



BRITISH COLUMBIA
CENTRE *for* EXCELLENCE
in HIV/AIDS

HIV MONITORING QUARTERLY REPORT **FOR BRITISH COLUMBIA**

SECOND QUARTER 2016



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. HIV 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 Therapy Starts

Indicator 8. CD4 Cell Count at ART Initiation

Indicator 9. Active and Inactive Drug Treatment Program (DTP) Participants

Indicator 10. Antiretroviral Adherence

Indicator 11. Resistance Testing and Results

Indicator 12. AIDS-Defining Illness

Indicator 13. HIV-Related Mortality

Table of Contents

Acknowledgements and Contributions

BC Provincial STOP Program:

A Note on Monitoring and Interpreting Hiv Indicators

Indicator 1 Hiv Testing Episodes *All HIV Testing Episodes reflect non-prenatal tests. All prenatal tests have been removed.*

Figure 1.1 Hiv Test Episodes for BC, 2011 Q3–2016 Q2

Figure 1.2 Hiv Test Episodes for BC by Gender, 2011 Q3–2016 Q2

Figure 1.3 Hiv Test Episodes for BC by Age Category, 2011 Q3–2016 Q2

Figure 1.4 Point-of-Care Hiv Tests for BC, 2011 Q3–2016 Q2

Figure 1.5 Hiv Test Episodes by Health Authority for BC, 2011 Q3–2016 Q2

Figure 1.6 Hiv Test Episodes for Non-Prenatal Females in BC by Health Authority, 2011 Q3–2016 Q2

Figure 1.7 Hiv Test Episodes for Males in BC by Health Authority, 2011 Q3–2016 Q2

Indicator 2 Hiv Testing Rates *All HIV Testing Rates reflect non-prenatal tests. All prenatal tests have been removed.*

Figure 2.1 Rate of Hiv Testing for BC and Health Authorities, 2009–2015

Figure 2.2 Rate of Hiv Testing for BC by Gender, 2009–2015

Figure 2.3 Rate of Hiv Testing for BC by Age Category, 2009–2015

Indicator 3 New Hiv Diagnoses

Figure 3.1 New Hiv Diagnoses for BC, 2011 Q3–2016 Q2

Figure 3.2 New Hiv Diagnoses for BC by Gender, 2011 Q3–2016 Q2

Figure 3.3 New Hiv Diagnoses for BC by Age Category, 2011 Q3–2016 Q2

Figure 3.4 New Hiv Diagnoses for BC by Exposure Category, 2011 Q1–2015 Q2

Figure 3.5 New Hiv Diagnoses for BC by Health Authority, 2011 Q3–2016 Q2

Indicator 4 Stage of Hiv Infection at Diagnosis *Stage definitions have been altered to remove AIDS diagnosis data. Individuals previously classified as Stage 3 have been re-classified based on CD4 cell count.*

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

Figure 4.1 Stage of Hiv Infection at Diagnosis for BC, 2011–2015

Figure 4.2 Stage of Hiv Infection at Diagnosis for BC by Gender, 2011–2015

Figure 4.3 Stage of Hiv Infection at Diagnosis for BC by Age Category, 2011–2015

Figure 4.4 Stage of Hiv Infection at Diagnosis for BC by Exposure Category, 2011–2015

Indicator 5 Hiv Cascade of Care

Figure 5.1 Estimated Cascade of Care for BC, Year Ending 2016 Q2

Figure 5.2 Estimated Cascade of Care for BC by Gender, Year Ending 2016 Q2

Figure 5.3 Estimated Cascade of Care for BC by Age Category, Year Ending 2016 Q2

Figure 5.4 Estimated Cascade of Care for BC by MSM Status, Year Ending 2016 Q2

Figure 5.5	Estimated Cascade of Care for BC by Age Category and MSM Status, Year Ending 2016 Q2
Figure 5.6	Estimated Cascade of Care for BC by PWID Status, Year Ending 2016 Q2
Figure 5.7	Estimated Cascade of Care for BC by Health Authority, Year Ending 2016 Q2
Indicator 6	Programmatic Compliance Score (PCS)
Table 2	Probability of Mortality, Immunologic Failure and Virologic Failure Based on the Programmatic Compliance Score
Figure 6.1	PCS Components for BC, 2014 Q3–2016 Q2 <ul style="list-style-type: none"> Less than 3 CD4 Tests in First Year Less than 3 Viral Load Tests in First Year Not Having Drug Resistance Testing at Baseline Non-Recommended Antiretroviral Therapy Regimen (ART) Baseline CD4 < 200 cells/μL Not Achieving Viral Suppression at 9 Months
Figure 6.2	Historical Trends for PCS Score for BC, 2014 Q3–2016 Q2
Indicator 7	New Antiretroviral Therapy Starts in BC
Figure 7	BC-CfE Drug Treatment Program Enrollment: New Antiretroviral Participants for BC, 2014 Q3–2016 Q2
Indicator 8	CD4 Cell Count at ART Initiation
Figure 8	CD4 Cell Count at ART Initiation for BC, 2014 Q3–2016 Q2
Indicator 9	Active and Inactive Drug Treatment Program (DTP) Participants
Table 3	Distribution of People on ART in BC, 2016 Q2
Figure 9	Active and Inactive DTP Participants for BC, 2014 Q3–2016 Q2
Indicator 10	Antiretroviral Adherence
Figure 10	Distribution of Individuals by Adherence Level in 1st Year of Therapy, Based on Pharmacy Refill Compliance for BC, 2014 Q3–2016 Q2
Indicator 11	Resistance Testing and Results
Figure 11	Cumulative Resistance Testing Results by Resistance Category for BC, 2014 Q3–2016 Q2
Indicator 12	AIDS-Defining Illness
Figure 12	AIDS Case Rate and Reports for BC, 2008–2015
Indicator 13	HIV-Related Mortality
Figure 13	HIV-Related Deaths by Year for BC, 2004–2011

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. James Nakagawa is responsible for compiling and publishing this report. Lilith Swetland is the editor of this report. Paul Sereda, Dr. Viviane Lima and Nada Gataric perform analysis of Indicators 5–13. This report was conceived and guided by Dr. Julio Montaner.



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

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. Olga Mazo, Theodora Consolacion and Dr. Jason Wong 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

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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 Health Service Delivery Areas (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 British Columbia

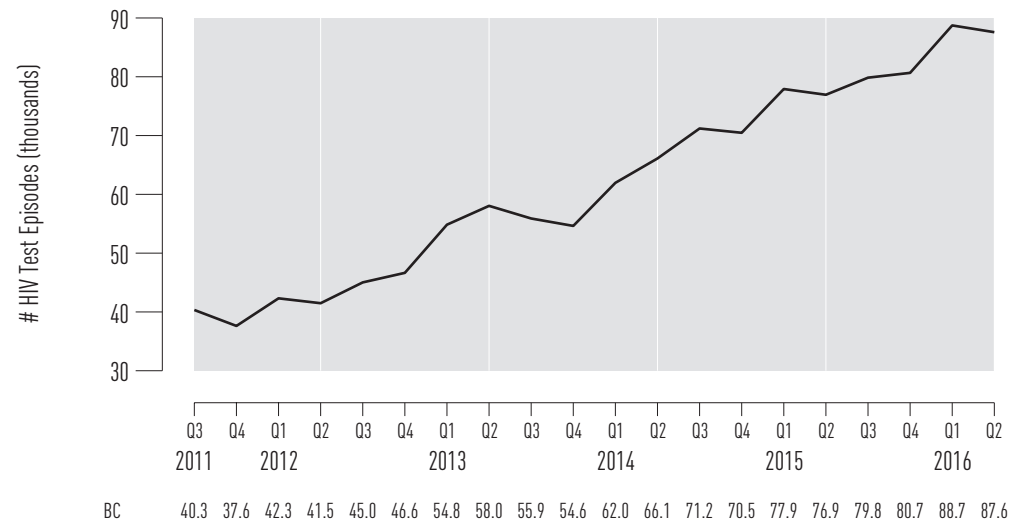


Figure 1.2 HIV Test Episodes by Gender for British Columbia ^{1,2}

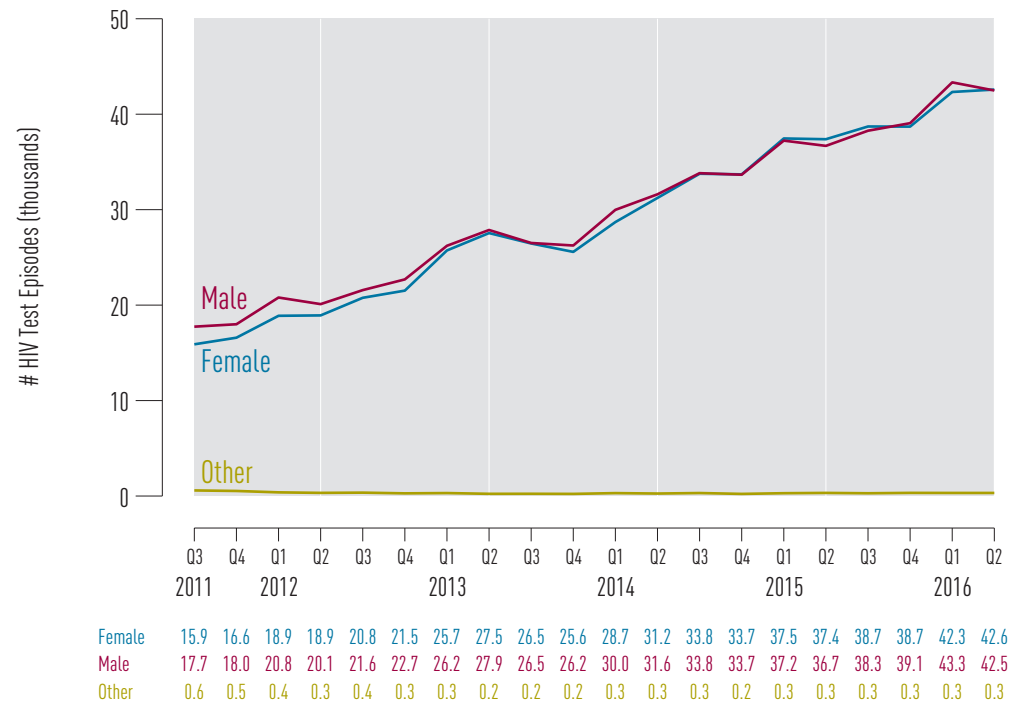


Figure 1.3 HIV Test Episodes by Age Category for British Columbia ^{1,2}

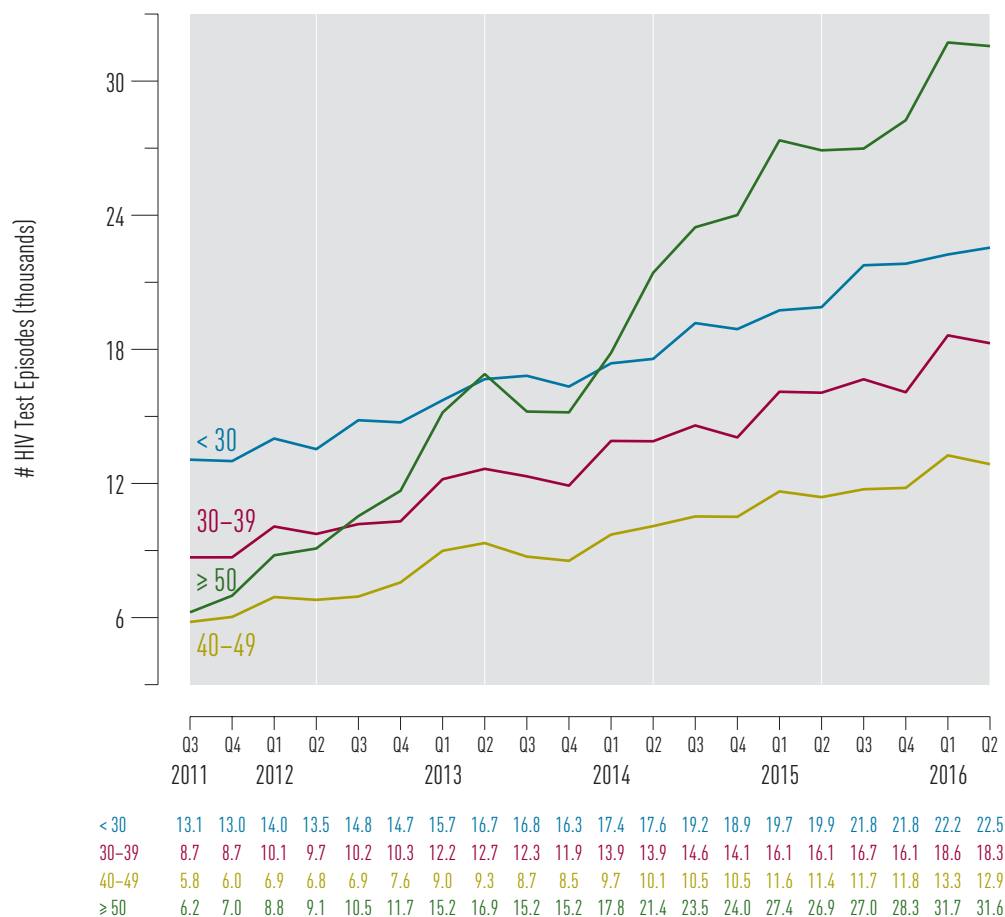
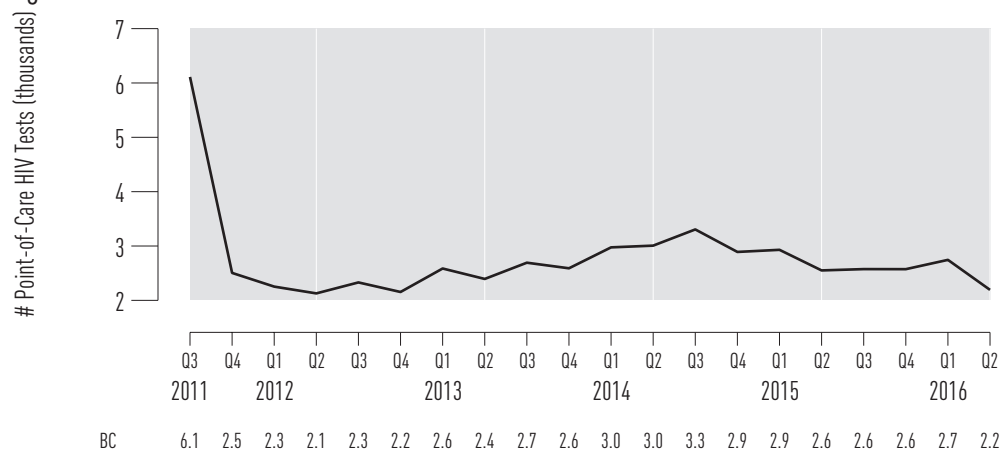


Figure 1.4 Point-of-Care HIV Tests for British Columbia



1 Data Source: The BC Public Health Microbiology and Reference Laboratory (BCPHMRL) courtesy of the BC Centre for Disease Control (BCCDC). HIV screening tests conducted by the VHA Laboratory are not included.

