



# Objective, Continuous Field Measurement of Alcohol for Event-Level, Population, and Policy Research

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SCHOOL OF  
**PUBLIC HEALTH**

UNIVERSITY OF MINNESOTA

As required by the Alcohol Policy 18 Conference,  
I/we have signed a disclosure statement and note the  
following conflict(s) of interest:

None



WEDNESDAY - FRIDAY  
APRIL 11-13, 2018

RENAISSANCE ARLINGTON CAPITAL VIEW HOTEL  
WASHINGTON, DC NATIONAL CAPITAL AREA - USA

# Collaborators and Funding

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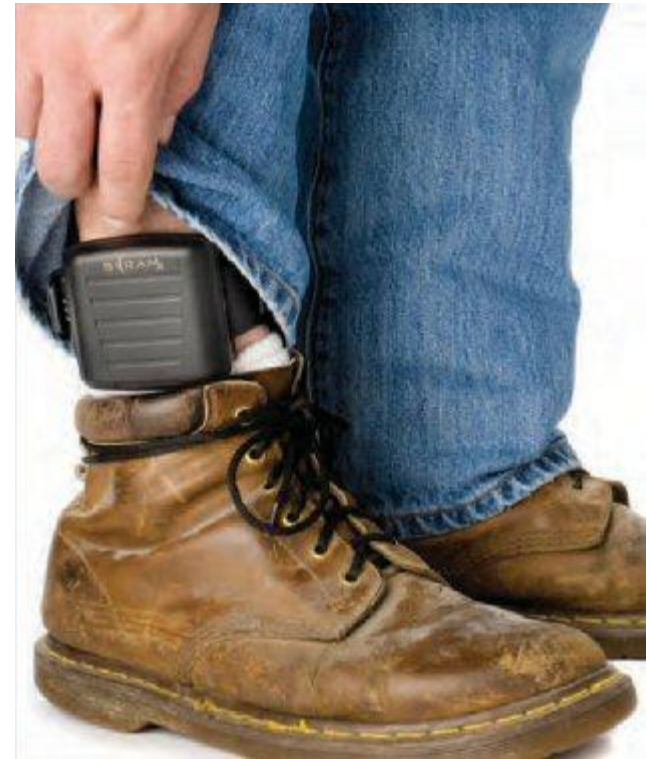
Funded by the National Institute on Alcohol Abuse and Alcoholism (1R34AA023611-01) Development of an Alcohol Risk Management Program for College Fraternities (T. Nelson, PI)

The content of this presentation does not necessarily represent the views of the National Institute of Alcohol Abuse and Alcoholism or the National Institutes of Health.

# TOGA Project Aims



- **Aim 1** Develop a training program to adopt and implement effective and feasible policies and procedures to reduce alcohol-related risks at Fraternity parties.
- **Aim 2** Pilot test the training program and evaluation methods.



Source: Midwest Monitoring & Surveillance, Inc.  
Burnsville, MN  
<http://www.midwestmonitoring.com/>

# Feasibility Study

- Candidate evaluation method
- Convenience sample of fraternity members
  - n=45
  - 3 fraternities
  - 2 Universities
- 7-day field study
- Data collection 30 minute intervals
- 2 subjects did not complete the 7 day protocol (96% compliance)

# Data points

- 13,622 total measurements
- For each subject
  - 316.8 measurements
  - 6 ½ days
- 5 variables
  - Date
  - Time
  - Transdermal Alcohol Concentration (TAC)
  - IR Voltage
  - Temperature
- 1,665 non-zero alcohol events (12.2%)



