



BRITISH COLUMBIA
CENTRE *for* EXCELLENCE
in HIV/AIDS

HIV MONITORING QUARTERLY REPORT **FOR BRITISH COLUMBIA**

FOURTH QUARTER 2013



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



Foreword

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

The objectives of these reports are to:

1. Provide timely HA-specific information on key HIV indicators which will guide and inform HIV leaders and innovators in the development of future HIV interventions and programs which will ultimately lead to decreasing the burden of HIV in BC. The indicators will reflect ongoing or past successful public health interventions and highlight areas in the HIV care spectrum which require further attention and support.
2. Highlight limitations in our current data due to incomplete or time lagged data and to develop future strategies to improve complete and timely data capture.

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

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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. Lillian Lourenco 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. Mark Gilbert are responsible for outputs for Indicators 1–4.

Other Data Sources:

The above databases were supplemented with:

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

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

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

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

The expansion to a province-wide programme was announced on November 30th 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 in British Columbia, 2009 Q1–2013 Q4

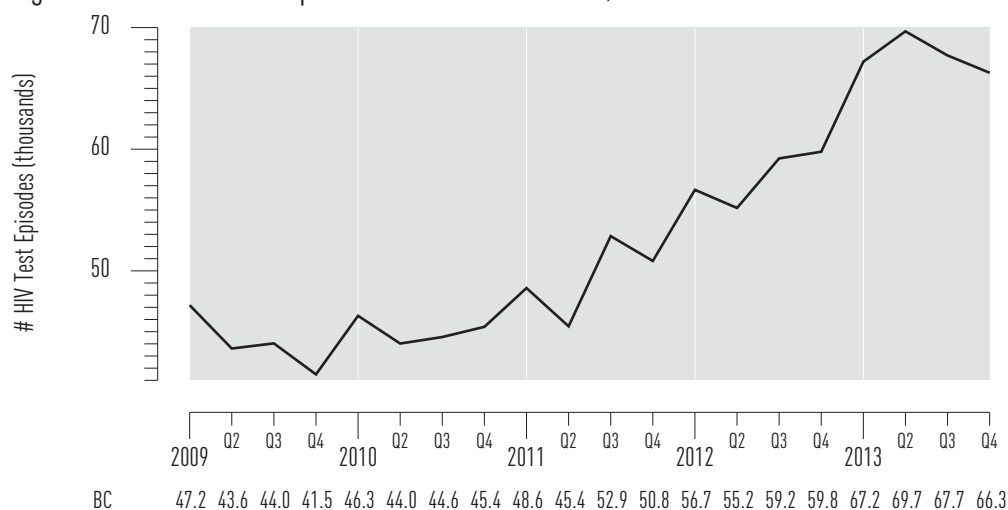
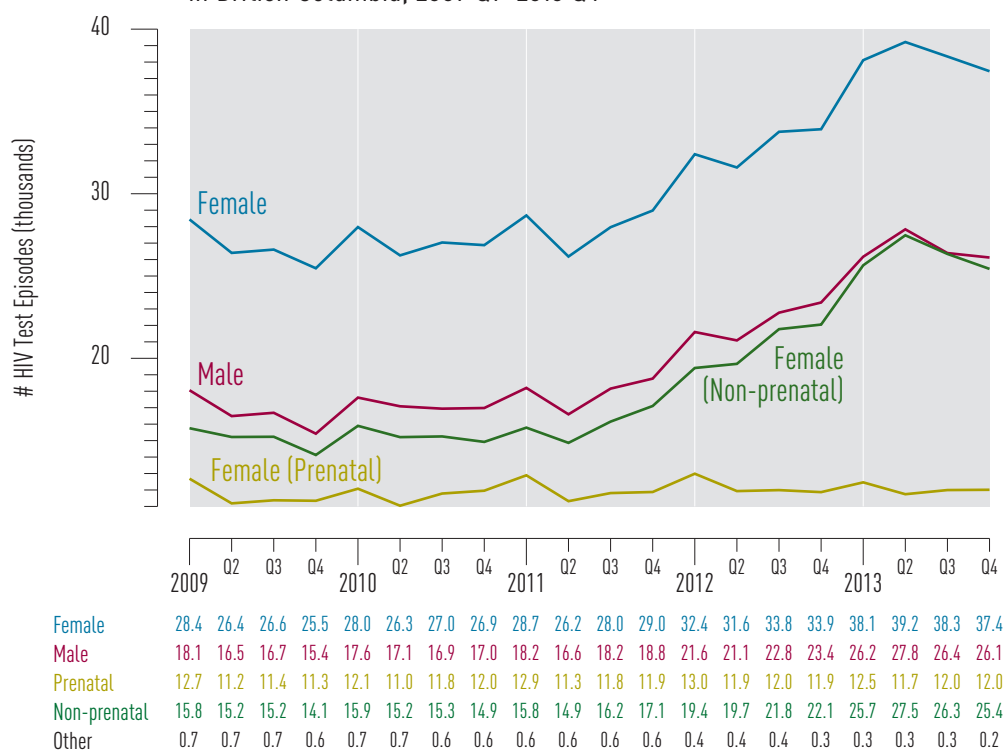


Figure 1.2 HIV Test Episodes by Gender and Prenatal Status in British Columbia, 2009 Q1–2013 Q4¹



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

Figure 1.3 HIV Test Episodes by Age Category in British Columbia, 2009 Q1–2013 Q4 ^{1,2}

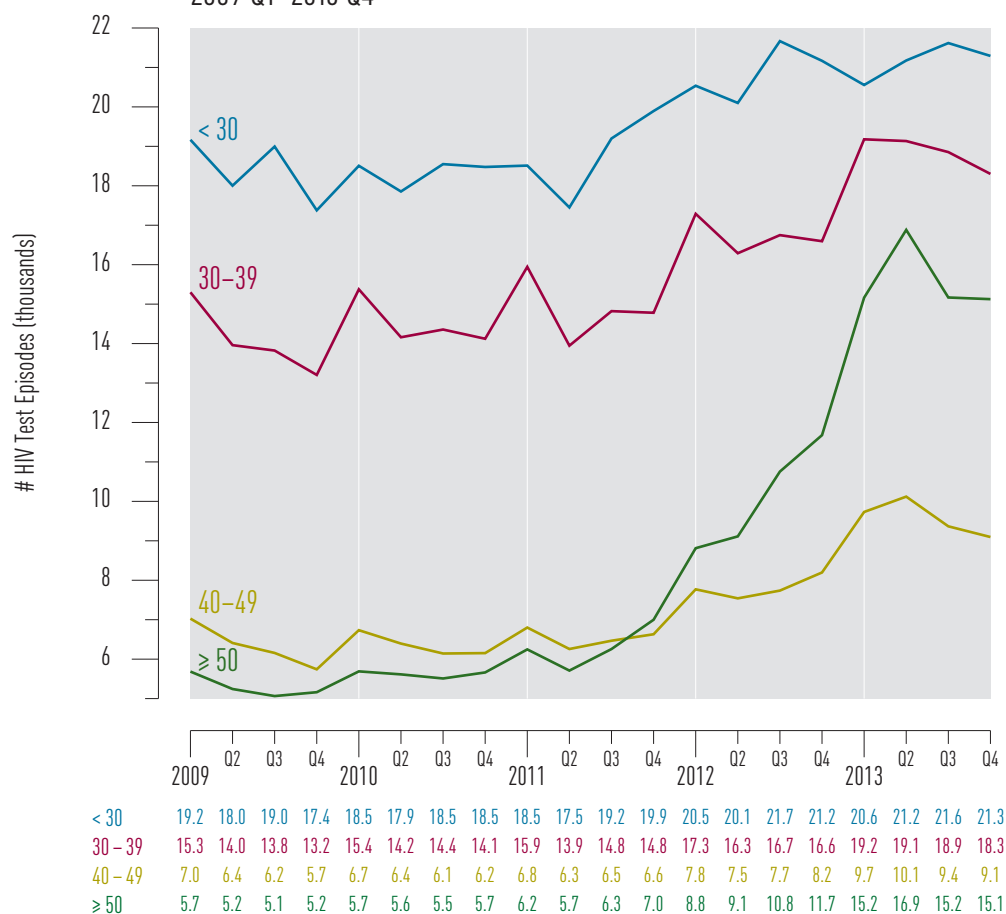
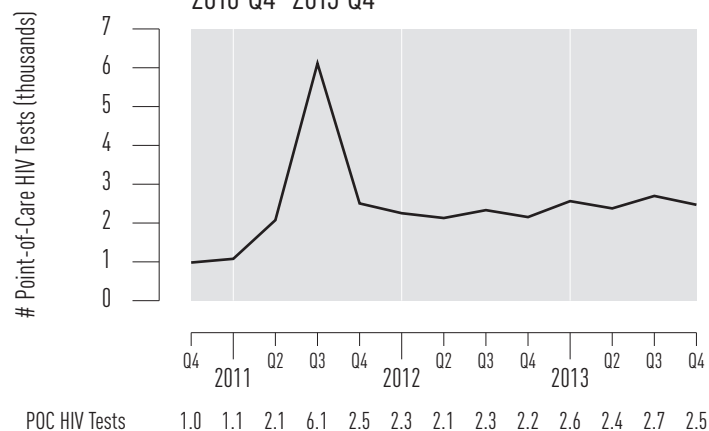


Figure 1.4 Point-of-Care HIV Tests in British Columbia, 2010 Q4–2013 Q4

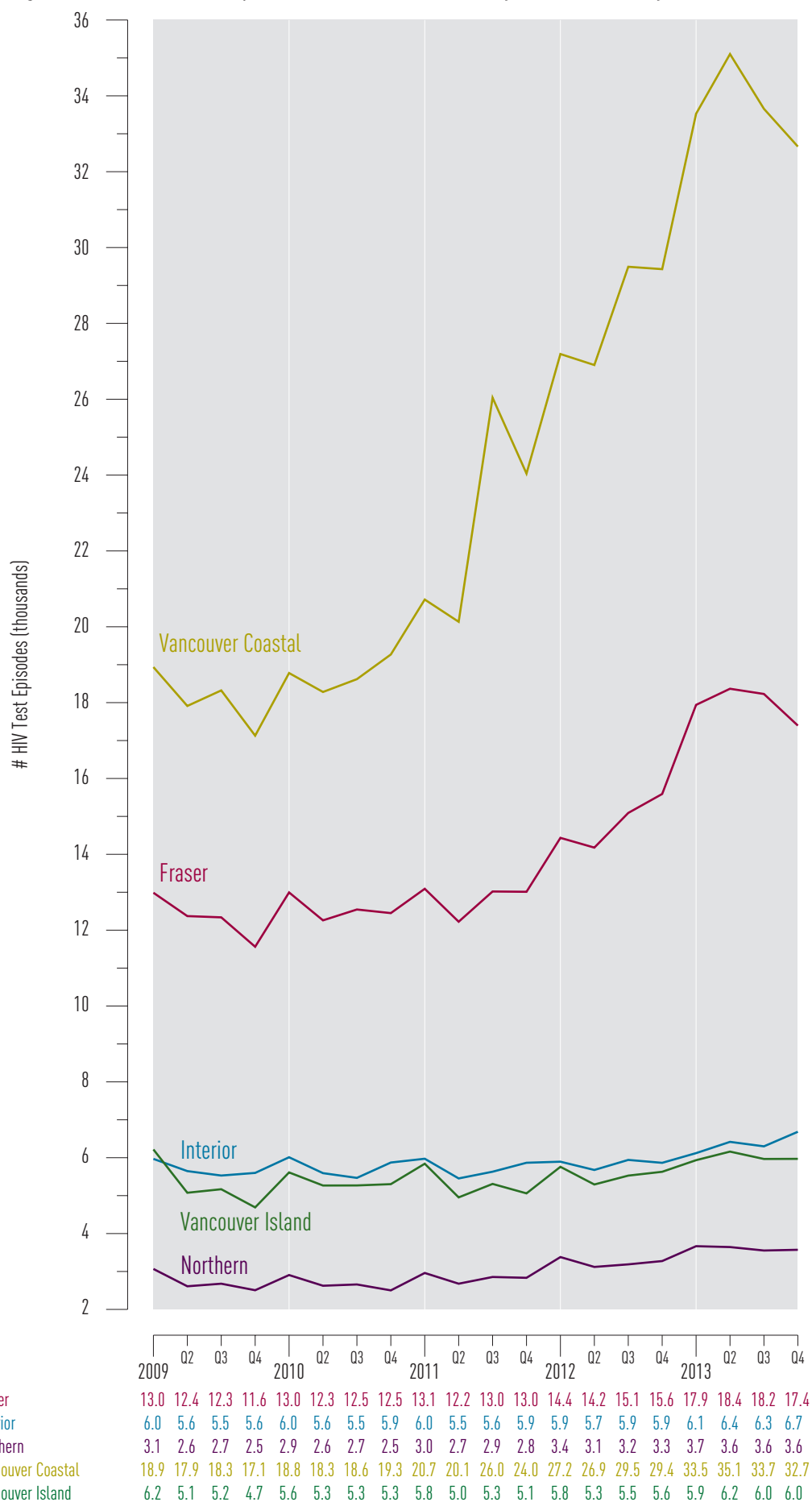


² Data Source: The BC Public Health Microbiology and Reference Laboratory (BCPHMRL) courtesy of the BC Centre for Disease Control (BCCDC).

