

# HCV co-infection in HIV positive population in BC

---

Jane Buxton

[Jane.buxton@bccdc.ca](mailto:Jane.buxton@bccdc.ca)

Yu A, Alvarez M, Kuo M, Kraijden M,  
Gilbert M, Kim PH



BC Centre for Disease Control  
AN AGENCY OF THE PROVINCIAL HEALTH SERVICES AUTHORITY



# BC Centre for Disease Control

---





# Collaboration divisions at BC CDC

---

- STI/HIV Prevention and Control
  - HIV dataset
- Provincial Public Health Reference laboratory
  - 95% HCV testing
- Epidemiology Services
  - Integrated Public Health Information System
- Hepatitis Services
  - Data analysis

# Objectives

---

To determine:

- Prevalence of HIV/HCV co-infection
- The sequence of virus identification
- Demographic factors and risk factors associated with co-infection

# Why is HIV/HCV co-infection important?

---

- Common modes of transmission
- Each agent affects the disease progression of the other
  - Cirrhosis 5X higher in co-infected vs. mono infected HCV
- Complicates treatment
  - ART hepatotoxicity increased in HCV – Rx HCV first
  - Response to anti-HCV Rx less in co-inf

# Why is our study new / important?

---

- Current HIV/HCV co-infection data is from cohort studies e.g. IDU or MSM etc
- Testing-Population
  - >6,000 persons tested positive for HIV in BC
  - >900,000 persons tested/reported in HCV dataset

# Methods

---

Positive cases of HIV in BC

*linked on personal identifiers to*

Combined dataset of

Laboratory HCV testing (+ve & -ve HCV)

*and*

Reported HCV (iPHIS)

- Dates: Jan 1<sup>st</sup> 1995 - Dec 31<sup>st</sup> 2008
- Excluded aged <15 years



# Data management & confidentiality

---

- Linked on personal identifiers by computer programmed algorithms (SAS)
- Unique study code allocated
- Nominal information deleted
- All interim files deleted

