Alcohol and Food Environments & Alcohol Misuse among PLWH

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Background

- PLWH are 2-4 times more likely to misuse alcohol. (Park et. al, 2016)
- Neighborhood and built environment is an under-researched social determinant of health regarding alcohol misuse among PLWH. (Kalichman et. al, 2014)
- Research implies that unhealthy food environments among PLWH is associated with heavy alcohol use, drug use, poor adherence of HIV medication, depression, as well as an increase of risky behaviors in order to gain food resources. (McKay et al., 2017)

Objectives

- To assess whether PLWH that live in a higher concentration of unhealthy food environments and increased number of alcohol outlets are more likely to misuse alcohol.

Methodology

- **Study Design**:
  - U.S adults (≥ 18, mean = 48.1 years) living with HIV (N = 359) from The New Orleans Alcohol Use in HIV (NOAH) Study.
- **Variables:**

Neighborhood & Built Environment
Food environments:
1. Healthy outlets (grocery stores, farmer's markets)
2. Unhealthy outlets (fast food, restaurants, convenience stores)
Alcohol environments:
1. Total alcohol outlets
2. On-site alcohol outlets (bars, restaurants)
3. Off-site alcohol outlets (liquor/convenience stores)

Alcohol Misuse Outcome
1. **Alcohol Use Disorders Test (AUDIT)**: < 8 = low risk of AUD ≥ 8 = risk of AUD
2. **Timeline Followback (TLFB)**: > 3 or 4 drinks per day for women/men
3. **Phosphatidylethanol (PEth)**: ≥ 250 ng/ml = alcohol misuse

- **Analysis:**
  - Alcohol and food environments were assessed using 2019 North American Industry Classification Systems (NAICS) codes.
  - Descriptive statistics of food and alcohol outlets by census tracts (outlets within 1/8-mile buffer of participant homes and rate per 1,000).
  - Multi-level logistic regression to estimate effects of food & alcohol outlets on alcohol misuse: adjusted by age, sex, race, and education. Additional models stratified by urban life stress (ULSS).
  - All analyses conducted in ArcGIS and SAS.