Limitation: Repeat tests in individuals who test using various identifiers may not be identified and these individuals may be counted more than once.

2 Testing does not include point of care tests.

Figure 1.5 HIV Test Episodes for British Columbia by Health Authority ¹

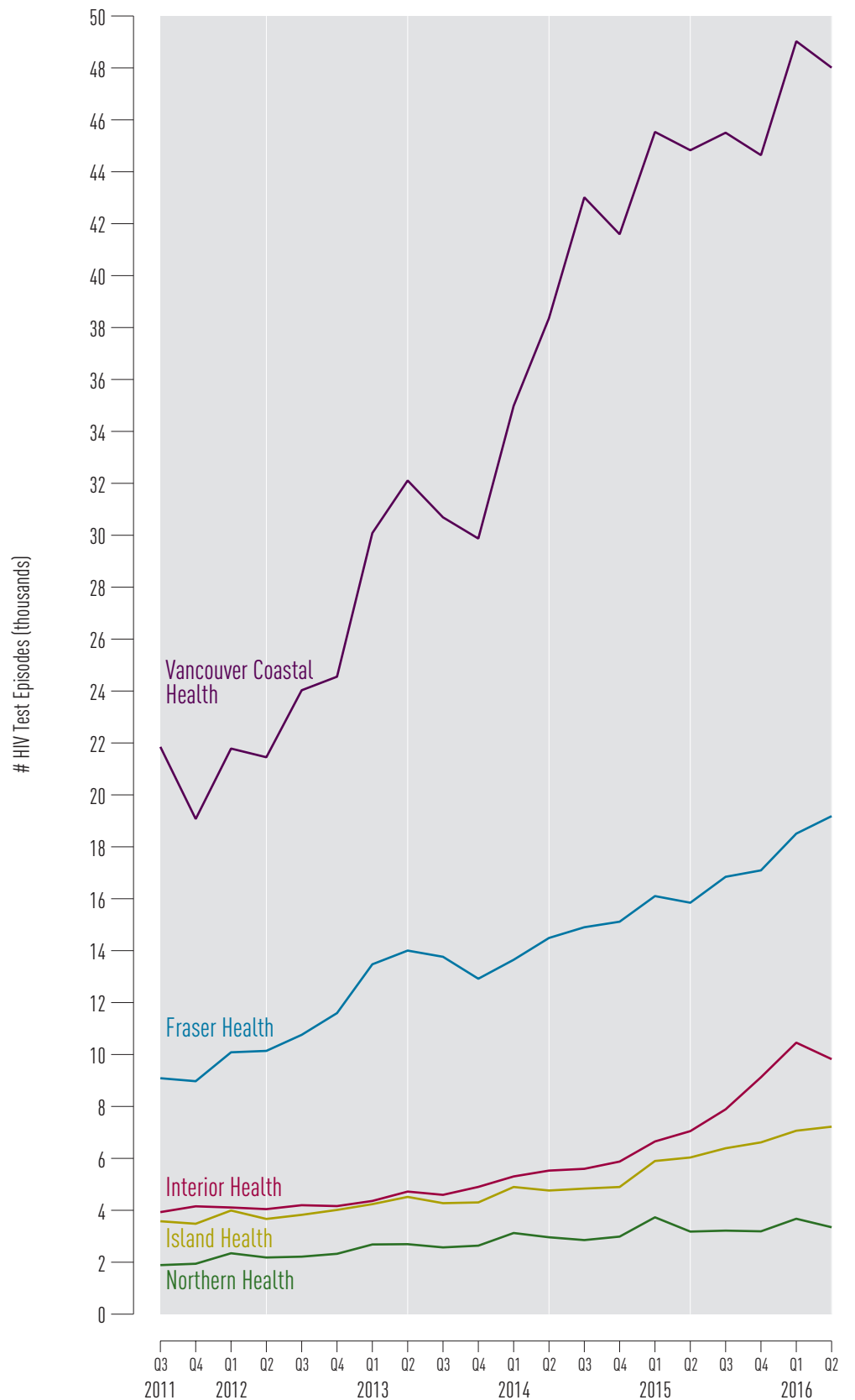


Figure 1.6 HIV Test Episodes for Non-prenatal Females in BC by Health Authority ^{1,2}

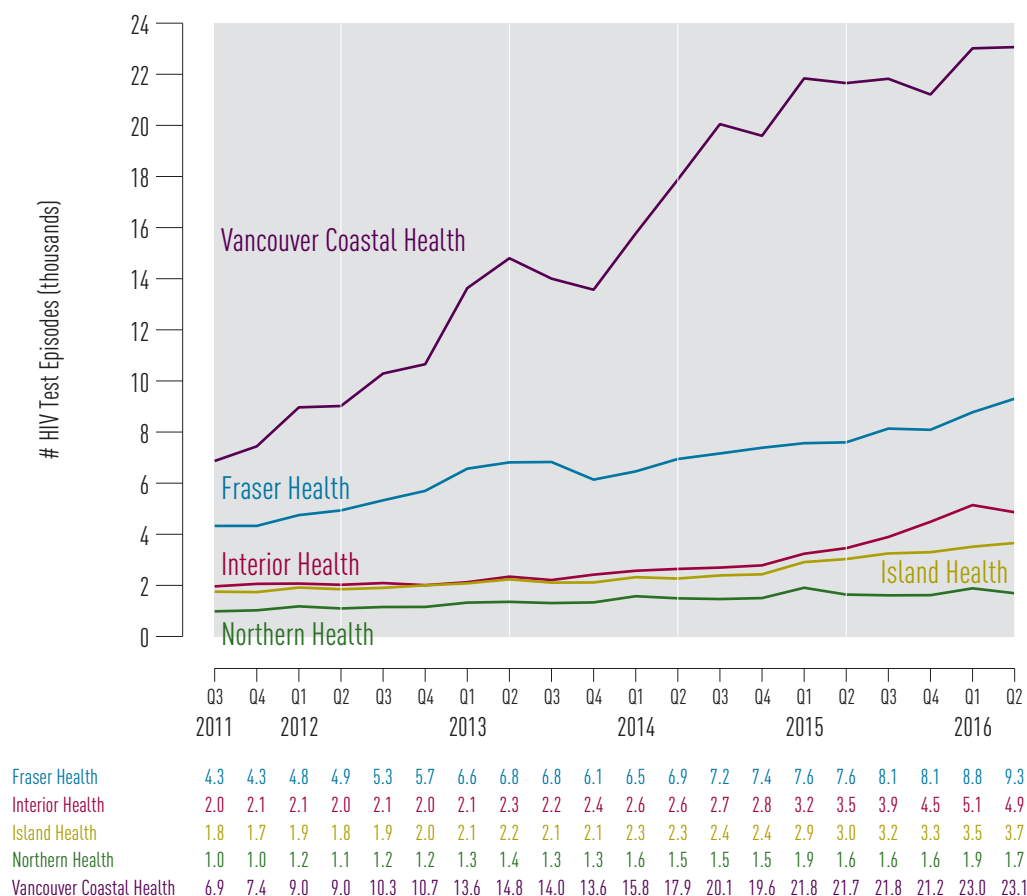
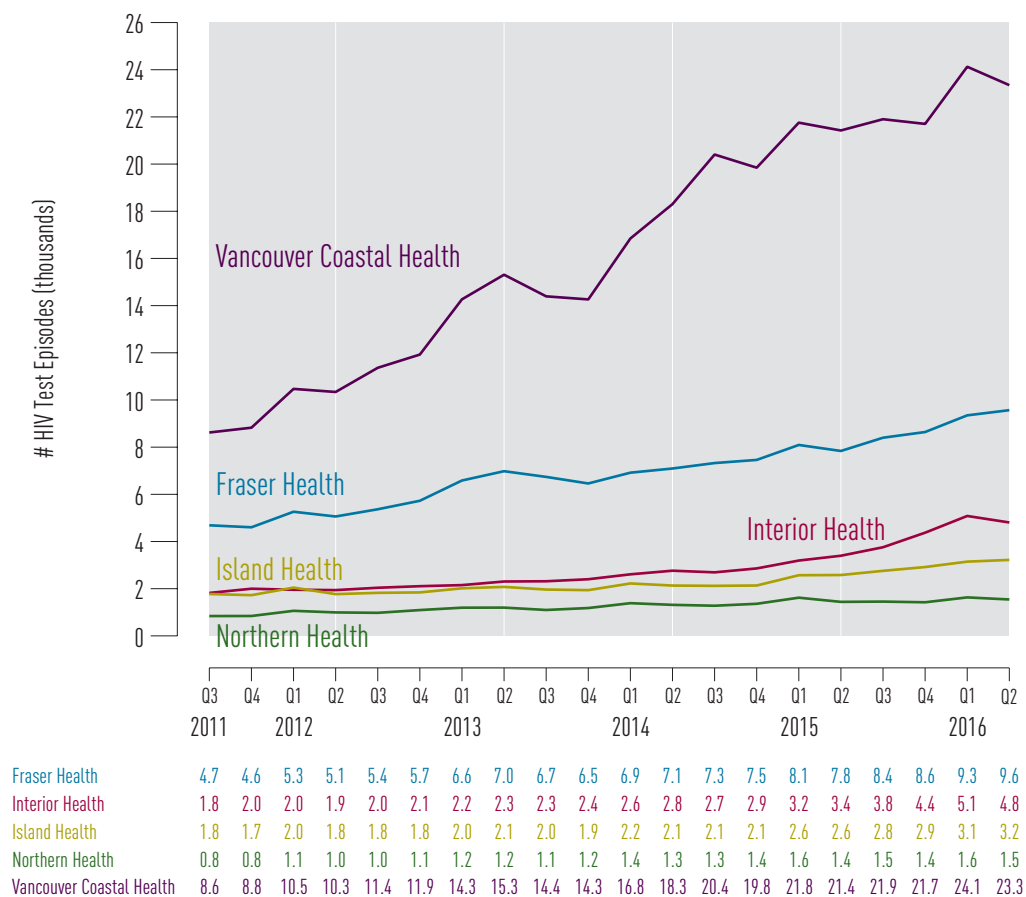


Figure 1.7 HIV Test Episodes for Males in British Columbia by Health Authority ^{1,2}



