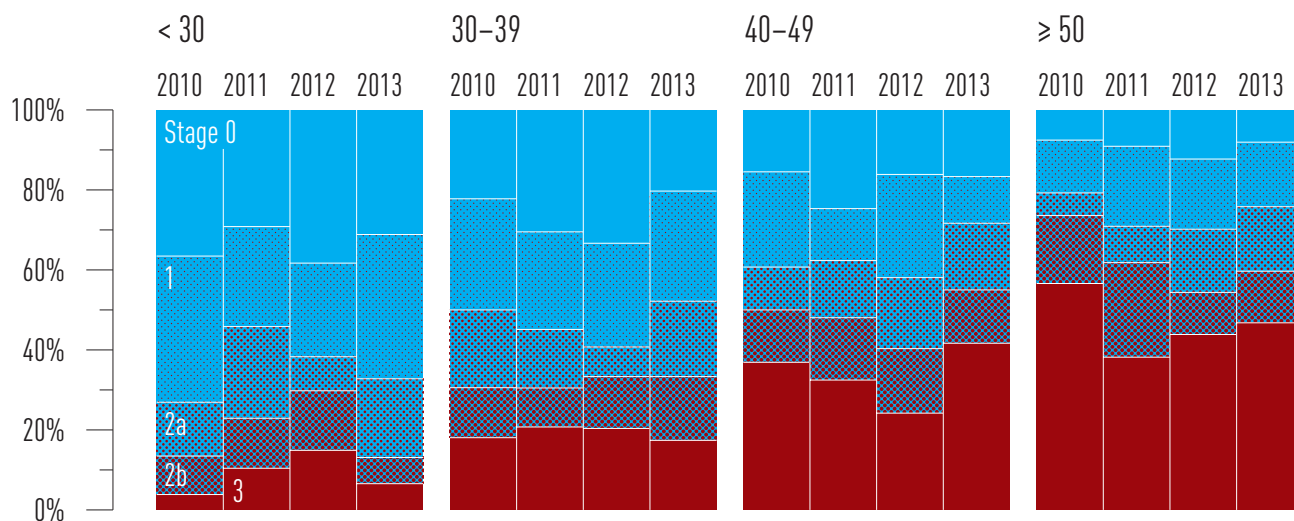
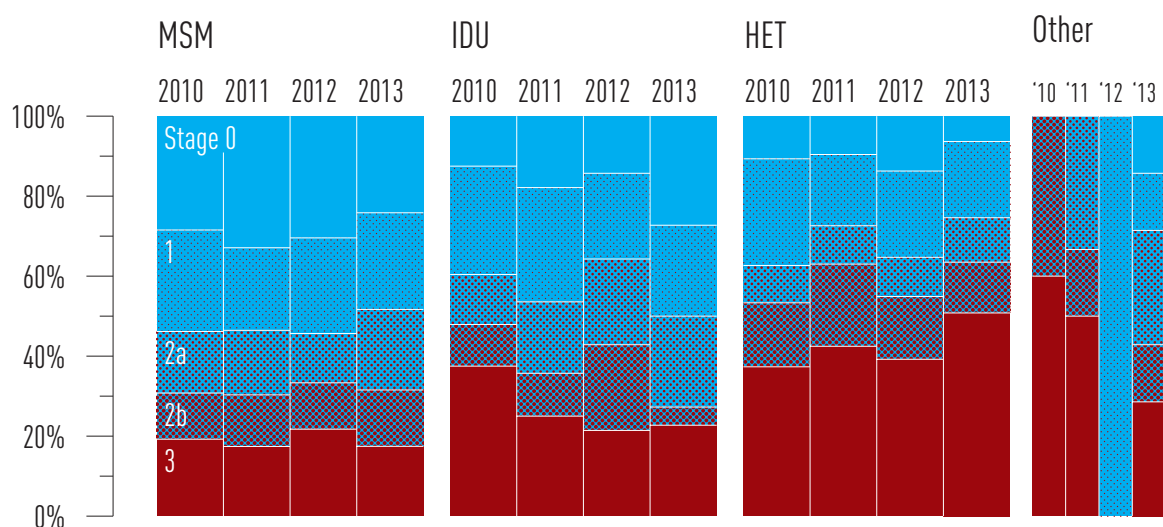


Figure 4.4 Stage of HIV Infection at Diagnosis by Exposure Category for BC, 2010–2013 <sup>5,6</sup>



	< 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	19	14	18	19	16	25	18	14	13	19	10	10	4	5	7	5	37	51	42	36	6	5	4	6	8	7	7	4	0	0	0	1	1	0	0	1
Stage 1	19	12	11	22	20	20	14	19	20	10	16	7	7	11	10	10	33	32	33	36	13	8	6	5	20	13	11	12	0	0	1	1	0	0	0	4
Stage 2a	7	11	4	12	14	12	4	13	9	11	11	10	3	5	9	10	20	25	17	30	6	5	6	5	7	7	5	7	0	2	0	2	0	0	0	1
Stage 2b	5	6	7	4	9	8	7	11	11	12	10	8	9	13	6	8	15	20	16	21	5	3	6	1	12	15	8	8	2	1	0	1	0	0	0	0
Stage 3	2	5	7	4	13	17	11	12	31	25	15	25	30	21	25	29	25	27	30	26	18	7	6	5	28	31	20	32	3	3	0	2	2	0	2	5
Unknown	11	6	7	1	13	10	3	4	10	5	2	5	1	5	4	6	22	15	10	4	4	6	1	4	7	2	1	4	1	1	1	4	1	2	3	0
Total (n=)	63	54	54	62	85	92	57	73	94	82	64	65	54	60	61	68	152	170	148	153	52	34	29	26	82	75	52	67	6	7	2	11	4	2	5	11

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 BC, Year Ending 2014 Q2 <sup>7</sup>

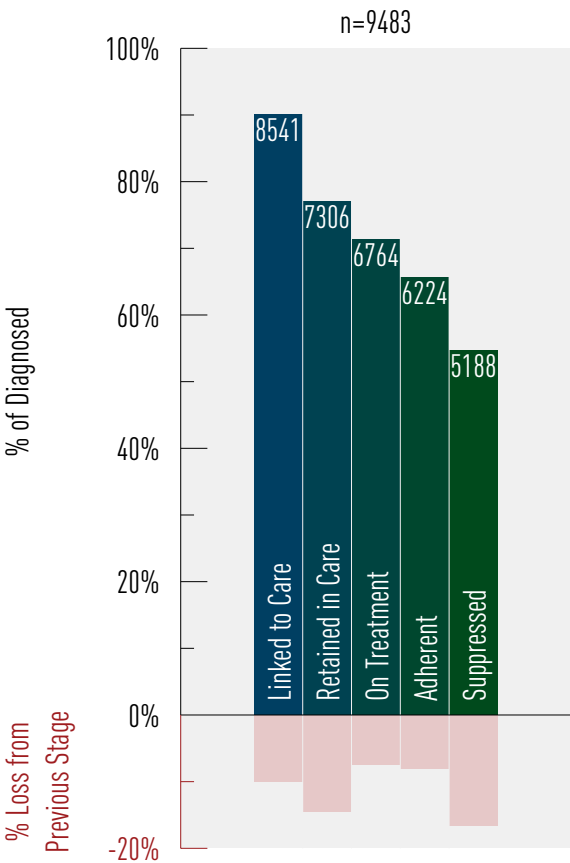
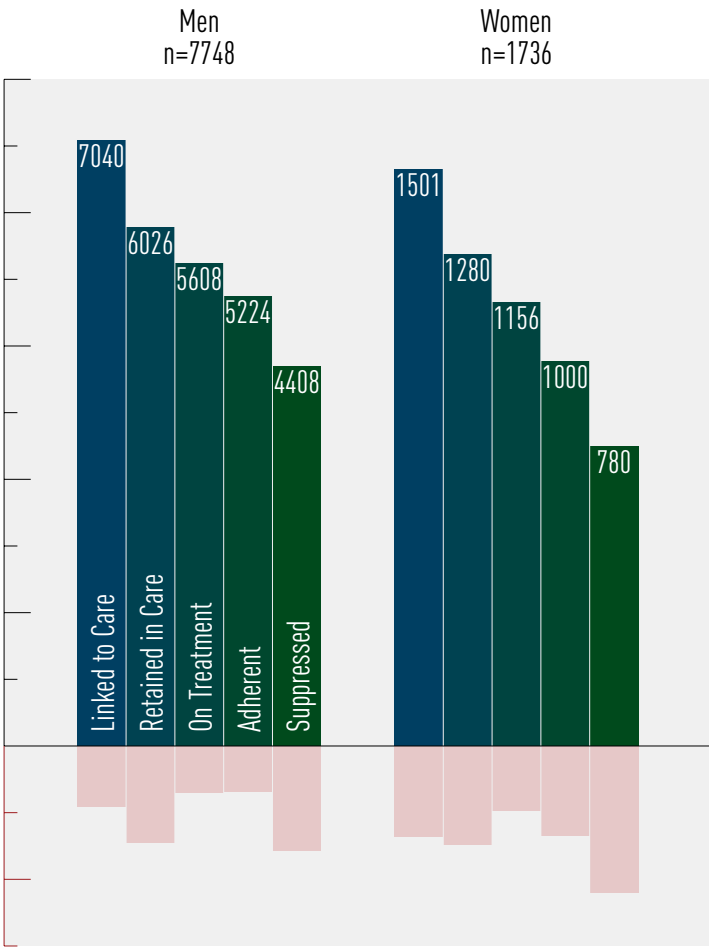


