



BRITISH COLUMBIA
CENTRE *for* EXCELLENCE
in HIV/AIDS

HIV MONITORING QUARTERLY REPORT **FOR BRITISH COLUMBIA**

FOURTH QUARTER 2015



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

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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. Ana Prado 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.



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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. 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 BC

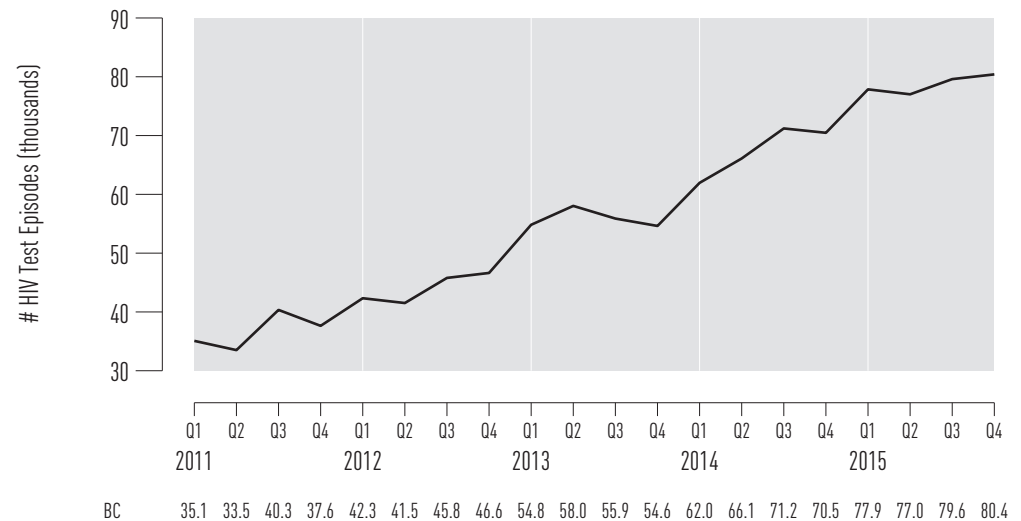


Figure 1.2 HIV Test Episodes by Gender for BC ^{1,2}

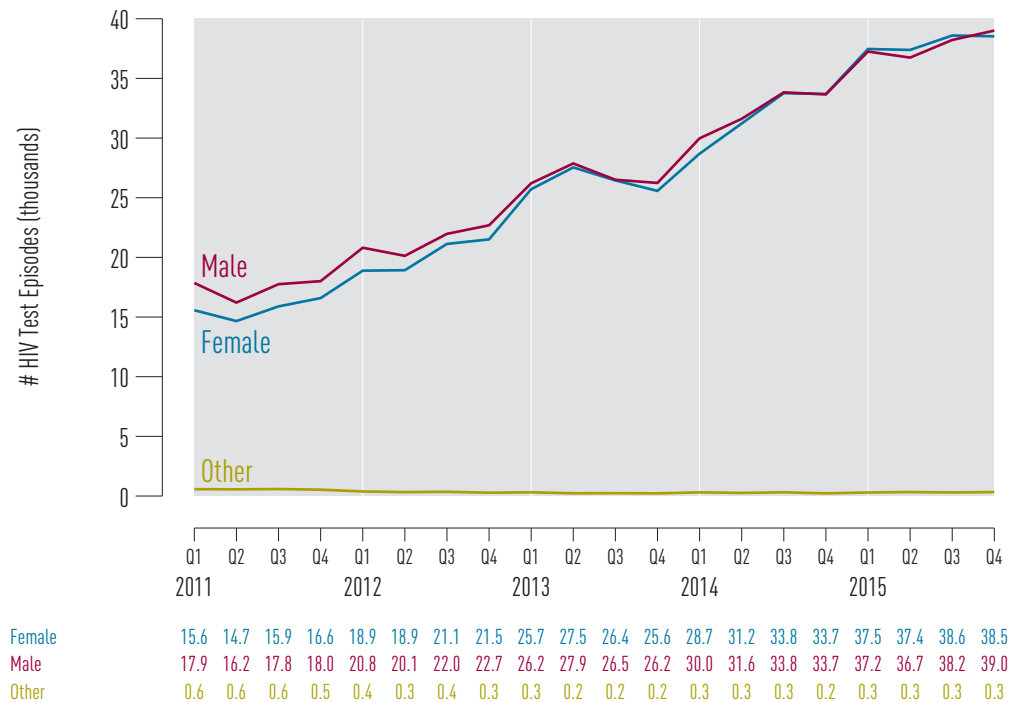


Figure 1.3 HIV Test Episodes by Age Category for BC ^{1,2}

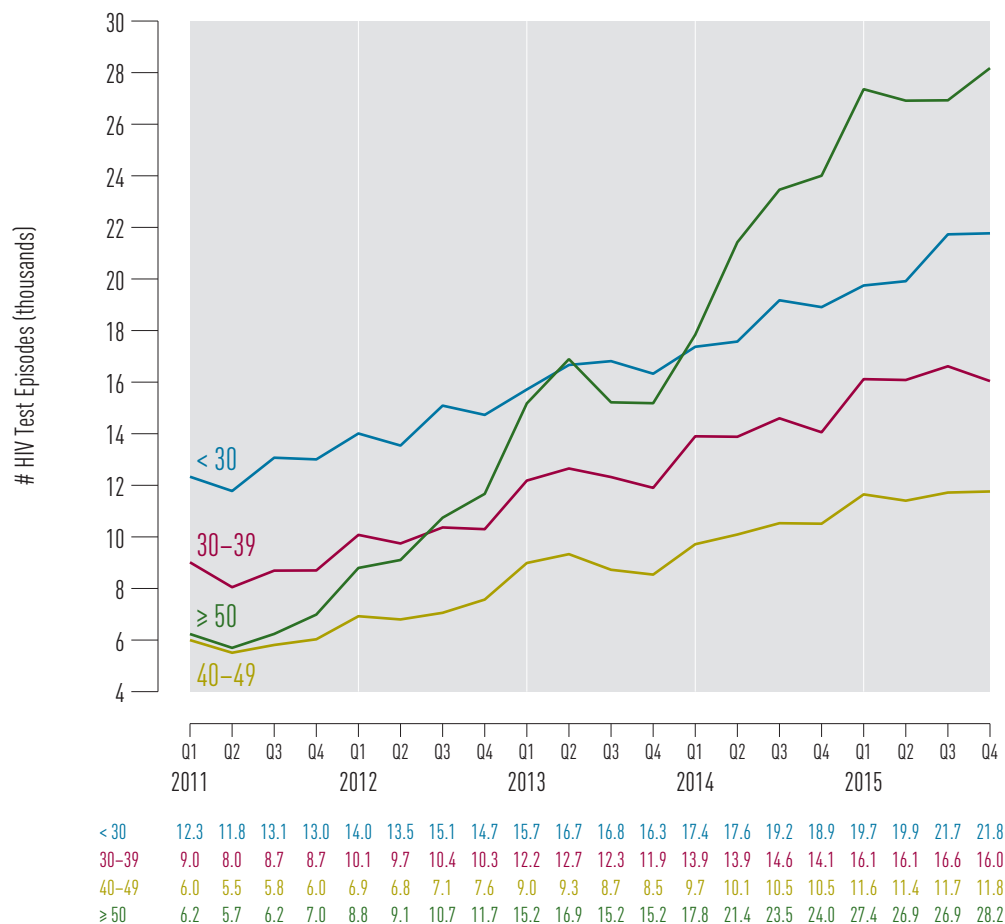
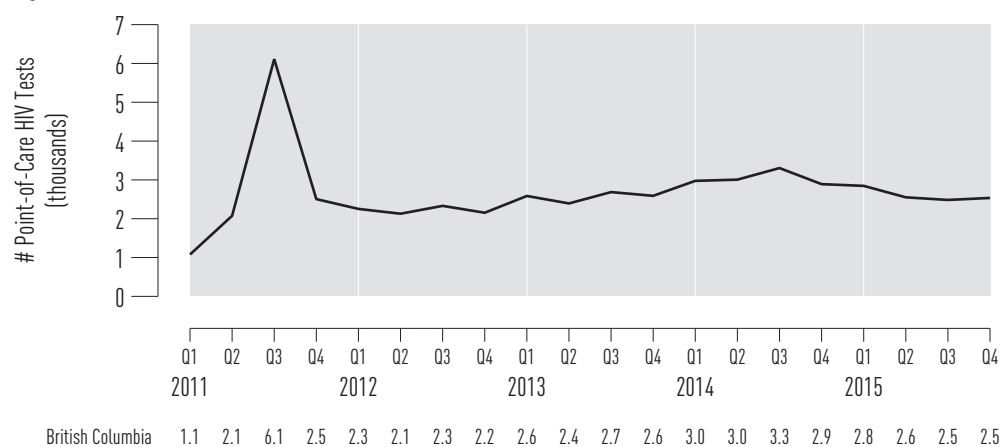


Figure 1.4 Point-of-Care HIV Tests for BC



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 ViHA Laboratory are not included.

Limitations:

- i Repeat tests in individuals who test using various identifiers may not be identified and these individuals may be counted more than once.
- ii In Fraser Health, POC testing data are available from March 2011 forward. In Interior Health, POC testing data are available for May 2011 forward. For all other health authorities, POC testing data are available from the fourth quarter of 2010 forward.

2 Testing does not include point of care tests.

Figure 1.5 HIV Test Episodes for BC by Health Authority ¹

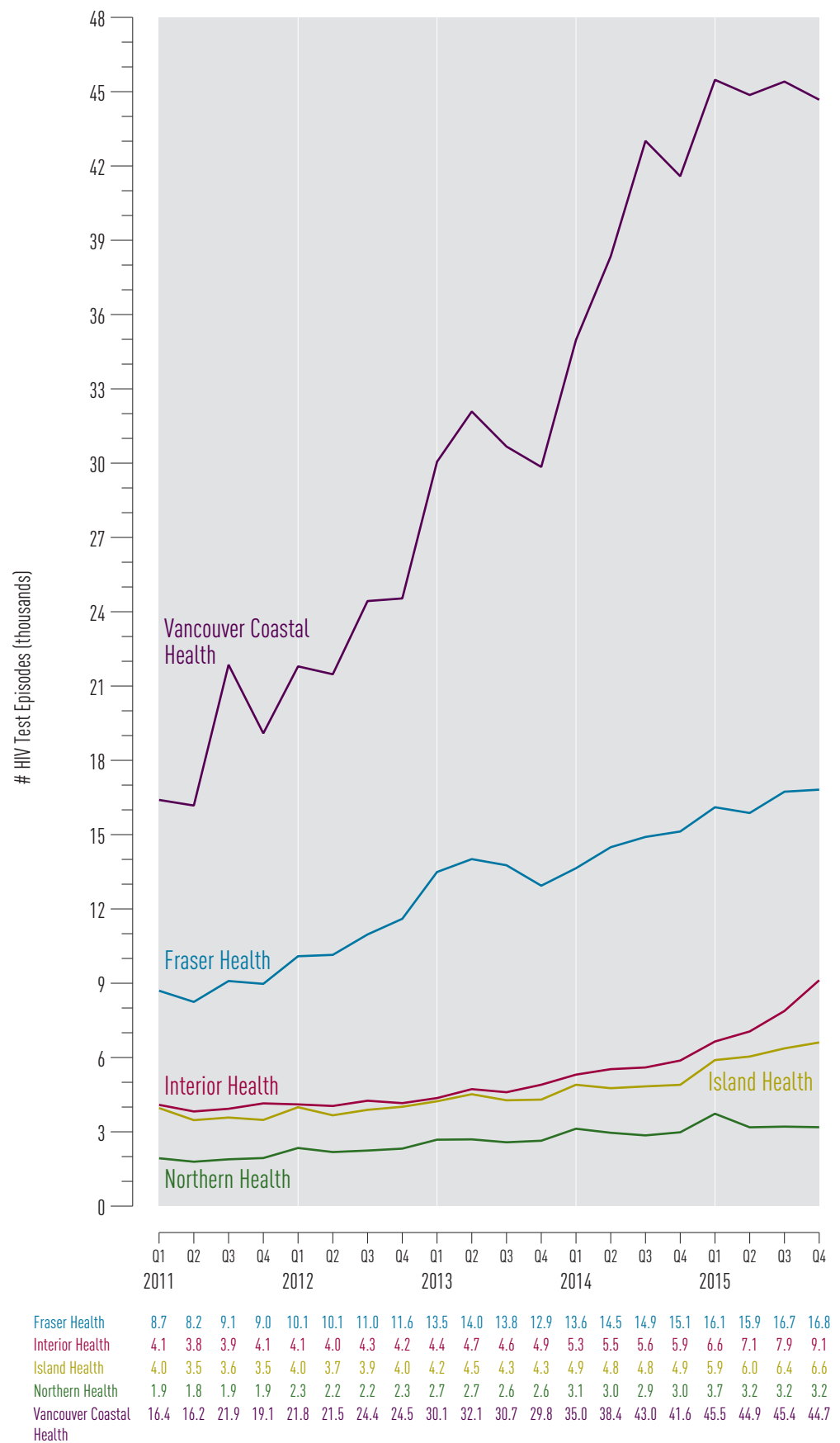


Figure 1.6 HIV Test Episodes for Non-prenatal Females in BC by Health Authority ^{1,2}

