

Epidemiology of HIV in BC



ROBERT HOGG

BC CENTRE FOR EXCELLENCE IN HIV/AIDS
SIMON FRASER UNIVERSITY
OCTOBER 2010

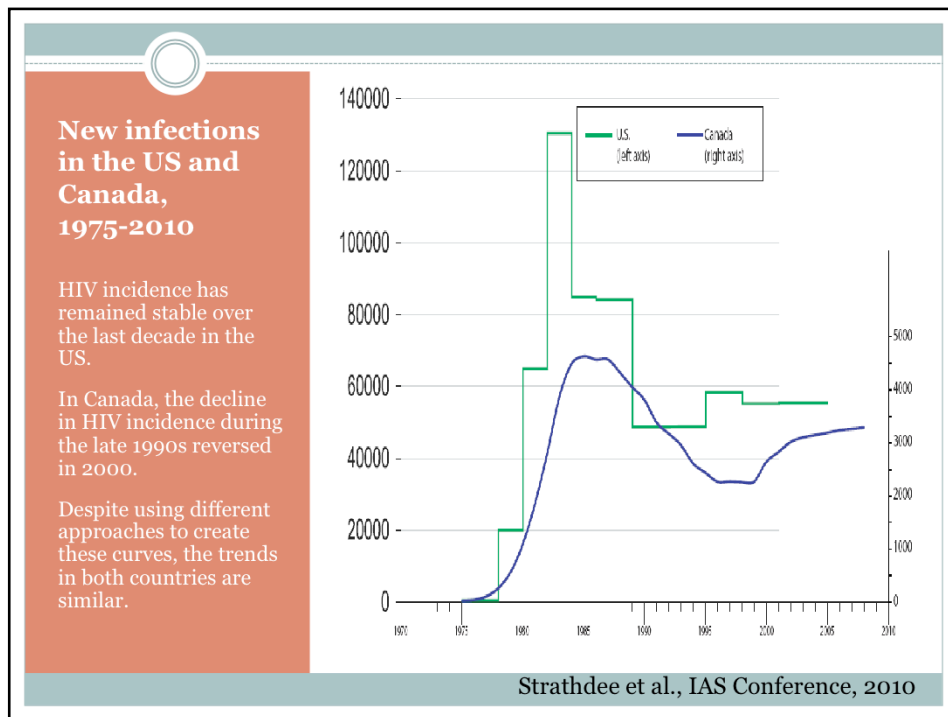
Overview



- HIV epidemic in Canada and BC
- HIV among Aboriginal Peoples
- HAART use and new infections in BC
- Survival and HAART use
- Women and HAART use

HIV epidemic in Canada and BC



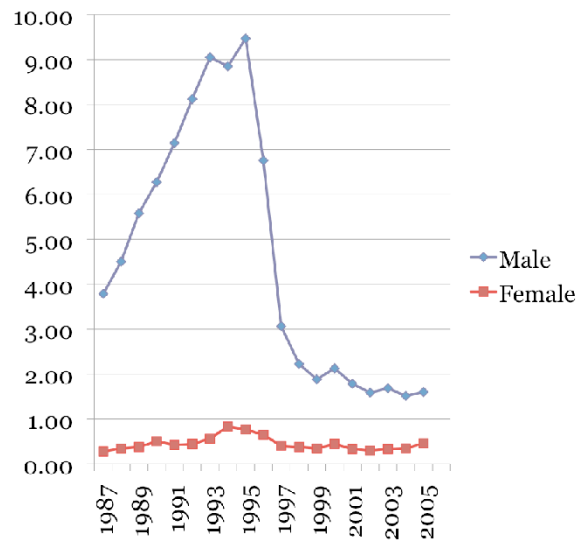


- The graph describes the epidemics in the US and in Canada.
- The epidemics in both countries began at the same time and although the numbers are significantly different the curves are similar. As a result, with the larger epidemic (USA) the data does not present as a smooth curve.
- In the US, over the past 10 years, the rate of new infections have remained relatively stable.
- In some provinces in Canada, the rates of new infections have slightly increased.

HIV death rates in Canada, by gender

Rates of mortality have declined considerably, especially for men, since the introduction of HAART.

However, death rates among women have remained stable.

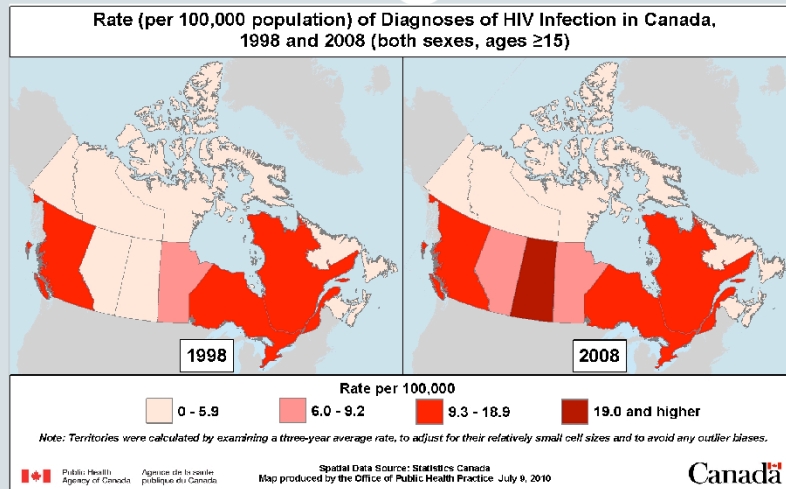


Standardized death rates (deaths/ per 100,000 population)

Belvedere et al., CAHR, 2010

- Since the introduction of HAART, there has been a significant reduction in mortality from 9 death per 100,000 population to less than 2 deaths per 100,000 population.
- The epidemic is different in women because more women have been diagnosed over the years, as a result, the decline overall is not apparent on the graph, however, death rates among women are stable.

