Cigarette smoking among HIV-infected adults with comorbid medical conditions in a large HIV cohort (2011 – 2017) in Washington, D.C.

Jessica L. Elf[1], Kimberly Horn[2], Lorien Abroms[3], Cassandra Stanton[4], Amy Cohn[5], Freya Spielberg[6], Tiffany Gray[7], Emily Harvey[8], Denise Sanchez, Charles Debnam[9], Amanda D. Castel[7], Alan Greenberg[7], Anne Monroe[7], and Raymond Niaura[10] on behalf of the DC Cohort Executive Committee

[1]Colorado State University, Fort Collins, CO; [2]Virginia Tech, Roanoke, VA; [3]George Washington University, Washington, D.C.; [4]Westat, Rockville, MD; [5]University of Oklahoma Health Sciences Center, Oklahoma City, OK; [6]University of Texas as Austin, Austin, TX; [7]George Washington University, Washington, D.C.; [8]The Henry M. Jackson Foundation for the Advancement of Military Medicine, Bethesda, MD; [9]Community Wellness Alliance, Washington, D.C.; [10]New York University, New York, NY

Background

HIV, Smoking, and Comorbidities

- People with HIV (PWH) have a high prevalence of smoking (40-70%)
- PWH have a high prevalence of comorbidities
  - *Comorbidities increase complexity of clinical care*
  - *Clinician intervention for smoking cessation may be more challenging*
- Continued smoking adversely affects disease prognosis of comorbidities
  - *Cessation strategies need to integrate into multi-disease treatment frameworks*
- People who smoke who also have comorbidities have a more difficult time quitting
  - Higher nicotine dependence, co-occurring mental health challenges, lower self-efficacy, limited treatment availability and diminished response

PWH in Washington, D.C

- n = 12,322 D.C. residents (1.8%) living with HIV
- ≥50% of PWH in Washington, D.C. are ≥ 50 years of age

Purpose: Assess prevalence of smoking among PWH with comorbidities and prevalence/correlates of having a comorbidity among PWH who smoke to inform cessation strategies.

Methods

The DC Cohort

- Prospective longitudinal cohort of PWH in the Washington, D.C. area
- Participants recruited from 15 HIV care centers in the Washington, D.C. metro area
- Electronic medical record (EMR) data extracted on a monthly basis
- Limited manual data collection at enrollment
- Present analysis includes data from 2011 – 2017
- Smoking status (current, former, never) abstracted from EMR at enrollment

Comorbid Conditions

- Cardiovascular, cancer, pulmonary, mental health diagnoses identified and categorized using ICD-9 and ICD-10 codes
  - Cardiovascular: acute myocardial infarction, unstable angina, angina pectoris (stable angina), peripheral arterial disease, transient ischemic attack, ischemic stroke, and congestive heart failure
  - Cancer: any cancer diagnosis
  - Pulmonary: COPD, asthma
  - Mental Health: any mood disorder, anxiety or stress/trauma-related disorder, psychotic disorder, or severe mental health disorder

Statistical Analysis

- **Primary Outcome**: prevalence of never, former, and current smoking at baseline and number of comorbidities among adults (≥ 18 years of age)
- **Secondary Outcome**: estimated risk of a) any comorbidity, b) a mental health comorbidity, and c) a cardiovascular, pulmonary, or cancer comorbidity *among PWH who smoke*
  - Multiple imputation (30 imputations) including comorbidity outcome, sociodemographic, and HIV clinical variables
  - Pooled Poisson regression with robust standard error estimates
  - Adjusted for age, race/ethnicity, gender, state of residence (vs D.C.), socioeconomic condition, substance use, BMI, years since HIV diagnosis, AIDS diagnosis, CD4+ Nadir, CD4+ at baseline, and viral load at baseline

