



BRITISH COLUMBIA
CENTRE *for* EXCELLENCE
in HIV/AIDS

HIV MONITORING QUARTERLY REPORT **FOR ISLAND HEALTH**

FIRST QUARTER 2014



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



First Nations Health Authority
Health through wellness



fraserhealth



Interior Health
For your whole life



island health



northern health
the northern way of caring



How you want to be treated.



Promoting wellness. Ensuring care.

Foreword

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

The objectives of these reports are to:

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

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

List of Indicators

Indicator 1. Testing Episodes

Indicator 2. HIV Testing Rate

Indicator 3. New HIV Diagnoses

Indicator 4. Stage of HIV Infection at Diagnosis

Indicator 5. HIV Cascade of Care

Indicator 6. Programmatic Compliance Score (PCS)

Indicator 7. New Antiretroviral Starts

Indicator 8. CD4 Cell Count at ART Initiation

Indicator 9. Active and Inactive Drug Treatment Program Participants

Indicator 10. Antiretroviral Adherence Level

Indicator 11. Resistance Testing Results by Resistance Category

Indicator 12. AIDS-Defining Illness

Indicator 13. HIV-Related Mortality

Table of Contents

Acknowledgements and Contributions

BC Provincial STOP Program:

A Note on Monitoring and Interpreting HIV Indicators

Indicator 1 HIV Testing Episodes

- Figure 1.1 HIV Test Episodes for Island Health, 2009 Q2–2014 Q1
- Figure 1.2 HIV Test Episodes for Island Health by Gender and Prenatal Status, 2009 Q2–2014 Q1
- Figure 1.3 HIV Test Episodes for Island Health by Age Category, 2009 Q2–2014 Q1
- Figure 1.4 Point-of-Care HIV Tests for Island Health, 2010 Q4–2014 Q1
- Figure 1.5 HIV Test Episodes by HSDA for Island Health, 2009 Q2–2014 Q1

Indicator 2 HIV Testing Rates

- Figure 2.1 Rate of HIV Testing for Island Health and HSDA's, 2009–2013
- Figure 2.2 Rate of HIV Testing for Island Health by Gender, 2009–2013
- Figure 2.3 Rate of HIV Testing for Island Health by Age Category, 2009–2013

Indicator 3 New HIV Diagnoses

- Figure 3.1 New HIV Diagnoses for Island Health, 2009 Q2–2014 Q1
- Figure 3.2 New HIV Diagnoses for Island Health by Gender, 2009 Q2–2014 Q1
- Figure 3.3 New HIV Diagnoses for Island Health by Age Category, 2009 Q2–2014 Q1
- Figure 3.4 New HIV Diagnoses for Island Health by Exposure Category, 2009 Q2–2013 Q3
- Figure 3.5 New HIV Diagnoses for Island Health by HSDA, 2009 Q2–2014 Q1

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
- Figure 4.1 Stage of HIV Infection at Diagnosis for Island Health, 2010–2013
- Figure 4.2 Stage of HIV Infection at Diagnosis for Island Health by Gender, 2010–2013
- Figure 4.3 Stage of HIV Infection at Diagnosis for Island Health by Age Category, 2010–2013
- Figure 4.4 Stage of HIV Infection at Diagnosis for Island Health by Exposure Category, 2010–2012

Indicator 5 HIV Cascade of Care

- Figure 5.1 Estimated Cascade of Care for Island Health, Year Ending 2014 Q1
- Figure 5.2 Estimated Cascade of Care for Island Health by Gender, Year Ending 2014 Q1

Figure 5.3	Estimated Cascade of Care for Island Health by Age Category, Year Ending 2014 Q1
Figure 5.4	Estimated Cascade of Care for Island Health by Msm Status, Year Ending 2014 Q1
Figure 5.5	Estimated Cascade of Care for Island Health by Age Category and Msm Status, Year Ending 2014 Q1
Figure 5.6	Estimated Cascade of Care for Island Health by History of IDU, Year Ending 2014 Q1
Figure 5.7	Estimated Cascade of Care for Island Health by HSDA, Year Ending 2014 Q1
Indicator 6	Programmatic Compliance Score (PCS)
Table 2	Probability of Mortality Based on the Programmatic Compliance Score
Figure 6.1	PCS Components for Island Health, 2012 Q2–2014 Q1
	First-Year CD4 Measurement
	First-Year VL measurement
	Baseline Resistance Testing
	Recommended Antiretroviral Therapy (ART)
	Baseline CD4 ≥ 200 cells/ μ L
	Suppression at 9 Months
Figure 6.2	Historical Trends for PCS Score for Island Health, 2012 Q2–2014 Q1
Indicator 7	New Antiretroviral Therapy Starts in Island Health
Figure 7	BC-CfE Drug Treatment Program Enrollment: New Antiretroviral Participants for Island Health, 2012 Q2–2014 Q1
Indicator 8	CD4 Cell Count at ART Initiation
Figure 8	CD4 Cell Count at ART Initiation for Island Health, 2012 Q2–2014 Q1
Indicator 9	Active and Inactive Drug Treatment Program (DTP) Participants
Table 3	Distribution of People on ART in Island Health, 2014 Q1
Figure 9	Active and Inactive DTP Participants for Island Health, 2012 Q2–2014 Q1
Indicator 10	Antiretroviral Adherence
Figure 10	Distribution of Individuals by Adherence Level in 1st Year of Therapy, Based on Pharmacy Refill Compliance for Island Health, 2012 Q2–2014 Q1
Indicator 11	Resistance Testing and Results
Figure 11	Cumulative Resistance Testing Results by Resistance Category for Island Health, 2012 Q2–2014 Q1
Indicator 12	AIDS-Defining Illness
Figure 12	AIDS Case Rate and Reports for Island Health, 2006–2013
Indicator 13	HIV-Related Mortality
Figure 13	HIV-Related Deaths by Year for Island Health, 2004–2011

Acknowledgements and Contributions



BRITISH COLUMBIA
CENTRE *for* EXCELLENCE
in HIV/AIDS

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



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

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

Other Data Sources:

The above databases were supplemented with:

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

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

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

Kate Heath, BC-CfE

Bohdan Nosyk, BC-CfE

Viviane Dias Lima, BC-CfE

Irene Day, BC-CfE

Dr. Mark Gilbert, BCCDC

Dr. Mel Kradjen, BCCDC

Stephanie Konrad, FHA

Joanne Nelson, FNHA

Jennifer May-Hadford, IHA

James Haggerstone, NHA

Dr. Neora Pick, PHSA

Dr. Reka Gustafson, VCHA

Melanie Rusch, VIHA

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

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

The expansion to a province-wide programme was announced on November 30th 2013 by the BC Ministry of Health with roll out of funding beginning on April 1st, 2013. This funding is intended to be used in the implementation and evaluation of HIV-related diagnosis and care initiatives within individual HA's. Goals of the project include: 1. A reduction in the number of new HIV infections in BC; 2. Improvements in the quality, effectiveness, and reach of HIV prevention services; 3. An increase in early diagnosis of HIV; 4. A reduction in AIDS cases and HIV-related mortality.

The goals of HA-led STOP-funded initiatives are to work toward achieving these goals. To these ends some outcome measures or indicators of progress have been drafted that should be considered in the design and implementation phases of these initiatives.

HIV Testing Episodes and Rates

In this section, the number of HIV test episodes and point of care (POC) HIV tests conducted each quarter in BC is shown. In general terms the goal is to increase the number of tests performed and to maximize testing efficiency. Test episodes are allocated by region according to where the test is performed.

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

Indicator 1. HIV Testing Episodes

Figure 1.1 HIV Test Episodes for Island Health, 2009 Q2–2014 Q1

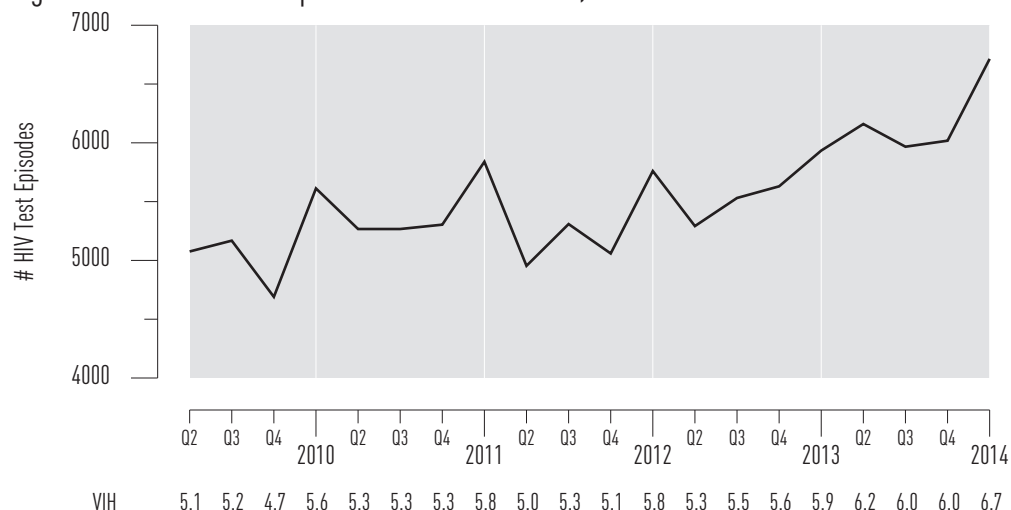
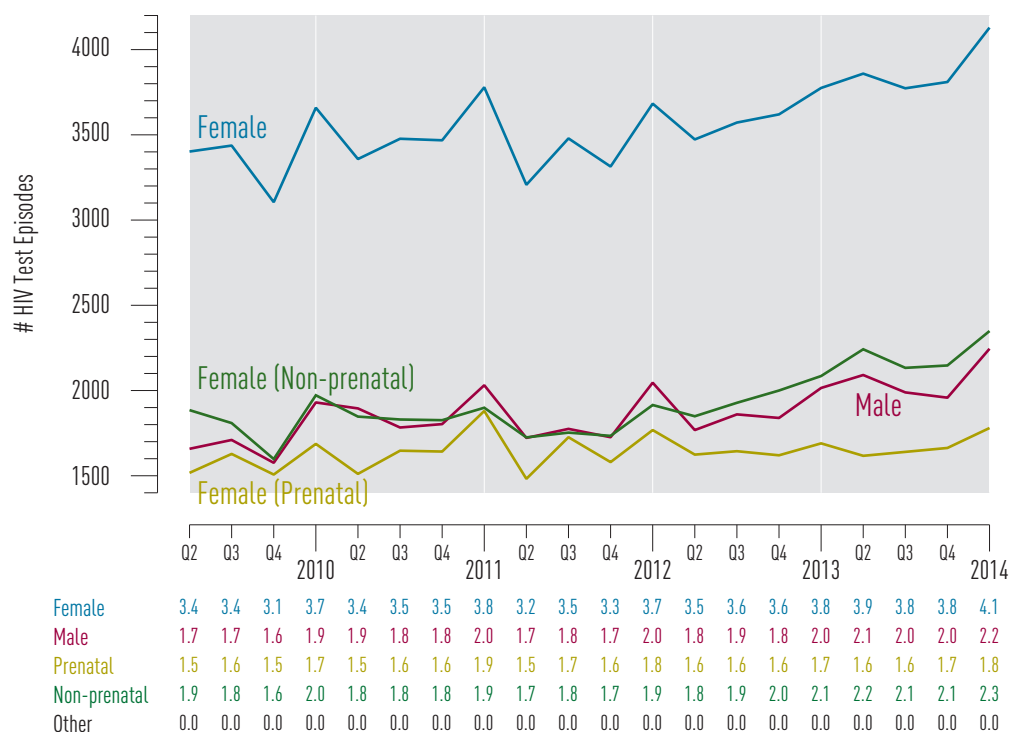


Figure 1.2 HIV Test Episodes by Gender and Prenatal Status for Island Health, 2009 Q2–2014 Q1¹



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

Figure 1.3 HIV Test Episodes by Age Category for Island Health, 2009 Q2–2014 Q1^{1,2}