Indicator 2. HIV Testing Rates

Figure 2.1 Rate of HIV Testing for British Columbia and Health Authorities ²

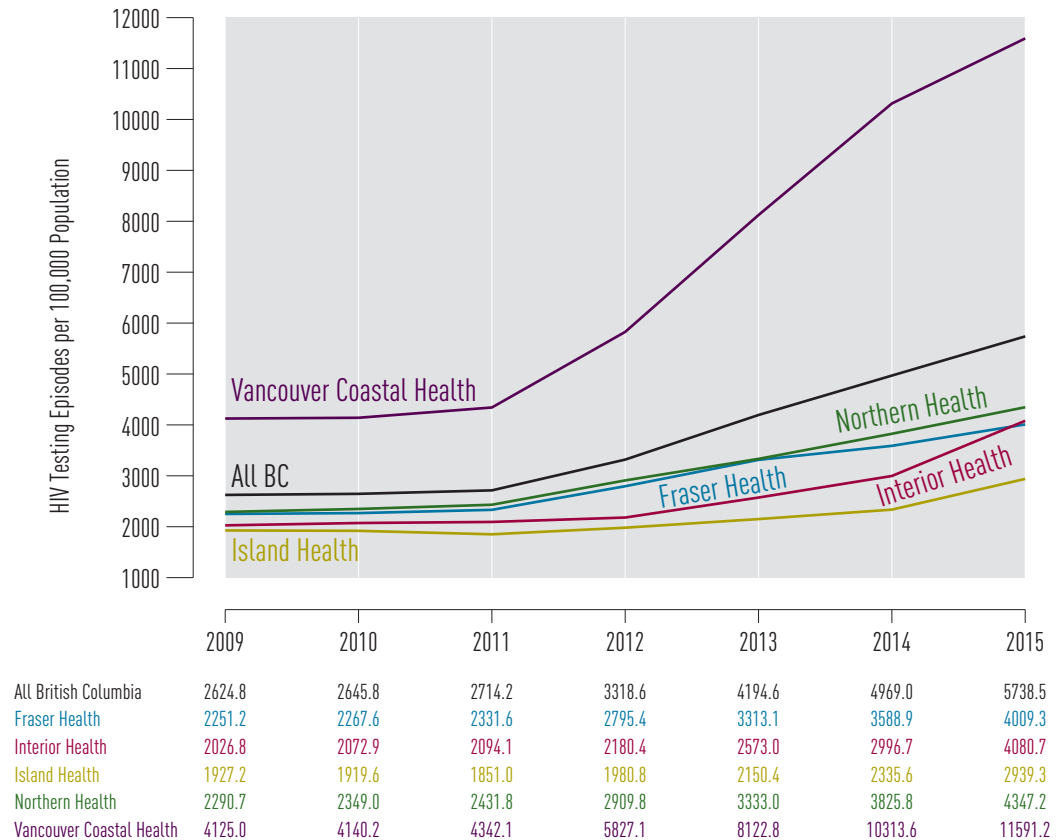


Figure 2.2 Rate of HIV Testing by Gender for British Columbia ²

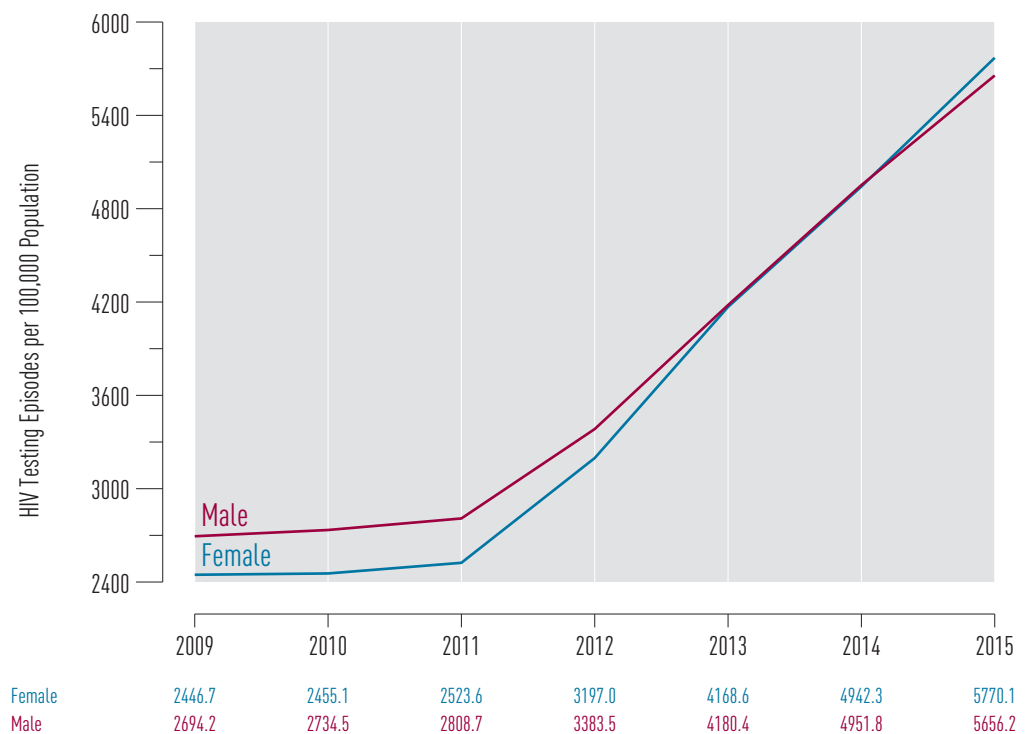
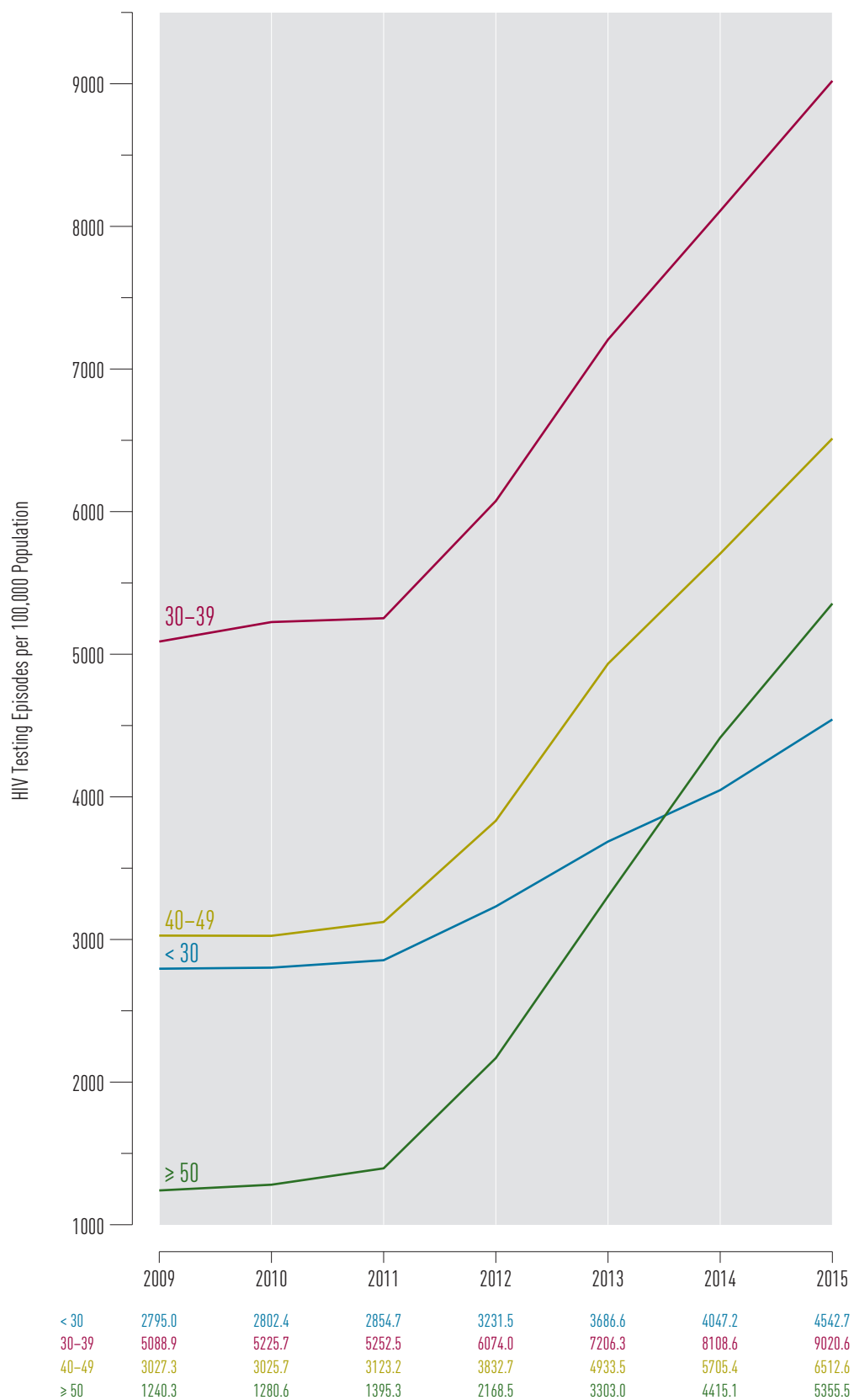


Figure 2.3 Rate of HIV Testing by Age Category for British Columbia ²



² 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 British Columbia³

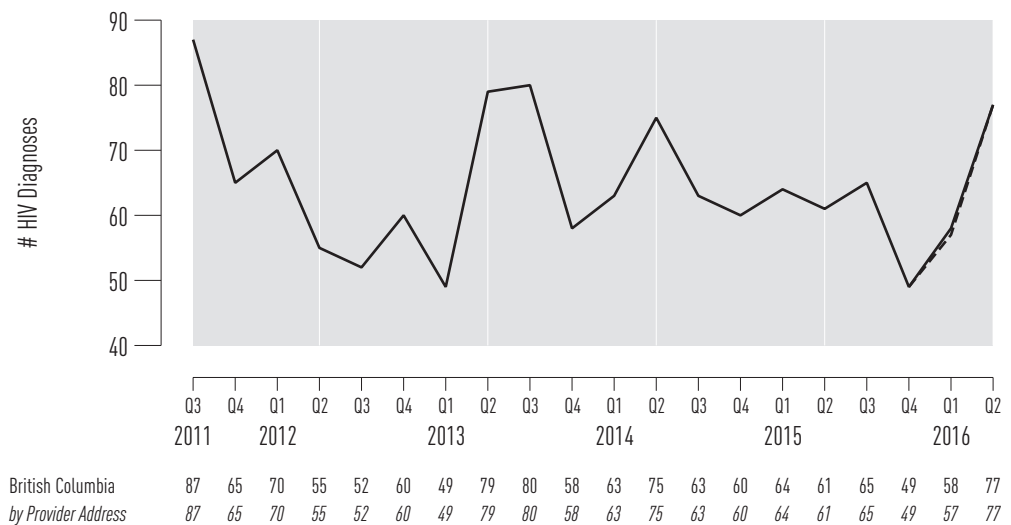
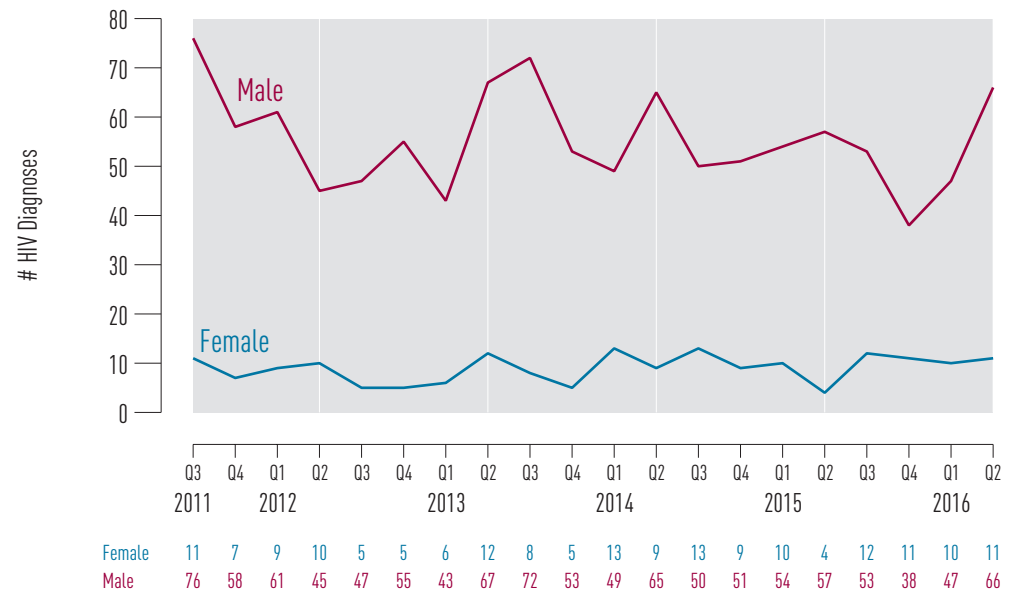


Figure 3.2 New HIV Diagnoses for BC by Gender³



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

Figure 3.3 New HIV Diagnoses for British Columbia by Age Category ³

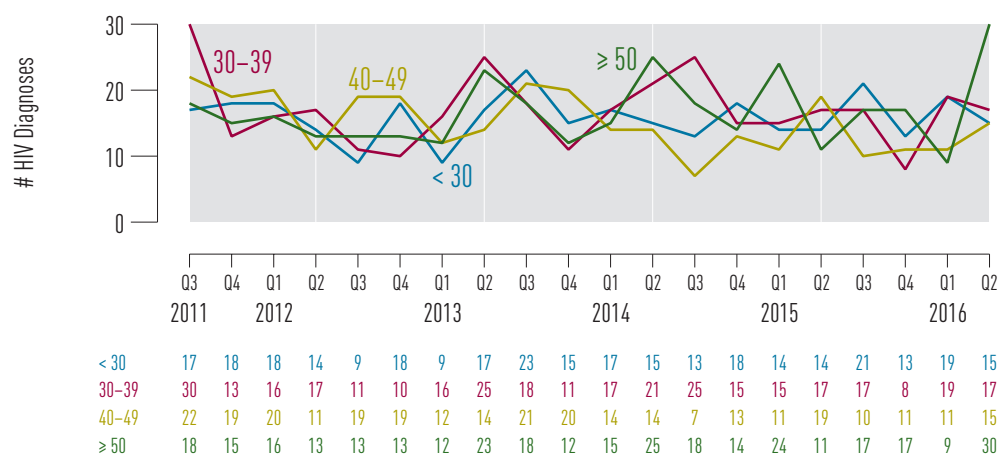
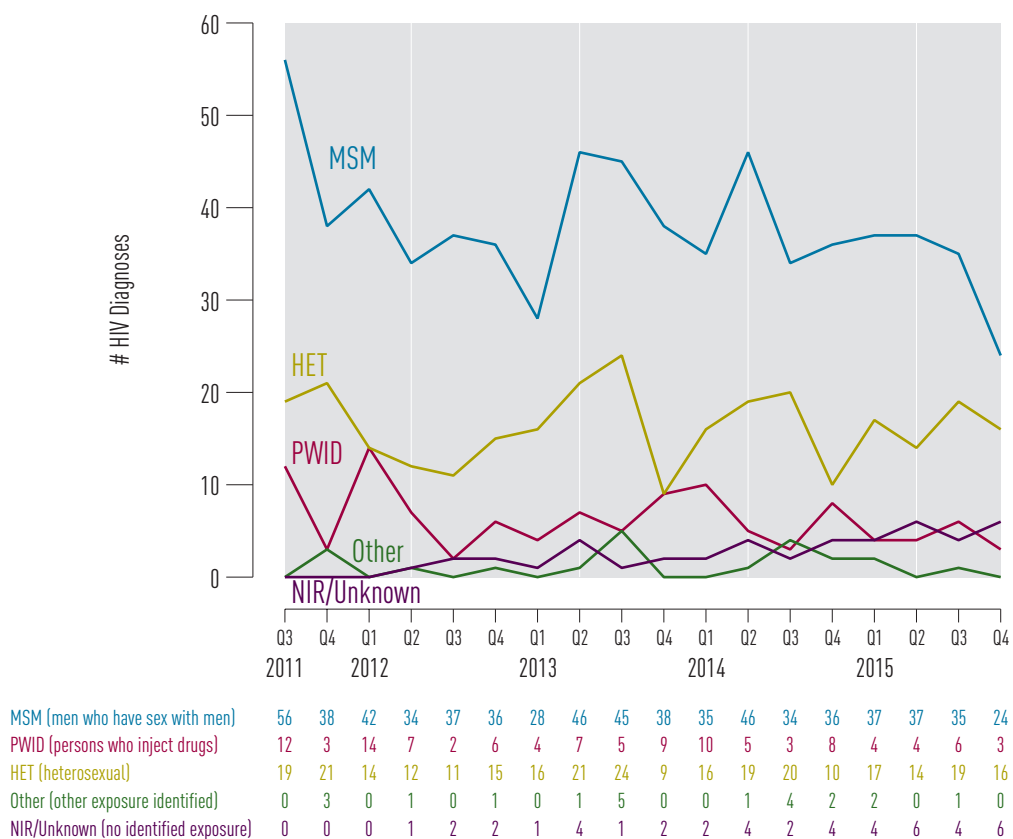


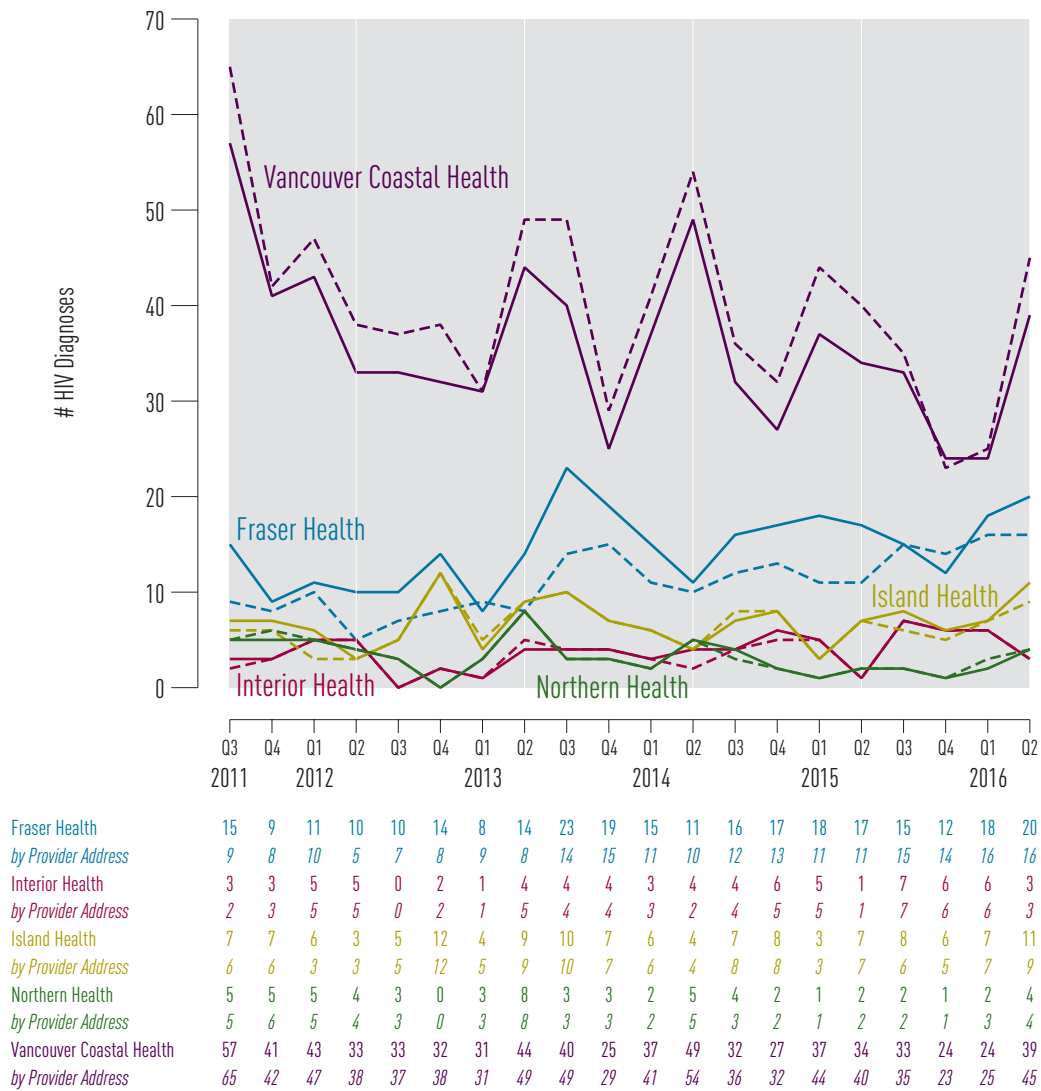
Figure 3.4 New HIV Diagnoses for BC by Exposure Category ^{3,4}



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

⁴ MSM=men who have sex with men; PWID=people who inject drugs; HET=heterosexual. NIR=No identified risk/exposure.