# Client Report

## 1/29/2017 - 2/7/2017

**Client:** 2799, Participant  
**Case Number:** 2799  
**Date of Birth:** 1/1/2000

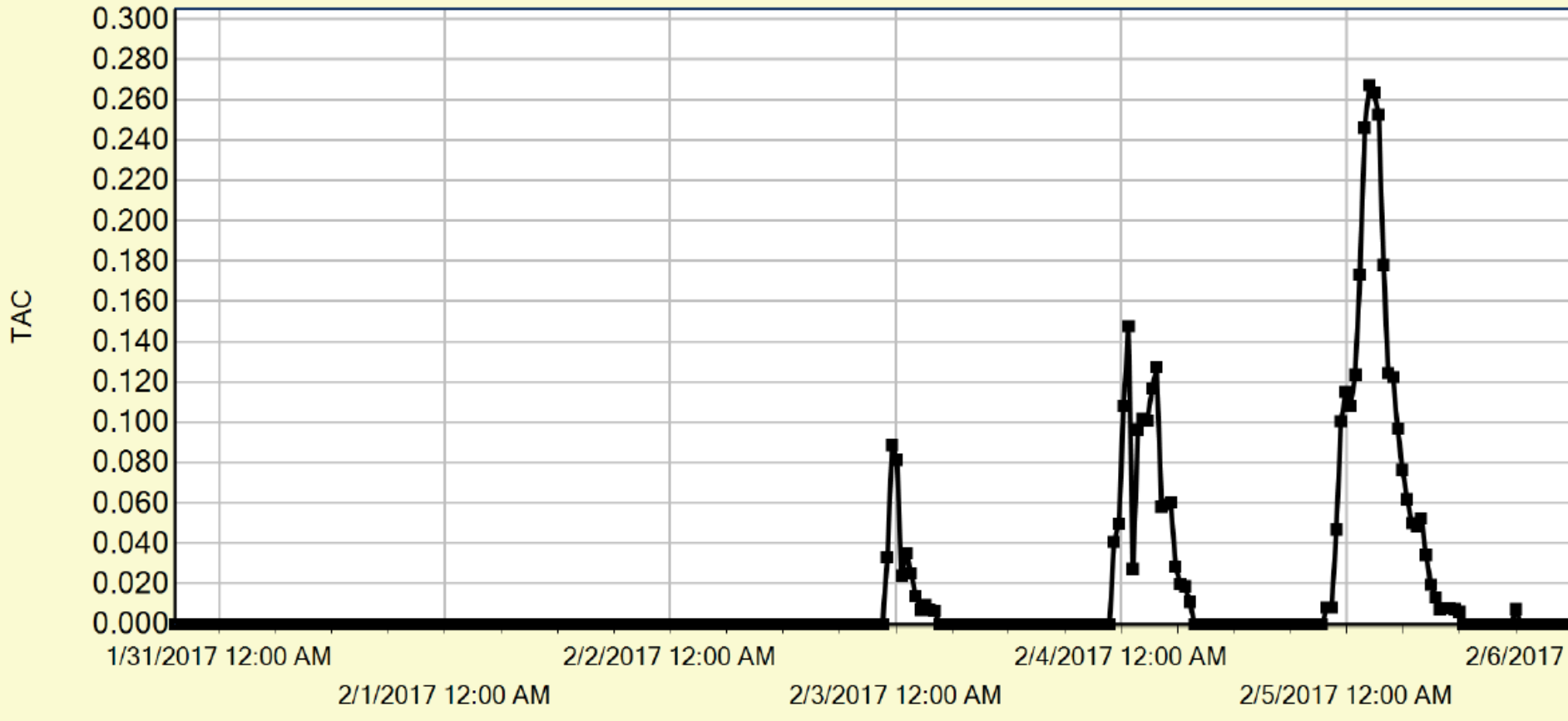
**Agency:** College Fraternity Study  
**Agent:** Agent, Mankato  
**Court:** Blue Earth County District Court

### Readings

TAC Level	IR Voltage	Temperature	Time	Date
0.000	0.906	87.082	12:07 AM	2/2/2017
0.000	0.906	85.222	12:38 AM	2/2/2017
0.000	0.906	88.754	1:09 AM	2/2/2017
0.000	0.906	91.544	1:39 AM	2/2/2017
0.000	0.906	98.049	2:09 AM	2/2/2017
0.000	0.906	97.864	2:40 AM	2/2/2017
0.000	0.906	97.864	3:10 AM	2/2/2017
0.000	0.906	97.677	3:40 AM	2/2/2017