Limitations:

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

Figure 1.5 HIV Test Episodes in British Columbia by Health Authority, 2009 Q1–2013 Q4



Indicator 2. HIV Testing Rates

Figure 2.1 Rate of HIV Testing in British Columbia and HAs, 2009–2013¹

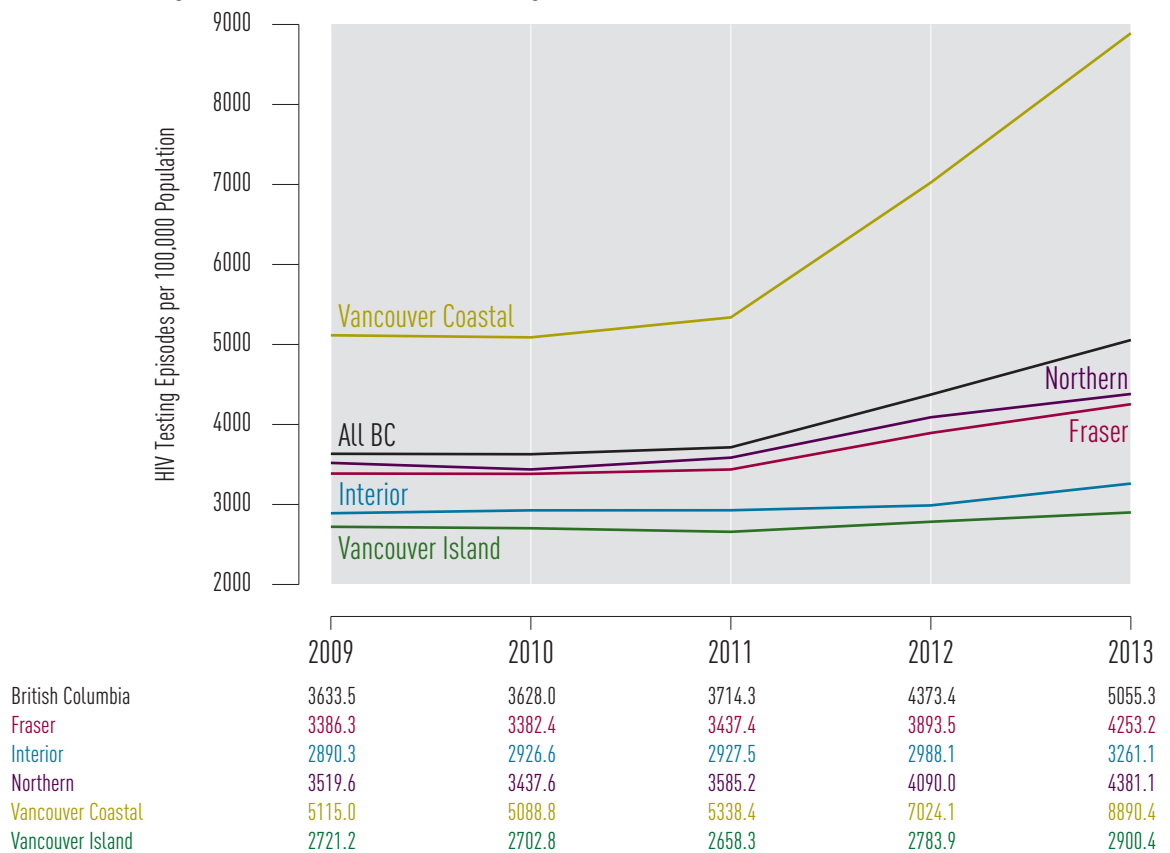


Figure 2.2 Rate of HIV Testing by Gender in British Columbia, 2009–2013¹

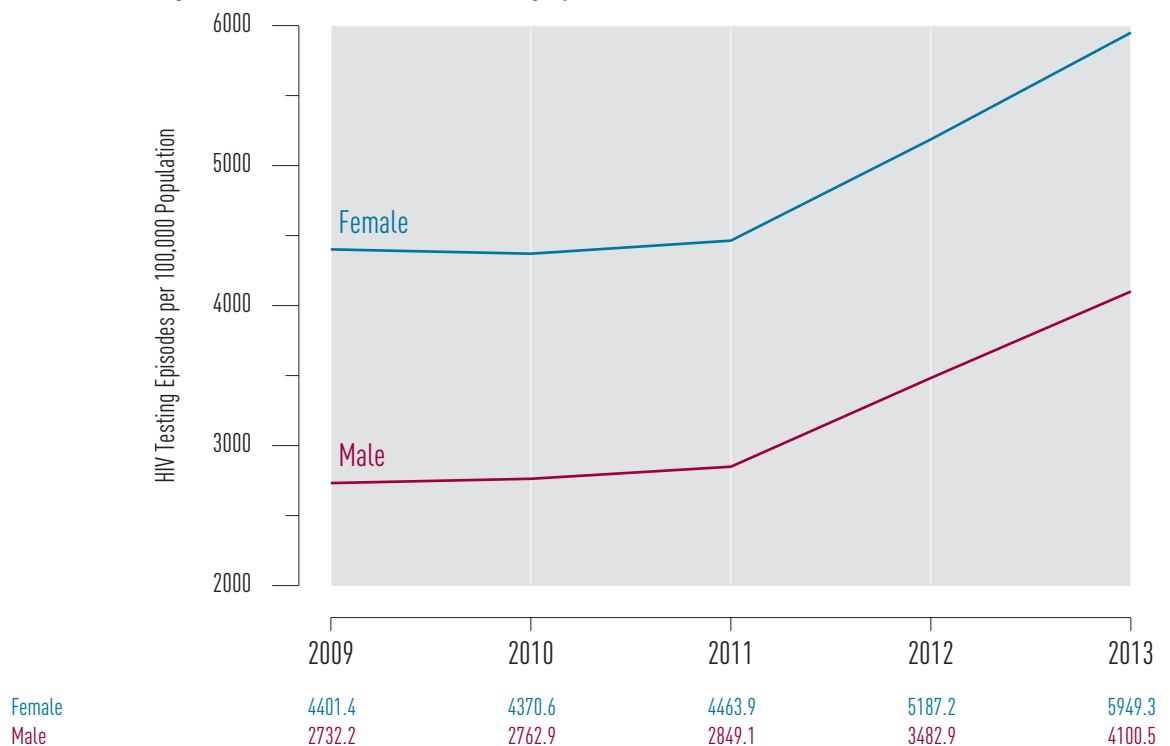
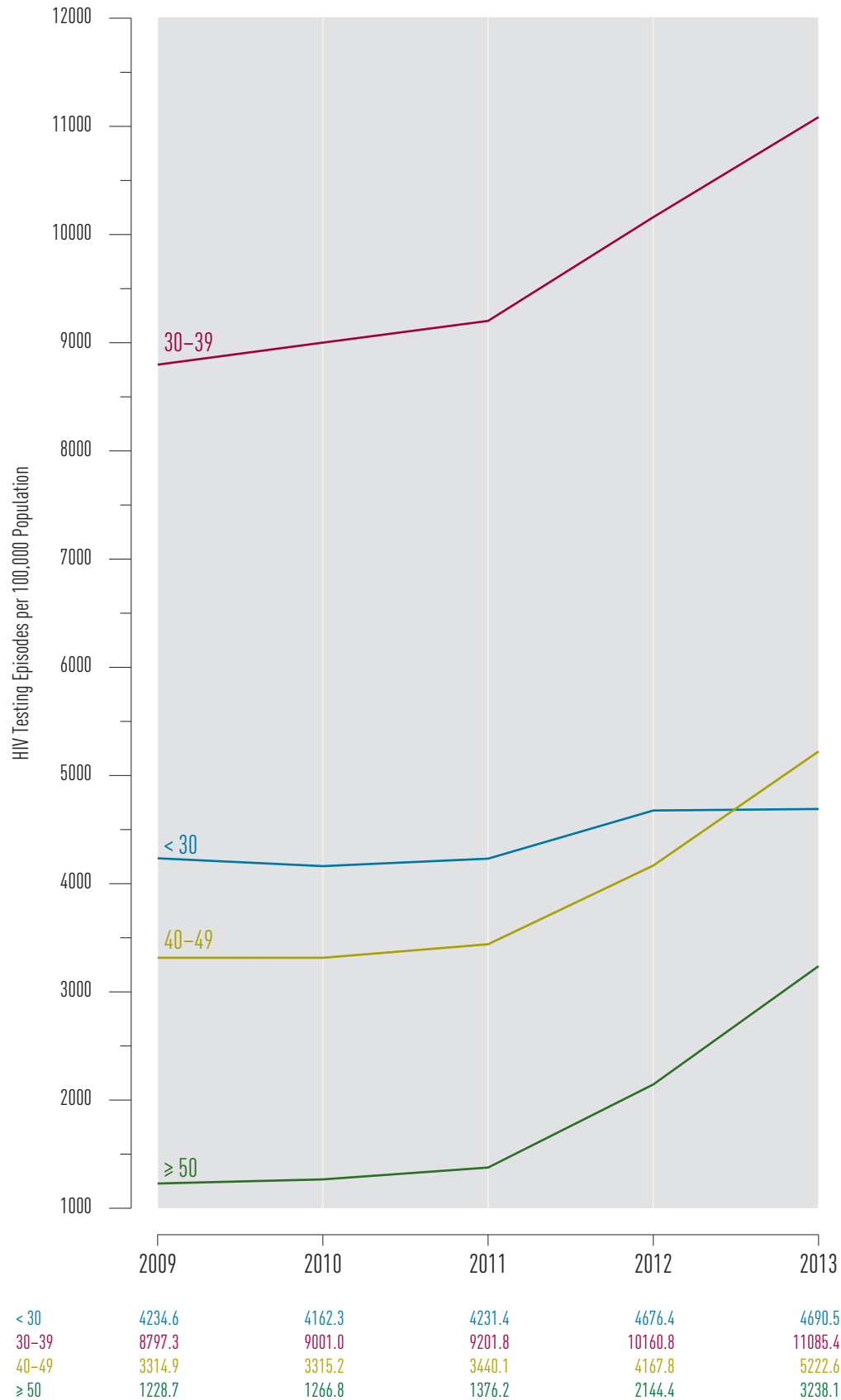


Figure 2.3 Rate of HIV Testing by Age Category in British Columbia, 2009–2013 ¹



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 in British Columbia, 2009 Q1–2013 Q4 ³

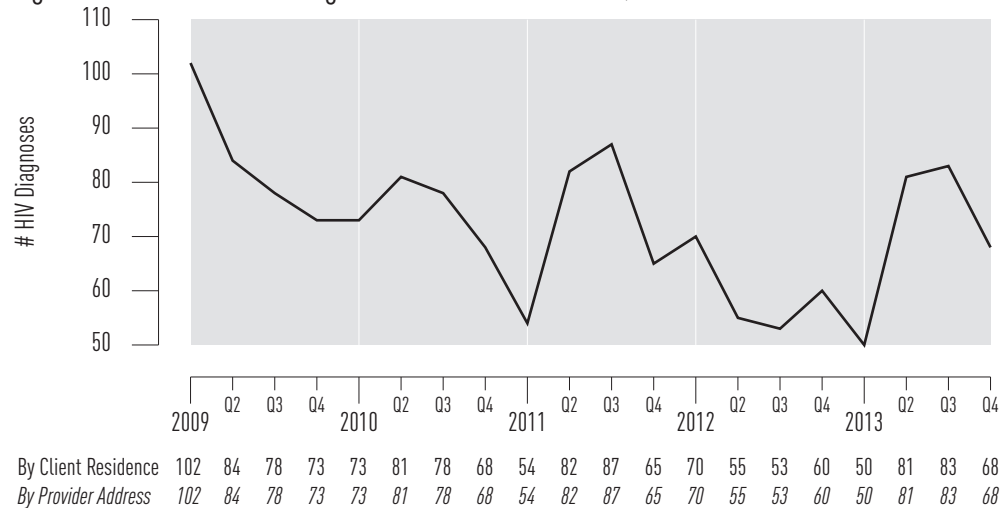


Figure 3.2 New HIV Diagnoses in British Columbia by Gender, 2009 Q1–2013 Q4

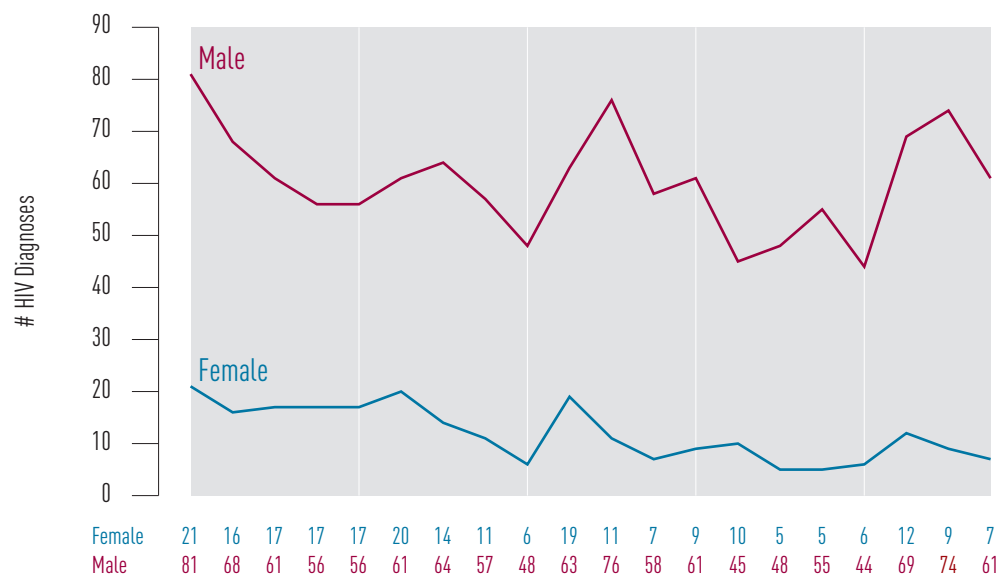


Figure 3.3 New HIV Diagnoses in British Columbia by Age Category, 2009 Q1–2013 Q4