Figure 5.2 Estimated Cascade of Care for BC by Gender, Year Ending 2014 Q2 <sup>8</sup>



7,8 Data is for the period 2013 Q3–2014 Q2.

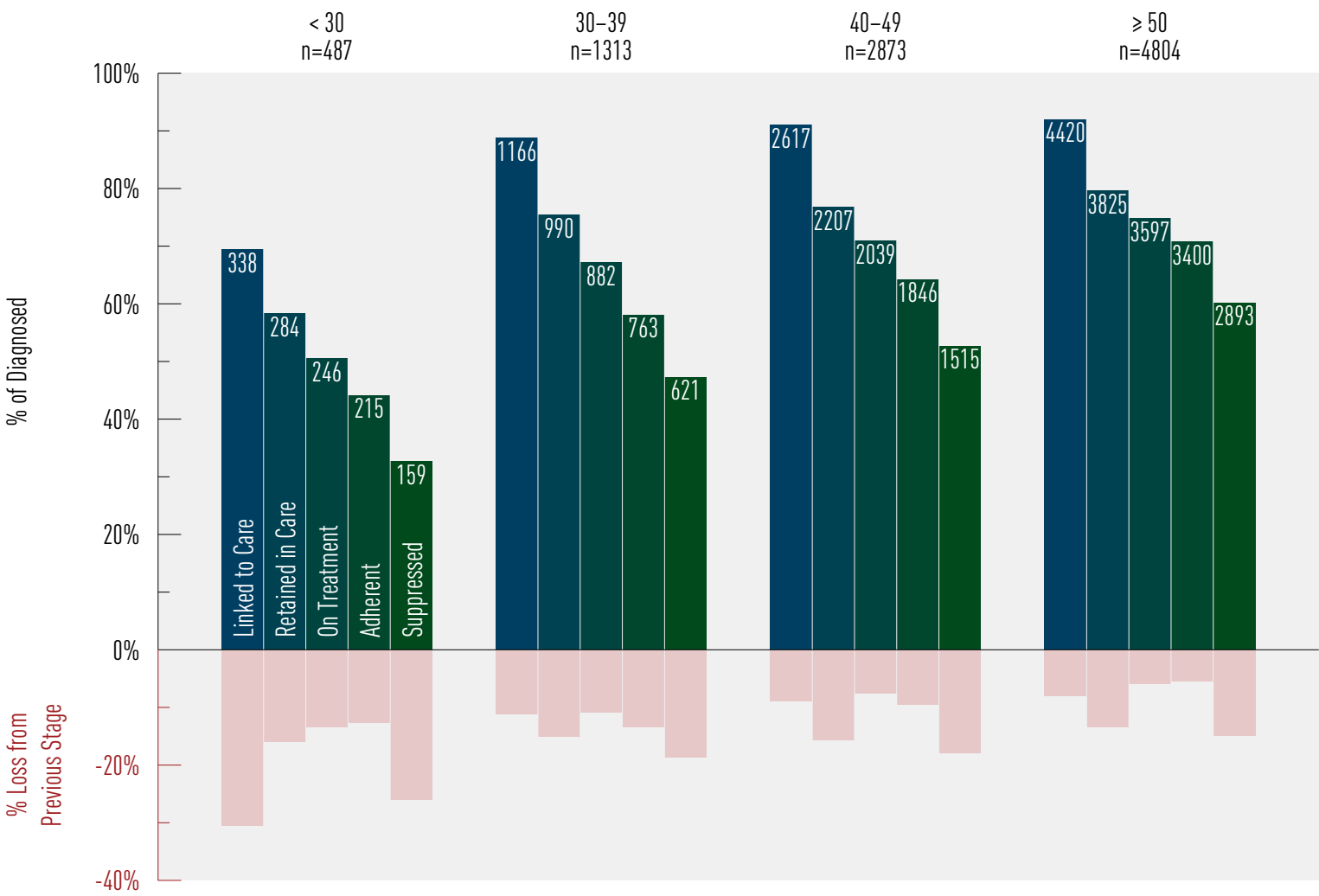
Data Sources:

- 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.

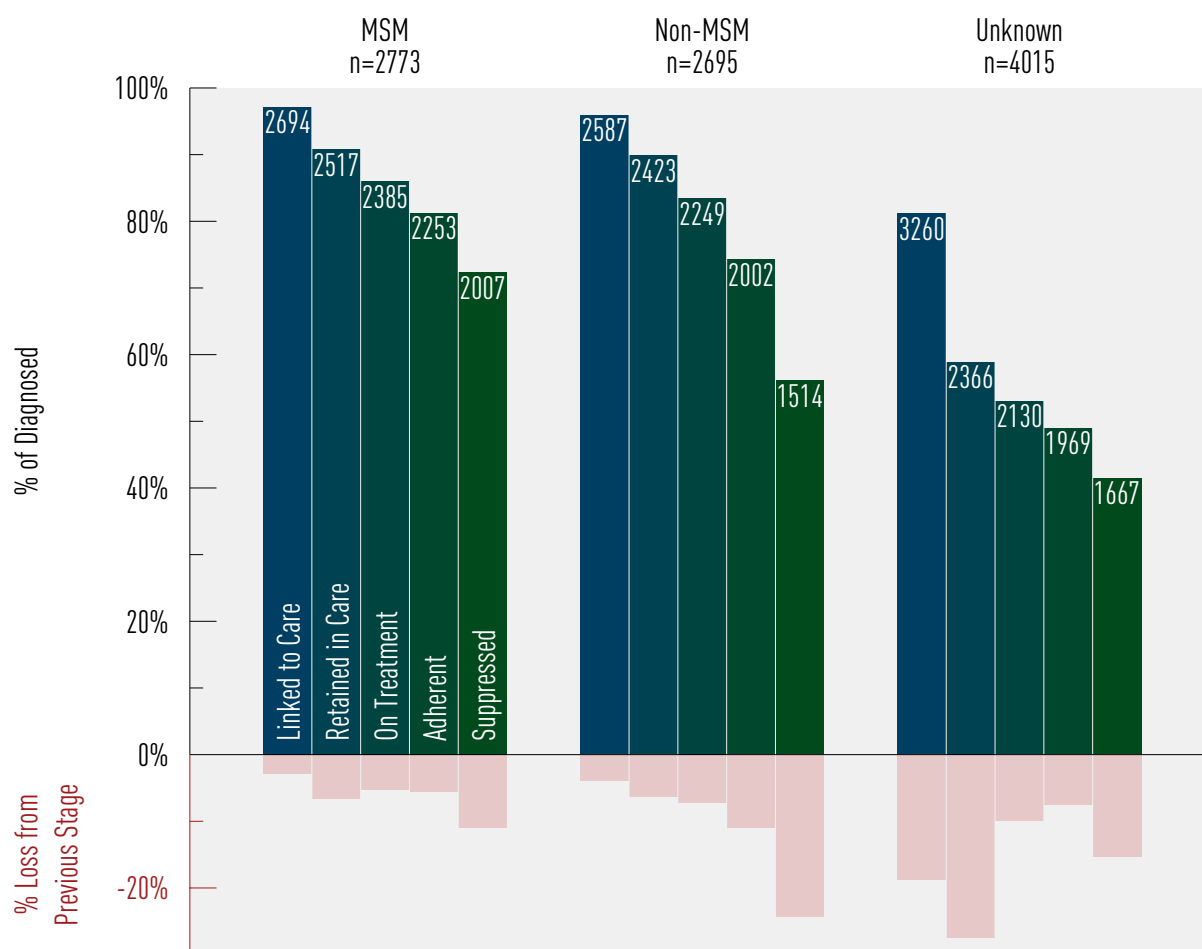
NB: Transgender has been assigned to their biological sex.

