Modern Antiretroviral Therapy Improves Life Expectancy of Gay and Bisexual Males in Vancouver's West End

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ABSTRACT

This study was undertaken to evaluate the life expectancy of gay and bisexual men in the West End of Vancouver, British Columbia during two time periods. Mortality data for males were obtained for the periods 1990 to 1992 and 1995 to 1997 and population estimates were obtained from the 1991 and 1996 Census. The proportion of the male population over 20 years of age estimated to be gay and bisexual was derived from a random telephone survey. Mortality patterns were assessed by comparing changes in life expectancy at age 20 years between the periods, and by examining the life expectancy lost attributed to HIV/AIDS. Between the periods there was 3.8 ± 3.4 years increase in life expectancy among gay and bisexual men. At exact age 20 years, life expectancy increased from 37.0 ± 3.5 years during the period 1990 to 1992 to 40.8 ± 2.4 years during the period 1995 to 1997. The loss of life expectancy attributed to HIV/AIDS at this age was 13.8 ± 3.9 during the first period and 9.8 ± 3.6 years during the second period. This gain is most likely the result of the improved efficacy of antiretroviral therapies.

ABRÉGÉ

L'étude a été faite afin de comparer l'espérance de vie des hommes gais et bisexuels dans le quartier West End de Vancouver (Colombie-Britannique) sur deux périodes. On a calculé les données relatives à la mortalité masculine pour les périodes de 1990 à 1992 et de 1995 à 1997 et on a dérivé les estimations démographiques à partir des recensements de 1991 et de 1996. La proportion de la population masculine de plus de 20 ans que l'on estime être gaie ou bisexuelle a été dérivée d'un sondage téléphonique par échantillons aléatoires. On a évalué les courbes de mortalité en comparant les changements de l'espérance de vie à 20 ans d'une période à l'autre, et en examinant l'espérance de vie perdue pour cause de VIH/sida. Entre les deux périodes, il y a eu augmentation de 3,8 ans (± 3,4 ans) de l'espérance de vie des hommes gais et bisexuels. L'espérance de vie à 20 ans exactement est passée de 37,0 ans (± 3,5 ans) pour la période de 1990 à 1992 à 40,8 ans (± 2,4 ans) pour la période de 1995 à 1997. La perte d'espérance de vie pour cause de VIH/sida à 20 ans était de 13,8 ans (± 3,9 ans) durant la première période, et de 9,8 ans (± 3,6 ans) durant la seconde. Sous toute probabilité, l'augmentation de l'espérance de vie résulte de l'efficacité accrue des thérapies antirétrovirales.

Despite vast improvements in population health that have been achieved over the last several decades, variations in health status across geographical areas and between population sub-groups persist. Such spatial and social variation is characteristic of the incidence of and mortality from HIV/AIDS.[1,2] For example, the highest incidence of HIV/AIDS in Canada occurs in the urban centres of Vancouver, Toronto, and Montreal, and evidence suggests that high rates of mortality attributed to this cause are concentrated within central neighbourhoods and among specific population sub-groups.[3,4] In these cities, HIV/AIDS was the leading cause of potential years of life lost and was responsible for a significant decrease in the life expectancy of males as early as 1992.[3] At this time it was forewarned that as the HIV epidemic evolved, the death rate from AIDS was likely to rise sharply.

As a result of the geographic and social clustering of HIV, certain neighbourhoods have been hardest hit by the HIV/AIDS epidemic. This is true of Vancouver's West End, which is recognized as the home of British Columbia's largest gay community. This area has suffered from one of the highest HIV/AIDS mortality rates in Canada.[4] In recent years, however, new antiretroviral therapies have provided a great deal of hope to those suffering from HIV infection. New anti-HIV regimens have proven extremely effective in improving CD4 cell counts and decreasing plasma viral load, and significant declines in AIDS-related mortality have been documented among persons on antiretroviral therapy.[5,6]

The present study was undertaken to determine the impact of HIV/AIDS on the life expectancy of gay and bisexual males who reside in the West End of Vancouver, British Columbia during two time periods. Over time we have attempted to determine how advances in, and the expanded availability of, highly active antiretroviral therapy has impacted the life expectancy of gay and bisexual males in this neighbourhood. Restricting our analyses to the West End enabled us to evaluate the life expectancy in an area where the HIV prevalence is extremely high, and where antiretroviral therapy is very accessible and highly utilized by persons with HIV.

METHODS

All-cause and HIV/AIDS mortality data in five-year age groupings for the West End were obtained from the British Columbia Division of Vital Statistics.[7] Non-HIV deaths were distributed according to the proportion of the total population aged 20 years and over estimated to be gay and bisexual men. Previous analyses have suggested that gay and bisexual men account for virtually all male HIV/AIDS-related deaths among residents of the West End, and we attributed all male HIV/AIDS deaths to this group.[4] In addition, population estimates for the West End were acquired from the 1991 and

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1996 Census conducted by Statistics Canada.[8]

The population of gay and bisexual males who reside in the West End was determined from a random telephone survey of over 3,000 West End residents. This survey was conducted between April 8 and July 11, 1998, and elicited information on the health and socioeconomic status of persons who identified themselves as gay or bisexual. The survey also asked respondents their HIV status and experience with antiretrovirals. The number of gay and bisexual males in the West End was estimated by projecting the proportion of gay and bisexual respondents onto the neighbourhood's population during the periods 1990 to 1992 and 1995 to 1997. Since their have been no estimates of the gay and bisexual populations prior to our analysis, we assumed that the proportion of male West End residents over 20 years of age who are gay and bisexual did not vary significantly between the study periods.