Figure 3.5 New HIV Diagnoses for British Columbia by Health Authority ³



³ Data Source: BCCDC. When present, "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 and laboratory results suggestive of acute HIV infection (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 <i>and</i>	CD4 ≥500
2a		CD4 350–499
2b		CD4 200–349
3		CD4 <200
Unknown		No available CD4

Updated 2016 Q1: AIDS diagnosis date is no longer used in this indicator.

Updated 2016 Q1: AIDS diagnosis date is no longer used in this indicator.

Figure 4.1 Stage of HIV Infection at Diagnosis for BC, 2011–2015⁵

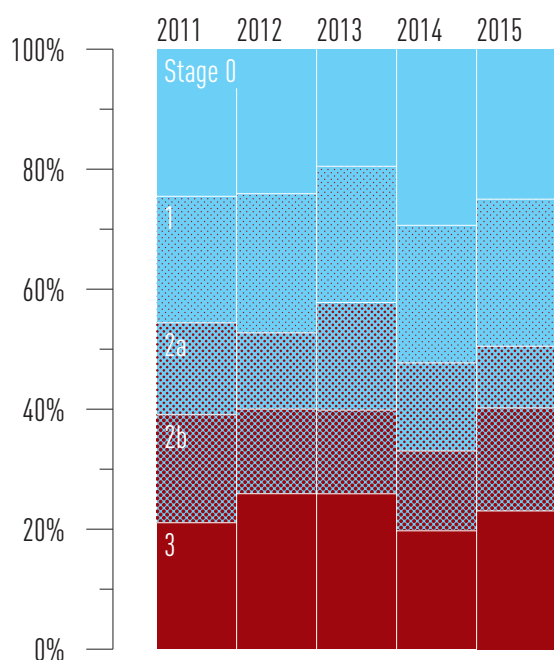
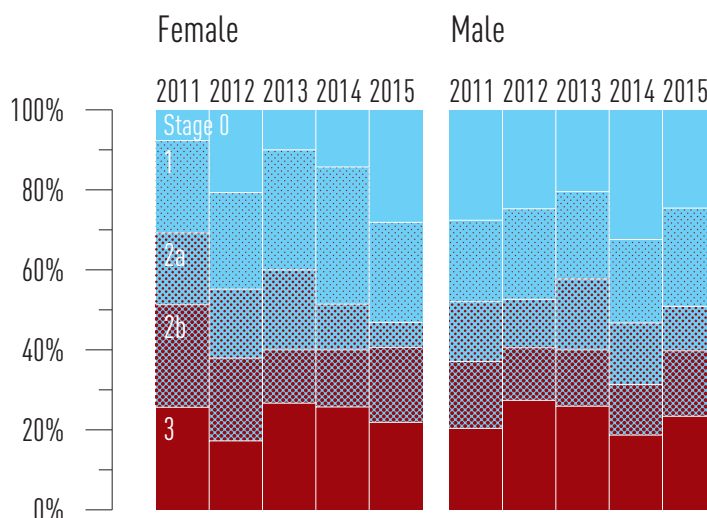


Figure 4.2 Stage of HIV Infection at Diagnosis by Gender for BC, 2011–2015⁵



	British Columbia					Female					Male				
	2011	'12	'13	'14	'15	'11	'12	'13	'14	'15	'11	'12	'13	'14	'15
Stage 0	64	53	49	64	51	3	6	3	5	9	61	47	45	59	42
Stage 1	55	51	57	50	50	9	7	9	12	8	45	43	48	38	42
Stage 2a	40	28	45	32	21	7	5	6	4	2	33	23	39	28	19
Stage 2b	47	31	35	29	35	10	6	4	5	6	37	25	31	23	28
Stage 3	55	57	65	43	47	10	5	8	9	7	45	52	57	34	40
Unknown	27	16	14	42	34	4	1	1	10	6	22	15	13	32	28
Total (n=)	288	236	265	260	238	43	30	31	45	38	243	205	233	214	199

Figure 4.3 Stage of HIV Infection at Diagnosis by Age Category for BC, 2011–2015 ⁵

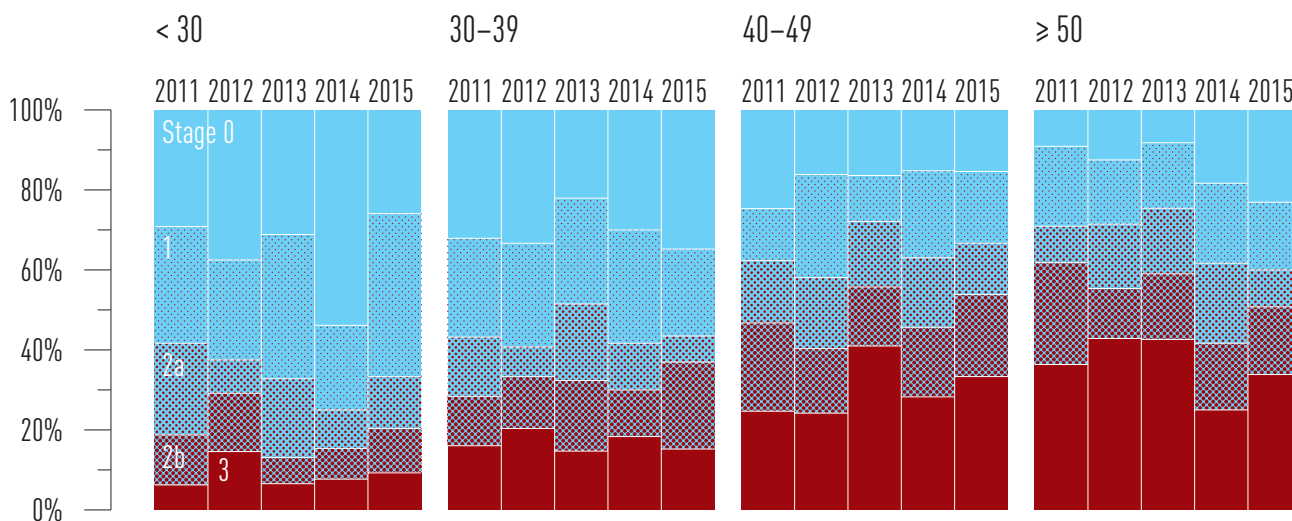
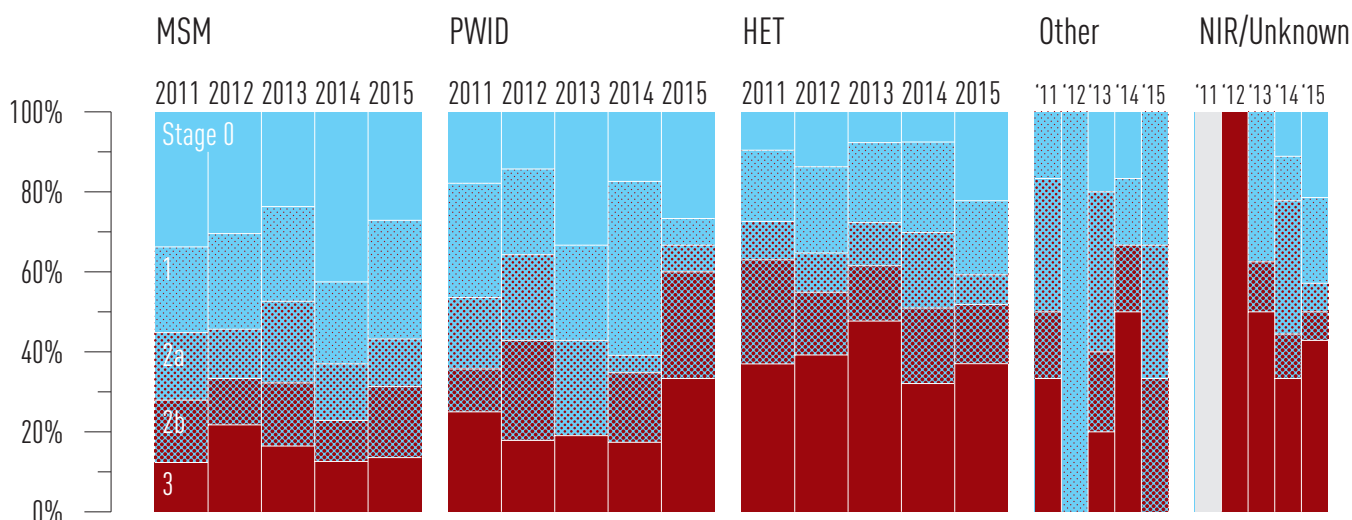


Figure 4.4 Stage of HIV Infection at Diagnosis by Exposure Category for BC, 2011–2015 ^{5,6}



	< 30 years					30–39 years					40–49 years					≥ 50 years					MSM					PWID					Heterosexual					Other					NIR/Unknown				
	2011	12	13	14	15	11	12	13	14	15	11	12	13	14	15	11	12	13	14	15	11	12	13	14	15	11	12	13	14	15	11	12	13	14	15	11	12	13	14	15					
Stage 0	14	18	19	28	14	26	18	15	18	16	19	10	10	7	6	5	7	5	11	15	52	42	36	54	32	5	4	7	4	4	7	7	5	4	12	0	0	1	1	0	0	0	1	3	
Stage 1	14	12	22	11	22	20	14	18	17	10	10	16	7	10	7	11	9	10	12	11	33	33	36	26	35	8	6	5	10	1	13	11	13	12	10	1	1	0	1	1	0	0	3	1	3
Stage 2a	11	4	12	5	7	12	4	13	7	3	12	11	10	8	5	5	9	10	12	6	26	17	31	18	14	5	6	5	1	1	7	5	7	10	4	2	0	2	0	1	0	0	3	1	
Stage 2b	6	7	4	4	6	10	7	12	7	10	17	10	9	8	8	14	7	10	10	11	24	16	24	13	21	3	7	0	4	4	19	8	9	10	8	1	0	1	1	1	0	0	1	1	1
Stage 3	3	7	4	4	5	13	11	10	11	7	19	15	25	13	13	20	24	26	15	22	19	30	25	16	16	7	5	4	4	5	27	20	31	17	20	2	0	1	3	0	0	2	4	3	6
Unknown	6	7	0	8	4	11	3	4	13	12	5	2	4	9	10	5	4	6	12	8	16	10	4	23	14	6	1	4	3	2	2	1	5	12	12	1	1	1	1	0	2	3	0	3	6
Total (n=)	54	55	61	60	58	92	57	72	73	58	82	64	65	55	49	60	60	67	72	73	170	148	156	150	132	34	29	25	26	17	75	52	70	65	66	7	2	6	7	3	2	5	8	12	20

⁵ Data Source: BCCDC

⁶ MSM=men who have sex with men; PWID=people who inject drugs; HET=heterosexual. NIR=No identified risk/exposure.

HIV Cascade of Care

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. Linked to HIV care, 3. Retained in HIV care, 4. On ART, 5. Adherent to ART and 6. Achieving a suppressed VL; collectively, they are referred to as the cascade of care. Attrition 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 (i.e. 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 period 2015 Q3–2016 Q2 in BC overall and stratified by sex and age for each Health Authority.

Figure 5.1 Estimated Cascade of Care for British Columbia, Year Ending 2016 Q2 ⁷
n=10130

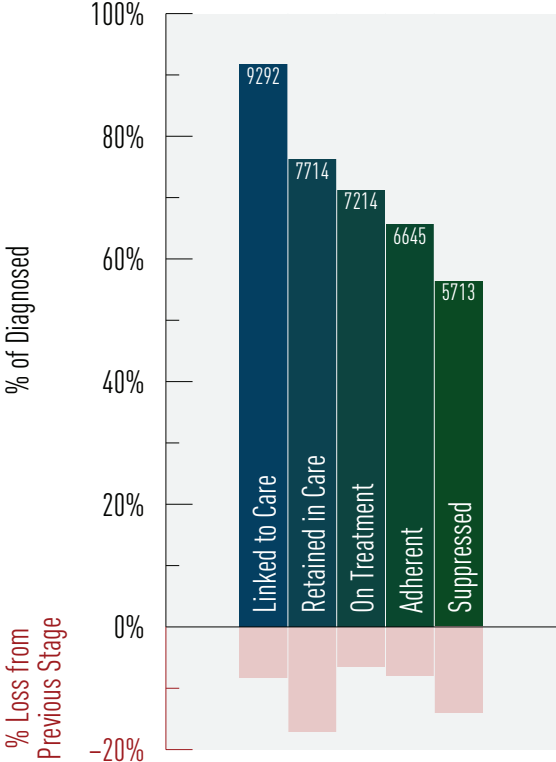
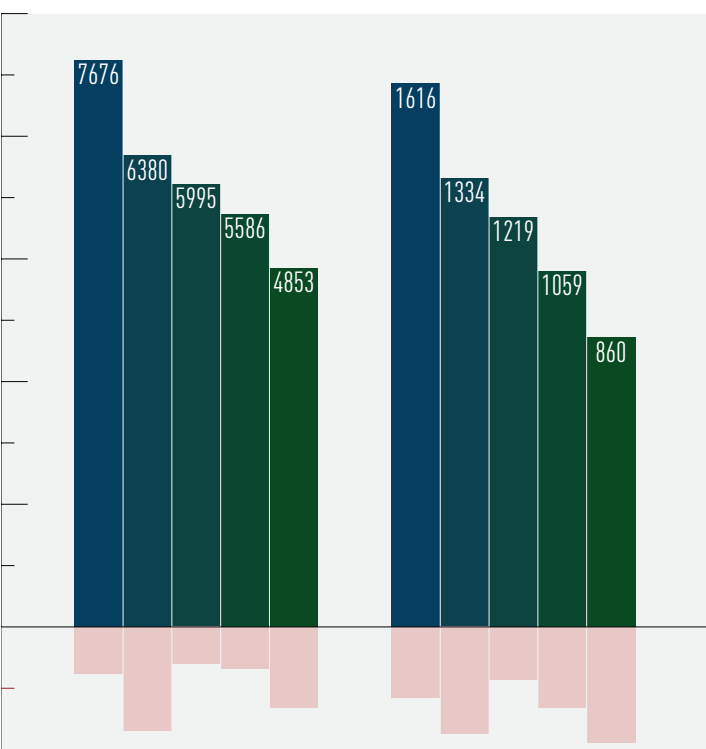


Figure 5.2 Estimated Cascade of Care for British Columbia by Gender, Year Ending 2016 Q2 ⁷
Men n=8305, Women n=1825



⁷ Data is for the period 2015 Q3–2016 Q2.