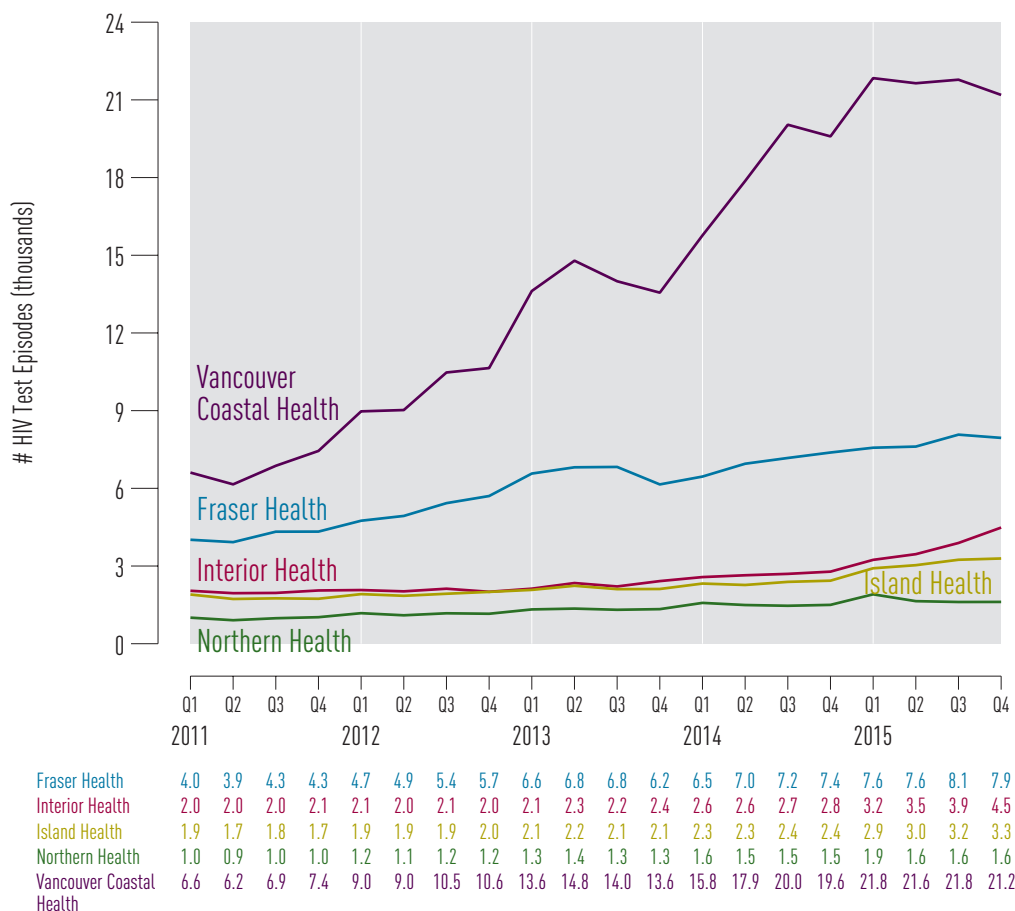
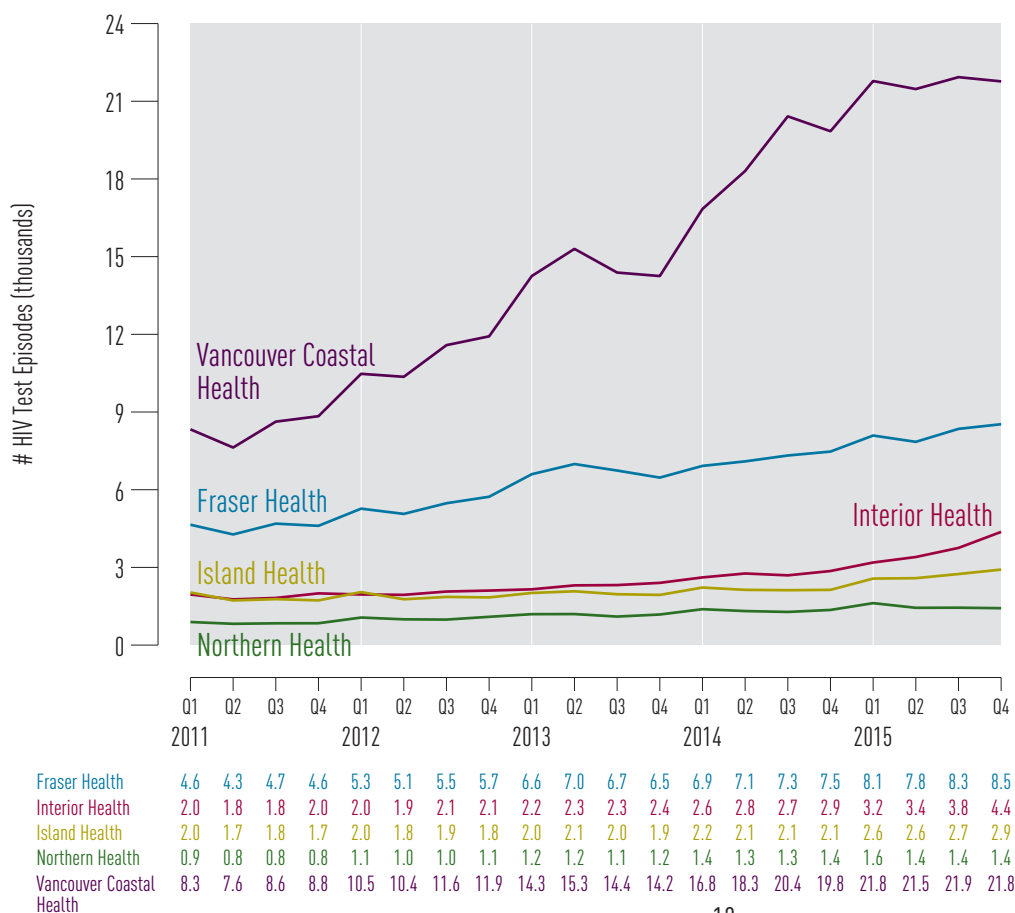
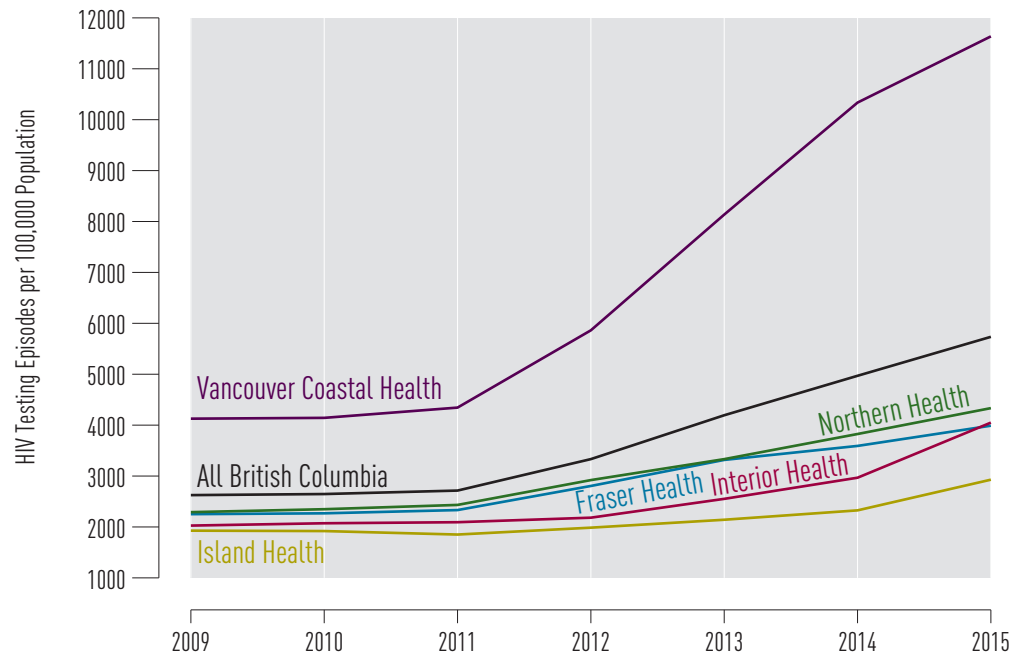


Figure 1.7 HIV Test Episodes for Males in BC by Health Authority ^{1,2}



Indicator 2. HIV Testing Rates

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



All British Columbia	2625.4	2646.5	2714.8	3332.8	4194.2	4969.4	5734.7
Fraser Health	2251.5	2267.9	2331.7	2805.3	3316.7	3591.8	3989.3
Interior Health	2026.9	2072.7	2093.2	2182.3	2551.9	2967.4	4049.4
Island Health	1927.2	1919.4	1850.9	1986.0	2141.6	2326.0	2928.7
Northern Health	2291.0	2348.6	2432.9	2920.7	3332.3	3825.8	4334.1
Vancouver Coastal Health	4127.0	4143.0	4344.6	5862.6	8135.6	10335.9	11636.4

Figure 2.2 Rate of HIV Testing by Gender for BC ²

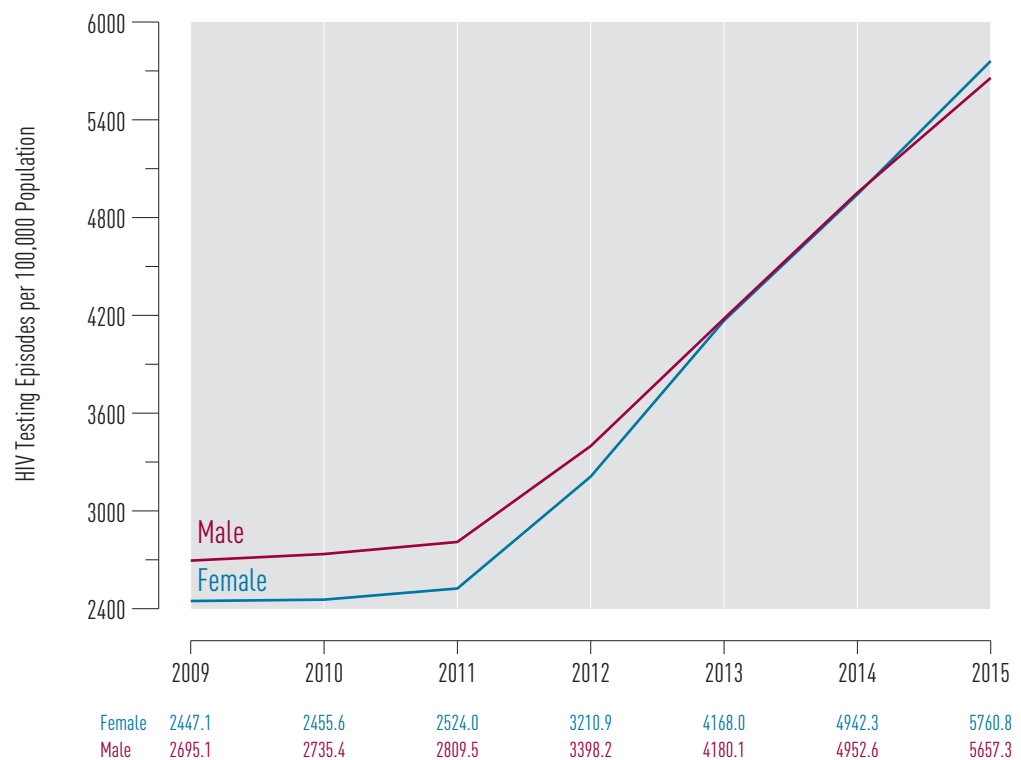
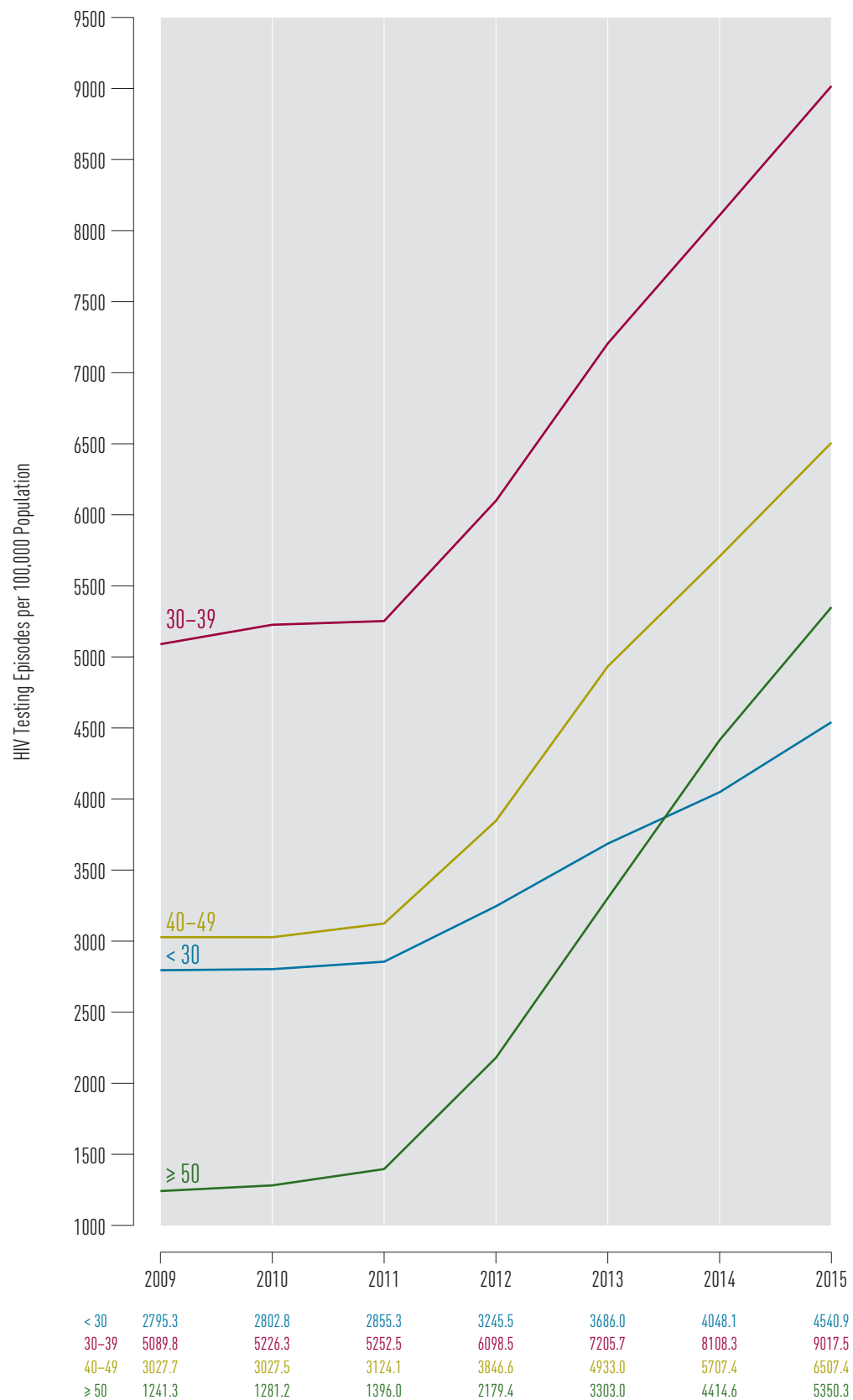