Figure 5.3      Estimated Cascade of Care for BC by Age Category, Year Ending 2014 Q2 <sup>9</sup>



<sup>9</sup> Data is for the period 2013 Q3–2014 Q2.  
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 BC by MSM Status, Year Ending 2014 Q2 <sup>10</sup>



<sup>10</sup> Data is for the period 2013 Q3–2014 Q2.

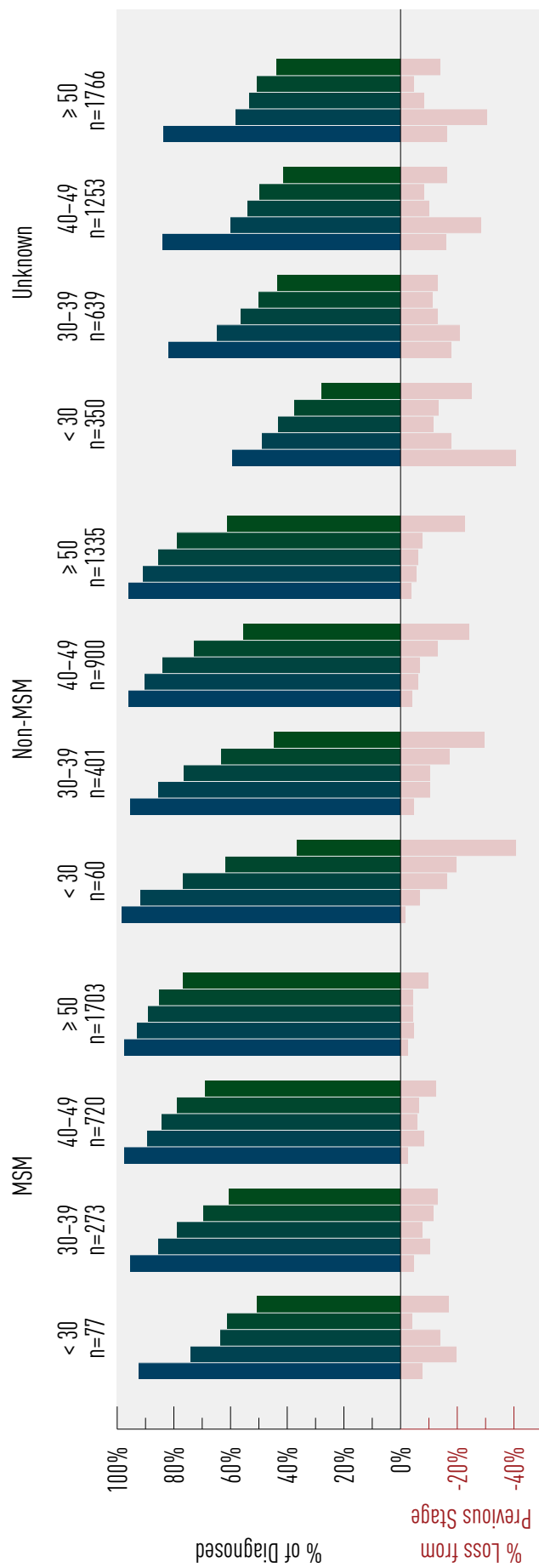
Data Sources:

- 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 BC by Age Category and MSM Status, Year Ending 2014 Q2 <sup>11</sup>



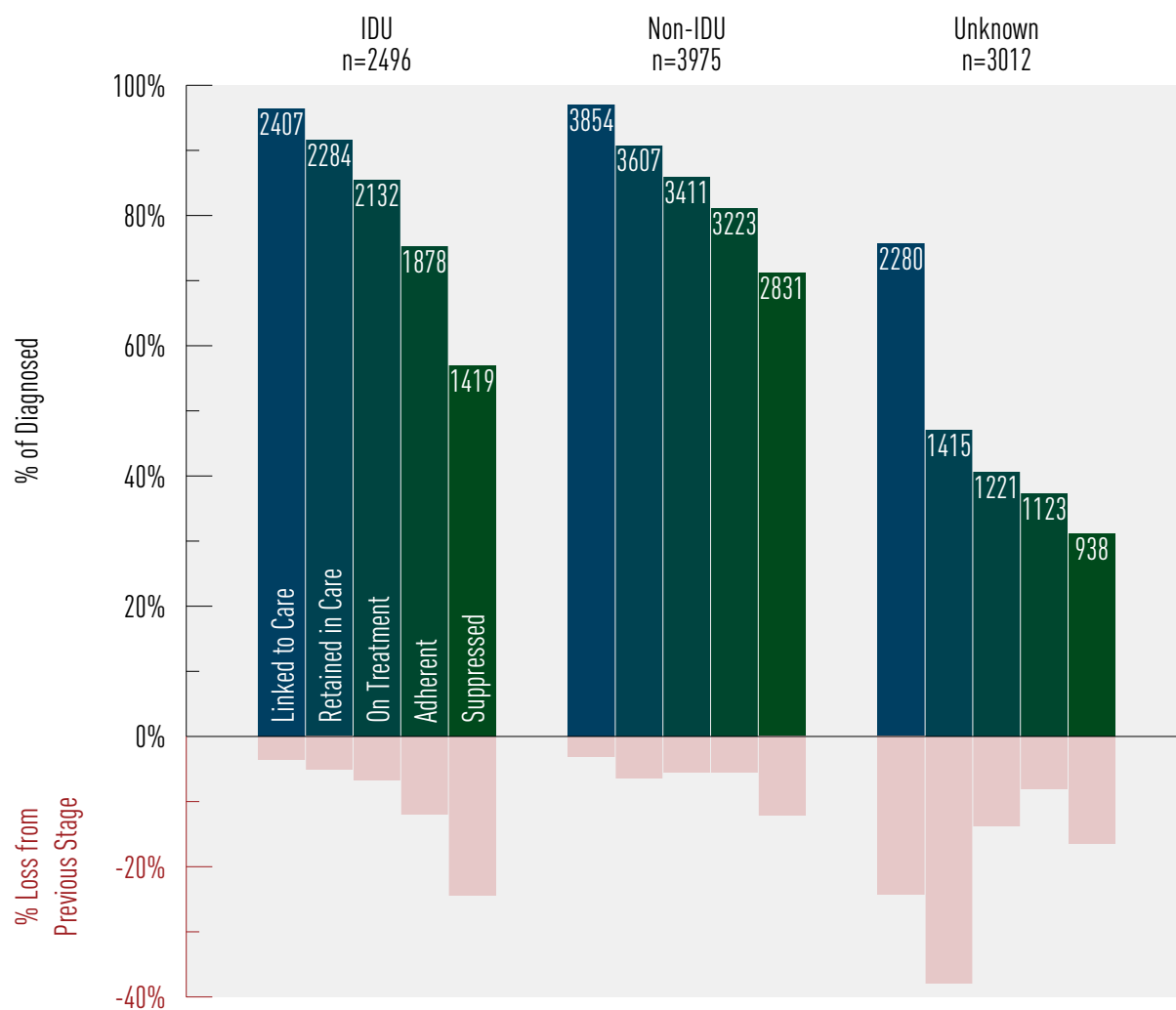
<sup>11</sup> Data is for the period 2013 Q3–2014 Q2.