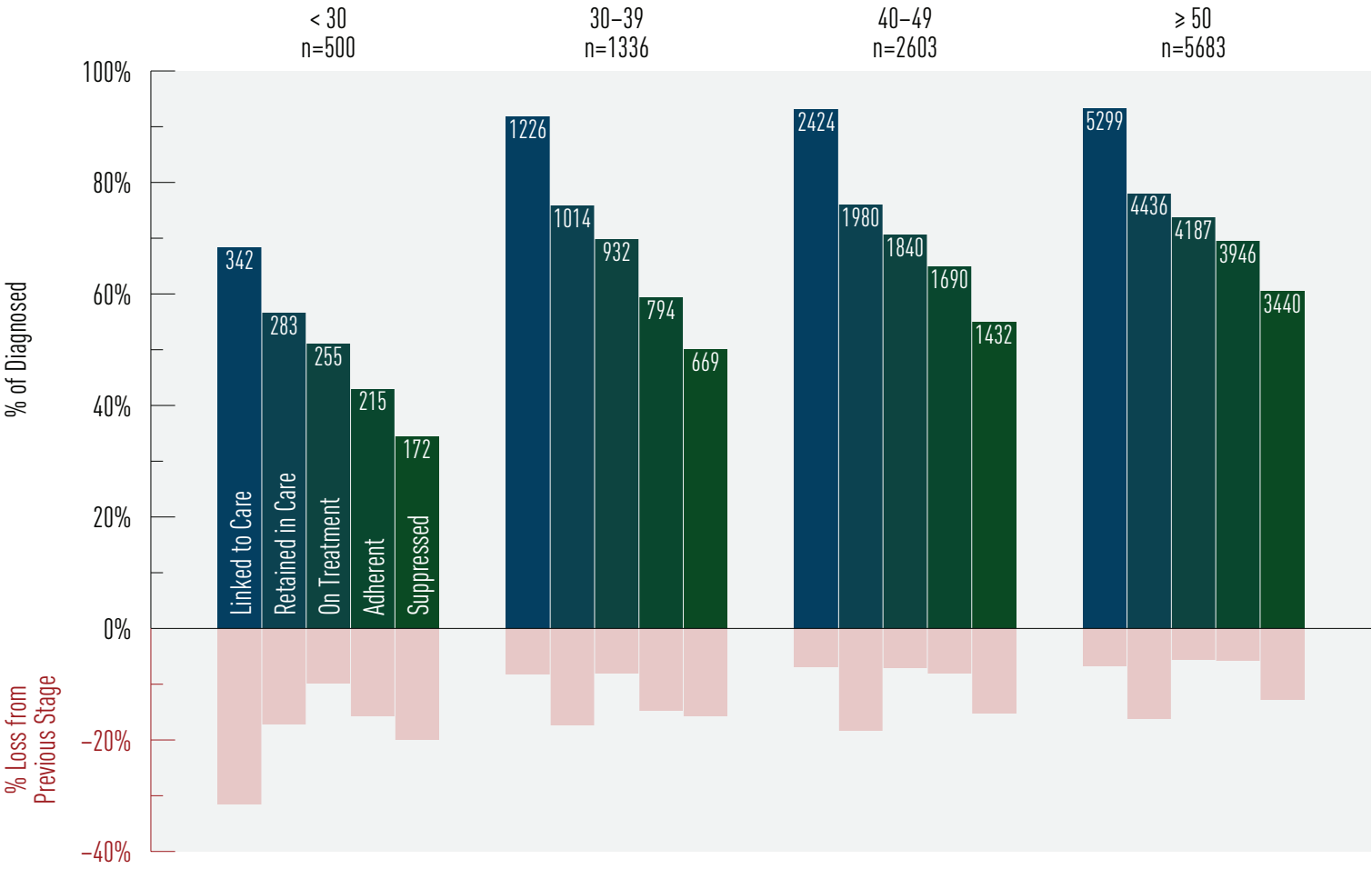
Data Sources:

- i British Columbia Centre for Excellence Drug Treatment Program (DTP) Database (ARV use, VL and CD4 count).
- ii 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.

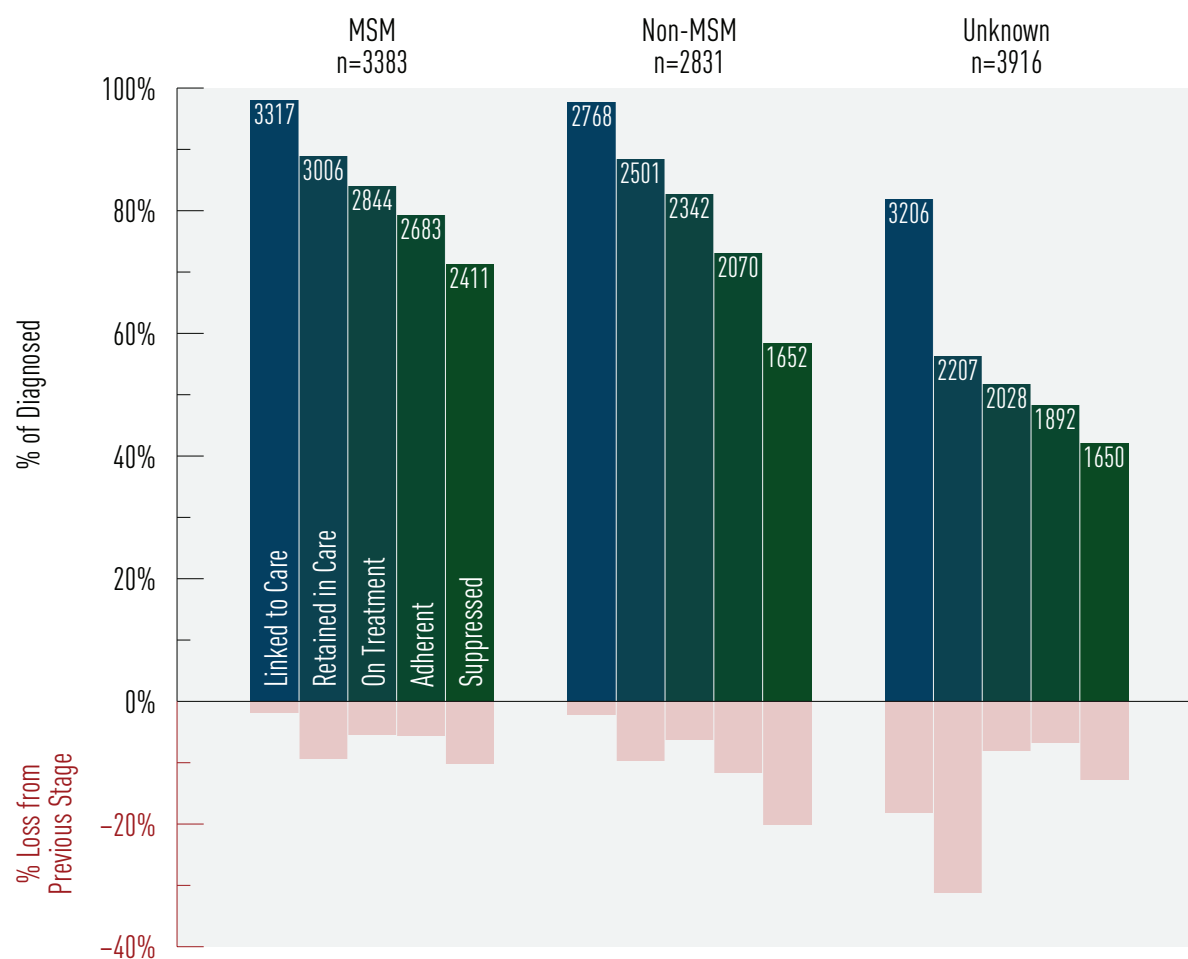
NB: Transgender have been assigned to their biological sex.

Figure 5.3 Estimated Cascade of Care for British Columbia by Age Category, Year Ending 2016 Q2 ⁸



⁸ Data is for the period 2015 Q3–2016 Q2.
Data Sources:
i British Columbia Centre for Excellence Drug Treatment Program (DTP) Database (ARV use, VL and CD4 count).
ii 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 British Columbia by MSM Status, Year Ending 2016 Q2 ⁹



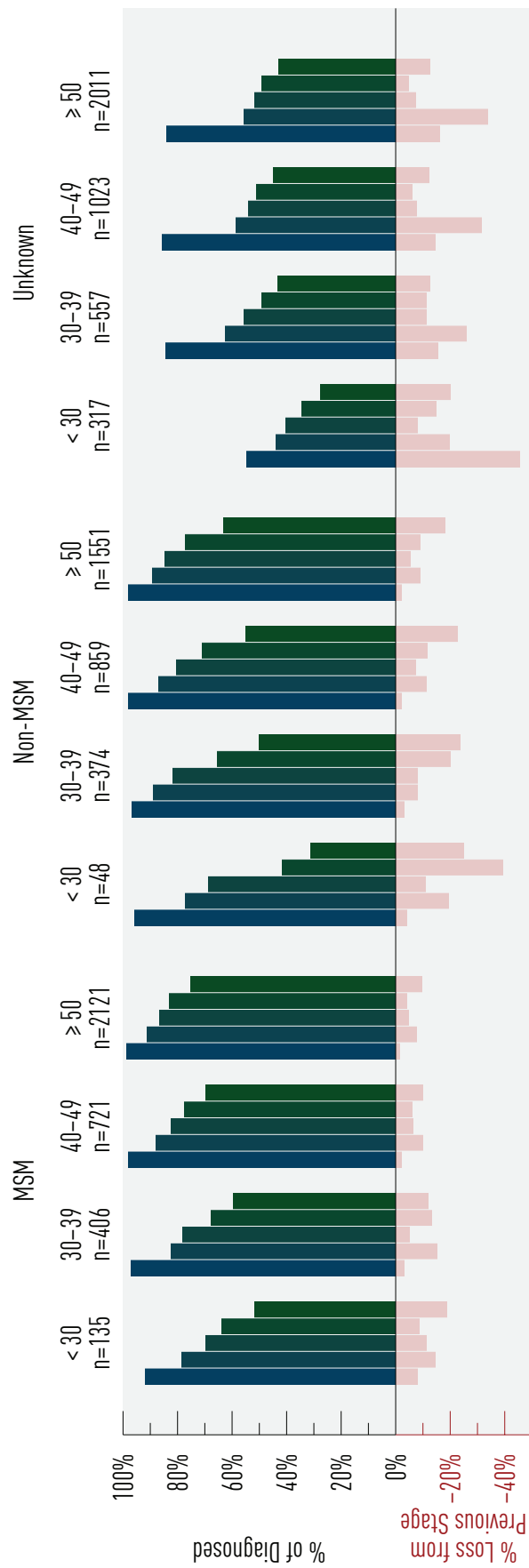
⁹ Data is for the period 2015 Q3–2016 Q2.

Data Sources:

- i British Columbia Centre for Excellence Drug Treatment Program (DTP) Database (ARV use, VL and CD4 count).
- ii 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 British Columbia by Age Category and MSM Status, Year Ending 2016 Q2 ⁹



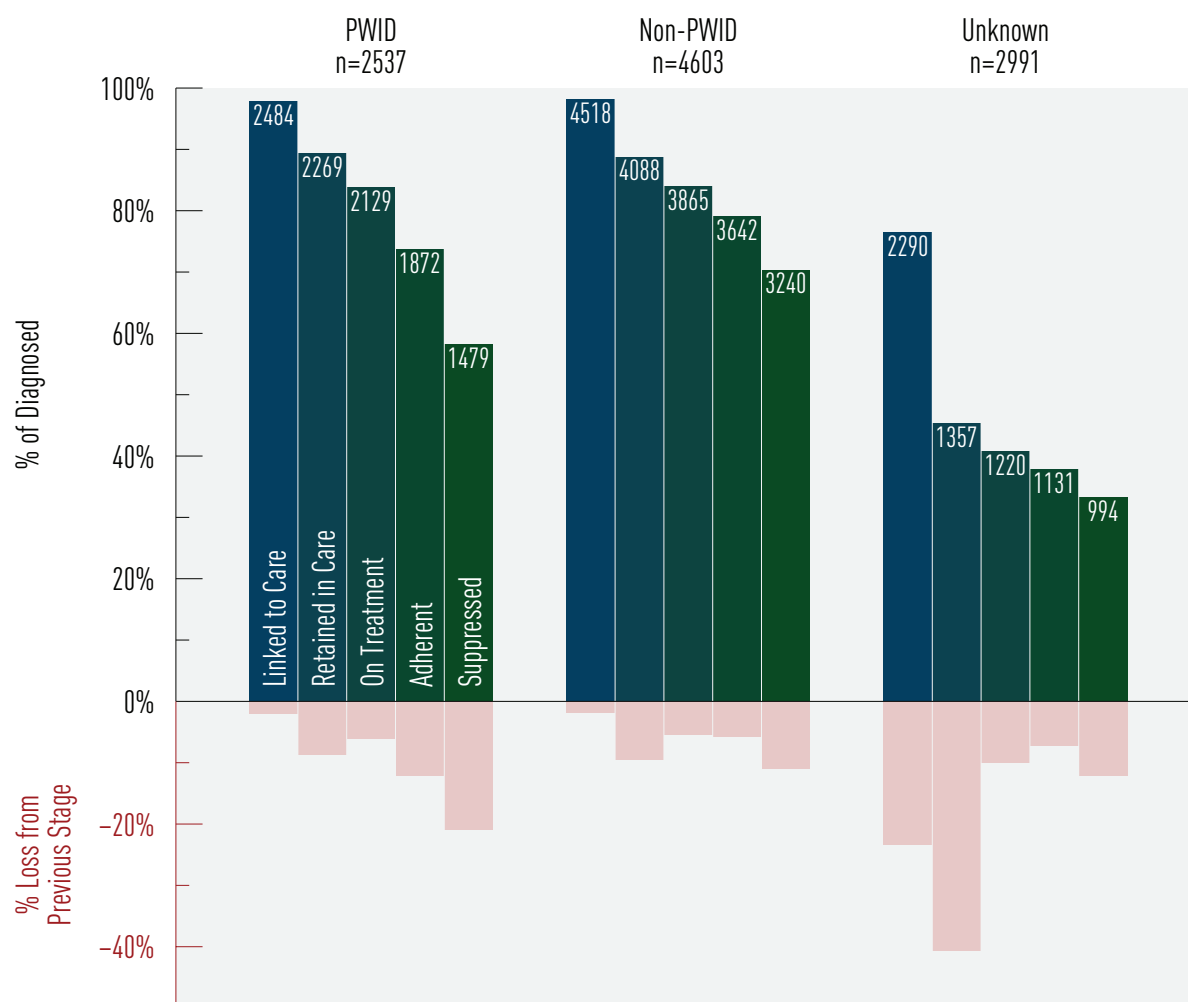
⁹ Data is for the period 2015 Q3–2016 Q2.

