# Internalized HIV Stigma and Mental Health/Substance Use Over Time

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## BACKGROUND

- Internalized HIV stigma (IHS) may have significant impact on people with HIV (PWH).
- Our prior work suggests associations between IHS and detectable HIV RNA levels are mediated by depression.
- Herein, we describe longitudinal changes in IHS and associations with mental health and substance use.

## METHODS

- The CFAR Network of Integrated Clinical Systems (CNICS) is a longitudinal, multisite, cohort of PWH in care who complete tablet-based patient reported outcomes assessments.
- IHS was assessed using a 4-item Likert scale response questions (low 1-5 high) at two different timepoints (T1 and T2) ~1 year apart (between 2016-2022).
- We assessed mean IHS score and as a dichotomized score at ≤2 (no stigma) vs >2 (stigma) used as primary exposures.
- We estimated adjusted rate ratios (ARR) of the association between IHS, depression, anxiety, and substance use at T1 and T2, adjusting for plausible confounders using conditional logistic regression for presence of stigma and Poisson regression for mean IHS score.
- We also fit autoregressive (AR) models with IHS parameterized as none, decreasing, constant, or increasing stigma (≤2 to >2) from T1 to T2.

## RESULTS

- 6123 PWH had complete IHS and outcome data at T1 and T2.
- 19% were cisgender women, 44% gay/lesbian identity; and mean age 50 years (±12 years) and years in care 3 (± 1).
- Mean IHS was 2.01 at T1 and 1.93 at T2.

**>30% of PWH reported experiencing internalized HIV stigma (IHS)** across repeated measures,

which was **consistently associated with depression, anxiety and substance use.**

**Table: Longitudinal associations between internalized HIV stigma (IHS) and substance use and mental health outcomes in different models (N=6123 for all models)**

| | Conditional Logistic Regression | Poisson Regression | Autoregression | |
|---|---|---|---|---|
| | Stigma > 2 | Stigma score | Stigma Change T1 –> T2 | |
| **Outcome** | ARR (95% CI) | ARR (95% CI) | (REF= No stigma T1 or T2) | ARR (95% CI) |
| **Depression** | 1.60 (1.39, 1.85) | 1.36 (1.27, 1.45) | Decreased | 1.19 (1.02, 1.41) |
| | | | Stayed high T1 & T2 | 1.88 (1.58, 2.23) |
| | | | Increased | 2.02 (1.72, 2.36) |
| **Anxiety attack past 4 weeks** | 1.34 (1.19, 1.50) | 1.23 (1.16, 1.29) | Decreased | 1.02 (0.90, 1.14) |
| | | | Stayed high T1 & T2 | 1.41 (1.24, 1.60) |
| | | | Increased | 1.47 (1.31, 1.64) |
| **Methamphetamine use** | 1.35 (1.12, 1.62) | 1.22 (1.11, 1.34) | Decreased | 0.88 (0.73, 1.06) |
| | | | Stayed high T1 & T2 | 1.10 (0.90, 1.35) |
| | | | Increased | 1.26 (1.06, 1.50) |
| **Cocaine/crack use** | 1.13 (0.89, 1.44) | 1.12 (0.99, 1.28) | Decreased | 0.93 (0.73, 1.18) |
| | | | Stayed high T1 & T2 | 1.20 (0.93, 1.54) |
| | | | Increased | 1.28 (1.02, 1.60) |
| **Opioid use** | 1.50 (1.04, 2.16) | 1.23 (1.03, 1.46) | Decreased | 1.25 (0.86, 1.82) |
| | | | Stayed high T1 & T2 | 1.19 (0.75, 1.90) |
| | | | Increased | 1.48 (1.01, 2.16) |
| **Binge alcohol consumption** | 1.32 (1.12, 1.55) | 1.20 (1.10, 1.30) | Decreased | 0.88 (0.75, 1.03) |
| | | | Stayed high T1 & T2 | 1.03 (0.85, 1.25) |
| | | | Increased | 1.16 (0.99, 1.36) |
| **At risk alcohol use** | 1.15 (1.01, 1.31) | 1.10 (1.03, 1.18) | Decreased | 0.98 (0.86, 1.12) |
| | | | Stayed high T1 & T2 | 1.24 (1.07, 1.45) |
| | | | Increased | 1.17 (1.03, 1.33) |

**All models adjusted for age and years in care, autoregression models also adjusted for outcome at T1**

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## RESULTS

- From T1 to T2, 2248 (37%) PWH had IHS score ≤ 2 (i.e., no stigma) and 694 (11%) had IHS >2 with no change in IHS, while 1737 (28%) had a decrease and 1444 (24%) had an increase in IHS score.
- Compared to those with no IHS at T1 and T2, PWH whose IHS changed or stayed high were in care for fewer years and were more likely to report heterosexual or bisexual than gay/lesbian identity.
- Those with a decrease in IHS were more likely to be female and younger.
- IHS was significantly associated with depression and recent anxiety attacks, methamphetamine and opioid use, and binge and at-risk alcohol consumption assessed dichotomously (Table).
- Associations remained consistent for those reporting an increase in IHS compared to those with no IHS at either T1 or T2.
- IHS >2 at both timepoints was associated with increased risk of depression and anxiety compared to no IHS.

## CONCLUSIONS

- IHS affects a large proportion of PWH under care in the US.
- We observed >30% prevalence of IHS at any timepoint, with consistent and concerning associations between IHS and depression, anxiety and substance use among PWH.
- There is a need for further causal inference analyses and future studies to support directionality of these associations and inform actionable interventions.

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