Exploring the Relationship Between Multiple Indoor Air Pollutants and Sleep Quality

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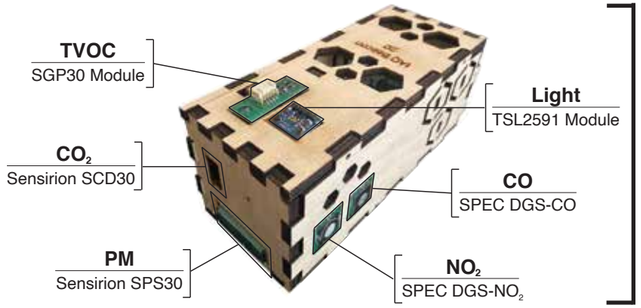
Motivation

Discover relationship between IAQ and sleep quality

Determine if relationship varies depending on how sleep is measured

Methods



Deployed: 26

Period: 06/15 - 09/01

BEVO Beacon: IAQ Monitor

Activity Tracking
Passively monitors activity

Sleep Tracking
Sleep periods/stages estimated by heart rate/movement

Deployed: 48

Period: 06/10 - 09/01

Fitbit Inspire HR: Sleep Monitor

Results

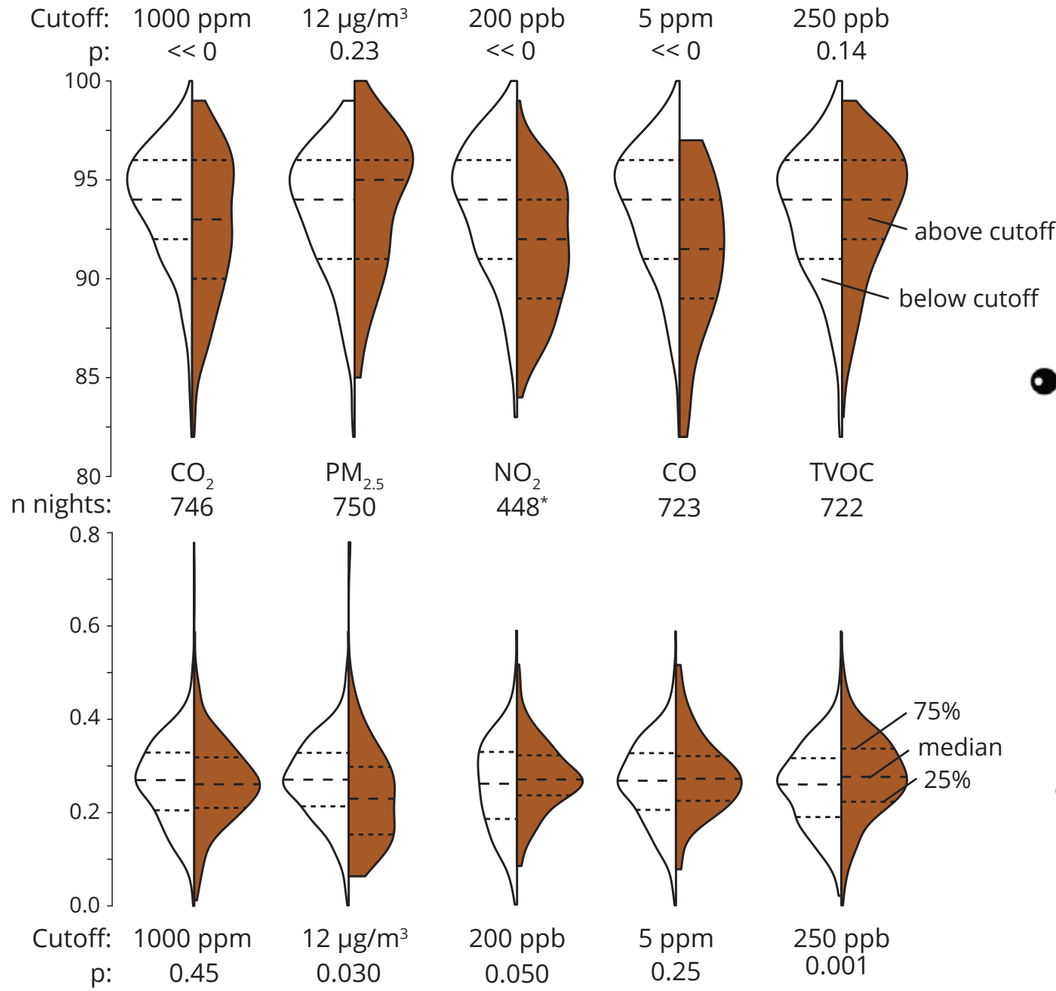


Figure 1. Differences in Fitbit sleep metrics on evenings when median pollutant concentrations were above/below specified cutoff.

*Only 15 of the 26 beacons had NO_2 sensors

Sleep Efficiency

- 85% is typical
- NO_2 has greatest effect (-)

REM:nREM

- Fitbit-measured REM : Light+Deep
- 0.2 - 0.25 is typical
- CO_2 has negligible effect

Key Points

Holistic view makes finding confounding variables easier

Outcome varies with self-report sleep quality

NO_2/TVOCs as important as CO_2/$PM_{2.5}$

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