A number of measures were used to assess the health status of males over two time periods. Over the periods 1990 to 1992 and 1995 to 1997, we calculated age-specific patterns of death in five-year age groupings for all causes and deaths specifically attributable to HIV/AIDS. In addition, we estimated the life expectancy and life expectancy lost due to HIV/AIDS at 20 years of age by constructing cause-eliminated life tables using standard demographic techniques.[9-11] In a life table, the expectation of life at an exact age measures the average number of years that will be lived by a person after that age according to mortality rates for all causes combined prevailing in a given period. In our analyses we calculated the life expectancy at age 20, so our life expectancy values reflect the life expectancy of 20-year-old gay and bisexual males. Cause-eliminated tables were designed to measure the impact of removing deaths attributable to HIV/AIDS on life expectancy at birth. The difference between life expectancy with HIV/AIDS deaths included and life expectancy with these deaths removed represents the life expectancy lost due to mortality attributable to this specific cause from age 20 to the end of life. Due to the small population size, we have chosen to report standard errors around all life expectancy values.

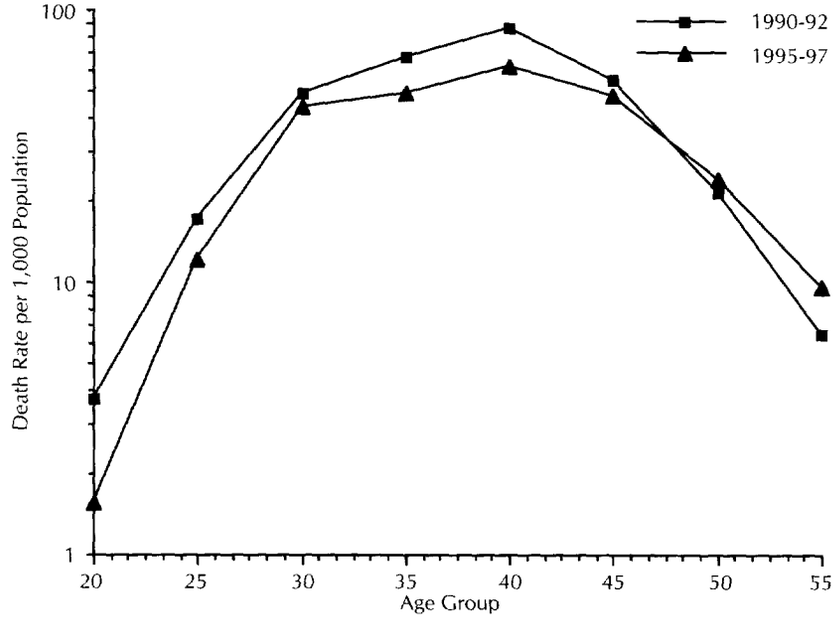

Figure 1. The differences in age-specific death rates for West End males over the periods 1990 to 1992 and 1995 to 1997.

TABLE I
Life Expectancy Among Gay and Bisexual Males in the West End

Time Period	Gay/Bisexual Population	Total Deaths	HIV/AIDS Deaths	Life Expectancy at 20 Years*	Life Expectancy Lost Due to HIV/AIDS*
1990-1992	4,600	737	205	37.0 ± 3.5	13.8 ± 3.9
1995-1997	5,100	750	155	40.8 ± 2.4	9.8 ± 3.6

* Including standard error.

RESULTS

The 1991 census population of the West End was 20,030 of which we estimated 4,600 were gay and bisexual men. The 1996 census population was 23,795 of which we estimated 5,100 were gay and bisexual men. Eighty-three percent of HIV-positive gay and bisexual survey respondents reported being on antiretroviral therapy. Vital Statistics data indicate that over the period 1990 to 1992, there were 737 deaths among males 20 years and over, of which 205 were attributed to HIV/AIDS. Over the period 1995 to 1997, there were 750 deaths among males 20 years and over, of which 155 were attributed to HIV/AIDS. The crude death rate among males in the West End declined from 25.1 deaths per 1,000 population during the first period to 19.4 during the second period.

The age-specific death rates in five-year age groupings for both periods are shown in Figure 1. As shown here, the death rate among males over 20 years of age was higher during the 1990 to 1992 period for almost every age group. The death rate in the 45 to 49 year age group was 38.0 deaths per 1,000 during the first period compared to only 26.0 deaths per 1,000 in the same age group during the second period. The death rate remained slightly higher in the 50 to 55 year age group during the second period, however, there were fewer deaths due to HIV during this time, and the higher death rate during the second period is due to causes of death other than HIV.