New HIV infections in Canada, 1998 and 2008



In 2008 -- 65,000 persons living with HIV; 3300 new infections a year

- The epidemic is continuing to spread in Canada.
- In 1998, the rates in BC, Quebec and Ontario were the highest in Canada.
- Since 1998 the epidemic has spread. In 1998, many of the individuals who were diagnosed in the DTES, particularly Aboriginal Peoples, were from out of province. It is possible that many of those individuals have moved away from Vancouver.
- Currently, Saskatchewan has the highest rate of newly diagnosed infections.

People living with HIV in BC, 2005 -2008

7.F Estimated number of prevalent HIV infections in BC by exposure category, 2005 & 2008

| Exposure Category | 2005 | | | 2008 | | |
|-------------------|--------|--------------|------------|--------|--------------|------------|
| | Number | Range | % of Total | Number | Range | % of Total |
| MSM | 4,260 | 3,280-5,240 | 41% | 4,770 | 3,640-5,900 | 42% |
| MSM-IDU | 340 | 240-440 | 3% | 360 | 250-470 | 3% |
| IDU | 3,580 | 2,660-4,500 | 35% | 3,760 | 2,820-4,700 | 33% |
| HET (non-endemic) | 1,750 | 1,300-2,200 | 17% | 2,030 | 1,520-2,540 | 18% |
| HET (endemic) | 300 | 220-380 | 3% | 350 | 260-440 | 3% |
| Other | 120 | 70-170 | 1% | 130 | 80-180 | 1% |
| All | 10,350 | 8,300-12,400 | | 11,400 | 9,300-13,500 | |

BC CDC, Annual HIV and STI report, 2009

- The graph above, estimates the prevalence of HIV in BC by exposure category in 2005 and 2008.
- Over this period of time, there has been an increase in the number of people living with HIV.
- The MSM population represents the largest proportion of new HIV infections in BC.
- In 2008, the populations that represent the largest prevalence of HIV in BC include:
 - Men who have sex with men (MSM)
 - Injection drug users (IDUs)
 - Heterosexual individuals from non-endemic countries

New HIV infections in BC, 2005 -2008

7.E Estimated number of incident HIV infections in BC by exposure category, 2005 & 2008

| Exposure Category | 2005 | | | 2008 | | |
|-------------------|--------|---------|------------|--------|---------|------------|
| | Number | Range | % of Total | Number | Range | % of Total |
| MSM | | 150-260 | 44% | | 140-250 | 47% |
| MSM-IDU | | 10-20 | 3% | | 10-20 | 3% |
| IDU | | 90-190 | 30% | | 70-140 | 25% |
| HET (non-endemic) | | 50-130 | 19% | | 50-120 | 21% |
| HET (endemic) | | 10-30 | 4% | | <20 | 4% |
| Other | | <10 | --- | | <10 | --- |
| All | | 320-620 | | | 280-540 | |

BC CDC, Annual HIV and STI report, 2009

- Data presented in this slide originates from health Canada and are estimates of new infections in BC in 2005 and 2008.
- In BC, the number of incident cases had slightly decreased in 2008 from 2005.
- The MSM population continues to be the population most affected by HIV, followed by IDUs, and HET individuals from non-endemic countries.

People living with HIV in Vancouver

Of the people over the age of 15 that reside in Vancouver, about 6100 were living with HIV in 2006

The overall prevalence rate was 1.21 percent with MSM and IDUs most affected.

The number infected is 6 times greater than the national average.

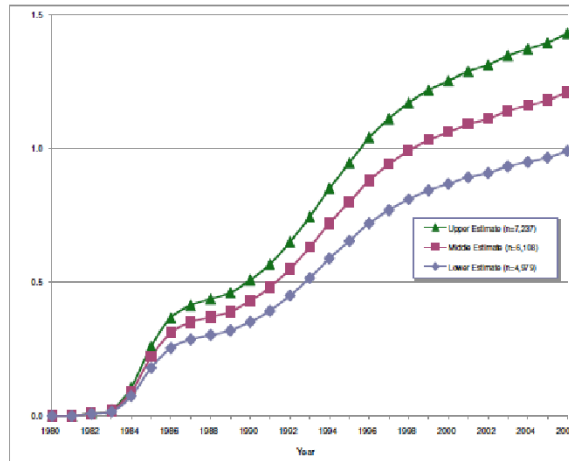


Figure 2
HIV prevalence among people living in Vancouver by upper, middle and lower estimates, 1980–2006.

McInnes et al., Int J. of Harm Reduction, 2009; rates expressed per 100 population

- Data in the above slide has been generated from various studies in the past 20 years and modeled using epidemiological software.
- The approximate population of Vancouver is 500,000. It is estimated that 6,100 people in Vancouver were living with HIV in 2006. As a result, the overall prevalence rate in Vancouver was 1.2%, which is 6 times greater than the national average.
- In conclusion, there is a significant number of people living with HIV in Vancouver.

