

## Introduction

- Fatal and non-fatal overdose rates have steadily risen in the United States (US) over the last 2 decades 1,2
- Drug overdose is the leading cause of death among people who inject drugs (PWID) 3
- PWID who experience a non-fatal overdose are at increased risk of subsequent fatal overdose with a dose-dependent relationship between number of non-fatal overdoses and overdose death 4, 5
- In the US, the highest overdose death numbers to date (>100,000 overdose deaths) occurred in a 12 month period (2020-2021) overlapping with the COVID 19 pandemic 6
- The COVID 19 pandemic has also been associated with increased mental health challenges across populations 7,8
- Mental health may be a significant contributor to overdose risk
- Recent data suggest an association between depression and anxiety diagnoses and higher hazards of repeated overdose 9,10
- These data are however limited and collected in primarily non-racially diverse populations

### Objective

- To examine the impact of psychosocial factors including mental health on drug overdose among a cohort of racially diverse PWID in Baltimore MD

## Methods

### Study Population

- Social networks of PWID were recruited from an infectious disease clinic and community-based sites in Baltimore, MD between January 2018 and January 2019.
- Data collected at baseline from index PWID and their recruited network members were analyzed

### Primary Outcome

- Number of lifetime overdoses assessed based on the response to the question, "how many drug overdoses have you had in your lifetime?"

### Statistical analyses

- Summary statistics for patterns of distribution of categorical and continuous variables, were computed for two groups of participants with no lifetime overdose versus one or more lifetime overdoses
- Simple and multiple linear regression with generalized estimating equations were used to determine factors independently associated with number of lifetime drug overdoses, and regression coefficient ( $\beta$ ), standard error (SE), and significance (P) are reported
- Predicted mean and 95% confidence interval (CI) of number of lifetime overdoses were analyzed by racial group for psychological variables
- Analyses were conducted in STATA

## Results

**Table 1: Demographic, social and behavioral characteristics by lifetime overdose history in a sample of PWID enrolled in a social network HCV intervention study in Baltimore, MD (N=111)**

Characteristics	Lifetime overdose history		P value
	Yes (N=75)	No (N=36)	
<b>Overdoses number, n</b>	<b>5.0 ± 9.7</b>	-	-
<b>Age, years</b>	48.5 ± 11.0	49.9 ± 8.9	0.447
<b>Female</b>	15 (20.0%)	13 (36.1%)	0.068
<b>Race/ethnicity</b>			
Black/African American	45 (60.0%)	28 (77.8%)	Reference
White	25 (33.3%)	7 (19.4%)	0.252
Other	5 (6.7%)	1 (2.8%)	0.241
<b>Education</b>			
<12 <sup>th</sup> grade	29 (38.7%)	11 (30.6%)	Reference
High school/GED	29 (38.7%)	14 (38.9%)	0.662
College	17 (22.7%)	11 (30.6%)	0.197
<b>Unemployed</b>	67 (89.3%)	29 (80.6%)	0.205
<b>Married</b>	9 (12.0%)	4 (11.1%)	0.892
<b>Offspring</b>	52 (69.3%)	23 (63.9%)	0.571
<b>Homeless</b>	39 (52.0%)	15 (41.7%)	0.308
<b>Health insurance</b>	73 (97.3%)	34 (94.4%)	0.447
<b>Monthly income, US\$</b>	1048.6 ± 1417.7	913.6 ± 781.9	0.520
<b>History of Incarceration</b>	72 (96.0%)	35 (97.2%)	0.752
<b>Lifetime duration of incarceration, months</b>	109.5 ± 128.5	83.6 ± 115.9	0.292
<b>AUDIT score</b>	2.92 ± 3.64	3.75 ± 3.56	0.258
<b>CES-D-10 score</b>	22.1 ± 5.9	21.7 ± 5.1	0.706
< 16	12 (16.0%)	6 (16.7%)	0.929
≥ 16	63 (84.0%)	30 (83.3%)	
<b>Age at 1<sup>st</sup> IDU, years</b>	<b>22.3 ± 7.7</b>	<b>25.9 ± 10.5</b>	<b>0.036</b>
<b>Frequency of injection in past 30 days</b>			
None	20 (20.7%)	5 (13.9%)	Reference
1 – 6 days per week	24 (32.0%)	15 (41.7%)	0.112
Daily	31 (41.3%)	16 (44.4%)	0.210
<b>Drug treatment</b>			
Lifetime	73 (97.3%)	34 (94.4%)	0.594
<b>Past 6 months</b>	<b>53 (70.7%)</b>	<b>18 (50.0%)</b>	<b>0.034</b>
<b>Lifetime psychiatric diagnosis</b>	46 (61.3%)	21 (58.3%)	0.762
<b>Psychiatric treatment in past 6 months</b>	<b>43 (57.3%)</b>	<b>13 (36.1%)</b>	<b>0.036</b>