Figure 2.3 Rate of HIV Testing by Age Category for BC ²



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 Columbia ³

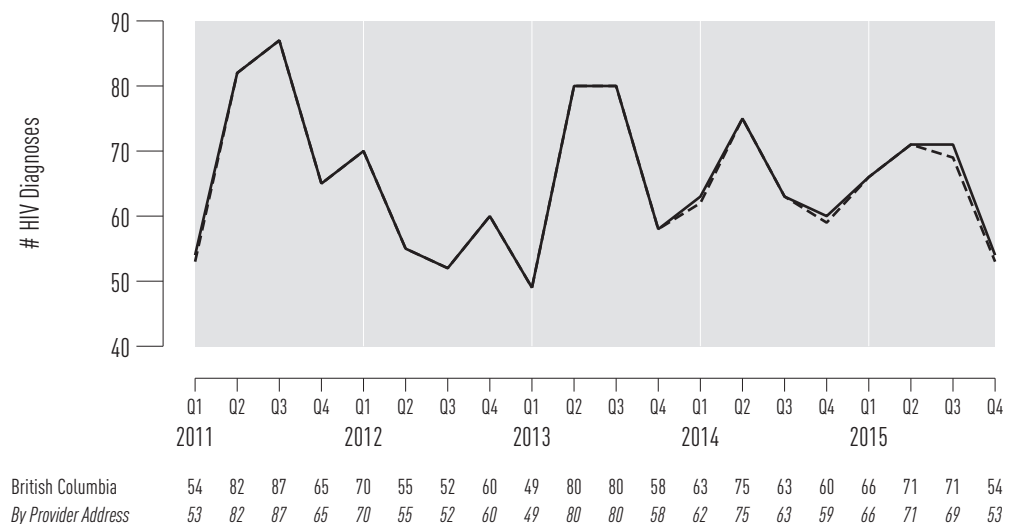
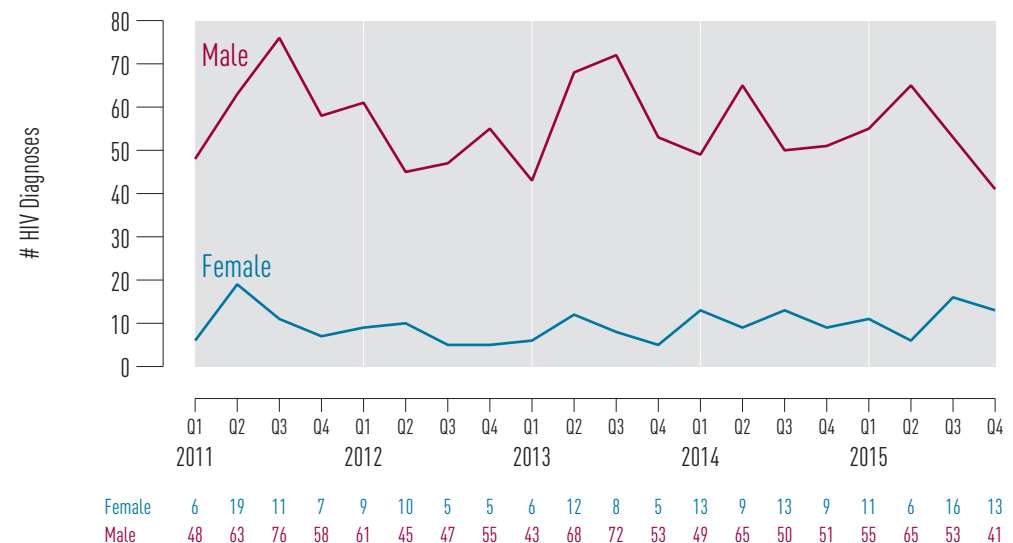


Figure 3.2 New HIV Diagnoses for BC by Gender ³



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

Figure 3.3 New HIV Diagnoses for BC by Age Category ³

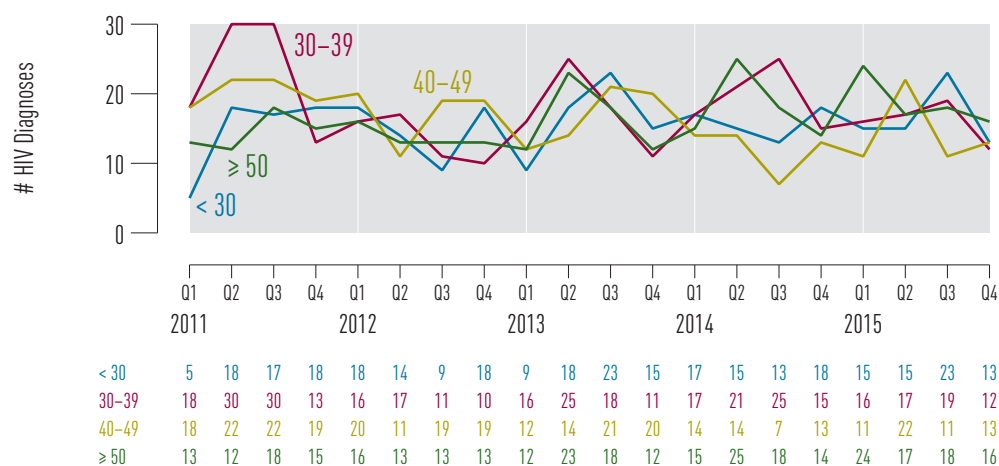
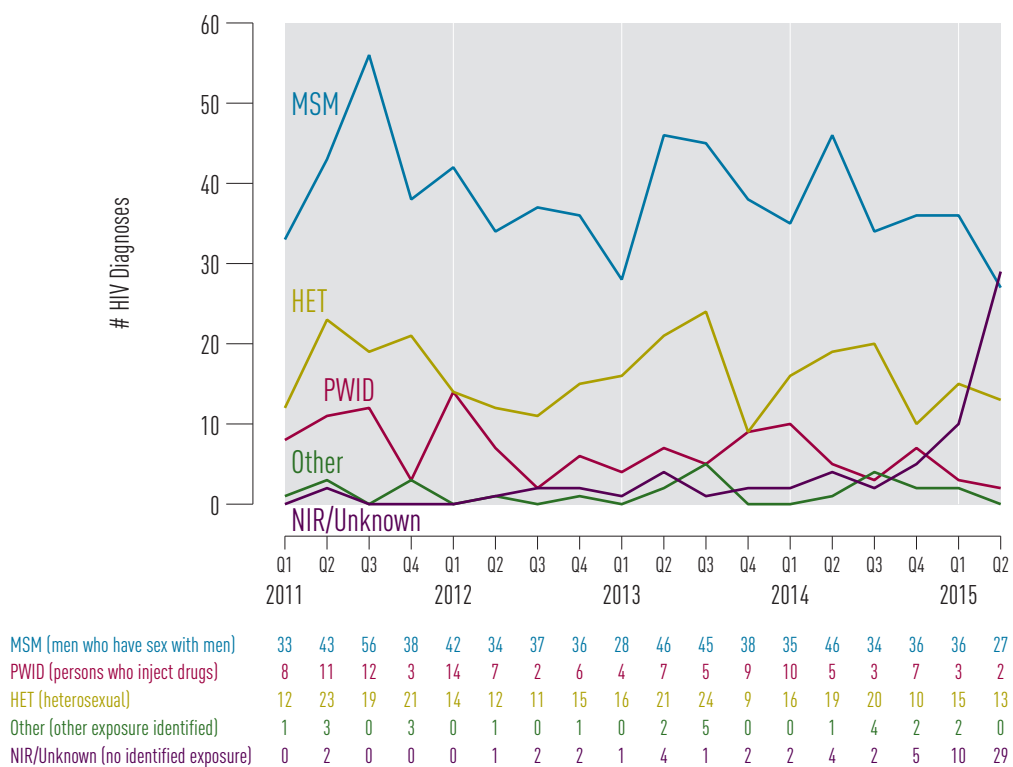


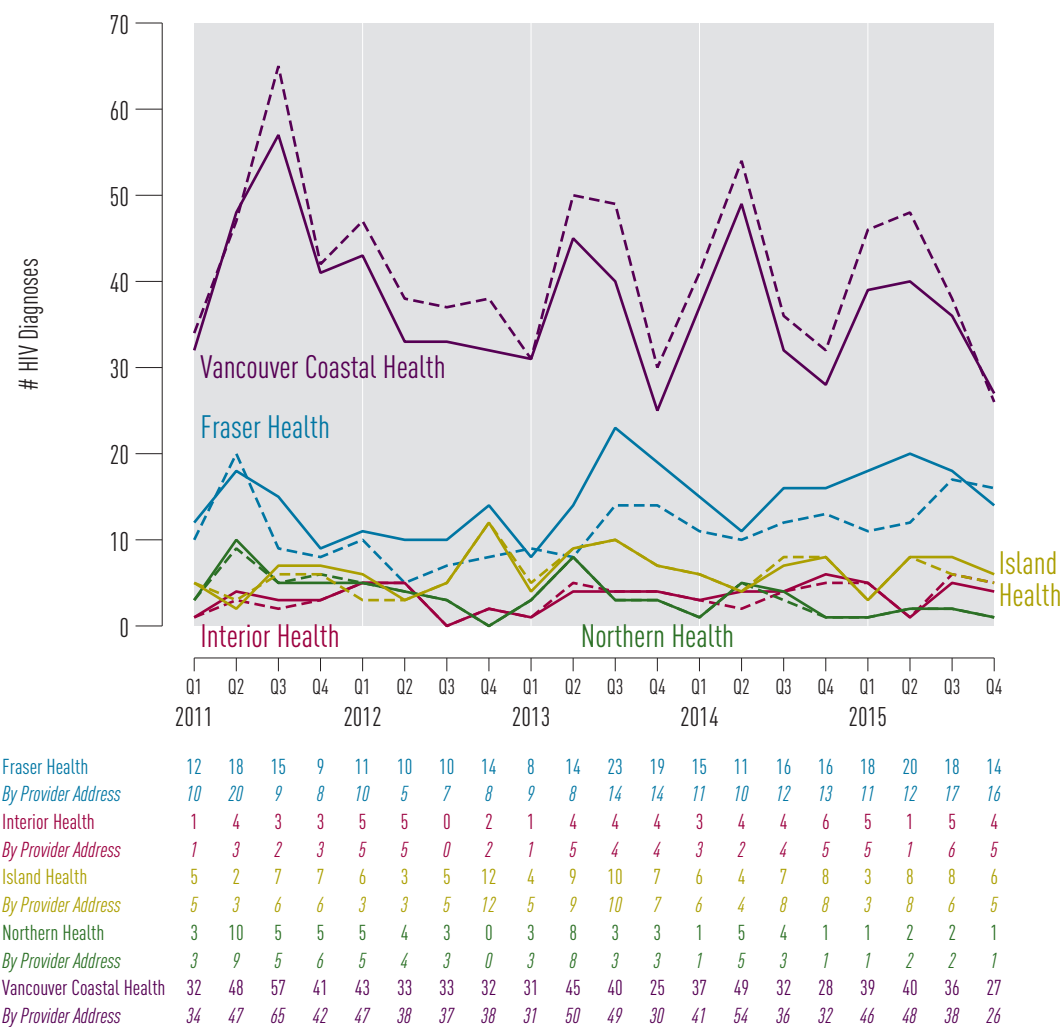
Figure 3.4 New HIV Diagnoses for BC by Exposure Category ^{3,4}



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 BC 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, 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	No AIDS case report
2a		CD4 350–499	
2b		CD4 200–349	
3		(CD4 <200	AIDS case report)
Unknown		No available CD4	No AIDS case report

Figure 4.1 Stage of HIV Infection at Diagnosis for BC, 2010–2014 ⁵

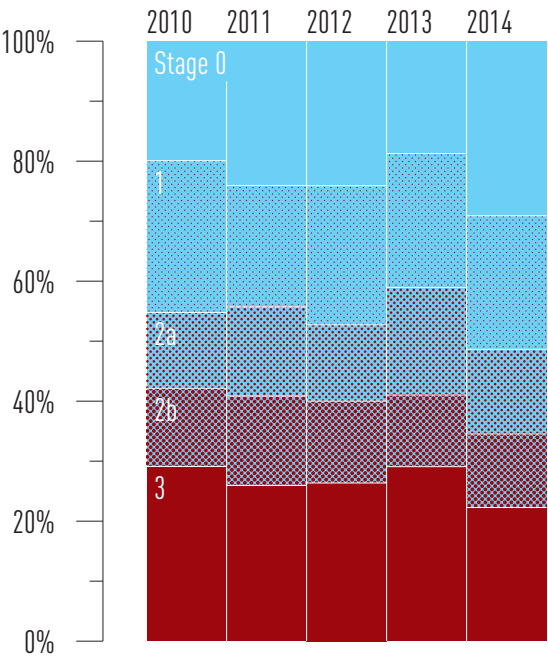
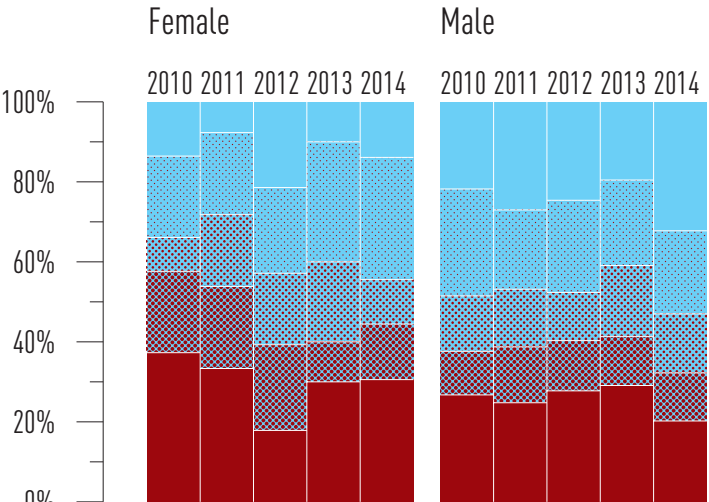