HIV among Aboriginal Peoples

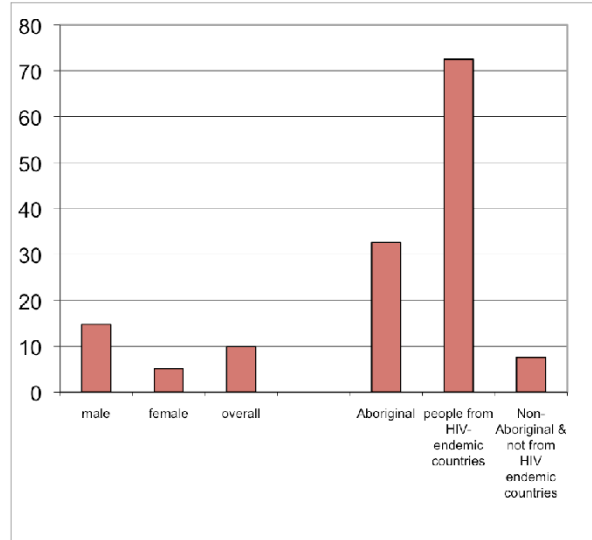


New HIV infections by sex and ethnicity, Canada, 2008

HIV incidence is 10 per 100,000 for both sexes and is higher among men than women.

People originating from a country where HIV is endemic, HIV incidence is over 70 per 100,000.

Among Aboriginal Peoples, HIV incidence is over 30 per 100,000.



Strathdee et al., IAS Conference, 2010; rates expressed per 100,000 population

- In Canada, the largest proportion of new infections are among people from HIV endemic countries and Aboriginal People.

HIV among Aboriginal Peoples in BC

Aboriginal peoples living with HIV has increased dramatically since 1980

In 2000, an estimated 1.3% of men and women aged 15 years and over were living with HIV.

Currently about 500 Aboriginal Peoples in BC are on HAART

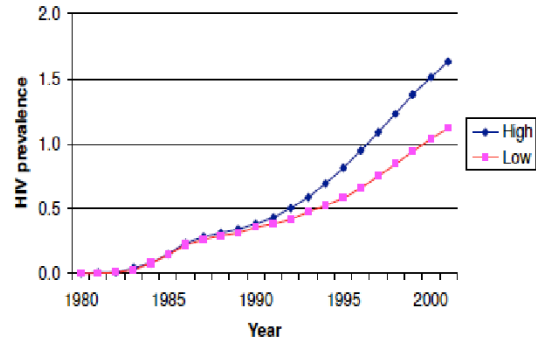


Figure 1
HIV prevalence among Aboriginal British Columbians by scenario, 1980 to 2001.

Hogg et al., Int J Harm Reduction 2005; rates expressed per 100 population

- The latest update of HIV among Aboriginal Peoples in BC is from 2000
- In 2000, 1.3% of Aboriginal British Columbians were living with HIV.

HIV among Aboriginal Peoples in Canada

Literature review of studies published in Canada from 1980 to 2010.

HIV infection was associated with syringe sharing and frequently injecting drugs, as well as geographic and social factors such as living in Vancouver or having a history of non-consensual sex.

AIDS Behav
DOI 10.1007/s10461-010-9792-y

ORIGINAL PAPER

HIV Incidence and Prevalence Among Aboriginal Peoples in Canada

Katrina C. Duncan · Charlotte Readline · Alexandra M. Burwein · Melanie C. M. Murray · Alexa Palmer · Warren Michelson · Hudson Samji · Viviane D. Lima · Julio S. G. Monaster · Robert S. Hogg

© Springer Science+Business Media, LLC 2010

Abstract We examined incidence, prevalence, and correlates of HIV infection in Aboriginal peoples in Canada and found that among most risk groups both Aboriginal and non-Aboriginal participants showed similar levels of HIV prevalence. Aboriginal peoples who use illicit drugs were found to have higher HIV incidence and prevalence when compared to their non-Aboriginal drug-using peers. Aboriginal street youth and female sex workers were also found to have higher HIV prevalence. Among Aboriginal populations, correlates of HIV positive sero-status include syringe sharing and frequently injecting drugs, as well as geographic and social factors such as living in Vancouver or having a history of non-consensual sex. This study is relevant to Canada and elsewhere, as indigenous populations are disproportionately represented in the HIV epidemic worldwide.

Electronic supplementary material The online version of this article (doi:10.1007/s10461-010-9792-y) contains supplementary material, which is available to authorized users.

K. C. Duncan · A. M. Burwein · A. Palmer · W. Michelson · V. D. Lima · J. S. G. Monaster · R. S. Hogg (✉)
Division of Epidemiology and Population Health,
British Columbia Centre for Excellence in HIV/AIDS,
606-608 Burrard Street, Vancouver, BC V6Z 1Y6, Canada
e-mail: robhogg@cfenet.abc.ca

K. C. Duncan
Faculty of Science, University of British Columbia,
Vancouver, BC, Canada

C. Readline
School of Health and Human Performance,
Dalhousie University, Halifax, NS, Canada

A. M. Burwein
Department of Human and Social Development,
University of Victoria, Victoria, BC, Canada

Keywords Aboriginal peoples · Indigenous populations · HIV incidence · HIV prevalence · Injection drug use · Canada

Introduction

The face of the Canadian HIV epidemic has changed markedly since its onset in the early 1980s. Initially, HIV primarily affected men who have sex with men (MSM), accounting for approximately 70% of infections from 1985 to 1996 [1]. Towards the latter part of the 1990s, the affected population changed dramatically; by 2000 the MSM risk group declined proportionately to 48% of new HIV infections in Canada, whereas people who inject drugs (PWID) accounted for approximately 17% of new infections [2]. The epidemic has also increased among women, heterosexuals, individuals from HIV-endemic countries, and other populations such as Aboriginal peoples [2–5].

