

Modelling of Care Engagement Patterns in a Longitudinal Cohort of PWH — Washington, DC

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Background

- Although the HIV care continuum is a linear model for care engagement, many PWH cycle in and out of care.
- Studies have shown that the longer PWH are out of care, the harder it is to re-engage them.
- Therefore, it is essential to identify PWH at risk of disengagement early in the course of their care.

Objectives

- To characterize dynamic states of engagement in care and identify potential factors associated with disengagement among a longitudinal cohort of PWH

Methods

DC COHORT STUDY

- Multi-site prospective longitudinal observational cohort study of HIV-infected persons in care in Washington, DC at 14 participating clinical sites
- Data abstracted from participants' electronic medical records at enrollment and through electronic exports monthly thereafter
- DC Cohort participants ≥18 year who enrolled from 1/1/2011 to 6/30/2021 were included

ANALYSIS

- Longitudinal care engagement was determined using discrete multistate modelling based on care engagement (i.e., having ≥1 HIV visit, CD4 or VL in a 200-day interval)
- Defined 6 mutually exclusive states based on Lee et al. *Stat Med*, 2018:
 - Engaged
 - Short-term disengagement for 1 interval
 - Medium-term disengagement for 2 intervals
 - Long-term disengagement for ≥3 intervals
 - Transferred HIV care during the interval
 - Died during the interval
- Multinomial logistic regression for repeated measures was used to identify predictors of transitioning between different care engagement states including demographics, HIV indicators, substance use and the modified Quan Charlson Comorbidity Index (mQCCI)
- QCCI is used to predict 10-year survival in persons with specified co-morbidities (Quan et al. *Med Care*, 2005). The modified QCCI excludes HIV disease.