Figure 4.2 Stage of HIV Infection at Diagnosis by Gender for BC, 2010–2014 ⁵



	British Columbia					Female					Male				
	2010	'11	'12	'13	'14	'10	'11	'12	'13	'14	'10	'11	'12	'13	'14
Stage 0	52	63	53	47	64	8	3	6	3	5	44	60	47	43	59
Stage 1	66	53	51	56	49	12	8	6	9	11	54	44	44	47	38
Stage 2a	33	39	28	45	31	5	7	5	6	4	28	32	23	39	27
Stage 2b	34	39	30	30	27	12	8	6	3	5	22	31	24	27	22
Stage 3	76	68	58	73	49	22	13	5	9	11	54	55	53	64	37
Unknown	35	26	16	15	40	2	4	1	1	9	33	21	15	14	31
Total (n=)	296	288	236	266	260	61	43	29	31	45	235	243	206	234	214

Figure 4.3 Stage of HIV Infection at Diagnosis by Age Category for BC, 2010–2014 ⁵

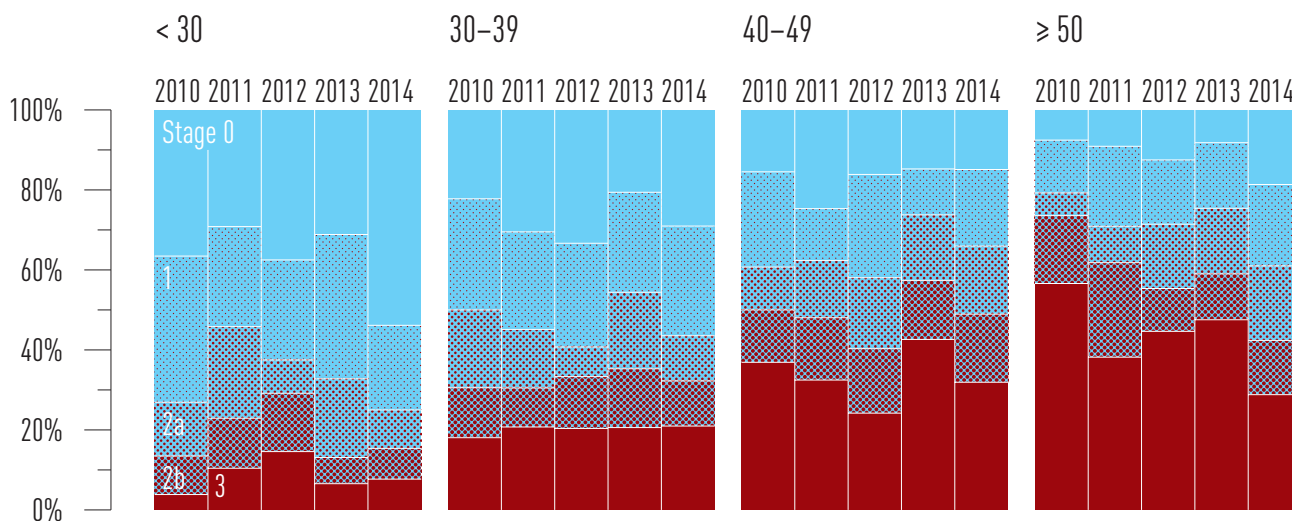
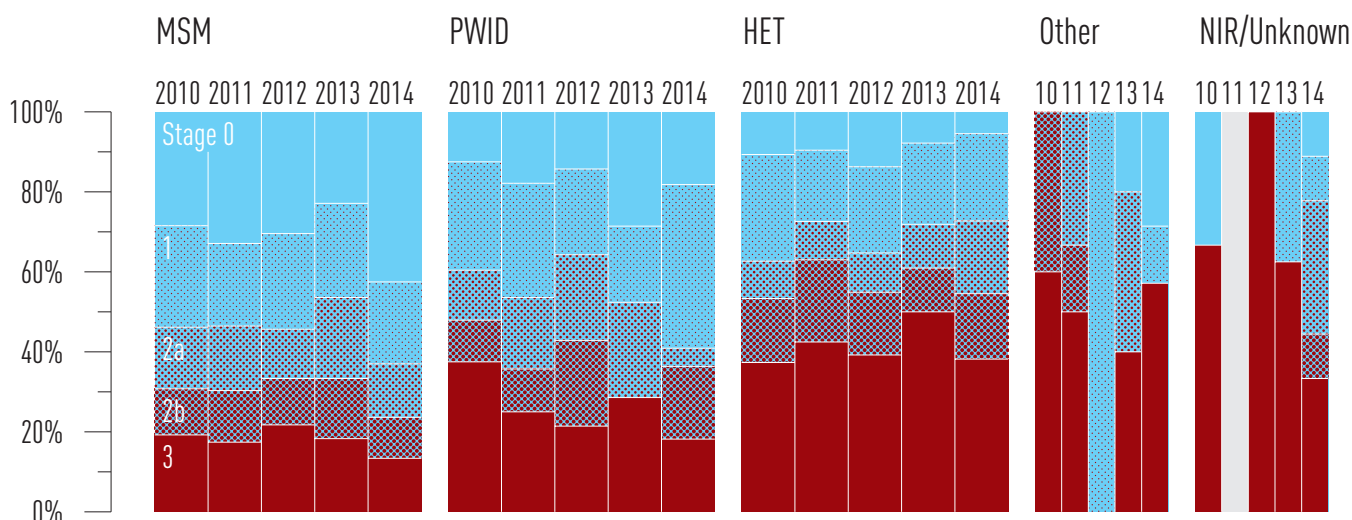


Figure 4.4 Stage of HIV Infection at Diagnosis by Exposure Category for BC, 2010–2014 ^{5,6}



	< 30 years					30–39 years					40–49 years					≥ 50 years					MSM					PWID					Heterosexual					Other					NIR/Unknown				
	2010	11	12	13	14	10	11	12	13	14	10	11	12	13	14	10	11	12	13	14	10	11	12	13	14	10	11	12	13	14	10	11	12	13	14	10	11	12	13	14	10	11	12	13	14
Stage 0	19	14	18	19	28	16	25	18	14	18	13	19	10	9	7	4	5	7	5	11	37	51	42	35	54	6	5	4	6	4	8	7	7	5	3	0	0	0	1	2	1	0	0	0	1
Stage 1	19	12	12	22	11	20	20	14	17	17	20	10	16	7	9	7	11	9	10	12	33	32	33	36	26	13	8	6	4	9	20	13	11	13	12	0	0	1	0	1	0	0	0	3	1
Stage 2a	7	11	4	12	5	14	12	4	13	7	9	11	11	10	8	3	5	9	10	11	20	25	17	31	17	6	5	6	5	1	7	7	5	7	10	0	2	0	2	0	0	0	0	0	3
Stage 2b	5	6	7	4	4	9	8	7	10	7	11	12	10	9	8	9	13	6	7	8	15	20	16	23	13	5	3	6	0	4	12	15	8	7	9	2	1	0	0	0	0	0	0	0	1
Stage 3	2	5	7	4	4	13	17	11	14	13	31	25	15	26	15	30	21	25	29	17	25	27	30	28	17	18	7	6	6	4	28	31	20	32	21	3	3	0	2	4	2	0	2	5	3
Unknown	11	6	7	1	8	13	10	3	4	11	10	5	2	4	8	1	5	4	6	13	22	15	10	4	23	4	6	1	4	3	7	2	1	4	9	1	1	1	3	1	1	2	3	0	4
Total (n=)	63	54	55	62	60	85	92	57	72	73	94	82	64	65	55	54	60	60	67	72	152	170	148	157	150	52	34	29	25	25	82	75	52	68	64	6	7	2	8	8	4	2	5	8	13

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. 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 (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 Q1–2015 Q4 in BC overall and stratified by sex and age for each Health Authority.

Figure 5.1 Estimated Cascade of Care for British Columbia, 2015 ⁷

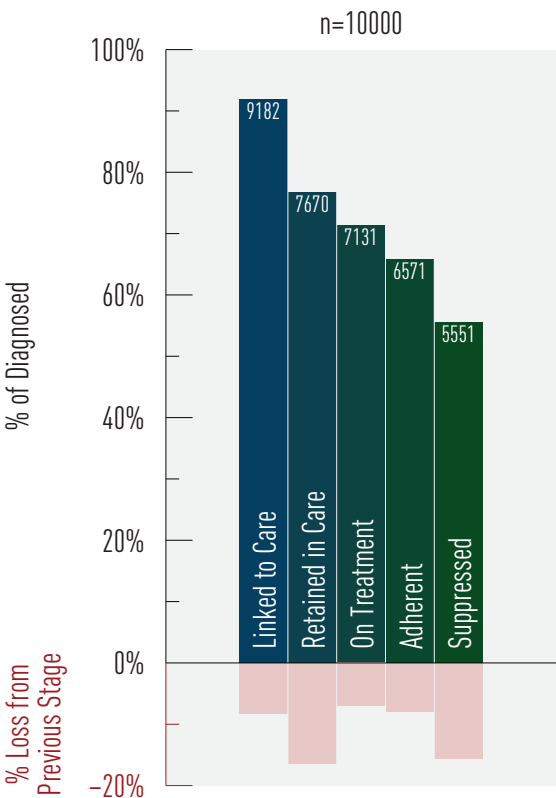
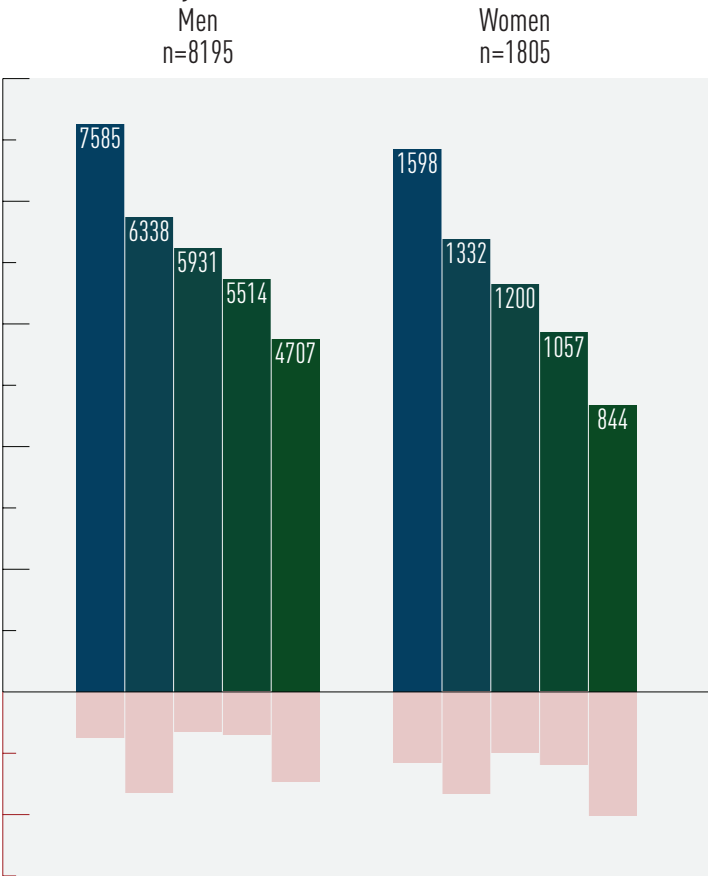


Figure 5.2 Estimated Cascade of Care for British Columbia by Gender, 2015 ⁷



⁷ Data is for the period 2015 Q1–2015 Q4.