C. Readline
Centre for Aboriginal Health Research, University of Victoria,
Victoria, BC, Canada

A. M. Burwein · R. S. Hogg
Faculty of Health Sciences, Simon Fraser University, Burnaby,
BC, Canada

M. C. M. Murray · V. D. Lima · J. S. G. Monaster
Division of AIDS, Faculty of Medicine, University of British
Columbia, Vancouver, BC, Canada

H. Samji
Department of Epidemiology, Johns Hopkins Bloomberg School
of Public Health, Baltimore, MD, USA

Springer

Duncan et al., AIDS and Behavior, 2010

- Common predictors of HIV infection include syringe sharing, injection drug use and geographical and social practices.
- Majority of the data arises from BC, as a result, little is known about epidemics in Alberta, Saskatchewan and Manitoba.
- Further research outside of the Vancouver context is needed.

HAART use, response, and mortality

Based on 622 people who started HAART between 1996 and 1999 and followed until 2003.

Aboriginal People starting HAART had similar HIV treatment responses, but were more likely to die than non-Aboriginal Peoples.

Table 4: Univariate and multivariate Cox proportional hazard models examining the association between Aboriginal status and mortality

| Variable | Unadjusted HR (95% CI) | Adjusted HR (95% CI) |
|--|------------------------|----------------------|
| Aboriginal (Yes versus No) | 2.87 (1.70, 4.84) | 3.12 (1.77, 5.48) |
| Plasma HIV viral load (per log ₁₀ increase) | 1.77 (0.94, 3.34) | -- |
| CD4 cell count (per 100 decrease) | 1.10 (0.97, 1.25) | -- |
| Gender (Female versus Male) | 0.89 (0.41, 1.95) | 0.98 (0.41, 2.34) |
| Age | 1.04 (1.01, 1.07) | 1.06 (1.03, 1.09) |
| Physician experience (per 10 patients) | 0.99 (0.96, 1.01) | -- |
| Completed high school (Yes versus No) | 0.63 (0.39, 1.02) | -- |
| Income (<\$10,000 versus ≥ \$10,000) | 2.76 (1.59, 4.82) | 1.86 (1.03, 3.34) |
| Baseline Combination (PI versus NRTI) | 1.22 (0.65, 2.29) | 1.65 (0.82, 3.31) |
| Adherence (≥ 95% versus < 95%) | 0.32 (0.20, 0.52) | 0.41 (0.24, 0.71) |
| AIDS diagnosis (Yes versus No) | 1.59 (0.91, 2.79) | -- |
| History of IDU (Yes versus No) | 2.18 (1.35, 3.51) | 1.47 (0.82, 2.62) |
| Year of initiation of therapy | | |
| 1996 | 1.00 (--) | 1.00 (--) |
| 1997 | 0.49 (0.27, 0.92) | -- |
| 1998 | 0.67 (0.34, 1.32) | -- |
| 1999 | 0.34 (0.14, 0.82) | -- |

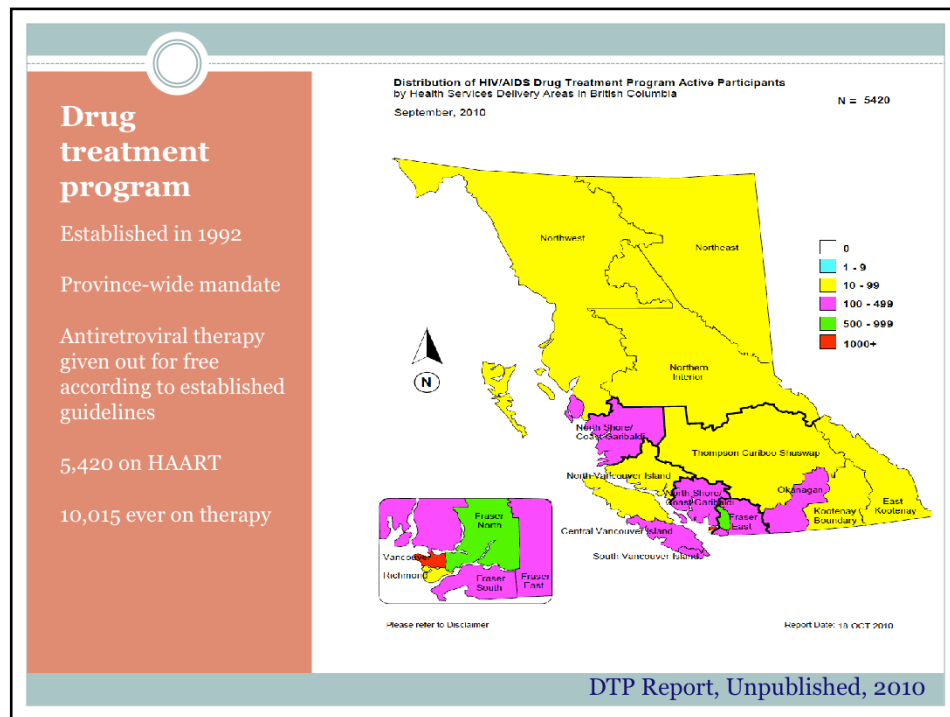
Notes: The symbol -- means that variable was not included in the analysis

Lima et al., AIDS Research and Therapy, 2006

- The response to HAART between Aboriginal People and non-Aboriginal People were similar, however, the mortality rates are higher in Aboriginal People.
- The underlying social determinants of health have a significant impact on the mortality rates among Aboriginal People living with HIV.

