Time to Retention Among Persons Linked to HIV Care in BC, Canada from 2000-2010

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on behalf of the STOP HIV/AIDS Study Group

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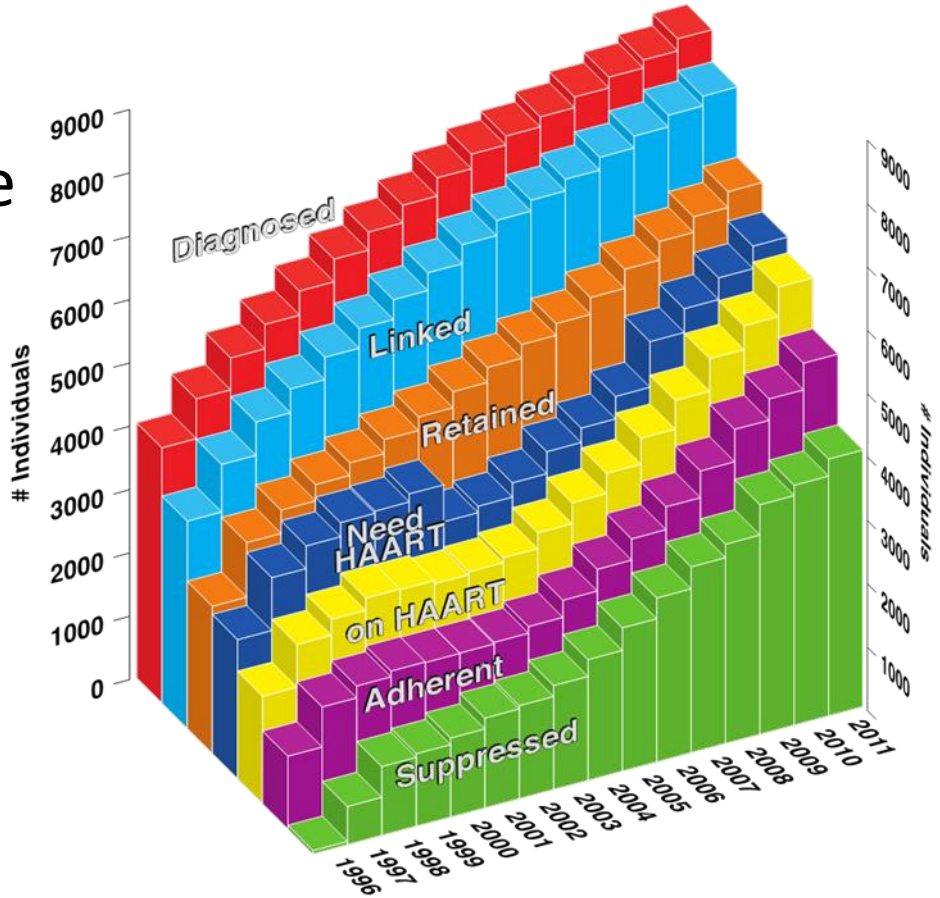
Disclosure

- I have no conflicts of interest.

Background

- A previous longitudinal analysis found that in the BC cascade the greatest attrition was observed between the stages linked and retained in care.