Results

n = 7,160 of 8,234 participants included

- Exclusions: n = 1,006 with no smoking variable and n = 68 < 18 years of age
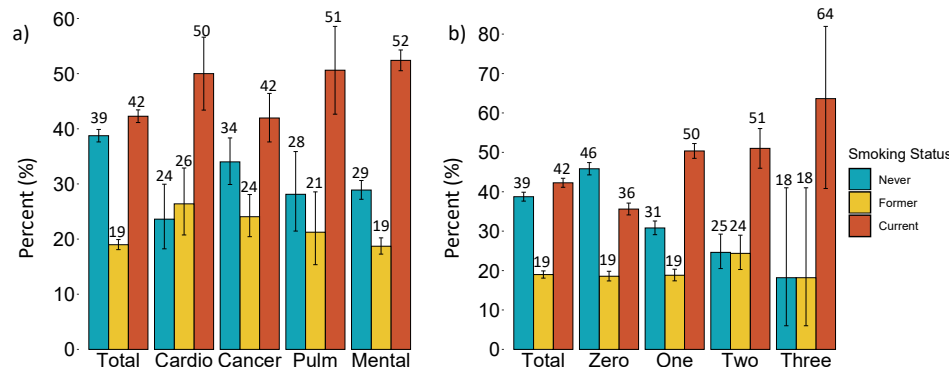
Ever Smoking Status

Never: n = 2,774 (39%)
Former: n = 1,359 (19%)
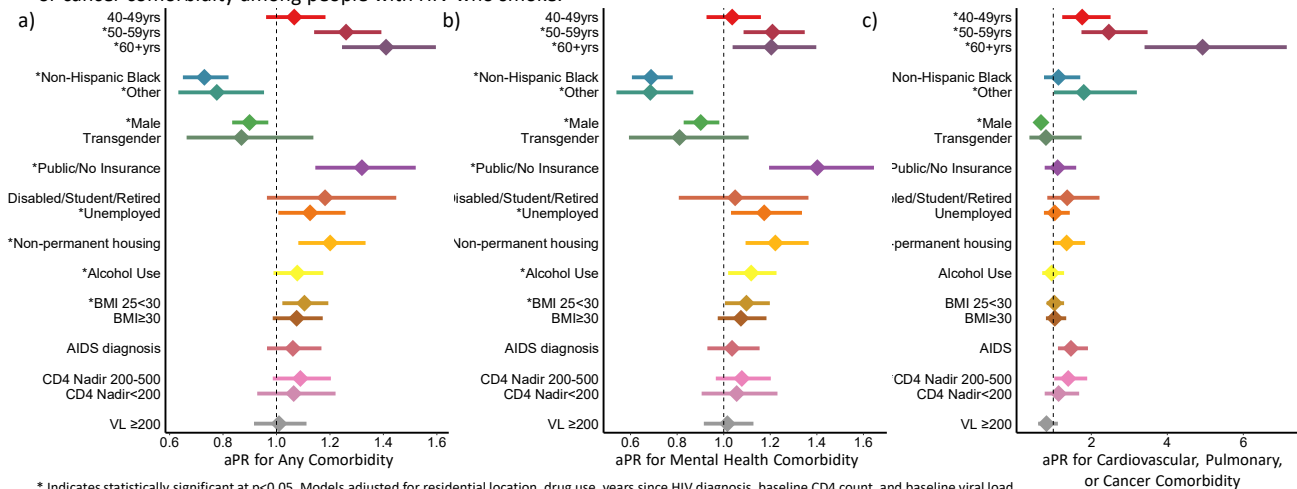Current: n = 3,027 (42%)

Dichotomous Smoking Status

Non-smoker: n = 4,133 (58%)
Current Smoker: n = 3,027 (42%)

n = 1,1617 (53%) of current smokers have at least one comorbidity

Figure 1. Percent of participants who are current smokers by a) comorbidity type and b) number of comorbidities

Figure 2. Adjusted prevalence ratios for an outcome of a) any comorbidity, b) mental health comorbidity, and c) cardiovascular, pulmonary, or cancer comorbidity among people with HIV who smoke.

* Indicates statistically significant at p<0.05. Models adjusted for residential location, drug use, years since HIV diagnosis, baseline CD4 count, and baseline viral load.

Conclusions

- PWH with a concurrent comorbidity have a higher prevalence of smoking than those without; nearly half of all PWH who smoked had a comorbidity
- As the number of comorbidities increased, so did the prevalence of smoking
- Risk of comorbidity varied by gender, race, socioeconomic status, substance use, and HIV clinical characteristics; these also differed by mental health or cardiovascular/pulmonary/cancer comorbidity
- Consideration of sociodemographic, alcohol use, and clinical factors, and how they are integrated within multi-disease treatment strategies, is likely important when developing smoking cessation interventions for PWH with concurrent comorbidities who smoke