# Analysis

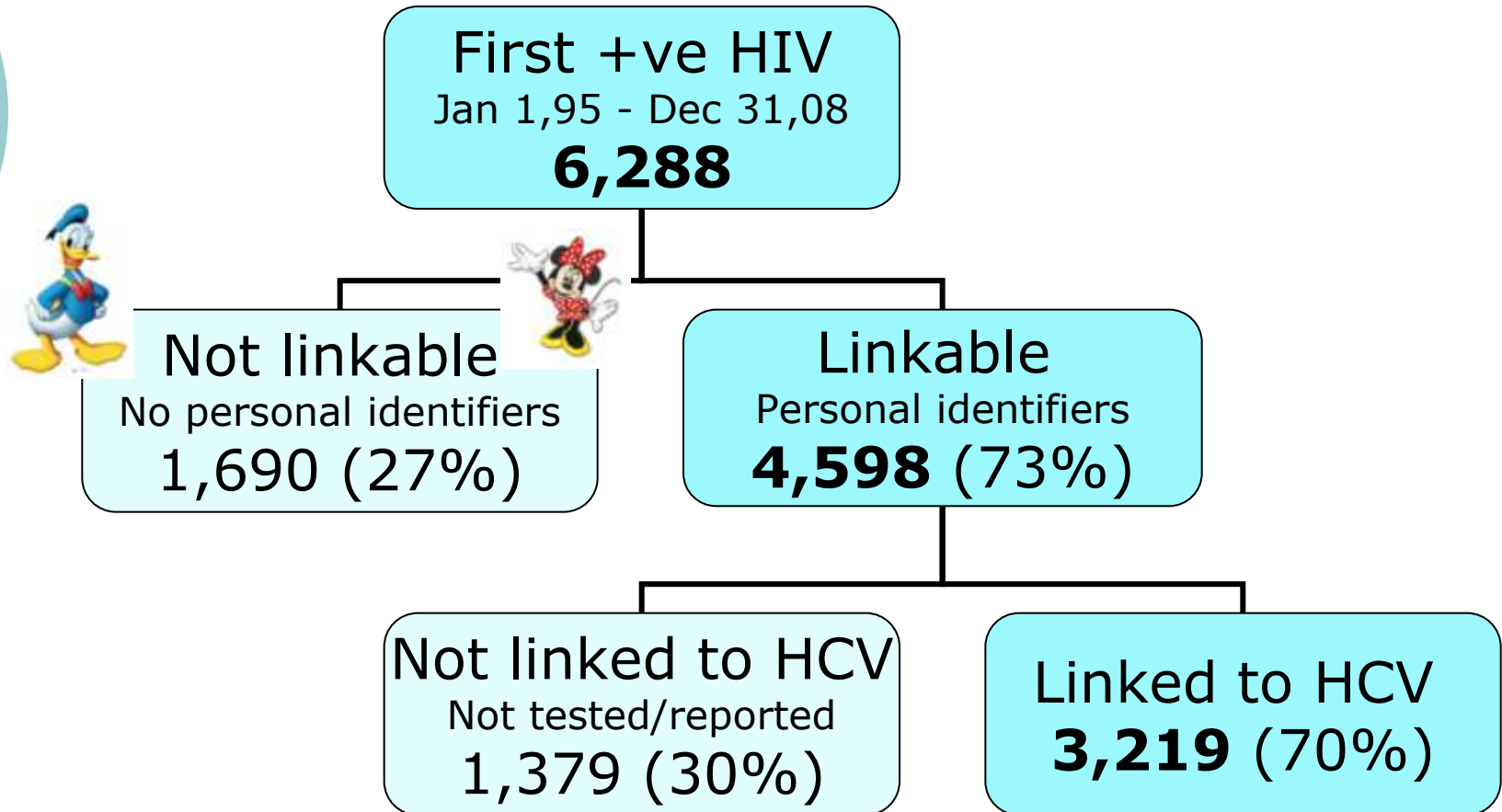
---

1. Descriptive
2. Compare linked & unlinked (univariate LR)
3. Co-infection of HIV mono-infected at baseline (Cox proportional hazard regression)
4. Sequence of virus and explanatory variables (Logistic regression)