Data Sources:

- i British Columbia Centre for Excellence Drug Treatment Program (DTP) Database (ARV use, VL and CD4 count).
- ii 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 British Columbia by History of IDU, Year Ending 2016 Q2 ⁹



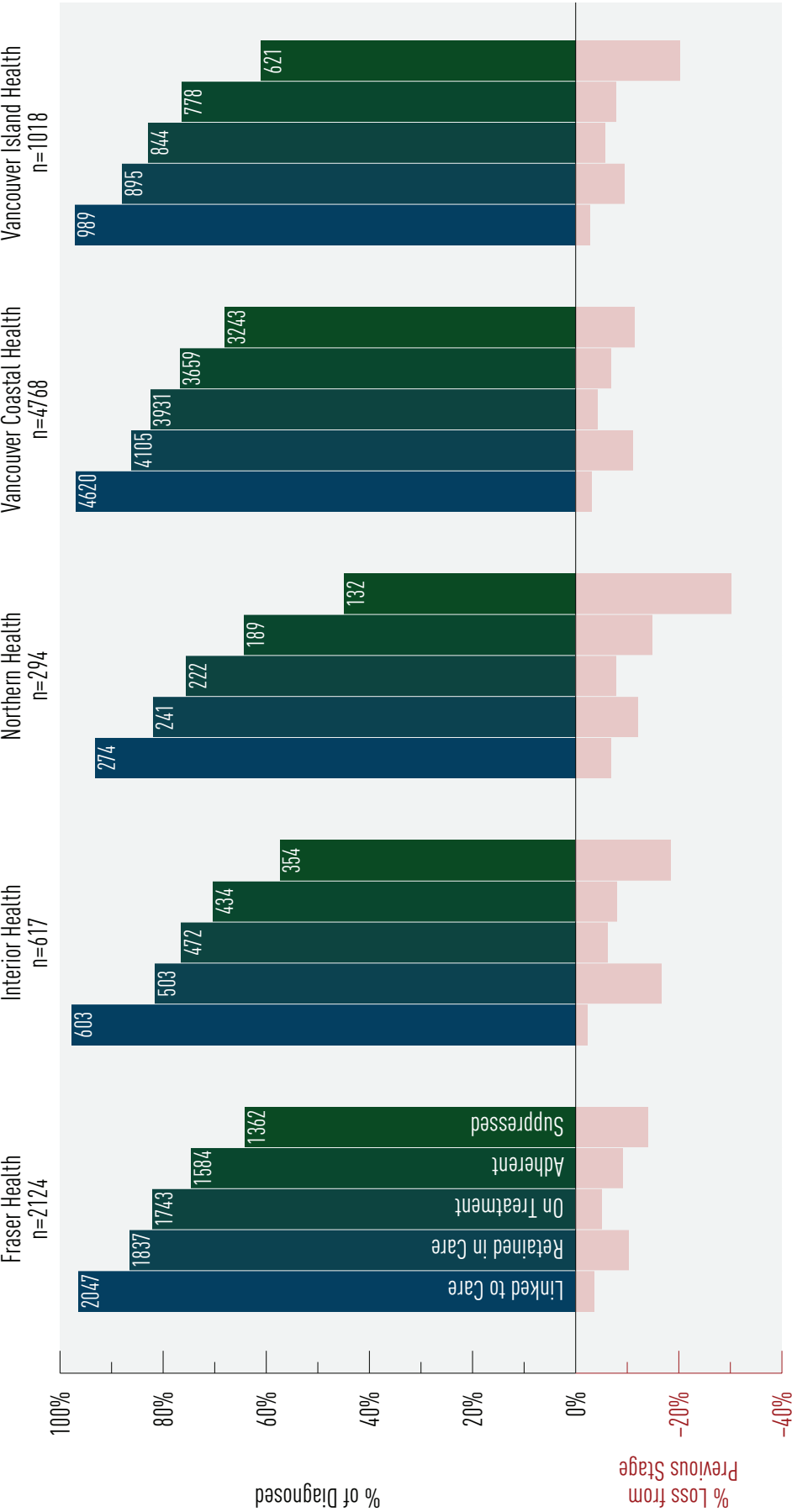
⁹ Data is for the period 2015 Q3–2016 Q2.

Data Sources:

- i British Columbia Centre for Excellence Drug Treatment Program (DTP) Database (ARV use, VL and CD4 count).
- ii 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 British Columbia by Health Authority, Year Ending 2016 Q2 ⁹



⁹ Data is for the period 2015 Q3–2016 Q2.

Data Sources:

- i British Columbia Centre for Excellence Drug Treatment Program (DTP) Database (ARV use, VL and CD4 count).
- ii 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.

Programmatic Compliance Score

Indicator 6. 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 2 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/ μ 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. 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, 2014 Q3–2016 Q2¹⁰

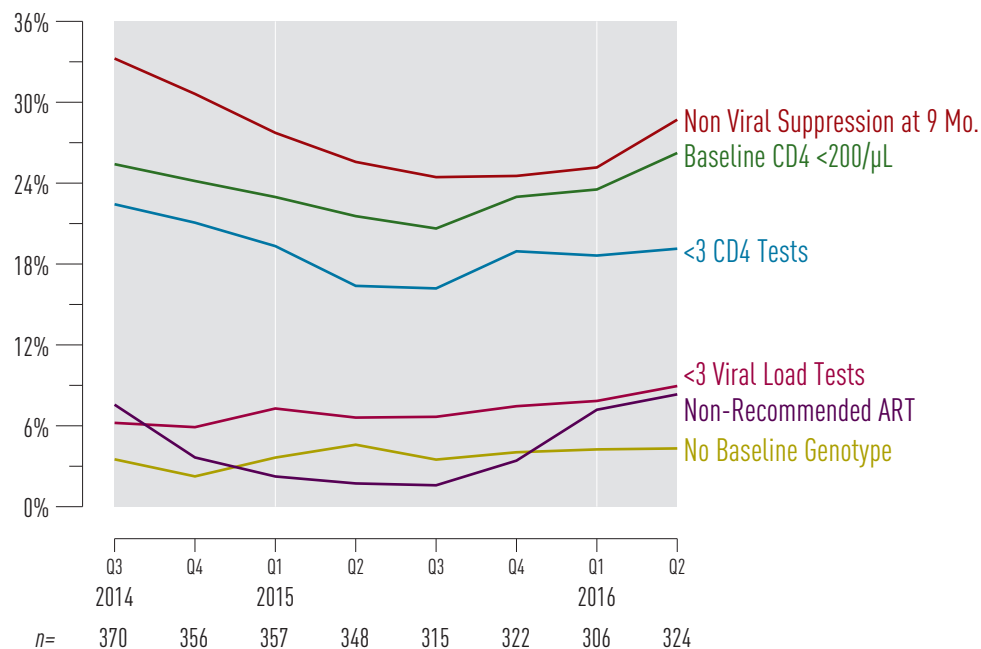
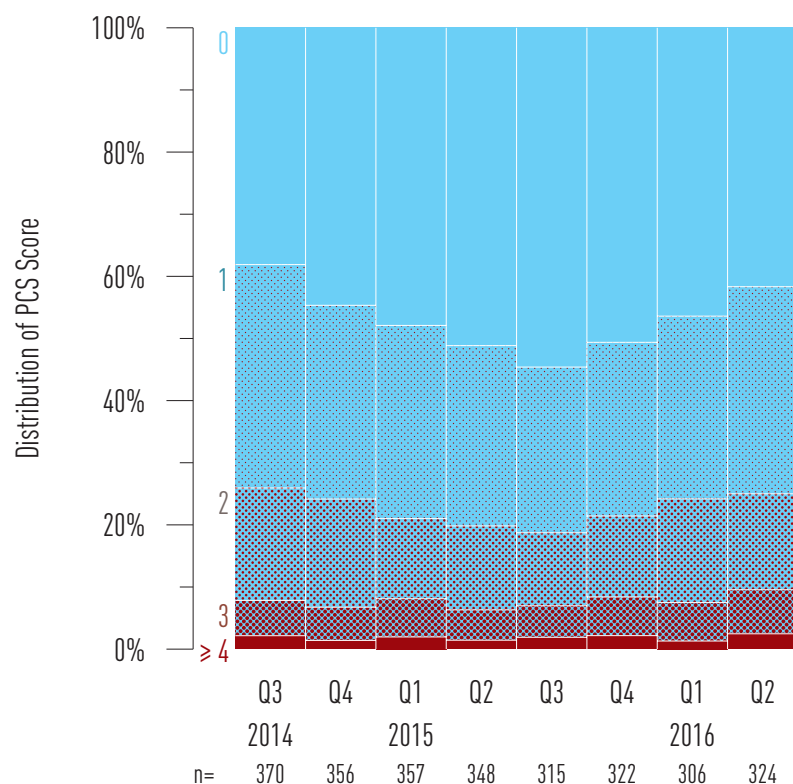


Figure 6.2 Historical Trends for PCS Score for BC, 2014 Q3–2016 Q2^{10,11}



¹⁰ Data Source: British Columbia Centre for Excellence Drug Treatment Program (DTP) Database.
Limitations: CD4 cell count capture is approximately 80%.

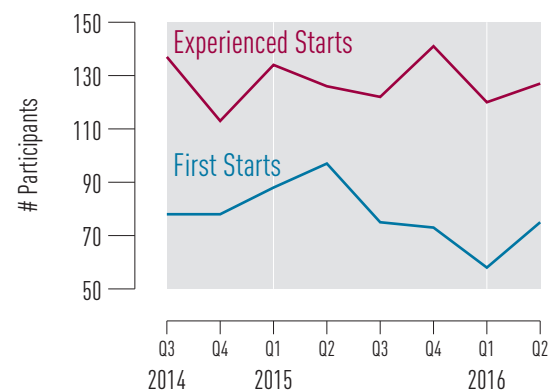
¹¹ Each quarter's data is calculated as the sum of the 4 quarters leading up to it. e.g. 2013 Q1 is calculated from 2012 Q2 – 2013 Q1.
NB: A score of 0 is the best score and a score of 4 or more is the worst score.

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.

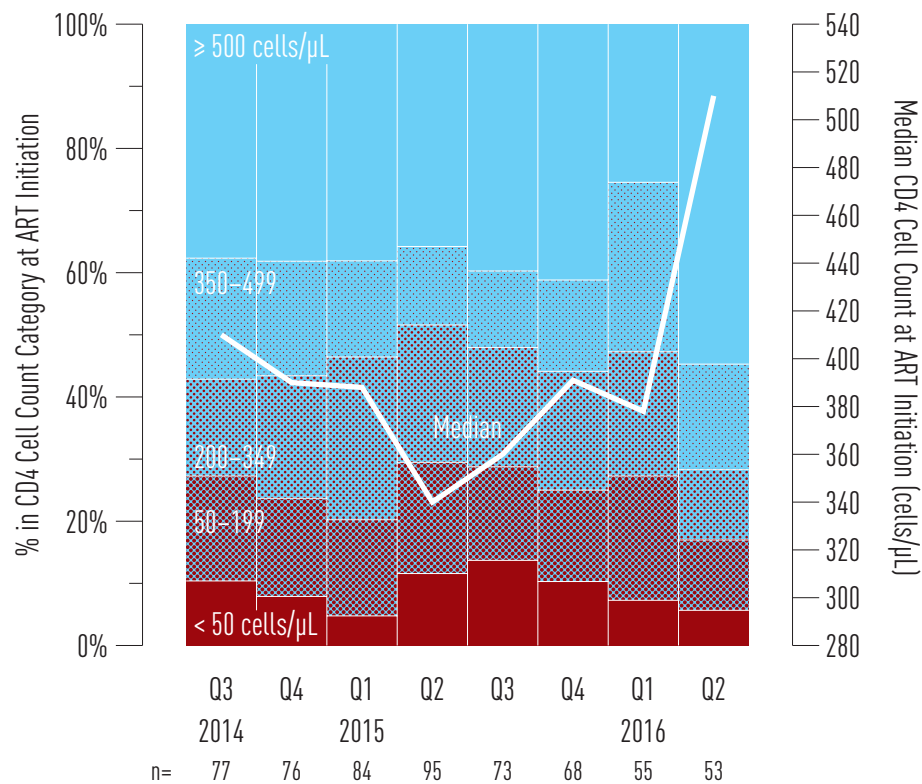
Indicator 7. New Antiretroviral Therapy Starts in BC

Figure 7 BC-CfE Drug Treatment Program Enrollment: New ART Participants in BC, 2014 Q3–2016 Q2¹²



Indicator 8. CD4 Cell Count at ART Initiation

Figure 8 CD4 Cell Count at ART Initiation of ART-Naïve DTP Participants in BC, 2014 Q3–2016 Q2¹³



¹² Data Source: Drug Treatment Program Database
Limitation: DTP participants are designated to an HA based on most current residence provided by the participant.

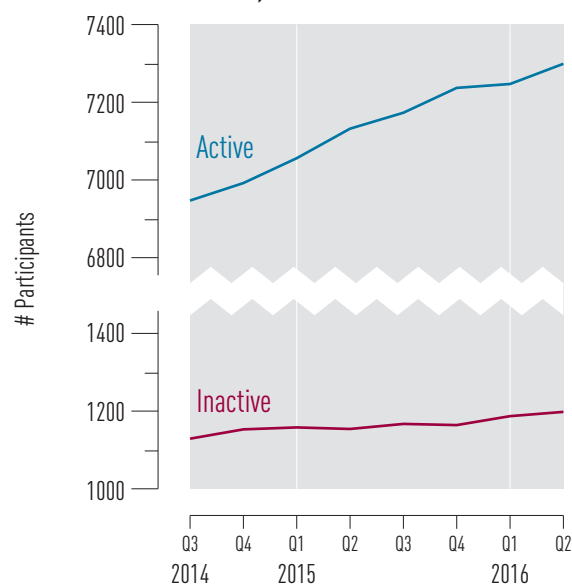
¹³ Data Source: Drug Treatment Program Database
Limitations: CD4 cell count data is approximately 80% complete.