Statistical significant factors highlighted in Bold font

\*Abbreviations: Alcohol use disorders identification test (AUDIT); Center for Epidemiologic Studies depression scale (CES-D); injecting drug use (IDU).

**Table 2: Simple and multiple linear regression analyses of total number of lifetime overdoses on self reported substance use in a sample of PWID in Baltimore, MD (N=111)**

Self reported substance use in past 6 months	Total Life time overdose events					
	Unadjusted Association			Adjusted Association		
	B	SE	P	B	SE	P
<b>Narcotic pain medications</b>	1.20	1.71	0.480	0.60	1.76	0.734
<b>Methamphetamine</b>	3.28	1.69	0.052	1.59	2.01	0.430
<b>Barbiturates</b>	<b>3.88</b>	<b>1.64</b>	<b>0.018</b>	2.72	1.74	0.118
<b>Benzodiazepine</b>	1.82	1.55	0.243	1.18	1.59	0.459
<b>Cocaine powder</b>	2.44	2.85	0.391	2.14	2.88	0.457
<b>Crack cocaine</b>	0.69	1.84	0.706	0.15	1.88	0.937
<b>Speedball</b>	1.97	3.22	0.541	0.70	3.13	0.824
<b>Inhalants</b>	<b>4.26</b>	<b>1.73</b>	<b>0.014</b>	3.44	1.84	0.062
<b>Hallucinogens</b>	2.18	1.58	0.168	0.07	1.92	0.971

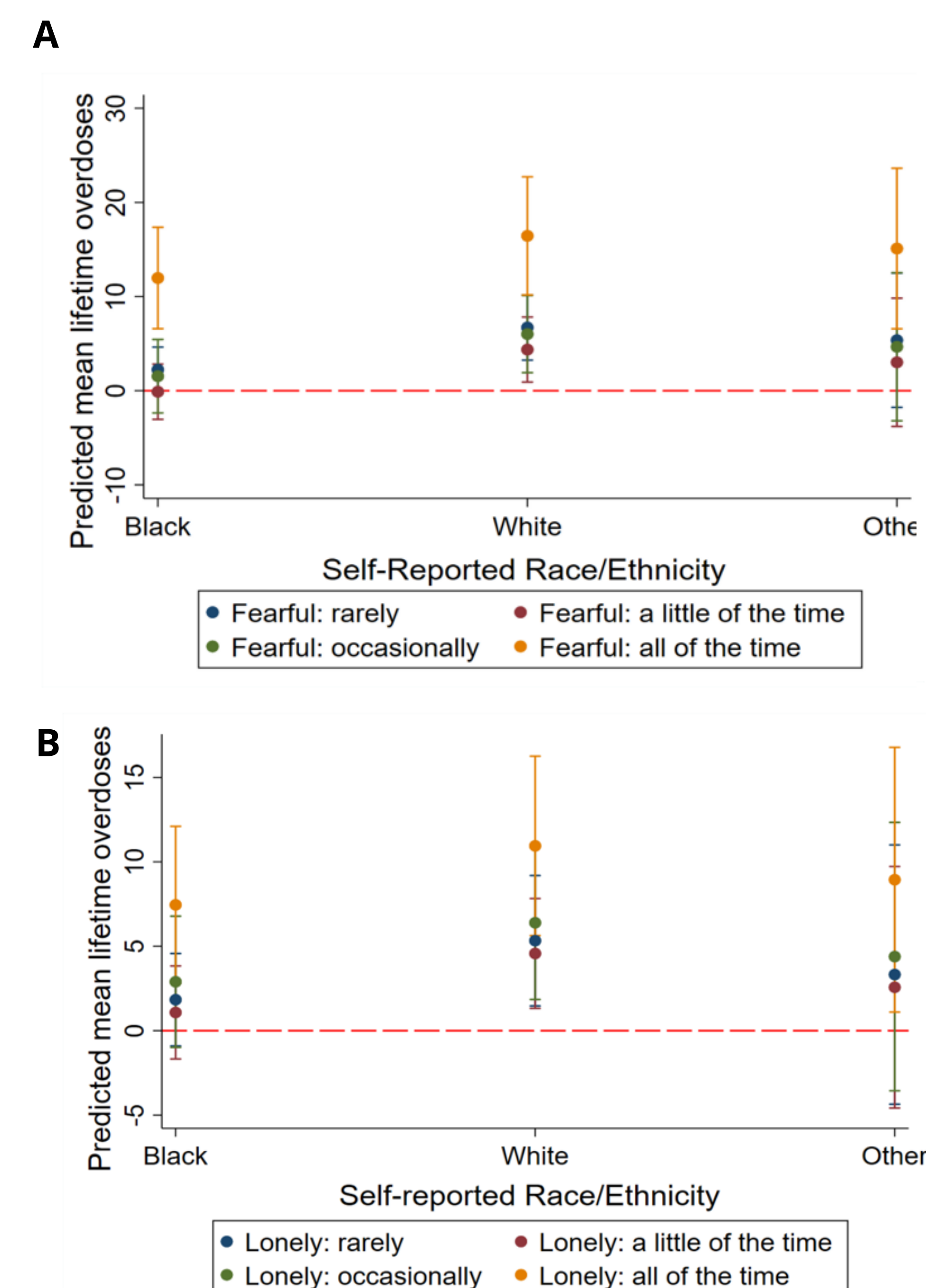
Multiple linear regression of drug use characteristics adjusted for gender, race/ethnicity, homelessness, employment status, having children, educational attainment, average income and duration of lifetime incarceration

