Comparing Clinical Outcomes of Persons Living with HIV who have and have not been Enrolled in a Large Longitudinal HIV Cohort Study, Washington, DC

Jenevieve Opoku[1], Rupali Doshi[1,2], Amanda D. Castel[2], Ian Sorensen[2], Michael A. Horberg[3], Adam Allston[1], Alan E. Greenberg[2], Michael Kharfen[1], on behalf of the DC Cohort Executive Committee

[1]Government of the District of Columbia Department of Health, HIV/AIDS, Hepatitis, STD, and TB Administration, [2]Milken Institute School of Public Health, Department of Epidemiology and Biostatistics, [3] Kaiser Permanente Mid-Atlantic Permanente Research Institute

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Background

- Cohort studies have been shown to be a tool in assessing health outcomes among populations.
- Subjects may participate in studies based on benefits of participation or may decline participation due to obstacles such as HIV stigma.
- The generalizability and representativeness of Cohort findings hinges upon the assumption that participants accurately represent the population from which they were drawn.

Objectives

- Determine whether DC Cohort participants are a representative city-wide sample of the overall HIV-infected community in DC.

Methods

- The DC Cohort study is a prospective, longitudinal observational study examining the clinical treatment of HIV-infected patients receiving HIV care in the District of Columbia; persons living with HIV who had consented to participate in the DC Cohort and were living in DC by December 31, 2016 were included.
- Surveillance data from the enhanced HIV/AIDS Reporting System (eHARS), the DC Public Health Information System (DCPHIS), and the Hepatitis surveillance were extracted; HIV cases diagnosed and living in DC through 2016 and alive in 2017, STIs (Chlamydia gonorrhea, and Primary & Secondary & early latent syphilis) and Hepatitis (HBV and HCV) diagnosed between 2011 and 2016 were included in this analysis.
- Surveillance and DC Cohort study data were matched using an 11-key algorithm that included first name, last name, date of birth and social security number; PLWH who did not match to the DC Cohort study were classified as non-DC Cohort participants
- Univariate analysis was performed to identify differences by demographics, HIV disease stage, receipt of HIV care, HIV viral suppression, and time to HIV viral suppression between the DC Cohort and reported surveillance cases of PLWH.
- Adjusted Odds Ratios (aOR), adjusting for demographics, time since HIV diagnosis and mode of HIV transmission were calculated to assess correlates of health outcomes between DC Cohort and non-cohort participants.

Results

Table 1. Demographic characteristics of DC Cohort and non-DC Cohort participants living in DC as of December 2017 (N=12,964)

	DC Cohort	Non-DC Cohort*	Total	
Characteristic	**N (%)**	**N (%)**	**N**	**p-value**
	5,193	7,771	12,964	
Gender Identity				
Male	3,533 (68.0)	5,818 (74.9)	9,351	
Female	1,580 (30.4)	1816 (23.4)	3,396	**<0.0001**
Transgender	80 (1.5)	137 (1.5)	217	
Race/ethnicity				
White	515 (9.2)	1561 (20.1)	2,076	
Black	4,271 (82.3)	5,399 (69.5)	9,670	**<0.0001**
Hispanic	302 (5.8)	582 (7.5)	884	
Other**	105 (2.0)	229 (3.0)	334	
HIV Transmission risk				
MSM	1,977 (38.1)	3,764 (48.5)	5,740	
IDU	768 (14.8)	604 (7.8)	1,372	
MSM/IDU	198 (3.8)	219 (2.8)	417	
Heterosexual contact	1,571 (30.3)	2,014 (25.9)	3,585	**<0.0001**
Perinatal	94 (1.8)	43 (0.6)	137	
Other***	3 (0.1)	7 (0.1)	10	
Risk not identified	582 (11.2)	1,121 (14.4)	1,703	
Age as of December 31, 2017				
Median (IQR)	50 (18)	48 (20)		0.6451
Time since HIV diagnosis				
Mean (SD)	12.6 (6.9)	10.7 (7.4)		0.0481
Ever STI as of 2011-2016	906 (17.4)	1,471(18.9)	2,377	**0.0328**
Ever Hepatitis B co-infection (2011-2016)	87 (1.7)	100 (1.3)	187	0.0689
Ever Hepatitis C co-infection (2011-2016)	282 (5.4)	345 (4.4)	627	**0.0099**

*Non-DC Cohort participants include persons who have not been approached, declined to participate, have consented and subsequently withdrawn from the study, patients diagnosed with HIV disease and receive care at a non-DC Cohort site, as well as persons diagnosed with HIV and reported to the DC Department of Health who were alive as of the end of December 2017.
** Other race includes mixed race individuals, Asians, Alaska Natives, American Indians, Native Hawaiian, Pacific Islanders, and unknown race.
*** Other mode of transmission includes perinatal transmission, hemophilia, blood transfusion, and occupational exposure (healthcare workers).