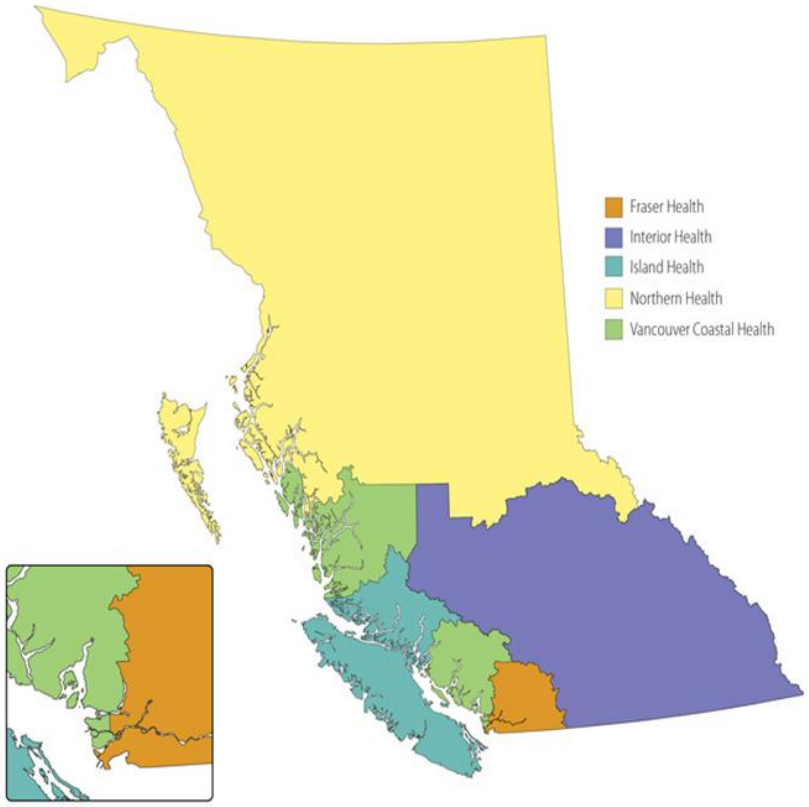
Nosyk, B et al Lancet Inf Dis 2013

Objectives

1. Measure the elapsed time from linkage to first retention in HIV care.
2. To explore factors associated with time to first retention.
3. Explore non-HIV related healthcare utilization between individuals who were retained in care and those who were not.

Data: The Seek and Treat for Optimal Prevention (STOP) HIV/AIDS Cohort

- Includes all HIV-positive persons (confirmed and unconfirmed) in BC from January 1st, 1996-March 2012.
- Data is refreshed annually.
- Cohort was formed through the linkage of nine provincial treatment, surveillance and administrative databases.
- Includes demographic, clinical, laboratory, prescription data and health service utilization data.



Nosyk B et al., PLoS ONE. (2013) Application and Validation of Case-Finding Algorithms for Identifying Individuals with Human Immunodeficiency Virus from Administrative Data in British Columbia, Canada.
Health et al., Int. J. Epidemiol. (2014) Cohort Profile: Seek and Treat for the Optimal Prevention of HIV/AIDS in British Columbia.

Methods

- Weibull survival analysis was used to determine factors associated with **time to first retention** among 'linked' study individuals.
- "**Linked**": the first instance of an HIV-related service following HIV diagnosis.
- "**Retained**": having, within a calendar year, either:
  1. ≥2 HIV-related physician visits or diagnostic tests (CD4 or plasma viral load) ≥3 months apart; or
  2. ≥2 ART dispensations, ≥3 months apart.
- **Inclusion:** We included individuals 'linked to HIV care' between 2000 and 2010 who had at least one calendar year of follow-up.
- **Follow-up:** Individuals were followed until being retained; or if not retained, until death, last contact date or December 31st, 2011.
- **Time of retention**: The date of the first retention event.

Study Covariates

Baseline Covariates

- Gender
- Age
- HIV risk category
- Patient Residing Health Authority (5 in BC)
- Patient Urban/Rural Residence
- Viral load
- CD4 cell count

Non-HIV Related Healthcare Service Utilization*

- General Practitioner (GP) Visit(s)
- Specialist Visit(s)
- Laboratory Test(s)
- Hospital Admission(s)
- Filled Prescription (Rx)

***Covariates measured from time of "linkage" to the end of follow-up.**

Results

- A total of 5231 individuals were linked to care between 2000 and 2010 (78% male; median age ([Q1-Q3]): 39 (32-46) years).
- 540 individuals (10%) were not ‘retained’ in care at the end of follow-up.
- Median time from linkage to retention was 8 (5-12) months for retained individuals and time to end of follow-up was 48 (24-84) months for not retained individuals.

