High mortality among women living with HIV enrolled in Canada's largest community-based cohort study

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*We honour and remember the **65 women** living with HIV who participated in CHIWOS from across Canada who have passed away, including a cherished Peer Research Associate, Marisol Desbiens.*

BACKGROUND

With treatment, people with HIV have life expectancies similar to that of the general population.[1] A recent Canadian analysis, however, found that female patients had significantly lower life expectancy than males.[2] While these data highlight inequities by sex, there is limited individual-level data on other features of women's lives that predict higher mortality.

Objectives: Among women living with HIV in Canada:

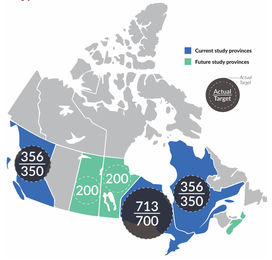
1. To measure all-cause mortality rate from study enrollment (August 2013) until December 1st, 2017.
2. To compare the age-standardized mortality rate of women with HIV with that of the 2011 Canadian female population.
3. To assess cause of death.
4. To determine socio-structural, HIV-related, and other predictors of mortality.

METHODS

The Canadian HIV Women's Sexual and Reproductive Health Cohort Study (CHIWOS) is Canada's largest longitudinal community-based research study that has enrolled 1,422 women with HIV (≥16 years; trans inclusive) in British Columbia, Ontario, & Québec (Figure 1).

Peer Research Associates (women with HIV) administer an online questionnaire (median: 120 minutes, Q1-Q3: 90-150) to participants at baseline and every 18-months.

Figure 1. Baseline recruitment of women with HIV across Canada



Wave 1: Baseline (2013-2015)
1,422 women

Wave 2: 18-months (2015-2017)
1,252 women (88% retention)

Wave 3: 36-months (2017-present)

METHODS (CONTINUED)

Death & cause of death were determined via study notification and follow-up procedures, and confirmation via Vital Statistics (in BC; Sensitivity of 64% and Specificity of 99%).

Time at risk of death was calculated for each participant by summing months between study start date (baseline) and end date (death, withdrawal, completed Wave 3, LTFU/Declined Wave 3, or Dec 1st, 2017). Total cohort "Time at risk" was summed across all participants and expressed as "woman-years of follow-up".

Loss-to-follow-up (LTFU) was defined as having no research team contact with the participant for at least 18 months. Between Waves 1 and 2, 6.9% (n=98) were considered LTFU and 1.7% (n=24) declined to complete Wave 2. All 122 were retained in the study and considered eligible for Wave 3 and attempts to contact continue.

- As LTFU may be associated with mortality, we used competing risk analyses to retain them in this analysis as participants who are "at risk of dying" rather than censoring them at the last point of contact.

Age-standardized mortality ratio was computed using the 2011 Canadian female reference population data from Statistics Canada (age 15+ years).

Proportional sub-distribution hazards model identified unadjusted and adjusted factors associated with mortality over the follow-up period, accounting for LTFU as a competing risk.

RESULTS

Table 1. Baseline characteristics (n=1,422)

Characteristics	Median or n	[Q1-Q3] or (%)
Median Age	42.5	[35.0-50.0]
Trans gender identity	63	4.4%
Ethnicity		
Indigenous	318	22.4%
African / Caribbean / Black	418	29.4%
White	584	41.1%
Other ethnicities	102	7.2%
Personal yearly income <$20,000	998	70.2%
Drug use (current or previous)	642	45.1%
Received HIV medical care in past year	1385	97.4%
Currently on ART	1175	82.6%
Undetectable viral load (<50 copies/mL)	1097	77.1%

RESULTS (CONTINUED)

Mortality Incidence

- 54 women died of 1,422 enrolled (3.8%) as of Dec 2017
- Crude mortality rate = 11.8 per 1,000 woman-years; 95% CI: 9.0-15.3

Figure 2. Age-standardized mortality ratio comparing CHIWOS to the Canadian female population (2011, age 15+ yrs)

