

Cancer mortality among HIV-positive adults in British Columbia, Canada: A retrospective analysis

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Background

- In the modern combination antiretroviral therapy (cART) era, life expectancy of people living with HIV (PLWH) on therapy is now approaching that of the general population.
- This is greatly impacting population morbidity and mortality trends and subsequent health care demands.
- While certain cancers, known as AIDS-defining malignancies, may be declining over time due to therapeutic advances, research suggests cancer is now one of the leading causes of death among PLWH.
- There is little known about the type of cancers most affecting PLWH in the modern cART era and how PLWH may be differentially impacted by cancer related mortality compared to the general population.

STUDY OBJECTIVE: This study aims to look at the burden of mortality due to malignancies among PLWH in British Columbia (BC), Canada in a retrospective study from 1996 to 2013.

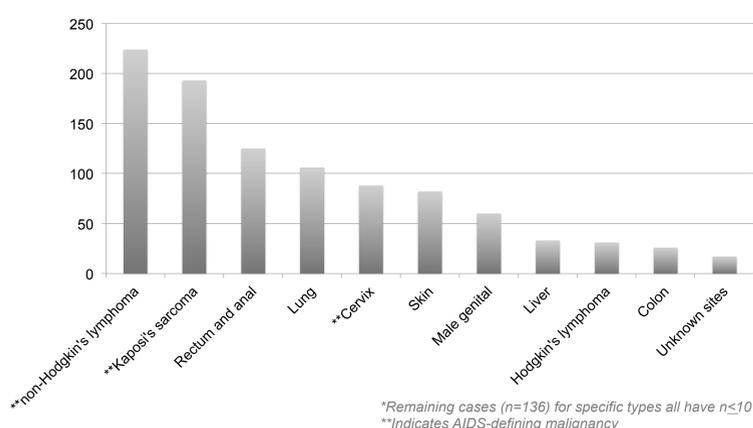
Methods

- The Comparative Outcomes and Service Utilization Trends (COAST) study is a population-based retrospective study that is inclusive of all PLWH in the province of BC, including those on and off cART, between April 1996 and March 2013.
- It utilizes demographic and clinical data from the BC Centre for Excellence in HIV/AIDS provincial Drug Treatment Program (DTP) and administrative data from Population Data BC to evaluate health outcomes and service utilizations among PLWH
- For the purposes of this study, we included all PLWH with a cancer diagnosis and at least two follow-up measures in the DTP database and a 10% general population sample.
- We conducted bivariate comparison of relevant clinical factors between a sample of 1121 PLWH with a cancer diagnosis and a control group of 35,426 from the general population with a cancer diagnosis in the same follow-up period.
- We also calculated cancer related mortality rates overall, by AIDS-defining malignancies (ADM) and Non-AIDS defining malignancies (NADM), and system-specific cancers (bone/tissue/breast, digestive, genitourinary, lymphatic, respiratory and others).

Results

- Between 1996 and 2013, there were 1121 PLWH in BC diagnosed with cancer.
- Of PLWH with cancer, 555 (49.5%) died, inclusive of 11 (2.0%) deaths attributed to ADM, 222 (40.0%) attributed to NADM, and 322 (58.0%) to non-cancer related causes.
- Compared to 12,119 people in the control group who died of cancer, the 233 PLWH who died of cancer were more likely to have HCV (30.0% vs <1%, p<0.0001) and be a younger age at cancer diagnosis (47 vs 74, p<0.0001).

Figure 1: Breakdown of cancer cases among PLWH, by cancer type, n=1121*



Results

Table 1: Age-adjusted mortality rates per 1000 person-year (PY), 95% confidence interval

	People living with HIV	General Population	Rate Ratio (HIV+/HIV-)
All-type cancer	63.1 (51.6, 74.6)	48.3 (46.7, 49.8)	1.3 (1.1, 1.6)
ADM	4.2 (0.8, 7.6)	2.3 (1.8, 2.7)	1.9 (0.3, 3.4)
NADM	58.9 (47.9, 69.9)	46.0 (44.5, 47.5)	1.3 (1.0, 1.5)

*Age strata were 19-39, 40-49, 50-59, 60-69 and 70+
**Bold indicates statistical significance at alpha 0.05

Table 2: Sex-stratified age-adjusted mortality rates per 1000 person-year (PY), 95% confidence interval

	WLWH	General population	Rate Ratio
All-type cancer	25.8 (12.5, 39.2)	36.7 (35.3, 38.2)	0.7 (0.3, 1.1)
ADM	6.9 (0, 14.0)	1.9 (1.5, 2.3)	3.6 (0, 7.4)
NADM	19.0 (7.7, 30.3)	34.8 (33.4, 36.2)	0.6 (0.2, 0.9)

Table 3: Sex-stratified age-adjusted mortality rates per 1000 person-year (PY), 95% confidence interval

	MLWH	General population	Rate Ratio
All-type cancer	81.2 (64.3, 98.1)	83.7 (78.3, 89.2)	1.0 (0.8, 1.2)
ADM	2.5 (0, 5.8)	3.8 (2.3, 5.2)	0.7 (0.0, 1.5)
NADM	78.7 (62.0, 95.3)	80.0 (74.7, 85.2)	1.0 (0.8, 1.2)

Table 4: Univariate and multivariate models determining predictors of cancer related mortality among PLWH

	Unadjusted Hazard Ratio (95% CI)	Adjusted Hazard Ratio (95% CI)
Sex		
Female	0.5 (0.3, 0.9)	
Male	1.00	
Indigenous ethnicity		
No	1.0	
Yes	1.2 (0.8, 1.8)	
Unknown	1.3 (0.9, 1.7)	
Hepatitis C diagnosis		
No	1.00	
Yes	0.82 (0.6, 1.1)	
ADM cancer diagnosis		
NADM	1.00	
ADM	0.33 (0.2, 0.5)	
Type of cancer, at diagnosis		
Bone, tissue or breast	1.00	1.00
Digestive organ	6.2 (3.6, 11.1)	6.1 (3.5, 10.8)
Genitourinary	1.6 (0.8, 3.5)	1.7 (0.8, 3.6)
Lymphatic system	2.3 (1.2, 4.2)	2.2 (1.2, 4.1)
Respiratory	13.5 (7.6, 24.0)	11.8 (6.5, 21.4)
Other	2.6 (1.4, 4.8)	2.4 (1.3, 4.5)
Age at HIV diagnosis		
Per 10 year increase	1.3 (1.2, 1.5)	1.1 (1.0, 1.3)

Discussion

- All-type cancer and NADM mortality was elevated among PLWH compared to the general population, however this effect was not significant when the analysis was sex-stratified
- As corroborated by previous research, NADM may be of particular concern for mortality among PLWH in the modern cART era and notably certain cancers including lymphatic, respiratory, genitourinary and bone/tissue cancers.
- This research highlights the importance of appropriate cancer screening recommendations that reflect the cancer risk realities for PLWH.

Acknowledgements

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