

Exploring the Live Birth Rates of Women Living with HIV in British Columbia (WLWH) and the CARMA Cohort

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Study Objectives

1. To compare age specific birth rates of WLWH in British Columbia with those of the general BC population.
2. To determine age specific birth and fertility rates of WLWH and HIV negative women 15-49 years of age enrolled in the CARMA cohort.
3. To examine the relationship between birth/fertility rate and telomere length in the above groups.

BC Population Level Analysis

Our study was a retrospective review of clinical and population surveillance data. We chose to examine birth rates from 1997-2015 because during this time period, cART would have been available to all women.

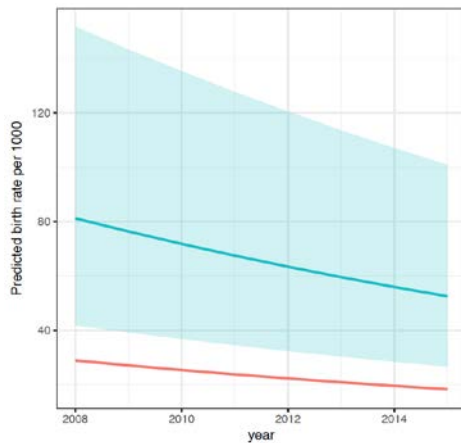
Oak Tree Clinic at BC Women’s Hospital in Vancouver, Canada is involved in the care of >95% of all pregnant WLWH in the province of BC. As such, the clinical surveillance data obtained from Oak Tree Clinic on the number of pregnancies and pregnancy outcomes for WLWH is the closest possible approximation of incident pregnancies among all WLWH in BC. Additionally, the BC Centre for Excellence in HIV/AIDS collects demographic data on all WLWH in BC who have engaged in treatment, and their dataset is the best possible estimate of the total number of WLWH living in BC.

Using data from Oak Tree Clinic on the number of live births to WLWH and population counts from the BC Centre for Excellence on HIV/AIDS on the total number of WLWH in BC, we determined the live birth rates (births/1000 women/year) from 1997-2015, among 15-49 years old WLWH in BC. These data were then compared to publicly available data on the live birth rates of all women aged 15-49 in BC for the same period.

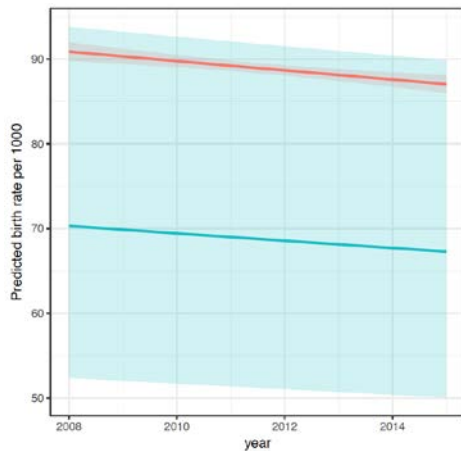
Negative binomial regression was used to compare birth rates between WLWH and the BC population by year (1997-2015) and age group (15-24, 25-34 and 35-49 years). Birth rates are expressed as number of births/1000 person-years.

In British Columbia, from 1997-2015 there were 456 births to WLWH over 14,539 person years, and 811,213 births to all BC women over 20,300,406 person years. WLWH had a lower crude birth rate over this period compared to BC women [31.4 (95%CI=28.6-34.30 vs. 40.0, 95%CI=39.3-40.1, age-adjusted risk ratio=0.85, 95%CI=0.75-0.95, $p=0.006$]. Compared to BC women, WLWH aged 15-24 had a higher birth rate, while WLWH aged 25-34 and 35-49 had lower birth rates ($p<0.0001$). Among WLWH and BC women, birth rates decreased over time for ages 15-24, and increased over time for ages 25-34 and 35-49 ($p<0.0001$). The proportion of births among WLWH aged 35-49 has increased over time. In 1997, 1 out of 16 births to WLWH were to women aged 35-49 versus 10 out of 24 births in 2015.

A



B



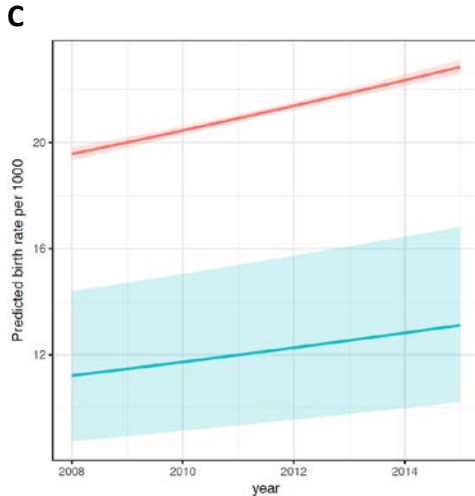


Figure 1. Predicted birth rate per 1000 women over time by HIV status and age group. A) Ages 15-24; B) Ages 25-34; C) Ages 35-49. Shading indicates 95%CI.

CARMA Cohort Analysis

The CARMA study is a prospective cohort study that enrolled women and girls living with HIV from 2008-2016. Participants were recruited from HIV clinics across Canada and HIV negative controls were recruited from the community. Data collected included demographics, clinical information and laboratory investigations. For this sub-study of the CARMA dataset we included participants aged ≥ 15 and data considered in analysis included: self reported lifetime obstetrical history, age, ethnicity and substance use.

In this analysis total number of live births and live birth rates were compared between WLWH and controls. Negative binomial regressions were used to calculate unadjusted and adjusted incident rate ratios (IRR).

We included 269 WLWH and 215 HIV negative controls from the CARMA cohort in this analysis. WLWH tended to be younger (38.4 vs. 42.1, $p=0.007$), more likely to be of African ethnicity ($p<0.0001$), less likely to have graduated from high school ($p<0.0001$), and more likely to have ever used illicit substances ($p=0.005$). WLWH reported more total pregnancies [3 (1-4) vs. 2 (0-3), $p<0.0001$] and more total live births [2 (1-3) vs. 1 (0-2), $p=0.003$] versus HIV negative controls. In analyses adjusted for ethnicity, education and substance use, WLWH reported more live births among all participants [IRR=1.47 (1.24-1.73), $p<0.0001$] and more live birth among participants reporting any pregnancy ever [IR=1.24 (1.07-1.45), $p=0.005$] versus HIV negative controls.

Table 1. Modeling CARMA cohort live birth rate for WLWH vs. HIV-negative controls, offset for age

	Unadjusted		Adjusted ^a	
	IRR (95%CI)	P-Value	IRR (95%CI)	P-Value
Live Births – All Participants	1.53 (1.29-1.81)	<0.0001	1.47 (1.24-1.73)	<0.0001
Live Births – Participants Reporting Any Pregnancy	1.22 (1.06-1.41)	0.006	1.24 (1.07-1.45)	0.005

^aadjusted for ethnicity, education and substance use

Conclusion

Our analyses have shown the following:

1. WLWH in BC have a lower birth rate compared to the general BC population.
2. WLWH are increasingly likely to have a pregnancy in their later reproductive years.
3. Among demographically similar women (as in the CARMA cohort), WLWH may achieve a birth rate similar to their peers.

Overall, we believe that our analyses emphasize the need to better understand the reproductive health of WLWH. Specifically, we need to better understand reproductive decision making among WLWH, the risks of pregnancies at a later reproductive age among WLWH, and the impact of HIV on fertility.