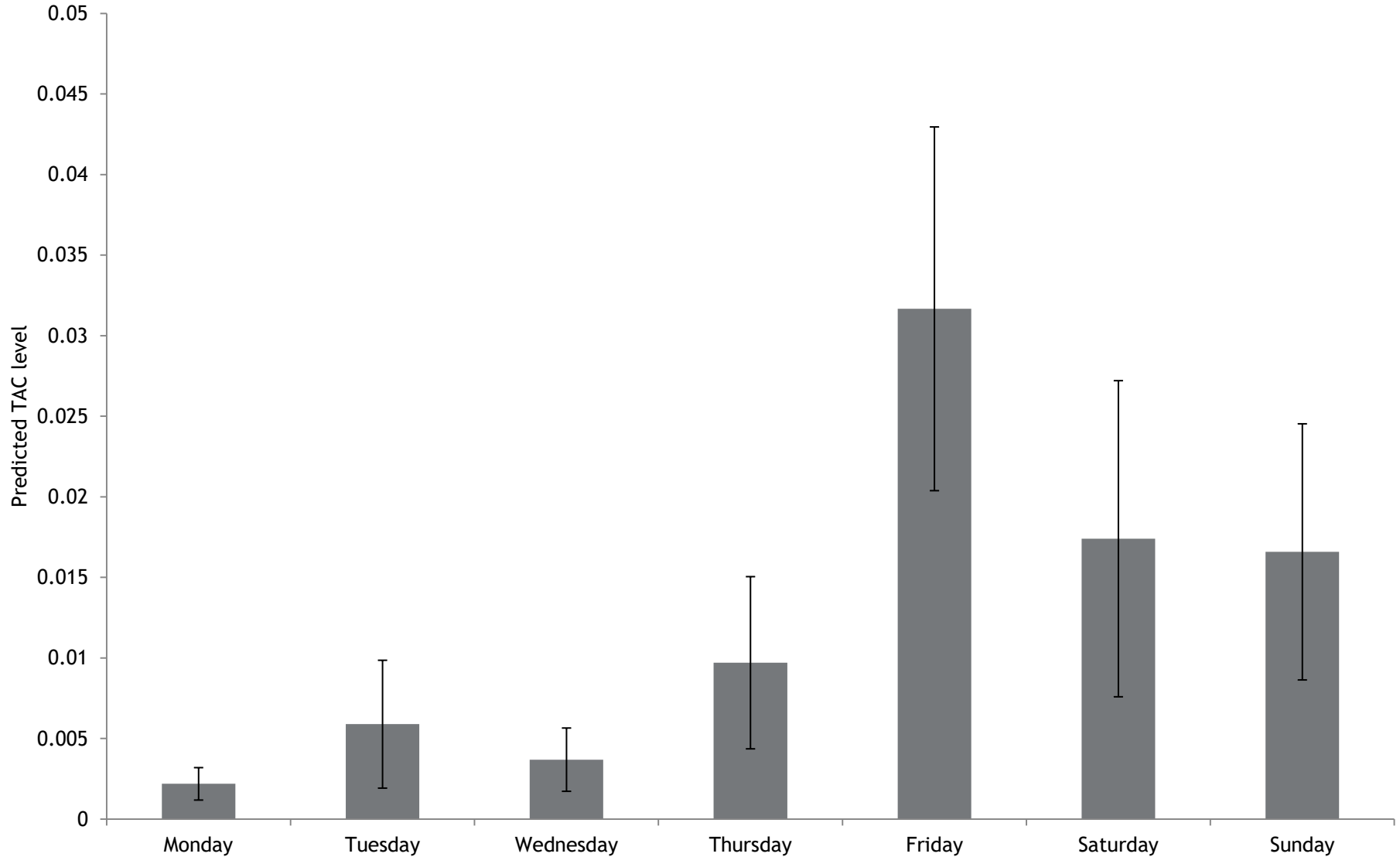


# TAC Data over time