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 5.6 Estimated Cascade of Care for BC by History of IDU, Year Ending 2014 Q2 <sup>12</sup>



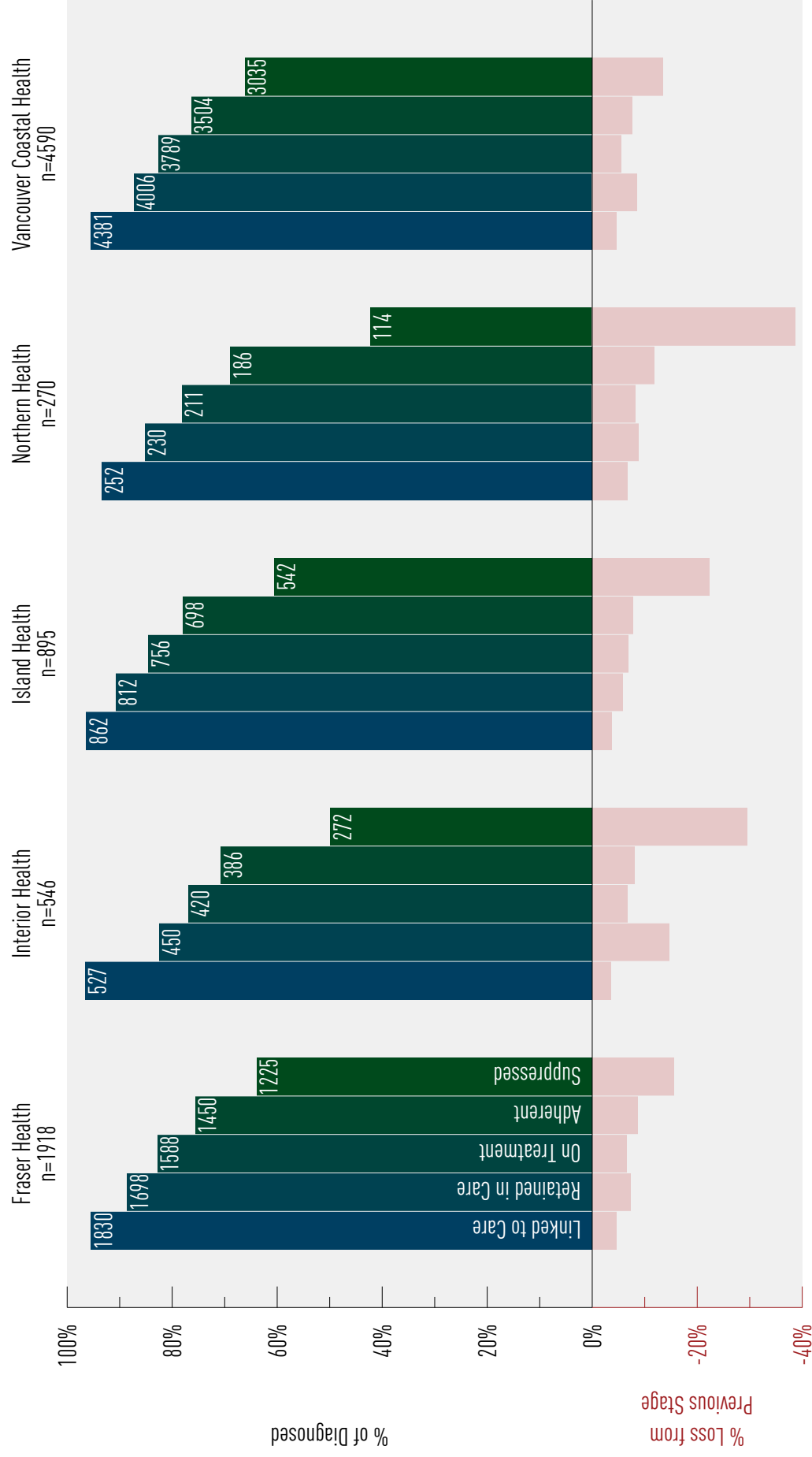
<sup>12</sup> Data is for the period 2013 Q3–2014 Q2.

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 BC by Health Authority, Year Ending 2014 Q2 <sup>13</sup>



<sup>13</sup> Data is for the period 2013 Q3–2014 Q2.

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  $PCS \geq 4$  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/ $\mu$ L; 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 BC, 2012 Q3–2014 Q2 <sup>14</sup>

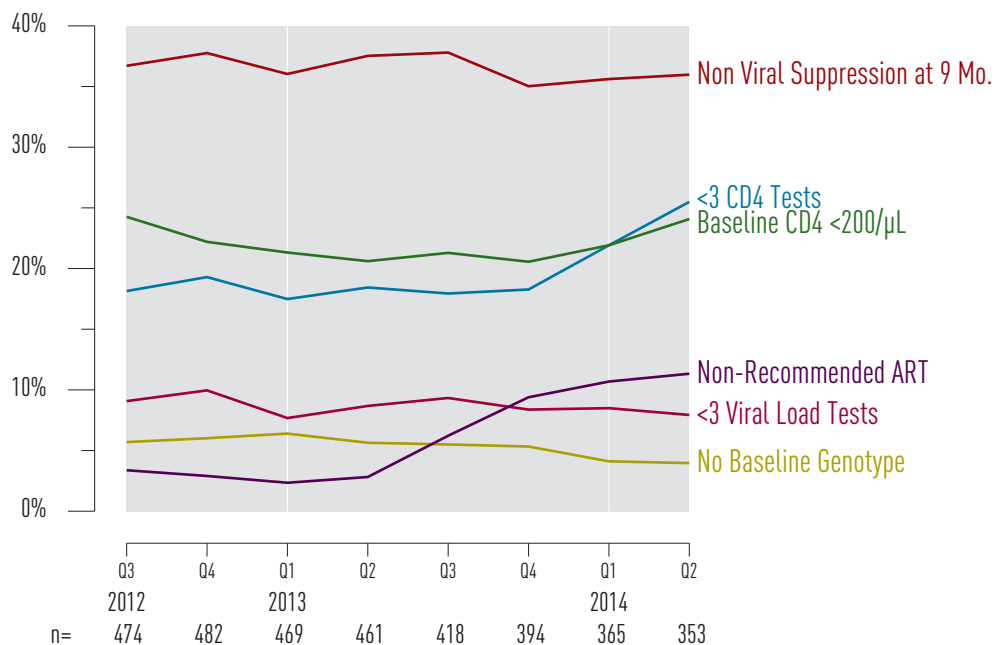
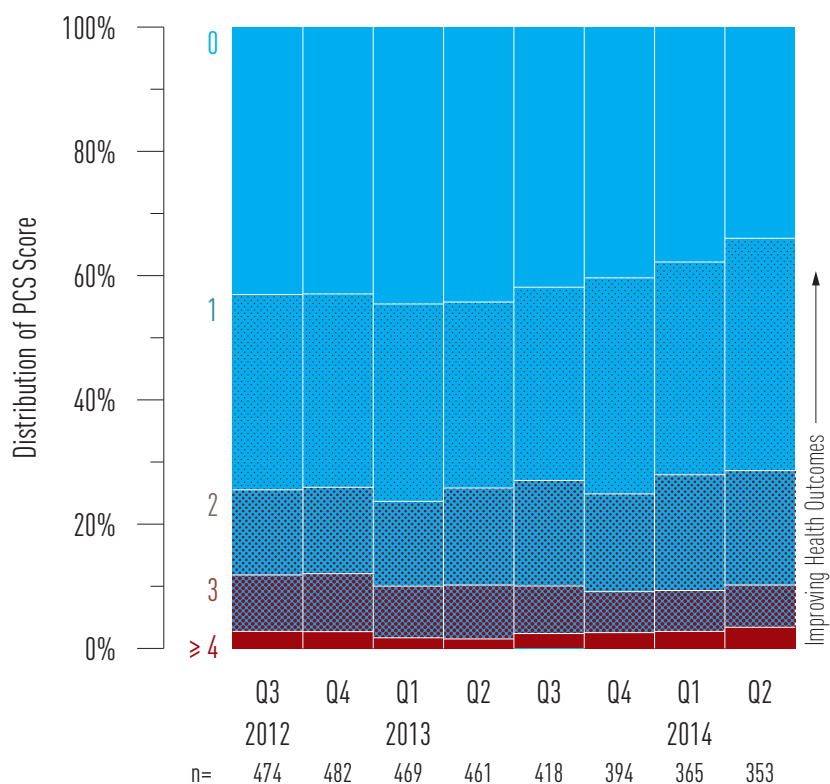


Figure 6.2 Historical Trends for PCS Score for BC, 2012 Q3–2014 Q2 <sup>14,15</sup>



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

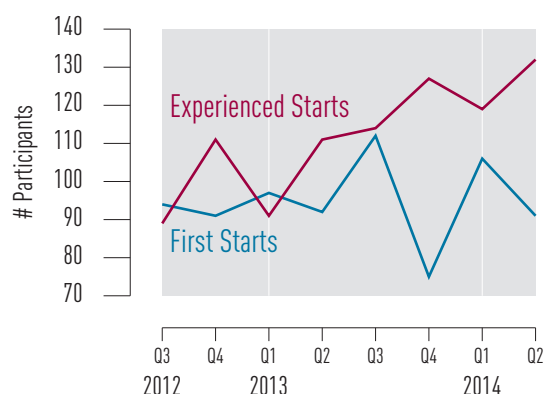
<sup>15</sup> Each quarter's data is calculated as the sum of the 4 quarters leading up to it. e.g. 2013 Q1 is calculated from 2012 Q2 – 2013 Q1. NB: A score of 0 is the best score and a score of 4 or more is the worst score.

