

Ecological Momentary Assessments in an Incentive-Based Intervention for Smoking Cessation: Predicting Near-term Engagement and Smoke Status

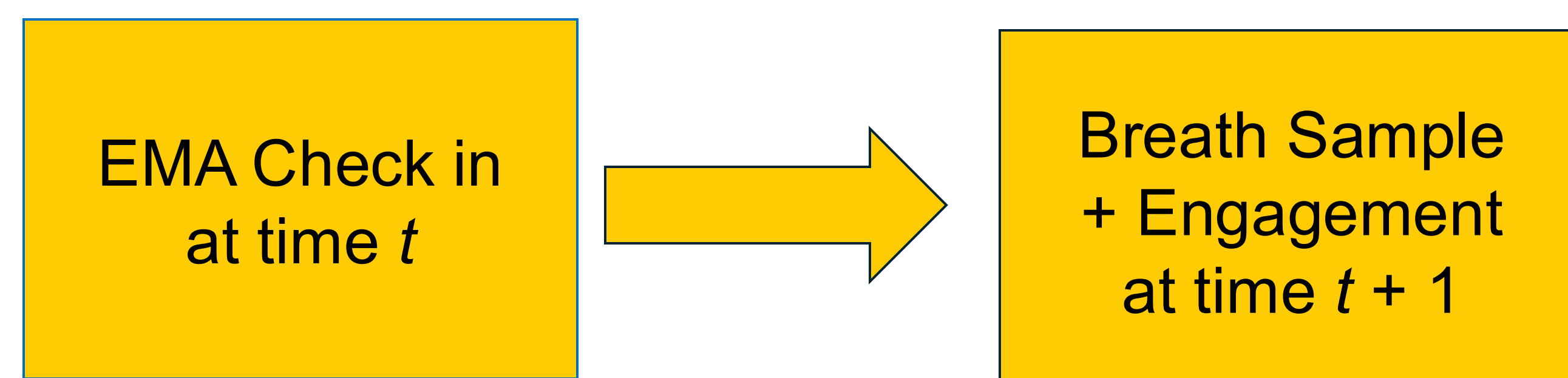
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Introduction

Cigarette smoking is a leading cause of preventable death in the U.S.¹ We evaluate predictors of engagement and smoking in a digital incentive-based intervention for tobacco cessation among Medicaid beneficiaries.²

Methods

- N=37 Medicaid beneficiaries who smoke self-referred and enrolled in a hybrid-human digital smoking cessation program. N=36 were included in analysis as 1 participant did not complete Ecological Momentary Assessments (EMAs) responses.
- Beneficiaries were recruited in partnership with 7 Federally-Qualified Health Centers in Michigan.
- **Monetarily incentivized** to submit breath samples and complete EMAs twice daily for 4 weeks.
- EMAs assessed were adapted from Businelle et al.^{2,3}
- Evaluated EMA responses and time in intervention on subsequent engagement (i.e., breath sample submission) and smoke status.
- Using **mixed effect logistic regression** (random intercept for patient), we evaluated EMA responses and time in intervention on subsequent engagement (i.e., breath sample submission) and smoke status.