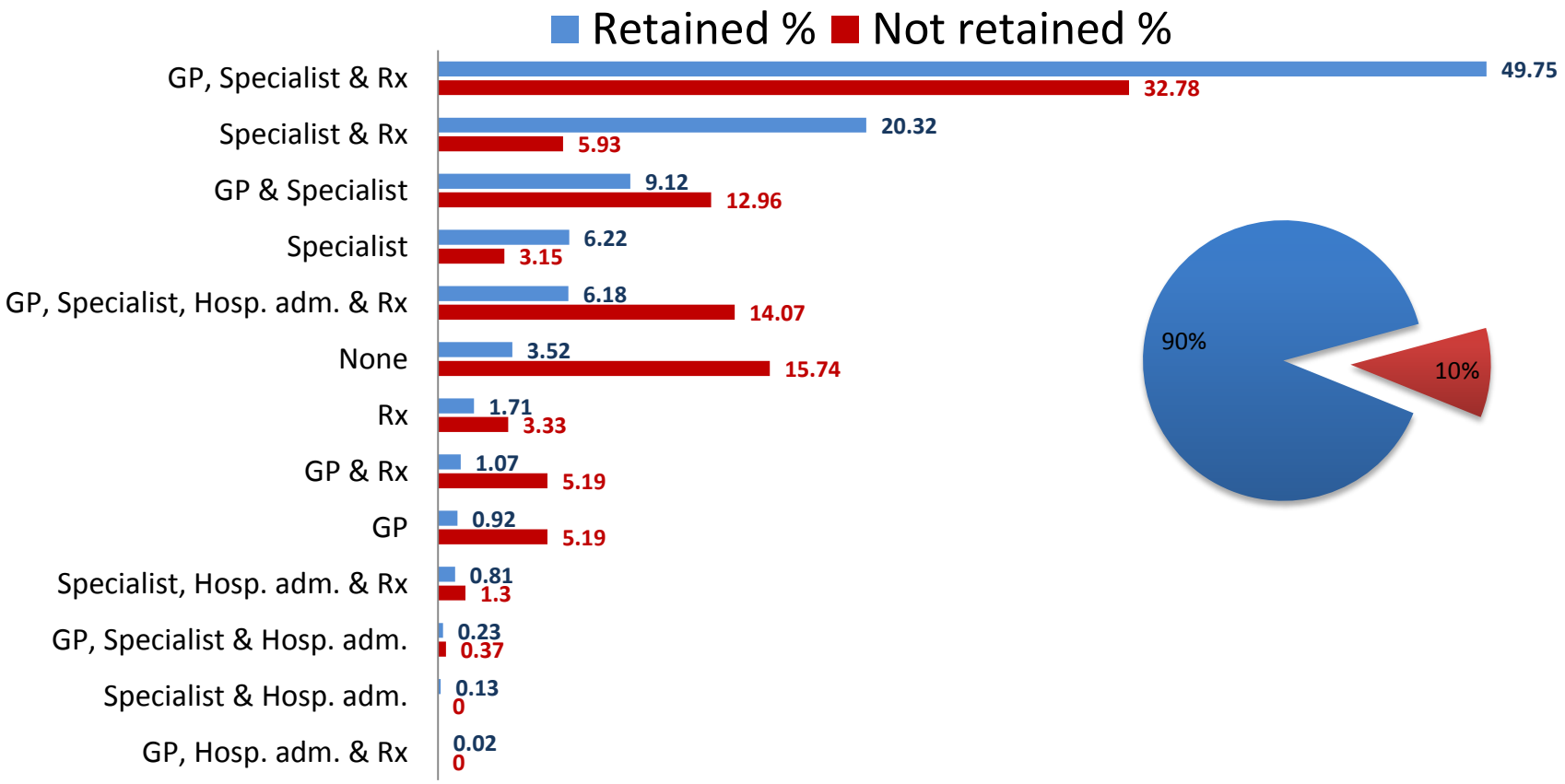
Results: Baseline Characteristics

Variable		Not Retained (N=540)	Retained (N=4691)	P
Gender, n (%)				
	Female	175(32)	952(20)	**<.001**
	Male	365(68)	3739(80)	
Age (years), n (%)				
	<30	113(21)	865(18)	**0.023**
	30-39	174(32)	1596(34)	
	40-49	144(27)	1463(31)	
	50+	109(20)	767(16)	
AIDS diagnosed, n (%)				
	Yes	13(2)	733(16)	**<.001**
	No	527(98)	3958(84)	
HIV-risk factors, n (%)				
	Heterosexual	47(9)	704(15)	**<.001**
	PWID	138(26)	1747(37)	
	MSM	54(10)	1398(30)	
	Other/Unknown	301(56)	842(18)	

Results: Baseline Characteristics

Variable		Not Retained (N=540)	Retained (N=4691)	P
Patient Residing Health Authority, n (%)				
	Fraser	154(29)	1062(23)	**<.001**
	Interior	42(8)	262(6)	
	Vancouver Coastal	212(39)	2569(55)	
	Vancouver Island	23(4)	539(11)	
	Vancouver Northern	212(39)	2569(55)	
	Unknown	56(10)	68(1)	
Reside in urban area, n (%)				
	Yes	320(59)	4309(92)	**<.001**
	No	5(1)	180(4)	
	Unknown	215(40)	202(4)	
Viral load (log_{10} copies/mL)				
	Median	3.88	3.69	0.104
	25th- 75th percentile	2.16-4.82	1.69-4.65	
CD4 cell count (cells/mm^3)				
	Median	460	360	0.110
	25th- 75th percentile	225-600	230-520	