# 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.

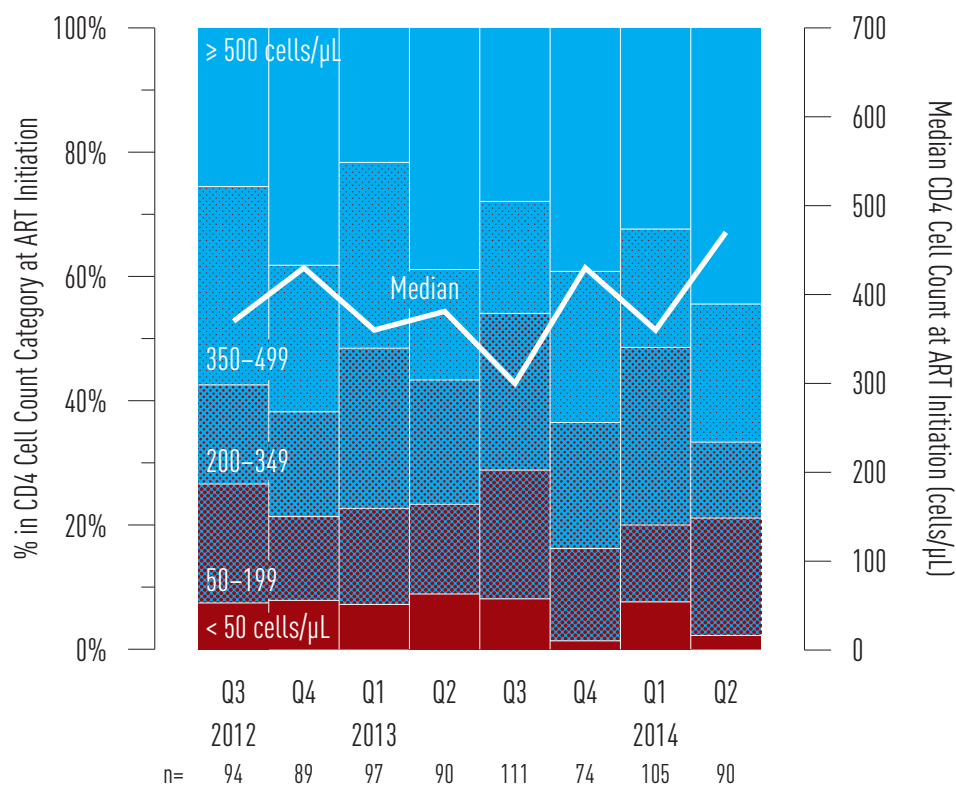
## Indicator 7. New Antiretroviral Therapy Starts in BC

Figure 7 BC-CfE Drug Treatment Program Enrollment: New ART Participants in BC, 2012 Q3–2014 Q2 <sup>16</sup>



## Indicator 8. CD4 Cell Count at ART Initiation

Figure 8 CD4 Cell Count at ART Initiation of ART-Naïve DTP Participants in BC, 2012 Q3–2014 Q2 <sup>17</sup>



<sup>16</sup> Data Source: Drug Treatment Program Database

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

<sup>17</sup> Data Source: Drug Treatment Program Database

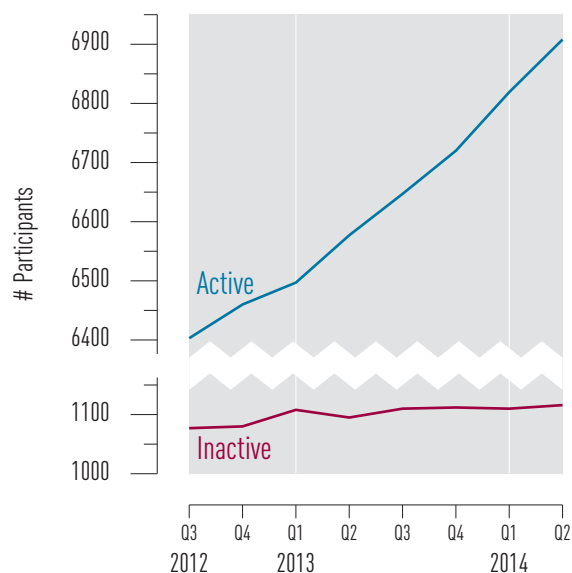
Limitations: CD4 cell count data is approximately 80% complete.

## Indicator 9. Active and Inactive DTP Participants

Table 3. Distribution of People on ART for BC, 2014 Q2 <sup>18</sup>

		Fraser	Interior	Island	Northern	Vancouver Coastal	Total BC
Age	< 30	75	14	28	13	145	275
	30–39	256	54	92	48	522	972
	40–49	543	112	224	68	1225	2172
	≥ 50	748	251	439	90	1961	3489
Gender	Male	1257	332	632	134	3382	5737
	Female	365	99	151	85	471	1171
Exposure	MSM	460	109	178	26	1635	2408
	IDU	444	145	279	129	1145	2142
Total		1622	431	783	219	3853	6908

Figure 9 Active and Inactive DTP Participants in BC, 2012 Q3–2014 Q2 <sup>19</sup>



<sup>18</sup> 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

<sup>19</sup> Active DTP participants: are those who are prescribed one or more drugs in the last six months.

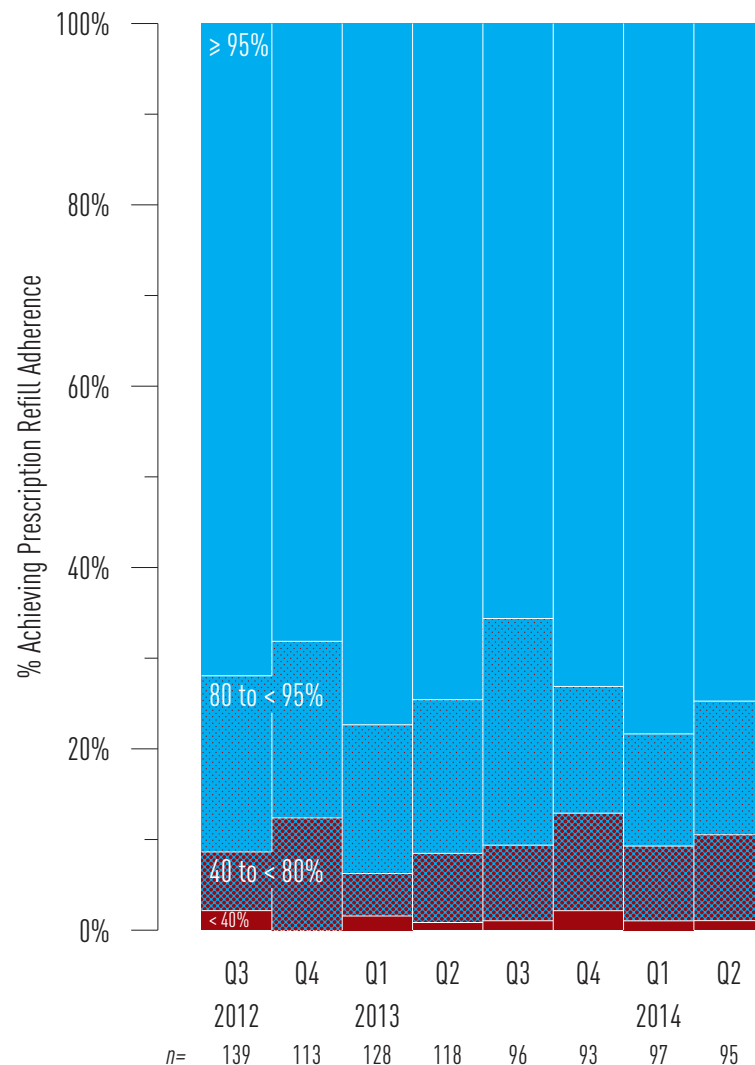
Inactive DTP Participants: Persons no longer prescribed drugs through the HIV/AIDS Drug Treatment Program in the last quarter.