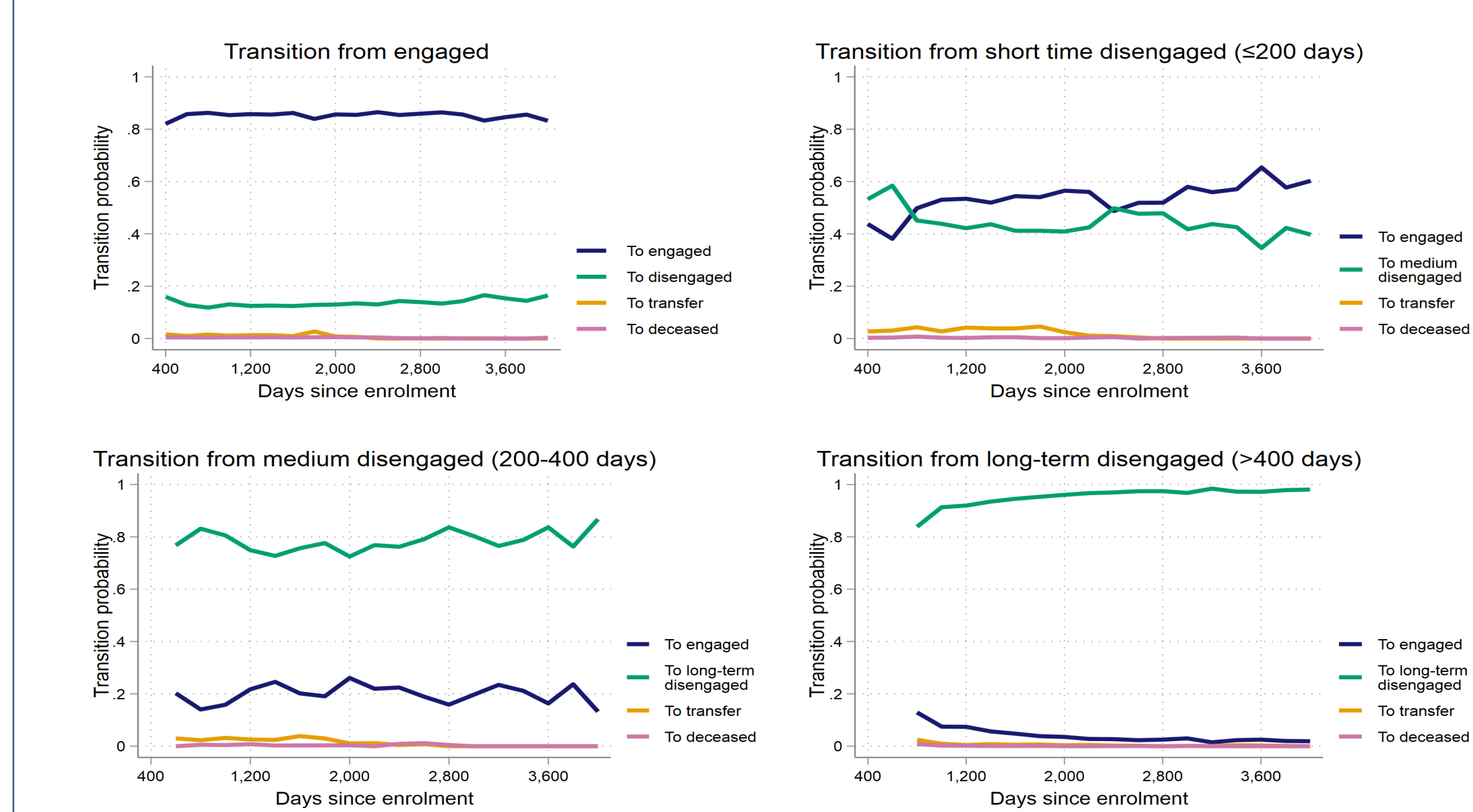
Results

Table 1. DC Cohort Participants (N=11,256)

Participant Characteristic	Total %
Age (median, IQR)	47 (36-55)
Gender (male)	72.0
Race/ethnicity	
NH Black	63.2
NH White	9.9
Hispanic	6.1
Other/unknown	20.6
Mode of HIV Transmission	
MSM	41.5
Heterosexual	31.9
MSM and IDU, IDU	7.7
Other*	18.8
Year of Cohort enrollment	
2011-2012	37.2
2013-2014	21.3
2015-2017	27.2
2018-2021	14.3
Duration of HIV diagnosis years (median, IQR)	9.5 (4-17)
On ART at enrollment	93.3
Viral suppression at enrollment (defined as VS < 200 copies/ml)	74.6
CD4 <500 copies/μl at enrollment	45.4
Quan-Charlson comorbidity index at enrollment**	
0	62.4
1	16.0
2+	21.6
Housing at enrollment (permanent/stable)	80.1
Insurance at enrollment (public)	55.2
Ever any mood disorder	23.5
Ever substance use disorder	7.4

*Other includes: perinatal, coagulation/hemophilia, blood transfusion, occupational exposure, and not reported; ** 0-2 indicates the number of comorbidities present.

Figure 1. Estimated Transition Probabilities Based on Care Engagement States by Time Since Enrollment*



*Participants who were short-term disengaged and remained disengaged, were moved to the medium disengaged state. Similarly, participants who remained medium-term disengaged were moved to the long-term disengaged state.

Among a longitudinal cohort of PWH linked to care, the probability of re-engaging in HIV in care decreased over time. Interventions to identify those at risk for early and sustained disengagement in HIV care should focus on ART initiation to promote viral suppression and adherence, as well as structural-level supports such as housing and insurance.

Results

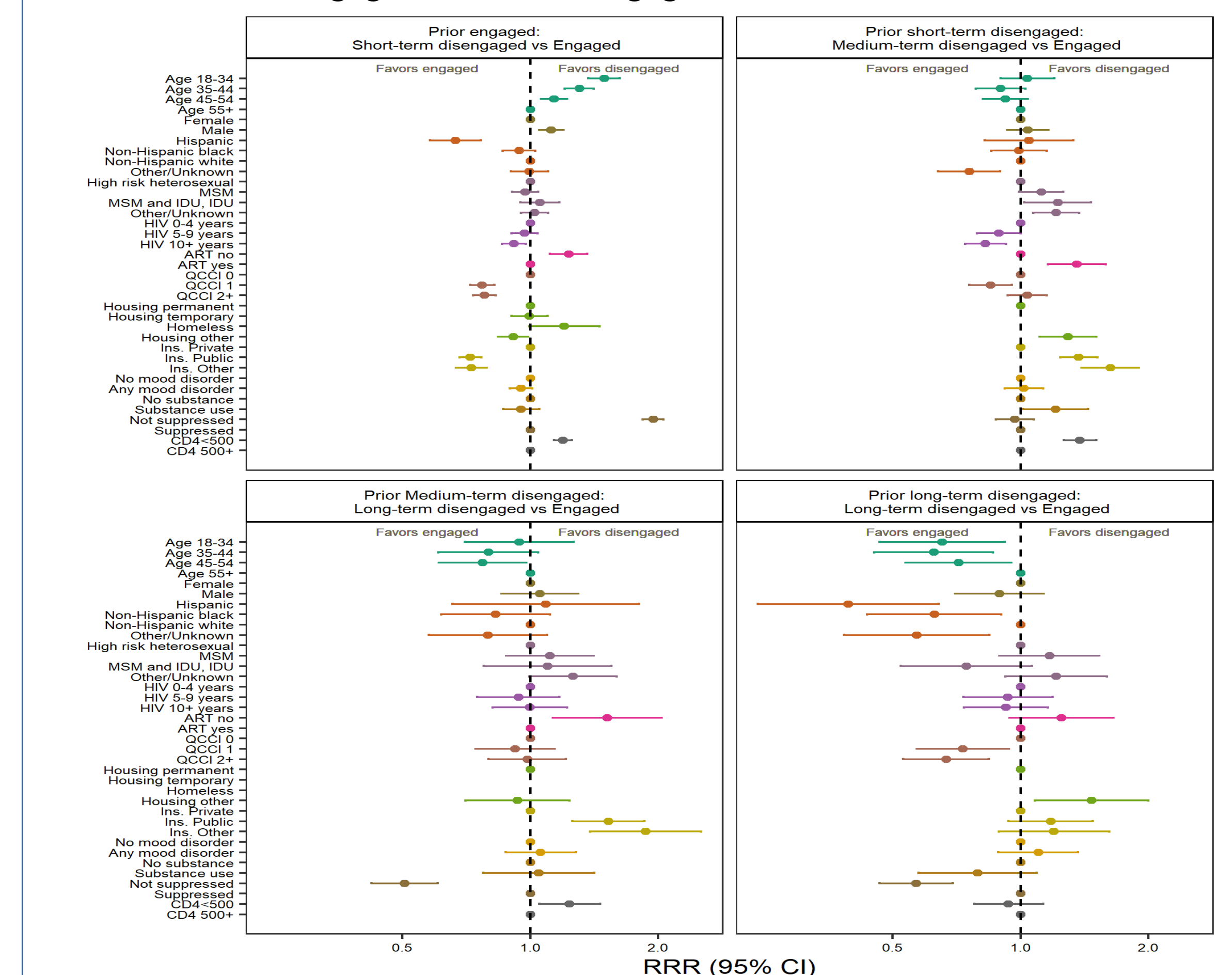
- Among 11,256 PWH, the probability of remaining engaged was 85%, the probability of disengagement was 14%.
- During the observation period 14% of PWH transferred their care; 4% died.
- After one 200-day period of disengagement (short-term disengagement), the probability of re-engagement was 54%, 20% after two periods (medium-term disengagement), and 4% after ≥3 periods of disengagement (long-term disengagement). (Figure 1, top right panel)
- For all states, the probability of transfer or death was low.