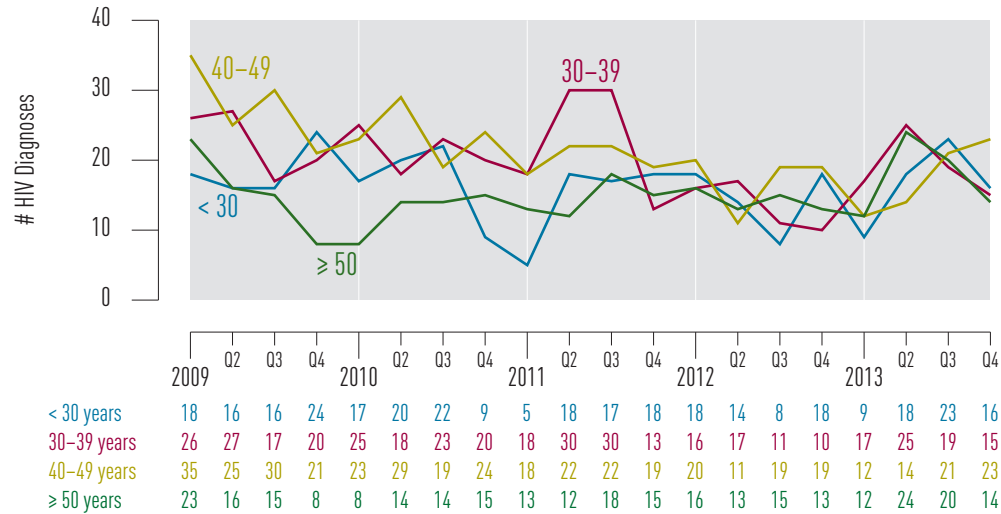
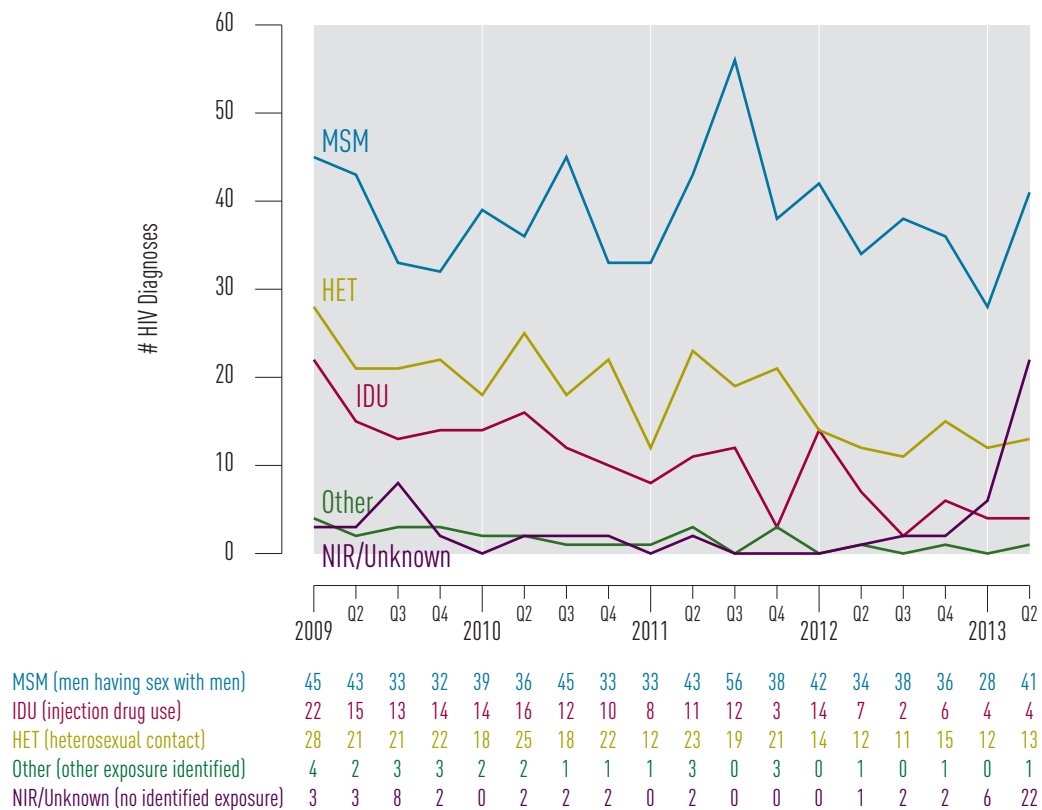


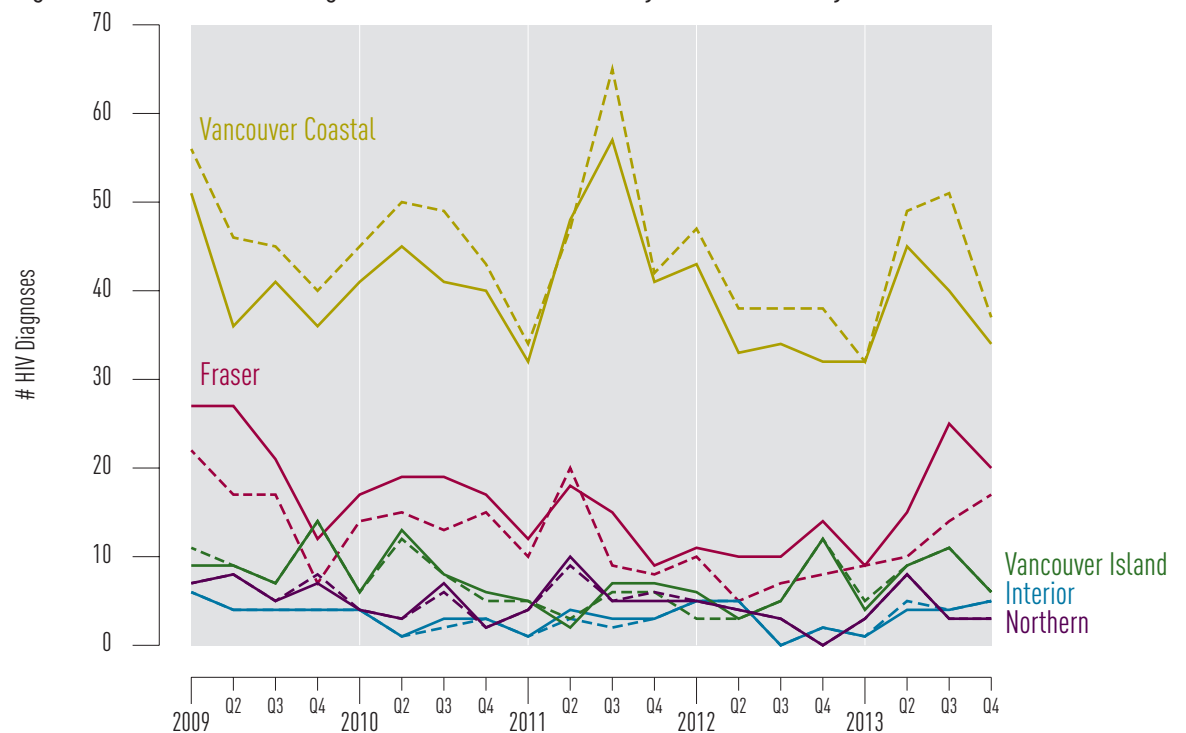
Figure 3.4 New HIV Diagnoses in British Columbia by Exposure Category, 2009 Q1–2013 Q2⁴



⁴ BCCDC: Data lags by 6 months.

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

Figure 3.5 New HIV Diagnoses in British Columbia by Health Authority, 2009 Q1–2013 Q4



Fraser	By Client Residence	27	27	21	12	17	19	19	17	12	18	15	9	11	10	10	14	9	15	25	20
	By Provider Address	22	17	17	7	14	15	13	15	10	20	9	8	10	5	7	8	9	10	14	17
Interior	By Client Residence	6	4	4	4	4	1	3	3	1	4	3	3	5	5	0	2	1	4	4	5
	By Provider Address	6	4	4	4	4	1	2	3	1	3	2	3	5	5	0	2	1	5	4	5
Northern	By Client Residence	7	8	5	7	4	3	7	2	4	10	5	5	5	4	3	0	3	8	3	3
	By Provider Address	7	8	5	8	4	3	6	2	4	9	5	6	5	4	3	0	3	8	3	3
Vancouver Coastal	By Client Residence	51	36	41	36	41	45	41	40	32	48	57	41	43	33	34	32	32	45	40	34
	By Provider Address	56	46	45	40	45	50	49	43	34	47	65	42	47	38	38	38	32	49	51	37
Vancouver Island	By Client Residence	9	9	7	14	6	13	8	6	5	2	7	7	6	3	5	12	4	9	11	6
	By Provider Address	11	9	7	14	6	12	8	5	5	3	6	6	3	3	5	12	5	9	11	6

"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 British Columbia, 2010–2013⁵

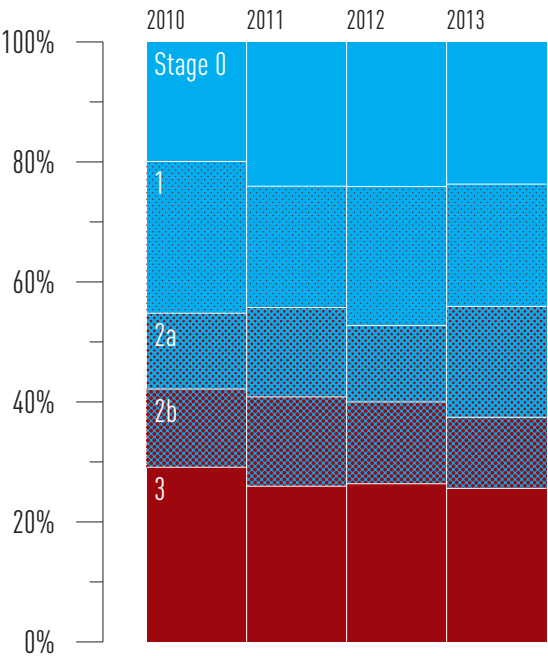
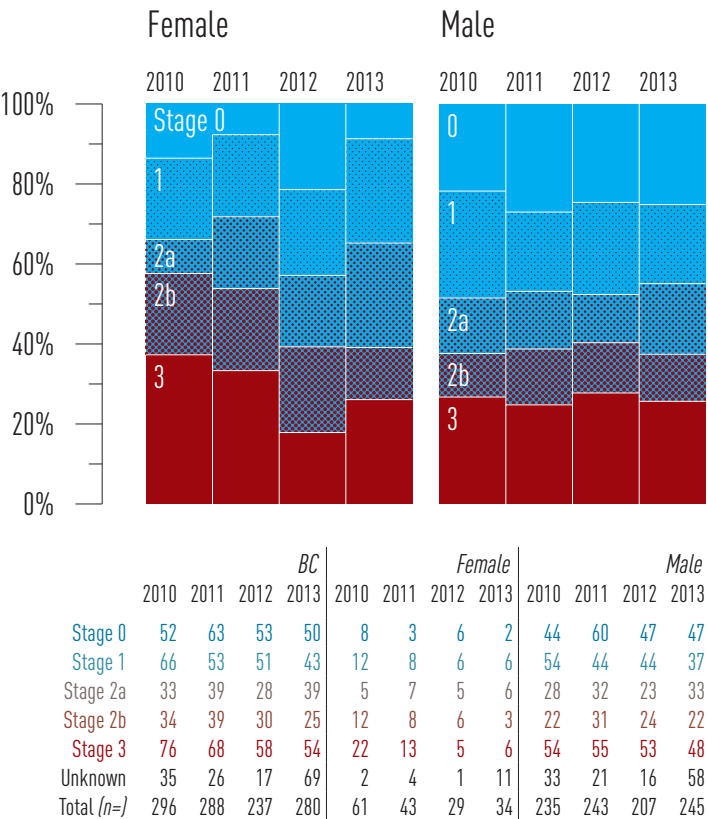


Figure 4.2 Stage of HIV Infection at Diagnosis by Gender for British Columbia, 2010–2013⁵



5 Data Source: BCCDC

Figure 4.3 Stage of HIV Infection at Diagnosis by Age Category for British Columbia, 2010–2013⁵