Results

Demographic characteristics

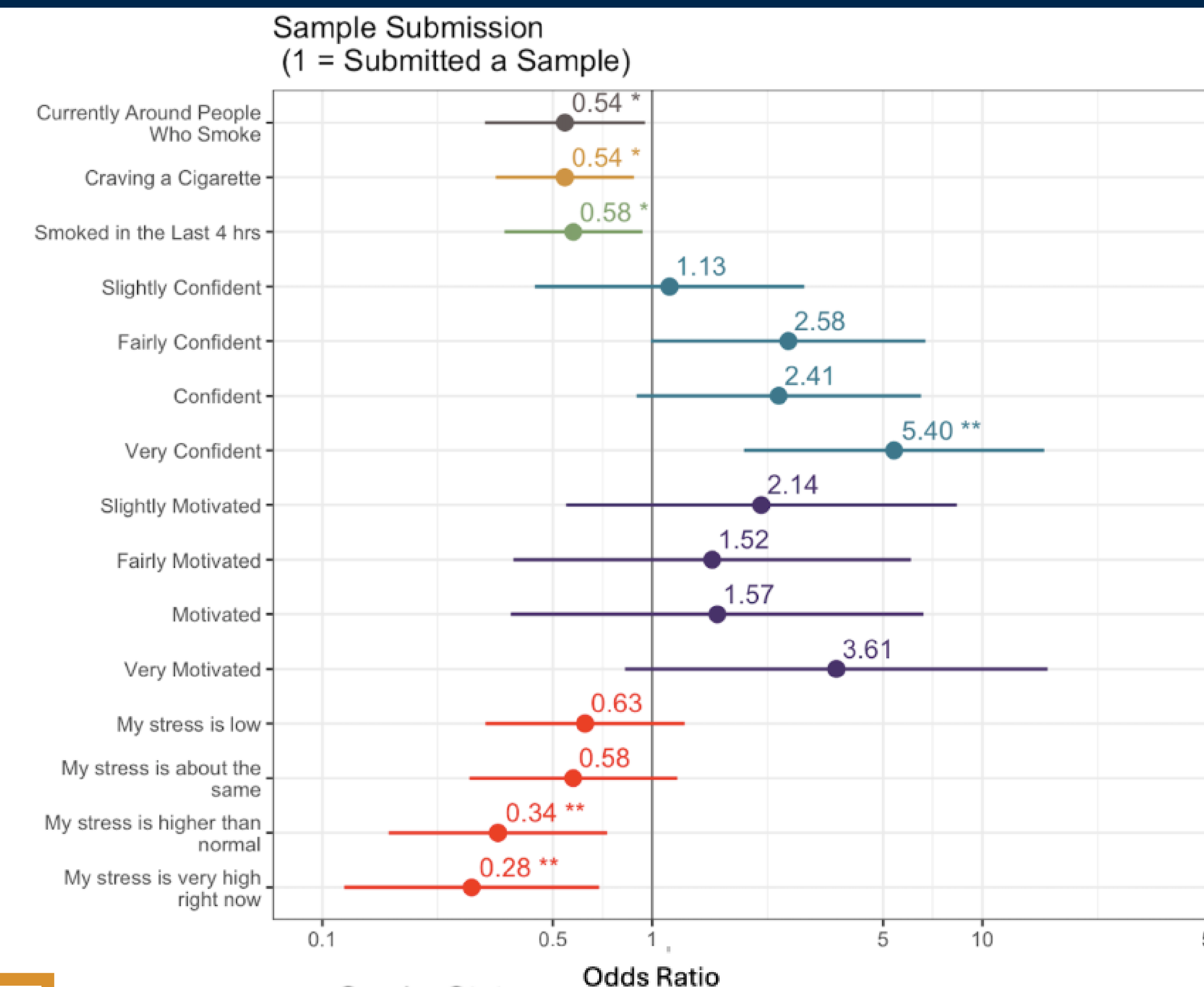
Characteristic	N (%) / Mean (SD)
n	36
Age (mean (SD))	39.50 (10.82)
Sex = Male (%)	14 (38.9%)
Gender (%)	
Female	21 (58.3%)
Genderqueer	1 (2.8%)
Male	13 (36.1%)
Trans Female/Trans Women	1 (2.8%)
Hispanic/Latinx = Yes (%)	1 (2.8%)
Race/Ethnicity (%)	
American Indian/Alaskan Native	2 (5.6%)
More than one race	4 (11.1%)
White/Caucasian	30 (83.3%)
Income (%)	
Under \$15,000	23 (63.9%)
\$15,000-\$24,999	5 (13.9%)
\$25,000-\$34,999	3 (8.3%)
\$35,000-\$49,999	3 (8.3%)
\$50,000-\$74,999	2 (5.6%)
Structural Vulnerability score (mean (SD))	1.34 (1.1)

EMA Questions

Are you currently around other people who are smoking? Yes or No	Are you currently craving a cigarette? Yes or No
Have you smoked even one puff in the last 4 hours? Yes or No	How confident are you in your ability to not smoke in the next 4 hours? Not Confident, Slightly Confident, Fairly Confident, Confident, Very Confident
How motivated are you to keep from smoking in the next 4 hours? Not Motivated, Slightly Motivated, Fairly Motivated, Motivated, Very Motivated	How stressed do you feel today? I don't feel stressed, My stress is low, My stress is about the same, My stress is higher than normal, My stress is very high right now