Non-HIV Related Healthcare Utilization by Retention Status



Results: Non-HIV Related Healthcare Utilization

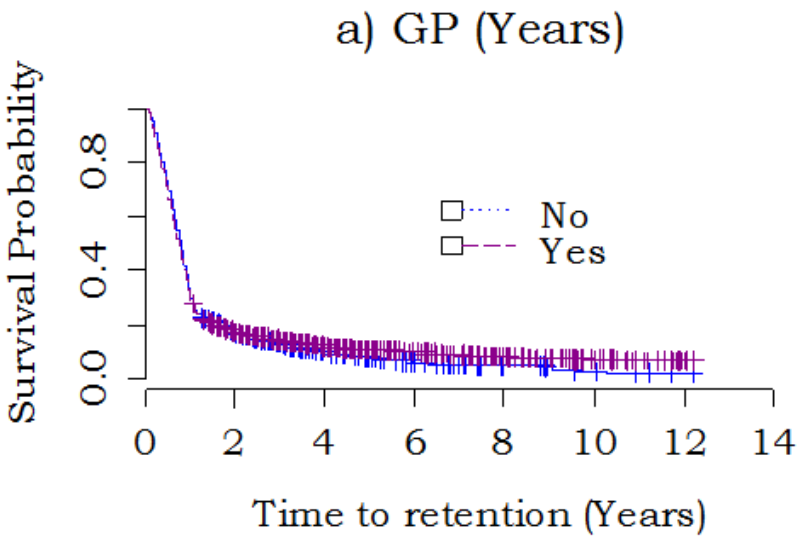
Non-HIV related healthcare service*		Not Retained (N=540)	Retained (N=4691)	P
GP visit, n (%)				
	Yes	381(71)	3157(67)	0.132
	No	159(29)	1534(33)	
Specialist visit, n (%)£				
	Yes	381(71)	4352(93)	**<.001**
	No	159(29)	339(7)	
Laboratory test, n (%)£				
	Yes	336(62)	4282(91)	**<.001**
	No	204(38)	409(9)	
Hospital admission(s), n (%)				
	Yes	85(16)	346(7)	**<.001**
	No	455(84)	4345(93)	
Drug prescriptions, n (%)				
	Yes	338(63)	3746(80)	**<.001**
	No	202(37)	945(20)	

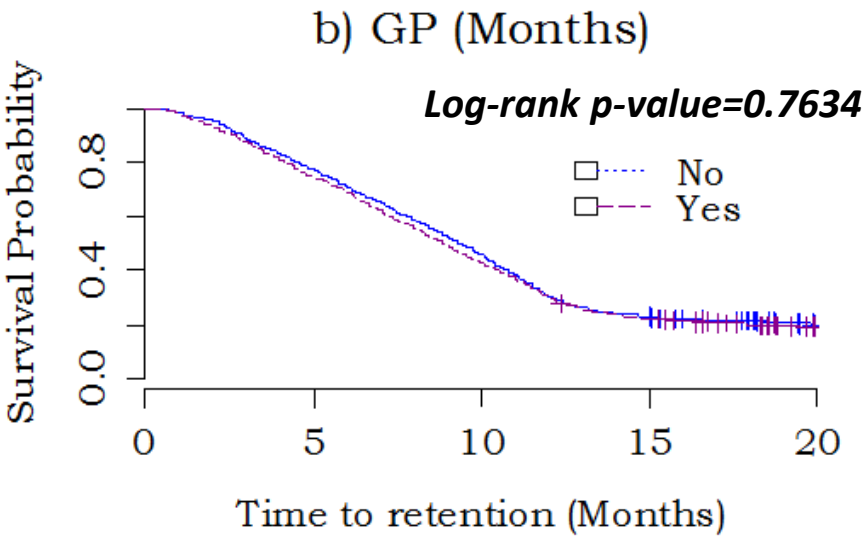
£Spearman Rank-Order Correlation Coefficient=0.98

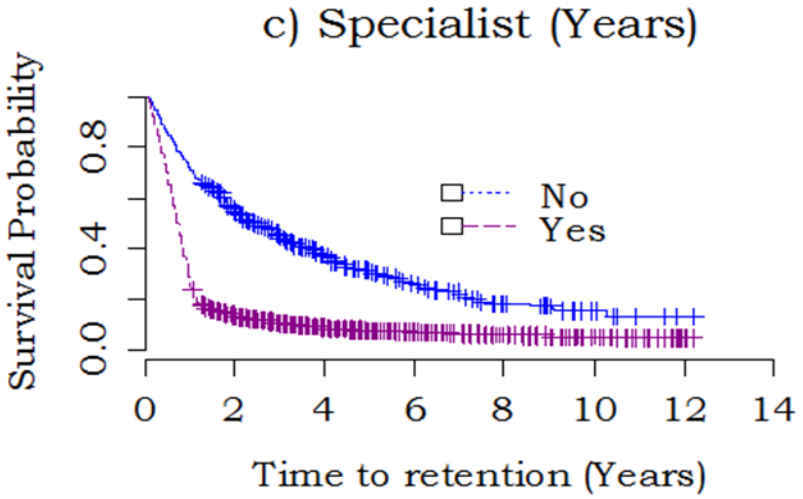
Results: Non-HIV Related Healthcare Utilization

