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Title: Aging with HIV – An Epidemiological Profile of Persons with Diagnosed HIV Aged 50 Years and Older in New York State, 2012-2021

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Background:

Advanced antiretroviral treatment has led to a growing population of older persons with HIV. To understand the characteristics of persons aging with HIV, this analysis examines epidemiological profiles of persons with diagnosed HIV through 2021 aged 50 and older in New York State.

Methods:

Persons diagnosed with HIV and reported to the NYS HIV registry by December 31, 2021 were included in the analysis. Characteristics of persons aged 50 years and older were compared to persons aged less than 50 years.

Results:

Persons diagnosed with HIV and aged 50 and older more often reported heterosexual transmission risk and were more often females than individuals diagnosed with HIV under age 50. Among new diagnoses in 2021, persons aged 50 and older were more likely to have a stage 3 HIV diagnosis. By the end of 2021, 57% of persons living with diagnosed HIV were aged 50 and

older. There was an upward trend of deaths with cardiovascular disease as an underlying cause of death among persons aged 50 years and older.

Conclusions:

More females diagnosed with HIV and a higher percent of persons who reported heterosexual transmission risk among persons aged 50 and older suggest a need for enhanced clinician education and sexual health discussions with this adult population. A greater rate of stage 3 HIV diagnoses in persons aged 50 and older emphasizes the need for specialized HIV testing and treatment, care for comorbidities, and social supports for this aging population.

Introduction

With widespread use, and clinical effectiveness and tolerability of antiretroviral therapy (ART), persons with diagnosed HIV are now living longer. The Centers for Disease Control and Prevention (CDC) reports that in 2021 53% of persons with diagnosed HIV in United State (US) and dependent areas were aged 50 years and older.[1] However, even with successful ART, as persons living with HIV age, they face potentially higher rates of comorbidities including frailty and metabolic, cardiovascular, cancer, bone, and neurodegenerative disorders.[2,3] Additionally, there is a difference in comorbidity-free years between persons living with HIV (PLWH) and the general population,[4,5] and the life expectancy of PLWH still lags that of the general population.[6] To understand the relationship of HIV and aging, this analysis examines the characteristics of persons with diagnosed HIV through 2021 and aged 50 years and older in New York State (NYS).

Methods

Data for this analysis were abstracted from the NYS HIV registry, which is comprised of name-based reports of HIV diagnosis and all HIV-related laboratory tests among persons who reside or receive HIV-related care in NYS.

For this analysis, diagnosis was defined as a new diagnosis of HIV with or without a concurrent diagnosis of AIDS. Stage 3 HIV diagnosis was defined as an AIDS diagnosis within 30 days of the initial diagnosis of HIV. Persons diagnosed with HIV in NYS between 2012-2021, persons living with diagnosed HIV (PLWDH) in NYS through December 2021, and persons with diagnosed HIV who died in NYS between 2012-2021 were included in the study. Only PLWDH in December 2020 and alive in December 2021 were included in the care and viral suppression calculations. Receiving care was defined as having a viral load, CD4, or nucleotide sequence test during the year, while retained in care was defined as having two such tests 91 days apart during the year. Viral suppression was defined as a viral load test result of <200 copies/ml.

Demographic characteristics of persons with diagnosed HIV and aged 50 and older were examined and compared to persons with diagnosed HIV aged less than 50 years. Demographic characteristics included sex at birth (male, female), current gender (cisgender man/boy, transgender man/boy, cisgender woman/girl, transgender woman/girl, gender non-confirming/non-binary [NCNB]), race/ethnicity (non-Hispanic Black, non-Hispanic White, Asian/Pacific Islander, Hispanic, Multi-Race, Native American, or Unknown), transmission risk

(history of male-to-male sexual contact (MSM), history of injection drug use (IDU), MSM/IDU, heterosexual contact, blood products, pediatric, and unknown).

NYS HIV registry data were matched to vital statistics death data to obtain the cause of death (COD). COD was defined by ICD-10 codes, categorized into major groups as described previously.[7] Five underlying COD (HIV, cardiovascular, cancer, respiratory, and overdose) were selected for this analysis.

Descriptive analyses were performed separately for persons newly diagnosed with HIV, PLWDH, and deaths among persons with diagnosed HIV. All analyses were conducted using SAS, version 9.4 (SAS Institute).