The life expectancy and the life expectancy lost attributable to HIV/AIDS for both time periods are shown in Table I. As shown here, the life expectancy among gay and bisexual males at exact age 20 improved from 37.0 ± 3.5 years during the period 1990 to 1992 to 40.8 ± 2.4 years during the period 1995 to 1997. In addition, the life expectancy lost attributable to HIV/AIDS decreased from 13.8 ± 3.9 during the first period to 9.8 ± 3.6 during the second period.

DISCUSSION

Our analyses indicate that between the periods 1990 to 1992 and 1995 to 1997, the crude death rate among males in the West End decreased from 25.1 to 19.4 deaths per 1,000 population. Correspondingly there was a notable increase in the life expectancy of gay and bisexual men between these periods. At exact age 20 years, life expectancy increased from 37.0 ± 3.5 years over the first period to 40.8 ± 2.4 years over the second period. A large decrease in life expectancy lost due to HIV/AIDS contributed to this, with the loss of life expectancy attributed to HIV/AIDS at age 20 dropping from 13.8 ± 3.9 years to 9.8 ± 3.6 years between the study periods.

Although the nature of our study only enables us to show an ecological association, there are three factors that may help to explain our findings. First, the life-extending benefits of modern antiretroviral therapies are very well documented among persons with HIV in British Columbia, and 83% of HIV-positive men surveyed reported being on antiretroviral therapy.[5,6] Second, the potential that exists for these benefits to accrue to the West End population is enhanced by the fact that there is a very high level of awareness about anti-HIV care in Vancouver's West End. In this neighbourhood, there are a number of services that serve as resources for persons with HIV disease, including community-based AIDS service organizations, treatment information resources, peer and social support, housing, and complementary therapists. Previous studies have estimated the HIV-seropositivity of West End gay and bisexual males to be 15.7%, and that 83% of HIV-positive men are on antiretroviral therapy.[12] Undoubtedly, other areas of the province may not have the same levels of awareness about antiretroviral therapy or the same wealth of support services.

Third, gay and bisexual men in the West End live in proximity to a large tertiary AIDS Care Centre, St. Paul's Hospital, that is responsible for providing in-hospital and outpatient care. As a result of this proximity, persons with HIV that live in the West End have access to some of the most experienced HIV physicians and nurses in the province, and may have enhanced access to new treatment options and clinical trials. Persons that reside elsewhere in the province may not be receiving the same quality of specialized health care. For example, recent analyses have shown that persons who reside in certain neighbourhoods in the Vancouver metropolitan area, outside of the West End, are less likely to be on a drug combination recommended by the BC Centre for Excellence in HIV/AIDS' therapeutic guidelines.[13]

Unfortunately, despite the improvements in life expectancy that we have shown over the study period, the life expectancy among gay and bisexual males in this neighbourhood still remains very low. In 1992 the life expectancy for British Columbian males at age 20 was 56.3 years, whereas West End gay male life expectancy at 20 years of age during the first period was only 37.0 ± 3.5 years.[14] Obviously the gain in life expectancy which we have documented has only amended a fraction of the life expectancy disparity between the West End gay and bisexual and British Columbian males. Furthermore, it is important to note that the gains in life expectancy that have been documented in the West End may not be generalizable to other Canadian settings. Access to antiretroviral therapy and HIV care differs considerably by province. Thus, in provinces where the antiretroviral therapy and HIV care remain out of reach, mortality rates will likely continue to rise.

Caution is always warranted when data from death registration systems are used, especially in a study of HIV/AIDS.[3] Although our analysis indicates that antiretroviral therapy has reduced mortality from HIV/AIDS, the disease's influence on life expectancy during both time periods may have been greater than we have reported. It is well recognized that AIDS-related deaths are under-reported by death registration systems, particularly with respect to underlying or antecedent causes of death.[15-18] This implies that the influence of HIV/AIDS on life expectancy in the West End may be greater than our analysis indicates during both time periods. It is worth noting that improving HIV/AIDS death reporting has received a great deal of attention in recent years. Although it is purely speculative, we believe that the bias that under-reporting introduces into our analyses has most likely dampened our findings, especially when you consider that death registration of HIV deaths has likely improved over time. In addition, using one survey to provide an estimate of the population during both time periods could have resulted in a small under- or over-estimate of the population at risk. However, there is no evidence to suggest that the proportion of the population that is gay or bisexual has varied significantly between the study periods and in the absence of an earlier survey, estimation was necessary.

In summary, this study demonstrates a substantial increase in the life expectancy of gay and bisexual males who reside in Vancouver's West End. We believe that this decline is likely attributable to greater access to highly specialized health care and antiretroviral drugs among those infected. Sadly, despite the gains that we have found, the life expectancy among gay and bisexual males in the West End remains low. Furthermore, we feel it is unlikely that we can generalize our findings to other settings. In fact, unless antiretroviral therapy becomes universally available in this country, there may be settings or provinces where HIV/AIDS could still continue to have a large impact on life expectancy.

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