# 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.  $\geq 95\%$ ) to increase with time. Furthermore, it is important that trends in the proportion of ART users achieving prescription refill adherence of  $\geq 95\%$  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 BC, 2012 Q3–2014 Q2 <sup>20</sup>

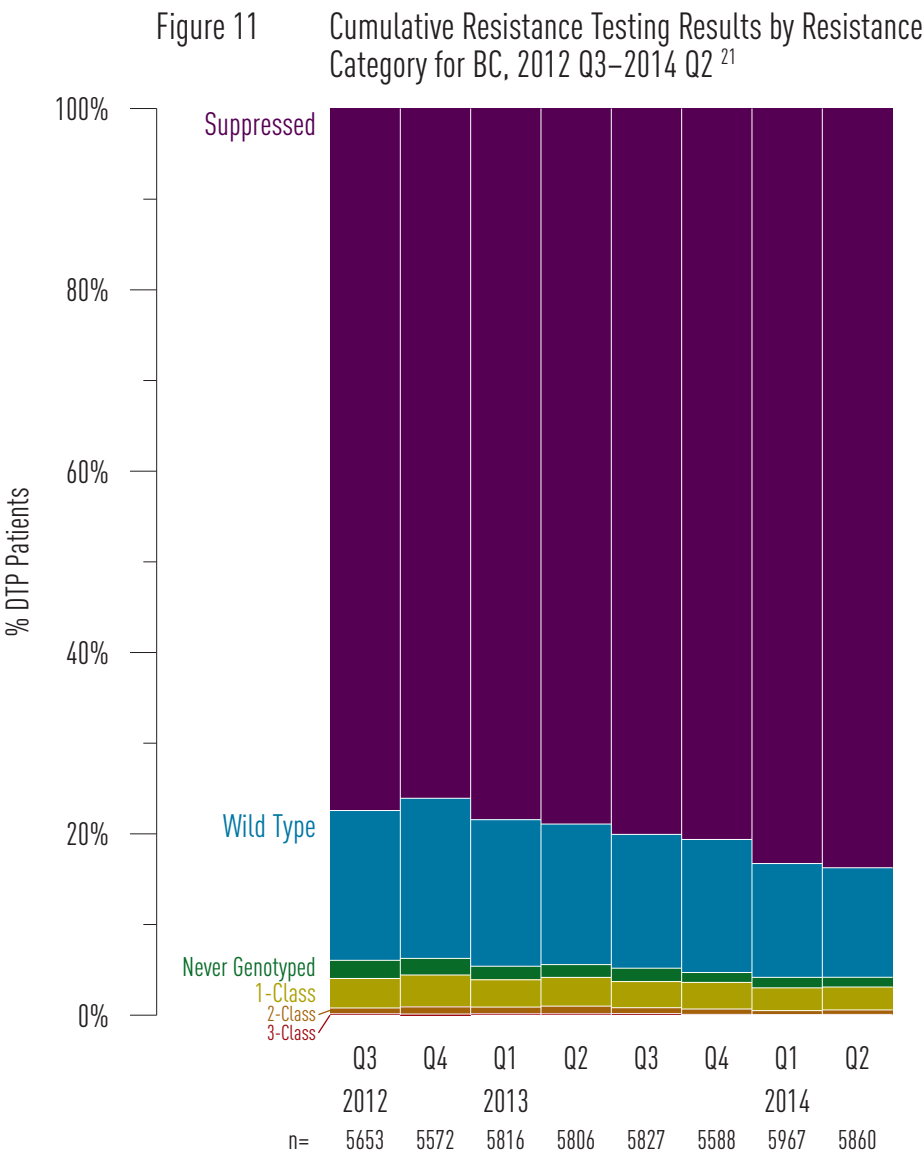


<sup>20</sup> Data Source: Drug Treatment Program Database  
Limitation: Prescription refill adherence is used as a proxy for patient adherence.



# 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.



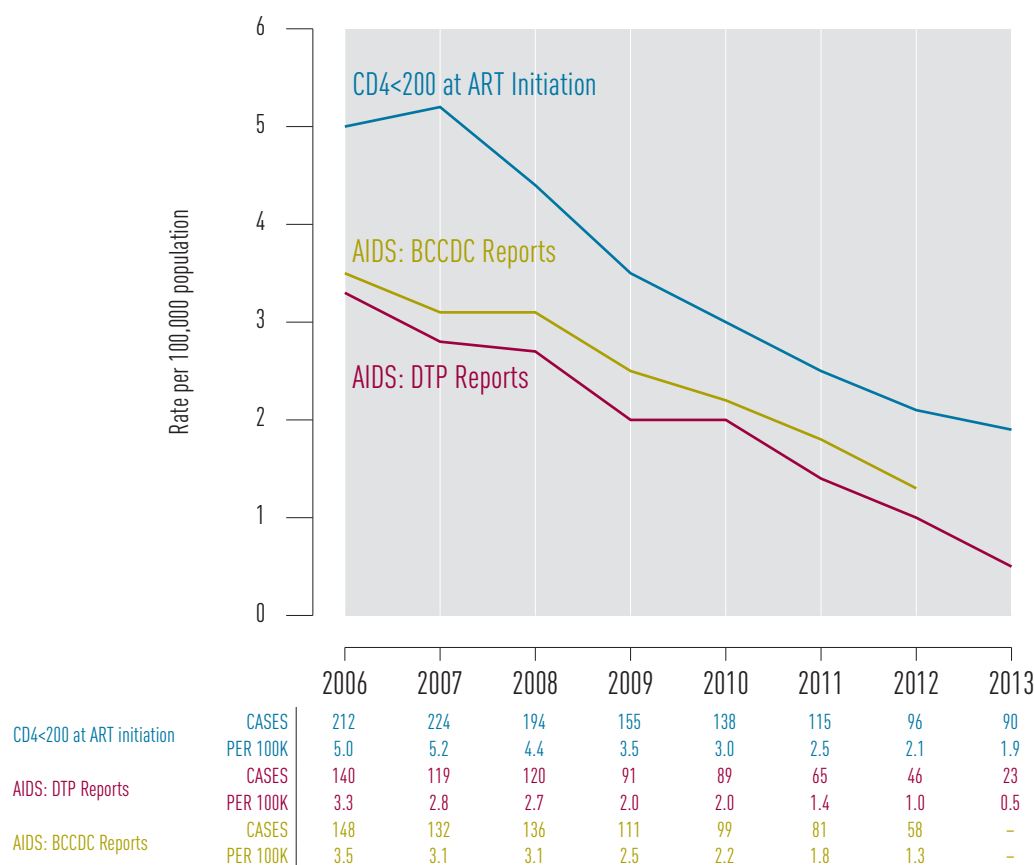
<sup>21</sup> Data Source: Drug Treatment Program Database

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 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 BC, 2006–2013 <sup>22</sup>



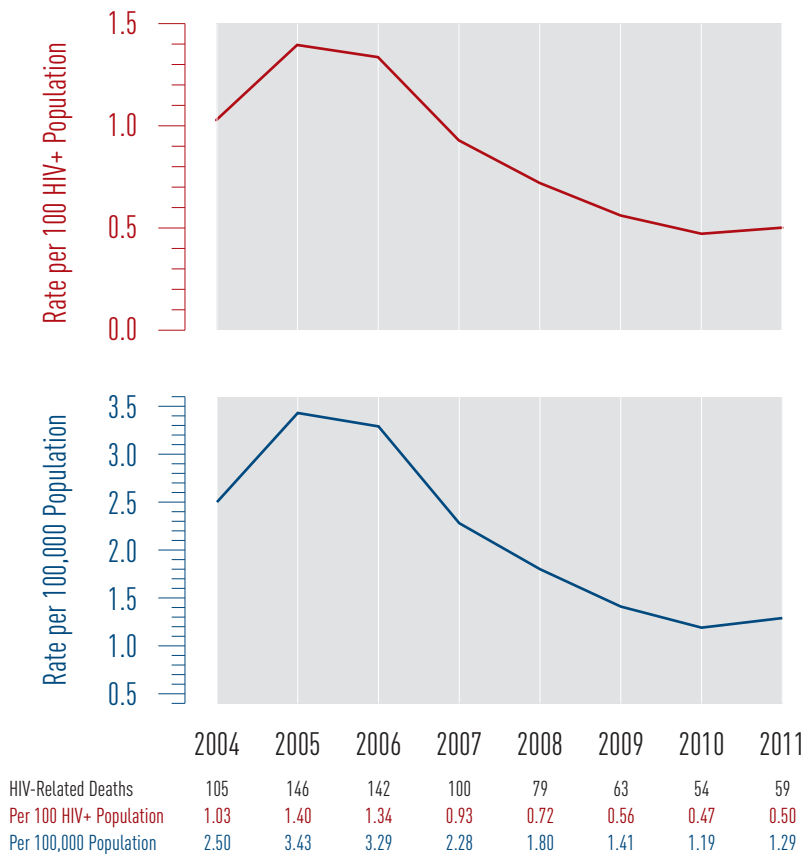
<sup>22</sup> Data Source: DTP AIDS cases are obtained from the Drug Treatment Program Database; BCCDC AIDS cases are obtained from the BC-CDC; CD4<200 at ART initiation data came from the DTP database.