Separate multivariate models for each sex as different risk factors i.e. MSM

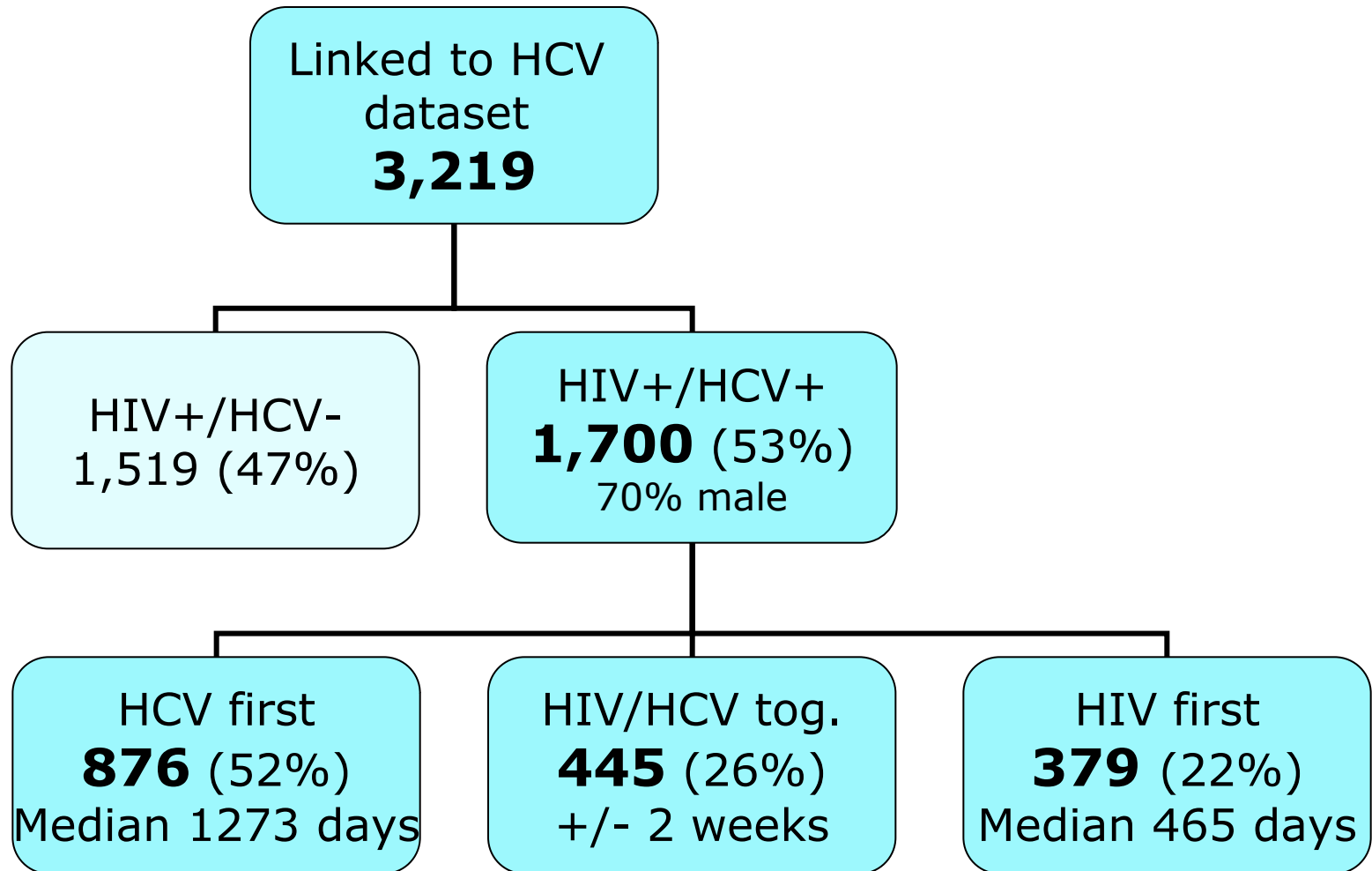
# Results: 1. Descriptive

---



# 1. Descriptive continued

---



# 1. Descriptive: Risk factors co-infection **MALES:**

	<b>HCV 1<sup>st</sup></b> 559 (%)	HIV/HCV tog 325 (%)	<b>HIV 1<sup>st</sup></b> 265 (%)	<b>All</b> 1,149 (%)
