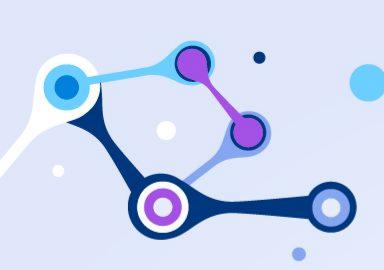# Project 1
Interim Presentation

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Research Question

- Data from MACS on HIV-positive men, specifically those receiving HAART

- Investigators hypothesize that hard drug use impacts treatment response

- Does treatment response over two years differ between individuals who reported hard drug use at baseline and those who did not?

- In other words, is there a difference in change from baseline to year 2 between exposure groups?

Data Overview

Characteristic	Baseline Visit N = 506[1]		Year 2 Visit N = 506[1]	
	No Hard Drug Use N = 467[1]	Hard Drug Use N = 39[1]	No Hard Drug Use N = 467[1]	Hard Drug Use N = 39[1]
Viral Load (copies/mL)	1,058,109 (11,789,942)	184,278 (430,227)	6,216 (40,802)	32,947 (114,453)
Missing	9	0	19	0
CD4+ T Cell Count (# of cells)	378 (202)	352 (195)	560 (265)	366 (240)
Missing	8	0	19	0
Physical QOL Score	51 (9)	48 (9)	50 (10)	44 (12)
Missing	1	0	6	0
Mental Health QOL Score	46 (14)	42 (11)	48 (12)	46 (13)
Missing	1	0	6	0

[1] Mean (SD)

Table 1. Summary of Outcomes of Interest

Characteristic	Overall N = 506[1]	No Hard Drug Use N = 467[1]	Hard Drug Use N = 39[1]
Age (years)	43 (9)	43 (9)	45 (9)
BMI	35.6 (99.4)	36.8 (103.4)	21.7 (7.4)
Missing	5	5	0
Race			
White, Non–Hispanic	320 (63%)	301 (64%)	19 (49%)
White, Hispanic	19 (3.8%)	19 (4.1%)	0 (0%)
Black, Non–Hispanic	137 (27%)	120 (26%)	17 (44%)
Black, Hispanic	3 (0.6%)	3 (0.6%)	0 (0%)
American Indian or Alaskan Native	0 (0%)	0 (0%)	0 (0%)
Asian or Pacific Islander	0 (0%)	0 (0%)	0 (0%)
Other	5 (1.0%)	5 (1.1%)	0 (0%)
Other Hispanic	22 (4.3%)	19 (4.1%)	3 (7.7%)
Highest Education Reached			
8th grade or less	4 (0.8%)	4 (0.9%)	0 (0%)
9, 10, or 11th grade	33 (6.5%)	20 (4.3%)	13 (33%)
12th grade	74 (15%)	71 (15%)	3 (7.7%)
At least one year college but no degree	180 (36%)	167 (36%)	13 (33%)
Four years college / got degree	106 (21%)	105 (22%)	1 (2.6%)
Some graduate work	38 (7.5%)	38 (8.1%)	0 (0%)
Post-graduate degree	71 (14%)	62 (13%)	9 (23%)
Smoking Status			
Never smoked	142 (28%)	142 (30%)	0 (0%)
Former smoker	168 (33%)	159 (34%)	9 (23%)
Current smoker	196 (39%)	166 (36%)	30 (77%)

[1] Mean (SD); n (%)

Table 2. Summary of Covariates

Analysis Plan

Identical Model Structures:

    Outcomes: CD4+ T-Cell Count, Viral Load, Physical QOL Score, Mental Health QOL Score

    Fixed Effects: Hard Drug Use, Time/Vist, Drug x Time Interaction

    Covariates: Adherence, Age, EMI, Race, Education, Smoking Status

Frequentist Approach:

- Linear Mixed Effects Model with Random Intercept for Participant
- Assessing interaction term using $\alpha = 0.05$

Bayesian Approach:

- Hierarchical Models with Weakly Informative Priors
  - Fixed Effects - Normal(0, 10)
  - Variance - Half-Cauchy(0, 5)
- 4 MCM Chains, 4,000 iterations
- Assessing posterior medians with 95% CIs