**Table 3: Simple and multiple linear regression analyses of total lifetime number of drug overdoses on lifetime psychiatric diagnoses, total CES-D 10 and CES-D-10 questionnaire items**

Psychological variables	Total Life time overdose events					
	Unadjusted Association			Adjusted Association		
	B	SE	P	B	SE	P
<b>Lifetime psychiatric diagnosis</b>	-1.13	1.59	0.477	0.94	1.75	0.593
<b>Total CES-D score</b>	0.19	0.14	0.161	0.19	0.14	0.175
<b>CES-D: depressed</b>						
Little of the time	-1.92	2.08	0.355	-2.47	2.13	0.246
Occasionally	-0.69	2.07	0.740	-0.67	2.06	0.745
All of the time	4.77	2.55	0.062	4.52	2.49	0.070
<b>CES-D hopeless</b>						
Little of the time	0.36	2.06	0.860	0.93	2.09	0.654
Occasionally	3.17	2.28	0.164	4.09	2.27	0.071
All of the time	0.86	2.31	0.711	1.79	2.32	0.440
<b>CES-D: fearful</b>						
Little of the time	-1.08	1.70	0.523	-2.34	1.71	0.172
Occasionally	0.41	2.14	0.848	-0.69	2.15	0.746
<b>All of the time</b>	<b>9.52</b>	<b>3.07</b>	<b>0.002</b>	<b>9.74</b>	<b>2.93</b>	<b>0.001</b>
<b>CES-D: lonely</b>						
Little of the time	-0.49	1.79	0.784	-0.75	1.83	0.680
Occasionally	0.27	2.35	0.908	1.06	2.33	0.648
<b>All of the time</b>	<b>6.07</b>	<b>2.65</b>	<b>0.022</b>	<b>5.62</b>	<b>2.64</b>	<b>0.033</b>

Multiple linear regression of psychological factors adjusted for gender, race/ethnicity, homelessness, employment status, having children, educational attainment, average income and duration of incarceration

**Figure 1: Predicted mean and 95% confidence intervals of number of lifetime overdoses by race conditional on severity of self reported fearfulness (A) and loneliness (B)**



### Summary

- There was a high prevalence of lifetime drug overdoses in this cohort of PWID
- Predicted number of lifetime drug overdoses was significantly associated with current feelings of fearfulness and loneliness
- Among Black participants but not White participants, only the highest degrees of fearfulness and loneliness were associated predicted number of lifetime overdoses
- Additional studies are needed to evaluate the role of fearfulness and loneliness in overdose risk

### References

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**Acknowledgements:** This work was supported by NIH/NIDA grants K24DA034621 (to MS), K23DA041294 (to OFN) and P30 AI094189