IDU	<b>436</b> (78%)	<b>247</b> (76%)	<b>154</b> (58%)	<b>837</b> (73%)
MSM	17 (3%)	13 (4%)	<b>32 (12%)</b>	62 (5%)
MSM/IDU	38 (7%)	18 (6%)	15 (6%)	71 (6%)
Hetero sex	35 (6%)	26 (8%)	<b>33 (12%)</b>	94 (8%)
Other/UK	33 (6%)	21 (6%)	31 (12%)	85 (7%)

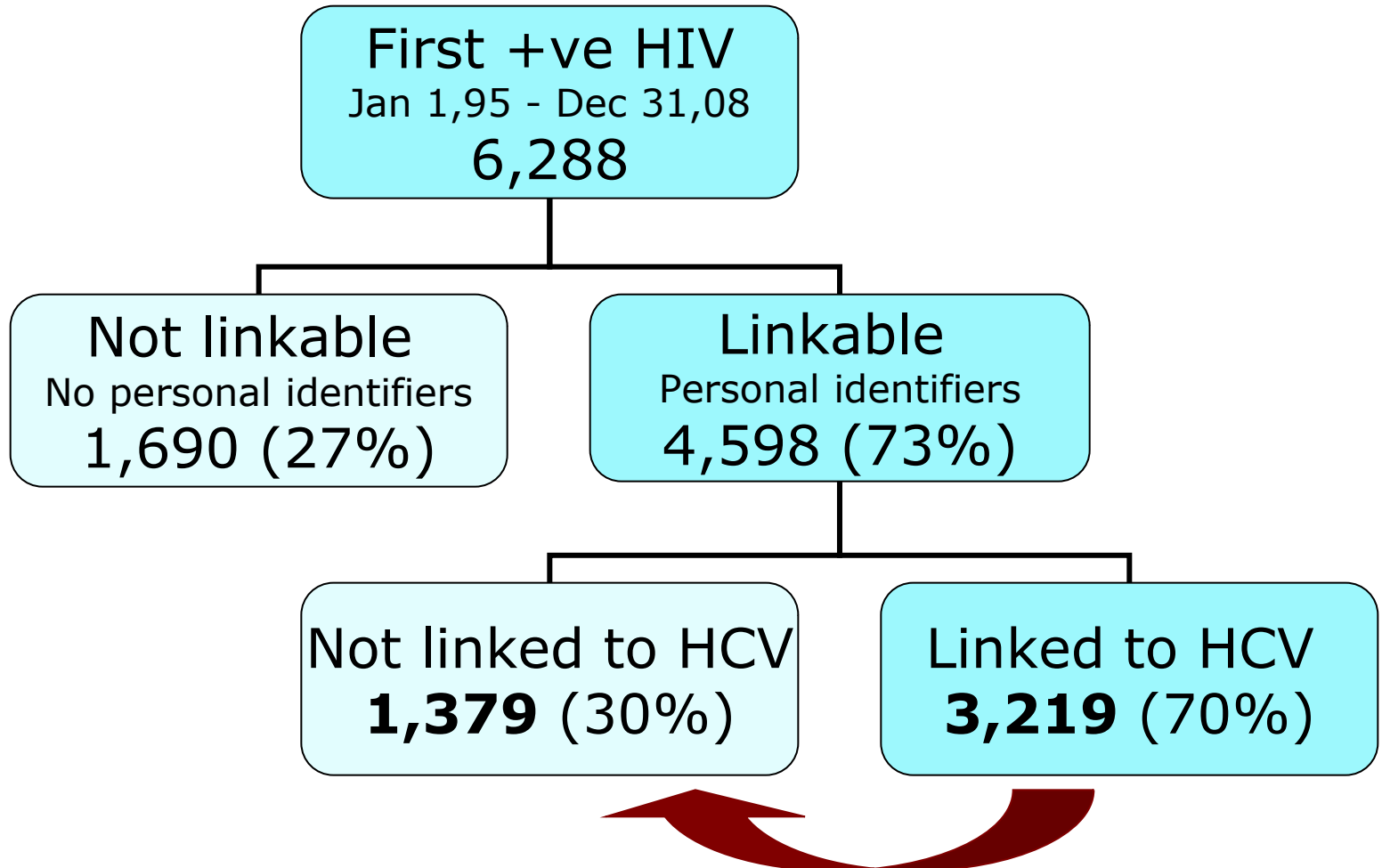
# 1. Descriptive: Risk factors co-infection **FEMALES:**