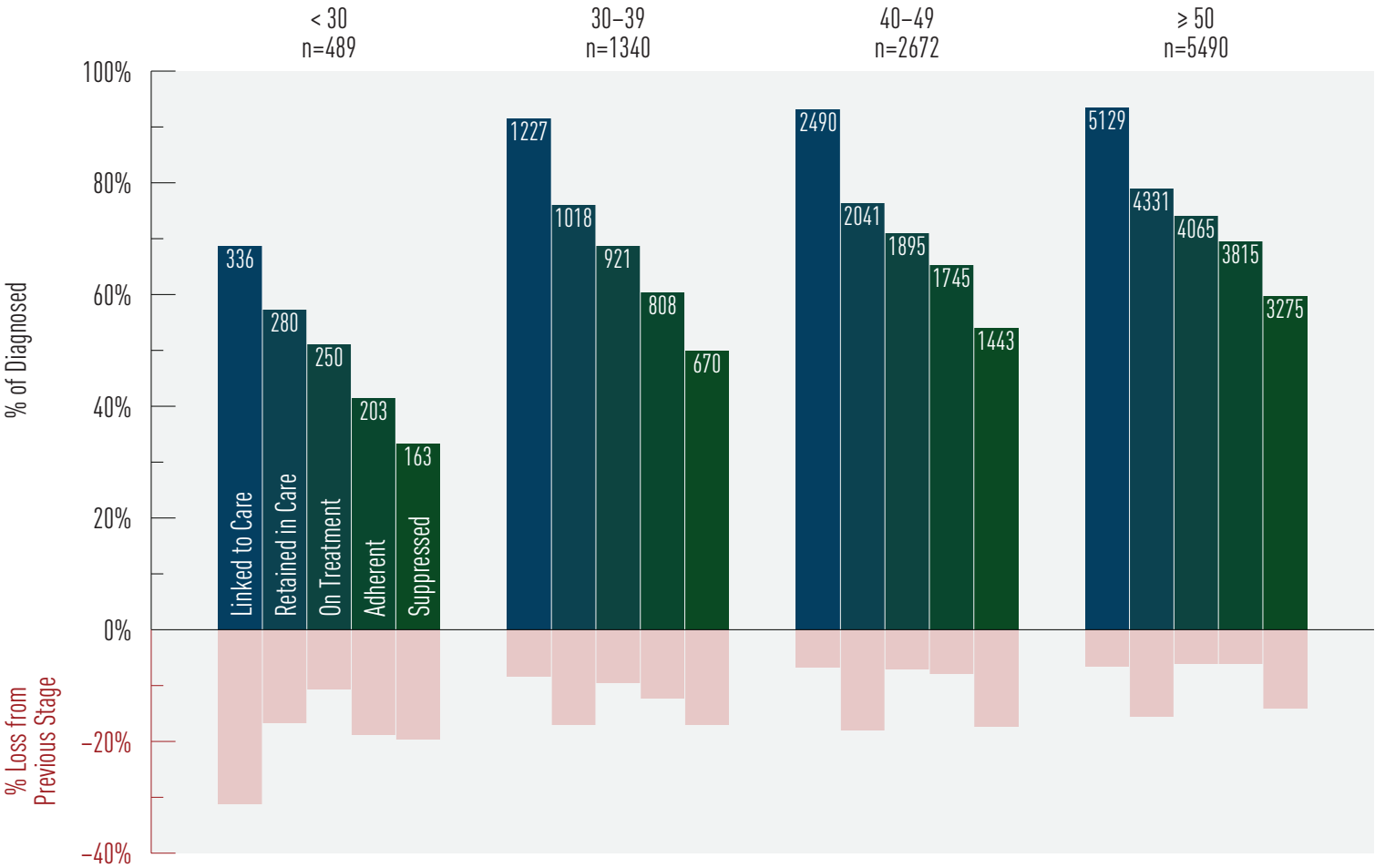
Data Sources:

- 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.

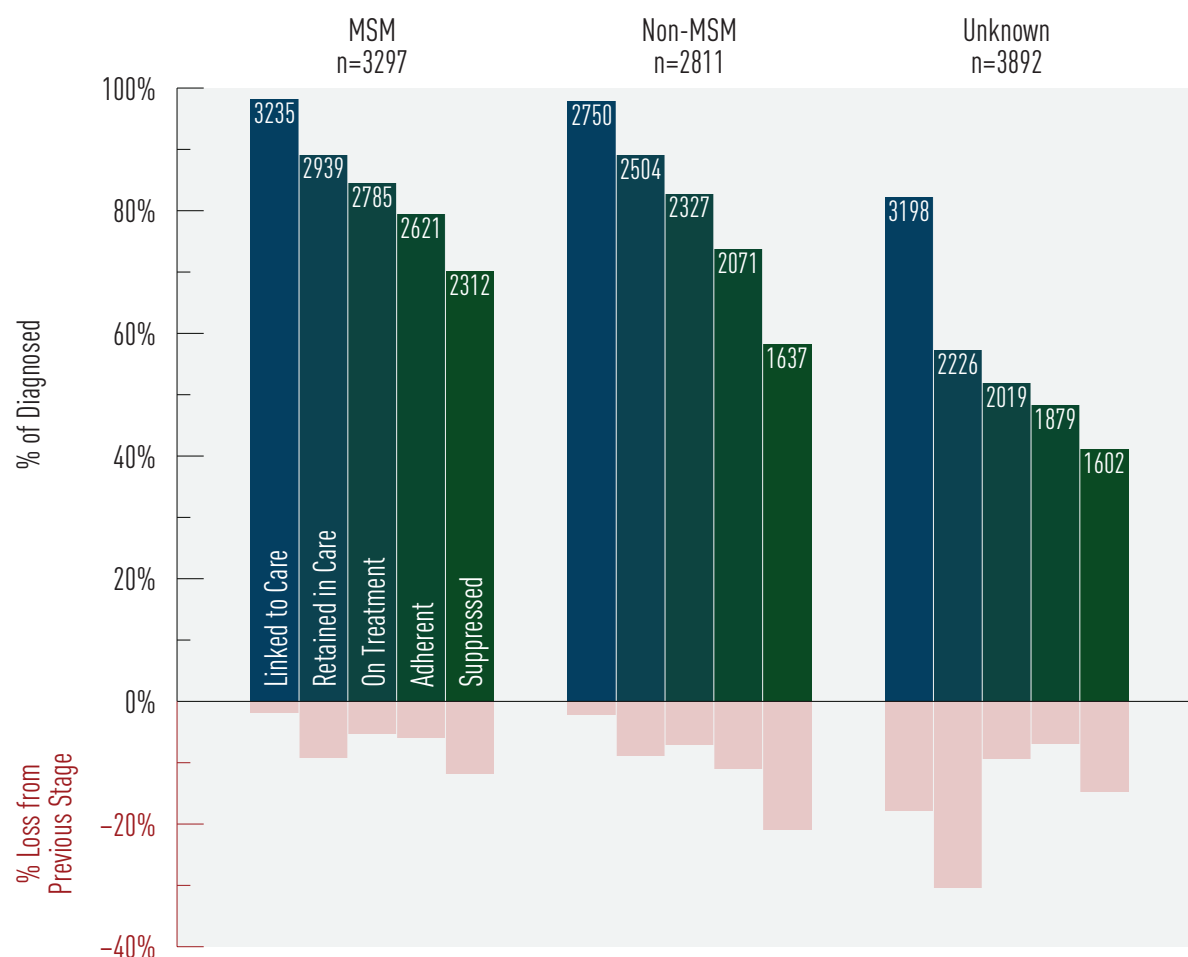
NB: Transgender have been assigned to their biological sex.

Figure 5.3 Estimated Cascade of Care for British Columbia by Age Category, 2015 ⁸



⁸ Data is for the period 2015 Q1–2015 Q4.
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, 2015 ⁹



⁹ Data is for the period 2015 Q1–2015 Q4.

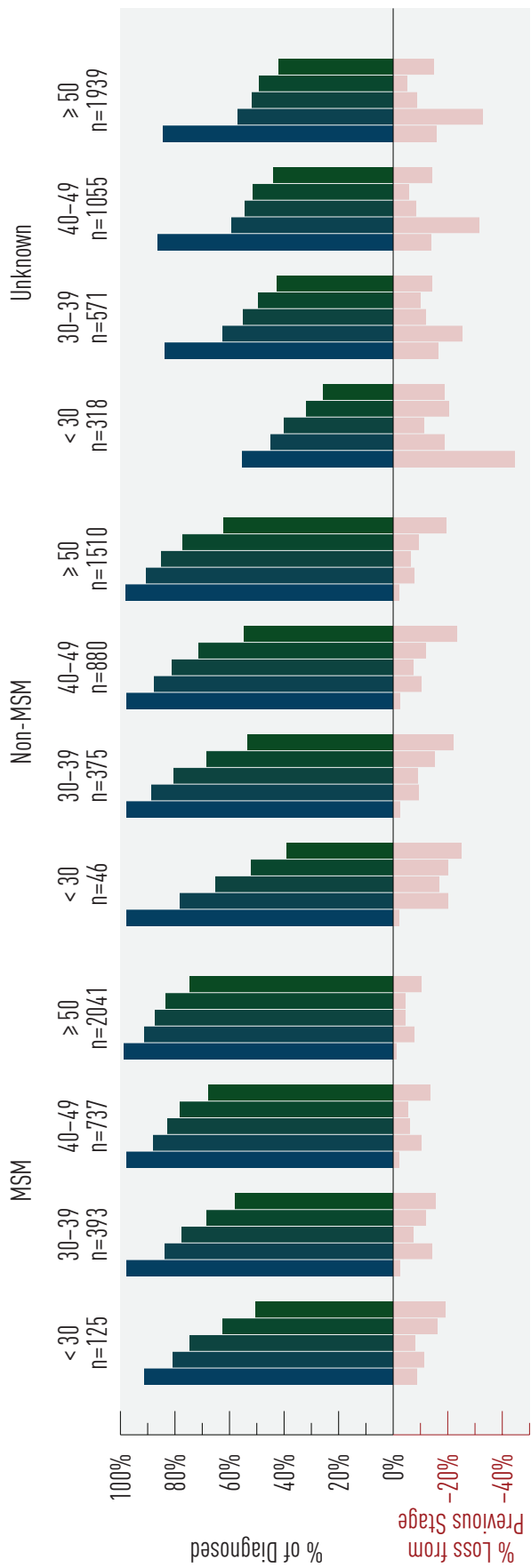
Data Sources:

- 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.

Recent updates to the DTP database have allowed for more comprehensive information on HIV risk group category. As a result, 2014 Q4 data may differ significantly from preceding reports in terms of total numbers ascribed to each risk group.

Figure 5.5 Estimated Cascade of Care for British Columbia by Age Category and MSM Status, 2015 ⁹



⁹ Data is for the period 2015 Q1-2015 Q4.

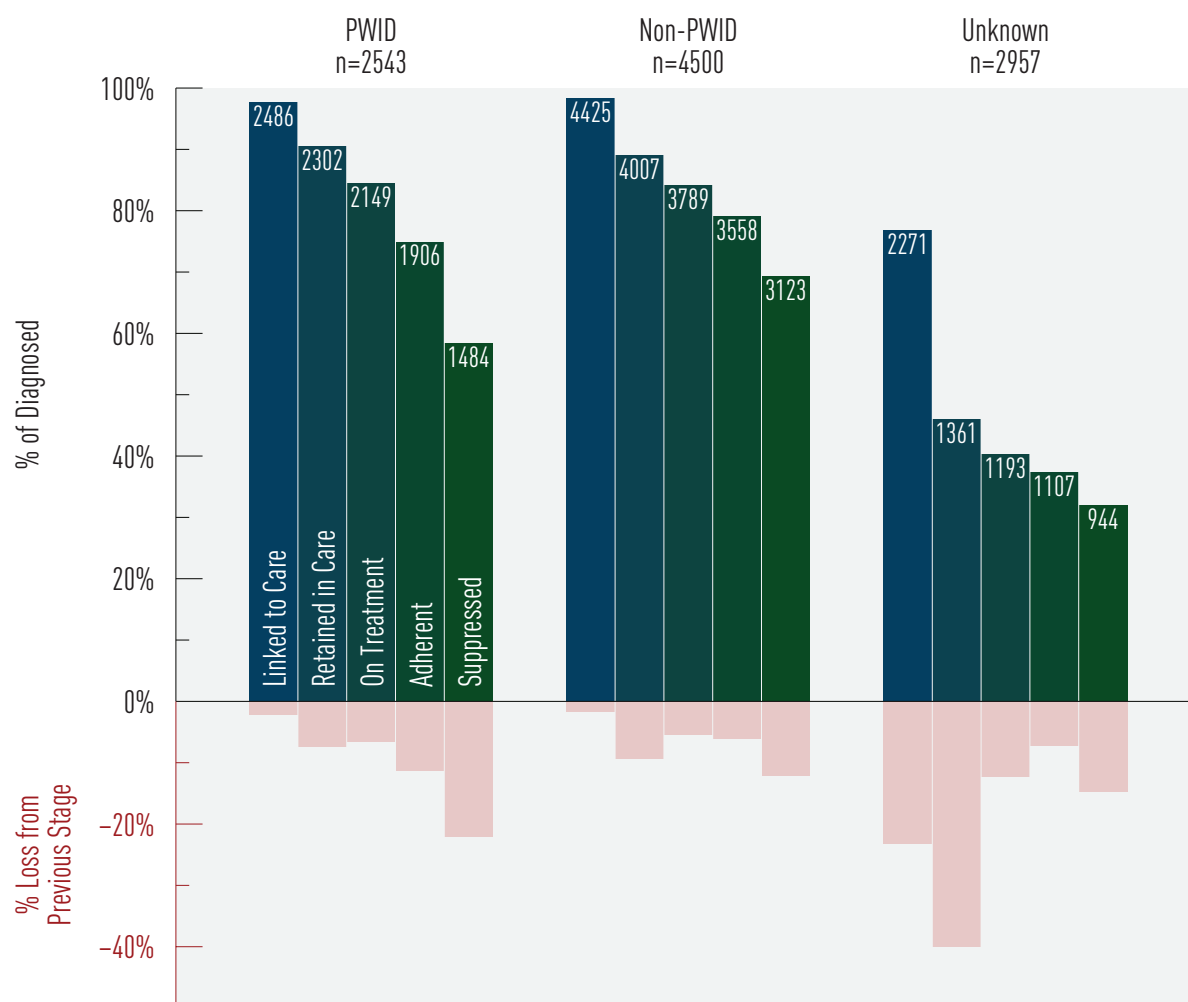
Data Sources:

- 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.

Recent updates to the DTP database have allowed for more comprehensive information on HIV risk group category. As a result, 2014 Q4 data may differ significantly from preceding reports in terms of total numbers ascribed to each risk group.

Figure 5.6 Estimated Cascade of Care for British Columbia by PWID Status, 2015 ⁹



⁹ Data is for the period 2015 Q1–2015 Q4.