Results

Persons Diagnosed with HIV

From 2012 to 2021, the number of persons diagnosed with HIV decreased steadily. The declining trend of HIV diagnoses was reflected in both age groups, persons aged 50 years and older and less than 50 years. Among persons diagnosed with HIV, a range of 16% to 20% were aged 50 and older (not shown).

In 2021, there were 2,123 new HIV diagnoses in NYS. Of those, 18% were among persons aged 50 and older. There was a greater percentage of females diagnosed with HIV among persons aged 50 and older compared to persons aged less than 50 (32% vs 15%). A higher proportion of non-Hispanic White and a lower proportion of Hispanic individuals was also observed among persons aged 50 and older newly diagnosed with HIV. All other race/ethnicity groups had similar proportions between the two age groups (Table 1). While nearly 60% of persons diagnosed with HIV aged less than 50 years reported MSM risk in 2021, the proportion was much lower (23%) in the 50 and older age group. Furthermore, the percent of persons with reported heterosexual contact transmission risk or unknown risk was higher among persons aged 50 and older compared to the less than 50 age group. Lastly, over one-third (36%) of new diagnoses among persons aged 50 and older were stage 3 diagnoses, compared to 17% in persons less than 50 years (Table 1). There were similar rates of stage 3 diagnosis among women aged 50 and older compared to men in the same age group (not shown).

Persons Living with Diagnosed HIV (PLWDH)

As of December 31st, 2021, there were 103,900 PLWDH in NYS. Of those, 59,395 (57%) were aged 50 and older. PLWDH aged 50 and older were more often female and non-Hispanic White compared to PLWDH under age 50. Additionally, more PLWDH aged 50 and older reported history of injection drug use or heterosexual contact transmission risk than PLWDH under age 50 (Table 1).

Approximately 5% of PLWDH identified as transgender, gender non-conforming, or non-binary. Of these individuals, less than 1% were aged 50 and older and over 70% of the transgender individuals identified as non-Hispanic Black or Hispanic with transmission risk of MSM or MSM/IDU.

PLWDH aged 50 and older had higher percentages of receiving care (91% vs. 84%) and remaining retained in care (73% vs. 62%) than PLWDH under age 50. PLWDH aged 50 and older also achieved viral suppression more often than PLWDH under age 50 (Table 1).

Deaths Among Persons with Diagnosed with HIV

The total number of deaths among persons with diagnosed HIV from all causes did not change substantially from 2012-2019[8]. There was an increase in deaths in 2020 and 2021, most likely related to COVID-19. From 2012-2021, an increasing number of deaths was observed among persons aged 50 and older, along with a growing median age at death. The median age at death in persons diagnosed with HIV aged 50 and older increased from 58 years in 2012 to 63 years in 2021 (Figure 1).

Over one-third (35%) of deaths among persons with diagnosed HIV aged 50 and older had a COD of HIV in 2012, which decreased to 23% in 2019. During this same time, an increasing percentage of cardiovascular COD was observed from 15% to 25%. Cancer, respiratory, and overdose COD remained stable over this time period. Starting in 2020, COVID-19 accounted for 20% of deaths and dropped to 9% of deaths 2021. During these two years, there was a decreased

percentage of COD related to HIV, cardiovascular, cancer and respiratory diseases, however, deaths related to overdose increased (not shown).

Discussion

With advancements in treatment options for PLWDH, more older persons are living with diagnosed HIV now than in the past. In NYS, 57% of PLWDH were aged 50 and older as of December 31st, 2021, and 18% of new diagnoses in 2021 were among persons aged 50 and older. A high rate of stage 3 HIV diagnosis among persons aged 50 and older indicate that older persons are less likely than younger persons to get tested for HIV. Health care professionals might not always recommend HIV testing for older persons with the assumption that older persons are not sexually active and are less at risk of contracting HIV. On the contrary, we found a high percentage of persons aged 50 and older reporting sexual contact as a possible mode of transmission upon HIV diagnosis. In addition, the large percentage of stage 3 diagnosis in this age group may be due to not having access to health facilities and services, or receiving treatment and care for other co-morbidities and not suspecting or testing for HIV. However, late HIV diagnosis can impair the health of the person. Late diagnosis and many years of untreated HIV can severely damage the immune system and make full recovery after treatment impossible, further decreasing a person's longevity.[9-10] It is important to address such stigmatizing factors to provide early HIV testing and to promote sexual health among this population.