*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 BC, 2004–2011 <sup>23</sup>



<sup>23</sup> 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				2014			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
British Columbia		44.0	41.5	46.3	44.0	44.6	45.4	48.6	45.4	52.9	50.8	56.7	55.2	59.2	59.8	67.3	69.8	67.9	66.7	74.7	77.7
Gender	Female	26.6	25.5	28.0	26.3	27.0	26.9	28.7	26.2	28.0	29.0	32.4	31.6	33.8	33.9	38.2	39.3	38.4	37.6	41.6	43.1
	Male	16.7	15.4	17.6	17.1	16.9	17.0	18.2	16.6	18.2	18.8	21.6	21.1	22.8	23.4	26.2	27.9	26.5	26.2	30.0	31.6
	Other	0.7	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.3	0.3
Female (Prenatal)		11.4	11.3	12.1	11.0	11.8	12.0	12.9	11.3	11.8	11.9	13.0	11.9	12.0	11.9	12.5	11.7	12.0	12.1	12.9	11.9
Female (Non-prenatal)		15.2	14.1	15.9	15.2	15.3	14.9	15.8	14.9	16.2	17.1	19.4	19.7	21.8	22.1	25.7	27.5	26.4	25.6	28.7	31.2
Age	< 30	17.8	16.4	17.5	16.9	17.6	17.5	17.5	16.5	18.1	18.2	18.9	18.2	20.0	19.7	20.4	21.1	21.6	21.3	21.9	22.0
	30–39	13.8	13.2	15.4	14.2	14.4	14.1	15.9	13.9	14.8	14.8	17.3	16.3	16.8	16.6	19.2	19.2	18.9	18.4	21.4	20.6
	40–49	6.2	5.7	6.7	6.4	6.1	6.2	6.8	6.3	6.5	6.6	7.8	7.5	7.7	8.2	9.7	10.1	9.4	9.1	10.5	10.9
	≥ 50	5.1	5.2	5.7	5.6	5.5	5.7	6.2	5.7	6.3	7.0	8.8	9.1	10.8	11.7	15.2	16.9	15.2	15.2	17.9	21.4
POC HIV Tests							1.0	1.1	2.1	6.1	2.5	2.3	2.1	2.3	2.2	2.6	2.4	2.7	2.6	2.8	2.7
Fraser Health		12.3	11.6	13.0	12.3	12.5	12.5	13.1	12.2	13.0	13.0	14.4	14.2	15.1	15.6	17.9	18.1	17.9	17.0	18.0	18.6
Interior Health		5.5	5.6	6.0	5.6	5.5	5.9	6.0	5.5	5.6	5.9	5.9	5.7	5.9	5.9	6.1	6.4	6.3	6.6	7.2	7.1
Island Health		5.2	4.7	5.6	5.3	5.3	5.3	5.8	5.0	5.3	5.1	5.8	5.3	5.5	5.6	5.9	6.1	5.9	6.0	6.7	6.3
Northern Health		2.7	2.5	2.9	2.6	2.7	2.5	3.0	2.7	2.9	2.8	3.4	3.1	3.2	3.3	3.7	3.6	3.5	3.5	4.2	3.7
Vancouver Coastal Health		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	33.7	35.6	34.4	33.5	38.7	41.9

Indicator 2: Rate of HIV Testing per 100,000

		2009	2010	2011	2012	2013
British Columbia		3633.3	3627.9	3714.4	4373.4	5067.7
Fraser Health		3387.2	3384.2	3439.2	3895.2	4270.7
Interior Health		2888.3	2924.8	2925.5	2989.8	3282.0
Island Health		2721.3	2702.9	2659.2	2784.2	2911.0
Northern Health		3515.1	3435.5	3583.1	4089.0	4391.3
Vancouver Coastal Health		5115.6	5087.3	5337.4	7020.4	8892.2
Gender	Female	4401.4	4370.3	4464.1	5187.5	5963.3
	Male	2732.0	2762.9	2849.2	3482.8	4112.0
Age	< 30	3986.5	3934.0	3946.9	4281.0	4675.6
	30–39	8797.3	8999.8	9201.8	10160.8	11106.1
	40–49	3315.0	3315.2	3439.9	4167.8	5231.8
	≥ 50	1228.6	1266.5	1376.2	2144.4	3246.6

Indicator 3: New HIV Diagnoses		2009		2010		2011				2012				2013				2014			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
British Columbia		78	73	73	81	78	68	54	82	87	65	70	55	52	60	49	80	81	59	64	80
	By Provider Address	78	73	73	81	78	68	54	82	87	65	70	55	52	60	49	80	81	59	64	80
Gender	Female	17	17	17	20	14	11	6	19	11	7	9	10	5	5	6	13	8	6	13	11
	Male	61	56	56	61	64	57	48	63	76	58	61	45	47	55	43	67	73	53	50	68
Age	< 30	16	24	17	20	22	9	5	18	17	18	18	14	8	18	9	18	23	15	18	15
	30–39	17	20	25	18	23	20	18	30	30	13	16	17	11	10	16	25	18	12	17	23
	40–49	30	21	23	29	19	24	18	22	22	19	20	11	19	19	12	14	21	20	14	18
	≥ 50	15	8	8	14	14	15	13	12	18	15	16	13	14	13	12	23	19	12	15	24
Exposure	MSM	33	32	39	36	45	33	33	43	56	38	42	34	37	36	29	44	44	37	–	–
	IDU	13	14	14	16	12	10	8	11	12	3	14	7	2	6	4	7	5	10	–	–
	HET	21	22	18	25	18	22	12	23	19	21	14	12	11	15	15	20	24	9	–	–
	Other	3	3	2	2	1	1	1	3	0	3	0	1	0	1	0	3	7	0	–	–
	NIR/Unknown	8	2	0	2	2	2	0	2	0	0	0	1	2	2	1	6	1	3	–	–
Fraser Health		21	12	17	19	19	17	12	18	15	9	11	10	10	14	8	14	24	20	14	13
	By Provider Address	17	7	14	15	13	15	10	20	9	8	10	5	7	8	9	8	14	15	11	12
Interior Health		4	4	4	1	3	3	1	4	3	3	5	5	0	2	1	4	4	4	4	2
	By Provider Address	4	4	4	1	2	3	1	3	2	3	5	5	0	2	1	5	4	4	4	1
Island Health		7	14	6	13	8	6	5	2	7	7	6	3	5	12	4	9	10	7	7	6
	By Provider Address	7	14	6	12	8	5	5	3	6	6	3	3	5	12	5	9	10	7	6	5
Northern Health		5	7	4	3	7	2	4	10	5	5	5	4	3	0	3	8	3	3	2	5
	By Provider Address	5	8	4	3	6	2	4	9	5	6	5	4	3	0	3	8	3	3	2	5
Vancouver Coastal Health		41	36	41	45	41	40	32	48	57	41	43	33	33	32	31	45	40	25	37	52
	By Provider Address	45	40	45	50	49	43	34	47	65	42	47	38	37	38	31	50	50	30	41	57