---

	<b>HCV 1<sup>st</sup></b> 313 (%)	HIV/HCV tog 120 (%)	<b>HIV 1<sup>st</sup></b> 112 (%)	<b>All</b> 545(%)
IDU	<b>266</b> (85%)	<b>100</b> (83%)	<b>81</b> (72%)	<b>447</b> (82%)
Heterosex	32 (10%)	14 (12%)	22 (20%)	68 (12%)
Other/UK	15 (5%)	6 (5%)	9 (8%)	30 (6%)

## 2. Compare linked and unlinked

---



## 2. Compare linked and unlinked

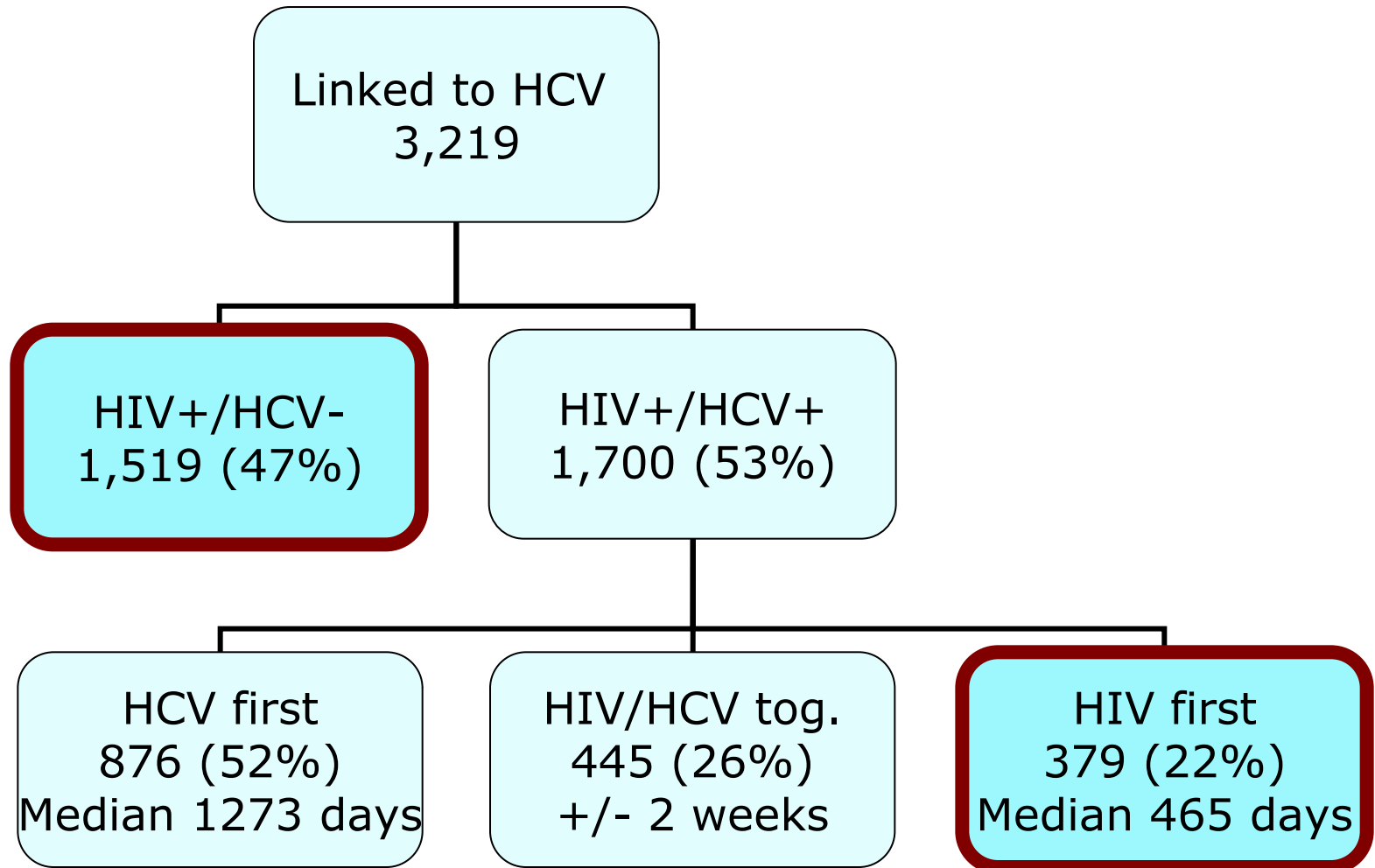
---

Those linked were:

- Younger  
Mean age; 37.9 vs. 39.3 years
- More likely female  
OR 2.01; (95% CI: 1.7-2.39)
- More likely Aboriginal  
OR 1.96; (95% CI: 1.6-2.42)

### 3. Mono-infected at baseline

---



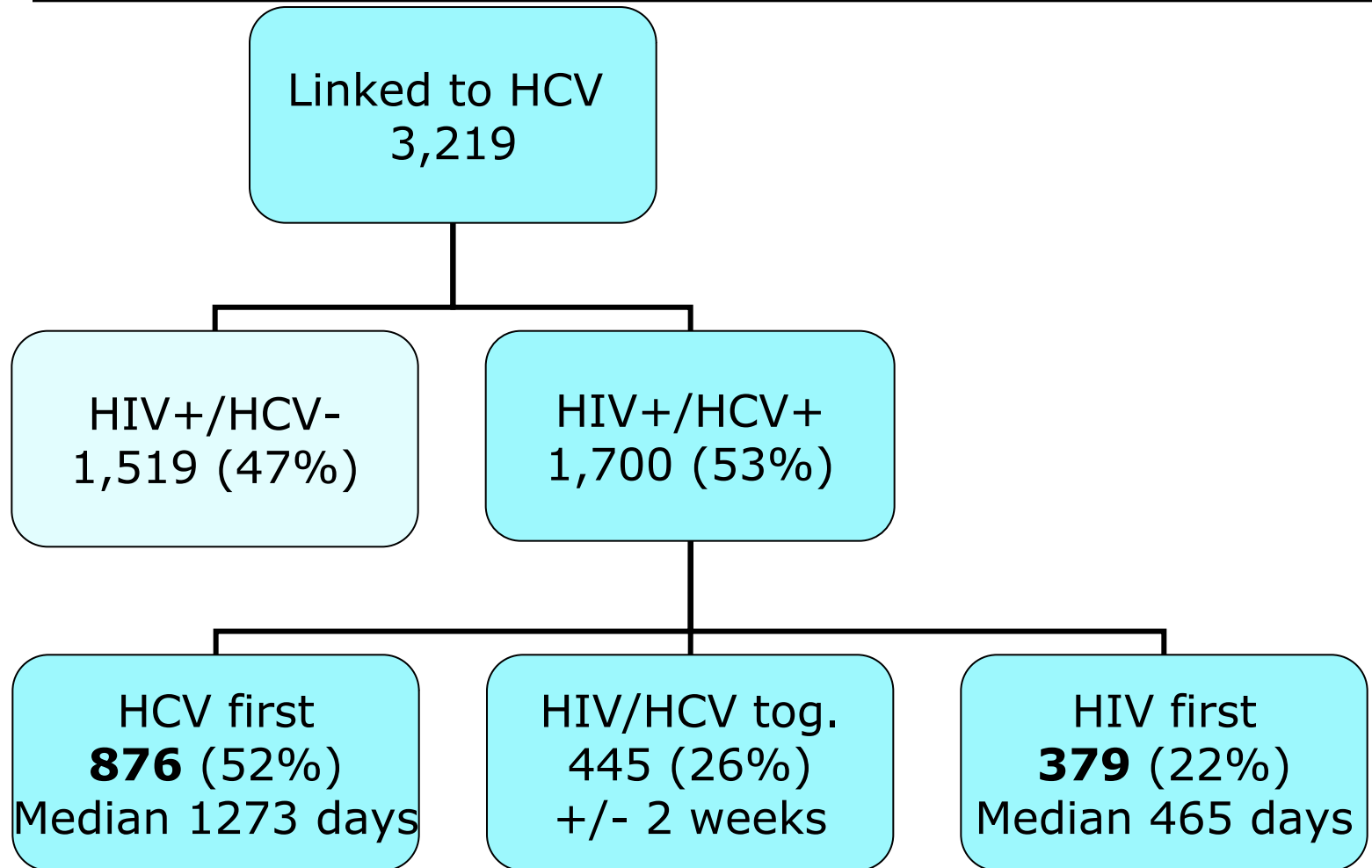
### 3. Co-infection of mono-infected at baseline

