

Agreement between self-reported illicit drug use and biological samples: a systematic review and meta-analysis

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Introduction: Studies often rely on self-report and biological testing methods for measuring illicit drug use, yet evidence for their agreement is limited. We comprehensively examined the evidence for agreement between self-reported and biologically measured illicit drug use across all major illicit drug classes, biological indicators, populations, and settings.

Method: We systematically searched peer-reviewed databases and grey literature. Included studies reported 2x2 table counts or agreement estimates comparing self-reported and biologically measured use published up to March 2022. Using random effect regression models and with biological results considered the reference standard, we evaluated pooled estimates for overall agreement (primary outcome), sensitivity, specificity, false omission rates and false discovery rates by drug class, potential consequences attached to self-report (i.e., work, legal or treatment impacts), and timeframe of use.

Key Findings: From 7,924 studies, there were 207 eligible studies. Overall agreement ranged from good to excellent (>0.79). False omission rates were generally low while false discovery rates varied by setting. Specificity was generally high but sensitivity varied. Self-report in clinical trials and situations of no consequences was generally reliable. For urine, recent (i.e., past 1-4 days) self-report produced lower sensitivity and false discovery rates than past month. Agreement was higher in studies that informed participants biological testing would occur (DOR: 2.9, 95% CI: 1.2-6.9). The main source of bias was biological assessments (51% studies).

Discussions and Conclusions: While there are limitations associated with self-report and biological measures of drug use, overall agreement was high, suggesting both provide good measures of illicit drug use.

Implications for Practice or Policy: These data provide robust estimates of how and when self-report and biological samples are reliable measures of drug use, and further evidence to inform clinical guidelines for drug testing, the design of future research studies, and related health policy decisions.

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