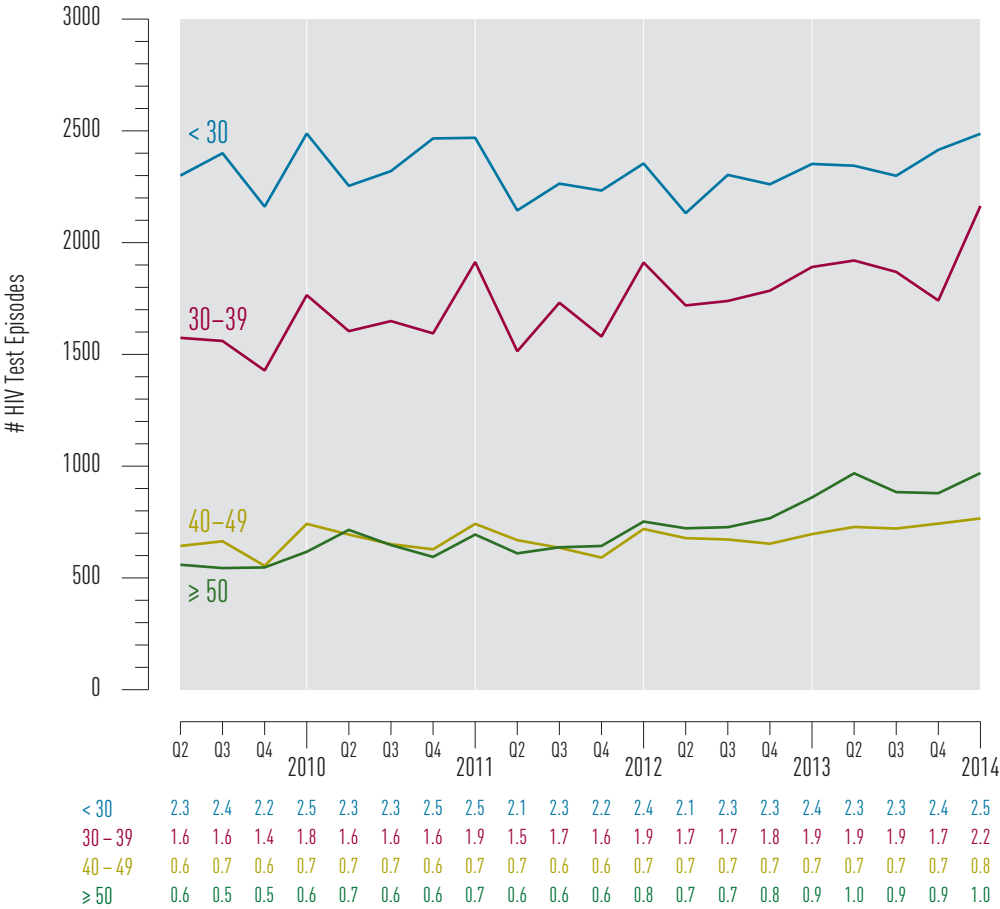
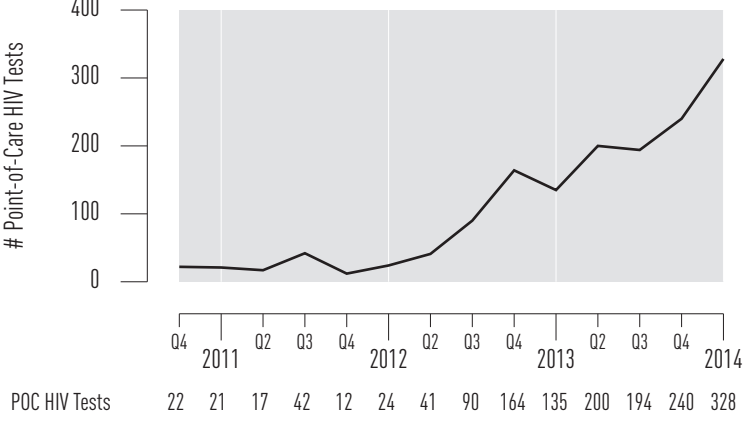


Figure 1.4 Point-of-Care HIV Tests for Island Health, 2010 Q4–2014 Q1

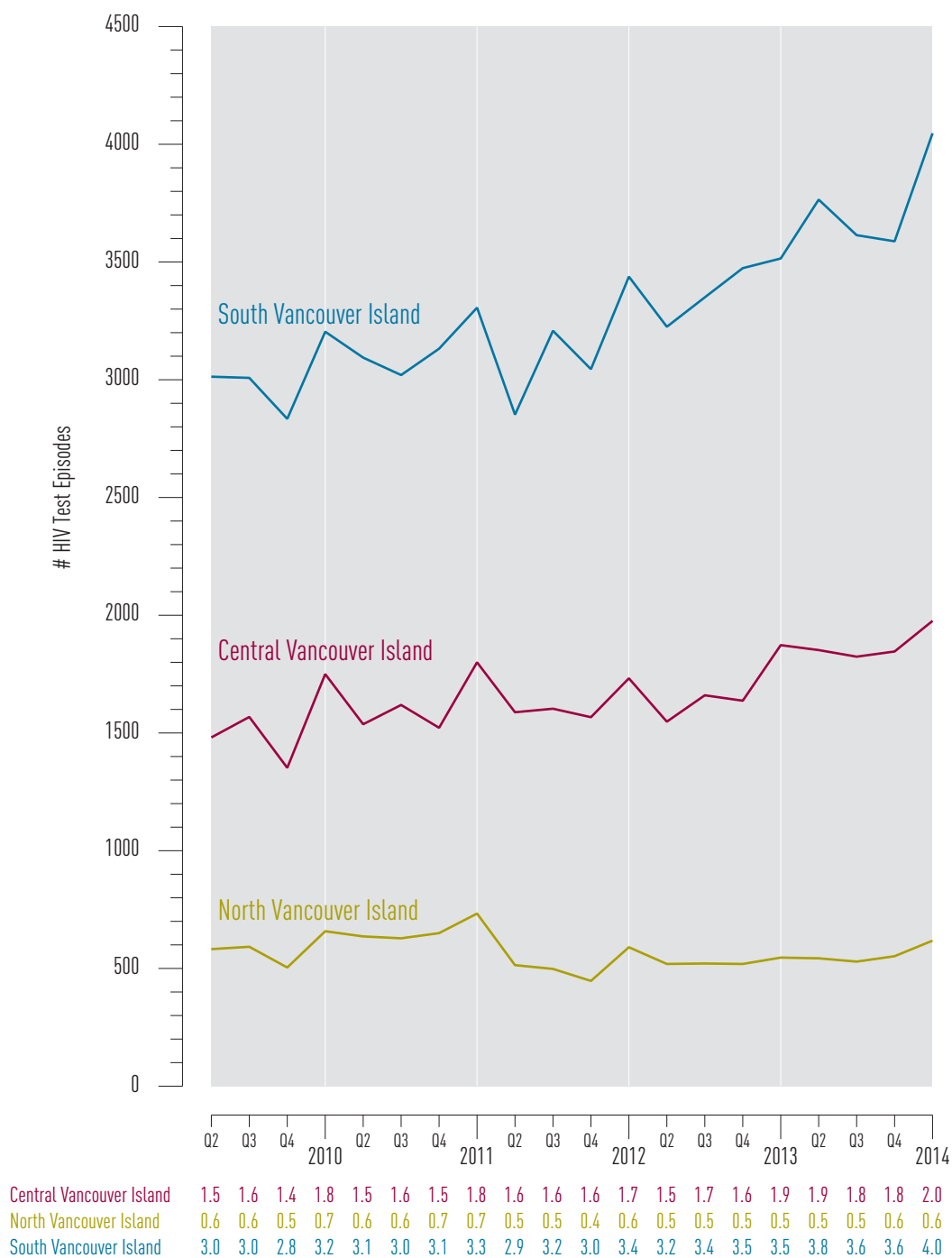


2 Data Source: The BC Public Health Microbiology and Reference Laboratory (BCPHMRL) courtesy of the BC Centre for Disease Control (BCCDC).

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 for Island Health, 2009 Q2–2014 Q1



