

Detection Limitations of Remote Breath Alcohol Monitoring: Transdermal Alcohol Monitoring Detected Off-Cycle Drinking Events in a Contingency Management Protocol

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INTRODUCTION

- Wearable biosensors expand alcohol monitoring opportunities in research, treatment, and forensic settings.
- Transdermal alcohol monitors (TAM) reliably measure transdermal alcohol concentration (TAC) (Marques & McKnight, 2007, 2009; van Egmon et al., 2021).
- Remote breathalyzers measure breath alcohol concentration (BrAC) and are common in research and treatment (Alessi & Petry, 2013, Buono et al., 2022).
- Prior studies comparing TAC and BrAC focus on scheduled testing periods (Dougherty et al., 2012, 2014).
- Limited research examines off-cycle periods (times between last BrAC test of one day and the first of the next).**
- Off-cycle alcohol use may go undetected with traditional BrAC protocols, leaving monitoring gaps.**

PURPOSE

This study compares scheduled BrAC testing with continuous TAC data to assess the limitations of remote BrAC monitoring, particularly during off-cycle periods.

METHODS

- Participants:** N=40 non-treatment-seeking recreational drinkers aged 21 years or older.
- Design:** 28-day remote monitoring observational study.
- BrAC Monitoring:** 4 scheduled tests/day via Soberlink remote breathalyzer; compliant = on-time, BrAC ≤0.02 g/dL, identity-verified.
- TAC Monitoring:** Continuous monitoring via SCRAM CAM transdermal ankle monitor.
- Analysis Focus:** Off-cycle events (between final BrAC test of the day and first BrAC test of the next-day).

KEY FINDINGS

- 206 of 1085 days (19%)** had off-cycle drinking events detected by TAC.
- 136 of 206 events (66%)** were also detected by BrAC.
- 26 of 40 participants (65%)** had ≥1 off-cycle event.
- Of **104** off-cycle events after a compliant evening BrAC:
 - 27 (26%)** led to a noncompliant BrAC the next morning
 - 77 (74%)** still had a compliant BrAC the next morning

CONCLUSION

- Remote BrAC testing can miss off-cycle drinking (e.g., overnight).**
- Findings highlight the limits of scheduled BrAC alone.
- Supplementary methods (e.g., continuous TAC or biomarkers like PEth) may provide a fuller picture of alcohol consumption behavior.