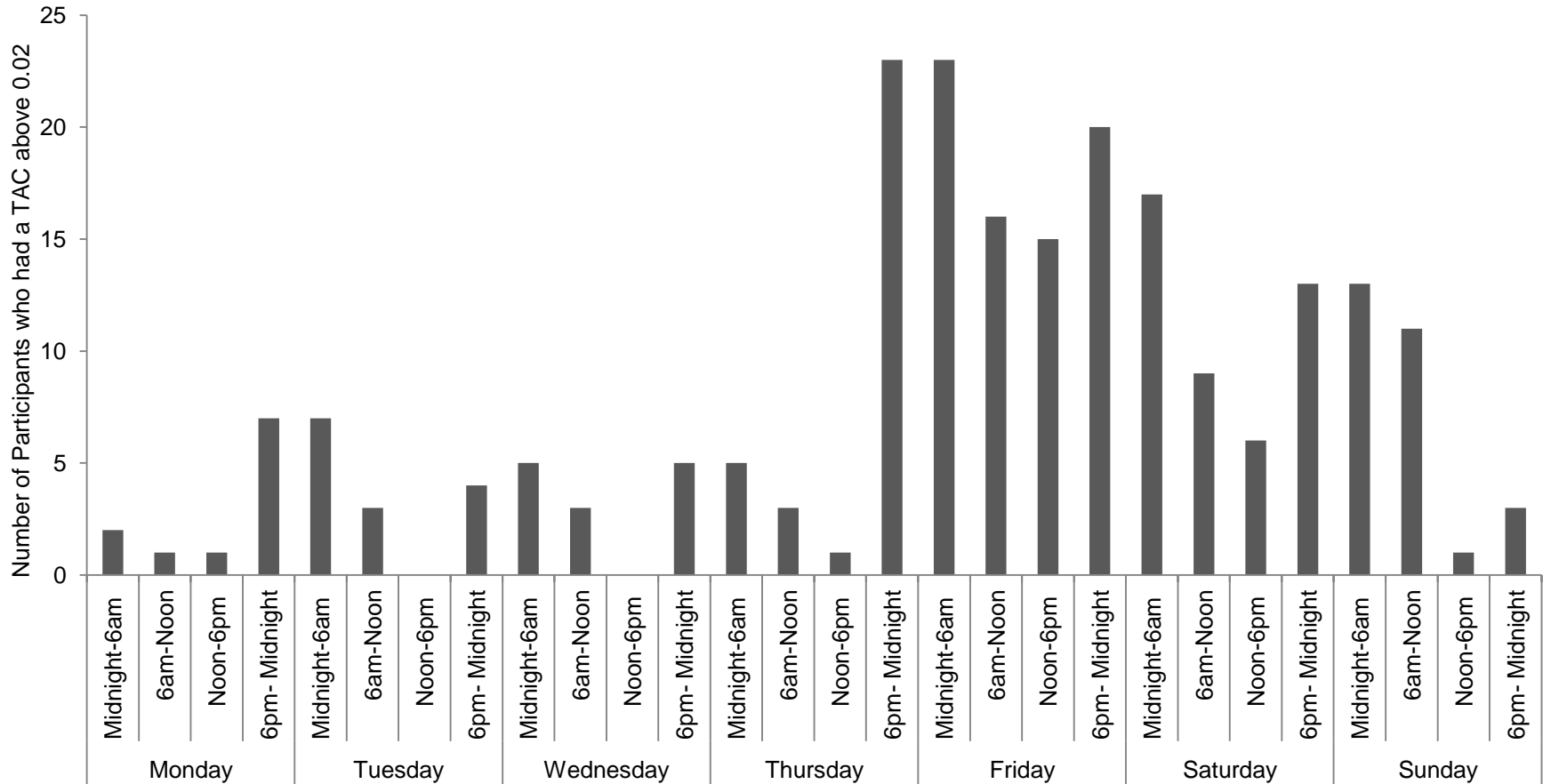


What variables are meaningful?