Indicator 2. HIV Testing Rates

Figure 2.1 Rate of HIV Testing for Island Health and HSDAs, 2009–2013 ¹

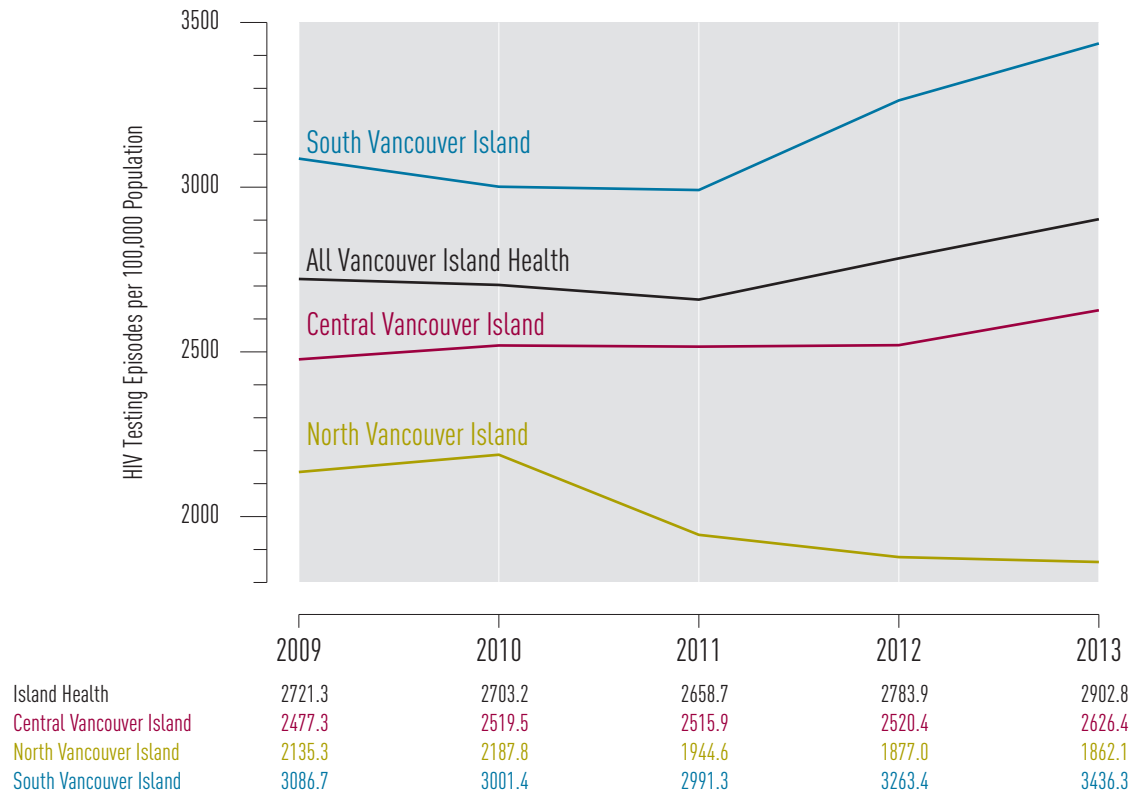


Figure 2.2 Rate of HIV Testing by Gender for Island Health, 2009–2013 ¹

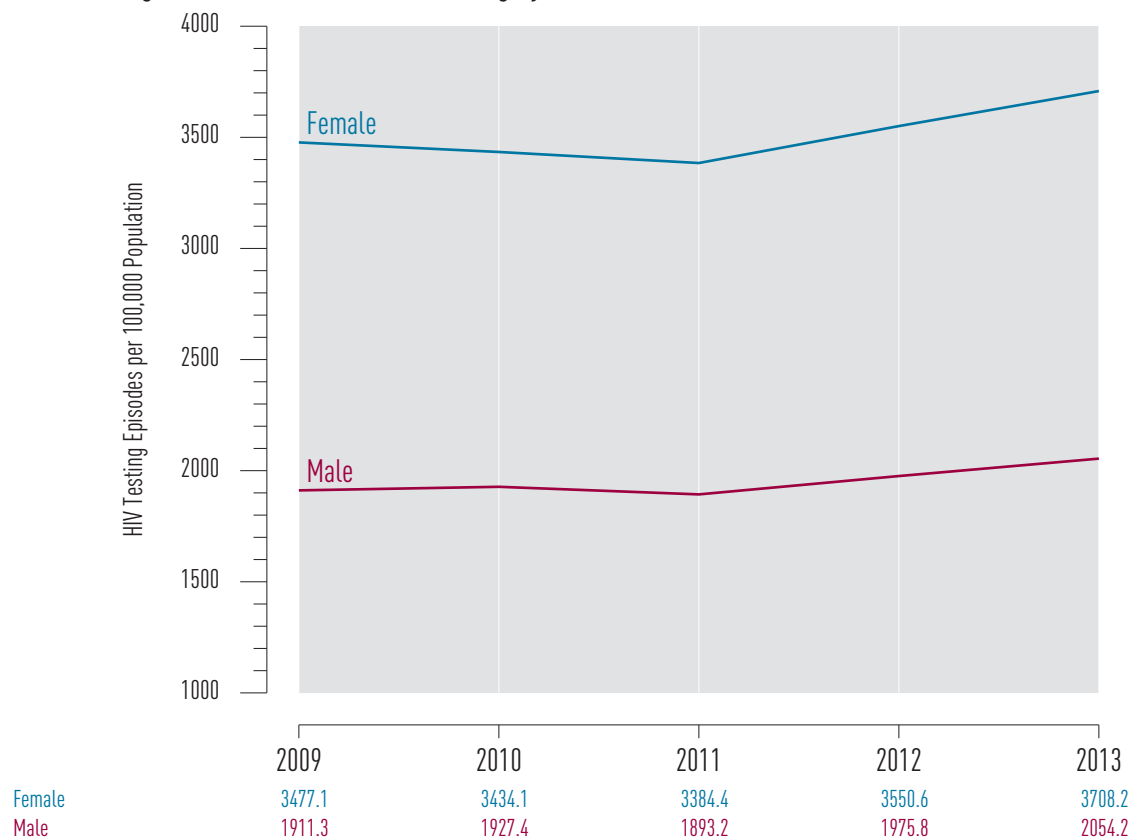
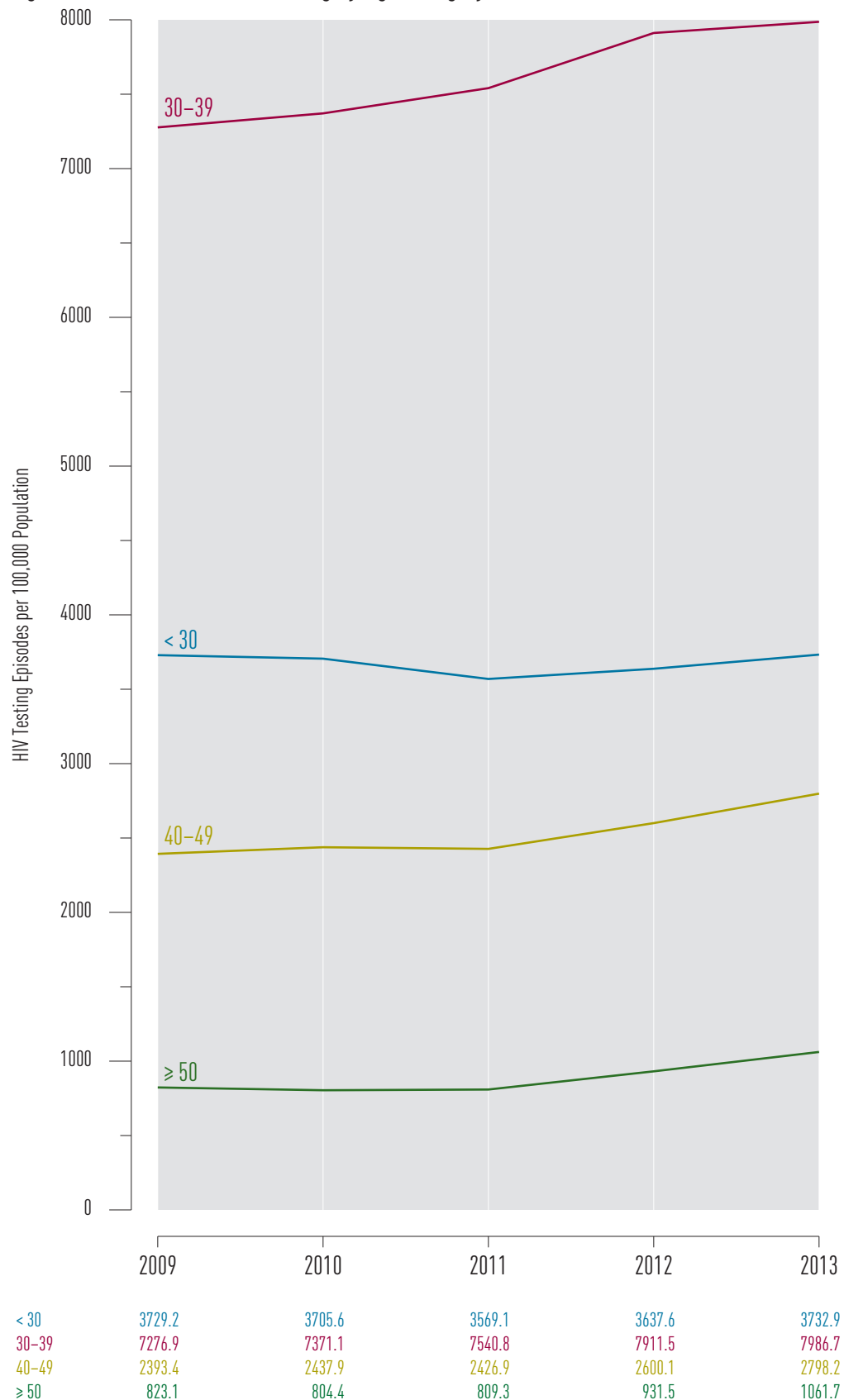


Figure 2.3 Rate of HIV Testing by Age Category for Island Health, 2009–2013 ¹



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

New HIV Diagnoses

Trends in HIV diagnoses by gender and exposure category are described. Interpreting HIV diagnoses must be done with consideration that trends are influenced by both changes in testing rate as well as changes in transmission rates. It is important to note that new HIV diagnoses cases and rates are not synonymous with HIV incidence as a person may have become infected with HIV long before they tested positive for HIV. However, as there is no reliable method for measuring HIV incidence we follow trends in HIV diagnoses.

Indicator 3. New HIV Diagnoses

Figure 3.1 New HIV Diagnoses for Island Health, 2009 Q2–2014 Q1³

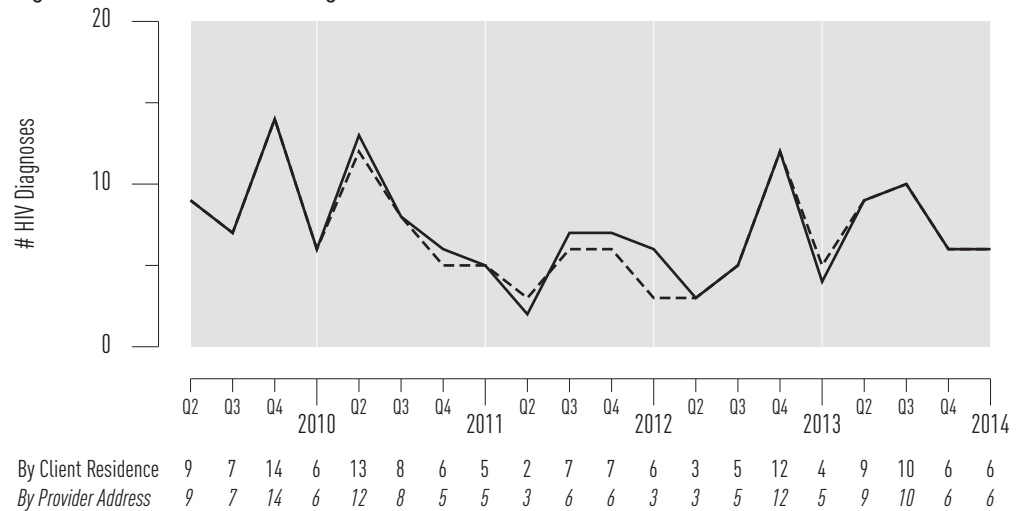
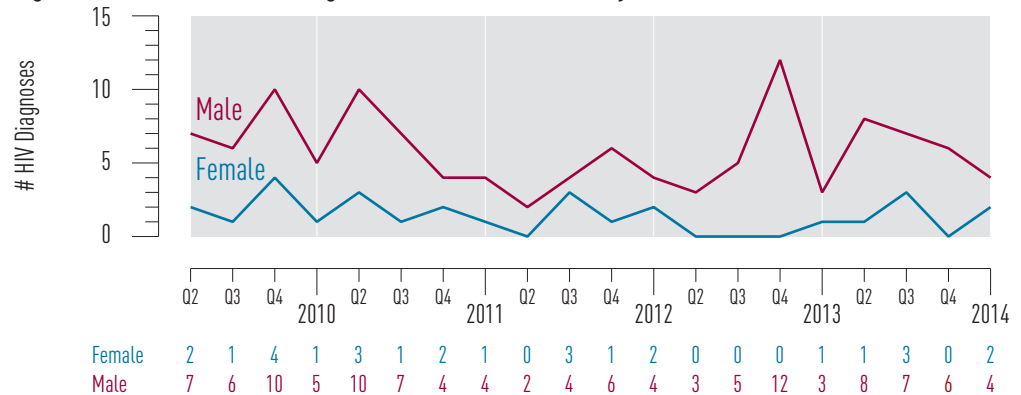


Figure 3.2 New HIV Diagnoses for Island Health by Gender, 2009 Q2–2014 Q1³



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

Figure 3.3

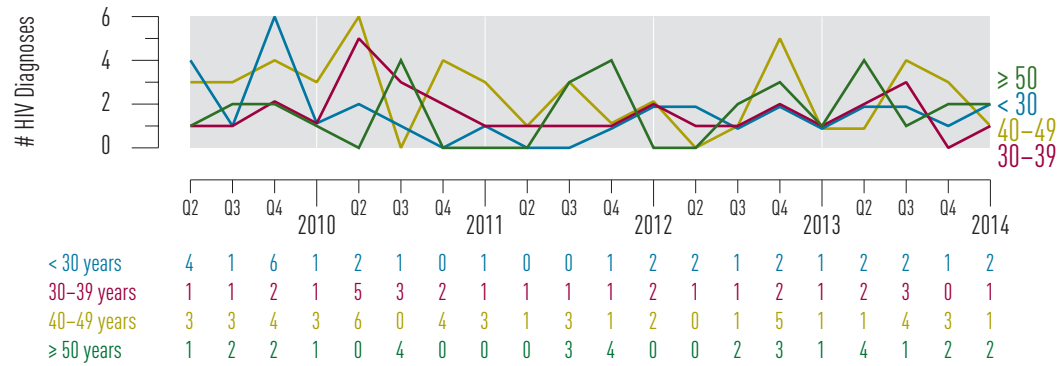
New HIV Diagnoses for Island Health by Age Category, 2009 Q2–2014 Q1³

Figure 3.4

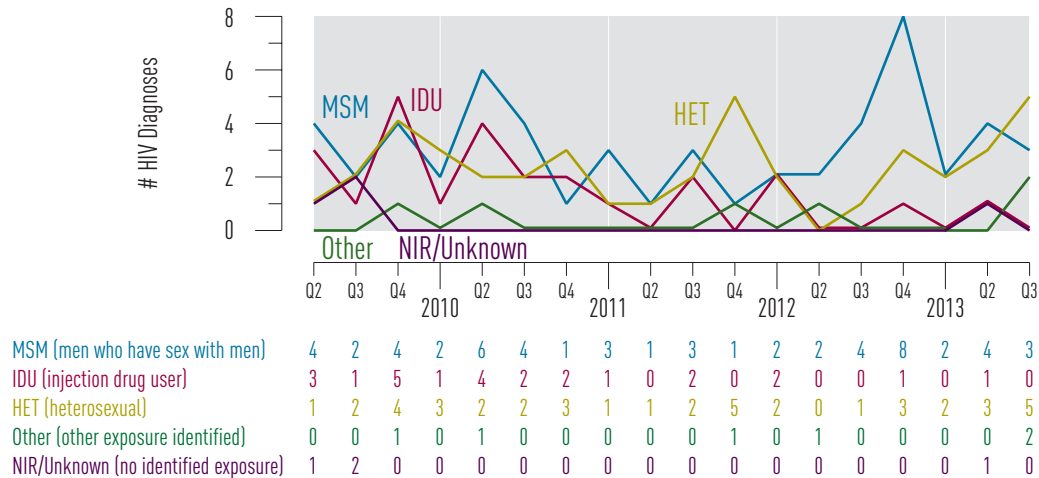
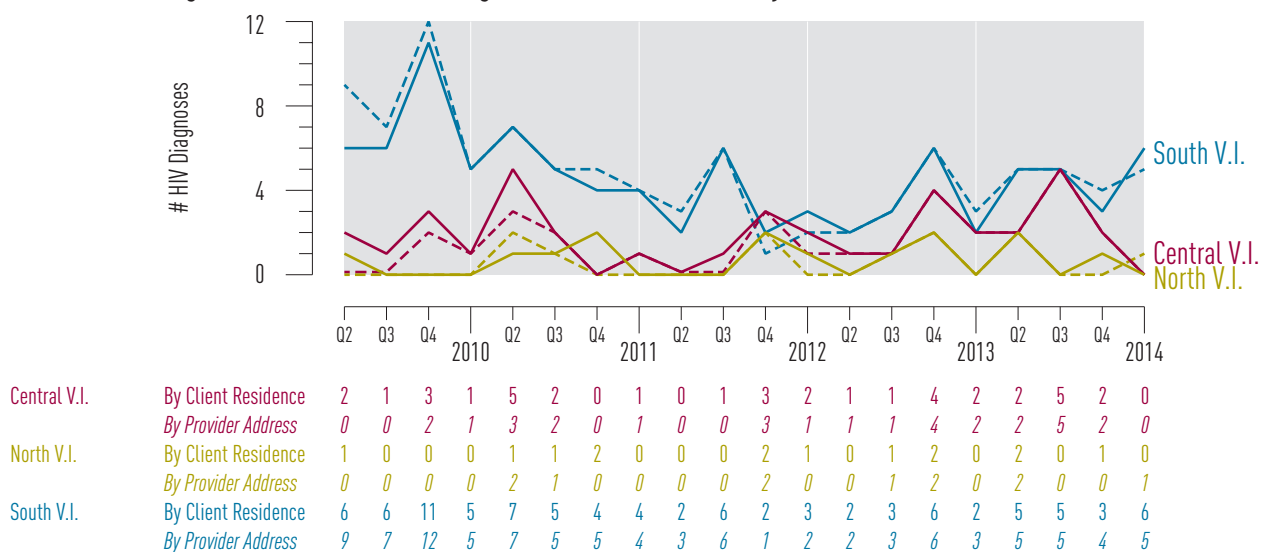
New HIV Diagnoses for Island Health by Exposure Category, 2009 Q2–2013 Q3^{3,4}

Figure 3.5

New HIV Diagnoses for Island Health by HSDA, 2009 Q2–2014 Q1³

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

⁴ MSM=men who have sex with men; IDU= injection drug user; HET=heterosexual. NIR=No identified risk/exposure.