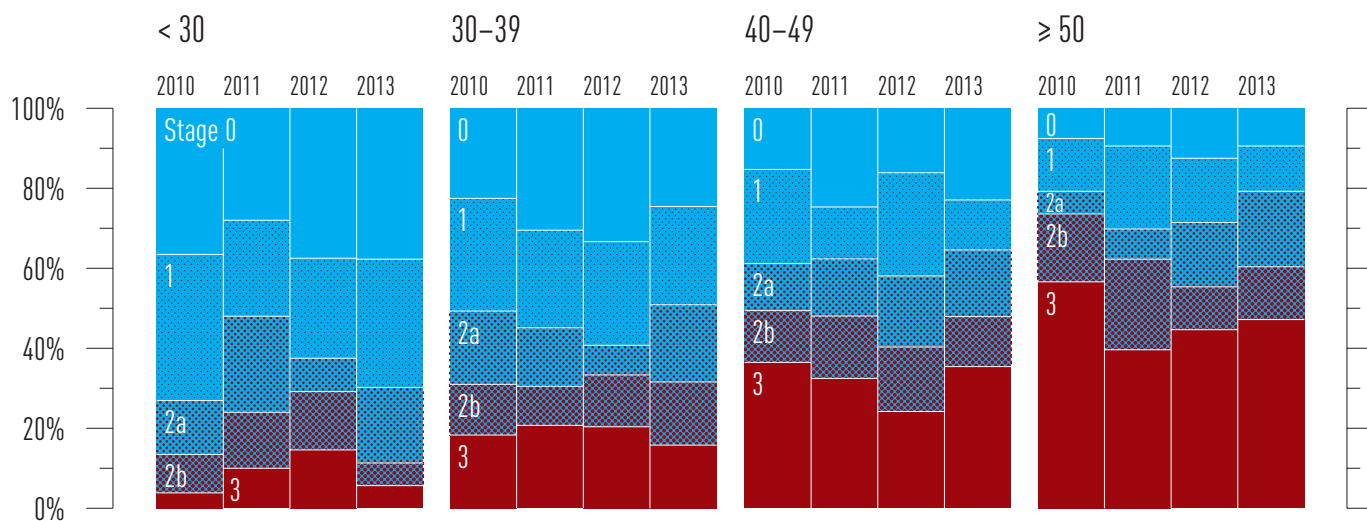
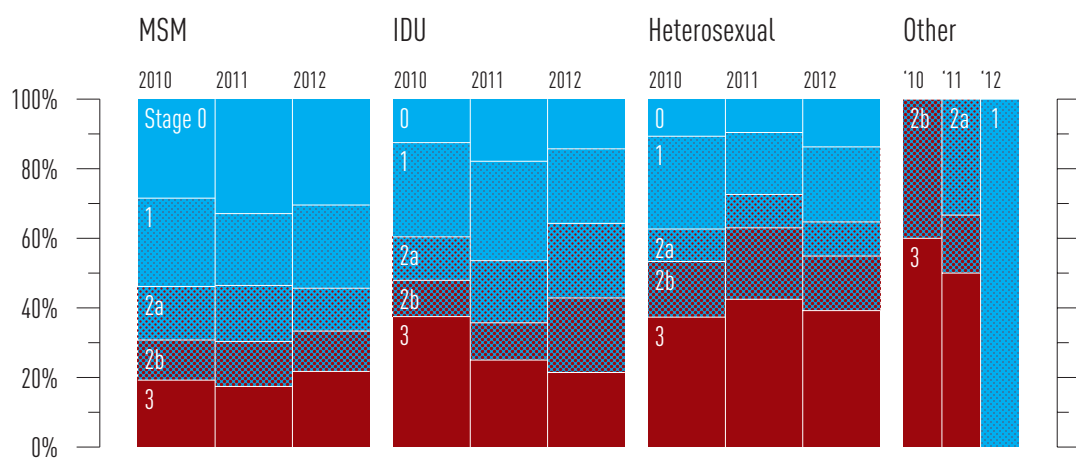


Figure 4.4 Stage of HIV Infection at Diagnosis by Exposure Category for British Columbia, 2010–2012^{5,6}



	< 30 years				30–39 years				40–49 years				≥ 50 years				MSM			IDU			HET			Other			NIR /Unknown		
	2010	'11	'12	'13	'10	'11	'12	'13	'10	'11	'12	'13	'10	'11	'12	'13	'10	'11	'12	'10	'11	'12	'10	'11	'12	'10	'11	'12	'10	'11	'12
Stage 0	19	14	18	20	16	25	18	14	13	19	10	11	4	5	7	5	37	51	42	6	5	4	8	7	7	0	0	0	1	0	0
Stage 1	19	12	12	17	20	20	14	14	20	10	16	6	7	11	9	6	33	32	33	13	8	6	20	13	11	0	0	1	0	0	0
Stage 2a	7	12	4	10	13	12	4	11	10	11	11	8	3	4	9	10	20	25	17	6	5	6	7	7	5	0	2	0	0	0	0
Stage 2b	5	7	7	3	9	8	7	9	11	12	10	6	9	12	6	7	15	20	16	5	3	6	12	15	8	2	1	0	0	0	0
Stage 3	2	5	7	3	13	17	11	9	31	25	15	17	30	21	25	25	25	27	30	18	7	6	28	31	20	3	3	0	2	0	2
Unknown	11	6	7	10	13	10	3	20	10	5	2	20	1	5	5	19	22	15	11	4	6	1	7	2	1	1	1	1	1	2	3
Total (n=)	63	56	55	63	84	92	57	77	95	82	64	68	54	58	61	72	152	170	149	52	34	29	82	75	52	6	7	2	4	2	5

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

Indicator 5. HIV Cascade of Care

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

Figure 5.1 Estimated Cascade of Care for British Columbia, 2013 ⁷

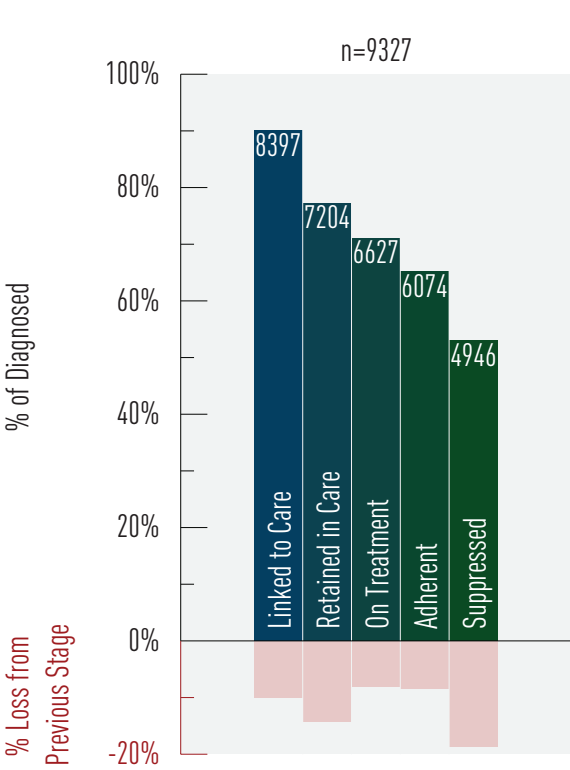
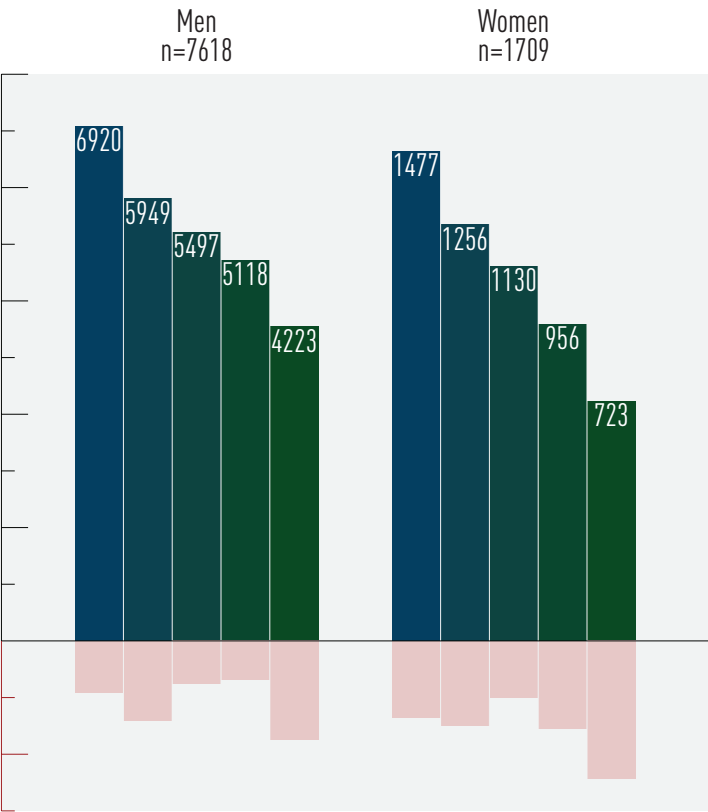


Figure 5.2 Estimated Cascade of Care for British Columbia by Gender, 2013 ⁸



7,8 Data is for the period 2013 Q1–2013 Q4.

Data Sources:

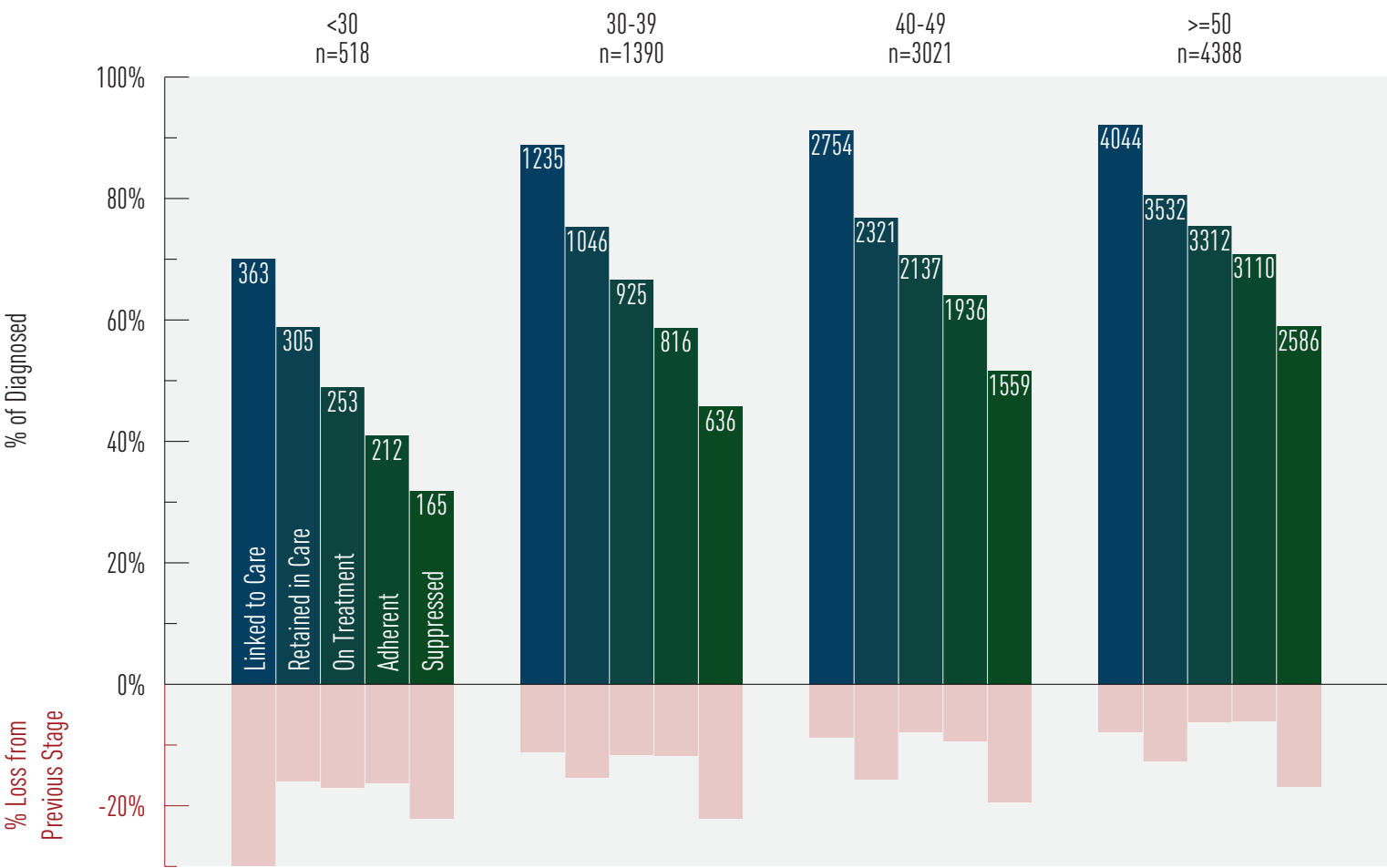
1 British Columbia Centre for Excellence Drug Treatment Program (DTP) Database (ARV use, VL and CD4 count).

2 Administrative data (ex. MSP billings; hospitalization data from the Discharge Abstract Database (DAD)).

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

NB: Transgender has been assigned to their biological sex.