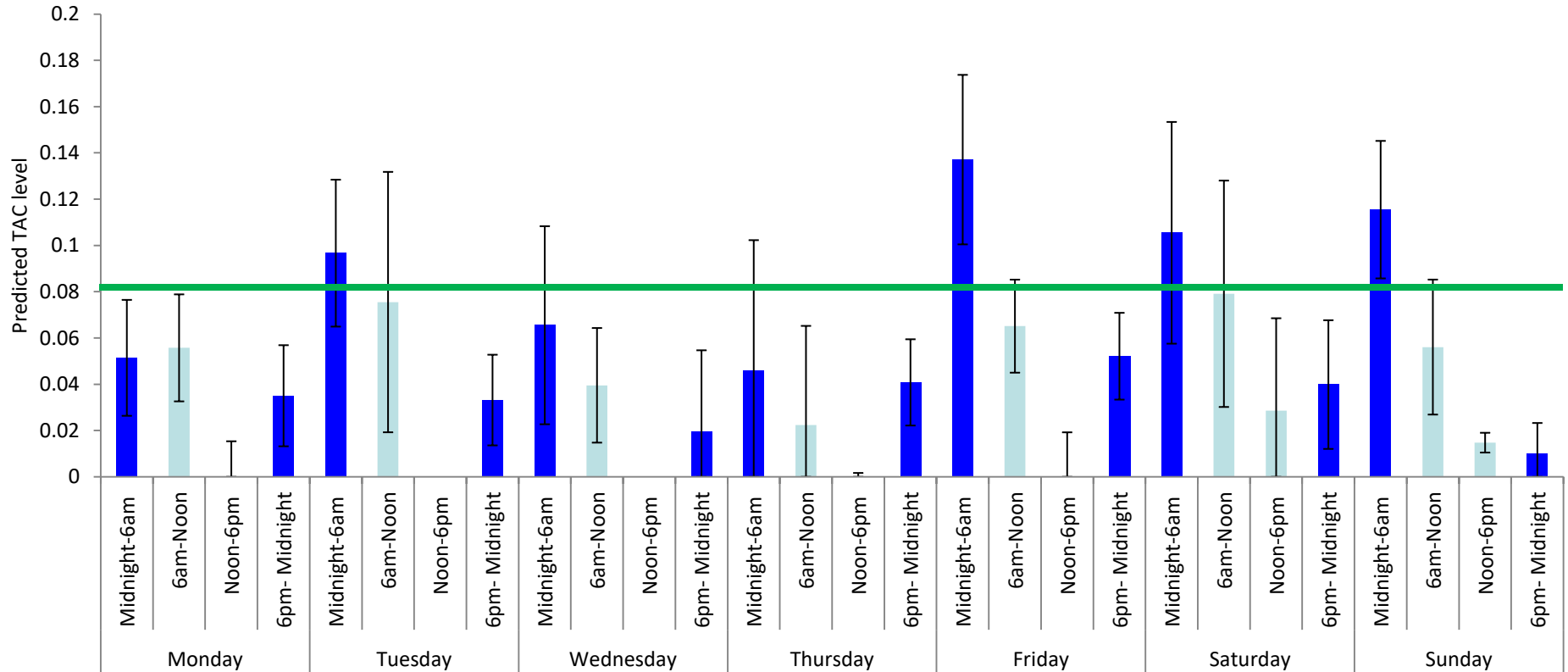
# Predicted mean TAC level by Day of the Week