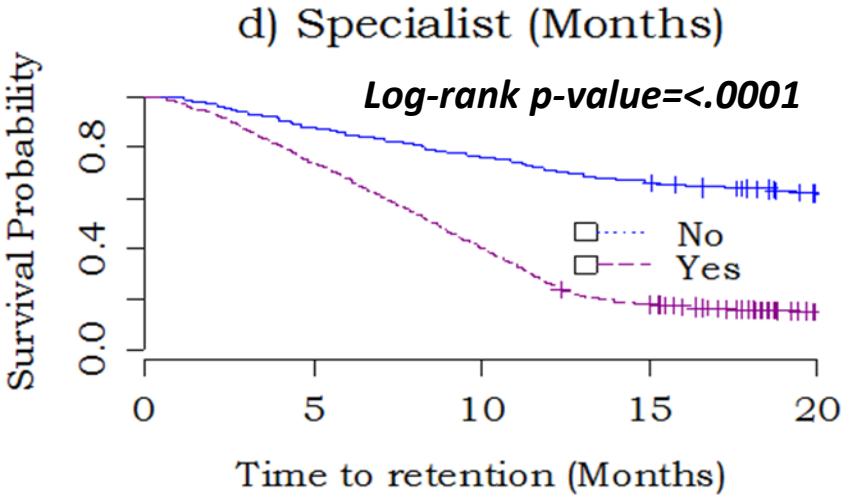
Variable	Not Retained (N=540)	Retained (N=4691)	P
Number of types of non-HIV related services used			
None	85(15.74)	165(3.52)	<.001
One	63(11.67)	415(8.85)	
Two	130(24.07)	1437(30.63)	
Three	186(34.44)	2384(50.82)	
Four	76(14.07)	290(6.18)	

