



# People with HIV who Use Substances Report Lower Health-Related Quality of Life

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# Background

- As people with HIV (PWH) continue to live close to normal life spans, the focus of care has shifted from survival to thriving<sup>1-4</sup>
- Health-related quality of life (HRQoL) measures health and well-being from the individual perspective<sup>5</sup>
- PWH report a higher burden of substance use than their peers in the general population<sup>6</sup>
- Some studies have suggested that substance use overall can lower HRQoL<sup>7</sup>
- Few studies have examined the impact of use of specific substances on HRQoL among PWH

References: (1) Lazarus JV, *et al*. BMC Med. (2016) 14:94; (2) Cho H, *et al*. AIDS Care. (2020) 32:1198–205; (3) Moyo, *et al*. HIV Res Clin Practice. (2024) 25:1; (4) Zhong *et al*. Frontiers Pub Health. (2023) 13:11; (5) CDC. Measuring Healthy Days. Atlanta, Georgia. (2000) <https://archive.cdc.gov/#/details?url=https://www.cdc.gov/hrqol/pdfs/mhd.pdf>; (6) Hai, *et al*. AIDS Care. (2025) 37:5, 843–854; (7) Armoon, *et al*. Archives Pub Health. (2022) 80:179.



# CNICS Cohort

- The CFAR Network of Integrated Clinical Systems (CNICS)
  - Longitudinal, clinical cohort of PWH receiving care
  - 10 sites across the US
  - Patient reported outcomes and measures (PRO) are collected ~every 6 months using validated, standardized questionnaires
  - Combined with electronic clinical data on diagnoses, laboratory results, medications, appointments, hospitalizations, etc.
- Data from PWH from 8 sites with sufficient data were included in analyses
  - UW, UCSF, UCSD, CWRU, UAB, UNC, JHU, Fenway



# *Measures*

## HRQoL- EuroQoL-5 Dimensions Questionnaire (EQ-5D)

- Validated, internationally used HRQoL measure
- Measures five dimensions:
  - Mobility, Pain/discomfort, Usual activities, Self-care, Anxiety/depression
- EQ-5D index
  - Responses to five questions → 3,125 possible health states
  - Each health state is mapped to indices that are adjusted to median responses for a given country
  - Range: -0.590 – 1
    - 1 = best possible HRQoL
    - 0 = as if dead
    - <0 = worse than dead

## Substance Use

- Measured using modified Alcohol, Smoking and Substance Involvement Screening Test (ASSIST)
- Use of Cannabis, Cocaine/Crack, Methamphetamine, or Opioids in the past 3 months





# Analyses

- Generalized estimating equations (GEEs) to estimate associations between use of individual substances and HRQoL index
  - Exchangeable correlation matrix
  - Adjusted using stabilized inverse probability of treatment weights (IPTW)

## Inverse Probability of Treatment Weighting (IPTW)

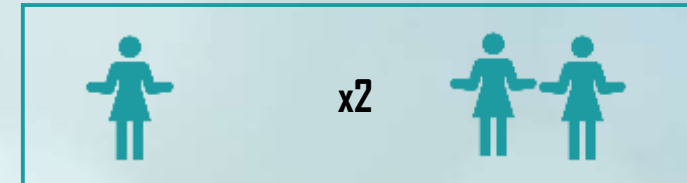
- Create a balanced sample where individual characteristics in each group are similar, even if they were not initially



$$w_i = \frac{\Pr(A = 1)}{\Pr(A = 1 \mid \text{female}_i)}$$



$$0.5/0.25 = 2$$



$$w_i = \frac{1 - \Pr(A = 1)}{1 - \Pr(A = 1 \mid \text{female}_i)}$$



$$0.5/0.75 = 0.666$$



- Multinomial logistic regression models in which adjustment variables are used to estimate the probability of each substance of interest
  - Age, sex, race/ethnicity, CNICS site, enrollment year, years in care, HIV viral load, fibrosis-4 index, diabetes, hepatitis C infection, hypertension, estimated glomerular filtration rate, HIV symptoms index score, depression (PHQ-9) score, and anxiety with panic (PHQ-5)