Figure 5.3 Estimated Cascade of Care for British Columbia by Age Category, 2013 ⁹



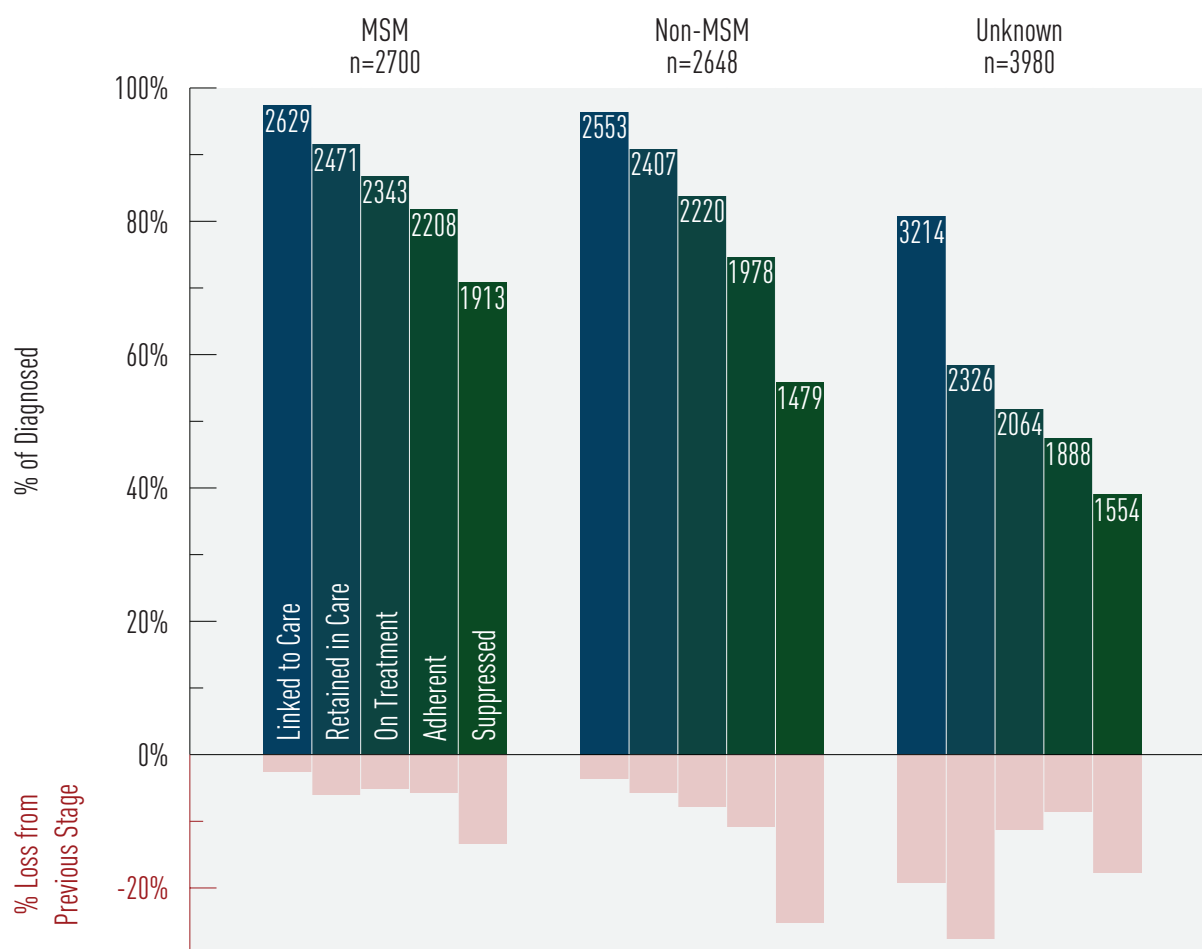
⁹ Data is for the period 2013 Q1–2013 Q4.

Data Sources:

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

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

Figure 5.4 Estimated Cascade of Care for British Columbia by MSM Status, 2013 ¹⁰



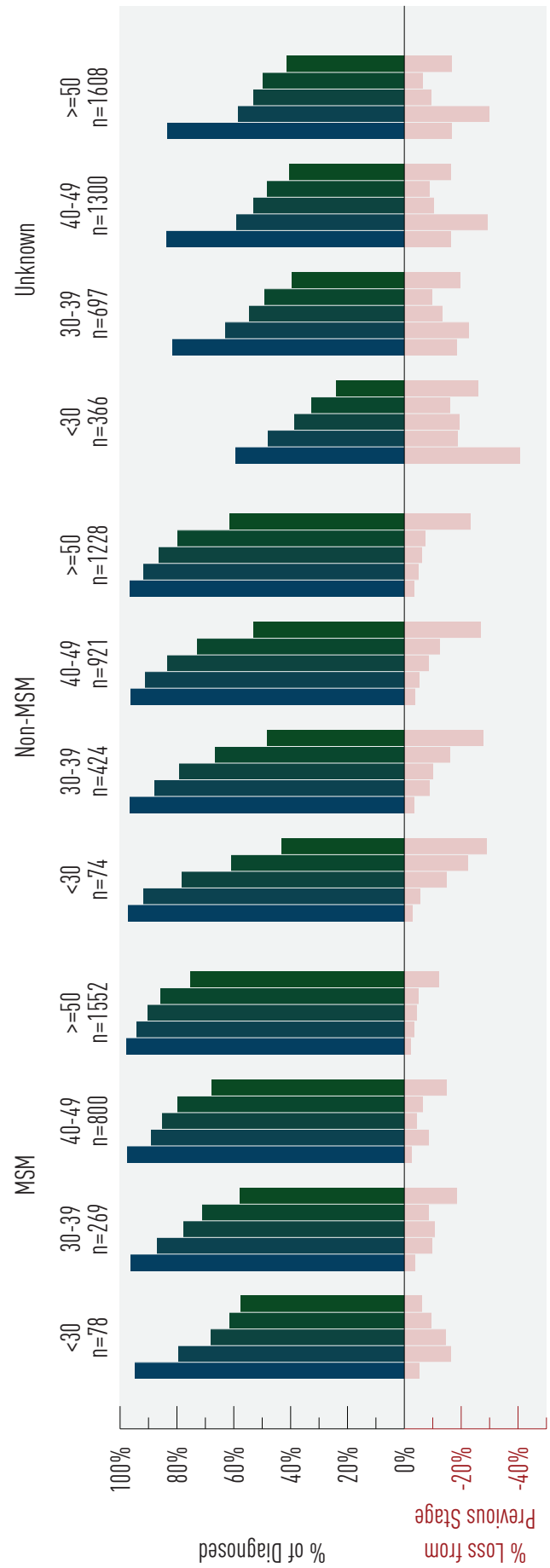
¹⁰ Data is for the period 2013 Q1–2013 Q4.

Data Sources:

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

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

Figure 5.5 Estimated Cascade of Care for British Columbia by Age Category and MSM Status, 2013 ¹¹



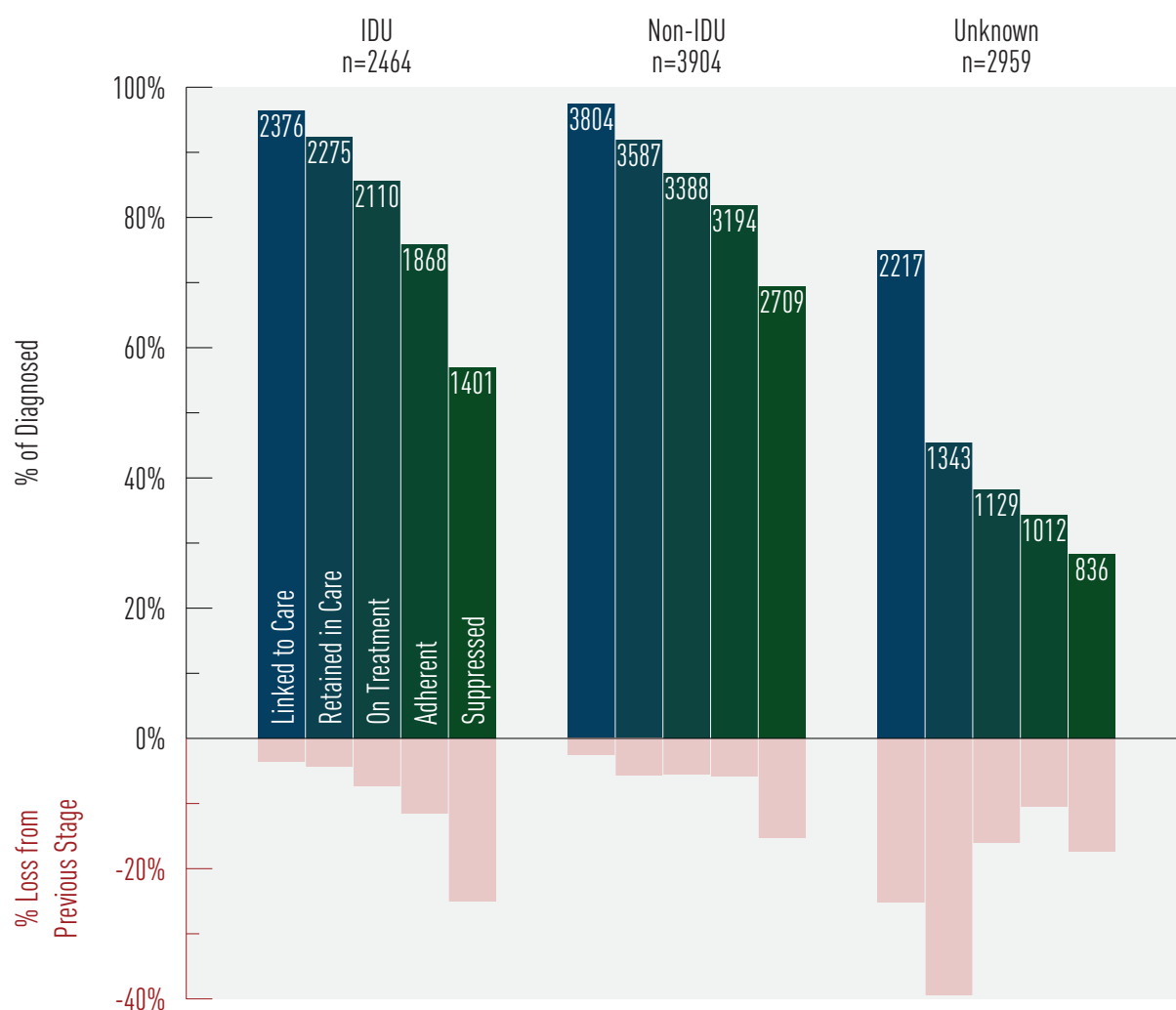
¹¹ Data is for the period 2013 Q1–2013 Q4.

Data Sources:

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

Limitations: HA assignment is based on the most recent HA of residence of the patient, if not available of the HIV-care provider. If the most recent HA of residence is not updated then the designated HA may be incorrect. Where $n \leq 5$, data has been withheld for concerns of statistical significance as well as privacy. Authorized parties may contact the British Columbia Centre for Excellence in HIV/AIDS to obtain this information.

Figure 5.6 Estimated Cascade of Care for British Columbia by History of IDU, 2013 ¹²



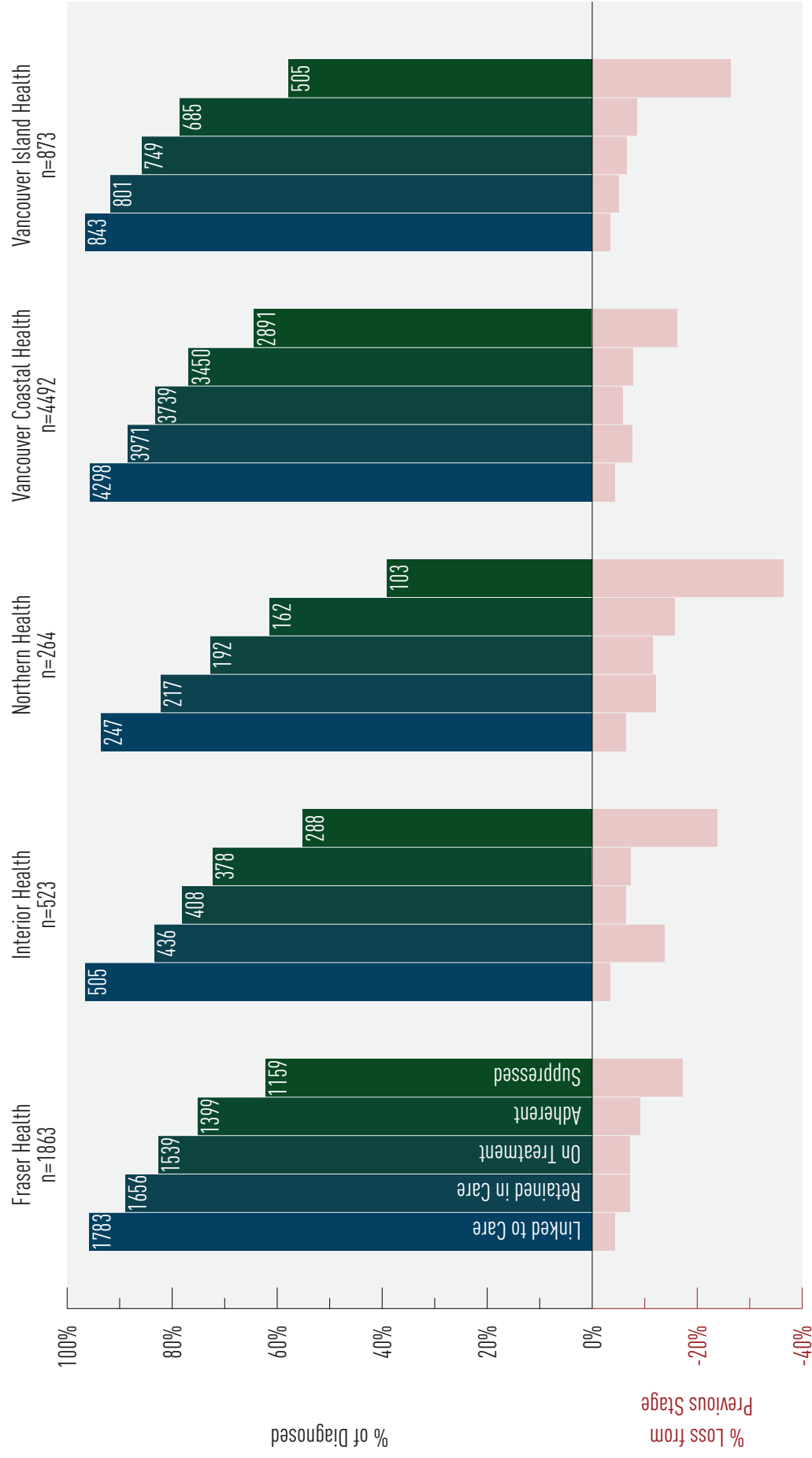
¹² Data is for the period 2013 Q1–2013 Q4.