HAART use and new infections in BC





- Data from the Drug Treatment Program in BC.
- Majority of active participants live in Vancouver and a significant number of participants reside in the Fraser Health Authority region.

HIV tests and HAART use in BC, 1996 - 2009

Between 1996 and 2009, the number receiving HAART increased from 837 to 5,413 (547% increase).

The number of new HIV diagnoses fell from 702 to 338 per year (52% decrease).

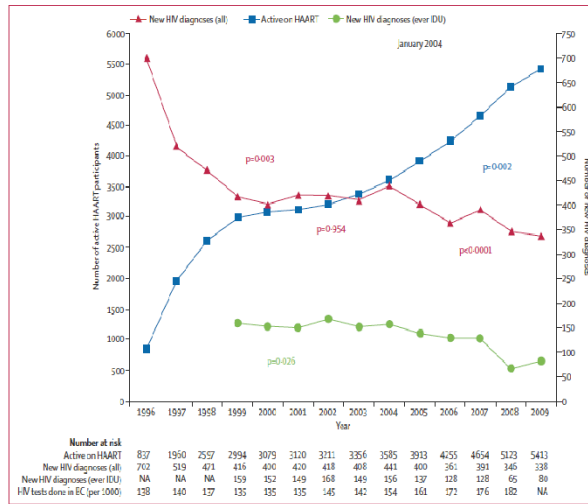


Figure 1: Number of active HAART participants and number of new HIV diagnoses per year in British Columbia, Canada, 1996-2009
p values are for trend and were obtained from the generalised additive model. Injecting drug user (IDU) refers to individuals who have ever injected illicit drugs.
HAART=highly active antiretroviral therapy; BC=British Columbia; NA=not available.

Montaner et al. Lancet, 2010

- Between 1996 and 2009 the number of participants on HAART dramatically increased, while the number of newly diagnosed individuals decreased by approximately 52%.

HAART use and new HIV infections in BC

For 1996–2000, there were 30% fewer new HIV diagnoses than were expected.

For 2001–03, the number reported and expected were the same.

For 2004–09, there was a 17% decrease in new HIV diagnoses.



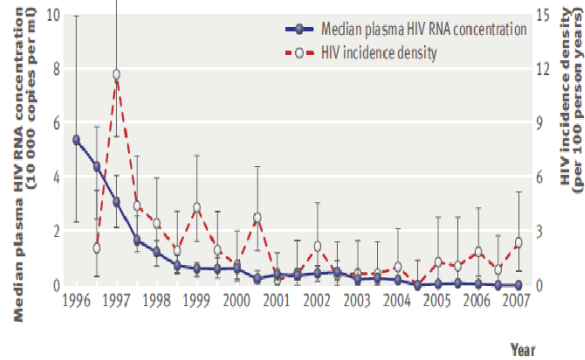
Figure 2: Reported and expected number of new HIV diagnoses per year in British Columbia, Canada, during the three phases of the study, 1996-2009
p values refer to the total reported number of HIV diagnoses compared with the total expected number of HIV diagnoses at the end of each study phase.

Montaner et al., CAHR, 2010

HAART use and new HIV infections among IDUs

Based on 622 HIV+ IDUs and 1429 HIV- IDUs.

Among HIV- IDUs, 155 new HIV infections were observed, resulting in an incidence density of 2.49 per 100 person years.



Estimated community plasma HIV-1 RNA concentrations and HIV incidence density, with 95% confidence intervals, among two parallel cohorts of injecting drug users. HIV incidence first estimated in second half of 1996 as enrolment started in May 1996 and repeat HIV tests to assess incidence were available only after six months of follow-up

Wood et al., BMJ , 2010

- This study investigated HIV incidence among IDUs. The incidence density was approximately 2.5/100 person years.

Determinants of HIV infections among 1429 HIV- IDUs

After adjusted for unsafe sexual behaviours and sharing used syringes, the estimated community plasma HIV-1 RNA concentration remained independently associated with the time to new HIV infection.

Table 2|Cox proportional hazards regression of time to HIV infection among 1429 HIV negative injecting drug users followed from 1 May 1996 to 30 June 2007

| Characteristic | Relative hazard (95% CI) | P value |
|--|--------------------------|---------|
| Plasma HIV RNA (per log ₁₀ increase)* | 3.32 (1.82 to 6.08) | <0.001 |
| Unsafe sex† (yes v no)‡ | 1.09 (0.77 to 1.54) | 0.619 |
| Used syringe sharing (yes v no) | 1.45 (0.99 to 2.12) | 0.058 |
| Ethnicity (white v other) | 0.65 (0.47 to 0.91) | 0.011 |
| Heroin injection (≥daily v <daily)‡ | 1.35 (0.97 to 1.90) | 0.079 |
| Cocaine injection (≥daily v <daily)‡ | 2.50 (1.76 to 3.54) | <0.001 |
| Unstable housing (yes v no)§ | 1.41 (1.00 to 1.98) | 0.049 |

*Plasma HIV RNA was time updated based on median value in BART cohort during six months before each HIV negative participant's follow-up visits.