# Baseline Measures

Mean EQ-5D Index:  
0.833 ( $\pm$  0.19)

## Total (N=18,111)

Mean Age: 43.8 ( $\pm$ 11.7)

Female: 17%

Black/African Am: 37%

Latine/Hispanic: 15%

White: 44%

Another Race/Ethnicity: 5%

Detectable VL: 23%

Cannabis Use: 34%

Cocaine/Crack Use: 8%

Opioid Use: 3%

Methamphetamine Use: 11%

## QoL <Mean (N=8,046)

Mean Age: 45.4 ( $\pm$ 11.2)

Female: 20%

Black/African Am: 36%

Latine/Hispanic: 14%

White: 46%

Another Race/Ethnicity: 5%

Detectable VL: 25%

Cannabis Use: 38%

Cocaine/Crack Use: 10%

Opioid Use: 5%

Methamphetamine Use: 13%

## QoL $\geq$ Mean (N=10,065)

Mean Age: 42.5 ( $\pm$ 11.9)

Female: 14%

Black/African Am: 37%

Latine/Hispanic: 15%

White: 42%

Another Race/Ethnicity: 6%

Detectable VL: 22%

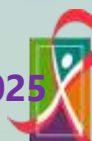
Cannabis Use: 31%

Cocaine/Crack Use: 6%

Opioid Use: 2%

Methamphetamine Use: 9%

2021 Normative US  
EQ-5D Index: 0.851 ( $\pm$  0.21)



# Observed Lower HRQoL by Substance Use

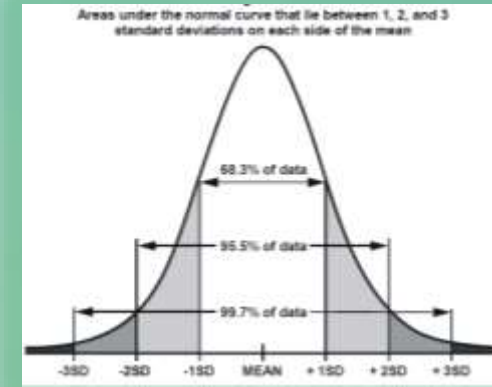
(N=18,111; obs=89,928)		Coefficient	95% CI	EQ-5D Substance Use Category
Cannabis Use:	Never	REF		0.838
	Past	-0.008	-0.015, -0.001	0.830
	Current	-0.019	-0.026, -0.012	0.819
Cocaine/Crack Use:	Never	REF		0.839
	Past	-0.015	-0.021, -0.010	0.824
	Current	-0.028	-0.036, -0.019	0.811
Methamphetamine Use:	Never	REF		0.835
	Past	-0.020	-0.034, -0.006	0.815
	Current	-0.049	-0.082, -0.016	0.786
Illicit Opioid Use:	Never	REF		0.835
	Past	-0.027	-0.036, -0.019	0.808
	Current	-0.049	-0.065, -0.032	0.786

All models adjusted for age, sex, race/ethnicity, CNICS site, enrollment year, years in care, HIV viral load, fibrosis-4 index, diabetes, hepatitis C infection, hypertension, estimated glomerular filtration rate, HIV symptoms index score, depression (PHQ-9) score, and anxiety with panic (PHQ-5)

US Normative: 0.851  
CNICS: 0.833

# Conclusions

- Among PWH receiving primary care, those reporting past or current cannabis, cocaine/crack, methamphetamine, or opioid use had lower HRQoL than those who reported never use
- PWH with current methamphetamine or opioid use had the lowest HRQoL
  - >2 standard deviations (SD) lower than the mean for their cohort
  - >3 SD lower than the normative US population mean
- 82.4% of the 85 PWH who reported HRQoL  $\leq 0$  (dead or worse) reported using substances
- Lower EQ-5D is impacted by: (1) low mobility; difficulty with (2) self care or (3) daily activities; (4) pain; and (5) mental health issues
- Harm reduction, prevention, and treatment programs for substance use could help support HRQoL among PWH





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## COAUTHORS



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