Data Sources:

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

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

Figure 5.7 Estimated Cascade of Care for British Columbia by Health Authority, 2013 ¹³



¹³ Data is for the period 2013 Q1–2013 Q4.

Data Sources:

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

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

Indicator 6. The Programmatic Compliance Score (PCS)

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

1. having <3 CD4 cell count tests in the first year after starting antiretroviral therapy (ART);
2. having <3 plasma viral load (VL) tests in the first year after starting ART;
3. not having drug resistance testing done prior to starting ART;
4. starting on a non-recommended ART regimen;
5. starting therapy with $CD4 < 200$ cells/ 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. The Probability of Mortality, Immunologic Failure and Virologic Failure based on the Programmatic Compliance Score

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

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

Figure 6.1 PCS Components for British Columbia, 2011–2013¹⁴

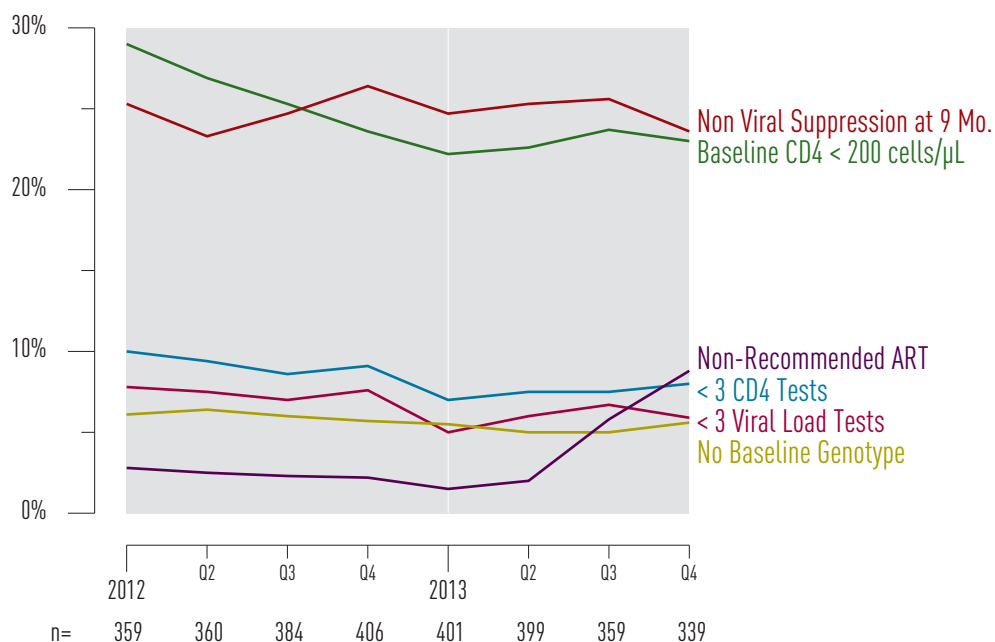
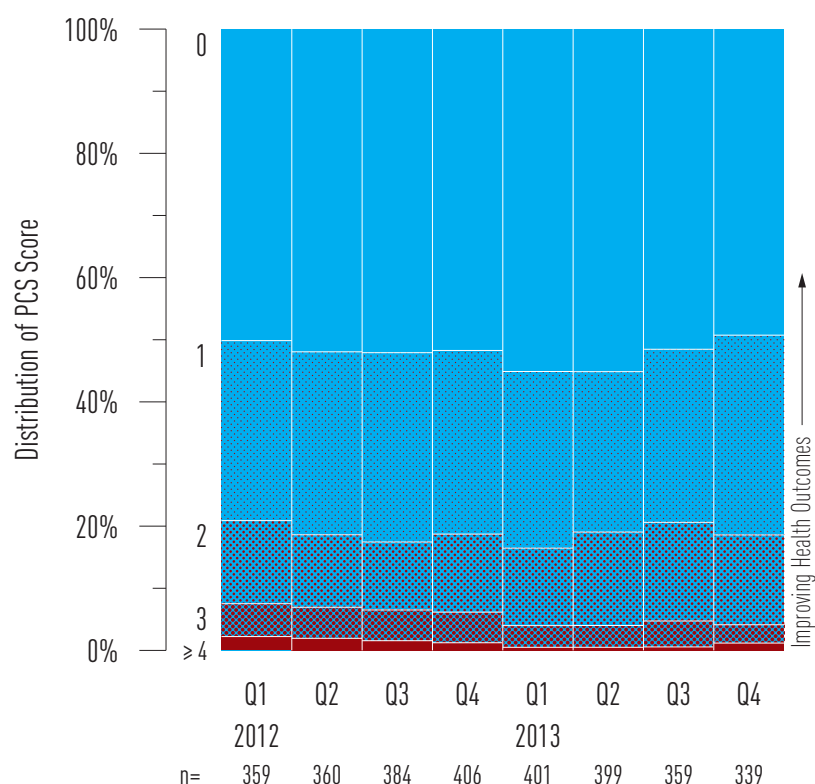


Figure 6.2 Historical Trends for PCS Score for British Columbia, 2011 Q1–2013 Q4¹⁵



NB: A score of 0 is the best score and a score of 4 or more is the worst score.

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

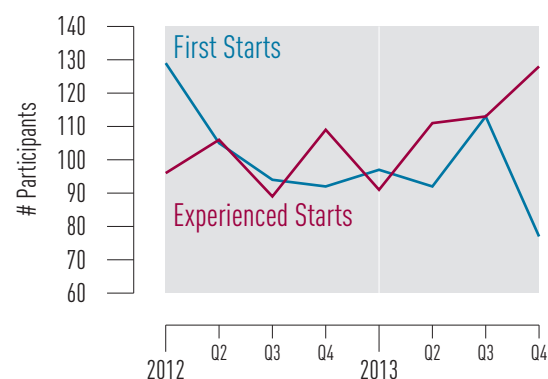
¹⁵ Data Source: British Columbia Centre for Excellence Drug Treatment Program (DTP) Database. Each quarter's data is calculated as the sum of the 4 quarters leading up to it. e.g. 2012 Q1 is calculated from 2011 Q2 – 2012 Q1.

Antiretroviral Uptake

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

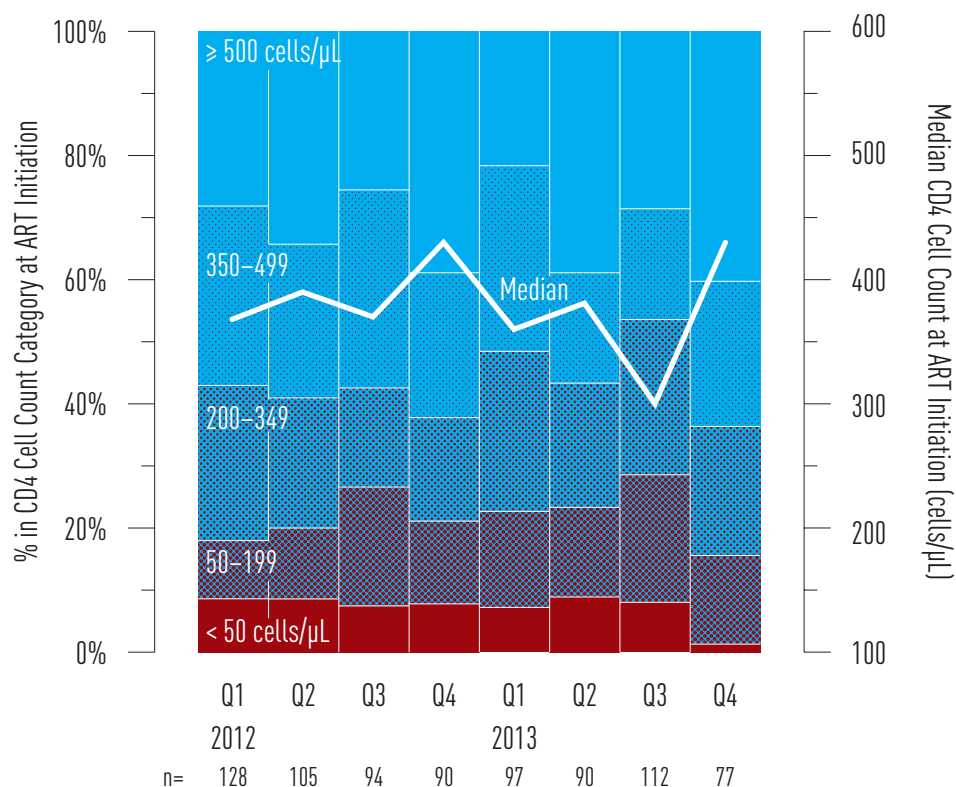
Indicator 7. New Antiretroviral Therapy Starts in British Columbia

Figure 7 BC-CfE Drug Treatment Program Enrollment: New ART Participants in BC, 2012 Q1–2013 Q4 ¹⁶



Indicator 8. CD4 Cell Count at ART Initiation

Figure 8 CD4 Cell Count at ART Initiation of ART-Naïve DTP Participants in British Columbia, 2012 Q1–2013 Q4 ¹⁷



¹⁶ Data Source: Drug Treatment Program Database

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

¹⁷ Data Source: Drug Treatment Program Database

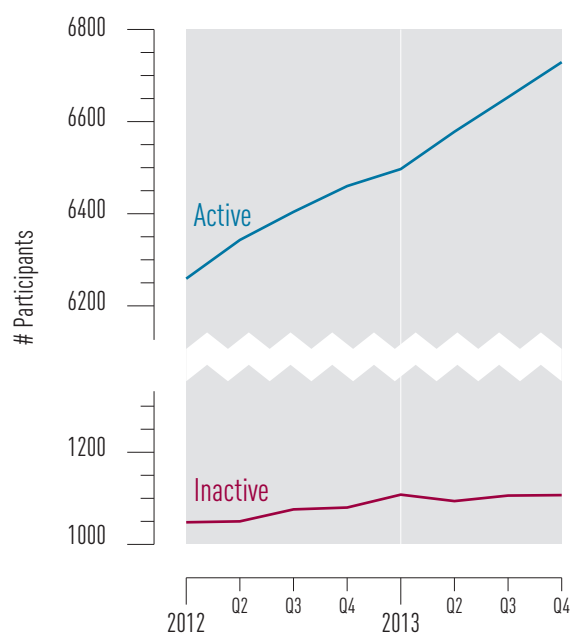
Limitations: CD4 cell count data is approximately 80% complete.