Indicator 9. Active and Inactive DTP Participants

Table 3. Distribution of People on ART for BC, 2016 Q2 ¹⁴

		Fraser	Interior	Island	Northern	Vancouver Coastal	Total BC
Age	< 30	84	22	30	7	127	270
	30–39	262	53	97	50	541	1005
	40–49	508	108	217	64	1049	1946
	≥ 50	913	294	523	99	2248	4078
Gender	Male	1369	374	709	137	3494	6085
	Female	397	103	158	83	471	1213
Exposure	MSM	573	153	255	30	1898	2910
	PWID	442	149	276	115	1121	2104
Total		1767	477	867	220	3965	7299

Figure 9 Active and Inactive DTP Participants for BC, 2014 Q3–2016 Q2 ¹⁵



¹⁴ Data Source: Drug Treatment Program Database

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

Definition:

'On antiretroviral therapy' defined as being on treatment in the current quarter

¹⁵ Active DTP participants: An individual who has had medication prescribed at least once in the preceding quarter.

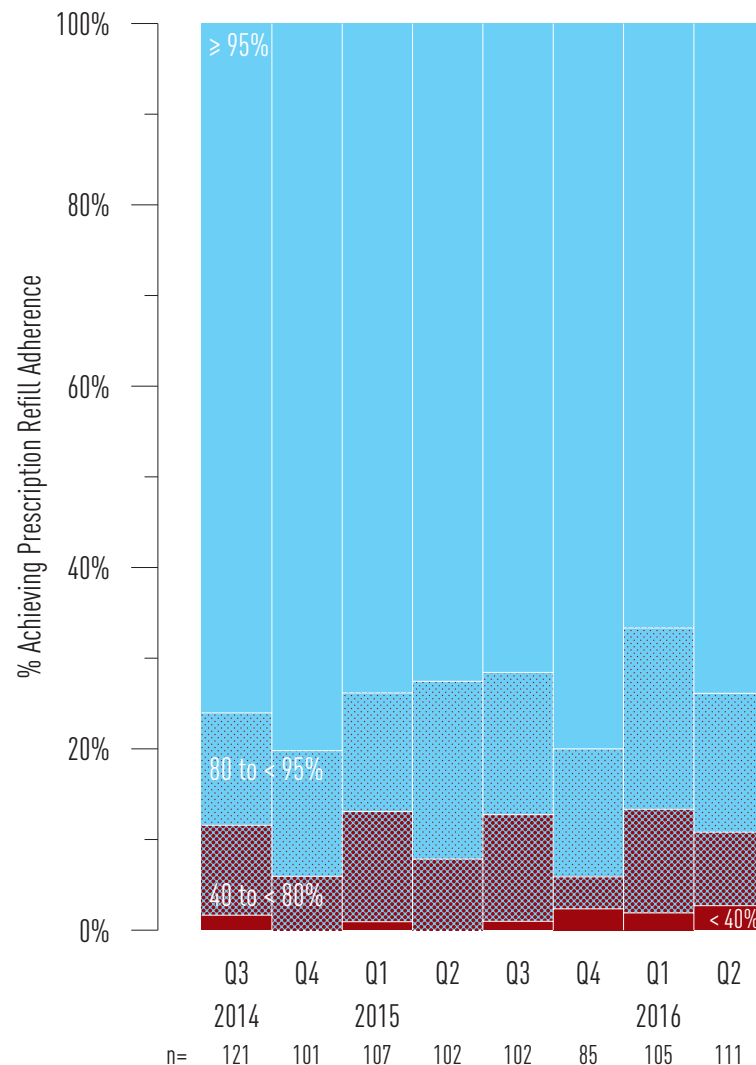
Inactive DTP participants: Persons no longer prescribed drugs through the HIV/AIDS Drug Treatment Program in the last quarter.

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, 2014 Q3–2016 Q2 ¹⁶



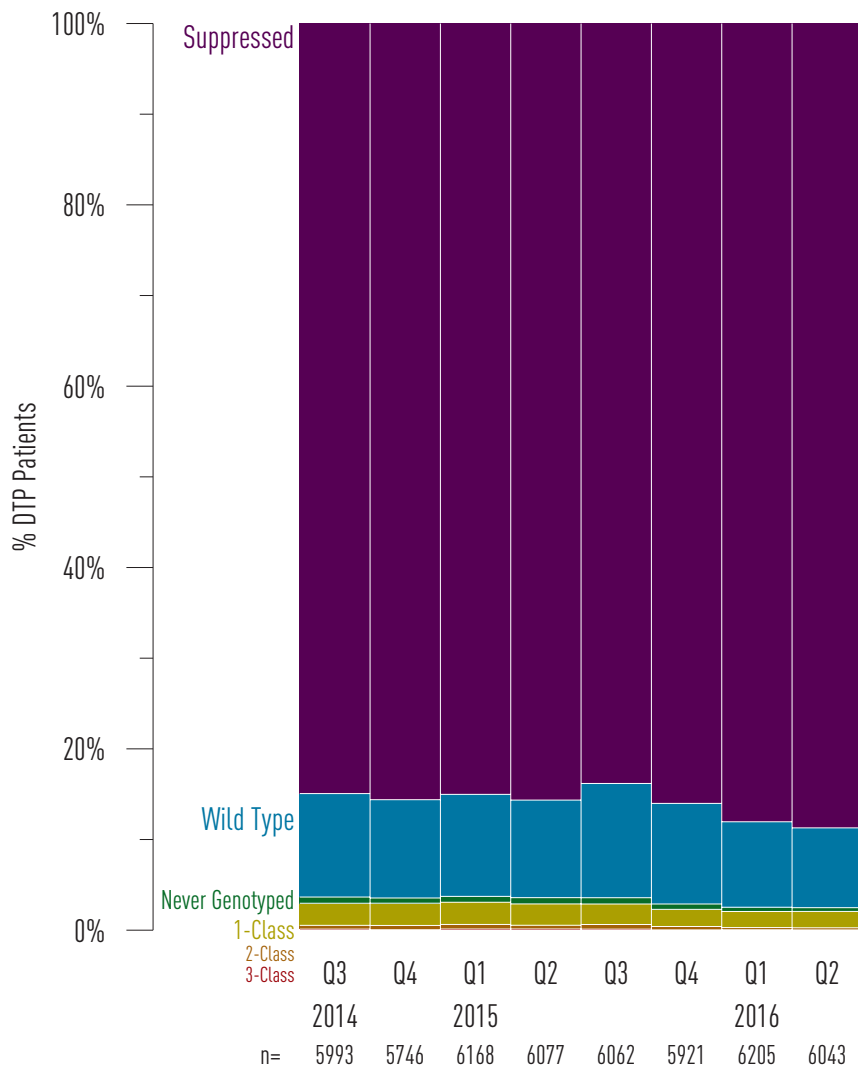
¹⁶ Data Source: Drug Treatment Program Database
Limitation: Prescription refill adherence is used as a proxy for patient adherence.

Resistance Testing and Results

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, three, or four** 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 BC, 2014 Q3–2016 Q2 ¹⁷



¹⁷ Data Source: Drug Treatment Program Database

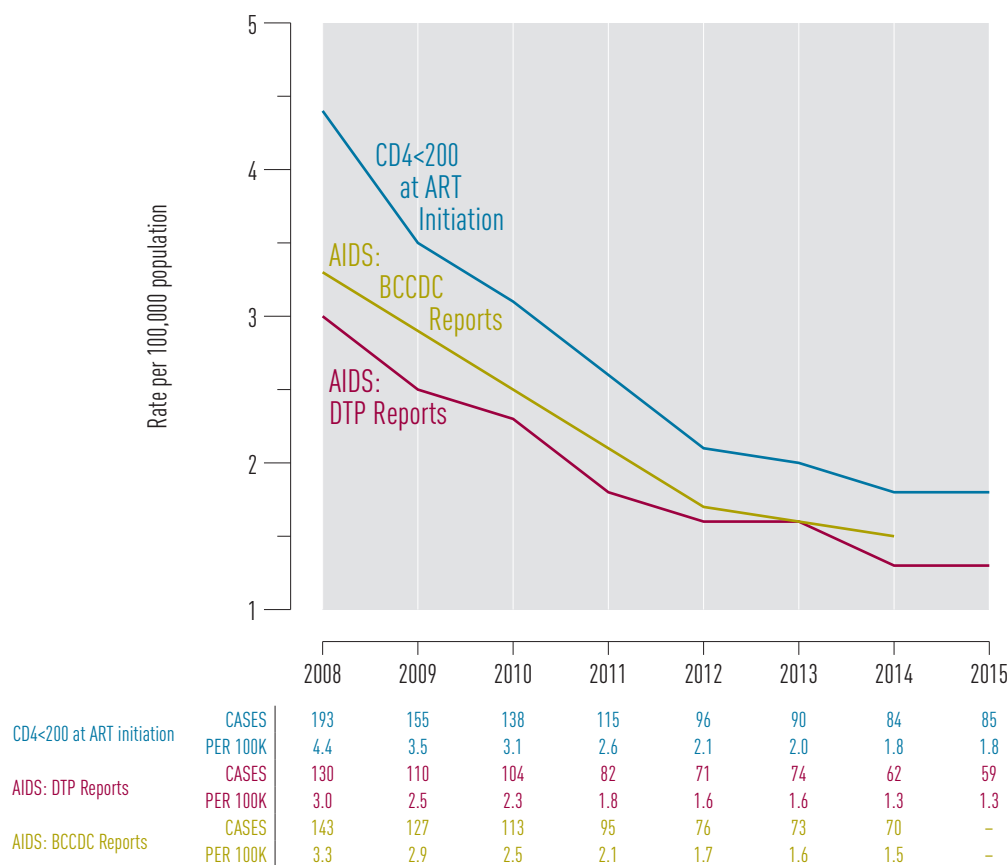
Limitation: DTP participants are designated to a HA based on most current residence provided by the participant.

AIDS-Defining Illness

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 ¹⁸



¹⁸ 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.

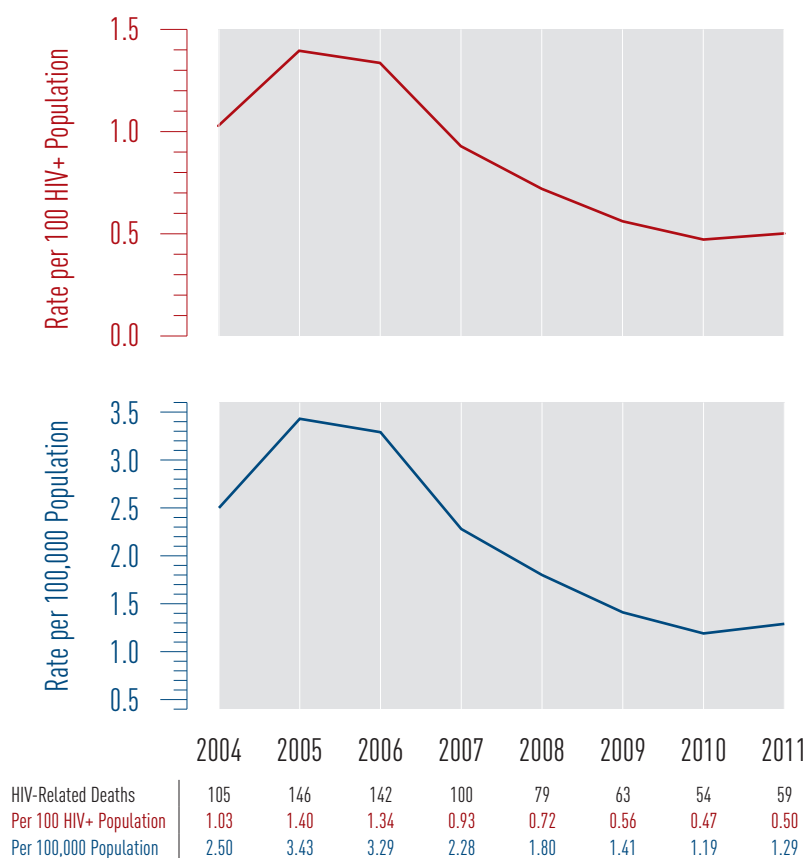
Limitation: AIDS case reporting was investigated using 3 definitions: First, using AIDS cases reported in AIDS case report forms from the DTP; Second, using AIDS cases reported via the BCCDC and third, using a CD4 cell count of <200 cells/μL at time of ART initiation using DTP data. AIDS case reporting 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.