Results

NOAH'S ARC

Figure 1: Descriptive Statistics of Participants

SEX: 31% Female, 69% Male
RACE: 1% Other, 15% White, 84% African American
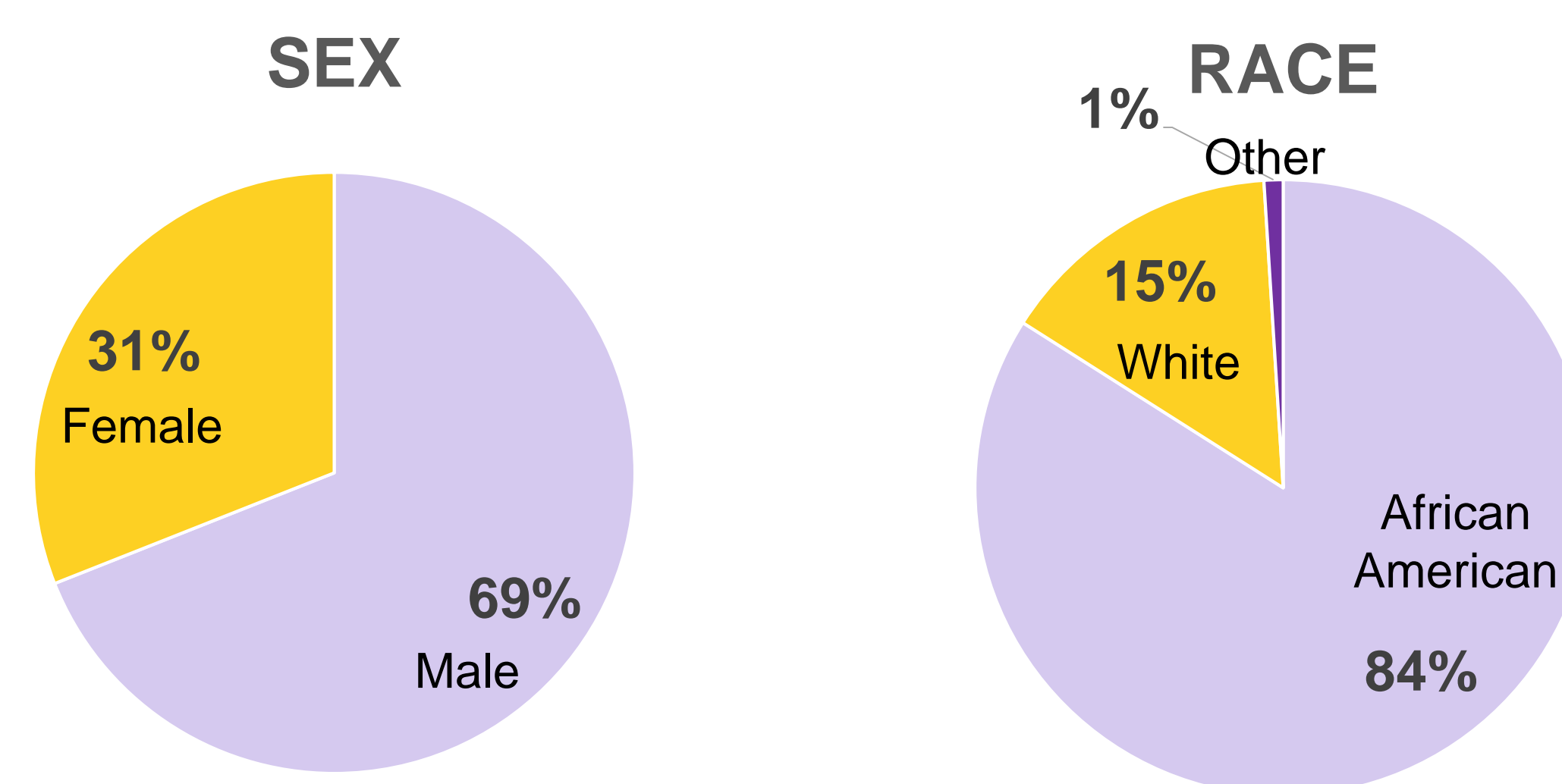
Participants had low income, lower levels of education, average BMI of 27.8 (overweight), experienced life stress (ULSS), and HIV stigma.