#### Adjusted hazard ratios

	Adjusted HR*		95% CI	
	Male	Female	Male	Female
Age gp v 15-24yr				
25-34 yrs	0.77	1.19	0.47-1.27	0.72-1.97
35-44 yrs	0.78	1.55	0.48-1.27	0.89-2.70
45+ yrs	<b>0.55</b>	0.99	<b>0.31-0.97</b>	0.39-2.49
Aboriginal Y vs. N	1.29	<b>2.09</b>	0.88-1.88	<b>1.34-3.27</b>
IDU Y vs. N	<b>6.64</b>	<b>9.76</b>	<b>4.86-9.07</b>	<b>5.76-16.54</b>
MSM N vs. Y	<b>2.99</b>		<b>2.09-4.27</b>	

\* Adjusted for health region

## 4. Sequence of virus and explanatory variables:



## 4. Adjusted odds ratio probability HCV first

	Adjusted HR*		95% CI	
	Male	Female	Male	Female
Age gp v. 15-24yr				
25-34 yrs	1.79	<b>2.20</b>	0.85-3.77	<b>1.15-4.21</b>
35-44 yrs	<b>3.22</b>	<b>3.73</b>	<b>1.56-6.66</b>	<b>1.89-7.50</b>
45+ yrs	<b>7.11</b>	<b>8.15</b>	<b>3.24-15.59</b>	<b>3.05-25.06</b>
Aboriginal Y vs. N	1.35	1.27	0.85-2.15	0.76-2.13
IDU Y vs. N	<b>2.83</b>	<b>2.25</b>	<b>1.84-4.37</b>	<b>1.14-4.39</b>
MSM N vs. Y	1.48		0.90-2.44	

\* Adjusted for health region

# Limitations

---

- Not everyone at risk is tested for HIV
- Those not linkable maybe most vulnerable - no personal identifiers
- Those not tested for HCV; older, male and non-Aboriginal ?Generalizeability to all HIV
- Risk factor & age is at time of HIV diagnosis
- To avoid bias in detection order 1995 start date (HCV testing since 1992)
- Data quality: HIV reportable in 2003 so enhanced follow-up
- Identification of virus not date infection

# Summary

---

- > 1/2 persons with HIV who were tested for HCV were +ve (1,700)
- HCV co-infection of HIV at baseline;
  - Female IDU 10x; male IDU 7x
  - Female Aboriginal twice as likely
- Those diagnosed with HCV 1<sup>st</sup>;  
3.5yrs to HIV diagnosis
- Those diagnosed with HIV 1<sup>st</sup>;  
1.5yrs to HCV diagnosis

# Conclusions

---

- Ability to link BC public health & laboratory information gave unique opportunity to explore demographic & risk factors associated with HIV/HCV co-infection
- Considerable co-infection in BC
- Follow-up of mono-infected HCV or HIV includes testing for other virus, and substance use management/harm reduction measures could prevent subsequent co-infection



# Thank You

---

# Any Questions?