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 Island Health, 2010–2013⁵

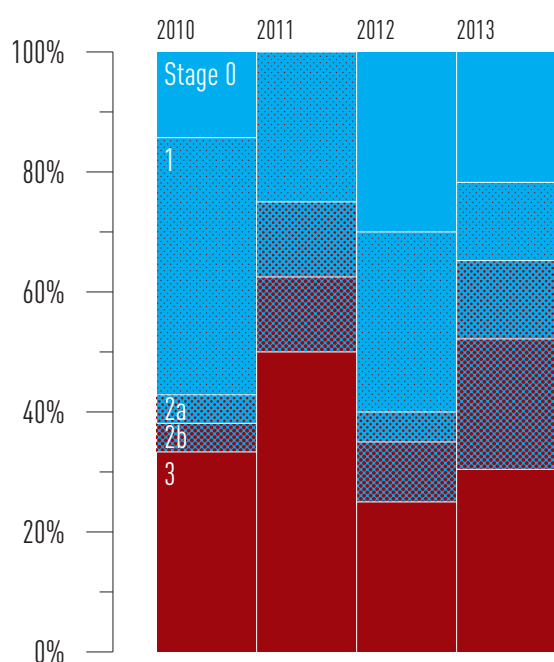


Figure 4.2 Stage of HIV Infection at Diagnosis by Gender for Island Health, 2010–2013⁵

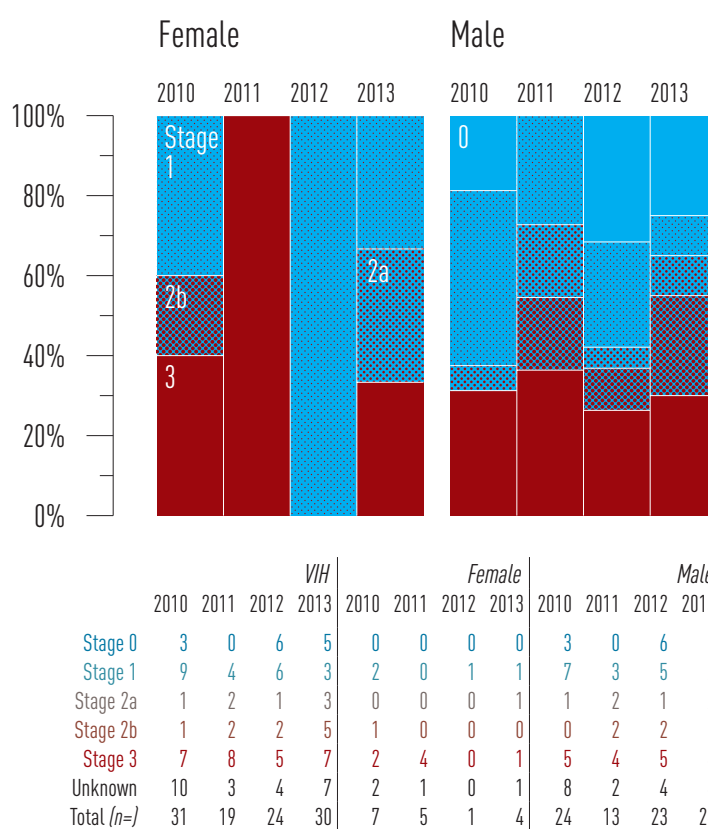


Figure 4.3 Stage of HIV Infection at Diagnosis by Age Category for Island Health, 2010–2013 ⁵

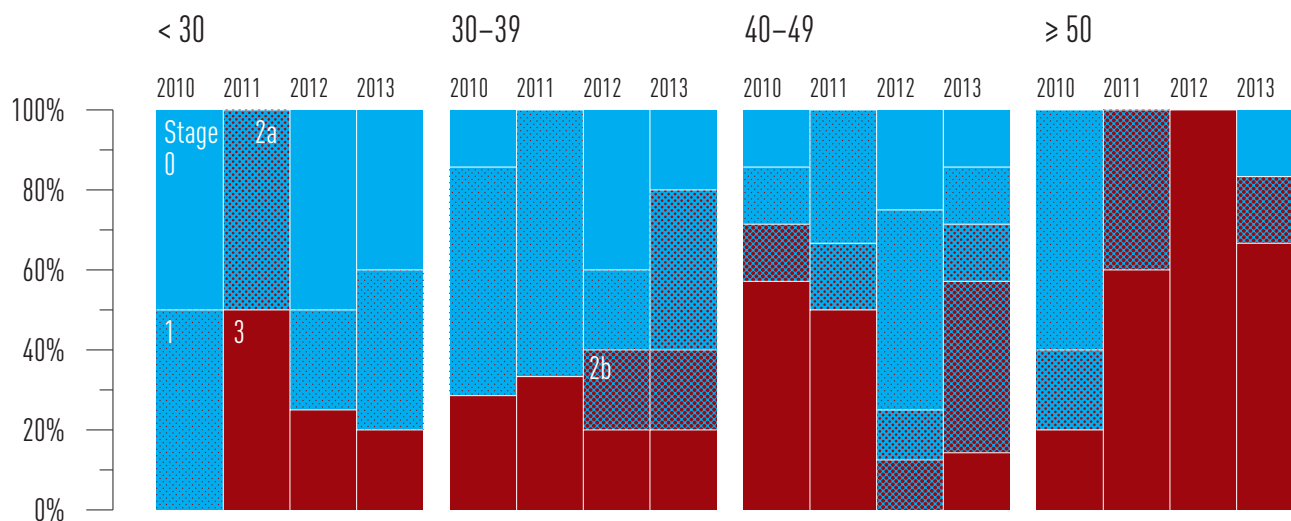
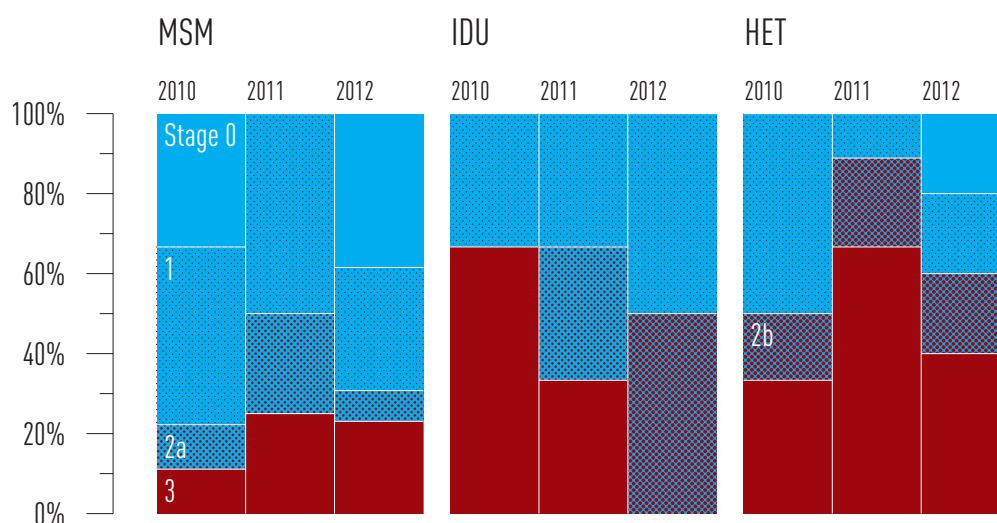


Figure 4.4 Stage of HIV Infection at Diagnosis by Exposure Category for Island Health, 2010–2012 ^{5,6}



	< 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	1	0	2	2	1	0	2	1	1	0	2	1	0	0	0	1	3	0	5	0	0	0	0	0	1	0	0	0	0	0	0
Stage 1	1	0	1	2	4	2	1	0	1	2	4	1	3	0	0	0	4	2	4	2	1	1	3	1	1	0	0	0	0	0	0
Stage 2a	0	1	0	0	0	0	0	2	0	1	1	1	1	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0
Stage 2b	0	0	0	0	0	0	1	1	1	0	1	3	0	2	0	1	0	0	0	0	0	1	1	2	1	0	0	0	0	0	0
Stage 3	0	1	1	1	2	1	1	1	4	3	0	1	1	3	3	4	1	1	3	4	1	0	2	6	2	0	0	0	0	0	0
Unknown	2	0	1	0	3	1	1	1	5	2	0	3	0	0	2	3	3	2	2	3	1	1	3	0	0	1	0	1	0	0	0
Total (n=)	4	2	5	5	10	4	6	6	12	8	8	10	5	5	5	9	12	6	15	9	4	3	9	9	5	1	0	1	0	0	0

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 Island Health, Year Ending 2014 Q1 ⁷

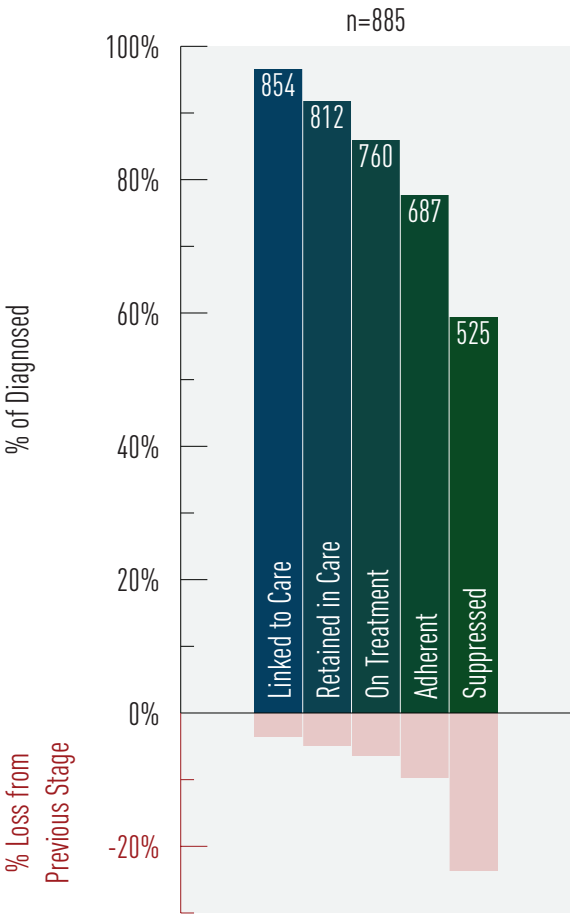
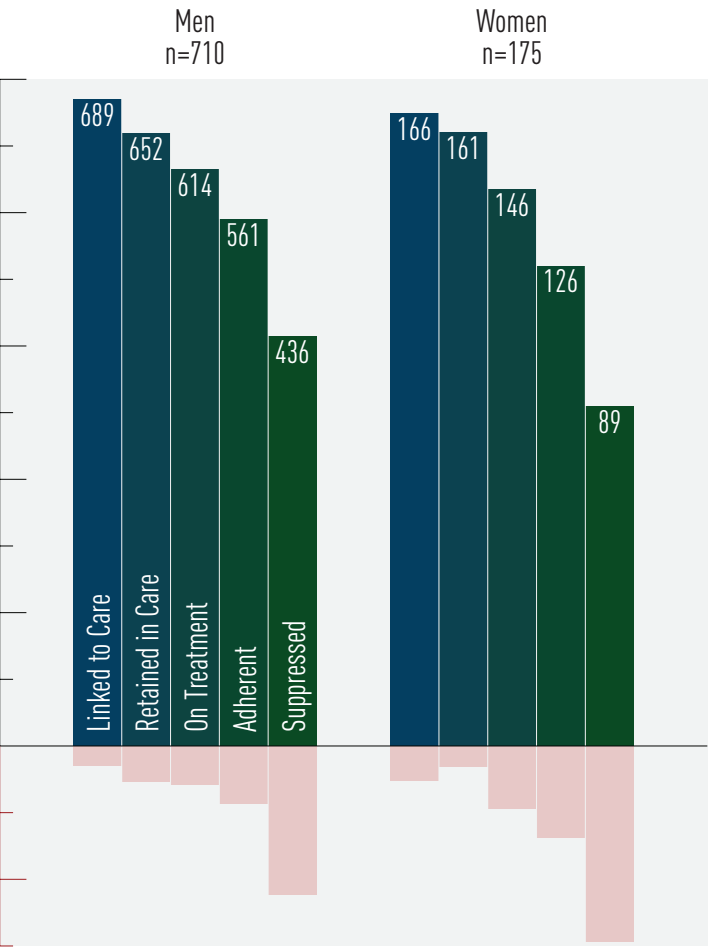


Figure 5.2 Estimated Cascade of Care for Island Health by Gender, Year Ending 2014 Q1 ⁸



7,8 Data is for the period 2013 Q2–2014 Q1.