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

	British Columbia				Female				Male				< 30 years				30–39 years				40–49 years			
	'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	52	63	53	48	8	3	6	2	44	60	47	45	19	14	18	19	16	25	18	14	13	19	10	10
Stage 1	66	53	51	58	12	8	6	10	54	44	44	48	19	12	11	22	20	20	14	19	20	10	16	7
Stage 2a	33	39	28	45	5	7	5	6	28	32	23	39	7	11	4	12	14	12	4	13	9	11	11	10
Stage 2b	34	39	30	31	12	8	6	5	22	31	24	26	5	6	7	4	9	8	7	11	11	12	10	8
Stage 3	76	68	58	70	22	13	5	8	54	55	53	62	2	5	7	4	13	17	11	12	31	25	15	25
Unknown	35	26	16	16	2	4	1	1	33	21	15	15	11	6	7	1	13	10	3	4	10	5	2	5
Total	296	288	236	268	61	43	29	32	235	243	206	235	63	54	54	62	85	92	57	73	94	82	64	65

	≥ 50 years				MSM				IDU				Heterosexual				Other Exposure				NIR/Unknown			
	'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	4	5	7	5	37	51	42	36	6	5	4	6	8	7	7	4	0	0	0	1	1	0	0	1
Stage 1	7	11	10	10	33	32	33	36	13	8	6	5	20	13	11	12	0	0	1	1	0	0	0	4
Stage 2a	3	5	9	10	20	25	17	30	6	5	6	5	7	7	5	7	0	2	0	2	0	0	0	1
Stage 2b	9	13	6	8	15	20	16	21	5	3	6	1	12	15	8	8	2	1	0	1	0	0	0	0
Stage 3	30	21	25	29	25	27	30	26	18	7	6	5	28	31	20	32	3	3	0	2	2	0	2	5
Unknown	1	5	4	6	22	15	10	4	4	6	1	4	7	2	1	4	1	1	1	4	1	2	3	0
Total	54	60	61	68	152	170	148	153	52	34	29	26	82	75	52	67	6	7	2	11	4	2	5	11

**Indicator 5: HIV Cascade of Care**

		DIAGNOSED	LINKED	RETAINED	ON ART	ADHERENT	SUPPRESSED
British Columbia		9483	8541	7306	6764	6224	5188
Age Category	< 30	487	338	284	246	215	159
	30–39	1313	1166	990	882	763	621
	40–49	2873	2617	2207	2039	1846	1515
	≥ 50	4804	4420	3825	3597	3400	2893
Age Category and MSM Status	MSM	< 30	77	71	57	49	39
		30–39	273	260	233	215	165
		40–49	720	701	643	567	497
		≥ 50	1703	1662	1584	1449	1306
	Non-MSM	< 30	60	59	55	46	22
		30–39	401	382	343	307	179
		40–49	900	864	811	756	498
		≥ 50	1335	1283	1213	1140	815
	Unknown	< 30	350	208	171	151	98
		30–39	639	524	414	360	277
		40–49	1253	1052	753	677	520
		≥ 50	1766	1476	1028	897	772
Gender	Male	7748	7040	6026	5608	5224	4408
	Female	1736	1501	1280	1156	1000	780
Injection Drug Use	IDU	2496	2407	2284	2132	1878	1419
	Non-IDU	3975	3854	3607	3411	3223	2831
	Unknown	3012	2280	1415	1221	1123	938
MSM Status	MSM	2773	2694	2517	2385	2253	2007
	Non-MSM	2695	2587	2423	2249	2002	1514
	Unknown	4015	3260	2366	2130	1969	1667
Health Authority	Fraser Health	1918	1830	1698	1588	1450	1225
	Interior Health	546	527	450	420	386	272
	Island Health	895	862	812	756	698	542
	Northern Health	270	252	230	211	186	114
	Vancouver Coastal Health	4590	4381	4006	3789	3504	3035

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

	2012 Q3	Q4	2013 Q1	Q2	Q3	Q4	2014 Q1	Q2
< 3 CD4 Tests	18.1%	19.3%	17.5%	18.4%	17.9%	18.3%	21.9%	25.5%
< 3 Viral Load Tests	9.1%	10.0%	7.7%	8.7%	9.3%	8.4%	8.5%	7.9%
No Baseline Genotype	5.7%	6.0%	6.4%	5.6%	5.5%	5.3%	4.1%	4.0%
Baseline CD4 < 200 cells/μL	24.3%	22.2%	21.3%	20.6%	21.3%	20.6%	21.9%	24.1%
Non-Recommended ART	3.4%	2.9%	2.3%	2.8%	6.2%	9.4%	10.7%	11.3%
Non Viral suppression at 9 Mo.	36.7%	37.8%	36.0%	37.5%	37.8%	35.0%	35.6%	36.0%
PCS Score: 0	204	207	209	204	175	159	138	120
PCS Score: 1	149	150	149	138	130	137	125	132
PCS Score: 2	65	67	64	72	71	62	68	65
PCS Score: 3	43	45	39	40	32	26	24	24
PCS Score: 4 or more	13	13	8	7	10	10	10	12
<b>Total (n=)</b>	<b>474</b>	<b>482</b>	<b>469</b>	<b>461</b>	<b>418</b>	<b>394</b>	<b>365</b>	<b>353</b>

**Indicator 7: New DTP ARV Participants**

First Starts	94	91	97	92	112	75	106	91
Experienced Starts	89	111	91	111	114	127	119	132

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

CD4 ≥ 500	24	34	21	35	31	29	34	40
CD4 350–499	30	21	29	16	20	18	20	20
CD4 200–349	15	15	25	18	28	15	30	11
CD4 50–199	18	12	15	13	23	11	13	17
CD4 < 50	7	7	7	8	9	1	8	2
<i>CD4 Median (cells/μL)</i>	<i>370</i>	<i>430</i>	<i>360</i>	<i>381</i>	<i>300</i>	<i>430</i>	<i>360</i>	<i>470</i>
<b>Total (n=)</b>	<b>94</b>	<b>89</b>	<b>97</b>	<b>90</b>	<b>111</b>	<b>74</b>	<b>105</b>	<b>90</b>

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

Active DTP Participants	6403	6460	6497	6577	6647	6720	6819	6908
Inactive DTP Participants	1077	1080	1108	1095	1110	1112	1110	1116

**Indicator 10: Antiretroviral Adherence**

≥ 95%	100	77	99	88	63	68	76	71
80% to < 95%	27	22	21	20	24	13	12	14
40% to < 80%	9	14	6	9	8	10	8	9
< 40%	3	0	2	1	1	2	1	1
<b>Total (n=)</b>	<b>139</b>	<b>113</b>	<b>128</b>	<b>118</b>	<b>96</b>	<b>93</b>	<b>97</b>	<b>95</b>

**Indicator 11: Resistance Testing and Results**

Suppressed	4377	4239	4562	4582	4665	4505	4969	4907
Wild Type	934	984	940	900	860	820	749	708
Never Genotyped	113	102	87	82	86	61	69	63
1-Class	184	196	175	184	168	164	150	148
2-Class	36	44	43	49	38	33	26	29
3-Class	9	7	9	9	10	5	4	5
<b>Total (n=)</b>	<b>5653</b>	<b>5572</b>	<b>5816</b>	<b>5806</b>	<b>5827</b>	<b>5588</b>	<b>5967</b>	<b>5860</b>

**Indicator 12: AIDS-Defining Illness**

	2006	2007	2008	2009	2010	2011	2012	2013
CD4 < 200 at Cases	212	224	194	155	138	115	96	90
ART initiation <i>Rate per 100,000</i>	<i>5.0</i>	<i>5.2</i>	<i>4.4</i>	<i>3.5</i>	<i>3.0</i>	<i>2.5</i>	<i>2.1</i>	<i>1.9</i>
AIDS Cases Cases	140	119	120	91	89	65	46	23
(DTP Reports) <i>Rate per 100,000</i>	<i>3.3</i>	<i>2.8</i>	<i>2.7</i>	<i>2.0</i>	<i>2.0</i>	<i>1.4</i>	<i>1.0</i>	<i>0.5</i>
AIDS Cases Cases	148	132	136	111	99	81	58	–
(BCCDC Reports) <i>Rate per 100,000</i>	<i>3.5</i>	<i>3.1</i>	<i>3.1</i>	<i>2.5</i>	<i>2.2</i>	<i>1.8</i>	<i>1.3</i>	<i>–</i>

**Indicator 13: HIV-Related Mortality**

	2004	2005	2006	2007	2008	2009	2010	2011
British Columbia	105	146	142	100	79	63	54	59
Per 100 HIV+ Population	1.03	1.40	1.34	0.93	0.72	0.56	0.47	0.50
Per 100,000 Population	2.50	3.43	3.29	2.28	1.80	1.41	1.19	1.29