Time to Retention Plots: GP and Specialist Visits

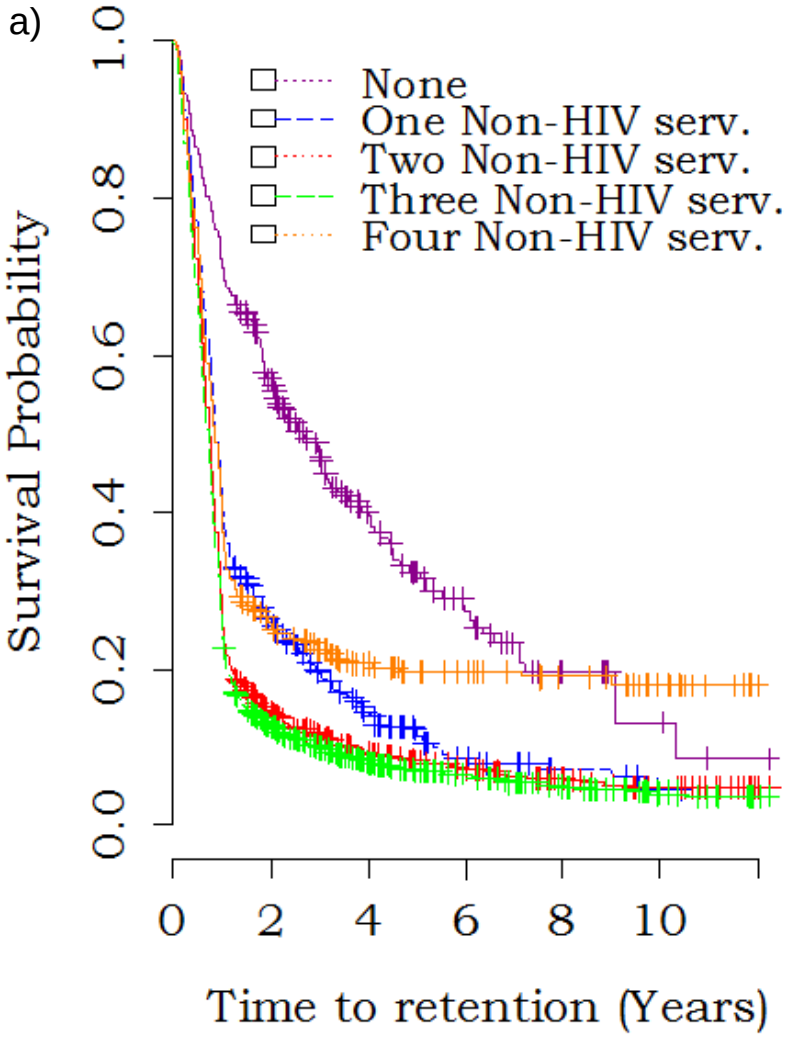


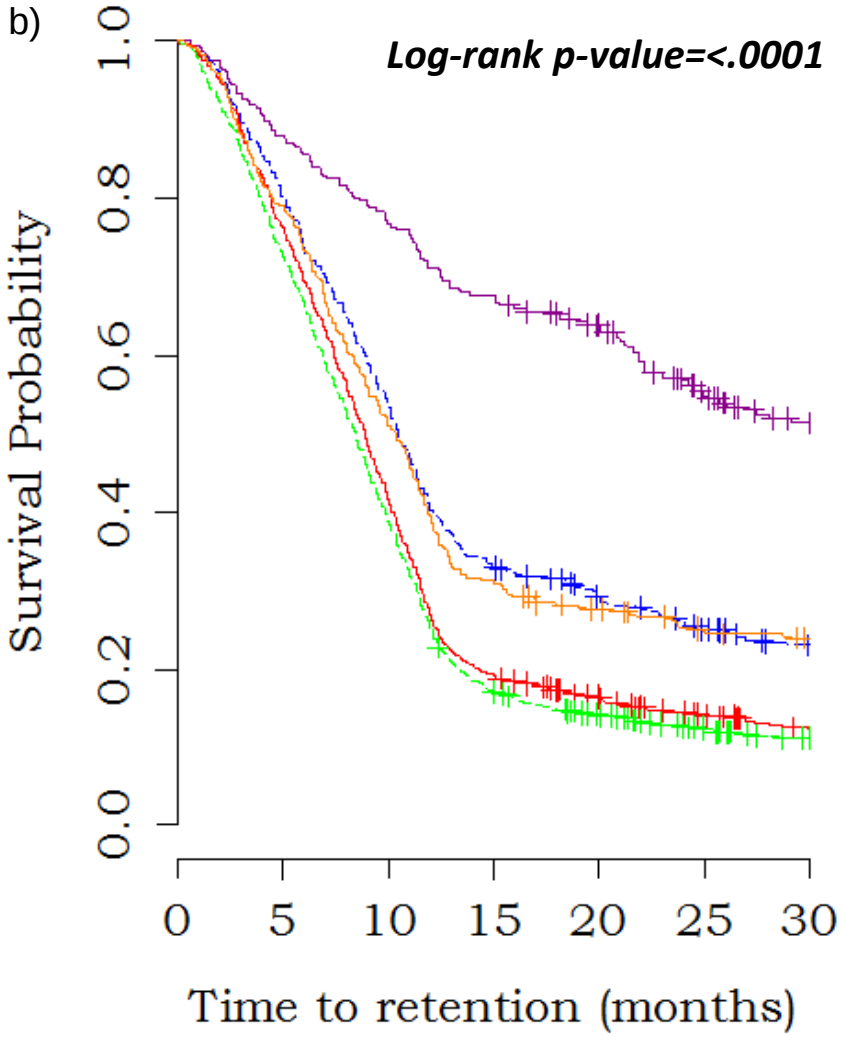






Time to Retention Plots: Number of Types of Non-HIV Related Services Utilized





Weibull Survival Analysis: Time to Retention

Variable		Adjusted Hazard Ratio (95% CI)
Gender	Male	1.0
	Female	**0.84 (0.78-0.91)**
AIDS diagnosed	No	1.0
	Yes	**1.32 (1.22-1.43)**
HIV-risk factors	MSM	1.0
	PWID	**0.73 (0.68-0.79)**
	Heterosexual	1.09 (0.99-1.2)
	Other/Unknown	**0.42 (0.39-0.46)**
Health Authority	Vancouver Coastal	1.0
	Fraser	0.92 (0.86-0.99)
	Interior	0.97 (0.85-1.11)
	Vancouver Island	**1.12 (1.02-1.24)**
	Vancouver Northern	1.08 (0.93-1.25)
	Other/Unknown	**0.64(0.51-0.82)**
Age	<30	0.93 (0.86-1.01)
	30-39	1.0
	40-49	**1.16 (1.08-1.24)**
	50+	**1.13 (1.03-1.24)**

Weibull Survival Analysis: Time to Retention

Model 1:

Variable		Adjusted Hazard Ratio (95% CI)
Number of Types of Non-HIV Related Services Utilized	None	1.0
	One	**1.99 (1.65-2.40)**
	Two	**2.57 (2.16-3.04)**
	Three	**2.72 (2.30-3.22)**
	Four	**1.70 (1.39-2.08)**

Model 2:

Variable	Adjusted Hazard Ratio (95% CI)
GP visit	**0.79 (0.74-0.84)**
Specialist visit	**2.79 (2.47-3.16)**
Laboratory tests	Did not include
Hospital admissions	**0.60 (0.54-0.67)**
Drug prescriptions	**1.27 (1.18-1.38)**

Discussion

- 95% of study population used non-HIV related healthcare services.
- Engagement in non-HIV related healthcare services increased the probability of being retained in HIV care.
- Specifically, individuals who saw a specialist for non-HIV related care were more likely to be retained in HIV care than those who didn't. Those who saw a GP were less likely to be retained in care than those who did not.
- Limitation: No medical chart data.
- Given the number of individuals attending GP visits, this missed opportunity for engagement in HIV care suggests a potential for GP-related interventions to improve time to retention in HIV care.