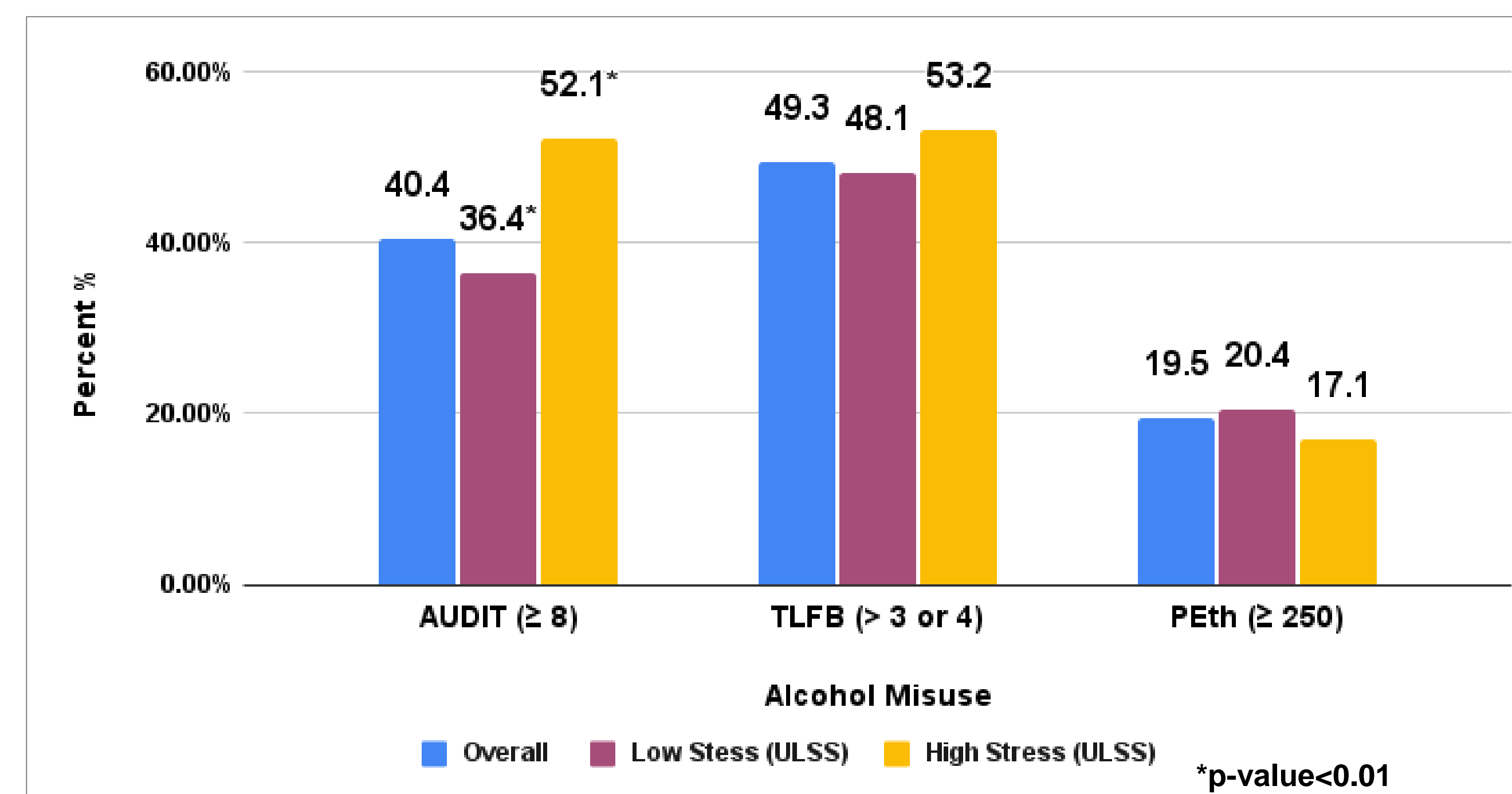### Figure 2: Alcohol Misuse and Stratification by ULSS

Alcohol Misuse	Overall	Low Stress (ULSS)	High Stress (ULSS)
AUDIT (≥ 8)	40.4	36.4*	52.1*
TLFB (> 3 or 4)	49.3	48.1	53.2
PEth (≥ 250)	19.5	20.4	17.1