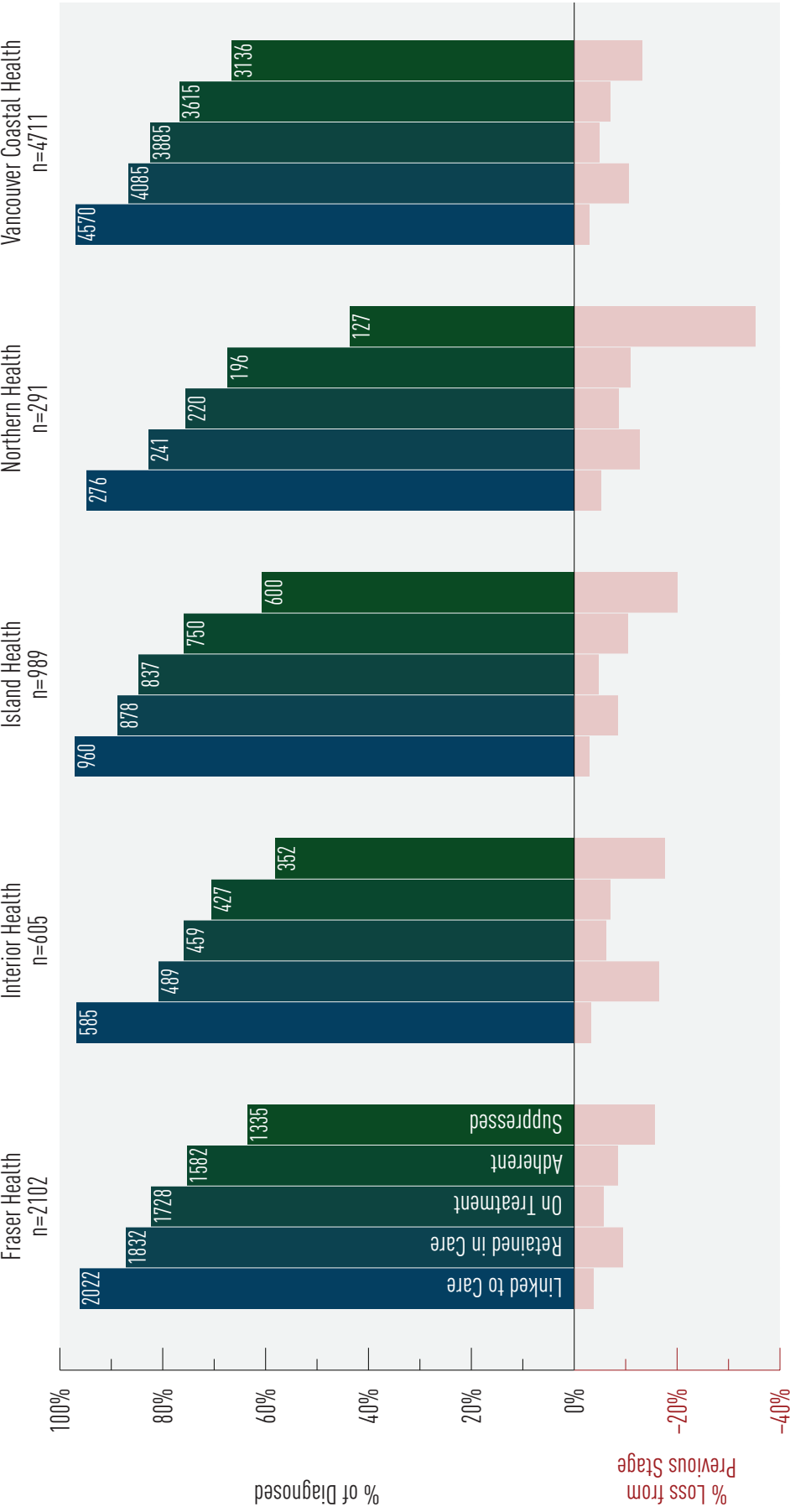
Data Sources:

- 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.

Recent updates to the DTP database have allowed for more comprehensive information on HIV risk group category. As a result, 2014 Q4 data may differ significantly from preceding reports in terms of total numbers ascribed to each risk group.

Figure 5.7 Estimated Cascade of Care for British Columbia by Health Authority, 2015 ⁹



⁹ Data is for the period 2015 Q1–2015 Q4.

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.

Recent updates to the DTP database have allowed for more comprehensive information on HIV risk group category. As a result, 2014 Q4 data may differ significantly from preceding reports in terms of total numbers ascribed to each risk group.

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 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/ 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 Q1–2015 Q4¹⁰

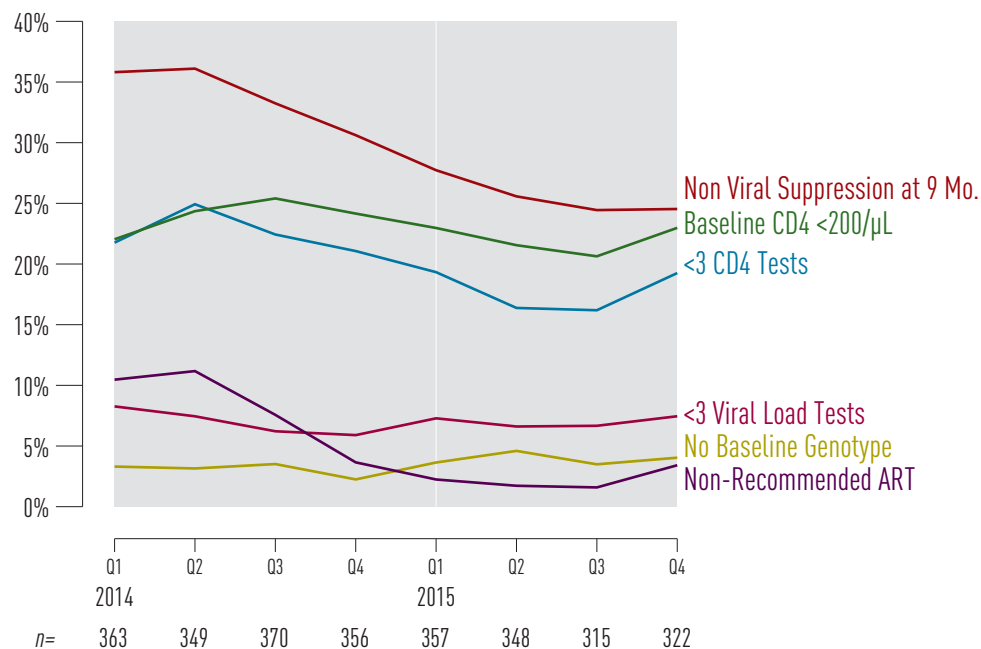
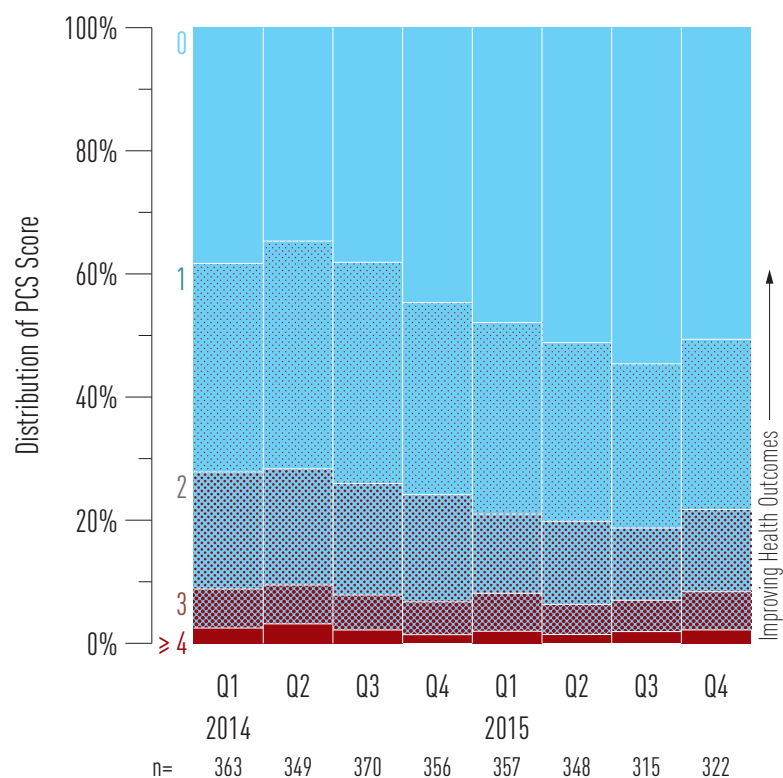


Figure 6.2 Historical Trends for PCS Score for BC, 2014 Q1–2015 Q4^{10,11}



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

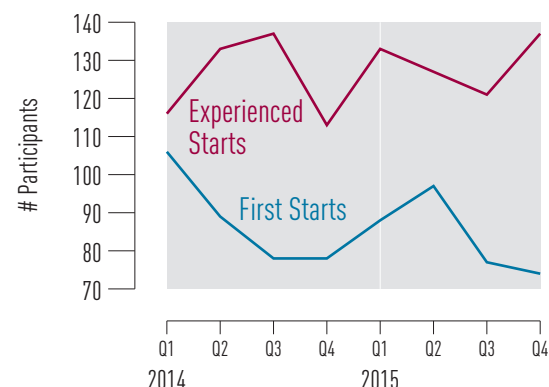
¹¹ Each quarter's data is calculated as the sum of the 4 quarters leading up to it. e.g. 2013 Q1 is calculated from 2012 Q2 – 2013 Q1.
NB: A score of 0 is the best score and a score of 4 or more is the worst score.

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.

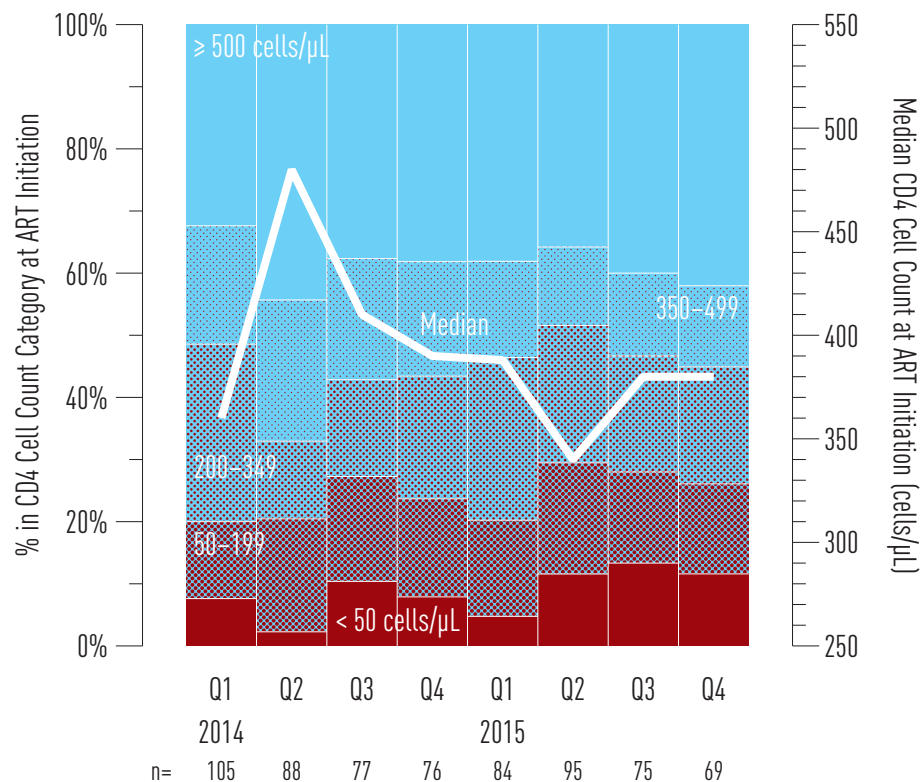
Indicator 7. New Antiretroviral Therapy Starts in BC

Figure 7 BC-CfE Drug Treatment Program Enrollment: New ART Participants in BC, 2014 Q1–2015 Q4 ¹²



Indicator 8. CD4 Cell Count at ART Initiation

Figure 8 CD4 Cell Count at ART Initiation of ART-Naïve DTP Participants in BC, 2014 Q1–2015 Q4 ¹³



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

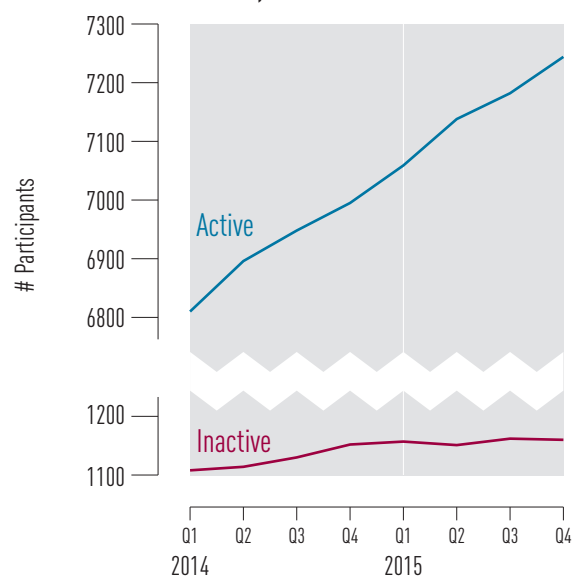
¹³ Data Source: Drug Treatment Program Database
Limitations: CD4 cell count data is approximately 80% complete.

Indicator 9. Active and Inactive DTP Participants

Table 3. Distribution of People on ART for BC, 2015 Q4 ¹⁴

		Fraser	Interior	Island	Northern	Vancouver Coastal	Total BC
Age	< 30	88	18	26	10	143	285
	30–39	257	59	94	46	519	976
	40–49	538	111	223	64	1085	2022
	≥ 50	874	290	496	98	2203	3961
Gender	Male	1362	380	680	138	3481	6043
	Female	395	98	159	80	469	1201
Exposure	MSM	560	143	228	30	1883	2846
	PWID	455	153	274	117	1134	2133
Total		1757	478	839	218	3950	7244

Figure 9 Active and Inactive DTP Participants for BC, 2014 Q1–2015 Q4 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.

Recent updates to the DTP database provides for improved classification allowing some individuals previously classified as 'unknown' to be reclassified into specific risk groups. This update is in effect from 2014Q4 and may result in noticeable changes of numbers in each risk group category compared to previous reports.