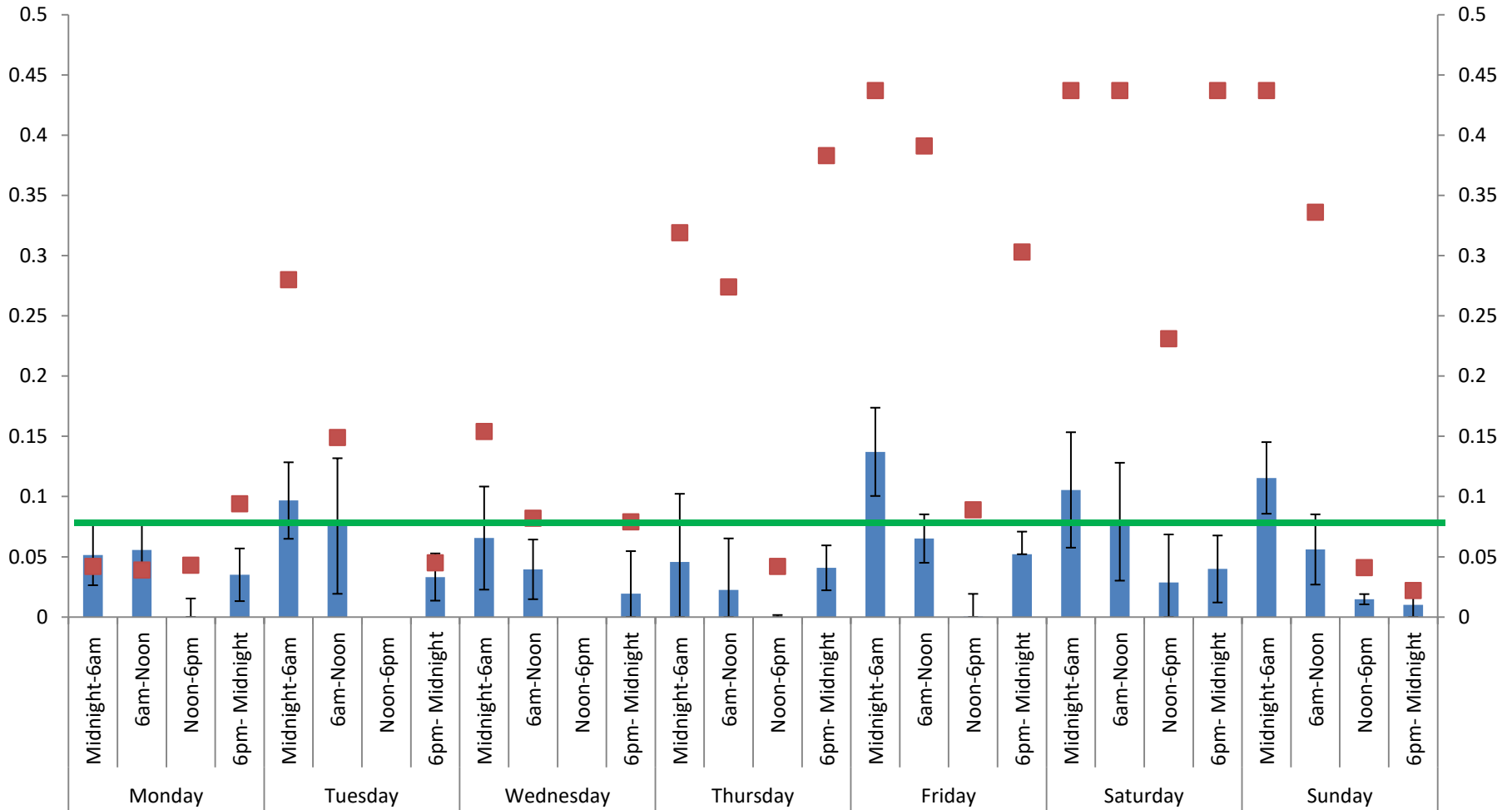
# Number of Participants with non-zero TAC by Day and Time



# Predicted mean TAC among those who Drank Alcohol by Day and Time



# Predicted and Peak TAC among those who Drank Alcohol by Day and Time



# Things We Learned About Fraternity Drinking

- Alcohol consumption is dynamic
- Most are not drinking at any given time
- Most drinking happens Thurs - Sat
- Most drinking happens at night
- Peak TAC  $> 0.08$  every night Mon-Sat
- TAC detectable hours after usual drinking times (morning)

# Things We Learned About Collecting TAC data

- Resource intensive to collect
- Lots of data
- Interpretation is challenging
- Need to construct meaningful variables
- Current measurement methods serve judicial (not research) purposes
- TAC  $\neq$  BAC
- Subjects were very aware of data collection (Hawthorne effect)



# Commentary on TAC data collection

- Trade offs
  - Gaining objective, continuous, precise data
  - New challenges with data management, analysis, standardization, methods
  - Lag
  - Scientists cede some control to companies
- Studies may need to be small and address discrete scientific questions
- Population and policy studies may be poor matches
- May be more challenges moving to wrist worn devices
- Extensive validation will be necessary
- Resist throwing out existing measures/methods



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