*p-value<0.01

Figure 3: Maps of Food & Alcohol Outlets within 1/8-mile

Healthy Food Outlets = 6

Unhealthy Food Outlets = 254
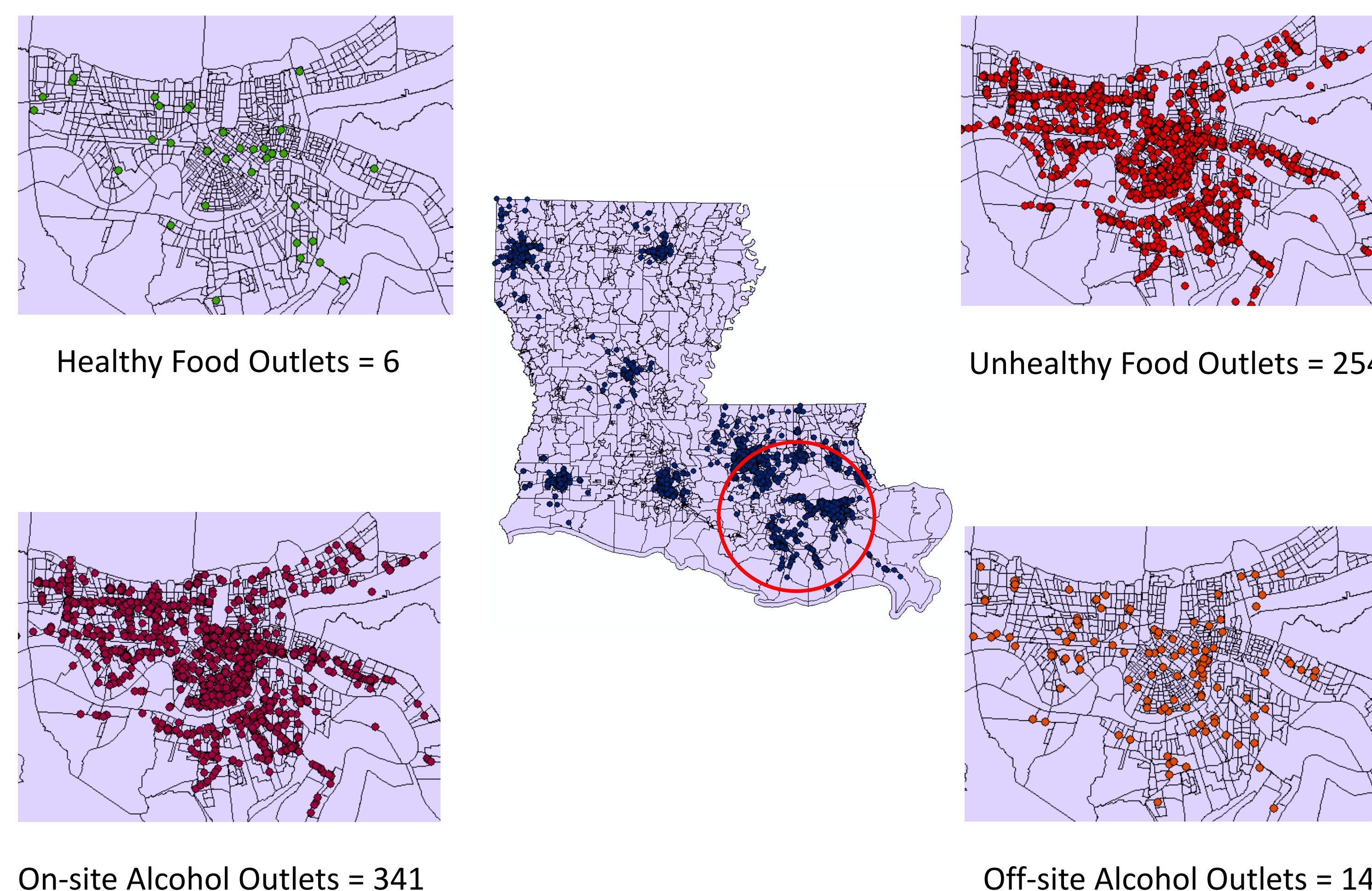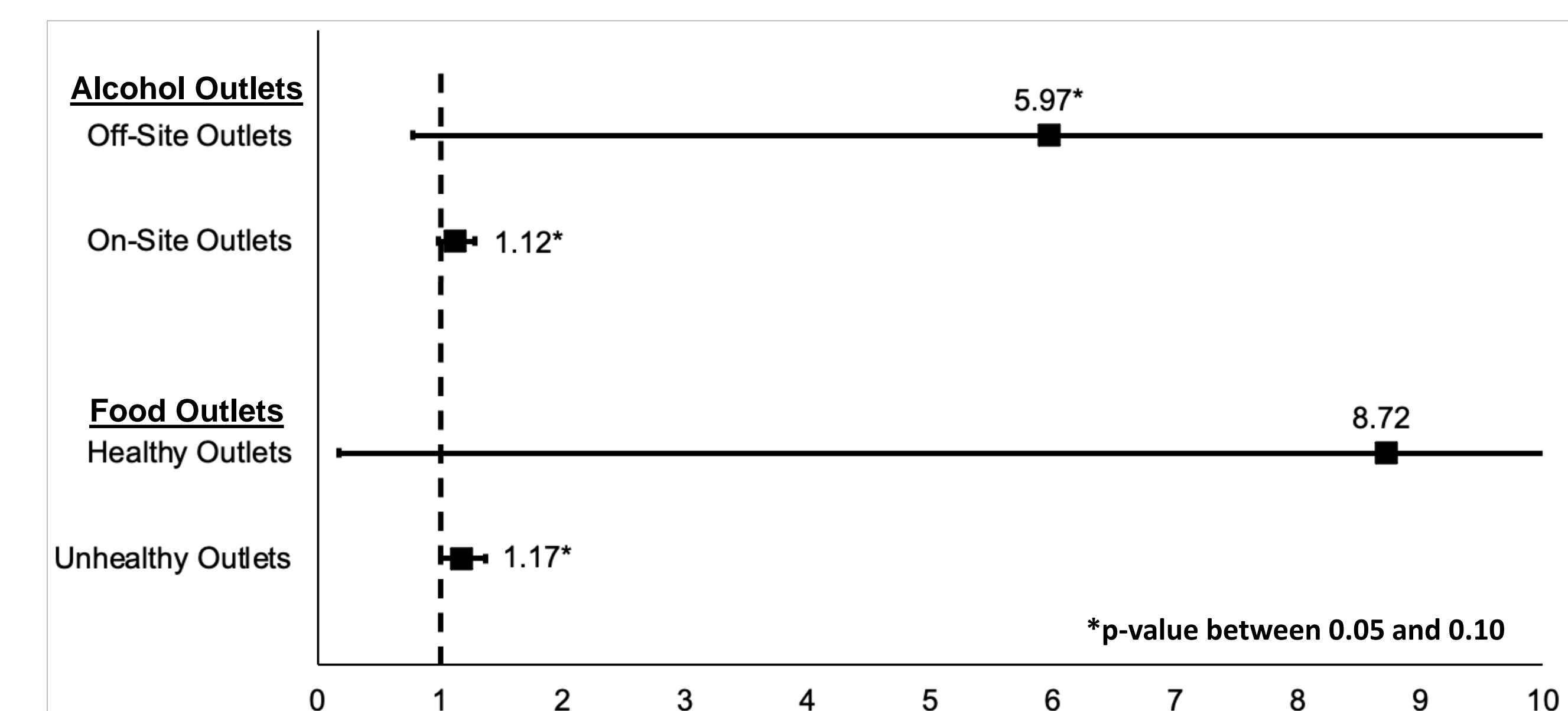
On-site Alcohol Outlets = 341