†Defined as insertive or receptive vaginal or anal intercourse.

‡All behavioural data time updated based on data from follow-up every six months.

§Living in single room occupancy hotel, shelter, recovery or transition house, jail, on street, or having no fixed address.

Wood et al., BMJ , 2010

- The community viral load is the most significant predictor of HIV incidence among individuals who use injection drugs.

Morality and HAART use

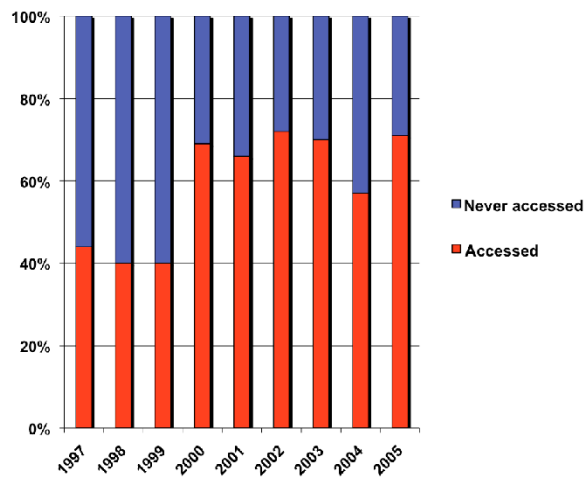


HAART use and mortality

HIV positive people from 1997 to 2005 who died in BC.

The proportion never accessing HAART before death has decreased, but still remains high.

With recent guideline changes it likely has increased again.



Joy et al., JAIDS, 2008

- When HAART became available, approximately 60% did not access treatment before death
- In 2005, approximately 30% of HIV positive individuals did not access HAART, which is a significant proportion.

Life expectancy on HAART

43,355 eligible patients and 14 participating cohorts.

Since 1996, life expectancy at age 20 years has increased from 36 to 49 years.

Life expectancy of individuals on combination antiretroviral therapy in high-income countries: a collaborative analysis of 14 cohort studies

The Antiretroviral Therapy Cohort Collaboration*

Summary

Background: Combination antiretroviral therapy has led to significant increases in survival and quality of life, but as population studies of the effect on life expectancy in adults are undertaken. One objective was to compare changes in mortality and life expectancy among HIV-positive individuals on combination antiretroviral therapy.

Methods: The Antiretroviral Therapy Cohort Collaboration is a multinational collaboration of HIV cohort studies in Europe and North America. Patients were included in this analysis if they were aged 16 years or over and antiretroviral-naïve when initiating combination therapy. We constructed abridged life tables to estimate life expectancy for individuals on combination antiretroviral therapy in 1996–99, 2000–02, and 2003–05, and stratified by sex, baseline CD4 cell count, and history of injecting drug use. The average number of years remaining to be lived by those treated with combination antiretroviral therapy at 20 and 35 years of age was estimated. Potential years of life lost from 20 to 64 years of age and crude mortality rates were also calculated.

Findings: 38 587, 13 914, and 10 854 eligible patients initiated combination antiretroviral therapy in 1996–99, 2000–02, and 2003–05, respectively. 2054 (4.7%) deaths were observed during the study period, with crude mortality rates decreasing from 16.3 deaths per 1000 person-years in 1996–99 to 10.0 deaths per 1000 person-years in 2003–05. Potential years of life lost per 1000 person-years also decreased over the same time, from 366 to 139 years. Life expectancy at age 20 years increased from 36.1 (95% CI 0–63 years to 45.4 (95% CI 0–53 years). Women had higher life expectancies than did men. Patients with presumed transmission via injecting drug use had lower life expectancies than did those from other transmission groups (12.6 (95% CI 0–11.7 years to 44.7 (95% CI 0–53 years). Life expectancy was lower in patients with lower baseline CD4 cell counts than in those with higher baseline counts (32.4 (95% CI 0–40 years for CD4 cell counts below 300 cells per µl, vs 50.4 (95% CI 0–61 years for counts of 300 cells per µl or more).

Interpretation: Life expectancy in HIV-infected patients treated with combination antiretroviral therapy increased between 1996 and 2005, although there is considerable variability between subgroups of patients. The average number of years remaining to be lived at age 20 years was about two-thirds of that in the general population in these countries.

Funding: UK Medical Research Council, GlaxoSmithKline.

Introduction

Treatment with antiretroviral drugs of people infected with HIV-1 has improved significantly since the introduction of combination antiretroviral therapy in 1996. In treatment-naïve patients, first-line combination therapy is generally derived from two different forms of regimen, which contains either non-nucleoside reverse transcriptase inhibitors (NNRTIs) or nucleoside inhibitors (NIs). Both regimens function by suppressing viral replication and rapidly increasing CD4 cell counts.