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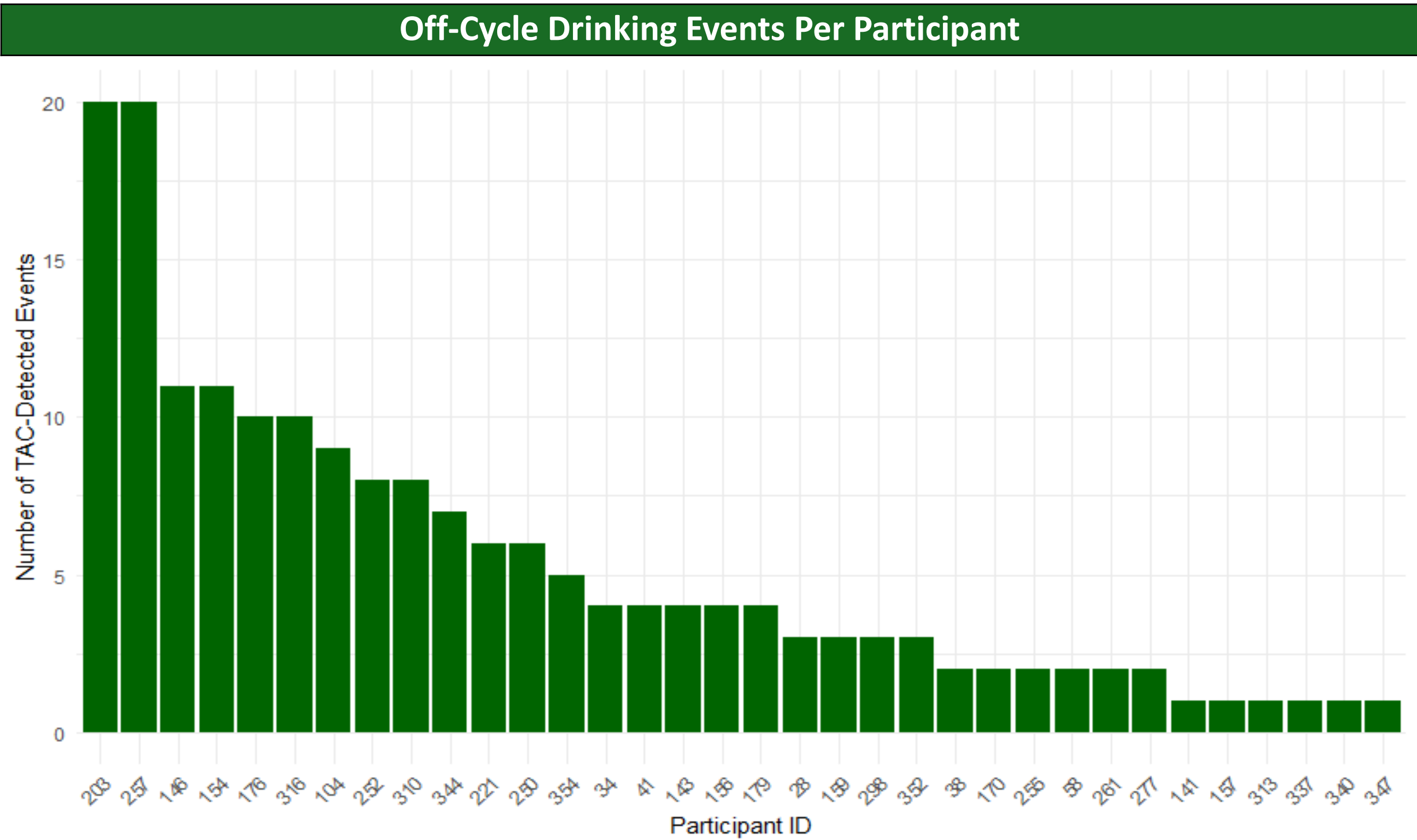
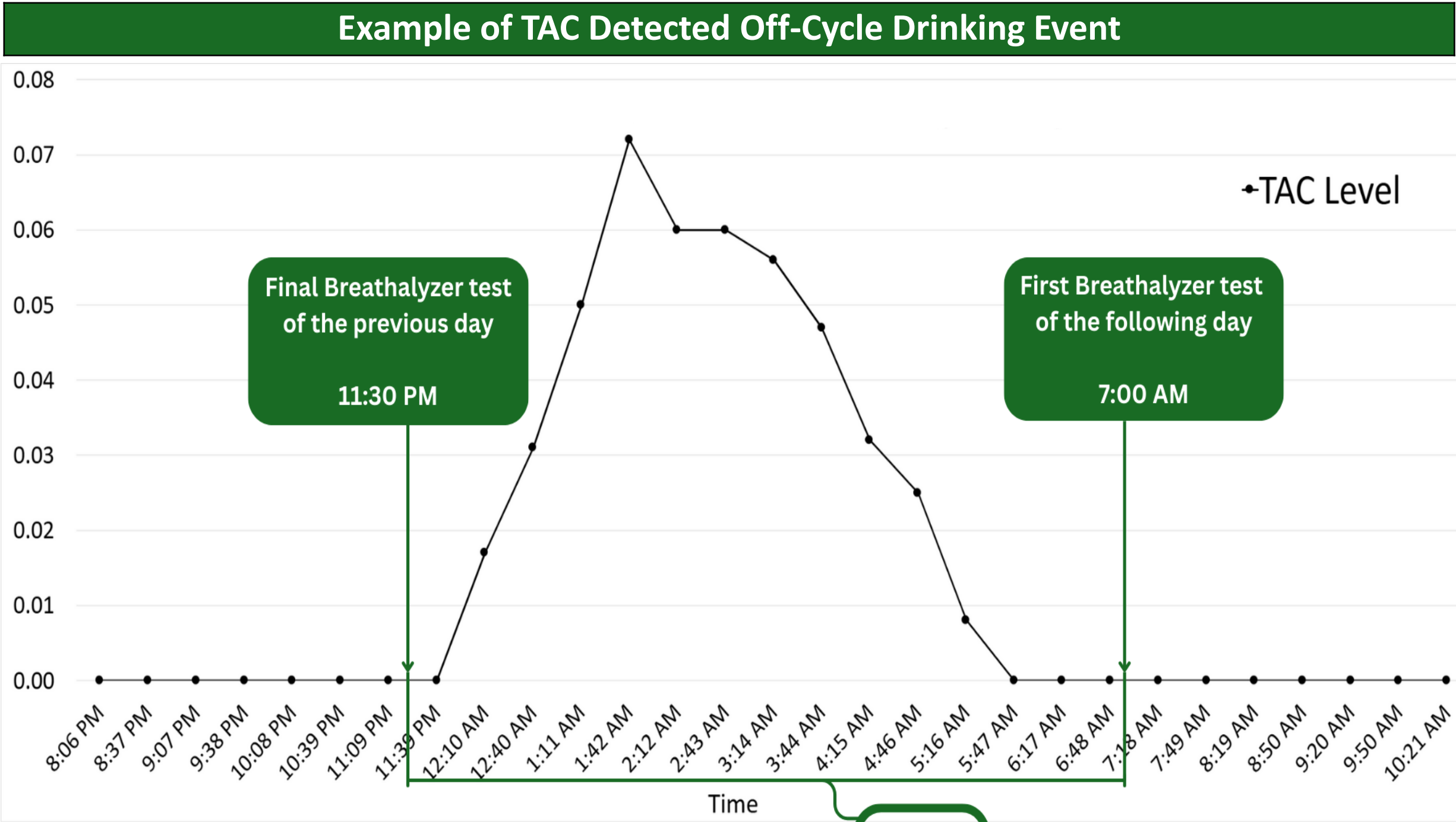
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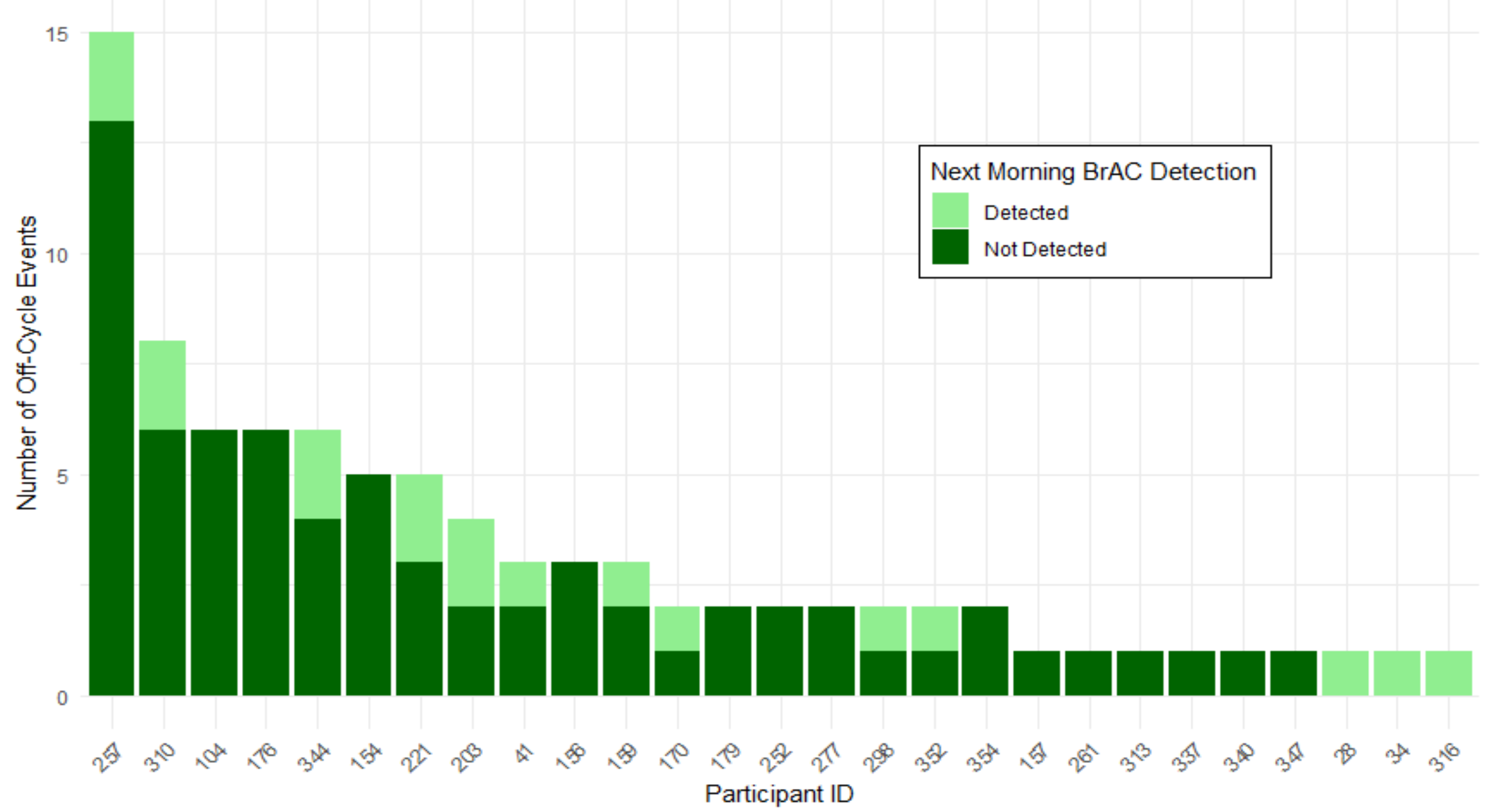
RESULTS



➤ Bar graph showing the frequency of TAC-Detected off-cycle drinking events by participant (≥1 event).

Description	Count
Total off-cycle drinking events detected by TAC readings	206
Total drinking events concurrently detected by TAC and BrAC readings	136
Participants with at least one drinking event that began during the off-cycle	26
Total number of days observed	1085
Total number of participants	40

Next Morning BrAC Detection Following Off-Cycle Drinking & Prior Compliant Evening BrAC Test



➤ Stacked bar graph showing TAC-detected off-cycle drinking events by participant (≥1 event). Color differentiation show next-morning BrAC outcome (compliant vs. noncompliant).

Description	Count
Total TAC-detected off-cycle drinking events following a compliant evening test	104
Total off-cycle events with compliant BrAC test the next morning	77
Total off-cycle events with non-compliant BrAC test the next morning	27