Data Sources:

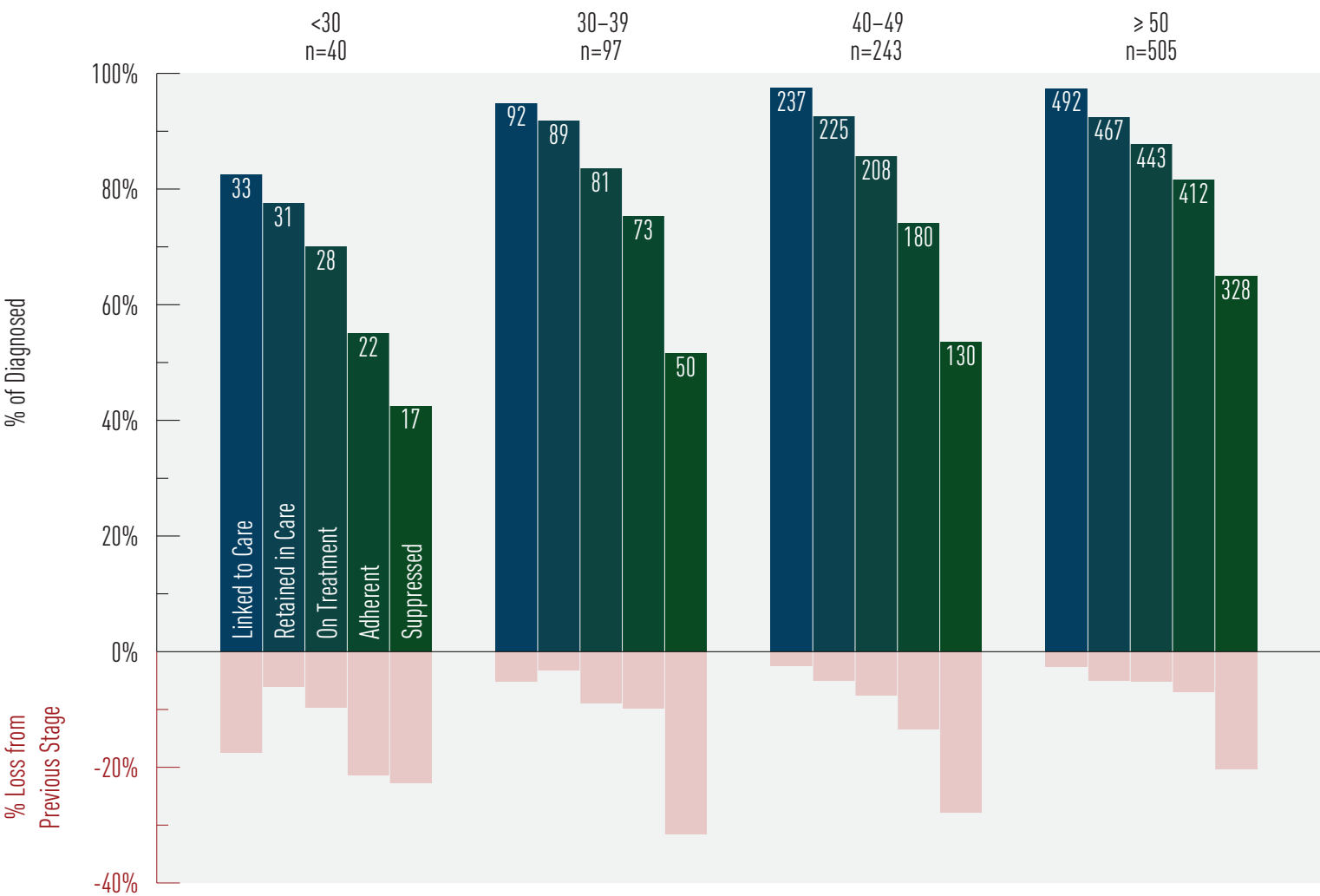
1 British Columbia Centre for Excellence Drug Treatment Program (DTP) Database (ARV use, VL and CD4 count).

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.

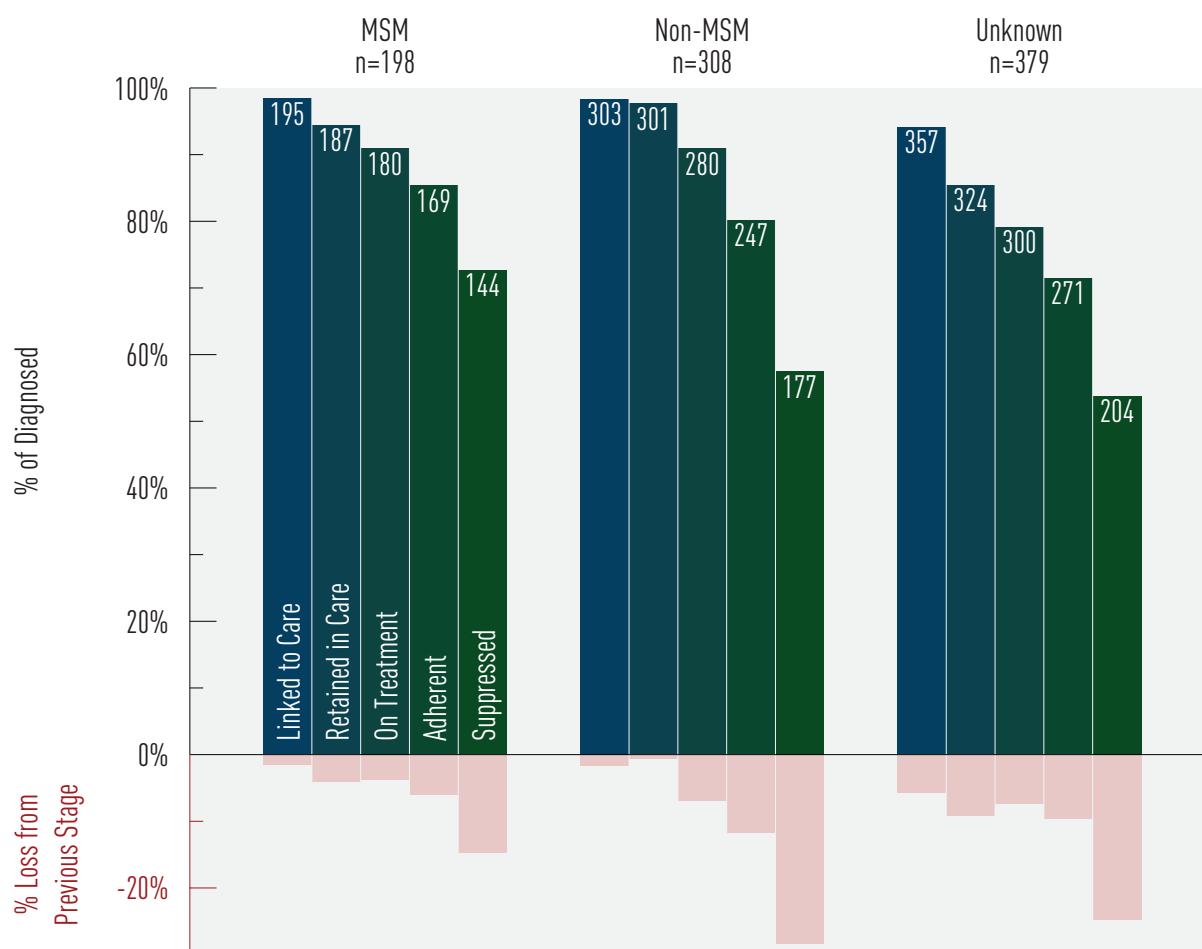
NB: Transgender has been assigned to their biological sex.

Figure 5.3 Estimated Cascade of Care for Island Health by Age Category, Year Ending 2014 Q1 ⁹



⁹ Data is for the period 2013 Q2–2014 Q1.
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 Island Health by MSM Status, Year Ending 2014 Q1 ¹⁰



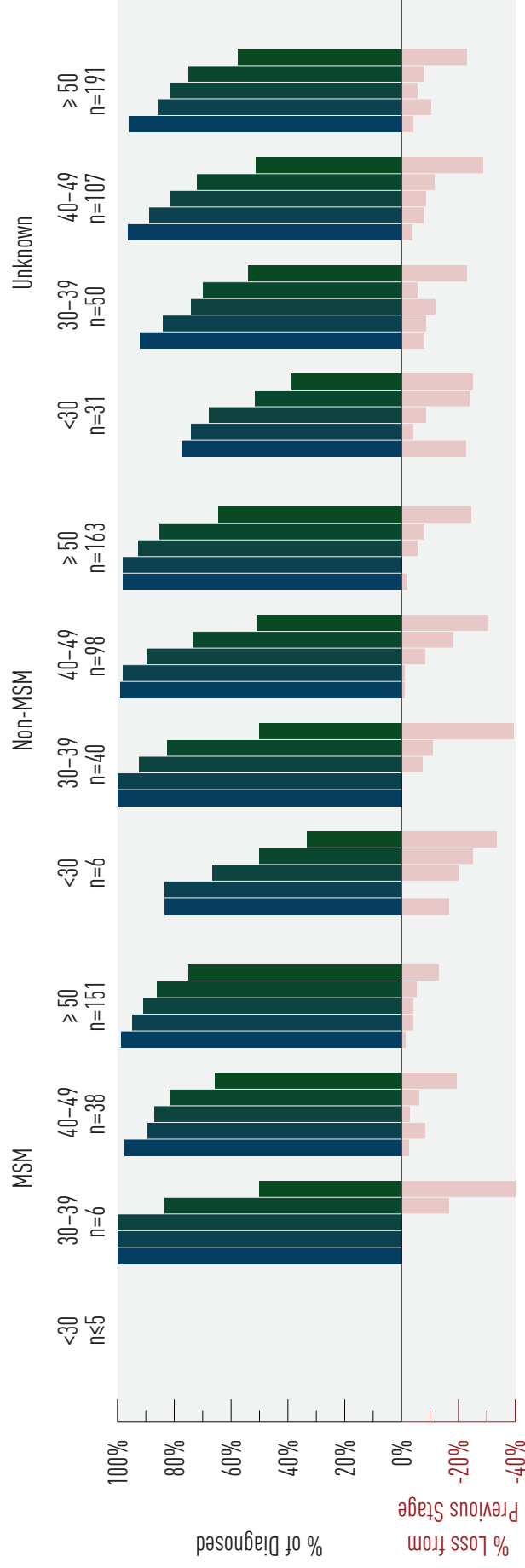
¹⁰ Data is for the period 2013 Q2–2014 Q1.

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 Island Health by Age Category and MSM Status, Year Ending 2014 Q1¹¹



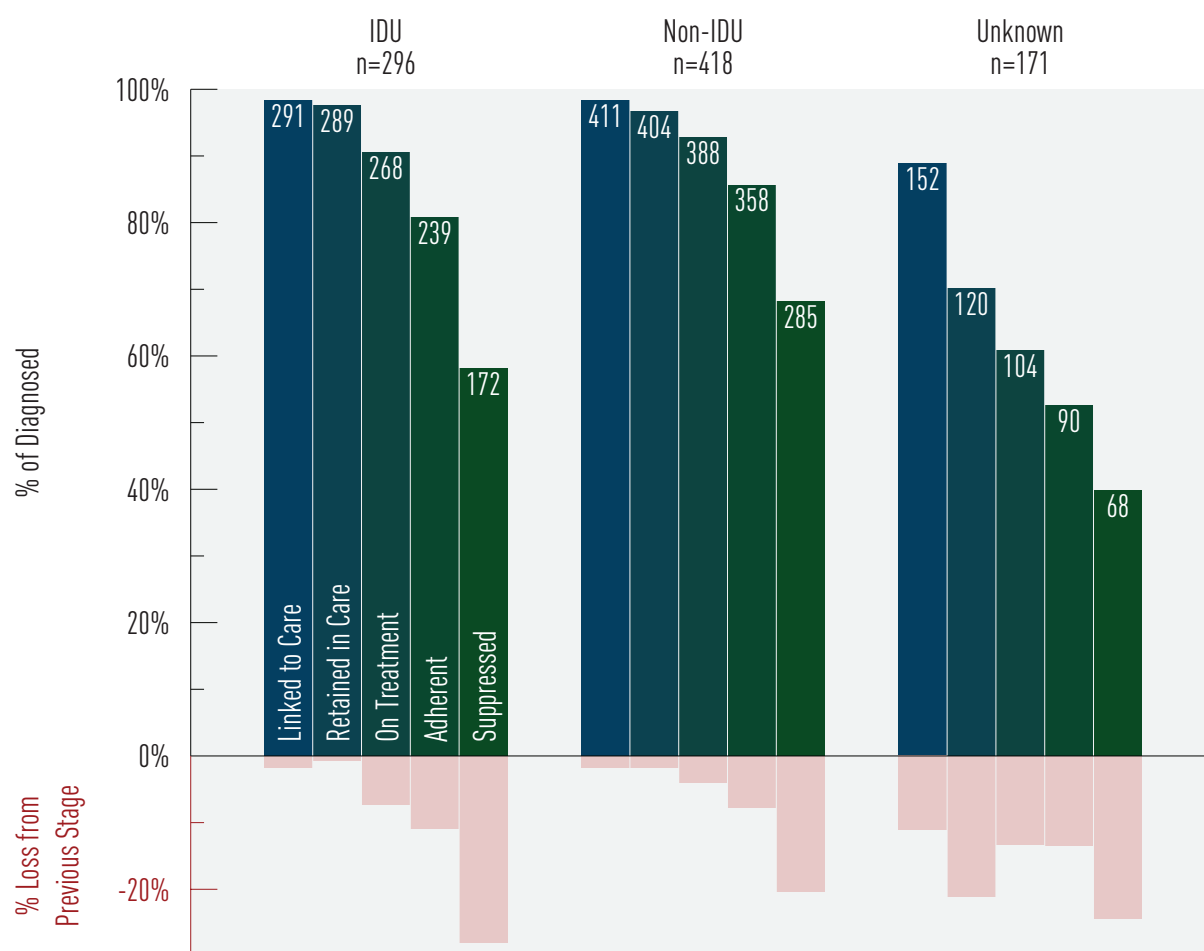
¹¹ Data is for the period 2013 Q2–2014 Q1.

