CARDIOVASCULAR DISEASE MORTALITY AMONG HIV-INFECTED PERSONS, NEW YORK CITY, 2001-2012

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David B. Hanna[1], Chitra Ramaswamy[2], Robert C. Kaplan[1], Jorge R. Kizer[1], Regina Zimmerman[2], Sarah L. Braunstein[2]
[1]Albert Einstein College of Medicine, Bronx, NY, USA and [2]New York City Department of Health and Mental Hygiene, Long Island City, NY, USA

BACKGROUND

- Cardiovascular disease (CVD) has become more prominent among HIV-infected individuals owing to improved survival, traditional CVD risk factors, and potential effects of antiretroviral therapy (ART)
- The extent to which CVD mortality rates are changing is unclear but has continued relevance in the context of current ART guidelines

METHODS

Study population

- The **New York City HIV Surveillance Registry** is a population-based registry of people diagnosed with HIV infection and reported by law to the New York City Department of Health and Mental Hygiene (DOHMH)

Inclusion criteria

- All persons age 13+ diagnosed with HIV infection and reported to the HIV Surveillance Registry, and at risk for death between 2001 and 2012

Statistical analysis

- Surveillance data were linked with the city's **Vital Statistics Registry** and the **National Death Index**
- We examined age-specific and age-standardized rates of mortality due to major cardiovascular diseases (ICD-10 codes I00-I78) as the underlying cause of death
  - 2000 U.S. Standard Population used for standardization
- Using log-linear models, we determined time trends in mortality rates among **HIV-diagnosed New Yorkers**, and compared them with trends among New Yorkers not diagnosed with HIV **(the "general population")**
  - General population derived from Vital Statistics and Census data after excluding HIV-diagnosed by population strata
- Analyses by HIV RNA level began in 2006, the first complete year of comprehensive viral load reporting
  - Used the most recent test result reported in each year

RESULTS

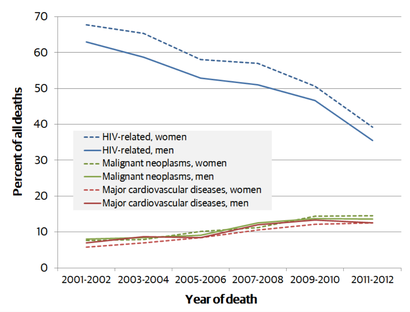
Study population characteristics (N=145,009)

- 71% male, 29% female; median age: 49 years (IQR 41-56)
- 46% of men reported sex with men as HIV transmission factor; 75% of women reported heterosexual transmission or unknown risk

CVD mortality among HIV-diagnosed individuals

- 29,326 deaths occurred, with annual declines due mainly to fewer HIV-related deaths (Fig. 1)
- CVD deaths increased from 7% to 13% of all deaths among HIV-diagnosed individuals (p<0.001)
  - In contrast, CVD deaths in the general population decreased from 47% to 39% (p<0.001)
- Specific causes included chronic ischemic heart disease (42%), hypertensive diseases (27%), stroke (10%)

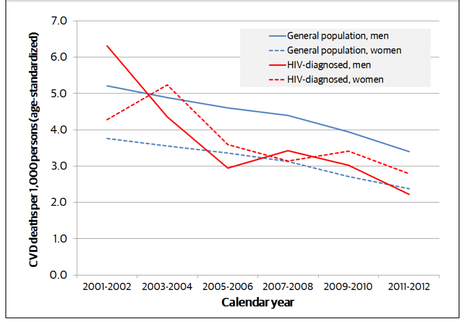
Figure 1. Leading underlying causes of death for HIV-diagnosed New Yorkers, by proportion



CVD mortality rates compared with the general population

- CVD mortality rate decreased over time regardless of HIV diagnosis status or sex (Fig. 2)
- Overall, the age-standardized CVD mortality rate was lower among HIV-diagnosed (3.24/1,000, 95% CI 2.97-3.51) than those not diagnosed with HIV (3.65, 95% CI 3.64-3.67)
- After adjustment for age, sex, race/ethnicity, borough, and year, HIV was associated with a 54% **increased** rate of CVD death (RR 1.54, 95% CI 1.47-1.62)

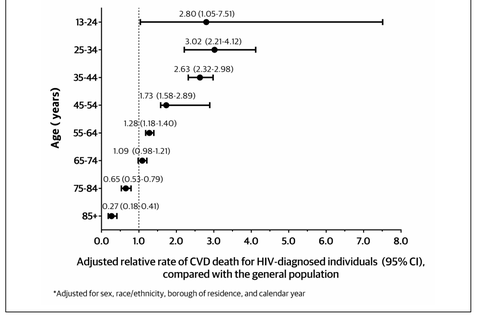
Figure 2. Age-standardized CVD mortality rate, by HIV diagnosis status and sex



Age-stratified comparison of CVD mortality rates with the general population

- HIV-diagnosed individuals had significantly higher CVD mortality than the general population through age 65, after which CVD mortality was similar or higher in the general population (Fig. 3)
  - For example, among those 45-54 years old, HIV-diagnosed individuals had a 73% increased rate of CVD death compared with the general population (adjusted RR 1.73, 95% CI 1.58-1.89)

Figure 3. Adjusted* relative rate of CVD death for HIV-diagnosed New Yorkers, by age



CVD mortality rates by HIV diagnosis status and RNA level, 2007-2012

- CVD mortality was lower among HIV-diagnosed individuals with a suppressed HIV RNA level (<400 copies/mL) versus an unsuppressed level (age-standardized rate 3.9 vs. 7.7/1,000, p<0.001)
  - However, both rates were still higher than among the general population (3.2/1,000, 95% CI 3.20-3.22) during this time period

CONCLUSIONS

- CVD deaths constitute an increasing share of deaths among HIV-diagnosed persons
- While CVD mortality rates decreased over the decade, both viremic and virologically suppressed HIV-diagnosed individuals had higher CVD mortality rates than the general population until age 65
- HIV care providers should emphasize preventive measures to reduce CVD risk such as **smoking cessation**, **blood pressure control**, and **lipid management**

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