- Compared to non-Cohort cases, DC Cohort participants were less likely to be male (p<0.0001) more likely to be black/African-American (p<0.0001) and less likely to have an HIV transmission risk attributed to MSM (p<0.0001).

Results

Table 2. Clinical characteristics of DC Cohort and Non-DC Cohort participants living in DC as of December 2017 (N=12,964)

	DC Cohort	Non-DC Cohort*	Total	
Characteristic	**N (%)**	**N (%)**	**N**	**p-value**
Ever stage 3 diagnosis (e.g. AIDS, CD<200 cells/μL, or OI)	3,093 (59.6)	3,652 (47.0)	6,745	**<0.0001**
Engaged in HIV care in 2017	4,336 (83.5)	5,572 (71.7)	9,908	**<0.0001**
CD4 count				
Most recent				
Median CD4 count in 2017 (IQR)	618 (440)	610 (431)		0.8347
<200 cells/μL	365 (8.5)	455 (8.4)		0.1856
200-500 cells/μL	1,159 (27.0)	1,495 (27.6)		
>500 cells/μL	2,764 (64.5)	3,473 (64.0)		
Ever virally suppressed(2011-2017)**	4,348 (83.7)	6,070 (78.1)	10,418	**<0.0001**
Virally suppressed at last lab in 2017**	3,189 (61.4)	3,921 (50.5)	7,110	**<0.0001**
Time to first known viral suppression**				
0-24 months	1,472 (33.4)	2,382 (39.2)	3,854	**<0.0001**
More than 24 months	2,876 (65.6)	3,688 (60.7)	6,564	

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**Viral suppression defined as HIV RNA<200 copies/ml

- Cohort participants were more likely to ever be diagnosed with Stage 3 HIV disease, have a CD4 count of <200 cells/microliter in, have received any HIV care in and be virally suppressed in 2017.

Table 3. Adjusted Odds Ratios for Clinical Characteristics of DC Cohort and Non-DC Cohort Participants Living in DC as of December 2017

Factor*	AOR (95%CI)
Model 1: Retained in any care	1.902 (1.739-2.079)
Model 2: Ever virally suppressed	1.263 (1.150-1.387)
Model 3: Virally suppressed at last in 2017	1.064 (0.938-1.208)
Model 4 (among those ever virally suppressed): Suppressed 24+ months vs 0-12mo	1.280 (1.187-1.381)

* Adjusting for gender identity, age at December 2017, race/ethnicity, time since HIV dx and mode HIV of transmission

- After adjusting for gender identity, current age, race/ethnicity, time since HIV diagnosis and mode of HIV transmission, Cohort participants were significantly more likely to have received any care in 2017 (aOR: 1.83, 95%CI: 1.70-1.98), and to ever to have been virally suppressed (aOR: 1.29, 95%CI: 1.17-1.41).

Discussion

- DC Cohort participants differed from non-Cohort participants by demographics and HIV-related clinical outcomes.
- Further evaluating Cohort and non-Cohort participants after adjusting for demographics, mode of HIV transmission and time since HIV diagnosis, revealed that cohort patients continued to have enhanced health outcomes compared to non-cohort participants.
- Age at the end of 2017 and mean time since HIV diagnosis most impacted the most recent viral suppression result, indicating that older age and longer duration of an HIV disease may have an effect among people living with HIV in DC.

Limitations

- Limited to only those who were living in DC at the end of 2016 and were alive in 2017.
- Lab data was used as a proxy for HIV clinical encounters and is limited to data received at the health department.

Conclusions

- Although participants from the DC Cohort may not represent the broader city-wide population of PLWH, it does provide insight into HIV care delivery and related clinical outcomes that can assist with understanding the quality of HIV care in a highly impacted urban area.
- As participants and healthcare facilities continue to enroll in the DC Cohort, ongoing assessment of representativeness will be required.

Contact

Jenevieve Opoku, MPH
Government of the District of Columbia DC Department of Health
HIV/AIDS, Hepatitis, STD and TB Administration
899 North Capitol St NE 4th Floor
Washington DC 20002
Jenevieve.opoku@dc.gov

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