Thank you

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Limitations

- Our study population was partially informed using health administrative data; thus, misclassification may have occurred.
- No medical chart data.
- We had a high number of unknowns in our risk category.
- Fourth, since this was an observational cohort study and we tried to adjust for several important demographic and clinical characteristics, residual confounding may persist.

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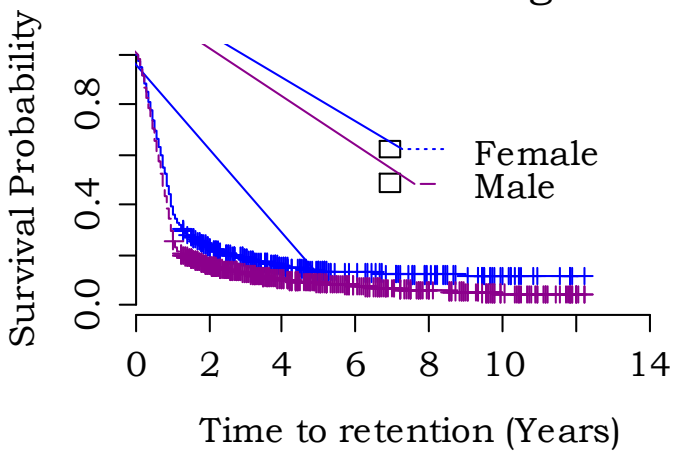
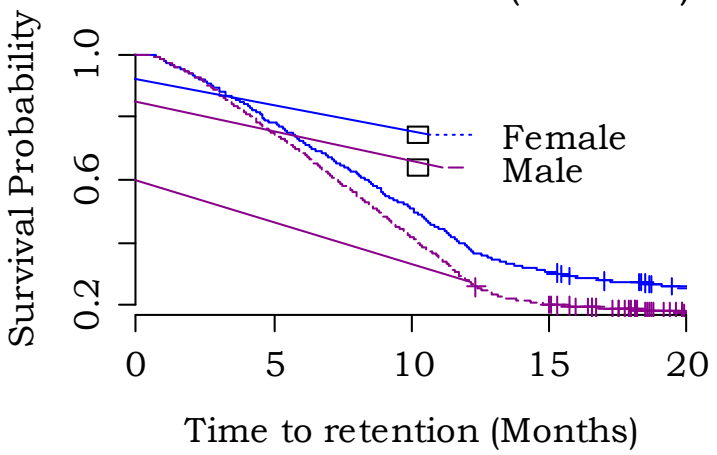
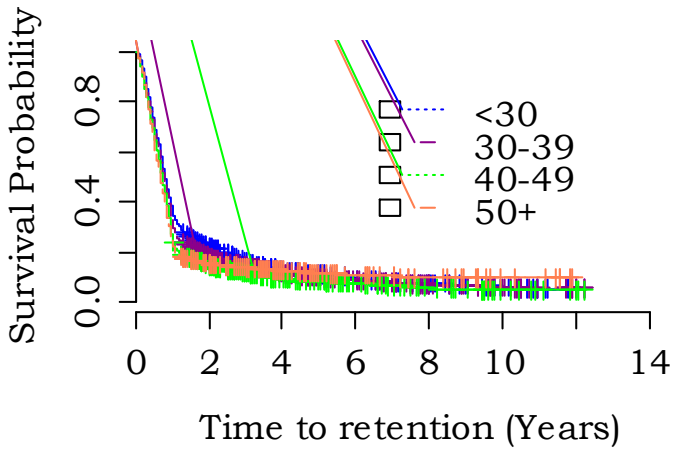
Time to retention gender



Time to retention (months)



Time to retention



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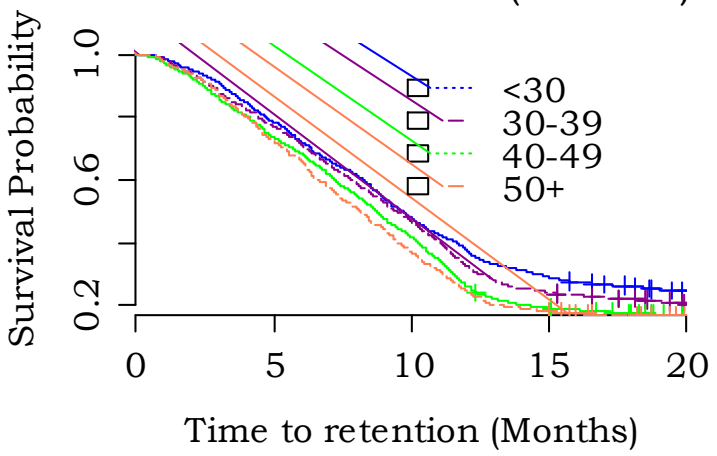