Definition:

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

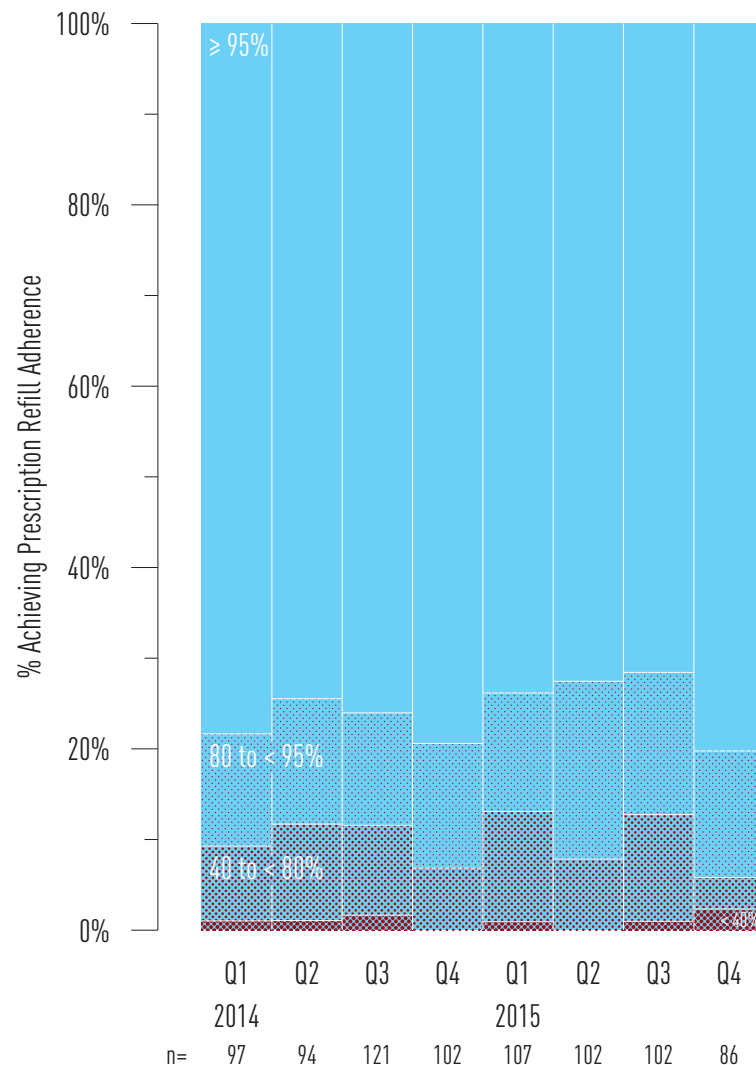
¹⁵ Active DTP participants: An individual who has had medication prescribed at least once in the preceding quarter.
Inactive DTP participants: Persons no longer prescribed drugs through the HIV/AIDS Drug Treatment Program in the last quarter.

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 Q1–2015 Q4 ¹⁶



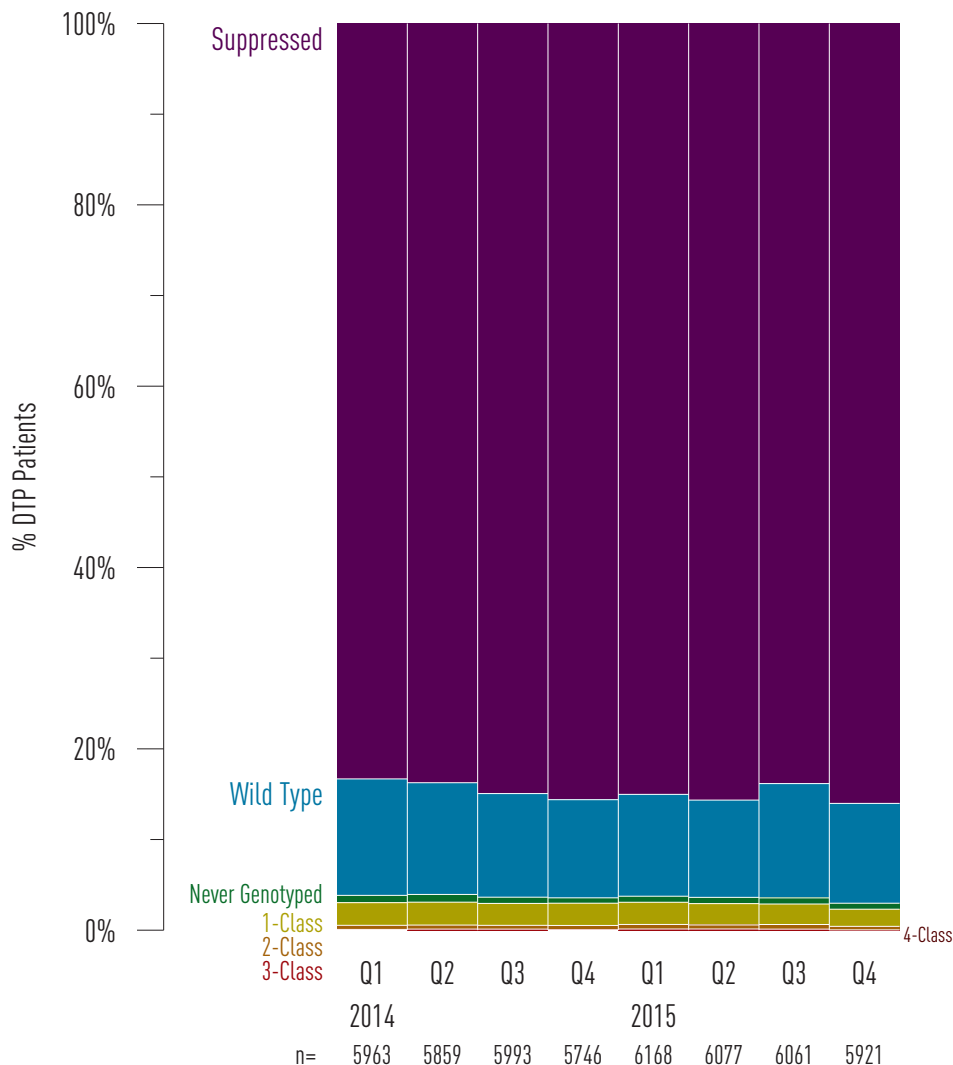
¹⁶ Data Source: Drug Treatment Program Database
Limitation: Prescription refill adherence is used as a proxy for patient adherence.

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 Q1–2015 Q4 ¹⁷



¹⁷ Data Source: Drug Treatment Program Database

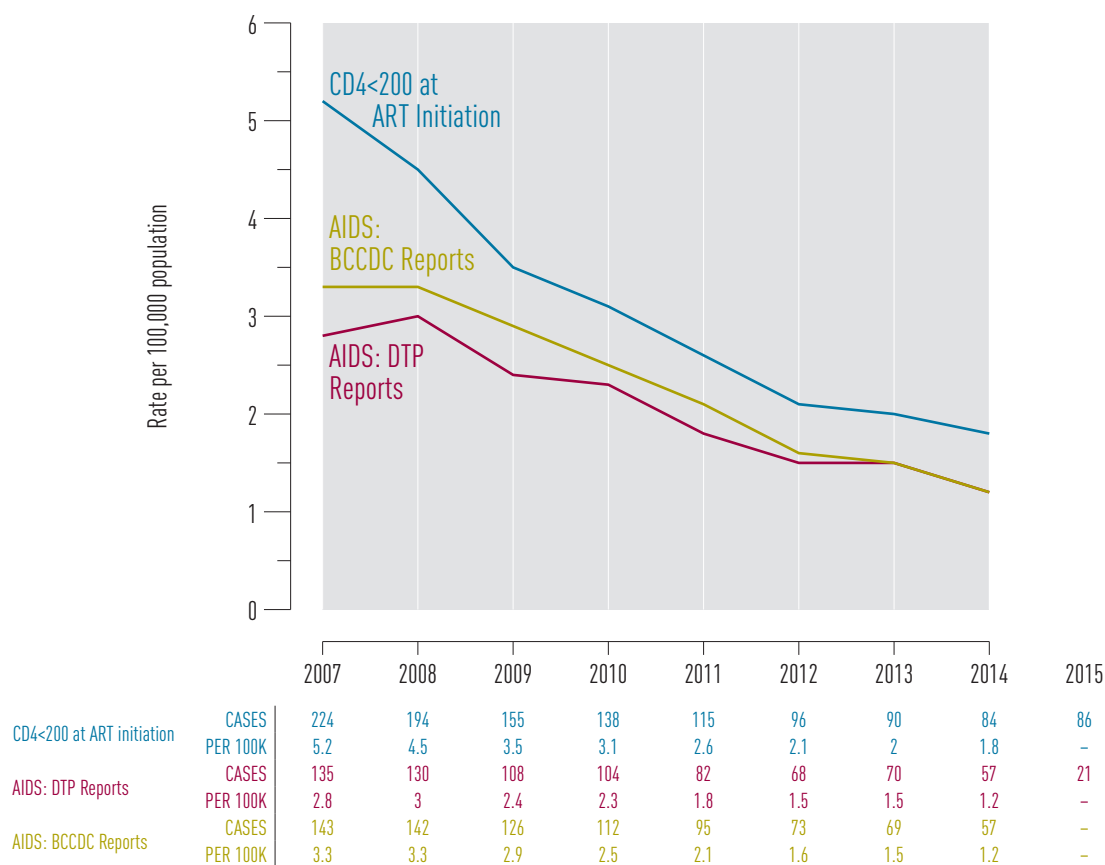
Limitation: DTP participants are designated to a HA based on most current residence provided by the participant.

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 British Columbia 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.

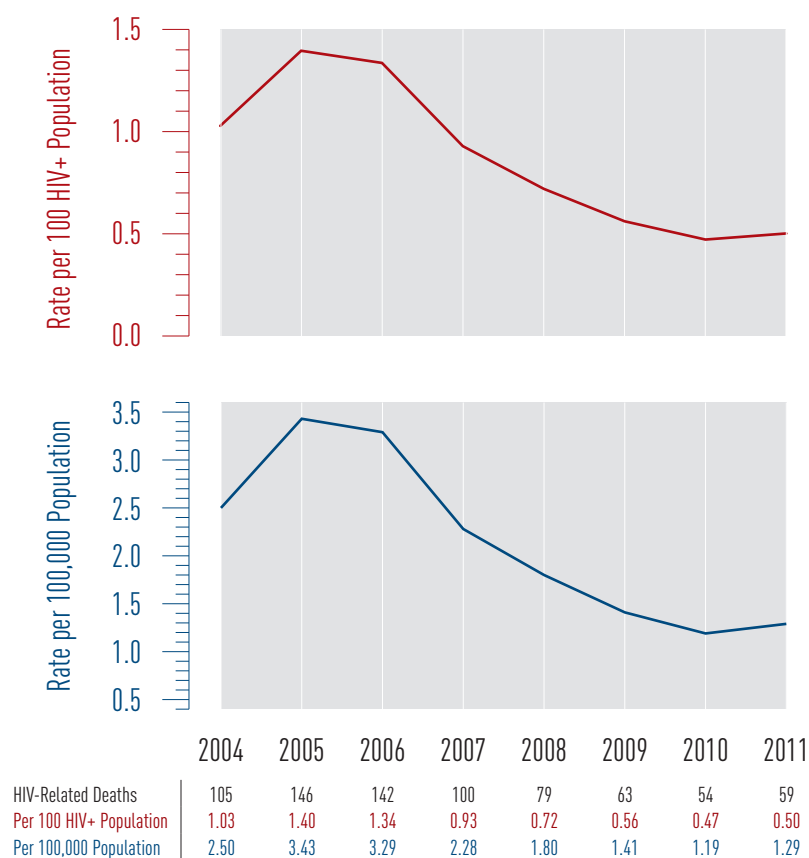
Limitation: AIDS case reporting was investigated using 3 definitions: First, using AIDS cases reported in AIDS case report forms from the DTP; Second, using AIDS cases reported via the BCCDC and third, using a CD4 cell count of <200 cells/μL at time of ART initiation using DTP data. AIDS case reporting 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			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
British Columbia		35.1	33.5	40.3	37.6	42.3	41.5	45.8	46.6	54.8	58.0	55.9	54.6	62.0	66.1	71.2	70.5	77.9	77.0	79.6	80.4
Gender	Female	15.6	14.7	15.9	16.6	18.9	18.9	21.1	21.5	25.7	27.5	26.4	25.6	28.7	31.2	33.8	33.7	37.5	37.4	38.6	38.5
	Male	17.9	16.2	17.8	18.0	20.8	20.1	22.0	22.7	26.2	27.9	26.5	26.2	30.0	31.6	33.8	33.7	37.2	36.7	38.2	39.0
	Other	0.6	0.6	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
Age	< 30	12.3	11.8	13.1	13.0	14.0	13.5	15.1	14.7	15.7	16.7	16.8	16.3	17.4	17.6	19.2	18.9	19.7	19.9	21.7	21.8
	30–39	9.0	8.0	8.7	8.7	10.1	9.7	10.4	10.3	12.2	12.7	12.3	11.9	13.9	13.9	14.6	14.1	16.1	16.1	16.6	16.0
	40–49	6.0	5.5	5.8	6.0	6.9	6.8	7.1	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
	≥ 50	6.2	5.7	6.2	7.0	8.8	9.1	10.7	11.7	15.2	16.9	15.2	15.2	17.8	21.4	23.5	24.0	27.4	26.9	26.9	28.2
POC HIV Tests		1.1	2.1	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	2.8	2.6	2.5	2.5
Fraser Health		8.7	8.2	9.1	9.0	10.1	10.1	11.0	11.6	13.5	14.0	13.8	12.9	13.6	14.5	14.9	15.1	16.1	15.9	16.7	16.8
	Female	4.0	3.9	4.3	4.3	4.7	4.9	5.4	5.7	6.6	6.8	6.8	6.2	6.5	7.0	7.2	7.4	7.6	7.6	8.1	7.9
	Male	4.6	4.3	4.7	4.6	5.3	5.1	5.5	5.7	6.6	7.0	6.7	6.5	6.9	7.1	7.3	7.5	8.1	7.8	8.3	8.5
Interior Health		4.1	3.8	3.9	4.1	4.1	4.0	4.3	4.2	4.4	4.7	4.6	4.9	5.3	5.5	5.6	5.9	6.6	7.1	7.9	9.1
	Female	2.0	2.0	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
	Male	2.0	1.8	1.8	2.0	2.0	1.9	2.1	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
Island Health		4.0	3.5	3.6	3.5	4.0	3.7	3.9	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
	Female	1.9	1.7	1.8	1.7	1.9	1.9	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
	Male	2.0	1.7	1.8	1.7	2.0	1.8	1.9	1.8	2.0	2.1	2.0	1.9	2.2	2.1	2.1	2.1	2.6	2.6	2.7	2.9
Northern Health		1.9	1.8	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
	Female	1.0	0.9	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
	Male	0.9	0.8	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	1.4	1.4
Vancouver Coastal Health		16.4	16.2	21.9	19.1	21.8	21.5	24.4	24.5	30.1	32.1	30.7	29.8	35.0	38.4	43.0	41.6	45.5	44.9	45.4	44.7
	Female	6.6	6.2	6.9	7.4	9.0	9.0	10.5	10.6	13.6	14.8	14.0	13.6	15.8	17.9	20.0	19.6	21.8	21.6	21.8	21.2
	Male	8.3	7.6	8.6	8.8	10.5	10.4	11.6	11.9	14.3	15.3	14.4	14.2	16.8	18.3	20.4	19.8	21.8	21.5	21.9	21.8