Over the past decade, combination therapy regimens have become more effective, better tolerated, and have been simplified in terms of dosing.^{1,2} Clinical trials and observational studies have shown profound reductions in mortality and morbidity in patients infected with HIV as a result of combination antiretroviral therapy.^{3–11} This decrease in mortality is particularly apparent in industrialised, high-income countries where access to health care and antiretroviral treatment is more readily available.¹²

Life expectancy and mortality are universally viewed as important population health indicators. As such, several studies have displayed the negative relation between HIV prevalence and life expectancy at a population level.^{13–16} However, the effect of HIV on life expectancy in the era of combination therapy is not well understood because of the relative novelty of this treatment. The objective of this study was to compare changes in mortality rates and life expectancy among HIV-positive individuals on combination therapy in high-income countries over three separate periods (1996–99, 2000–02, and 2003–05) and in subgroups defined by patient characteristics at initiation of such treatment.

Methods

Participants

The Antiretroviral Therapy Cohort Collaboration (ART-CO) is a multinational cohort study of antiretroviral-naïve HIV-positive patients initiating combination antiretroviral therapy.^{17–19} The collaboration was estab-

See end of article for Supplementary Appendix, which is published on line only. For more information on the full text of this article, please see the end of the article.

Correspondence: Prof Robert Grant, Centre for HIV and AIDS Research, 1001 North Tower Drive, University of Colorado, Denver, CO 80202, USA (robert.grant@ucdenver.edu).

© 2008 The Authors. Journal compilation © 2008 Blackwell Publishing Ltd

DOI: 10.1016/S0140-6736(08)61111-1

Lancet 2008; 371: 895–903

ISSN 0140-6736

Published online 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

First published as an article in press on 14 May 2008

Antiretroviral cohort collaboration

Hogg et al., Lancet, 2008

- This study involves a collaboration of cohorts from around North America and Europe to investigate life expectancy for individuals on HAART.
- The life expectancy at age 20 has increased from 36 to 49 years. As a result, there has been a significant increase in life expectancy because of HAART use.

HAART use and mortality in Vancouver

People on HAART from 1997 to 2005.

Mortality was 3 times higher for people in the neighbourhood with a higher concentration of injecting drug users.

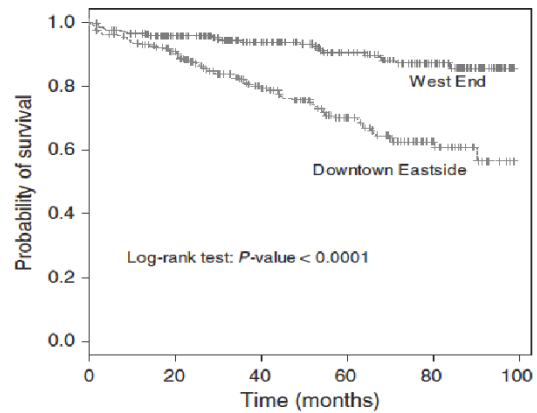


Fig. 1 Kaplan-Meier survival curves for the 533 patients on highly active antiretroviral therapy (HAART) in the two neighbourhoods: West End (high concentration of gay men) and Downtown Eastside (high concentration of injecting drug users).

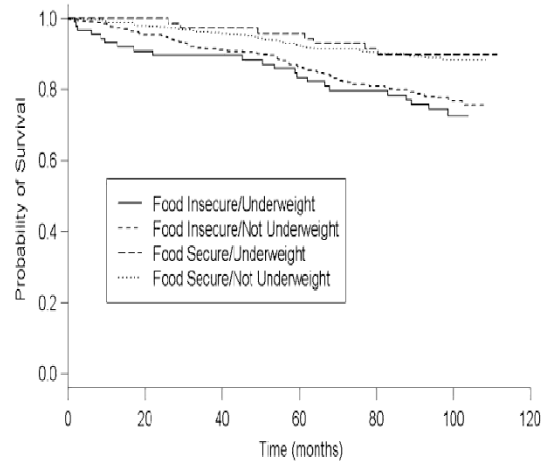
Druyts et al., HIV Medicine, 2009

- Within provinces there exists differences in mortality.
- The concentration of IDUs is higher in the Downtown Eastside neighborhood. Mortality was 3 times higher in this neighborhood compared to the West End neighborhood.

HAART use, food insecurity, and mortality

People on HAART and other ARV therapies from 1998 and 1999 and followed to 2007.

People who are underweight and food insecure are more likely to die.



| People remaining in the Study n(%) | 0 months | 20 months | 40 months | 60 months | 80 months | 100 months |
|------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Food Insecure/Underweight | 87 (7.8%) | 75 (8.7%) | 73 (8.5%) | 68 (8.1%) | 62 (5.5%) | 40 (3.8%) |
| Food Insecure/Not Underweight | 449 (40.1%) | 418 (37.4%) | 394 (35.2%) | 362 (32.4%) | 331 (29.8%) | 156 (13.9%) |
| Food Secure/Underweight | 73 (6.5%) | 70 (6.3%) | 68 (6.1%) | 65 (5.8%) | 60 (5.4%) | 38 (3.4%) |
| Food Secure/Not Underweight | 510 (45.9%) | 485 (43.3%) | 464 (41.5%) | 442 (39.5%) | 428 (38.2%) | 232 (20.7%) |

Weiser et al., JAIDS, 2009

- Food security was investigated as a determinant of health in individuals on HAART.
- Individuals who were food insecure and underweight were more likely to die than individuals who were food insecure and not underweight.

HAART use, depression, and mortality

Based on 563 people on HAART.

Both depressive symptoms and adherence were associated with death.

People who were depressed and non-adherent were 6 times more likely to die than those who were not.