Data Sources:

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

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

Figure 5.6 Estimated Cascade of Care for Island Health by History of IDU, Year Ending 2014 Q1 ¹²



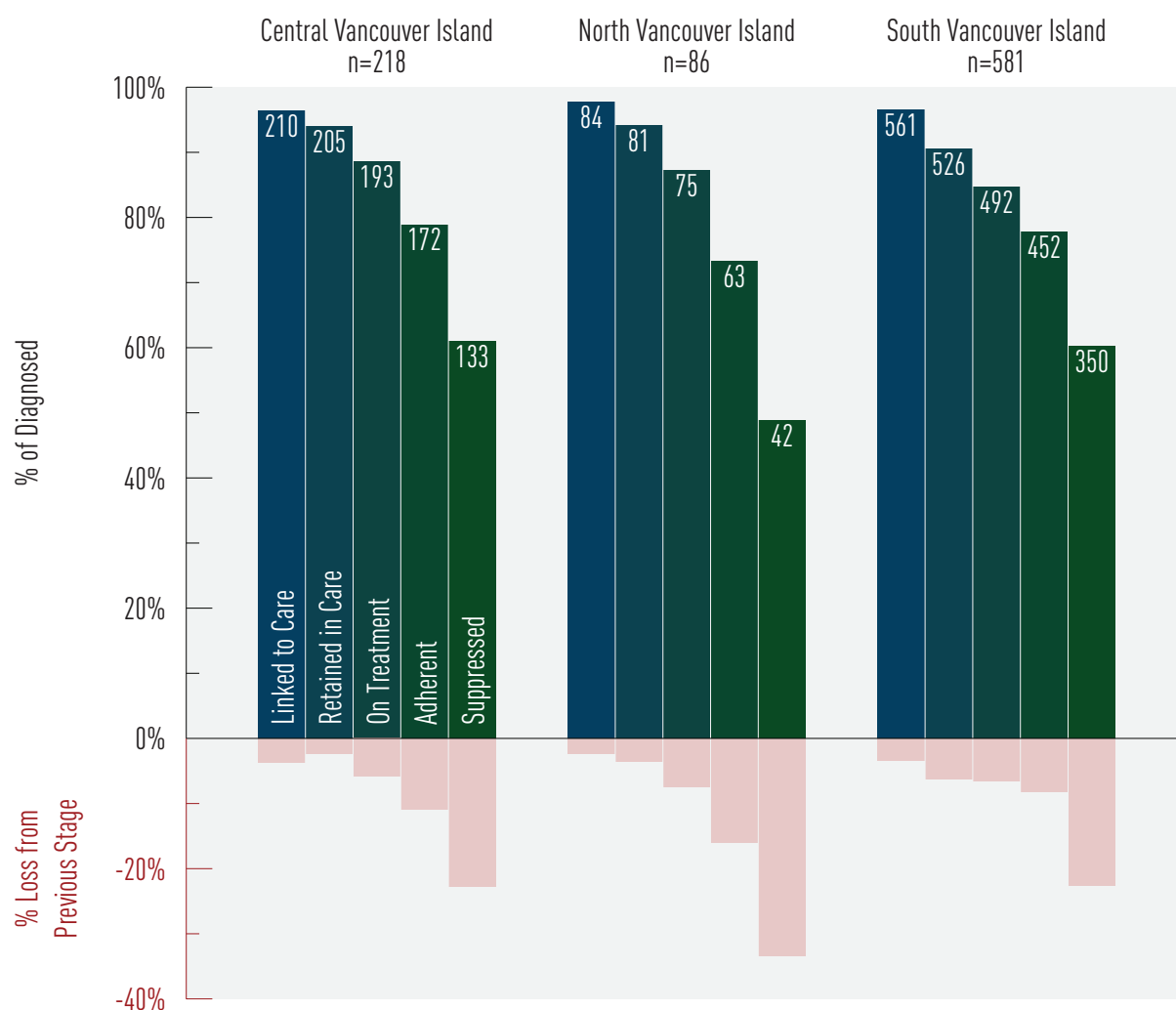
¹² Data is for the period 2013 Q2–2014 Q1.

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 Island Health by HSDA, Year Ending 2014 Q1 ¹³



¹³ Data is for the period 2013 Q2–2014 Q1.

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 Island Health, 2012 Q2–2013 Q4 ¹⁴

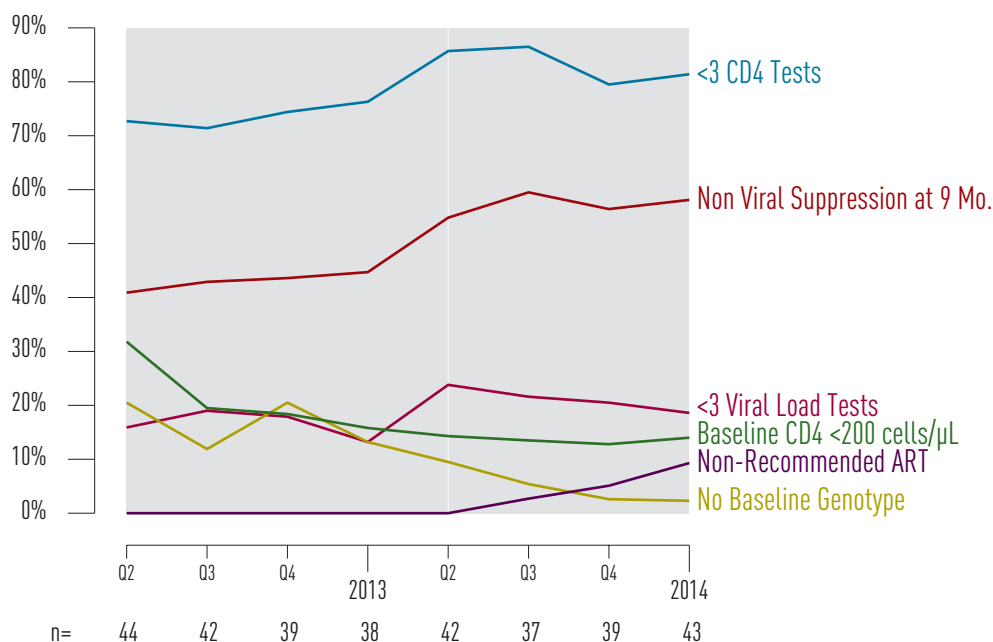
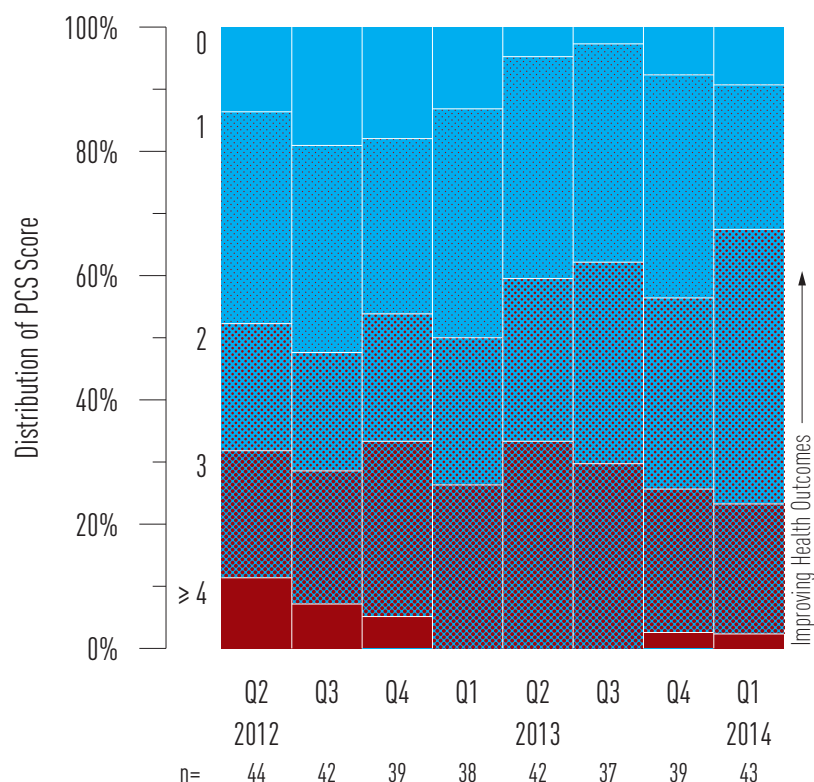


Figure 6.2 Historical Trends for PCS Score for Island Health, 2012 Q2–2014 Q1 ^{14,15}



¹⁴ Data Source: British Columbia Centre for Excellence Drug Treatment Program (DTP) Database. Limitations: CD4 cell count capture is approximately 80%. Due to improvements in the automated system, some changes in data representation are expected compared to previous reports.

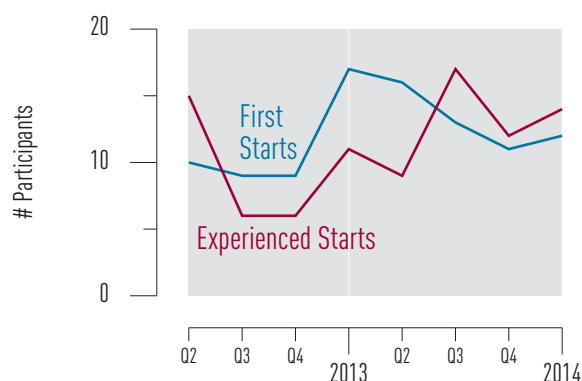
¹⁵ Each quarter's data is calculated as the sum of the 4 quarters leading up to it. e.g. 2013 Q1 is calculated from 2012 Q2 – 2013 Q1. NB: A score of 0 is the best score and a score of 4 or more is the worst score.

Antiretroviral Uptake

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

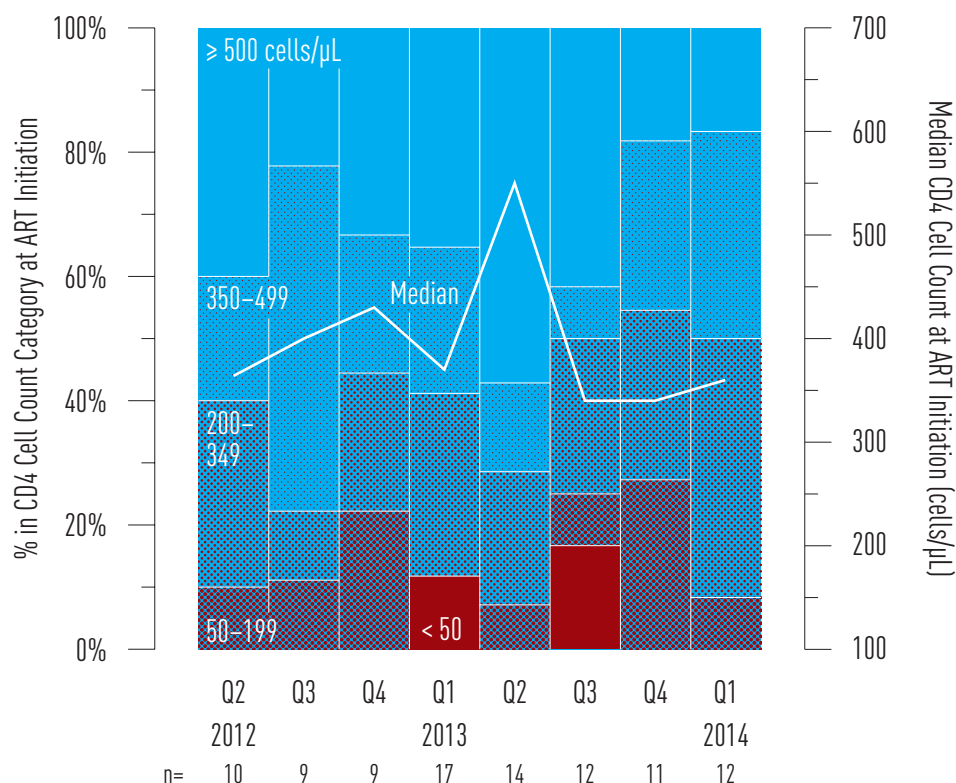
Indicator 7. New Antiretroviral Therapy Starts in Island Health

Figure 7 BC-CfE Drug Treatment Program Enrollment: New ART Participants in Island Health, 2012 Q2–2014 Q1 ¹⁶



Indicator 8. CD4 Cell Count at ART Initiation

Figure 8 CD4 Cell Count at ART Initiation of ART-Naïve DTP Participants in Island Health, 2012 Q2–2014 Q1 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

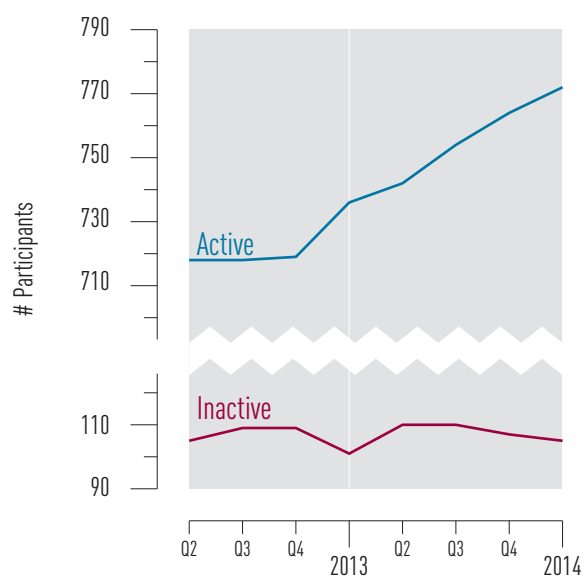
Limitations: CD4 cell count data is approximately 80% complete.

