

Racial/Ethnic Disparities in HIV Survival Among People Diagnosed with HIV in Arizona, 1998-2012

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Abstract

We described the racial/ethnic disparities in survival among people diagnosed with HIV in Arizona from 1998 to 2012. We determined whether these disparities widened when adjusting for AIDS diagnosis, age at diagnosis, year of diagnosis, and gender.

All cause survival was compared between Whites and Blacks, Hispanics, Native Americans, Asians, and Multiple/Other races via Kaplan-Meier survival curves and Cox proportional hazard models controlling for various clinical factors.

Multiple/Other races (1.85), Native Americans (1.28), and Blacks (1.19) had statistically significant higher hazard ratios in all-cause mortality than Whites. When adjusting for AIDS diagnosis, these disparities widened.

Racial/ethnic minorities with HIV, specifically Black, Native Americans, and Multiple races, have significantly decreased overall survival. Those with an AIDS-defining condition have even worse survival. Further studies and resources could help identify the cause of these disparities and help generate a solution to diminish the survival gap.

Introduction

Human immunodeficiency virus (HIV) infects 50,000 individuals each year in the United States, and it is estimated that over one million individuals are currently living with HIV.

While HIV has been the subject of much research interest, studies on HIV survival are limited as accurately known infection dates and other mortality data were difficult to obtain during the initial height of the HIV epidemic in the late 1980s. With the advent of highly active antiretroviral therapy (HAART), HIV survival has greatly improved with near normal life expectancy.

Very few studies have analyzed survival rates by race/ethnicity. This is telling since racial/ethnic disparities do exist in HIV epidemiology. According to the CDC, in 2011, 46% of newly HIV-infected individuals were African American and 20% were Hispanic/Latino. A study investigating disparities in HIV survival in Arizona would prove valuable to the state's HIV preventive, educational, and treatment efforts, as well as help generate awareness for strategies and resources to better serve ethnic minorities.

Methods

This analysis used available HIV/AIDS surveillance data from the Arizona Department of Health Services (ADHS) annual data reports. All Arizona residents with a confirmatory HIV-positive test and who were reported to the Arizona Department of Health Services HIV Epidemiology Program from 1998-2012 were included in the study. The dependent variable of interest was the number of years alive with HIV. In order to determine this, the date of diagnosis was subtracted from the date of death (or Dec 31, 2012 if still living).

The racial ethnic survival disparities were tested with the Cox proportional hazard model method using the SAS 9.3 proc phreg procedure. This function was used to graph Kaplan-Meier Curves.

Four different models were used in our analysis. Model 1 analyzed HIV survival by race/ethnicity, using Whites as the reference group. Model 2 analyzed HIV survival by race/ethnicity among the entire cohort as well, but adjusted for age at diagnosis, diagnosis year, and gender. Model 3 analyzed HIV survival by race/ethnicity among those with HIV only (non-AIDS) and adjusted for the same 3 covariates. Finally, model 4 analyzed HIV survival by race/ethnicity among those with AIDS and adjusted for the same 3 covariates.

Results

There were 10,283 records of people diagnosed and reported with HIV between January 1, 1998 and December 31, 2012 to the Arizona Department of Health Services. Of these, 1,201 (11.7%) were excluded because of missing data leaving a final cohort of 9,082 HIV-positive individuals.

Multiple/Other races (1.85), Native Americans (1.28), and Blacks (1.19) had higher hazard ratios in HIV-related mortality than Whites (reference group) with statistical significance. When considering those meeting AIDS diagnosis, the racial/ethnic disparities widened [Blacks (1.43), Hispanics (1.22), Native Americans (1.44), Multiple/Other races (2.53)].

Kaplan-Meier survival curves to the right (Figures 1 and 2) visualize these data. Both figures show that with the exception of Asians, Whites had the greatest survival.

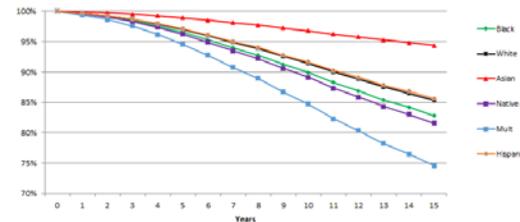


Figure 1. Kaplan-Meier Survival Curves for entire HIV/AIDS cohort, by race/ethnicity.

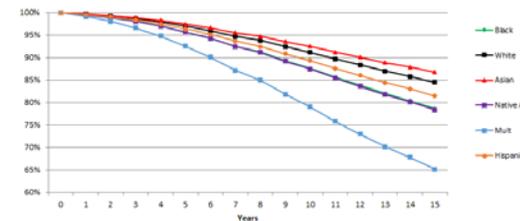


Figure 2. Kaplan-Meier Survival Curves for patients with AIDS defining condition, by race/ethnicity.

Race/Ethnicity (Ref = White)	HIV/AIDS		AIDS only	
	HR	P-value	HR	P-value
Black	1.19	0.0415	1.43	<0.0001
Hispanic	0.98	0.6808	1.22	0.0039
American Indian	1.28	0.0290	1.44	0.0025
Multiple	1.85	0.0031	2.53	<0.0001
Asian	0.37	0.0080	0.84	0.6538

Table 1. Hazard ratios (HR) and P-values for HIV survival, by race/ethnicity with Whites serving as the reference group. Analyzed in both the entire HIV/AIDS cohort and in the AIDS-only cohort. Controlled for age at diagnosis, gender, and diagnosis year.

Discussion and Conclusions

There are two principal findings from this study: racial/ethnic disparities, particularly between Whites and Blacks/Hispanics/Native Americans/Multiple races, exist in all-cause survival among those diagnosed with HIV/AIDS in the past 15 years, and the largest disparities are seen among AIDS-specific patients.

The first principal finding can be explained by various factors, including higher nadir CD4 count, higher median CD4 count, and fewer IDU in Whites than all other races/ethnicities studied besides Asians. Additional reason could be factors such as perceived racial/ethnic discrimination, discrimination by providers, distrust in providers, certain beliefs about or lack of knowledge of HIV discouraging adherence, and less access to care.

The second principal finding can be explained by similar factors as mentioned above. However, there may be a larger effect from a lack of access to care and adherence, which are strongly tied to socioeconomic factors. Pre-HAART, one would expect people to progress to AIDS due to a lack of effective treatment. However, in a post-HAART time period such as the one in this study, those that have progressed to AIDS are likely to be a group of people with less access to care or difficulty with adherence.

Limitations of this study include the incompleteness of the 2012 ADHS death data at the time of analysis. This was limited to a minimal number of cases, but still should be noted. Also, there was some difficulty trying to create a standardized definition of what an HIV-associated death is based on over 900 ICD-09 codes that can be attributed to cause of death. We may have underreported the actual number of HIV-associated deaths. Finally, this study does not explain why these disparities exist. The reasons are likely multi-factorial, but further studies are necessary to ascertain this.

Acknowledgements

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