Indicator 9. Active and Inactive DTP Participants

Table 3. Distribution of People on ART in British Columbia, 2013 Q4 ¹⁸

		Fraser	Interior	Northern	Vancouver Coastal	Vancouver Island	Total BC
Age	< 30	68	10	16	132	28	254
	30–39	261	51	42	523	91	968
	40–49	530	111	63	1242	224	2170
	≥ 50	710	236	86	1884	421	3337
Gender	Male	1212	315	123	3321	617	5588
	Female	357	93	84	460	147	1141
Exposure	MSM	457	109	22	1589	176	2353
	IDU	444	143	124	1116	277	2104
Total		1569	408	207	3781	764	6729

Figure 9 Active and Inactive DTP Participants in British Columbia, 2012 Q1–2013 Q4 ¹⁹



¹⁸ Data Source: Drug Treatment Program Database

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

Definitions:

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

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

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

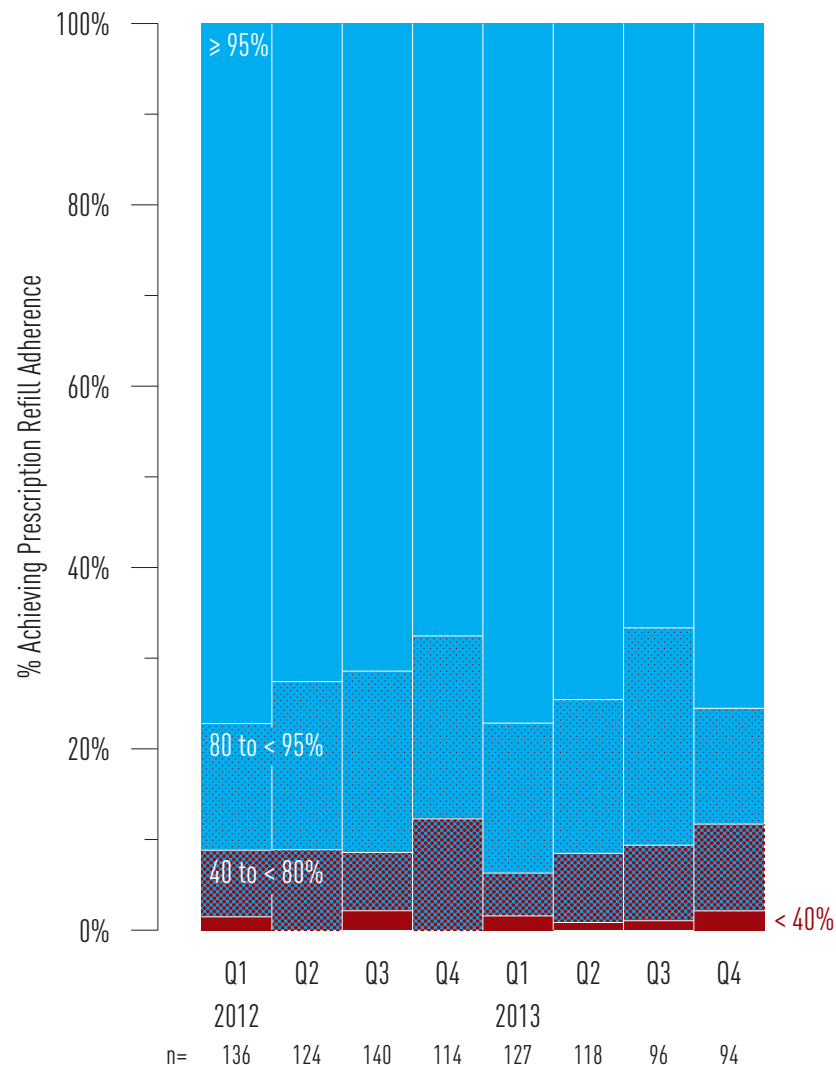
Inactive DTP Participants: Persons no longer prescribed drugs through the HIV/AIDS Drug Treatment Program in the last quarter.

Antiretroviral Adherence Level

In this section we present trends in prescription refill adherence levels for individuals in their first year of treatment. Given that the benefits of ART are compromised in the presence of imperfect ART adherence, we expect to see the proportion of persons on ART achieving **near perfect adherence** (ie. $\geq 95\%$) 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

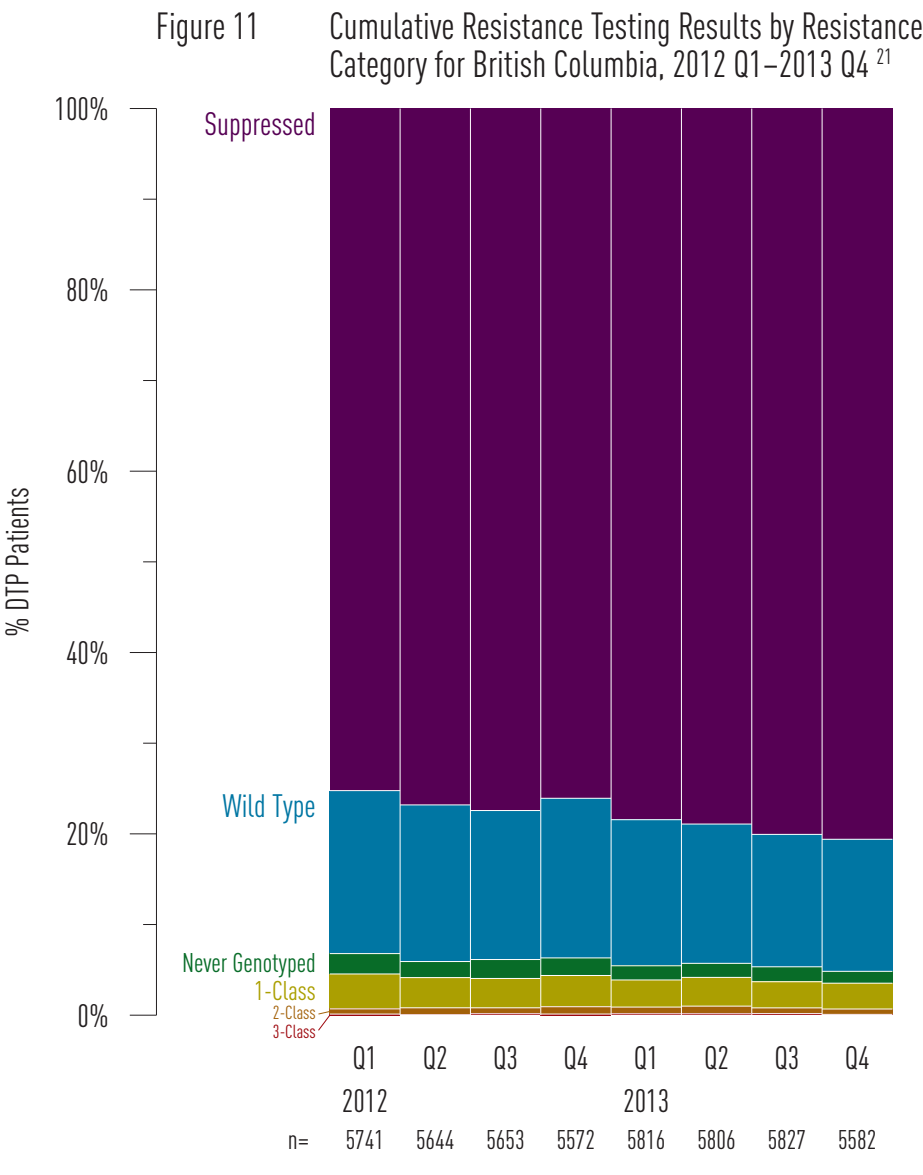
Figure 10 Distribution of Individuals by Adherence Level in 1st Year of Therapy, Based on Pharmacy Refill Compliance in British Columbia, 2012 Q1–2013 Q4 ²⁰



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

Indicator 11. Resistance Testing and Results

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



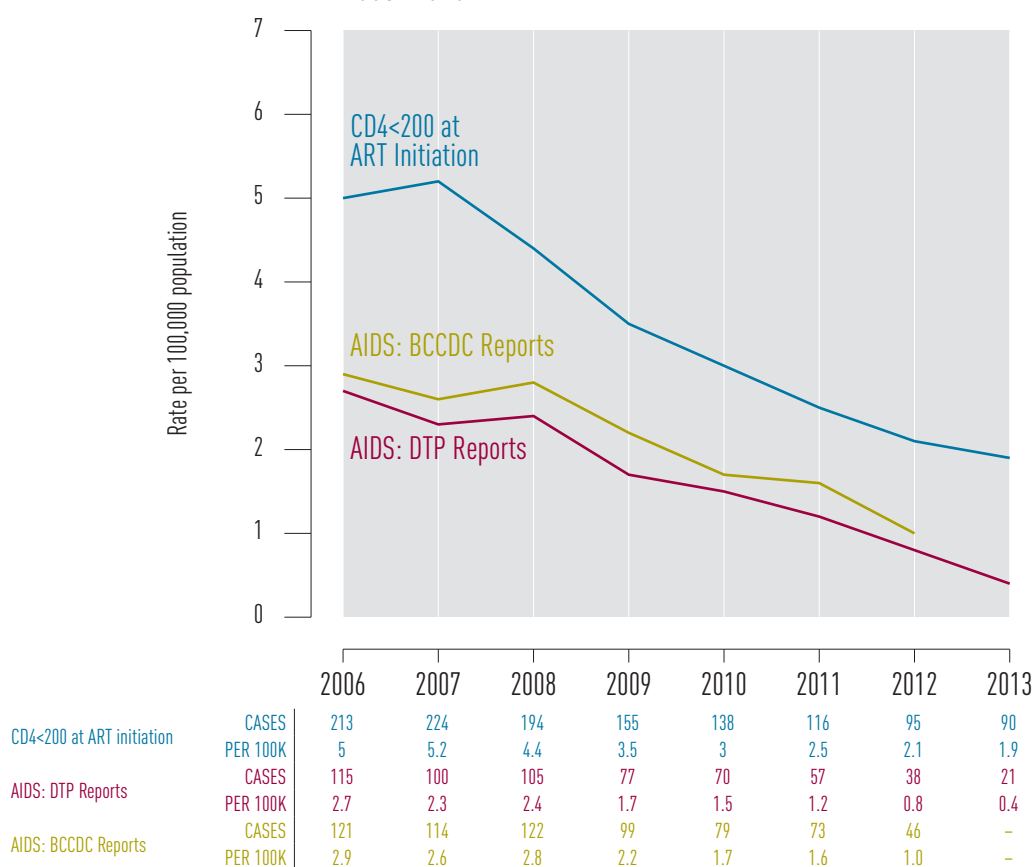
²¹ Data Source: Drug Treatment Program Database

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

Indicator 12. AIDS-Defining Illness

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

Figure 12 AIDS Case Rate and Reports in British Columbia, 2006–2013²²



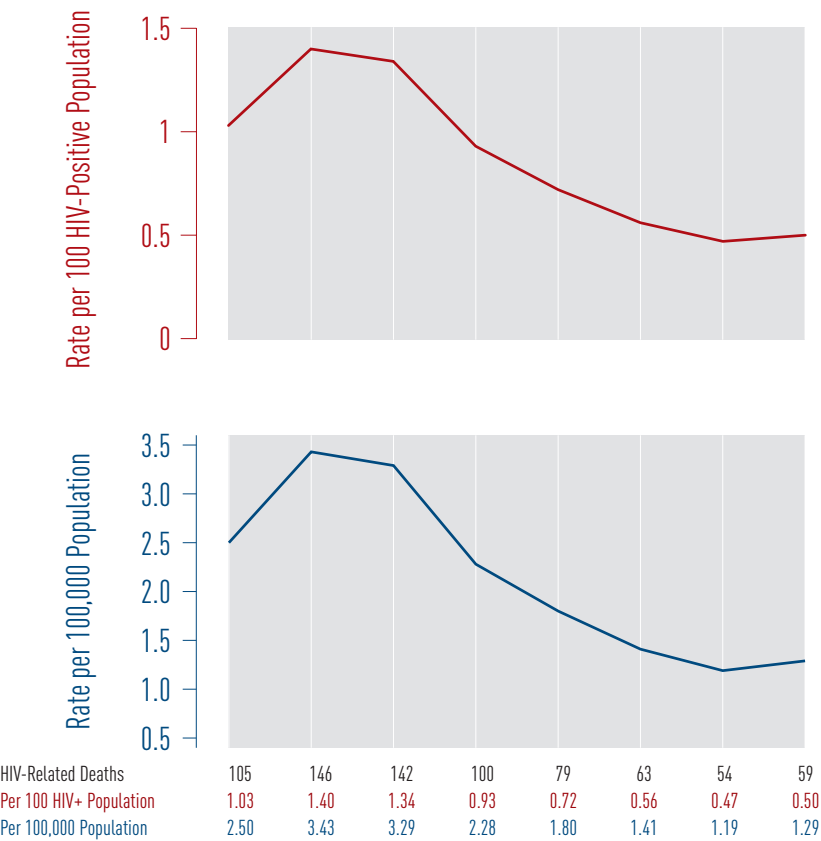
²² Data Source: Drug Treatment Program Database

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

Indicator 13. HIV-Related Mortality

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

Figure 13 HIV-Related Deaths by Year in British Columbia, 2004–2011 ²³



²³ Data Source: BC Vital Statistics

Limitation:

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

Appendices

Indicator 1: Test Episodes (thousands)		2009				2010				2011				2012				2013			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
British Columbia		47.2	43.6	44.0	41.5	46.3	44.0	44.6	45.4	48.6	45.4	52.9	50.8	56.7	55.2	59.2	59.8	67.2	69.7	67.7	66.3
Gender	Female	28.4	26.4	26.6	25.5	28.0	26.3	27.0	26.9	28.7	26.2	28.0	29.0	32.4	31.6	33.8	33.9	38.1	39.2	38.3	37.4
	Male	18.1	16.5	16.7	15.4	17.6	17.1	16.9	17.0	18.2	16.6	18.2	18.8	21.6	21.1	22.8	23.4	26.2	27.8	26.4	26.1
	Other	0.7	0.7	0.7	0.6	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.2
Female (Prenatal)		12.7	11.2	11.4	11.3	12.1	11.0	11.8	12.0	12.9	11.3	11.8	11.9	13.0	11.9	12.0	11.9	12.5	11.7	12.0	12.0
Female (Non-prenatal)		15.8	15.2	15.2	14.1	15.9	15.2	15.3	14.9	15.8	14.9	16.2	17.1	19.4	19.7	21.8	22.1	25.7	27.5	26.3	25.4
Age	< 30	19.2	18.0	19.0	17.4	18.5	17.9	18.5	18.5	18.5	17.5	19.2	19.9	20.5	20.1	21.7	21.2	20.6	21.2	21.6	21.3
	30–39	15.3	14.0	13.8	13.2	15.4	14.2	14.4	14.1	15.9	13.9	14.8	14.8	17.3	16.3	16.7	16.6	19.2	19.1	18.9	18.3
	40–49	7.0	6.4	6.2	5.7	6.7	6.4	6.1	6.2	6.8	6.3	6.5	6.6	7.8	7.5	7.7	8.2	9.7	10.1	9.4	9.1
	≥ 50	5.7	5.2	5.1	5.2	5.7	5.6	5.5	5.7	6.2	5.7	6.3	7.0	8.8	9.1	10.8	11.7	15.2	16.9	15.2	15.1
POC HIV Tests									1.0	1.1	2.1	6.1	2.5	2.3	2.1	2.3	2.2	2.6	2.4	2.7	2.5
Fraser Health		13.0	12.4	12.3	11.6	13.0	12.3	12.5	12.5	13.1	12.2	13.0	13.0	14.4	14.2	15.1	15.6	17.9	18.4	18.2	17.4
Interior Health		6.0	5.6	5.5	5.6	6.0	5.6	5.5	5.9	6.0	5.5	5.6	5.9	5.9	5.7	5.9	5.9	6.1	6.4	6.3	6.7
Northern Health		3.1	2.6	2.7	2.5	2.9	2.6	2.7	2.5	3.0	2.7	2.9	2.8	3.4	3.1	3.2	3.3	3.7	3.6	3.6	3.6
Vancouver Coastal Health		18.9	17.9	18.3	17.1	18.8	18.3	18.6	19.3	20.7	20.1	26.0	24.0	27.2	26.9	29.5	29.4	33.5	35.1	33.7	32.7
Vancouver Island Health		6.2	5.1	5.2	4.7	5.6	5.3	5.3	5.3	5.8	5.0	5.3	5.1	5.8	5.3	5.5	5.6	5.9	6.2	6.0	6.0