Multinomial regression analysis of transition probabilities

- Factors associated with **short-term disengagement** compared to those who remained engaged included younger age, race/ethnicity, male, not on ART at baseline, a QCCI score of 0, private insurance, not VS and CD4 <500 cells/μL (p-values <0.01). (Figure 2, top left)
- Medium-term disengagement** was associated with younger age, not being on ART, lack of permanent/stable housing, any substance use, public insurance, and CD4 <500 cells/μL (p-values <0.01). (Figure 2, top right)
- Predictors of **long-term disengagement** included increasing age, being NH White, not being on ART, lower QCCI score, lack of permanent/stable housing, and being VS (p-values <0.01)(Figure 2 bottom panels).

Results

Figure 2. Relative Risk Ratios (95%CI) for the Multinomial Regression for the Transitions from Engagement and Disengagement in Care



Conclusions

- Among a cohort of PWH who linked to care, we found the probability of re-engaging in care decreased with each additional 6-month interval and factors associated with disengagement varied based on the duration out of care.
- Identifying PWH at risk of early disengagement may minimize the cyclic nature of care and improve long term care continuum outcomes.

Additional Information

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Acknowledgements: Data in this analysis were collected by the DC Cohort Study Group with investigators and research staff located at: Children's National Hospital (Natella Rakhmanina); the Senior Deputy Director of the DC Department of Health HAHSTA (Clover Barnes); Family and Medical Counseling Service (Angela Wood); Georgetown University (Princy Kumar); The George Washington University Biostatistics Center (Marinella Temprosa, Vinay Bhandaru, Tsendia Bezabeh, Nisha Grover, Lisa Mele, Susan Reamer, Alla Sapozhnikova, Asare Buahin, and Greg Strylewicz); The George Washington University Department of Epidemiology (Shannon Barth, Morgan Byrne, Amanda Castel, Alan Greenberg, Shannon Hammerlund, Paige Kullie, Anne Monroe, James Peterson, and Bianca Stewart); The George Washington University Medical Faculty Associates (Jose Lucar); Howard University Adult Infectious Disease Clinic (Jhansi L. Gajjala) and Pediatric Clinic (Sohail Rana); Kaiser Permanente Mid-Atlantic States (Michael Horberg); La Clinica Del Pueblo (Ricardo Fernandez); MetroHealth (Diane Taylor); National Institutes of Health (Melanie Bacon, Carl Dieffenbach, Henry Masur); Washington Health Institute (Jose Bordon); Unity Health Care (Gebeysu Teferi); Veterans Affairs Medical Center (Debra Benator, Rachel Denyer); Washington Hospital Center (Adam Klein); and Whitman-Walker Institute (Stephen Abbott), and the DC Cohort Community Advisory Board.
 Funding: The DC Cohort is funded by the National Institute of Allergy and Infectious Diseases, 1R24AI12598-01.