Increase in out-migration in persons reported with AIDS in New York City since the introduction of HAART



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Introduction

- Survival and quality of life continue to improve for persons living with HIV/AIDS (PLWHA) since the introduction of highly active antiretroviral therapy (HAART), creating greater opportunities for migration
- However, out-migration among PLWHA creates challenges to surveillance systems in accurately measuring HIV/AIDS prevalence in a given area
- We assessed trends in out-of-state deaths occurring 1990-2004 among persons reported with AIDS in New York City (NYC), to:
 - better understand out-migration patterns among PLWHA in the era of HAART
 - inform strategies to improve the capture of out-migration patterns by surveillance systems

Methods

- The New York City HIV/AIDS Surveillance Registry records deaths of all persons reported with HIV/AIDS in NYC based on periodic matches with the local Vital Statistics registry and the National Death Index
- We determined the annual percentage of all deaths among persons with AIDS occurring out-of-state from 1990-2004, as a marker of out-migration, based on data reported through September 30, 2007
- We compared differences in characteristics of persons who died in-state versus out-of-state in the current HAART era (1999-2004)
- We assessed regional differences among out-of-state deaths before and after the introduction of HAART
- Analyses in SAS 9.1 (SAS Institute, Cary, NC) were limited to persons with AIDS because HIV reporting was implemented in NYC in 2000

Results

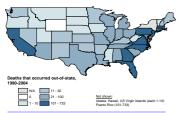
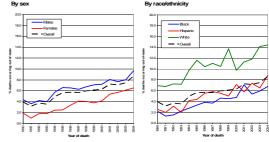


Figure 1. Deaths to persons reported with AIDS in New York City that occurred out-of-state, 1990-2004. Between 1990 and 2004, 70,921 deaths were recorded among persons reported in NYC with AIDS; 3,620 of these occurred outside New York State (5.1%), especially New Jersey (N=733), Florida (N=534), and Puerto Rico (N=401).

	%, New York	%, Outside	
l	State or	New York	
	unknown	State	
	(N=14,336)	(N=1,094)	
Sex			
Male	68.8	77.4	
Female	31.2	22.6	
Race/ethnicity			
Black	52.2	41.3	
Hispanic	32.1	30.3	
White	14.8	27.8	
Asian/Pacific Islander	0.6	0.4	
Other/Unknown	0.2	0.3	
Median age (years)	46	45	
Transmission risk			
Men who have sex with men	14.3	30.2	
Injection drug use history	47.7	36.8	
Heterosexual	14.0	10.9	
Perinatal	0.7	0.9	
Other/Unknown	23.4	21.2	
Median years since AIDS			
diagnosis	3.9	5.2	
Cause of death			
HIV-related	73.4	67.4	
Non-HIV-related	23.7	27.7	
Cause unknown	2.9	4.9	

Table 1. Characteristics of deaths to persons reported with AIDS in New York City, 1999-2004, by state of death. In the current HAART era, out-of-state deaths were more likely to be male, white, younger, men who have sex with men, have lived with AIDS longer, and have died of non-HIV-related causes compared with in-state deaths (all p<0.001).



by age at death

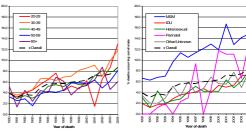


Figure 2. Percent of deaths to persons reported with AIDS in New York City that occurred out-of-state, 1990-2004. The annual proportion of deaths that occurred out-of-state more than doubled, from 3.9% in 1990 to 8.7% in 2004 (p trend-0.0001). Increases in out-of-state deaths were consistent across population subgroups.

	%, 1990-1995	%, 1996-1998	%, 1999-2004	%, 1990-2004
US region	(N=1,820)	(N=706)	(N=1,094)	(N=3,620)
Northeast	36.4	31.4	34.6	34.9
South	35.5	40.1	41.6	38.2
Midwest	7.3	5.8	5.6	6.5
West	10.6	7.8	8.1	9.3
Caribbean	10.2	14.9	10.1	11.1

Table 2. Percent of all out-of-state deaths among persons reported with AIDS in New York City, 1999-2004, by year of death.

Persons with AIDS who died out-of-state increasingly migrated to the South more than other areas (32% in 1990 to 43% in 2004, p trend<0.001)

Limitations

 Out-of-state deaths were used as an extreme proxy for out-migration, since only limited information on out-migration prior to death was available Among deaths occurring in New York State identified through the NDI, we could not distinguish between those occurring in NYC versus those occurring upstate

Conclusions

- We demonstrated a consistent increase in out-migration among persons with AIDS since the widespread availability of HAART, based on mortality data
 - This is the first known description of this phenomenon in a US city
- Out-migration appears to be most common among MSM and among whites, and the respective gaps widen over time
 - Socioeconomic advantage when coupled with longer life expectancy may increase geographic mobility
- Overestimation of local disease prevalence may occur as the epidemic matures and treatment improves, unless steps are taken to measure out-migration
- In the US, HIV/AIDS surveillance systems should better capture out-migration patterns (especially prior to death) in order to improve the accuracy of prevalence estimates by:
 - Participating in the CDC's Routine Interstate Duplicate Review (RIDR) process with other jurisdictions
 - Conducting death matches with the National Death
 Index and Social Security Death Master File to
 - ascertain vital status of those who migrate out
 3. Improving epidemiologic monitoring of reported cases to assess loss to follow-up, such as linking all received CD4 and viral load tests to existing cases