Indicator 2: Rate of HIV Testing per 100,000

		2009	2010	2011	2012	2013
British Columbia		3633.5	3628.0	3714.3	4373.4	5055.3
Fraser Health		3386.3	3382.4	3437.4	3893.5	4253.2
Interior Health		2890.3	2926.6	2927.5	2988.1	3261.1
Northern Health		3519.6	3437.6	3585.2	4090.0	4381.1
Vancouver Coastal Health		5115.0	5088.8	5338.4	7024.1	8890.4
Vancouver Island Health		2721.2	2702.8	2658.3	2783.9	2900.4
Gender	Female	4401.4	4370.6	4463.9	5187.2	5949.3
	Male	2732.2	2762.9	2849.1	3482.9	4100.5
Age	< 30	4234.6	4162.3	4231.4	4676.4	4690.5
	30–39	8797.3	9001.0	9201.8	10160.8	11085.4
	40–49	3314.9	3315.2	3440.1	4167.8	5222.6
	≥ 50	1228.7	1266.8	1376.2	2144.4	3238.1

Indicator 3: New HIV Diagnoses		2009				2010				2011				2012				2013			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
British Columbia	By Client Residence	102	84	78	73	73	81	78	68	54	82	87	65	70	55	53	60	50	81	83	68
	By Provider Address	102	84	78	73	73	81	78	68	54	82	87	65	70	55	53	60	50	81	83	68
Gender	Female	21	16	17	17	17	20	14	11	6	19	11	7	9	10	5	5	6	12	9	7
	Male	81	68	61	56	56	61	64	57	48	63	76	58	61	45	48	55	44	69	74	61
Age	< 30	18	16	16	24	17	20	22	9	5	18	17	18	18	14	8	18	9	18	23	16
	30–39	26	27	17	20	25	18	23	20	18	30	30	13	16	17	11	10	17	25	19	15
	40–49	35	25	30	21	23	29	19	24	18	22	22	19	20	11	19	19	12	14	21	23
	≥ 50	23	16	15	8	8	14	14	15	13	12	18	15	16	13	15	13	12	24	20	14
Exposure	MSM	45	43	33	32	39	36	45	33	33	43	56	38	42	34	38	36	28	41	–	–
	IDU	22	15	13	14	14	16	12	10	8	11	12	3	14	7	2	6	4	4	–	–
	HET	28	21	21	22	18	25	18	22	12	23	19	21	14	12	11	15	12	13	–	–
	Other	4	2	3	3	2	2	1	1	1	3	0	3	0	1	0	1	0	1	–	–
	NIR/Unknown	3	3	8	2	0	2	2	2	0	2	0	0	0	1	2	2	6	22	–	–
Fraser Health	By Client Residence	27	27	21	12	17	19	19	17	12	18	15	9	11	10	10	14	9	15	25	20
	By Provider Address	22	17	17	7	14	15	13	15	10	20	9	8	10	5	7	8	9	10	14	17
Interior Health	By Client Residence	6	4	4	4	4	1	3	3	1	4	3	3	5	5	0	2	1	4	4	5
	By Provider Address	6	4	4	4	4	1	2	3	1	3	2	3	5	5	0	2	1	5	4	5

Northern Health	By Client Residence	7	8	5	7	4	3	7	2	4	10	5	5	5	4	3	0	3	8	3	3
	By Provider Address	7	8	5	8	4	3	6	2	4	9	5	6	5	4	3	0	3	8	3	3
Vancouver Coastal Health	By Client Residence	51	36	41	36	41	45	41	40	32	48	57	41	43	33	34	32	32	45	40	34
	By Provider Address	56	46	45	40	45	50	49	43	34	47	65	42	47	38	38	38	32	49	51	37
Vancouver Island Health	By Client Residence	9	9	7	14	6	13	8	6	5	2	7	7	6	3	5	12	4	9	11	6
	By Provider Address	11	9	7	14	6	12	8	5	5	3	6	6	3	3	5	12	5	9	11	6

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

	BC				Female				Male				< 30 years				30–39 years				40–49 years			
	'10	'11	'12	'13	'10	'11	'12	'13	'10	'11	'12	'13	'10	'11	'12	'13	'10	'11	'12	'13	'10	'11	'12	'13
Stage 0	52	63	53	50	8	3	6	2	44	60	47	47	19	14	18	20	16	25	18	14	13	19	10	11
Stage 1	66	53	51	43	12	8	6	6	54	44	44	37	19	12	12	17	20	20	14	14	20	10	16	6
Stage 2a	33	39	28	39	5	7	5	6	28	32	23	33	7	12	4	10	13	12	4	11	10	11	11	8
Stage 2b	34	39	30	25	12	8	6	3	22	31	24	22	5	7	7	3	9	8	7	9	11	12	10	6
Stage 3	76	68	58	54	22	13	5	6	54	55	53	48	2	5	7	3	13	17	11	9	31	25	15	17
Unknown	35	26	17	69	2	4	1	11	33	21	16	58	11	6	7	10	13	10	3	20	10	5	2	20
Total	296	288	237	280	61	43	29	34	235	243	207	245	63	56	55	63	84	92	57	77	95	82	64	68

	≥ 50 years				MSM			IDU			Heterosexual			Other Exposure			NIR/Unknown		
	'10	'11	'12	'13	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012	2010	2011	2012
Stage 0	4	5	7	5	37	51	42	6	5	4	8	7	7	0	0	0	1	0	0
Stage 1	7	11	9	6	33	32	33	13	8	6	20	13	11	0	0	1	0	0	0
Stage 2a	3	4	9	10	20	25	17	6	5	6	7	7	5	0	2	0	0	0	0
Stage 2b	9	12	6	7	15	20	16	5	3	6	12	15	8	2	1	0	0	0	0
Stage 3	30	21	25	25	25	27	30	18	7	6	28	31	20	3	3	0	2	0	2
Unknown	1	5	5	19	22	15	11	4	6	1	7	2	1	1	1	1	1	2	3
Total	54	58	61	72	152	170	149	52	34	29	82	75	52	6	7	2	4	2	5

Indicator 5: **HIV Cascade of Care**

		DIAGNOSED	LINKED	RETAINED	ON ART	ADHERENT	SUPPRESSED
British Columbia		9327	8397	7204	6627	6074	4946
Age Category	< 30	518	363	305	253	212	165
	30–39	1390	1235	1046	925	816	636
	40–49	3021	2754	2321	2137	1936	1559
	≥ 50	4388	4044	3532	3312	3110	2586
Age Category and MSM Status	MSM	< 30	78	74	62	53	45
		30–39	269	259	234	209	156
		40–49	800	780	713	637	543
		≥ 50	1552	1516	1462	1400	1169
	Non-MSM	< 30	74	72	68	58	32
		30–39	424	409	373	336	204
		40–49	921	886	839	767	490
		≥ 50	1228	1187	1128	1059	753
	Unknown	< 30	366	217	176	142	88
		30–39	697	568	439	380	276
		40–49	1300	1088	769	689	526
		≥ 50	1608	1342	942	853	664
Gender	Male	7618	6920	5949	5497	5118	4223
	Female	1709	1477	1256	1130	956	723
Injection Drug Use	IDU	2464	2376	2275	2110	1868	1401
	Non-IDU	3904	3804	3587	3388	3194	2709
	Unknown	2959	2217	1343	1129	1012	836
MSM Status	MSM	2700	2629	2471	2343	2208	1913
	Non-MSM	2648	2553	2407	2220	1978	1479
	Unknown	3980	3214	2326	2064	1888	1554
Health Authority	Fraser Health	1863	1783	1656	1539	1399	1159
	Interior Health	523	505	436	408	378	288
	Northern Health	264	247	217	192	162	103
	Vancouver Coastal Health	4492	4298	3971	3739	3450	2891
	Vancouver Island Health	873	843	801	749	685	505

Indicator 6: Programmatic Compliance Score (PCS)

	2012				2013			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
< 3 CD4 Tests	10.0%	9.4%	8.6%	9.1%	7.0%	7.5%	7.5%	8.0%
< 3 Viral Load Tests	7.8%	7.5%	7.0%	7.6%	5.0%	6.0%	6.7%	5.9%
No Baseline Genotype	6.1%	6.4%	6.0%	5.7%	5.5%	5.0%	5.0%	5.6%
Baseline CD4 < 200 cells/μL	29.0%	26.9%	25.3%	23.6%	22.2%	22.6%	23.7%	23.0%
Non-Recommended ART	2.8%	2.5%	2.3%	2.2%	1.5%	2.0%	5.8%	8.8%
Non Viral suppression at 9 Mo.	25.3%	23.3%	24.7%	26.4%	24.7%	25.3%	25.6%	23.6%
PCS Score: 0	180	187	200	210	221	220	185	167
PCS Score: 1	104	106	117	120	114	103	100	109
PCS Score: 2	48	42	42	51	50	60	57	49
PCS Score: 3	19	18	19	20	14	14	15	10
PCS Score: 4 or more	8	7	6	5	2	2	2	4
Total (n=)	359	360	384	406	401	399	359	339

Indicator 7: New DTP ARV Participants

First Starts	129	105	94	92	97	92	113	77
Experienced Starts	96	106	89	109	91	111	113	128

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

CD4 ≥ 500	36	36	24	35	21	35	32	31
CD4 350–499	37	26	30	21	29	16	20	18
CD4 200–349	32	22	15	15	25	18	28	16
CD4 50–199	12	12	18	12	15	13	23	11
CD4 < 50	11	9	7	7	7	8	9	1
<i>CD4 Median (cells/μL)</i>	<i>368</i>	<i>390</i>	<i>370</i>	<i>430</i>	<i>360</i>	<i>381</i>	<i>300</i>	<i>430</i>
Total (n=)	128	105	94	90	97	90	112	77

Indicator 9: Active and Inactive DTP Participants

Active DTP Participants	6259	6343	6404	6460	6497	6578	6653	6729
Inactive DTP Participants	1048	1050	1076	1080	1108	1094	1106	1107

Indicator 10: Antiretroviral Adherence

≥ 95%	105	90	100	77	98	88	64	71
80% to < 95%	19	23	28	23	21	20	23	12
40% to < 80%	10	11	9	14	6	9	8	9
< 40%	2	0	3	0	2	1	1	2
Total (n=)	136	124	140	114	127	118	96	94

Indicator 11: Resistance Testing and Results

Suppressed	4319	4335	4377	4239	4562	4582	4665	4499
Wild Type	1032	975	929	981	937	892	851	813
Never Genotyped	129	100	118	108	91	90	96	73
1-Class	221	188	183	192	174	184	168	159
2-Class	33	43	37	45	43	49	37	33
3-Class	7	3	9	7	9	9	10	5
Total (n=)	5741	5644	5653	5572	5816	5806	5827	5582

Indicator 12: AIDS-Defining Illness

		2006	2007	2008	2009	2010	2011	2012	2013
CD4 < 200 at	Cases	213	224	194	155	138	116	95	90
ART initiation	<i>Rate per 100,000</i>	<i>5</i>	<i>5.2</i>	<i>4.4</i>	<i>3.5</i>	<i>3</i>	<i>2.5</i>	<i>2.1</i>	<i>1.9</i>
AIDS Cases	Cases	115	100	105	77	70	57	38	21
(DTP Reports)	<i>Rate per 100,000</i>	<i>2.7</i>	<i>2.3</i>	<i>2.4</i>	<i>1.7</i>	<i>1.5</i>	<i>1.2</i>	<i>0.8</i>	<i>0.4</i>
AIDS Cases	Cases	121	114	122	99	79	73	46	–
(BCCDC Reports)	<i>Rate per 100,000</i>	<i>2.9</i>	<i>2.6</i>	<i>2.8</i>	<i>2.2</i>	<i>1.7</i>	<i>1.6</i>	<i>1.0</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