Indicator 9. Active and Inactive DTP Participants

Table 3. Distribution of People on ART for Island Health, 2014 Q1 ¹⁸

Age	< 30	26
	30–39	92
	40–49	226
	≥ 50	428
Gender	Male	624
	Female	148
Exposure	MSM	181
	IDU	274
Total		772

Figure 9 Active and Inactive DTP Participants in Island Health, 2012 Q2–2014 Q1 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.

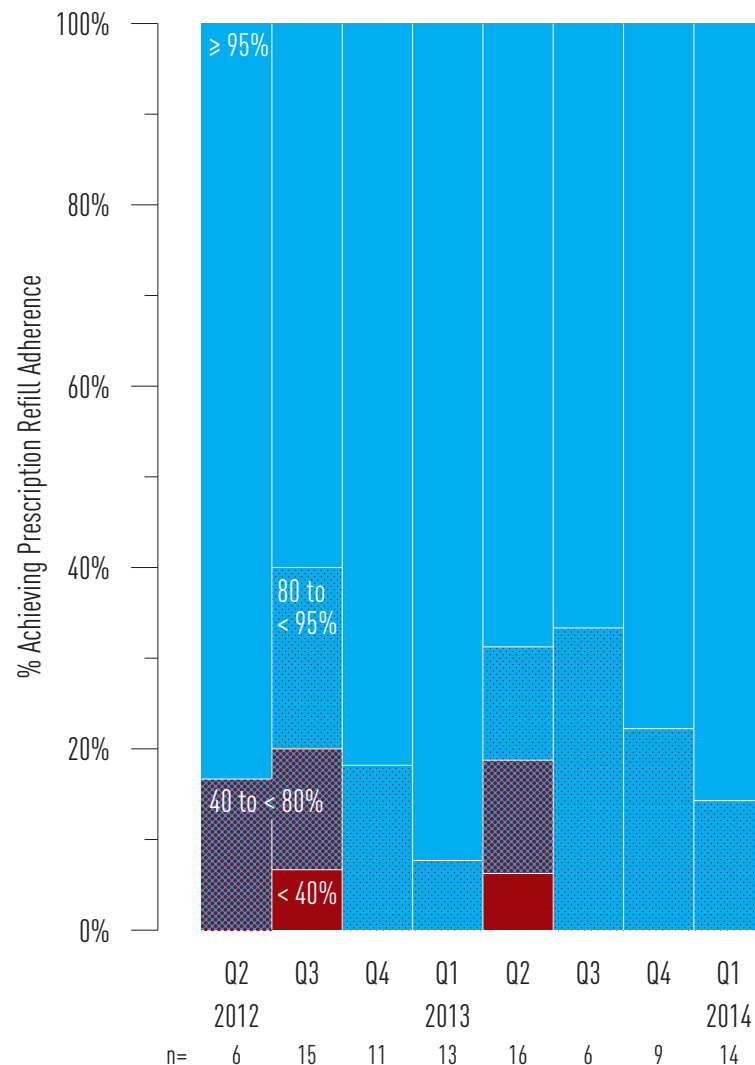
Inactive DTP Participants: Persons no longer prescribed drugs through the HIV/AIDS Drug Treatment Program in the last quarter.

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

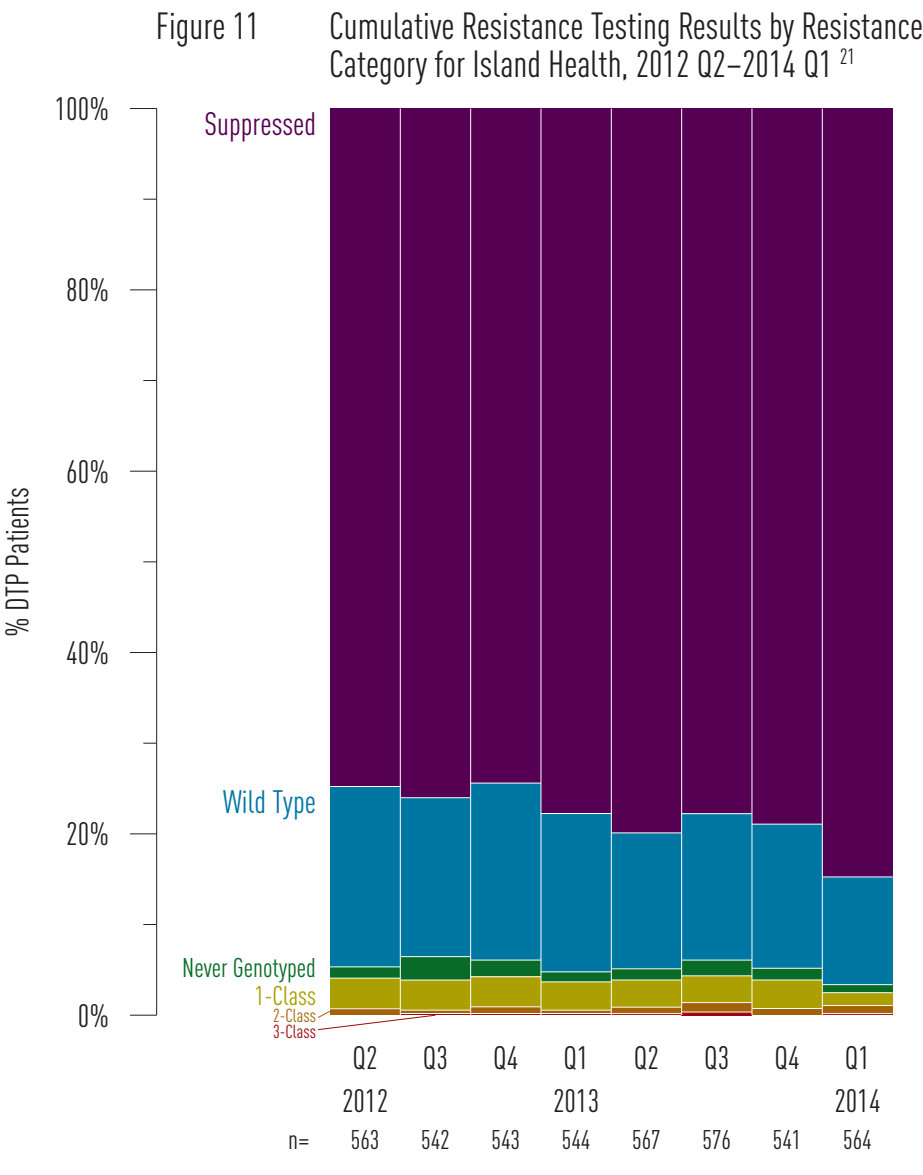
Figure 10 Distribution of Individuals by Adherence Level in 1st Year of Therapy, Based on Pharmacy Refill Compliance for Island Health, 2012 Q2–2014 Q1 ²⁰



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.



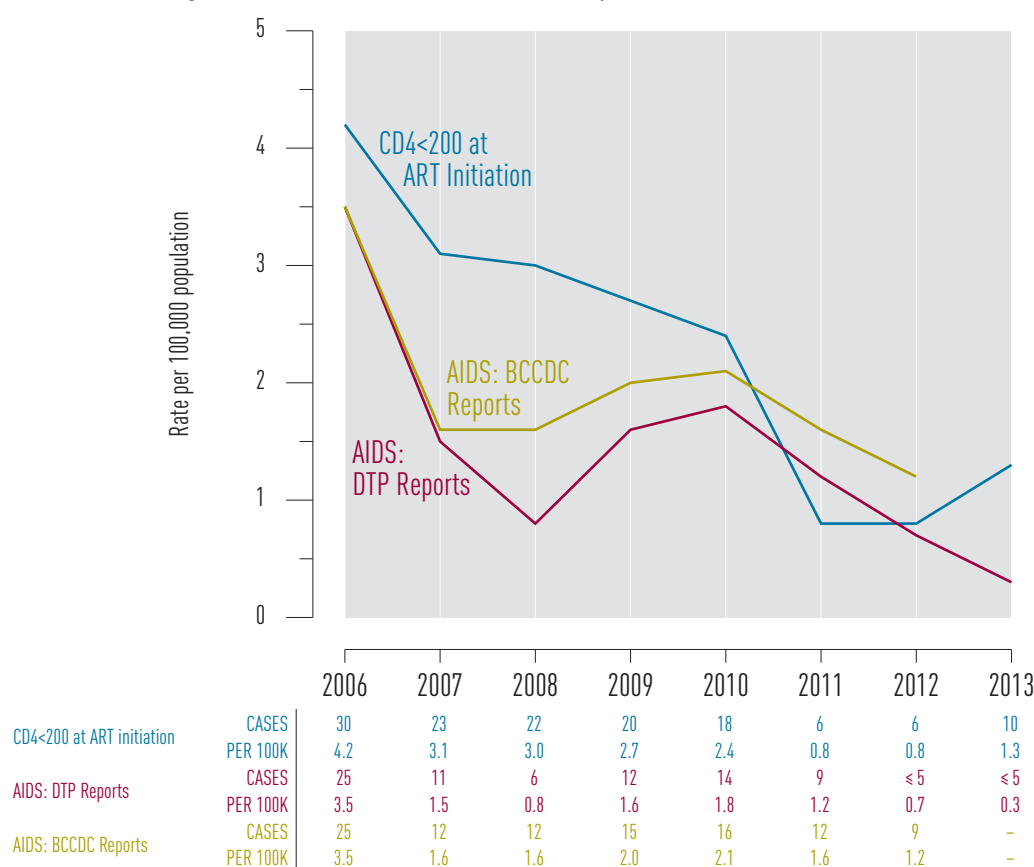
²¹ Data Source: Drug Treatment Program Database

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 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 Island Health, 2006–2013 ²²



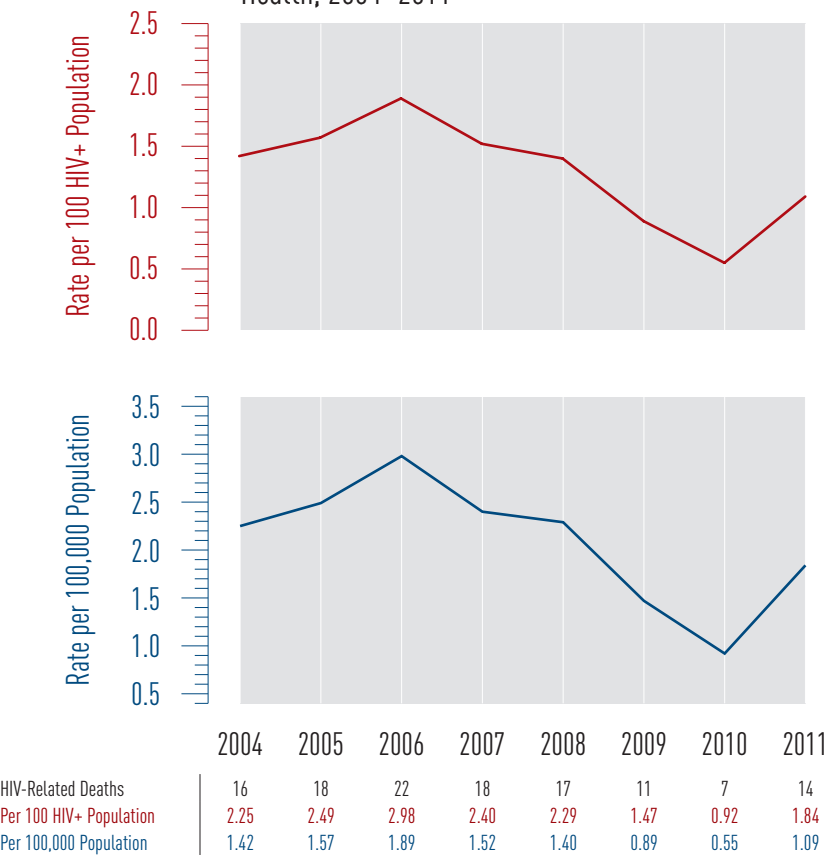
²² Data Source: DTP AIDS cases are obtained from the Drug Treatment Program Database; BCCDC AIDS cases are obtained from the BC-CDC; CD4<200 at ART initiation data came from the DTP database.