In NYS, PLWDH aged 50 and older have higher rates of accessing care and obtaining viral suppression than their younger counterparts. Nonetheless, even when HIV is well controlled,

HIV and HIV-related treatments can cause other health conditions and shorten life expectancy. Studies have shown that HIV can accelerate aging in HIV seroconverters[11], persons with HIV may be aging at a faster rate,[12-13] older persons with HIV may have higher levels of multimorbidity compared with persons of similar age without HIV,[2-5] and persons with HIV have a higher mortality rate than those of the HIV free population.[14-18] The result of a growing trend of cardiovascular COD among persons diagnosed with HIV and aged 50 and older from our analysis supports previous finding of an increased risk of aging-associated diseases in PLWDH.[19] Despite the difference in the age distribution, our analysis showed a lower median age at death in PLWDH who aged 50 and older than that of individuals of all ages without HIV (64.9 years).[5] It is crucial to appropriately equip our health care system to meet the needs of the growing population of older persons with HIV, by integrating aging services, HIV prevention and care services, and social support systems.

Our analysis exhibited that the percentage of deaths with HIV as an underlying COD continued to decrease, even in the years of the COVID-19 pandemic (2020-2021), which is consistent with previous analyses.[7] The higher number of deaths in 2020 and 2021 during the COVID-19 pandemic reflected the vulnerability of persons living with HIV to COVID-19.[20] Due to the NYS Ending the AIDS Epidemic (ETE) initiative, which focuses on identifying persons with HIV who remain undiagnosed and linking and retaining them to health care to maximize virus suppression and to prevent further transmission,[21] persons diagnosed with HIV and aged 50 and older achieved higher rates of linking to care and viral suppression in NYS. Vast improvements have been made in NYS progressing from 69% of persons linked to care within 30 days of diagnosis

in 2013 to over 80% by 2021. Additionally, 66% of PLWDH were virally suppressed in 2013, while in recent years, over 75% of PLWDH have achieved viral suppression.[21]

The efficacy of ART and successes of healthcare have changed the course of the HIV epidemic. While there is a steady rate of HIV acquisition among older adults, young persons who acquire HIV are surviving and aging, which adds to a growing population of older persons with HIV. The complexity of HIV, aging, and co-morbidities brings a new frontier to explore to adapt to these changes in HIV testing, treatment, and prevention.

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Figure 1. Deaths among Persons with Diagnosed HIV by Age Group and Median Age at Death for Persons aged 50 and Older, New York State, 2012-2021

