

Dose-response relationships of binge drinking, cannabis, inhaled nitrites (poppers), and methamphetamine with risky sex and viral load among men who have sex with men in Los Angeles

Kodi B. Arfer, Brendan Quinn, and Steve Shoptaw

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Background

- Drug use is thought to contribute to risky sex and poor HIV management.
- Binge drinking and cannabis haven't received as much attention as methamphetamine and nitrites.
- If there are associations, do these associations show a dose-response pattern?

Data

- The mSTUDY is an ongoing longitudinal study (since 2014) of MSM in Los Angeles
 - who are HIV+ (and prescribed ARVs) or at risk
 - but who don't use injection drugs.
- We used 1,319 observations of 482 men (51% HIV+).
 - The 4 men who seroconverted were omitted.
- Predictors:
 - race; age; time between observations
 - self-reported frequency (in the past 6 months) of
 - binge drinking (6+ drinks)
 - cannabis, nitrites, and methamphetamine use
- DVs:
 - any self-reported risky sex (in the past 3 months)
 - detectable viral load (≥ 20 copies / mL)

Data: frequency options

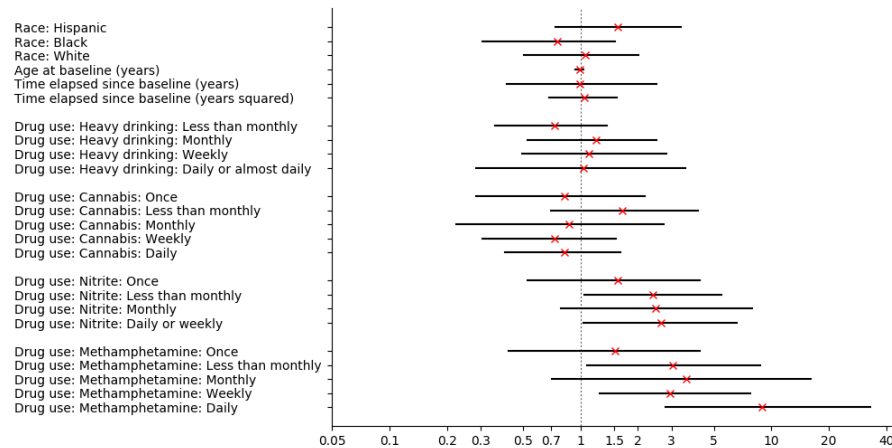
- Subjects could choose these frequency options (in the past 6 months) for each drug:
 1. never
 2. once
 3. less than monthly
 4. monthly
 5. weekly
 6. daily
- Exceptions for binge drinking:
 - no "once"
 - "daily" replaced with "daily or almost daily"

Analysis

- We fit three models, varying by DV and subsample:
 1. risky sex among HIV- men (650 observations)
 2. risky sex among HIV+ men (669 observations)
 3. detectable viral load among HIV+ men (669 obs.)
- Each model used logistic regression and had a per-subject random intercept.
- Each frequency of drug use gets a dummy variable.
 - No use is the reference category.
- There were 24 fixed effects in total.

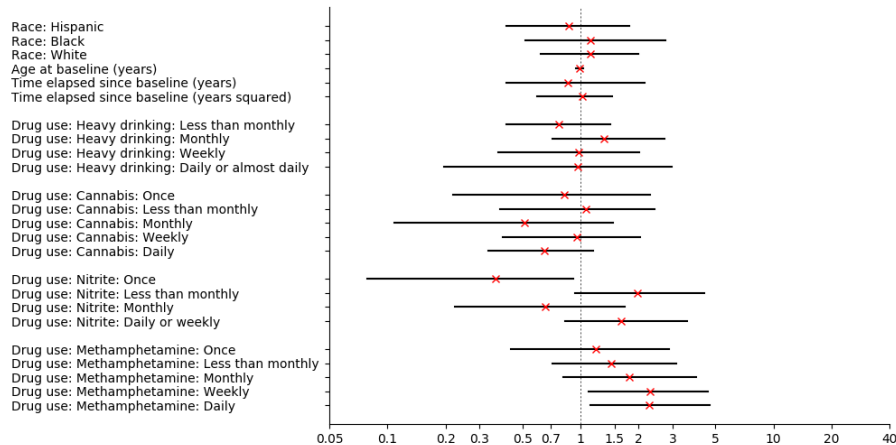
Results: odds ratios: risky sex, HIV-

- Binge drinking: all near 1
- Cannabis: "less than monthly" at 1.7; others near 1
- Nitrites: "once" at 1.6; others near 2.4
- Methamphetamine: increasing with frequency from 1.5 for "once" to 9.0 for "daily"



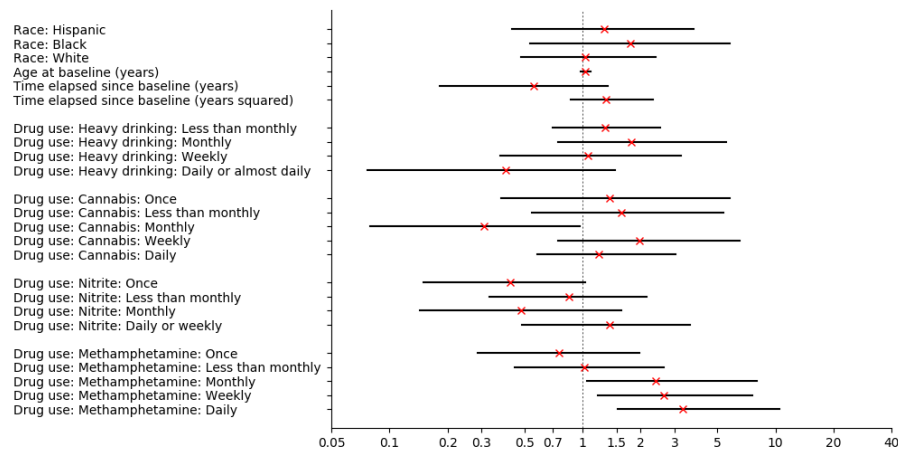
Results: odds ratios: risky sex, HIV+

- Binge drinking: all near 1
- Cannabis: "monthly" at 0.5; others near 1
- Nitrites: inconsistent ("less than monthly" at 2.0, "once" at 0.4)
- Methamphetamine: increasing from 1.2 for "once" to 2.29 for "weekly"



Results: odds ratios: detectable viral load, HIV+

- Binge drinking: inconsistent ("monthly" at 1.8, "daily" at 0.4)
- Cannabis: inconsistent ("monthly" at 0.3; "weekly" at 2.0)
- Nitrites: inconsistent (two near 0.5; one at 1.4)
- Methamphetamine: increasing from 0.8 for "once" to 3.3 for "daily"



Summary

- Methamphetamine is bad news, and the only drug with clear evidence of a monotonic dose-response relationship.
 - The biggest effect is the 9× increase in odds of risky sex among HIV– men with daily use.
- Binge drinking has the weakest effects.
- Cannabis and nitrites have inconsistent effects at different levels
 - except for a consistent association of nitrite with risky sex among HIV– men.

Conclusions

- These results provide some support for the practice of measuring drug use dichotomously, except for methamphetamine.
- The association of methamphetamine with detectable viral load is worth further study.
 - Do methamphetamine users have more trouble taking ARVs?
 - Does methamphetamine reduce the efficacy of ARVs?