Limitation: AIDS case reporting was investigated using 3 definitions: First, using AIDS cases reported in AIDS case report forms from the DTP; Second, using AIDS cases reported via the BCCDC and third, using a CD4 cell count of <200 cells/μL at time of ART initiation using DTP data. AIDS case reporting is passive in BC, thus; AIDS case reporting is not well captured. The DTP sends out AIDS reporting forms to physicians annually. The BCCDC uses DTP AIDS case reports as well as physician AIDS case reports made directly to the BCCDC. Interpreting AIDS case reports should be done with these limitations in mind. AIDS data is updated annually as very few AIDS cases reports are reported in general and trends would be difficult to notice if reported quarterly.

Indicator 13. HIV-Related Mortality

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

Figure 13 HIV-Related Deaths by Year for Island Health, 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		2014	
		Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Island Health		5.1	5.2	4.7	5.6	5.3	5.3	5.3	5.8	5.0	5.3	5.1	5.8
Gender	Female	3.4	3.4	3.1	3.7	3.4	3.5	3.5	3.8	3.2	3.5	3.3	3.7
	Male	1.7	1.7	1.6	1.9	1.9	1.8	1.8	2.0	1.7	1.8	1.7	2.0
	Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Female (Prenatal)		1.5	1.6	1.5	1.7	1.5	1.6	1.6	1.9	1.5	1.7	1.6	1.8
Female (Non-prenatal)		1.9	1.8	1.6	2.0	1.8	1.8	1.8	1.9	1.7	1.8	1.7	1.9
Age	< 30	2.3	2.4	2.2	2.5	2.3	2.3	2.5	2.5	2.1	2.3	2.2	2.4
	30–39	1.6	1.6	1.4	1.8	1.6	1.6	1.6	1.9	1.5	1.7	1.6	1.9
	40–49	0.6	0.7	0.6	0.7	0.7	0.7	0.6	0.7	0.7	0.6	0.7	0.7
	≥ 50	0.6	0.5	0.5	0.6	0.7	0.6	0.6	0.7	0.6	0.6	0.8	0.7
POC HIV Tests (not in thousands)								22	21	17	42	12	24
Central Vancouver Island		1.5	1.6	1.4	1.8	1.5	1.6	1.5	1.8	1.6	1.6	1.6	1.7
North Vancouver Island		0.6	0.6	0.5	0.7	0.6	0.6	0.7	0.7	0.5	0.5	0.4	0.6
South Vancouver Island		3.0	3.0	2.8	3.2	3.1	3.0	3.1	3.3	2.9	3.2	3.0	3.4

Indicator 2: Rate of HIV Testing per 100,000

		2009	2010	2011	2012	2013
Island Health		2721.3	2703.2	2658.7	2783.9	2902.8
Central Vancouver Island		2477.3	2519.5	2515.9	2520.4	2626.4
North Vancouver Island		2135.3	2187.8	1944.6	1877.0	1862.1
South Vancouver Island		3086.7	3001.4	2991.3	3263.4	3436.3
Gender	Female	3477.1	3434.1	3384.4	3550.6	3708.2
	Male	1911.3	1927.4	1893.2	1975.8	2054.2
Age	< 30	3729.2	3705.6	3569.1	3637.6	3732.9
	30–39	7276.9	7371.1	7540.8	7911.5	7986.7
	40–49	2393.4	2437.9	2426.9	2600.1	2798.2
	≥ 50	823.1	804.4	809.3	931.5	1061.7

Indicator 3: New HIV Diagnoses		2009		2010		2011		2012		2013		2014	
		Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
Island Health	By Client Residence	9	7	14	6	13	8	6	5	2	7	7	6
	By Provider Address	9	7	14	6	12	8	5	5	3	6	6	3
Gender	Female	2	1	4	1	3	1	2	1	0	3	1	2
	Male	7	6	10	5	10	7	4	4	2	4	6	4
Age	< 30	4	1	6	1	2	1	0	1	0	0	1	2
	30–39	1	1	2	1	5	3	2	1	1	1	2	1
	40–49	3	3	4	3	6	0	4	3	1	3	1	2
	≥ 50	1	2	2	1	0	4	0	0	0	3	4	0
Exposure	MSM	4	2	4	2	6	4	1	3	1	3	1	2
	IDU	3	1	5	1	4	2	2	1	0	2	0	2
	HET	1	2	4	3	2	2	3	1	1	2	5	2
	Other	0	0	1	0	1	0	0	0	0	0	1	0
	NIR/Unknown	1	2	0	0	0	0	0	0	0	0	0	0
Central Vancouver Island	By Client Residence	2	1	3	1	5	2	0	1	0	1	3	2
	By Provider Address	0	0	2	1	3	2	0	1	0	0	3	1
North Vancouver Island	By Client Residence	1	0	0	0	1	1	2	0	0	0	2	1
	By Provider Address	0	0	0	0	2	1	0	0	0	0	2	0
South Vancouver Island	By Client Residence	6	6	11	5	7	5	4	4	2	6	2	3
	By Provider Address	9	7	12	5	7	5	5	4	3	6	1	2

Indicator 4: Stage of HIV Infection at Baseline

	Island Health				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	3	0	6	5	0	0	0	0	3	0	6	5	1	0	2	2	1	0	2	1	1	0	2	1
Stage 1	9	4	6	3	2	0	1	1	7	3	5	2	1	0	1	2	4	2	1	0	1	2	4	1
Stage 2a	1	2	1	3	0	0	0	1	1	2	1	2	0	1	0	0	0	0	0	2	0	1	1	1
Stage 2b	1	2	2	5	1	0	0	0	0	2	2	5	0	0	0	0	0	0	1	1	1	0	1	3
Stage 3	7	8	5	7	2	4	0	1	5	4	5	6	0	1	1	1	2	1	1	1	4	3	0	1
Unknown	10	3	4	7	2	1	0	1	8	2	4	6	2	0	1	0	3	1	1	1	5	2	0	3
Total	31	19	24	30	7	5	1	4	24	13	23	26	4	2	5	5	10	4	6	6	12	8	8	10

	≥ 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	0	0	0	1	3	0	5	0	0	0	0	0	1	0	0	0	0	0	0
Stage 1	3	0	0	0	4	2	4	2	1	1	3	1	1	0	0	0	0	0	0
Stage 2a	1	0	0	0	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0
Stage 2b	0	2	0	1	0	0	0	0	0	1	1	2	1	0	0	0	0	0	0
Stage 3	1	3	3	4	1	1	3	4	1	0	2	6	2	0	0	0	0	0	0
Unknown	0	0	2	3	3	2	2	3	1	1	3	0	0	1	0	1	0	0	0
Total	5	5	5	9	12	6	15	9	4	3	9	9	5	1	0	1	0	0	0

Indicator 5: HIV Cascade of Care

		DIAGNOSED	LINKED	RETAINED	ON ART	ADHERENT	SUPPRESSED
Island Health		885	854	812	760	687	525
Age Category	< 30	40	33	31	28	22	17
	30–39	97	92	89	81	73	50
	40–49	243	237	225	208	180	130
	≥ 50	505	492	467	443	412	328
Age Category and MSM Status	MSM	< 30	≤ 5	≤ 5	≤ 5	≤ 5	≤ 5
		30–39	6	6	6	5	3
		40–49	38	37	34	31	25
		≥ 50	151	149	143	130	113
	Non-MSM	< 30	6	5	5	4	2
		30–39	40	40	40	37	20
		40–49	98	97	96	88	50
		≥ 50	163	160	160	151	105
	Unknown	< 30	31	24	23	21	12
		30–39	50	46	42	37	27
		40–49	107	103	95	87	55
		≥ 50	191	183	164	155	110
Gender	Male	710	689	652	614	561	436
	Female	175	166	161	146	126	89
Injection Drug Use	IDU	296	291	289	268	239	172
	Non-IDU	418	411	404	388	358	285
	Unknown	171	152	120	104	90	68
MSM Status	MSM	198	195	187	180	169	144
	Non-MSM	308	303	301	280	247	177
	Unknown	379	357	324	300	271	204
Health Authority	Central Vancouver Island	218	210	205	193	172	133
	North Vancouver Island	86	84	81	75	63	42
	South Vancouver Island	581	561	526	492	452	350

Indicator 6: Programmatic Compliance Score (PCS)

	2012 Q2	Q3	Q4	2013 Q1	Q2	Q3	Q4	2014 Q1
< 3 CD4 Tests	72.7%	71.4%	74.4%	76.3%	85.7%	86.5%	79.5%	81.4%
< 3 Viral Load Tests	15.9%	19.0%	17.9%	13.2%	23.8%	21.6%	20.5%	18.6%
No Baseline Genotype	20.5%	11.9%	20.5%	13.2%	9.5%	5.4%	2.6%	2.3%
Baseline CD4 < 200 cells/μL	31.8%	19.0%	17.9%	15.8%	14.3%	13.5%	12.8%	14.0%
Non-Recommended ART	0.0%	0.0%	0.0%	0.0%	0.0%	2.7%	5.1%	9.3%
Non Viral suppression at 9 Mo.	40.9%	42.9%	43.6%	44.7%	54.8%	59.5%	56.4%	58.1%
PCS Score: 0	6	8	7	5	2	1	3	4
PCS Score: 1	15	14	11	14	15	13	14	10
PCS Score: 2	9	8	8	9	11	12	12	19
PCS Score: 3	9	9	11	10	14	11	9	9
PCS Score: 4 or more	5	3	2	0	0	0	1	1
Total (n=)	44	42	39	38	42	37	39	43

Indicator 7: New DTP ARV Participants

First Starts	10	9	9	17	16	13	11	12
Experienced Starts	15	6	6	11	9	17	12	14

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

CD4 ≥ 500	4	2	3	6	8	5	2	2
CD4 350–499	2	5	2	4	2	1	3	4
CD4 200–349	3	1	2	5	3	3	3	5
CD4 50–199	1	1	2	0	1	1	3	1
CD4 < 50	0	0	0	2	0	2	0	0
<i>CD4 Median (cells/μL)</i>	<i>364</i>	<i>400</i>	<i>430</i>	<i>370</i>	<i>550</i>	<i>340</i>	<i>340</i>	<i>360</i>
Total (n=)	10	9	9	17	14	12	11	12

Indicator 9: Active and Inactive DTP Participants

Active DTP Participants	718	718	719	736	742	754	764	772
Inactive DTP Participants	105	109	109	101	110	110	107	105

Indicator 10: Antiretroviral Adherence

≥ 95%	5	9	9	12	11	4	7	12
80% to < 95%	0	3	2	1	2	2	2	2
40% to < 80%	1	2	0	0	2	0	0	0
< 40%	0	1	0	0	1	0	0	0
Total (n=)	6	15	11	13	16	6	9	14

Indicator 11: Resistance Testing and Results

Suppressed	421	412	404	423	453	448	427	478
Wild Type	112	95	106	95	85	93	86	67
Never Genotyped	7	14	10	6	7	10	7	5
1-Class	19	18	18	17	17	17	17	8
2-Class	4	2	4	2	4	6	4	5
3-Class	0	1	1	1	1	2	0	1
Total (n=)	563	542	543	544	567	576	541	564

Indicator 12: AIDS-Defining Illness

	2006	2007	2008	2009	2010	2011	2012	2013
CD4 < 200 at Cases	30	23	22	20	18	6	6	10
ART initiation <i>Rate per 100,000</i>	<i>4.2</i>	<i>3.1</i>	<i>3.0</i>	<i>2.7</i>	<i>2.4</i>	<i>0.8</i>	<i>0.8</i>	<i>1.3</i>
AIDS Cases Cases	25	11	6	12	14	9	≤ 5	≤ 5
(DTP Reports) <i>Rate per 100,000</i>	<i>3.5</i>	<i>1.5</i>	<i>0.8</i>	<i>1.6</i>	<i>1.8</i>	<i>1.2</i>	<i>0.7</i>	<i>0.3</i>
AIDS Cases Cases	25	12	12	15	16	12	9	–
(BCCDC Reports) <i>Rate per 100,000</i>	<i>3.5</i>	<i>1.6</i>	<i>1.6</i>	<i>2.0</i>	<i>2.1</i>	<i>1.6</i>	<i>1.2</i>	<i>–</i>

Indicator 13: HIV-Related Mortality

	2004	2005	2006	2007	2008	2009	2010	2011
Island Health	16	18	22	18	17	11	7	14
Per 100 HIV+ Population	2.25	2.49	2.98	2.40	2.29	1.47	0.92	1.84
Per 100,000 Population	1.42	1.57	1.89	1.52	1.40	0.89	0.55	1.09