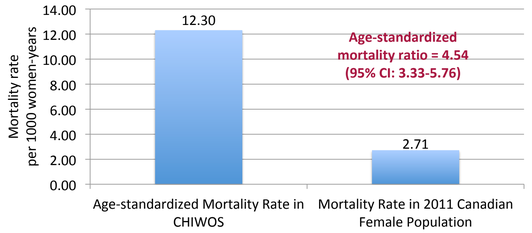


Figure 3. Cause of death among women living with HIV enrolled in CHIWOS with follow-up until December 1st, 2017 (n=54)

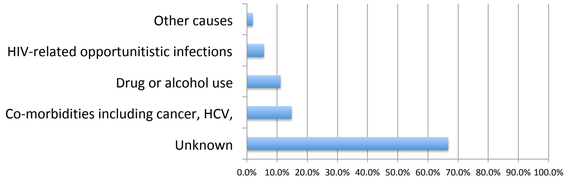
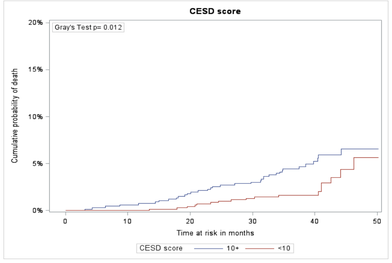


Figure 4. Cumulative incidence plot of mortality by probable depression (CES-D score >=10 vs <10)



Women reporting symptomology indicative of depression at baseline (the blue line) had higher cumulative incidence of mortality over time.

Table 2. Proportional sub-distribution hazards model of mortality among CHIWOS participants, with LTFU as a competing risk (n=1,422)

Baseline Characteristics		Unadjusted HR (95% CI)	Adjusted HR (95% CI)
Age at interview (per year increase)		1.05 (1.02, 1.07)	1.06 (1.03, 1.09)
Ethnicity:	White	1.00	
	Indigenous	1.35 (0.75-2.41)	Not selected
	African/Caribbean/Black	0.20 (0.07, 0.57)	
	Other ethnicity	0.82 (0.29-2.32)	
Personal annual income < $20,000		3.08 (1.32, 7.21)	2.11 (0.81, 5.54)
Current sex work		2.35 (1.05-5.25)	Not selected
Illicit drug use (past 3 months)		4.54 (2.27, 9.06)	Not selected
Alcohol use:	Non-binge drinkers	1.00	1.00
	Binge drinkers	1.25 (0.60, 2.62)	0.95 (0.40, 2.28)
	Heavy drinkers	4.19 (1.50, 11.7)	4.62 (1.66, 12.82)
Tobacco use:	Never	1.00	1.00
	Former	5.71 (1.86, 17.5)	3.26 (0.97, 10.94)
	Current	8.20 (3.22, 20.9)	3.93 (1.45, 10.65)
Incarceration:	Never	1.00	
	Ever	4.07 (2.22, 7.44)	Not selected
	Last year	3.32 (1.27, 8.65)	
Depressive symptoms (CESD score ≥10)		2.08 (1.16, 3.73)	1.95 (0.97, 3.92)
Violence as adult (ever)		5.60 (1.36, 23.07)	Not selected
Physical Health Summary Score (SF-12;/unit increase)		0.97 (0.95, 0.99)	Not selected

CONCLUSIONS

- We found an alarmingly high mortality rate among a community-based cohort of women with HIV in Canada, a majority of whom were engaged in HIV care.
- Sensitivity analyses indicate that reported rates likely under-estimate true mortality by 36%. Thus, at the time of analysis (i.e., Dec 1, 2017), we estimated 69 CHIWOS women have likely died; n=15 more than reported.
  —*As of July 11, 2018, there were 65 reported deaths.*
- No HIV-related clinical factors predicted mortality. Instead, co-morbidities, substance use (hazardous alcohol use, tobacco), and mental health present greater risks to survival.

To prevent premature mortality among women living with HIV, good HIV clinical care is necessary, but it is not sufficient. There is an urgent need for women-centred HIV community outreach, social care services, and policy changes that address social disparities and mental health needs, and integrate harm reduction services, inclusive of tobacco and hazardous alcohol use. We must prioritize peer support and leadership in these services.

References:
1. Samji et al. (2013). Closing the gap: increases in life expectancy among treated HIV-positive individuals in the United States and Canada.
2. Patterson et al. (2015). BMC Infectious Dis. Life expectancy of HIV-positive individuals on combination antiretroviral therapy in Canada.

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