Indicator 2: Rate of HIV Testing per 100,000

		2009	2010	2011	2012	2013	2014	2015
British Columbia		2625.4	2646.5	2714.8	3332.8	4194.2	4969.4	5734.7
Fraser Health		2251.5	2267.9	2331.7	2805.3	3316.7	3591.8	3989.3
Interior Health		2026.9	2072.7	2093.2	2182.3	2551.9	2967.4	4049.4
Island Health		1927.2	1919.4	1850.9	1986.0	2141.6	2326.0	2928.7
Northern Health		2291.0	2348.6	2432.9	2920.7	3332.3	3825.8	4334.1
Vancouver Coastal Health		4127.0	4143.0	4344.6	5862.6	8135.6	10335.9	11636.4
Gender	Female	2447.1	2455.6	2524.0	3210.9	4168.0	4942.3	5760.8
	Male	2695.1	2735.4	2809.5	3398.2	4180.1	4952.6	5657.3
Age	< 30	2795.3	2802.8	2855.3	3245.5	3686.0	4048.1	4540.9
	30–39	5089.8	5226.3	5252.5	6098.5	7205.7	8108.3	9017.5
	40–49	3027.7	3027.5	3124.1	3846.6	4933.0	5707.4	6507.4
	≥ 50	1241.3	1281.2	1396.0	2179.4	3303.0	4414.6	5350.3

		2011				2012				2013				2014				2015			
Indicator 3: New HIV Diagnoses		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
British Columbia	By Client Residence	54	82	87	65	70	55	52	60	49	80	80	58	63	75	63	60	66	71	71	54
	By Provider Address	53	82	87	65	70	55	52	60	49	80	80	58	62	75	63	59	66	71	69	53
Gender	Female	6	19	11	7	9	10	5	5	6	12	8	5	13	9	13	9	11	6	16	13
	Male	48	63	76	58	61	45	47	55	43	68	72	53	49	65	50	51	55	65	53	41
Age	< 30	5	18	17	18	18	14	9	18	9	18	23	15	17	15	13	18	15	15	23	13
	30–39	18	30	30	13	16	17	11	10	16	25	18	11	17	21	25	15	16	17	19	12
	40–49	18	22	22	19	20	11	19	19	12	14	21	20	14	14	7	13	11	22	11	13
	≥ 50	13	12	18	15	16	13	13	13	12	23	18	12	15	25	18	14	24	17	18	16
Exposure	MSM	33	43	56	38	42	34	37	36	28	46	45	38	35	46	34	36	36	27	–	–
	PWID	8	11	12	3	14	7	2	6	4	7	5	9	10	5	3	7	3	2	–	–
	HET	12	23	19	21	14	12	11	15	16	21	24	9	16	19	20	10	15	13	–	–
	Other	1	3	0	3	0	1	0	1	0	2	5	0	0	1	4	2	2	0	–	–
	NIR/Unknown	0	2	0	0	0	1	2	2	1	4	1	2	2	4	2	5	10	29	–	–
Fraser Health	By Client Residence	12	18	15	9	11	10	10	14	8	14	23	19	15	11	16	16	18	20	18	14
	By Provider Address	10	20	9	8	10	5	7	8	9	8	14	14	11	10	12	13	11	12	17	16
Interior Health	By Client Residence	1	4	3	3	5	5	0	2	1	4	4	4	3	4	4	6	5	1	5	4
	By Provider Address	1	3	2	3	5	5	0	2	1	5	4	4	3	2	4	5	5	1	6	5
Island Health	By Client Residence	5	2	7	7	6	3	5	12	4	9	10	7	6	4	7	8	3	8	8	6
	By Provider Address	5	3	6	6	3	3	5	12	5	9	10	7	6	4	8	8	3	8	6	5
Northern Health	By Client Residence	3	10	5	5	5	4	3	0	3	8	3	3	1	5	4	1	1	2	2	1
	By Provider Address	3	9	5	6	5	4	3	0	3	8	3	3	1	5	3	1	1	2	2	1
Vancouver Coastal Health	By Client Residence	32	48	57	41	43	33	33	32	31	45	40	25	37	49	32	28	39	40	36	27
	By Provider Address	34	47	65	42	47	38	37	38	31	50	49	30	41	54	36	32	46	48	38	26

Indicator 4: Stage of HIV Infection at Baseline

	British Columbia					Female					Male					< 30 years					30–39 years					40–49 years				
	'10	'11	'12	'13	'14	'10	'11	'12	'13	'14	'10	'11	'12	'13	'14	'10	'11	'12	'13	'14	'10	'11	'12	'13	'14	'10	'11	'12	'13	'14
Stage 0	52	63	53	47	64	8	3	6	3	5	44	60	47	43	59	19	14	18	19	28	16	25	18	14	18	13	19	10	9	7
Stage 1	66	53	51	56	49	12	8	6	9	11	54	44	44	47	38	19	12	12	22	11	20	20	14	17	17	20	10	16	7	9
Stage 2a	33	39	28	45	31	5	7	5	6	4	28	32	23	39	27	7	11	4	12	5	14	12	4	13	7	9	11	11	10	8
Stage 2b	34	39	30	30	27	12	8	6	3	5	22	31	24	27	22	5	6	7	4	4	9	8	7	10	7	11	12	10	9	8
Stage 3	76	68	58	73	49	22	13	5	9	11	54	55	53	64	37	2	5	7	4	4	13	17	11	14	13	31	25	15	26	15
Unknown	35	26	16	15	40	2	4	1	1	9	33	21	15	14	31	11	6	7	1	8	13	10	3	4	11	10	5	2	4	8
Total	296	288	236	266	260	61	43	29	31	45	235	243	206	234	214	63	54	55	62	60	85	92	57	72	73	94	82	64	65	55
	≥ 50 years					MSM					PWID					Heterosexual					Other Exposure					NIR/Unknown				
	'10	'11	'12	'13	'14	'10	'11	'12	'13	'14	'10	'11	'12	'13	'14	'10	'11	'12	'13	'14	'10	'11	'12	'13	'14	'10	'11	'12	'13	'14
Stage 0	4	5	7	5	11	37	51	42	35	54	6	5	4	6	4	8	7	7	5	3	0	0	0	1	2	1	0	0	0	1
Stage 1	7	11	9	10	12	33	32	33	36	26	13	8	6	4	9	20	13	11	13	12	0	0	1	0	1	0	0	0	3	1
Stage 2a	3	5	9	10	11	20	25	17	31	17	6	5	6	5	1	7	7	5	7	10	0	2	0	2	0	0	0	0	0	3
Stage 2b	9	13	6	7	8	15	20	16	23	13	5	3	6	0	4	12	15	8	7	9	2	1	0	0	0	0	0	0	0	1
Stage 3	30	21	25	29	17	25	27	30	28	17	18	7	6	6	4	28	31	20	32	21	3	3	0	2	4	2	0	2	5	3
Unknown	1	5	4	6	13	22	15	10	4	23	4	6	1	4	3	7	2	1	4	9	1	1	1	3	1	1	2	3	0	4
Total	54	60	60	67	72	152	170	148	157	150	52	34	29	25	25	82	75	52	68	64	6	7	2	8	8	4	2	5	8	13

Indicator 5: HIV Cascade of Care			DIAGNOSED	LINKED	RETAINED	ON ART	ADHERENT	SUPPRESSED
British Columbia			10000	9182	7670	7131	6571	5551
Age Category	< 30		489	336	280	250	203	163
	30–39		1340	1227	1018	921	808	670
	40–49		2672	2490	2041	1895	1745	1443
	≥ 50		5490	5129	4331	4065	3815	3275
Age Category and MSM Status	MSM	< 30	125	114	101	93	78	63
		30–39	393	384	329	305	269	227
		40–49	737	721	647	609	576	498
		≥ 50	2041	2017	1863	1778	1698	1524
	Non-MSM	< 30	46	45	36	30	24	18
		30–39	375	366	332	302	256	200
		40–49	880	859	770	713	628	481
		≥ 50	1510	1479	1367	1282	1163	938
	Unknown	< 30	318	176	143	127	101	82
		30–39	571	477	357	314	283	243
		40–49	1055	910	625	573	541	464
		≥ 50	1939	1634	1101	1005	954	813
Gender	Male		8195	7585	6338	5931	5514	4707
	Female		1805	1598	1332	1200	1057	844
Injection Drug Use	PWID		2543	2486	2302	2149	1906	1484
	Non-PWID		4500	4425	4007	3789	3558	3123
	Unknown		2957	2271	1361	1193	1107	944
MSM Status	MSM		3297	3235	2939	2785	2621	2312
	Non-MSM		2811	2750	2504	2327	2071	1637
	Unknown		3892	3198	2226	2019	1879	1602
Health Authority	Fraser Health		2102	2022	1832	1728	1582	1335
	Interior Health		605	585	489	459	427	352
	Island Health		989	960	878	837	750	600
	Northern Health		291	276	241	220	196	127
	Vancouver Coastal Health		4711	4570	4085	3885	3615	3136

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

	2014				2015			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
< 3 CD4 Tests	21.8%	24.9%	22.4%	21.1%	19.3%	16.4%	16.2%	19.3%
< 3 Viral Load Tests	8.3%	7.4%	6.2%	5.9%	7.3%	6.6%	6.7%	7.5%
No Baseline Genotype	3.3%	3.2%	3.5%	2.2%	3.6%	4.6%	3.5%	4.0%
Baseline CD4 < 200 cells/μL	22.0%	24.4%	25.4%	24.2%	23.0%	21.6%	20.6%	23.0%
Non-Recommended ART	10.5%	11.2%	7.6%	3.7%	2.2%	1.7%	1.6%	3.4%
Non Viral suppression at 9 Mo.	35.8%	36.1%	33.2%	30.6%	27.7%	25.6%	24.4%	24.5%
PCS Score: 0	139	121	141	159	171	178	172	163
PCS Score: 1	123	129	133	111	111	101	84	89
PCS Score: 2	69	66	67	62	46	47	37	43
PCS Score: 3	23	22	21	19	22	17	16	20
PCS Score: 4 or more	9	11	8	5	7	5	6	7
Total (n=)	363	349	370	356	357	348	315	322

Indicator 7: New DTP ARV Participants

	2014 Q1	Q2	Q3	Q4	2015 Q1	Q2	Q3	Q4
First Starts	106	89	78	78	88	97	77	74
Experienced Starts	116	133	137	113	133	127	121	137

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

CD4 ≥ 500	34	39	29	29	32	34	30	29
CD4 350–499	20	20	15	14	13	12	10	9
CD4 200–349	30	11	12	15	22	21	14	13
CD4 50–199	13	16	13	12	13	17	11	10
CD4 < 50	8	2	8	6	4	11	10	8
<i>CD4 Median (cells/μL)</i>	<i>360</i>	<i>480</i>	<i>410</i>	<i>390</i>	<i>388</i>	<i>340</i>	<i>380</i>	<i>380</i>
Total (n=)	105	88	77	76	84	95	75	69

Indicator 9: Active and Inactive DTP Participants

Active DTP Participants	6810	6896	6948	6995	7059	7138	7182	7244
Inactive DTP Participants	1108	1114	1130	1152	1157	1151	1162	1160

Indicator 10: Antiretroviral Adherence

≥ 95%	76	70	92	81	79	74	73	69
80% to < 95%	12	13	15	14	14	20	16	12
40% to < 80%	8	10	12	7	13	8	12	3
< 40%	1	1	2	0	1	0	1	2
Total (n=)	97	94	121	102	107	102	102	86

Indicator 11: Resistance Testing and Results

Suppressed	4968	4906	5090	4919	5244	5205	5081	5093
Wild Type	766	722	685	622	693	652	764	652
Never Genotyped	48	50	41	34	41	42	41	39
1-Class	149	148	145	141	151	143	137	112
2-Class	27	26	25	27	31	27	31	23
3-Class	5	7	7	3	8	8	7	2
Total (n=)	5963	5859	5993	5746	6168	6077	6061	5922

Indicator 12: AIDS-Defining Illness

	2007	2008	2009	2010	2011	2012	2013	2014	2015
CD4 < 200 at ART initiation	Cases	224	194	155	138	115	96	90	86
	<i>Rate per 100,000</i>	5.2	4.5	3.5	3.1	2.6	2.1	2.0	–
AIDS Cases (DTP Reports)	Cases	135	130	108	104	82	68	70	21
	<i>Rate per 100,000</i>	2.8	3.0	2.4	2.3	1.8	1.5	1.5	–
AIDS Cases (BCCDC Reports)	Cases	143	142	126	112	95	73	69	–
	<i>Rate per 100,000</i>	3.3	3.3	2.9	2.5	2.1	1.6	1.5	–

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