Off-site Alcohol Outlets = 14

Table 1: Means/SD/Range of Alcohol and Food Outlets

	Within 1/8-mile of Participants' Home Address	Rates per 1,000 Persons
	Mean ±SD (Range)	
Alcohol Outlets		
Total	0.9 ±4.6 (0-52)	3.8 ±12.4 (0-141.0)
Off-Site	0.04 ±0.2 (0-1)	0.2 ±0.7 (0-6.2)
On-Site	0.9 ±4.6 (0-52)	3.6 ±12.0 (0-136.1)
Food Outlets		
Healthy	0.02 ±0.1 (0-1)	0.1 ±0.3 (0-2.4)
Unhealthy	0.7 ±2.0 (0-20)	3.3 ±8.4 (0-82.0)

Figure 4: Odds Ratios and 95% Confidence Intervals for Alcohol and Food Outlets on Severe Alcohol Misuse (PEth≥250 ng/ml)

Alcohol Outlets
- Off-Site Outlets: 5.97*
- On-Site Outlets: 1.12*

Food Outlets
- Healthy Outlets: 8.72
- Unhealthy Outlets: 1.17*

*p-value between 0.05 and 0.10

Discussion

- Unhealthy food outlets and alcohol outlets have some associations when evaluating alcohol misuse among PLWH.
- Participants experiencing high life stress levels were more likely to misuse alcohol.
- There was greater availability of unhealthy food outlets and total/on-site alcohol outlets around the participants' homes.
- PEth score yielded near significant associations compared to AUDIT and TLFB, since it is a direct biomarker.
- ULSS as a modifier, but we did not find any significant associations.
- Limitations: It is difficult to make causal conclusions from this data since people's behaviors cannot be predicted. The data was also cross-sectional (link between exposure and outcome cannot be determined).

Conclusions

- The results suggests that there needs to be interventions for limiting the number of unhealthy food and alcohol environments among low resourced individuals living with HIV.
- Future research should consider providing additional insight into observing this association through other measures of food insecurity among PLWH.