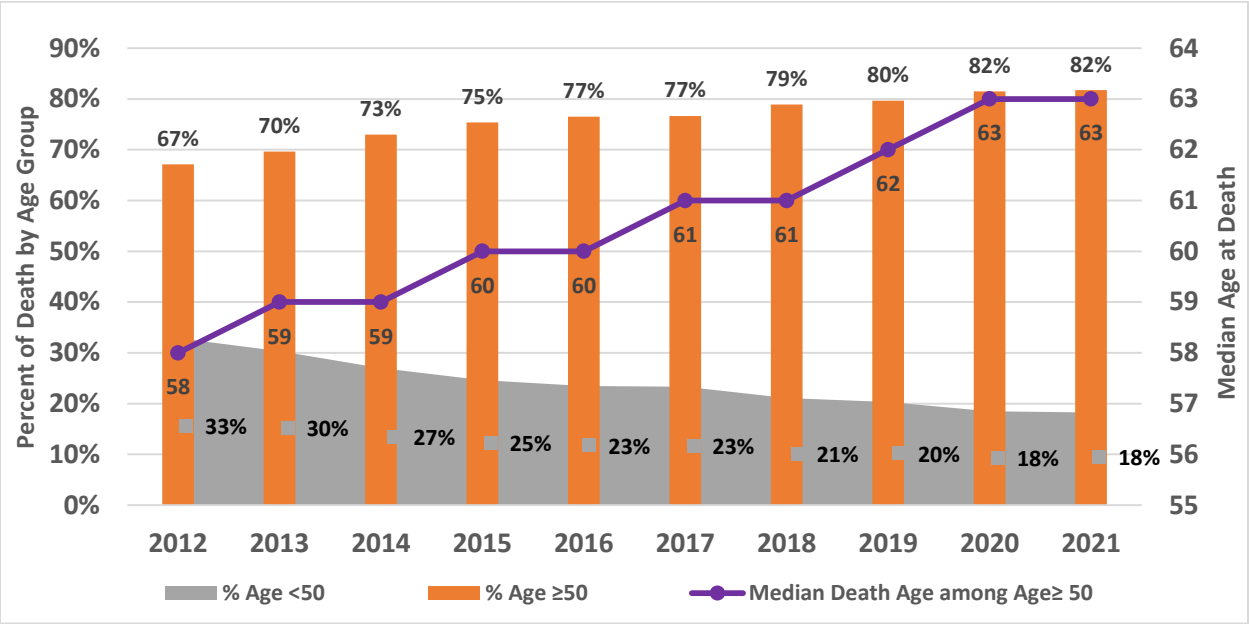

Table 1. Demographics and Care Outcomes for Persons with Diagnosed HIV, by Age ≥ 50 and Age < 50, New York State, 2021

	New Diagnoses in 2021		PLWDH at the end of 2021	
	Age ≥ 50 n (%)	Age < 50	Age ≥ 50	Age < 50
Total	380 (18%)	1,743 (82%)	59,395 (57%*)	44,505 (43%*)
Sex at Birth				
Male	259 (68%)	1,481 (85%)	40,532 (68%)	34,633 (78%)
Female	121(32%)	262 (15%)	18,863 (32%)	9,872 (22%)
Current Gender				
Gender non-Confirming/non-Binary	1 (0%)	7 (0%)	27 (0%)	114 (0%)
Cisgender Man/Boy	255 (67%)	1,411 (81%)	40,032 (67%)	32,761 (74%)
Transgender Man/Boy	0 (0%)	5 (0%)	479 (1%)	1,769 (4%)
Cisgender Woman/Girl	121 (32%)	255 (15%)	18,844 (32%)	9,817 (22%)
Transgender Woman/Girl	3 (1%)	65 (4%)	13 (0%)	44 (0%)
Race/Ethnicity				
Non-Hispanic White	94 (25%)	327 (19%)	15,385 (26%)	8,302 (19%)

			26,168	20,553
Non-Hispanic Black	172 (45%)	730 (42%)	(44%)	(46%)
			16,304	13,581
Hispanic	99 (26%)	574 (33%)	(28%)	(31%)
Asian	13 (3%)	89 (5%)	1,071 (2%)	1,522 (3%)
Hawaiian/Pacific Islander	0 (0%)	4 (0%)	48 (0%)	63 (0%)
Native American	0 (0%)	4 (0%)	102 (0%)	93 (0%)
Multi-Race	2 (0%)	15 (1%)	246 (0%)	375 (1%)
Unknown	0 (0%)	0 (0%)	71 (0%)	16 (0%)
Transmission Risk				
			20,933	26,292
Male-to-Male Sexual contact (MSM)	89 (23%)	1,016 (58%)	(35%)	(59%)
Injection Drug Use (IDU)	13 (3%)	29 (2%)	8,818 (15%)	1,140 (3%)
MSM/IDU	4 (1%)	40 (2%)	2,859 (5%)	1,644 (4%)
			19,396	
Heterosexual	127 (33%)	298 (17%)	(33%)	9,775 (22%)
Blood	0 (0%)	0 (0%)	134 (0%)	16 (0%)
Pediatric	0 (0%)	3 (0%)	5 (0%)	1,993 (5%)
Unknown	147 (39%)	357 (20%)	7,250 (12%)	3,645 (8%)
Stage 3 Diagnosis	137 (36%)	299 (17%)	-	-
Care & Viral Suppression			-	-
All	-	-	58,338**	41,173**
Any Care†	-	-	53,178	34,429

			(91%)	(84%)
Retained in Care (≥2 tests, ≥91 days apart)	-	-	42,594 (73%)	25,508 (62%)
≥1 VL Test during The Year	-	-	52,533 (90%)	33,955 (82%)
Virally Suppressed at Test Closest to End-of-Year‡	-	-	48,205 (92%)	29,437 (87%)

** Of total PLWDH*

***PLWDH in Dec. 2020 and Alive in Dec. 2021*

†Any viral load, CD4, or nucleotide sequence test during the year

‡Last viral load test of the year was undetectable or <200 copies/ml