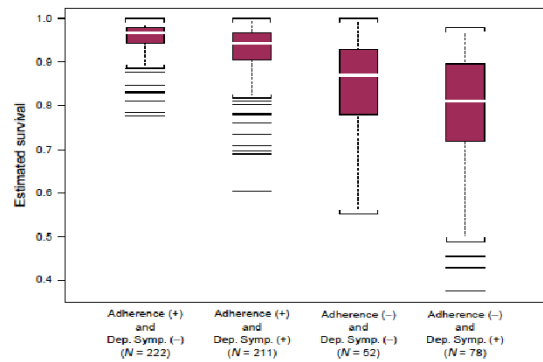


Fig. 2. Distribution of the estimated model-based survival probabilities for the 563 patients with HIV, stratified by adherence and depressive symptoms levels. (—), absence of factor; (+), presence of factor; CES-D, Center for Epidemiologic Studies Depression Scale; Dep. Symp., depressive symptoms. Adherence cut-off point was 95%. Depressive symptoms cut-off point was 16 points in the CES-D scale.

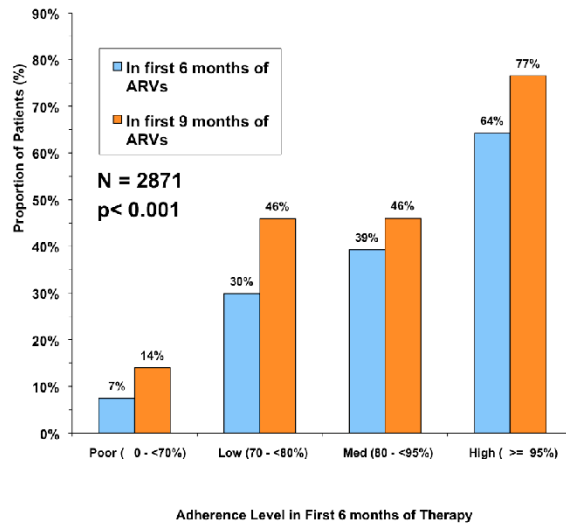
Weiser et al., JAIDS, 2009

- This study investigated mortality related to level of adherence to HAART and symptoms of depression.
- Symptoms of depression were measured at a single point in time, when individuals began HAART.
- Individuals who were non-adherence and had symptoms of depression were 6 times more likely to die.

HIV-1 RNA Suppression, by HAART adherence

Suppression defined as the first 2 consecutive HIV-1 RNA measures below 50 copies.

The proportion of persons suppressed increases with HAART adherence

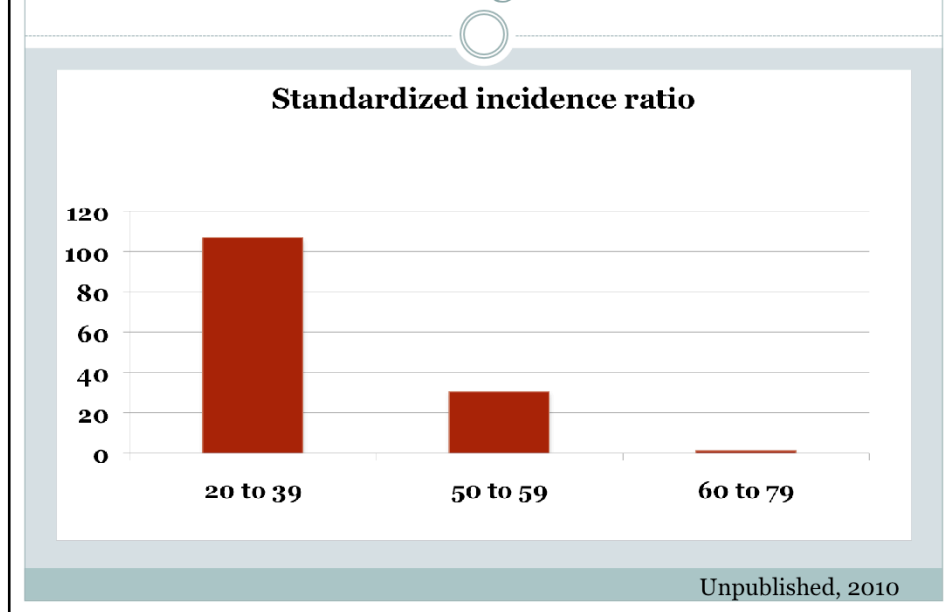


Unpublished, 2010

Women and HAART use



Cervical cancer among women on HAART



- Standardized incidence ratio is standardized against the general population of women in BC.
- In women on HAART, aged 20-39 years, rates of cervical cancer were 100x greater than the general population. This is a significant incidence ratio.
- For primary care providers, this shows that there is an opportunity to increase screening for cervical cancer.
- The rates decline with age, which is also seen in the general population. However, rates among women on HAART aged 50-59 years are still higher than the general population.

Summary



- BC has more HIV infected people than the national average.
- Rates are especially high in Vancouver and among Aboriginal peoples.
- HAART use is associated with a reduction in new infections both at a population and cohort-level.
- Mortality rates are declining, but differences can still be observed by gender, adherence, and other social determinants of health

Acknowledgements

- Antiretroviral Cohort Collaboration (ART-CC)
- BC Centre for Excellence in HIV/AIDS
- Nada Gataric
- Mark Gilbert and BC CDC
- LISA team
- Julio Montaner
- Simon Fraser University
- Steffanie Strathdee
- Benita Yip