Conclusion

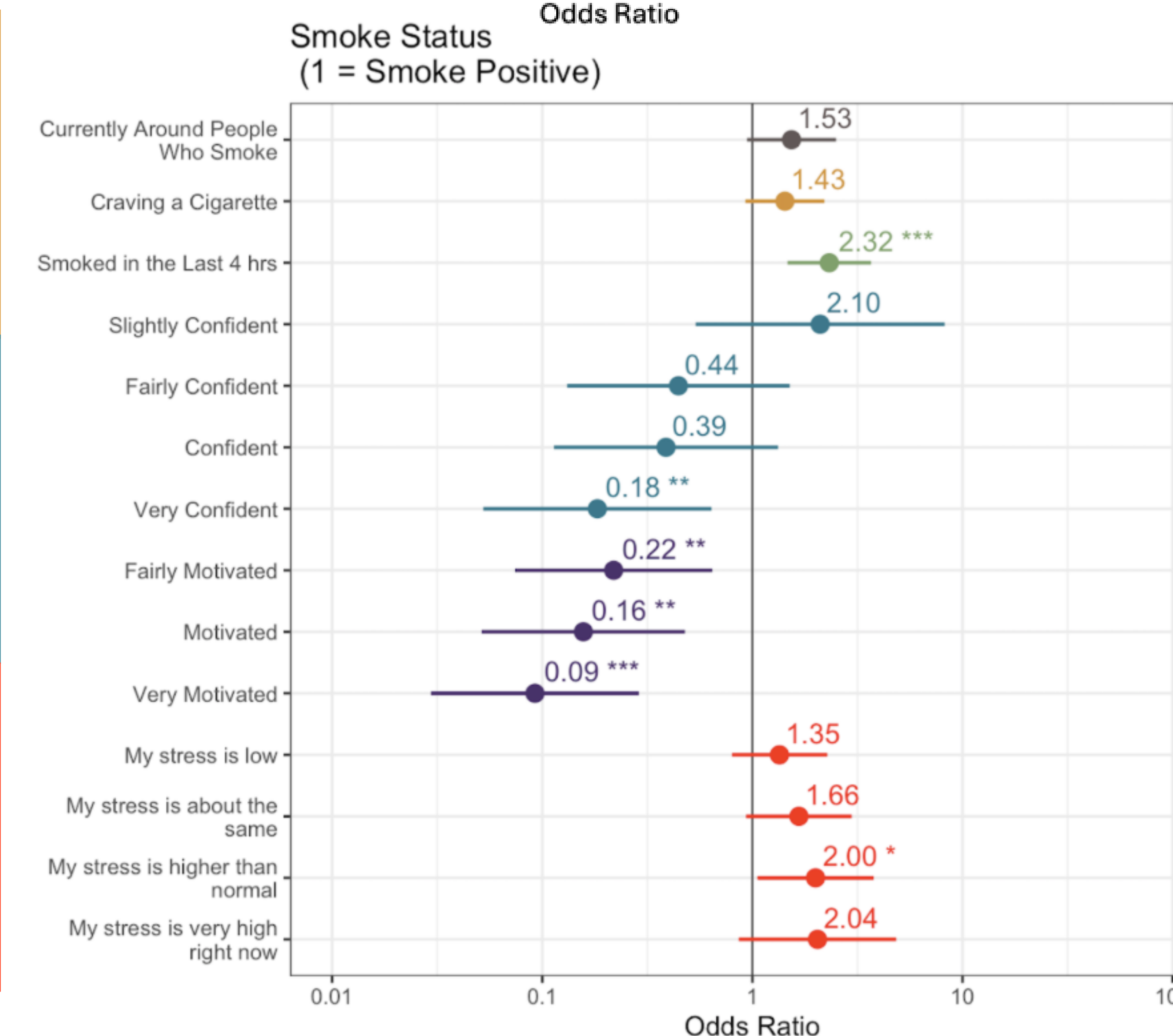
EMAs (e.g. currently around other smokers, craving a cigarette, smoked in the last 4 hours, motivation, and high confidence) during incentive-based interventions are useful to predict engagement and smoke status which could inform future just-in-time adaptive interventions to enhance engagement and response.



Forest plot of the Odds Ratio and 95% Confidence Interval for the adjusted models evaluating sample submission (1= submitted a sample). Colors and rows represent EMA items. The p-value threshold value for model are * 0.05, ** 0.01.

Daily Check-in Questions

- Currently Around People Who Smoke
- Craving a Cigarette
- Smoked in Last 4 Hours
- Confident about Not Smoking
- Motivated to Not Smoke
- Stress Level



Forest plot of the Odds Ratio and 95% Confidence Interval for the adjusted models evaluating Smoke Status (1= Smoke Positive). Colors and rows represent EMA items. The p-value threshold value for model are * 0.05, ** 0.01, *** 0.001.

Daily Check-in Questions

- Currently Around People Who Smoke
- Craving a Cigarette
- Smoked in Last 4 Hours
- Confident about Not Smoking
- Motivated to Not Smoke
- Stress Level

References:

1. CDC. Current cigarette smoking among adults in the United States. Centers for Disease Control and Prevention. May 16th, 2024 Accessed September 7, 2024.
2. Businelle MS, Ma P, Kendzor DE, Frank SG, Vidrine DJ, Wetter DW. An Ecological Momentary Intervention for Smoking Cessation: Evaluation of Feasibility and Effectiveness. *J Med Internet Res*. 2016;18(12):e321. doi:10.2196/jmir.6058
3. Businelle MS, Ma P, Kendzor DE, Frank SG, Wetter DW, Vidrine DJ. Using intensive longitudinal data collected via mobile phone to detect imminent lapse in smokers undergoing a scheduled quit attempt. *J Med Internet Res*. 2016;18(10):e275. doi:10.2196/jmir.6307

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