Results: Non-HIV Related Healthcare Utilization

Non-HIV related MSP-services provided by general practitioners to the patient from linkage to retention			
Median	4	3	0.004
25th- 75th percentile	0-12	0-10	
Non-HIV related MSP-services provided by specialists to the patient from linkage to retention			
Median	10	51	<.001
25th- 75th percentile	0-32	22-100	
Non-HIV related laboratory tests, taken by the patient from linkage to retention			
Median	6	46	<.001
25th- 75th percentile	0-24	19-93	
Non-HIV related hospital admissions from linkage to retention			
Median	0	0	<.001
25th- 75th percentile	0-0	0-0	
Non-HIV related drugs prescriptions (from pharmanet) from linkage to retention			
Median	2	6	<.001
25th- 75th percentile	0-15	1-22	

Background

- Patients retained in HIV care are more likely to initiate timely ART, have fewer hospitalizations, lower likelihood of developing HIV opportunistic infections, have higher CD4 cell counts, lower Viral loads, fewer ART resistances, better ART adherence and increased survival rates.
- Retention in care is emphasized in the context of treatment as prevention programs.

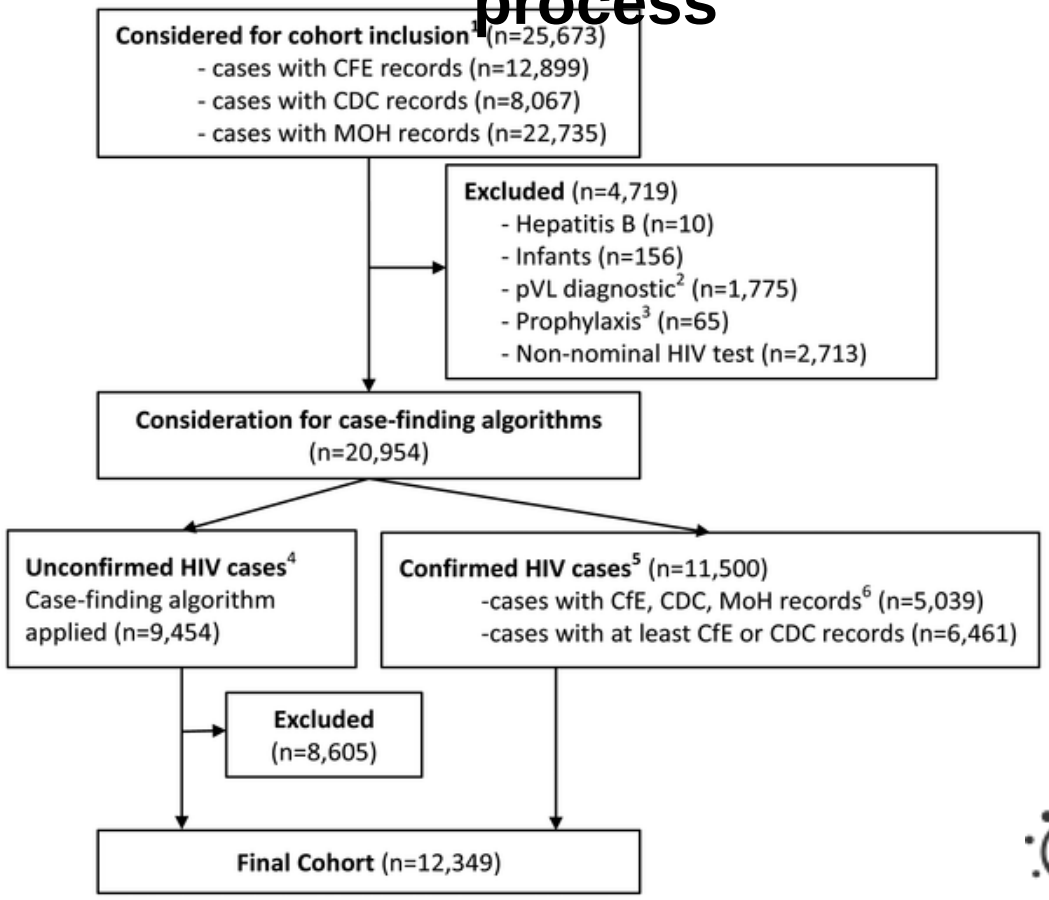
The HIV Cascade of Care

- Shows gaps in health service delivery and uptake along the HIV care continuum.

- Tool to plan, monitor and evaluate the implementation of TasP programs.

Gardner et al. CID, 2011

Flow diagram of the STOP HIV/AIDS cohort selection process



PLOS ONE

Nosyk B, Colley G, Yip B, Chan K, et al. (2013) Application and Validation of Case-Finding Algorithms for Identifying Individuals with Human Immunodeficiency Virus from Administrative Data in British Columbia, Canada. PLoS ONE 8(1): e54416. doi:10.1371/journal.pone.0054416
http://www.plosone.org/article/info:doi/10.1371/journal.pone.0054416