HIV-Related Mortality

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 ¹⁹



¹⁹ 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)		2011		2012		2013				2014				2015				2016			
		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
British Columbia		40.3	37.6	42.3	41.5	45.0	46.6	54.8	58.0	55.9	54.6	62.0	66.1	71.2	70.5	77.9	76.9	79.8	80.7	88.7	87.6
Gender	Female	15.9	16.6	18.9	18.9	20.8	21.5	25.7	27.5	26.5	25.6	28.7	31.2	33.8	33.7	37.5	37.4	38.7	38.7	42.3	42.6
	Male	17.7	18.0	20.8	20.1	21.6	22.7	26.2	27.9	26.5	26.2	30.0	31.6	33.8	33.7	37.2	36.7	38.3	39.1	43.3	42.5
	Other	0.6	0.5	0.4	0.3	0.4	0.3	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3
Age	< 30	13.1	13.0	14.0	13.5	14.8	14.7	15.7	16.7	16.8	16.3	17.4	17.6	19.2	18.9	19.7	19.9	21.8	21.8	22.2	22.5
	30–39	8.7	8.7	10.1	9.7	10.2	10.3	12.2	12.7	12.3	11.9	13.9	13.9	14.6	14.1	16.1	16.1	16.7	16.1	18.6	18.3
	40–49	5.8	6.0	6.9	6.8	6.9	7.6	9.0	9.3	8.7	8.5	9.7	10.1	10.5	10.5	11.6	11.4	11.7	11.8	13.3	12.9
	≥ 50	6.2	7.0	8.8	9.1	10.5	11.7	15.2	16.9	15.2	15.2	17.8	21.4	23.5	24.0	27.4	26.9	27.0	28.3	31.7	31.6
POC HIV Tests		6.1	2.5	2.3	2.1	2.3	2.2	2.6	2.4	2.7	2.6	3.0	3.0	3.3	2.9	2.9	2.6	2.6	2.6	2.7	2.2
Fraser Health		9.1	9.0	10.1	10.1	10.8	11.6	13.5	14.0	13.8	12.9	13.6	14.5	14.9	15.1	16.1	15.8	16.8	17.1	18.5	19.2
	Female	4.3	4.3	4.8	4.9	5.3	5.7	6.6	6.8	6.8	6.1	6.5	6.9	7.2	7.4	7.6	7.6	8.1	8.1	8.8	9.3
	Male	4.7	4.6	5.3	5.1	5.4	5.7	6.6	7.0	6.7	6.5	6.9	7.1	7.3	7.5	8.1	7.8	8.4	8.6	9.3	9.6
Interior Health		3.9	4.2	4.1	4.0	4.2	4.2	4.4	4.7	4.6	4.9	5.3	5.5	5.6	5.9	6.7	7.0	7.9	9.1	10.5	9.8
	Female	2.0	2.1	2.1	2.0	2.1	2.0	2.1	2.3	2.2	2.4	2.6	2.6	2.7	2.8	3.2	3.5	3.9	4.5	5.1	4.9
	Male	1.8	2.0	2.0	1.9	2.0	2.1	2.2	2.3	2.3	2.4	2.6	2.8	2.7	2.9	3.2	3.4	3.8	4.4	5.1	4.8
Island Health		3.6	3.5	4.0	3.7	3.8	4.0	4.2	4.5	4.3	4.3	4.9	4.8	4.8	4.9	5.9	6.0	6.4	6.6	7.1	7.2
	Female	1.8	1.7	1.9	1.8	1.9	2.0	2.1	2.2	2.1	2.1	2.3	2.3	2.4	2.4	2.9	3.0	3.2	3.3	3.5	3.7
	Male	1.8	1.7	2.0	1.8	1.8	1.8	2.0	2.1	2.0	1.9	2.2	2.1	2.1	2.1	2.6	2.6	2.8	2.9	3.1	3.2
Northern Health		1.9	1.9	2.3	2.2	2.2	2.3	2.7	2.7	2.6	2.6	3.1	3.0	2.9	3.0	3.7	3.2	3.2	3.2	3.7	3.3
	Female	1.0	1.0	1.2	1.1	1.2	1.2	1.3	1.4	1.3	1.3	1.6	1.5	1.5	1.5	1.9	1.6	1.6	1.6	1.9	1.7
	Male	0.8	0.8	1.1	1.0	1.0	1.1	1.2	1.2	1.1	1.2	1.4	1.3	1.3	1.4	1.6	1.4	1.5	1.4	1.6	1.5
Vancouver Coastal Health		21.9	19.1	21.8	21.4	24.0	24.6	30.1	32.1	30.7	29.9	35.0	38.4	43.0	41.6	45.5	44.8	45.5	44.6	49.0	48.0
	Female	6.9	7.4	9.0	9.0	10.3	10.7	13.6	14.8	14.0	13.6	15.8	17.9	20.1	19.6	21.8	21.7	21.8	21.2	23.0	23.1
	Male	8.6	8.8	10.5	10.3	11.4	11.9	14.3	15.3	14.4	14.3	16.8	18.3	20.4	19.8	21.8	21.4	21.9	21.7	24.1	23.3

Indicator 2: Rate of HIV Testing per 100,000

		2009	2010	2011	2012	2013	2014	2015
British Columbia		2624.8	2645.8	2714.2	3318.6	4194.6	4969.0	5738.5
Fraser Health		2251.2	2267.6	2331.6	2795.4	3313.1	3588.9	4009.3
Interior Health		2026.8	2072.9	2094.1	2180.4	2573.0	2996.7	4080.7
Island Health		1927.2	1919.6	1851.0	1980.8	2150.4	2335.6	2939.3
Northern Health		2290.7	2349.0	2431.8	2909.8	3333.0	3825.8	4347.2
Vancouver Coastal Health		4125.0	4140.2	4342.1	5827.1	8122.8	10313.6	11591.2
Gender	Female	2446.7	2455.1	2523.6	3197.0	4168.6	4942.3	5770.1
	Male	2694.2	2734.5	2808.7	3383.5	4180.4	4951.8	5656.2
Age	< 30	2795.0	2802.4	2854.7	3231.5	3686.6	4047.2	4542.7
	30–39	5088.9	5225.7	5252.5	6074.0	7206.3	8108.6	9020.6
	40–49	3027.3	3025.7	3123.2	3832.7	4933.5	5705.4	6512.6
	≥ 50	1240.3	1280.6	1395.3	2168.5	3303.0	4415.1	5355.5

		2011		2012		2013		2014		2015		2016	
Indicator 3: New HIV Diagnoses		Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
British Columbia	By Client Residence	87	65	70	55	52	60	49	79	80	58	63	75
	By Provider Address	87	65	70	55	52	60	49	79	80	58	63	75
Gender	Female	11	7	9	10	5	5	6	12	8	5	13	9
	Male	76	58	61	45	47	55	43	67	72	53	49	65
Age	< 30	17	18	18	14	9	18	9	17	23	15	17	15
	30–39	30	13	16	17	11	10	16	25	18	11	17	21
	40–49	22	19	20	11	19	19	12	14	21	20	14	14
	≥ 50	18	15	16	13	13	13	12	23	18	12	15	25
Exposure	MSM	56	38	42	34	37	36	28	46	45	38	35	46
	PWID	12	3	14	7	2	6	4	7	5	9	10	5
	HET	19	21	14	12	11	15	16	21	24	9	16	19
	Other	0	3	0	1	0	1	0	1	5	0	0	1
	NIR/Unknown	0	0	0	1	2	2	1	4	1	2	2	4
Fraser Health	By Client Residence	15	9	11	10	10	14	8	14	23	19	15	11
	By Provider Address	9	8	10	5	7	8	9	8	14	15	11	10
Interior Health	By Client Residence	3	3	5	5	0	2	1	4	4	4	3	4
	By Provider Address	2	3	5	5	0	2	1	5	4	4	3	2
Island Health	By Client Residence	7	7	6	3	5	12	4	9	10	7	6	4
	By Provider Address	6	6	3	3	5	12	5	9	10	7	6	4
Northern Health	By Client Residence	5	5	5	4	3	0	3	8	3	3	2	5
	By Provider Address	5	6	5	4	3	0	3	8	3	3	2	5
Vancouver Coastal Health	By Client Residence	57	41	43	33	33	32	31	44	40	25	37	49
	By Provider Address	65	42	47	38	37	38	31	49	49	29	41	54

Indicator 4: Stage of HIV Infection at Baseline

	British Columbia					Female					Male					< 30 years					30–39 years					40–49 years				
	'11	'12	'13	'14	'15	'11	'12	'13	'14	'15	'11	'12	'13	'14	'15	'11	'12	'13	'14	'15	'11	'12	'13	'14	'15	'11	'12	'13	'14	'15
Stage 0	64	53	49	64	51	3	6	3	5	9	61	47	45	59	42	14	18	19	28	14	26	18	15	18	16	19	10	10	7	6
Stage 1	55	51	57	50	50	9	7	9	12	8	45	43	48	38	42	14	12	22	11	22	20	14	18	17	10	10	16	7	10	7
Stage 2a	40	28	45	32	21	7	5	6	4	2	33	23	39	28	19	11	4	12	5	7	12	4	13	7	3	12	11	10	8	5
Stage 2b	47	31	35	29	35	10	6	4	5	6	37	25	31	23	28	6	7	4	4	6	10	7	12	7	10	17	10	9	8	8
Stage 3	55	57	65	43	47	10	5	8	9	7	45	52	57	34	40	3	7	4	4	5	13	11	10	11	7	19	15	25	13	13
Unknown	27	16	14	42	34	4	1	1	10	6	22	15	13	32	28	6	7	0	8	4	11	3	4	13	12	5	2	4	9	10
Total	288	236	265	260	238	43	30	31	45	38	243	205	233	214	199	54	55	61	60	58	92	57	72	73	58	82	64	65	55	49
	≥ 50 years					MSM					PWID					Heterosexual					Other Exposure					NIR/Unknown				
	'11	'12	'13	'14	'15	'11	'12	'13	'14	'15	'11	'12	'13	'14	'15	'11	'12	'13	'14	'15	'11	'12	'13	'14	'15	'11	'12	'13	'14	'15
Stage 0	5	7	5	11	15	52	42	36	54	32	5	4	7	4	4	7	7	5	4	12	0	0	1	1	0	0	0	0	1	3
Stage 1	11	9	10	12	11	33	33	36	26	35	8	6	5	10	1	13	11	13	12	10	1	1	0	1	1	0	0	3	1	3
Stage 2a	5	9	10	12	6	26	17	31	18	14	5	6	5	1	1	7	5	7	10	4	2	0	2	0	1	0	0	0	3	1
Stage 2b	14	7	10	10	11	24	16	24	13	21	3	7	0	4	4	19	8	9	10	8	1	0	1	1	1	0	0	1	1	1
Stage 3	20	24	26	15	22	19	30	25	16	16	7	5	4	4	5	27	20	31	17	20	2	0	1	3	0	0	2	4	3	6
Unknown	5	4	6	12	8	16	10	4	23	14	6	1	4	3	2	2	1	5	12	12	1	1	1	1	0	2	3	0	3	6
Total	60	60	67	72	73	170	148	156	150	132	34	29	25	26	17	75	52	70	65	66	7	2	6	7	3	2	5	8	12	20

Indicator 5: HIV Cascade of Care			DIAGNOSED	LINKED	RETAINED	ON ART	ADHERENT	SUPPRESSED
British Columbia			10130	9292	7714	7214	6645	5713
Age Category	< 30		500	342	283	255	215	172
	30–39		1336	1226	1014	932	794	669
	40–49		2603	2424	1980	1840	1690	1432
	≥ 50		5683	5299	4436	4187	3946	3440
Age Category and MSM Status	MSM	< 30	135	124	106	94	86	70
		30–39	406	394	334	317	275	242
		40–49	721	706	635	595	559	503
		≥ 50	2121	2093	1931	1838	1763	1596
	Non-MSM	< 30	48	46	37	33	20	15
		30–39	374	362	333	306	245	187
		40–49	859	841	746	691	610	471
		≥ 50	1551	1519	1385	1312	1195	979
	Unknown	< 30	317	173	139	128	109	87
		30–39	557	470	348	309	274	240
		40–49	1023	876	599	554	521	458
		≥ 50	2011	1687	1120	1037	988	865
Gender	Male		8305	7676	6380	5995	5586	4853
	Female		1825	1616	1334	1219	1059	860
Injection Drug Use	PWID		2537	2484	2269	2129	1872	1479
	Non-PWID		4603	4518	4088	3865	3642	3240
	Unknown		2991	2290	1357	1220	1131	994
MSM Status	MSM		3383	3317	3006	2844	2683	2411
	Non-MSM		2831	2768	2501	2342	2070	1652
	Unknown		3916	3206	2207	2028	1892	1650
Health Authority	Fraser Health		2124	2047	1837	1743	1584	1362
	Interior Health		617	603	503	472	434	354
	Island Health		1018	989	895	844	778	621
	Northern Health		294	274	241	222	189	132
	Vancouver Coastal Health		4768	4620	4105	3931	3659	3243

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

	2014		2015		2016		
	Q3	Q4	Q1	Q2	Q3	Q4	Q2
< 3 CD4 Tests	22.4%	21.1%	19.3%	16.4%	16.2%	18.9%	19.1%
< 3 Viral Load Tests	6.2%	5.9%	7.3%	6.6%	6.7%	7.5%	9.0%
No Baseline Genotype	3.5%	2.2%	3.6%	4.6%	3.5%	4.0%	4.3%
Baseline CD4 < 200 cells/μL	25.4%	24.2%	23.0%	21.6%	20.6%	23.0%	26.2%
Non-Recommended ART	7.6%	3.7%	2.2%	1.7%	1.6%	3.4%	8.3%
Non Viral suppression at 9 Mo.	33.2%	30.6%	27.7%	25.6%	24.4%	24.5%	28.7%
PCS Score: 0	141	159	171	178	172	163	135
PCS Score: 1	133	111	111	101	84	90	108
PCS Score: 2	67	62	46	47	37	42	50
PCS Score: 3	21	19	22	17	16	20	23
PCS Score: 4 or more	8	5	7	5	6	7	8
Total (n=)	370	356	357	348	315	322	324

Indicator 7: New DTP ARV Participants

	2014 Q3	Q4	2015 Q1	Q2	Q3	Q4	2016 Q1	Q2
First Starts	78	78	88	97	75	73	58	75
Experienced Starts	137	113	134	126	122	141	120	127

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

CD4 ≥ 500	29	29	32	34	29	28	14	29
CD4 350–499	15	14	13	12	9	10	15	9
CD4 200–349	12	15	22	21	14	13	11	6
CD4 50–199	13	12	13	17	11	10	11	6
CD4 < 50	8	6	4	11	10	7	4	3
<i>CD4 Median (cells/μL)</i>	<i>410</i>	<i>390</i>	<i>388</i>	<i>340</i>	<i>360</i>	<i>391</i>	<i>378</i>	<i>510</i>
Total (n=)	77	76	84	95	73	68	55	53

Indicator 9: Active and Inactive DTP Participants

Active DTP Participants	6947	6992	7056	7132	7173	7237	7247	7299
Inactive DTP Participants	1129	1153	1158	1154	1167	1164	1187	1198

Indicator 10: Antiretroviral Adherence

≥ 95%	92	81	79	74	73	68	70	82
80% to < 95%	15	14	14	20	16	12	21	17
40% to < 80%	12	6	13	8	12	3	12	9
< 40%	2	0	1	0	1	2	2	3
Total (n=)	121	101	107	102	102	85	105	111

Indicator 11: Resistance Testing and Results

Suppressed	5090	4919	5244	5205	5081	5093	5463	5361
Wild Type	684	623	694	654	764	657	585	532
Never Genotyped	41	33	40	42	42	35	29	25
1-Class	146	141	151	143	137	112	110	109
2-Class	25	27	31	25	31	22	15	14
3-Class	7	3	8	8	7	2	3	2
Total (n=)	5993	5746	6168	6077	6062	5922	6205	6043

Indicator 12: AIDS-Defining Illness

	2007	2008	2009	2010	2011	2012	2013	2014	2015
CD4 < 200 at ART initiation	Cases	224	193	155	138	115	96	90	85
	<i>Rate per 100,000</i>	<i>5.2</i>	<i>4.4</i>	<i>3.5</i>	<i>3.1</i>	<i>2.6</i>	<i>2.1</i>	<i>2.0</i>	<i>1.8</i>
AIDS Cases (DTP Reports)	Cases	135	130	110	104	82	71	74	59
	<i>Rate per 100,000</i>	<i>2.8</i>	<i>3.0</i>	<i>2.5</i>	<i>2.3</i>	<i>1.8</i>	<i>1.6</i>	<i>1.6</i>	<i>1.3</i>
AIDS Cases (BCCDC Reports)	Cases	143	143	127	113	95	76	73	–
	<i>Rate per 100,000</i>	<i>3.3</i>	<i>3.3</i>	<i>2.9</i>	<i>2.5</i>	<i>2.1</i>	<i>1.7</i>	<i>1.6</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